

3.14 Climate Change

This section of the EIR uses data from other sections and from documents that the County has prepared to quantitatively analyze how implementation of the proposed Castro Valley General Plan may contribute to global climate change through greenhouse gas emissions.

ENVIRONMENTAL SETTING

PHYSICAL SETTING

Global Climate Change

Global climate change (GCC) is currently one of the most important and widely debated scientific, economic, and political issues in the United States. GCC refers to a change in the average weather of the earth that may be measured by wind patterns, storms, precipitation, and temperature. The baseline by which these changes are measured originates in historical records identifying temperature changes that have occurred in the distant past, such as during previous ice ages. The rate of temperature change has typically been incremental, with warming and cooling occurring over the course of thousands of years. In the past 10,000 years the earth has experienced incremental warming as glaciers retreated across the globe. However, scientists have observed an unprecedented increase in the rate of warming over the past 150 years, roughly coinciding with the global industrial revolution.

The world's leading climate scientists—the Intergovernmental Panel on Climate Change (IPCC)¹—have reached consensus that global climate change is very likely caused by humans, and that hotter temperatures and rising sea levels will continue for centuries no matter how much humans control their future emissions. In particular, human influences have:

- very likely contributed to sea level rise during the latter half of the 20th century;
- likely contributed to changes in wind patterns, affecting extra-tropical storm tracks and temperature patterns;
- likely increased temperatures of extreme hot nights, cold nights and cold days;
- more likely than not increased risk of heat waves, area affected by drought since the 1970s, and frequency of heavy precipitation events.²

The IPCC predicts that global mean temperature increase from 1990-2100 could range from 2.0 to 11.5 degrees Fahrenheit, with the most likely scenario between 3.2 and 7.1 degrees. The same

¹ The Intergovernmental Panel on Climate Change is a scientific intergovernmental body set up by the World Meteorological Organization and by the United Nations Environment Programme. Its role is to assess on a comprehensive, objective, open and transparent basis the latest scientific, technical and socio-economic literature produced worldwide relevant to the understanding of the risk of human-induced climate change, its observed and projected impacts, and options for adaptation and mitigation.

² Intergovernmental Panel on Climate Change, November 2007.

report projects a sea level rise of seven to 23 inches by the end of the century, with a greater rise possible depending on the rate of polar ice sheet melting.

A 2009 report from the Climate Action Team headed by the California Natural Resources Agency states that climate change is already affecting California. Increased average temperatures, a longer growing season and changes in the water cycle have caused an increase in sea levels, increasing erosion, and pressure on the state's infrastructure, water supplies. Accelerating GCC has the potential to cause a number of adverse impacts in California, including but not limited to: a shrinking Sierra snowpack that would threaten the state's water supply; public health threats caused by higher temperatures and more smog; damage to agriculture and forests due to reduced water storage capacity, rising temperatures, increasing salt water intrusion, flooding, and pest infestations; critical habitat modification and destruction; eroding coastlines; increased wildfire risk; and increased electricity demand. (California Natural Resources Agency, December 2009) These impacts have and will continue to have considerable costs associated with them.

While all of these impacts may be felt to some extent in the Bay Area generally and Castro Valley specifically, of particular concern are high temperatures and the negative impacts on air quality, and water quality and water supply issues. Recent studies indicate that hot days correlate with poor air quality days, and air pollution is contributing to more annual deaths and cases of respiratory illness and asthma (Jacobson, 2008). In other areas of the Bay Area, sea level rise and the resulting potential for intermittent flooding and gradual inundation is a concern that must be addressed.

Greenhouse Gases

Gases that trap heat in the Earth's atmosphere are called greenhouse gases (GHGs). These gases play a critical role in determining the Earth's surface temperature. Part of the solar radiation that enters Earth's atmosphere from space is absorbed by the Earth's surface. The Earth reflects this radiation back toward space, but GHGs absorb some of the radiation. As a result, radiation that otherwise would have escaped back into space is retained, resulting in a warming of the atmosphere. Without natural GHGs, the Earth's surface would be about 61°F cooler. (CCAT, April 2006) This phenomenon is known as the greenhouse effect. However, many scientists believe that emissions from human activities—such as electricity generation, vehicle emissions, and even farming and forestry practices—have elevated the concentration of GHGs in the atmosphere beyond naturally-occurring concentrations, contributing to the larger process of global climate change. The six primary GHGs are:

- Carbon dioxide (CO₂), emitted as a result of fossil fuel combustion, with contributions from cement manufacture;
- Methane (CH₄), produced through the anaerobic decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion;
- Nitrous oxide (N₂O), typically generated as a result of soil cultivation practices, particularly the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning;
- Hydrofluorocarbons (HFCs), primarily used as refrigerants;

- Perfluorocarbons (PFCs), originally introduced as alternatives to ozone depleting substances and typically emitted as by-products of industrial and manufacturing processes; and
- Sulfur hexafluoride (SF₆), primarily used in electrical transmission and distribution systems.

There are other gases, such as diesel particulate matter, that can contribute to global warming but California law identifies these six as being of primary concern. GHGs have varying potentials to trap heat in the atmosphere, known as global warming potential (GWP), and atmospheric lifetimes. GWP ranges from 1 (carbon dioxide) to 23,900 (sulfur hexafluoride). GHG emissions with a higher GWP have a greater global warming effect on a molecule-by-molecule basis. According to the California Climate Action Registry³, one ton of CH₄ has the same contribution to the greenhouse effect as approximately 21 tons of CO₂.⁴ GWP is alternatively described as “carbon dioxide equivalents”, or CO₂e. The parameter “atmospheric lifetime” describes how long it takes to restore the system to equilibrium following an increase in the concentration of a GHG in the atmosphere. Atmospheric lifetimes of GHGs range from tens to thousands of years.

California and Bay Area GHG Emissions

GHG emissions contributing to GCC are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors.⁵ The State of California alone produces about 2 percent of the entire world’s GHG emissions, with major sources here including fossil fuel consumption from transportation (41 percent), industry (23 percent), electricity production (20 percent), and agricultural and forestry (8 percent). Like many nations around the world, California government is looking at options and opportunities for drastically reducing GHG emissions with the hope of thereby delaying, mitigating, or preventing at least some of the anticipated impacts of GCC on California communities.

In 2008, the Bay Area Air Quality Management District (BAAQMD) completed a baseline inventory of GHG emissions for the year 2007. According to that inventory, 102 million tons of CO₂e were emitted in the Bay Area that year.⁶ Table 3.14-1 shows the emissions breakdown by pollutant.

³ The Climate Action Registry is a private non-profit organization that was originally established by the State of California, which serves as a voluntary greenhouse gas (GHG) registry to protect and promote early actions to reduce GHG emissions by organizations.

⁴ California Climate Action Registry, 2008.

⁵ California Energy Commission, 2006.

⁶ Bay Area Air Quality Management District, 2008.

Table 3.14-1: 2007 Bay Area CO₂e Emissions by Pollutant

<i>Pollutant</i>	<i>Percentage</i>	<i>CO₂e (Million Tons/Year)</i>
Carbon Dioxide	91.4	93.7
Methane	2.4	2.5
Nitrous Oxide	2.2	2.3
HFC, PFC, SF6	3.9	4.0
Total	100.0	102.6

Source: Bay Area Air Quality Management District, 2008

The Bay Area’s transportation sector contributes 40 percent of the CO₂e GHG emissions, followed by industrial and commercial sources (34 percent), electricity and co-generation (15 percent), residential fuel usage (7 percent), off-road equipment (3 percent), and agriculture and farming (1 percent). Without changes in policies or regulations, the BAAQMD expects Bay Area GHG emissions to grow at a rate of 1.4 percent a year due to population growth and economic expansion. Economic activity variations and the fraction of electric power generation in the region will cause year-to-year fluctuations in the emissions trends. Alameda County is one of several cities and counties in the Bay Area that has developed or is in the processing of completing a climate/GHG reduction action plan and inventory.

Alameda County GHG Emissions

In 2008, Alameda County completed a baseline inventory of GHG emissions for the year 2005. (Alameda County, 2010) Table 3.14-2 shows the unincorporated County’s total greenhouse gas emissions from the major sectors for the year 2005. The unincorporated portions of Alameda County are emitting approximately 930,000 tonnes of CO₂e emissions each year. Burning fossil fuels in vehicles and for energy use in buildings and facilities is a major contributor to the County’s greenhouse gas emissions. Fuel consumption in the transportation sector is the single largest source of emissions, contributing almost 60 percent of total emissions. The estimated emissions from transportation include trips on local roads and locally-generated highway trips but omit “pass through” trips that originate or end in other counties. The residential and commercial/industrial sectors represent emissions that result from electricity and natural gas used in buildings and facilities. Emissions from waste landfill sites and the energy use associated with water consumption represent account for 6.6 percent of the total emissions.

Table 3.14-2 Unincorporated County 2005 GHG Emissions

<i>Sector</i>	<i>Emissions (Tonnes of CO₂e)</i>	<i>Percent of Total Emissions</i>	<i>Estimated Average Emissions</i>
Transportation	556,041	59.8%	3.86 tonnes per resident and employee
Residential	179,864	19.3%	1.25 tonnes per household
Commercial/Industrial	132,768	14.3%	3.16 tonnes per employee
Waste/Water	61,366	6.6%	0.34 tonnes per resident and employee
Total	930,039	100%	

Source: Alameda County, Draft Alameda County Community Climate Action Plan, Technical Appendix A, 2010; Dyett & Bhatia, 2010

Castro Valley Emissions

The Baseline Emissions Inventory for Unincorporated Alameda County for the year 2005 can be used to estimate the emissions from residents and employees in Castro Valley. Assuming that Castro Valley residents and employees use the same average amount of energy and generate the same average amount of waste as the other residents and employees in unincorporated Alameda County, in 2005, Castro Valley's service population (i.e. residents plus employees) would have generated about 402,700 tonnes of CO₂e emissions as shown in Table 3.14-3.

Table 3.14-3 Castro Valley Estimated 2005 GHG Emissions

<i>Sector</i>	<i>Emissions (Tonnes of CO₂e)</i>	<i>Percent of Total Emissions</i>	<i>Estimated Average Emissions</i>
Transportation	272,643	67.7	3.86 tonnes per resident and employee
Residential	76,696	19.0	1.25 tonnes per resident
Commercial/Industrial	29,312	7.3	3.16 tonnes per employee
Waste/Water	24,015	6.0	0.34 tonnes per resident and employee
Total	402,667	100%	

Source: Alameda County, Draft Alameda County Community Climate Action Plan, Technical Appendix A, 2010; Kahn/Mortimer/Associates, 2010

Note: Average emissions for residents and workers based on ABAG Projections 2005 for Alameda County unincorporated area.

Because of Castro Valley's location within the regional transportation system, even though the planning area has less than 40 percent of the unincorporated area's service population, it accounts for about 56 percent of the County's vehicle mileage. If the average emissions from transportation are adjusted to reflect Castro Valley's larger share of mileage the estimated emissions from the planning area increases to about 447,000 tons per year. This analysis, however, assumes that the planning area's service population generates emissions at the same rate in all sectors, including transportation, as residents and employees in the entire unincorporated area.

REGULATORY SETTING

Federal Regulations

Global Change Research Act (1990)

In 1990, Congress passed and the President signed Public Law 101-606, the Global Change Research Act. The purpose of the legislation was: "...to require the establishment of a United States Global Change Research Program aimed at understanding and responding to global change, including the cumulative effects of human activities and natural processes on the environment, to promote discussions towards international protocols in global change research, and for other purposes." To that end, the Global Change Research Information Office (GCRIO) was established in 1991 (it began formal operation in 1993) to serve as a clearinghouse of information. The Act requires a report to Congress every four years on the environmental, economic, health and safety consequences of climate change; however, the first and only one of these reports to-date, the *National Assessment on Climate Change*, was not published until 2000. In February 2004, operational responsibility for GCRIO shifted to the U.S. Climate Change Science Program.

Energy Policy Act (2005)

The Energy Policy Act of 2005 seeks to reduce reliance on non-renewable energy resources and provide incentives to reduce current demand on these resources. For example, under the Act, consumers and businesses can attain federal tax credits for purchasing fuel-efficient appliances and products. Because driving fuel-efficient vehicles and installing energy-efficient appliances can provide many benefits, such as lower energy bills, increased indoor comfort, and reduced air pollution, businesses are eligible for tax credits for buying hybrid vehicles, building energy efficient buildings, and improving the energy efficiency of commercial buildings. Additionally, tax credits are given for the installation of qualified fuel cells, stationary microturbine power plants, and solar power equipment.

Energy Independence and Security Act (2007)

In December 2007, President Bush signed the Energy Independence and Security Act of 2007 to move the U.S. toward greater energy independence and security. This energy bill increases the supply of alternative fuel sources by setting a mandatory Renewable Fuel Standard (RFS) requiring fuel producers to use at least 36 billion gallons of biofuel in 2022. It also tightens the Corporate Average Fuel Economy (CAFE) standards that regulate the average fuel economy in the vehicles produced by each major automaker. The current CAFE standard for cars, set in 1984, requires manufacturers to achieve an average of 27.5 miles per gallon, while a new standard for light trucks and heavier SUVs was adopted in 2006 that would require new vehicles to achieve 24 mpg by 2011 (this standard was later challenged in court). This energy bill requires that these

standards be increased such that, by 2020, the new cars and light trucks sold each year deliver a combined fleet average of 35 miles per gallon.

Greenhouse Gas Findings (2009)

In the U.S. Supreme Court case *Massachusetts v EPA* (2007), 12 states, three cities, and 13 environmental groups filed suit that the U.S. Environmental Protection Agency (EPA) should be required to regulate carbon dioxide and other greenhouse gases as pollutants under the federal Clean Air Act. In April 2007, the U.S. Supreme Court found that the EPA has a statutory authority to formulate standards and regulations to address greenhouse gases, which it historically has not done. On December 7, 2009, the Environmental Protection Agency Administrator finalized two findings to be effective January 14, 2010. The findings are related to greenhouse gases under section 202(a) of the Clean Air Act. These findings do not themselves impose any requirements on industry or other entities.

- **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases—carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆)—in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor vehicle engines contribute to the greenhouse gas pollution, which threatens public health and welfare. (U.S. Environmental Protection Agency, 2009)

Executive Order 13154 Federal Leadership in Environmental, Energy, and Economic Performance

On October 5, 2009, President Obama issued Executive Order 13154, which instructs federal agencies to set or achieve various emissions reduction and energy and environmental benchmarks by 2015, 2020, and 2030. The order requires agencies to set GHG emissions reduction targets for 2020 within 90 days, and requires OMB to set a federal government target for 2020 within 120 days. The order also sets out required reductions in vehicle fleet petroleum use and requires increases in water and energy efficiency and in recycling and waste diversion rates. The order also mandates adoption of certain contract and procurement practices designed to promote energy and water efficiency and environmentally-preferable products.

Section 202 GHG Regulation of Cars and Light Duty Trucks

EPA and the National Highway Traffic Safety Administration (NHTSA) jointly proposed a National Program of GHG emission standards and Corporate Average Fuel Economy (CAFE) standards. The standards apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards are designed to achieve a national vehicle fleet whose emissions and fuel economy performance improves year over year. The goal is to reduce CO₂ emissions by 960 million metric tons and save 1.8 billion barrels of oil over the lifetime of the vehicles sold in model years 2012 through 2016 (US EPA, 2010). The final rule was signed on April 1, 2010 and will become effective 60 days after its publication in the Federal Register.

Renewable Fuel Standard Program

Finalized on February 3, 2010, this rule makes changes to the Renewable Fuel Standard (RFS) program, as required by the Energy Independence and Security Act of 2007. The original RFS program was designed to implement the provisions of the Energy Policy Act of 2005 (EPAct, described above). The revised statutory requirements establish new specific volume standards for cellulosic biofuel, biomass-based diesel, advanced biofuel, and total renewable fuel that must be used in transportation fuel each year. The revised statutory requirements also include new definitions and criteria for both renewable fuels and the feedstocks used to produce them, including new greenhouse gas emission thresholds for renewable fuels.

State Regulations

Assembly Bill 1493 (Chapter 200, Statutes 2002)

AB 1493 (Pavley) amended Health and Safety Code sections 42823 and 43018.5 requiring the California Air Resources Board (CARB) to develop and adopt regulations that reduce GHG emissions from passenger vehicles and light-duty trucks. CARB has estimated that these regulations would reduce GHG emissions from these light-duty vehicles 18 percent by 2020 and 27 percent by 2030. (CARB, 2004)

Executive Order S-3-05 (Gov. Schwarzenegger, June 2005)

The Governor of California signed Executive Order S-3-05 on June 1, 2005. The Order recognizes California's vulnerability to climate change, noting that increasing temperatures could potentially reduce snow pack in the Sierra Nevada, which is a primary source of the State's water supply. Additionally, according to this Order, climate change could influence human health, coastal habitats, microclimates, and agricultural yield. The Order set the greenhouse gas reduction targets for California: By 2010, reduce GHG emissions to 2000 levels; by 2020 reduce GHG emissions to 1990 levels; by 2050 reduce GHG emissions to 80 percent below 1990 levels.

State Alternative Fuels Plan (Chapter 371, Statutes of 2005)

Assembly Bill (AB) 1007, the State Alternative Fuels Plan, required the California Energy Commission (CEC) to prepare a state plan to increase the use of alternative fuels in the transportation sector in California. The CEC prepared the State Alternative Fuels Plan (Plan) in partnership with the California Air Resources Board and in consultation with the other state, federal, and local agencies. The Plan was adopted in October 2007. The Plan presents strategies and actions California must take to increase the use of alternative non-petroleum fuels in a manner that minimizes costs to California and maximizes the economic benefits of in-state production. Specific strategies include combining private capital investment, financial investment, technology advancement, investment in infrastructure, and others. The Plan also assessed various alternative fuels and developed fuel portfolios to meet California's goals to reduce petroleum consumption, increase alternative fuels use, reduce greenhouse gas emissions, and increase in-state production of biofuels without causing a significant degradation of public health and environmental quality.

California Global Warming Solutions Act of 2006 (Assembly Bill 32)

In September 2006, Governor Arnold Schwarzenegger signed AB 32, the California Climate Solutions Act (Health and Safety Code Section 38500 et. seq.). The Act requires the reduction of statewide GHG emissions to 1990 levels by the year 2020. This change, which is equivalent to a 25 percent reduction from current emission levels, will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. Reducing emissions to 1990 levels means cutting about 30 percent from the “business as usual” levels projected for 2020, or about 15 percent from today’s levels. That means reducing per capita annual emissions of carbon dioxide equivalent from the current annual rate of 14 tons to about 10 tons per person.

The Act also directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources and address GHG emissions from vehicles. The Climate Change Scoping Plan that CARB adopted in December 2008 lays out the state’s strategy for achieving the Act’s reduction goals. The scoping plan has a range of GHG reduction actions including direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 program implementation regulation to fund the program. The implementation plan regulatory requirements for stationary sources will be first applied to electricity power generation and utilities, petrochemical refining, cement manufacturing, and industrial/commercial combustion. The second group of target industries will include oil and gas production/distribution, transportation, landfills and other GHG-intensive industrial processes.

As directed by Senate Bill 97 (Chapter 185, Statutes 2007), the Office of Planning and Research prepared guidelines for feasible mitigation of GHG emissions or the effects of GHG emissions, by July 1, 2009. Appendix F of the revised CEQA guidelines adopted by the Resources Agency describes the types of information and analyses related to energy conservation that are to be included in Environmental Impact Reports (EIRs). Energy conservation is described in terms of decreasing per capita energy consumption; decreasing reliance on fossil fuels such as coal, natural gas, and oil; and increasing reliance on renewable energy sources. To assure that energy implications are considered in project decisions, EIRs must include a discussion of the potentially significant energy impacts of proposed projects (to the extent relevant and applicable to the proposed Project), with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.

Senate Bill 1368 (Chapter 598, Statutes of 2006)

Senate Bill (SB) 1368 requires the California Public Utilities Commission (PUC) to establish a GHG emissions performance standard for “baseload” generation from investor-owned utilities by February 1, 2007. The California Energy Commission (CEC) was required to establish a similar standard for local publicly-owned utilities by June 30, 2007. The legislation further required that all electricity provided to California, including imported electricity, must be generated from plants that meet or exceed the standards set by the PUC and the CEC. In January 2007, the PUC adopted an interim performance standard for new long-term commitments (1,100 pounds of CO₂ per megawatt-hour), and in May 2007, the CEC approved regulations that match the PUC standard.

Executive Order S-01-07 (Gov. Schwarzenegger, January 2007)

This Order calls for a statewide goal to be established to reduce the carbon intensity of California’s trans-

portation fuels by at least 10 percent by 2020 (“2020 Target”), and that a Low Carbon Fuel Standard (“LCFS”) for transportation fuels be established for California. Further, it directs CARB to determine if an LCFS can be adopted as a discrete early action measure pursuant to AB 32, and if so, consider the adoption of a LCFS by June 30, 2007, pursuant to Health and Safety Code Section 38560.5. The LCFS applies to all refiners, blenders, producers or importers (“Providers”) of transportation fuels in California, will be measured on a full fuels cycle basis, and may be met through market-based methods by which Providers exceeding the performance required by a LCFS shall receive credits that may be applied to future obligations or traded to Providers not meeting the LCFS. In June 2007, CARB approved the LCFS as a Discrete Early Action item under AB 32. The LCFS rulemaking package was filed with the Office of Administrative Law (OAL) on November 25, 2009. The OAL approved the LCFS rulemaking and filed with the Secretary of State on January 12, 2010.

Sustainable Communities and Climate Protection Act of 2008 (Chapter 728, Statutes 2008)

The Sustainable Communities and Climate Protection Act of 2008 (also known as Senate Bill (SB) 375) established a process for the California Air Resources Board (CARB) to implement the state’s global warming legislation (AB 32) for the transportation sector by requiring CARB to adopt regional GHG targets for emissions associated with the automobile and light truck sector. SB 375 requires MPOs such as the Metropolitan Transportation Commission (MTC) to develop a Sustainable Communities Strategy (SCS)—a new element of the regional transportation plan (RTP)—to strive to reach these GHG reduction targets. The SCS is intended to coordinate transportation and land use planning to promote changes in the development pattern for each region. Together with the transportation network and other transportation measures and policies, reduce GHG emissions from passenger vehicles to help achieve State GHG targets. SB 375 directs the California Air Resources Board (CARB) to establish passenger vehicle GHG reduction targets for 2020 and 2035 for each of the 18 Metropolitan Planning Organization (MPO) regions in California.

On June 30, 2010, CARB released proposed 2020 targets for the State’s four largest MPO regions including the San Francisco Bay area. The targets propose a five to ten percent reduction in per capita GHG emissions from 2005 levels for each region. Although CARB found that there is insufficient technical information to establish firm targets for 2035, the agency has proposed placeholder targets for each of the four largest regions. Based on the work that has already been done on the Bay Area SCS by the Metropolitan Transportation Commission (MTC), the 2035 target for this region is a 3 to 12 percent reduction in GHG levels in addition to the emission reductions expected from the Greenhouse Gas Vehicle Standards and Low Carbon Fuel Standard measures the State adopts to implement AB 1493, the Pavley bill discussed above.⁷

On September 23, 2010, CARB approved regional targets for GHG emissions that reflect a set of "Bay Area Principles for Establishing Regional Greenhouse Gas Reduction Targets" (Resolution 3970) approved by MTC in July 2010. The Bay Area targets for emissions from automobiles and light trucks are per-capita reductions of 7 percent by 2020 and 15 percent by 2035.⁸

⁷ California Air Resources Board, *Proposed Regional Greenhouse Gas Emission Reduction Targets For Automobiles and Light Trucks Pursuant to Senate Bill 375*, August 9, 2010

⁸ MTC website: http://www.mtc.ca.gov/news/current_topics/7-10/ghg.htm

California Building Code

Title 24, Part 6, of the California Code of Regulations is the California Building Code, governs all aspects of building construction. Included in Part 6 of the Code are standards mandating energy efficiency measures in new construction. Since its establishment in 1977, the building efficiency standards (along with standards for energy efficiency in appliances) have contributed to a reduction in electricity and natural gas costs in California. The standards are updated every three years to allow new energy efficiency technologies to be considered. The latest update to Title 24 standards became effective on January 1, 2007. The standards regulate energy consumed in buildings for heating, cooling, ventilation, water heating, and lighting. Title 24 is implemented through the local plan check and permit process.

CalGreen, the nation's first Green Building Standards Code, became effective in August 2009 for voluntary compliance and local adoption, and has required mandatory compliance since January 1, 2011. This Code establishes minimum standards for new construction that are intended to help the State achieve the AB 32 goal of reducing GHG emissions to 1990 levels by 2020. In addition to energy efficiency standards, CalGreen includes mandatory measures for water conservation, storm water drainage and retention, material conservation, and construction waste reduction. The requirements for nonresidential construction also include parking, landscaping, and other standards. Local jurisdictions have the option of adopting procedures by ordinance to improve the level of construction beyond the CalGreen minimum standard.⁹

California Attorney General Actions

As the chief law enforcement officer of the State, charged by the Constitution to protect the public interest and the State's natural resources, then California Attorney General Edmund G. Brown Jr. stated his commitment to do everything within his power to ensure that California meets its greenhouse gas reduction targets.¹⁰ Examples of his efforts include suing companies in the power industry and the auto industry for their contributions to global warming and writing letters or submitting oral testimony in over 30 different CEQA environmental review processes for city general plans, county general plans, regional transportation plans, and specific projects throughout California.

In the first legal action of its kind, as Attorney General Governor Brown sued San Bernardino County based on its failure to analyze increased greenhouse gas emissions that would result from adoption of the county's proposed comprehensive General Plan update. The lawsuit was significant as the first challenge to a CEQA environmental review document based on global warming claims. Furthermore, the lawsuit sought to expand the debate about addressing climate change beyond simply reducing emissions from power plants, factories, automobiles and other such sources, to addressing how land use and transportation planning decisions have climate change impacts.

⁹ Draft 2010 California Green Building Standards Code, <http://www.bsc.ca.gov/CALGreen/default.htm>

¹⁰ The Attorney General's global warming website portal at <http://ag.ca.gov/globalwarming/> has information on global warming generally, impacts in California, and documentation of the Attorney General's comments, speeches, articles, testimony, and litigation actions regarding climate change.

The matter was resolved by a settlement agreement in August 21, 2007, which suggests how other jurisdictions should deal with the climate change impacts of their general plans. The agreement required the County to: 1) prepare an inventory of all known or "reasonably discoverable" sources of greenhouse gases currently existing in the county; 2) prepare an inventory of greenhouse gas emissions in 1990 and 2007 and those projected for 2020; and 3) prepare a "Greenhouse Gas Emissions Reductions Plan" that included a reduction target for emissions attributable to the County's discretionary land use decisions and its own internal government operations, and feasible GHG emission reduction measures. Since that settlement the Attorney General has commented on several city, county, and regional transportation plan EIRs providing further guidance to local and regional agencies about how to comply with CEQA requirements applicable to climate change impacts.¹¹

Regional Regulations

The State has, to date, not imposed any requirements on local agencies to help achieve GHG emissions reductions, nor has it established official criteria for evaluating the significance of impacts on greenhouse gas emissions and global climate change under CEQA. The GHG reduction targets that the CARB has established for each region pursuant to SB 375 do, however, provide a basis for evaluating the climate change impacts of actions taken by agencies within that region. The Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC) have issued an Initial Vision Scenario that shows how growth could occur in the Bay Area in order to meet state targets for reducing GHG emissions. Additionally, the Bay Area Quality Management District (BAAQMD) has adopted guidelines for evaluating air quality and climate change impacts under CEQA that establish thresholds for determining whether projects and plans will have a potential significant impact on climate change.

ABAG and MTC

SB 375 requires that each Regional Transportation Plan contain a Sustainable Communities Strategy (SCS) that integrates land-use planning and transportation planning. For the 25-year period covered by the Regional Transportation Plan, the Sustainable Communities Strategy must identify areas within the nine-county Bay Area sufficient to house all of the region's population, including all economic segments of the population. It must also attempt to coordinate the resulting land-use pattern with the transportation network so as to reduce per capita greenhouse-gas emissions from personal-use vehicles (automobiles and light trucks). Anticipating that financial constraints will likely limit expenditures for maintenance and operation of the transportation system, MTC expects that most of the GHG reductions that can be achieved in the Bay area will result from moving toward more dense, mixed use and transit-oriented development along with the implementation of programs to price the transportation system to better reflect the true costs of transportation systems.

The ABAG-MTC Initial Vision Scenario (IVS) accommodates 97 percent of the region's new households within the existing urban footprint. Only 3 percent of the forecasted new homes require "greenfield development" (building on previously undeveloped lands). Priority Development Areas and Growth Opportunity Areas, including the area around the Castro Valley

¹¹ Attorney General EIR comment letters can be found at <http://ag.ca.gov/globalwarming/ceqa/comments.php>

BART station, contain about 70 percent of the total growth (743,000 households). The IVS assigns 24 percent of the region's new households to Alameda County, a 38.2 percent increase from 2010 to 2035. This includes a 24.6 percent increase in households in the unincorporated area of Alameda County along with a 26.5 percent increase in jobs representing 12,606 additional households and 10,744 new jobs in the unincorporated area during 2010-35. These estimates assume a 52 percent increase in households living in the transit neighborhood around the Castro Valley BART Station to about 2,000 by 2035.

MTC provides incentives to local agencies to implement these strategies through its Transportation for Livable Communities (TLC) program. The TLC program offers planning assistance and capital grants for transit-oriented development projects totaling about \$30 million per year. Other MTC programs include the Regional Bike Network (about \$20 million/yr) and Climate Change Initiative Program (about \$40 million/yr).

Bay Area Air Quality Management District

The Bay Area Air Quality Management District (BAAQMD) has adopted Air Quality Guidelines that include thresholds of significance for determining when plans, including general plans, community plans, specific plans, regional plans, congestion management plans, may have a significant impact on the environment. The updated guidelines (May 2011) employ either a GHG efficiency-based metric (per Service Population [SP]), or a GHG Reduction Strategy option. The Thresholds of Significance options for plan level GHG emissions are:

- A GHG efficiency metric of 6.6 MT per SP per year of carbon dioxide equivalent (CO₂e). If annual maximum emissions of operational-related GHGs exceed this level, the proposed plan would result in a significant impact to global climate change.
- Consistency with an adopted GHG Reduction Strategy. If a proposed plan is consistent with an adopted GHG Reduction Strategy that meets the standards described in Section 4.3, the plan would be considered to have a less than significant impact. This approach is consistent with the plan elements described in the State CEQA Guidelines, Section 15183.5.

County Regulations

In June 2006 the Alameda County Board of Supervisors established the County Climate Change Leadership Strategy. The County, along with 11 Alameda County cities, committed to becoming members of the global organization Local Governments for Sustainability (ICLEI) and participating in the Alameda County Climate Protection Project (ACCPP). In committing to the project, the participating jurisdictions embarked on an ongoing, coordinated effort to reduce the emissions that cause global warming, improve air quality, reduce waste, cut energy use and save money. In 2007, the Board of Supervisors went further and adopted a Climate Change Leadership Resolution committing the County to taking steps to reduce greenhouse gas emissions and create a cross-agency and community plan for addressing climate change.

On May 4, 2010, the Board of Supervisors adopted a Climate Action Plan for Government Services and Operations that establishes a structure for reducing emissions from the County's own activities. The Plan identifies 80 actions to reduce emissions in areas such as building energy use, transportation, employee commuting, and waste disposal.

The second part of the County's strategy for achieving its goal of a 15 percent reduction in GHG emissions by 2020 was the Board's recent approval of a Community Climate Action Plan (CAP) applicable to the County's unincorporated communities including Castro Valley. The CAP outlines a course of action to reduce GHG emissions generated within the County's unincorporated areas to 15 percent below 2005 levels by 2020. The CAP includes a variety of implementation measures that focus the County's efforts in six action areas: transportation, land use, building energy, water, waste, and green infrastructure. For each measure the CAP identifies responsible departments, establishes an implementation schedule, and specifies progress indicators and performance targets to help track implementation and measure progress toward meeting objectives. Before the County can implement the measures the CAP proposes in Castro Valley and other unincorporated areas, it will conduct environmental review of the Plan. However, where appropriate, the proposed Castro Valley Plan incorporates some of the measures that the CAP also includes. For example, the proposed Plan and the CAP both include proposals and implementation actions that would improve pedestrian safety, encourage ride-sharing, promote transit-oriented development, and facilitate mixed-use development in neighborhood commercial districts.

Once the County approves the environmental review for the Plan itself, it will be able to use the CAP to determine whether the projects it approves in the unincorporated area would have a significant impact on climate change. If the project level environmental view finds that a proposed project conflicts with the CAP, the County will have to incorporate measures to minimize its GHG emissions. If such measures are deemed not feasible, the County will have the option to adopt a statement of overriding considerations,

In addition to developing the CAP, the County has initiated several other activities to help achieve its GHG emissions reduction goals. These include the adoption of green building ordinances for County buildings and certain private development projects; the Alameda County Green Business Program; and increased use of alternative fuels for County operations.

IMPACT ANALYSIS

Significance Criteria

Based on the recent amendments to the State CEQA Guidelines and the BAAQMD Air Quality Guidelines, the adoption of the proposed Castro Valley General Plan would have a significant impact on climate change if its implementation would either:

- Cause a substantial increase in per capita or per service population energy consumption.
- Require a substantial increase in energy supply capacity or infrastructure, the construction of which could cause adverse environmental effects.
- Conflict with any existing local, regional, state, or federal standards for energy production or efficiency.
- Exceed the per service population (residents + jobs) threshold of 6.6 MT CO₂e/year.
- Conflict with existing local, regional, or state efforts to implement AB 32 or SB 375.

Methodology & Assumptions

Table 3.14-3 shows how GHG emissions in the entire unincorporated area can be anticipated to increase from 2005 to 2035 if there are no changes in the practices that result in current emission levels other than those mandated by state and Federal law such as improvements in fuel efficiency. In order to establish an effective baseline for the Community Climate Action Plan, the County adjusted the data from the ICLEI Clean Air Climate Protection (CACP) software, which did not include the emissions from vehicles traveling on state highways. The emissions projections in the draft CAP assume that 57 percent of the vehicle miles travelled (VMT) on state highways in the unincorporated area are locally-generated. Because of the large geographic area that the County includes, many of the trips on state highways are locally-generated. The GHG emissions from the transportation sector, which were originally only calculated for local roadway VMT were scaled up, therefore, to account for that portion of the locally-generated trips on state highways.¹²

Table 3.14-4: Alameda County Baseline and Projected GHG Emissions, 2005-2035

<i>Sector</i>	<i>2005</i>	<i>2020</i>	<i>2035</i>
Transportation	556,000	611,300	684,500
Tonnes/resident	3.86	3.89	4.05
Residential	179,900	197,700	217,600
Tonnes/resident	1.25	1.26	1.29
Commercial/Industrial	132,800	148,800	168,100
Tonnes/employee	3.16	2.92	3.10
Waste/Water	61,400	70,700	76,600
Tonnes/resident and employee	.34	.34	.34
Total Emissions	930,100	1,028,500	1,146,800

Source: Alameda County, Draft Alameda County Community Climate Action Plan, Technical Appendix A, 2010; Kahn/Mortimer/Associates, 2010

Note: Average emissions for residents and workers have been calculated based on ABAG Projections 2005 for Alameda County unincorporated area.

During the 20 year planning period, from 2005 to 2025, implementation of the General Plan is projected to result in an increase of about 2,400 dwelling units, a 9.5 percent increase in population from 61,400 to 67,200, and the net addition of 202,300 of non-residential floor area. The Plan also anticipates the addition of about 1,600 jobs, a 17.3 percent increase. Tables 2.4-1 through 2.4-4 in the revised Project Description of this EIR describe these changes in greater detail. These figures are only slightly higher than increases projected under the 1985 Plan (the No Project alternative). Moreover, based on ABAG projections 2005, Castro Valley's share of the population and jobs in the unincorporated area will decline from about 39 percent of the unincorporated area's service population to 36 percent.

¹² Alameda County, Draft Community Climate Action Plan, Technical Appendix A, p. 92

To determine the GHG emission reductions necessary to achieve a 15 percent reduction in 2005 emission levels, the County's CAP includes projections of emission levels for the years 2020, 2035, and 2050 under a trend scenario. The projected emissions assume a continuation of current development patterns and trends in fuel consumption without any regulatory action at the state or local level that would change the conditions that contribute to GHG emissions. Assuming that the average level of emissions for Castro Valley's residents and employees is the same as the levels shown in Table 3.14-4 for all residents and employees in unincorporated Alameda County, a similar trend scenario for Castro Valley would show an increase in total annual emissions of 10.9 percent from 402,667 metric tons of carbon dioxide equivalent in 2005 to 446,460 at build-out in 2025. (Because the CAP does not include projections for 2025, the build-out year for the proposed General Plan, the projected emissions for Castro Valley for 2025 were calculated using the projected 2020 emissions for each sector in the CAP¹³ and the ABAG 2005 projections for 2020 population and employment for the Alameda County unincorporated area.) The total annual emissions per capita for the service population would increase by less than .5 percent, however, due to the projected increase in employment.

The estimated annual emission rates in Tables 3.14-4 and 3.14-5 represent conditions that assume no changes in policy or regulations at the local or State level. Although the proposed Castro Valley Plan does incorporate a variety of measures that would help to reduce GHG emissions, because the projections in 3.14-5 are based on the County data, which assume no change in policies or regulations, further analysis is required to determine how implementation of these measures would reduce emissions. Table 3.14-6 shows how the projected 2025 emission levels in the "business as usual" analysis of the Castro Valley Plan could affect such reductions. These reductions are based on information in Technical Appendix A of the CAP, which provides estimates of the extent to which implementation of a variety of measures could reduce emissions and help to achieve a reduction of about 23 percent from projected 2020 emissions based on population growth and continuation of current consumption trends.

¹³ Ibid, Table A-3

**Table 3.14-5: Estimated and Projected Castro Valley GHG Emissions (Tonnes/year)
By Sector Without Emission Reduction Measures**

<i>Sector</i>	<i>2005</i>	<i>Proposed Plan</i>	<i>No Project</i>
Transportation	272643	303712	300934
Daily VMT	1,529,766	1,663,204	1,672,245
Annual VMT	558,364,590	607,069,460	610,369,425
Tonnes/resident	3.86	3.89	3.89
Residential	76,696	84,448	83,867
Tonnes/resident	1.25	1.26	1.26
Commercial/Industrial	29,312	31,793	31,536
Tonnes/employee	3.16	2.92	2.92
Waste/Water	24,015	26,507	26,303
Tonnes/resident and em- ployee	0.34	0.34	0.34
TOTAL EMISSIONS	402,667	446,460	442,640
Tonnes/resident and em- ployee	5.70	5.72	5.72

Source: Alameda County, Draft Alameda County Community Climate Action Plan, Technical Appendix A, 2010; Kahn/Mortimer/Associates, 2010

Table 3.14-6 shows how changes in land use patterns and other policies in the proposed Plan that are intended to reduce reliance on the private automobile will contribute to a reduction in emissions from the Castro Valley. The most significant changes will result from the Plan's emphasis on promoting residential and commercial development near transit or neighborhood centers. As shown in Table 2.4-2 of the revised Project Description, close to 60 percent of the dwelling units that would be added under the proposed Plan are projected to be in multi-family development, much of it in the Castro Valley CBD and within walking distance to BART. Similarly, about half of the new jobs would be in the CBD (see revised Table 2.4-3). Additional reductions can be anticipated due to an increase in employees who work from home. Based on trends indicated in the 2000 Census, which reported that close to 4 percent of Castro Valley's employed residents worked from home, the proposed Plan anticipates that by 2025, 5 percent of Castro Valley's employed residents (about 1,900 workers) will be engaged in home occupations within the worker's place of residence. Based on this increase, 570 new jobs, representing about 35 percent of the jobs added in the planning area, are likely to be home occupations within the worker's place of residence.

Based on analysis by MTC, Caltrans, and others, the CAP states that increasing development near BART stations and around neighborhood commercial centers could result in a 5 percent reduction

in VMT for every 100 percent increase in density. The CAP estimates that in Castro Valley and other unincorporated areas in the western part of the County, these changes could reduce emissions by .2 percent or the equivalent of 2,497 tonnes/year.¹⁴ The CAP also estimates that actions and regulations that would increase transit, pedestrian, and bicycle usage could result in an 8.3 percent reduction in vehicle miles traveled and an associated 3.1 percent reduction in GHG emissions. Other measures to reduce emissions would increase use of renewable energy sources, reduce water use, increase solid waste reduction and diversion, and provide incentives for incorporating “green” building features in new construction.¹⁵ Requiring new development to reduce the use of potable water for landscaping by 50 percent would, for example, reduce emissions in the entire unincorporated area by 2,354 tonnes/year.

Table 3.14-6: Estimated Effect of Selected CV Plan Reduction Measures

	2005	Projected 2025 Baseline	Reduction	Projected 2025 With Se- lected Reduction Measures
Improve Bicycle/Pedestrian Infrastructure				
8.3% Reduction in VMT	558,364,590	607,069,460	1,681,895	556,682,695
3.1% Reduction in Emissions		303,712	9,415	294,297
Increase Home Occupations (570 new jobs)				
5.2% Reduction in Job Commuting		42,339	2,217	40,121
Increase Multi-Family Housing in CBD (900 units)				
.2% Reduction in Emissions		10,665	6,335	4,330
Reduce Water Use in New Landscaping				
		1,883*	942	941
TOTAL	402,667	446,460	18,909	427,551
% Change from 2005			+6.18%	
Average Emissions/Capita	5.70	5.72		5.48
% Change from 2005			-3.94%	
Average Emissions/HH	17.34	17.43		16.69
% Change from 2005			-3.74%	

Source: Alameda County, Draft Alameda County Community Climate Action Plan, Technical Appendix A, 2010;

¹⁴ Ibid, p. 98. Kahn/Mortimer/Associates, 2010

¹⁵ * Assumes that 40 percent of the new residential units in the unincorporated area of the County will be constructed in Castro Valley
Ibid, pp. 94-105.

As shown in Table 3.14-6, because the proposed Plan already incorporates a number of the emission reduction measures evaluated in the draft CAP, at build-out under the Plan, GHG emission levels would actually be at least 4 percent lower than the 2025 projections shown in Table 3.14-5 with accompanying reductions in average emissions per capita and per household.

SUMMARY OF IMPACTS

Implementation of the proposed Castro Valley General Plan would have a less than significant impact on climate change because it would result in a reduction in per capita GHG emissions. Moreover, because the provisions of the County's Climate Action Plan are applicable to all development that would occur in Castro Valley under the proposed plan, implementation of the plan will have to conform to the CAP and could not either directly or indirectly or conflict with the goals, objectives, policies, or regulations the County has adopted for the purpose of reducing the emissions of greenhouse gases.

At build-out, implementation of the proposed Castro Valley General Plan could increase total emissions by about 6 percent but would result in about a 4 percent decline in emissions per capita. The Plan incorporates a variety of measures that would encourage increased use of alternatives to the private automobile that could further reduce GHG emissions. A number of these measures are included in the County's Community Climate Action Plan.

IMPACTS AND MITIGATION MEASURES

Impact

3.14-1 Implementation of the Castro Valley General Plan will increase the number of residents and employees in the Planning Area, which will cause an increase in the total emission of greenhouse gases that could have a significant impact on climate change. (*Less Than Significant*)

The impact of the proposed plan on climate change would be less than significant when compared to existing conditions and to the No Project alternative. Many General Plan policies, particularly those related to land use, circulation, public utilities, biological resources, and community character and design, will help to reduce the total GHG emissions and limit climate change impacts on the community. The General Plan will also be updated to incorporate the strategies of the Alameda County Community Climate Action Plan when it is adopted.

- **Land Use and Development.** The General Plan land use policies focus on infill residential development and commercial renovation to accommodate anticipated growth, rather than developing in new areas. The land use and development strategies include: establishing an infill opportunity zone around the Castro Valley BART station to facilitate higher levels of development within easy access of regional public transit; creating neighborhood centers by allowing a mix of uses at key locations; and supporting local and home-based businesses to reduce commute traffic.
- **Community Character and Design.** Revitalizing the Central Business District and other commercial areas is one of the highest goals for the Castro Valley General Plan and the community. Improving the look and feel of the commercial areas will support new commercial uses that will serve the local community and help to reduce the number and length of trips that residents and local workers have to drive.

- **Transportation.** The transportation policies prioritize balancing the needs of transit riders, pedestrians, and bicyclists with the needs of drivers and create new opportunities for Castro Valley residents to travel by alternative modes. Since transportation is the largest sources of GHGs in Castro Valley, measures that reduce dependence on traveling by private automobile has the greatest potential to reduce total GHGs.
- **Biological Resources.** Preserving and improving natural habitat is a primary proposal in the General Plan. In addition, there are policies that support expanding the urban forest and community gardens. These initiatives are intended to improve air quality by providing for carbon sequestration and support local food networks in order to limit the need to transport food products.
- **Public Services and Utilities.** This chapter contains strategies that will help to reduce greenhouse gases – water conservation and recycling measures, and solid waste reduction and recycling. Shrinking water demand through conservation and recycling will reduce the amount of GHG produced while transporting water. Reducing solid waste disposal through composting and recycling will limit the amount of methane and other GHGs produced at landfills.

Additional policies and actions specific to addressing greenhouse gases and adapting to climate change are listed below. These policies support the County’s green building and energy efficiency initiatives.

Proposed Climate Change Policies and Actions that Reduce the Impact

- Policy 12.2-1 **GHG Reduction Program Participation.** The County shall continue to participate in international, national, regional, and local programs to reduce greenhouse gas emissions.
- Policy 12.2-2 **County Climate Action Plan.** The County’s Climate Action Plan shall be the guiding document for the reduction of greenhouse gases in Castro Valley and shall be implemented through all components of the County General Plan including the Castro General Plan.
- Policy 12.2-3 **Renewable Energy.** Decrease dependency on non-renewable fuel by increasing availability and use of renewable energy sources.
- Policy 12.2-4 **Energy Efficiency.** Improve the energy efficiency of new and remodeled buildings in Castro Valley.
- Policy 12.2-5 **Adaptation Strategies.** The County shall participate in regional efforts focused on adapting communities to the effects of climate change.
- Action 12.2-1 **Emissions Inventory.** Reevaluate the government and community emissions inventories on a regular basis to monitor progress towards the County’s emission reduction targets.

Action 12.2-2 Zoning to Support Emissions Reductions. Review and, if appropriate, modify the Zoning and Subdivision Ordinances to support the emissions reduction targets and the goals of the Climate Action Plan.

Action 12.2-3 Renewable Energy Availability. The County shall participate in regional and statewide efforts to improve the proportion of renewable energy available to Castro Valley energy customers.

Action 12.2-4 Green Building Standards. New construction and remodels above a certain size shall comply with the County's Green Building Ordinances.

Action 12.2-5 Adaptive Reuse. The County shall encourage adaptive reuse of existing buildings, where they can be used efficiently or remodeled for energy-efficient operations.

Action 12.2-6 Zoning for Energy Efficiency and Heat Reduction. Modify the Zoning and Subdivision Ordinances to incorporate measures that will increase energy efficiency, reduce reliance on non-renewable fuels, and reduce heat retention. These could include:

- Passive solar and appropriate landscaping techniques;
- Requiring “cool” roofs and paving and shade trees to reduce heat retention;
- Water-efficient landscaping requirements;
- Parking provisions for low or zero-emission vehicles;
- “Unbundling” parking for transit-accessible development.

Action 12.2-7 Green Building Incentives. Develop and implement incentives to encourage green building practices in Castro Valley. Such incentives for green building could include:

- Fast-track permitting;
- Permit fee reductions correlated with green building features;
- Green design assistance program;
- Staff training; and/or
- Other energy efficiency programs.

Mitigation Measures

No mitigation measures are required.

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