

### 4.13 GLOBAL CLIMATE CHANGE

The California Environmental Quality Act (CEQA) requires that lead agencies consider the reasonably foreseeable adverse environmental effects of projects they are considering for approval. Emissions of greenhouse gases (GHGs) have the potential to adversely affect the environment because such emissions contribute, on a cumulative basis, to global climate change. In turn, global climate change has the potential to cause sea level rise, which can inundate low-lying areas; to affect rain and snow fall, leading to changes in water supply; to affect habitat, leading to adverse effects on biological resources, etc.

As noted previously, cumulative impacts are the collective impacts of one or more past, present, and future projects, that, when combined, result in adverse changes to the environment. When the adverse change is substantial, the cumulative impact is considered significant. The cumulative project list for this issue (global climate change) comprises anthropogenic (i.e., man-made) GHG emission sources across the planet. No project alone would cause any noticeable incremental change to the global climate. However, legislation and executive orders on the subject of climate change in California have established a statewide context for GHG emissions and an enforceable statewide cap on GHG emissions. Given the nature of environmental consequences from GHGs and global climate change, CEQA requires the evaluation of the cumulative impacts of GHGs. Even relatively small (on a global basis) additions need to be considered, and small contributions to this cumulative impact (from which significant effects are occurring and are expected to worsen over time) may be potentially considerable (and therefore significant). Thus, the City of San Mateo has concluded that GHG emissions require consideration under CEQA.

#### EXISTING CLIMATE SETTING

To fully understand global climate change, it is important to recognize the naturally occurring “greenhouse effect” and to define the greenhouse gases that contribute to this phenomenon. The temperature on Earth is regulated by this greenhouse effect, which is so named because the Earth’s atmosphere acts like a greenhouse, warming the planet in much the same way that an ordinary greenhouse warms the air inside its glass walls. Like glass, the gases in the atmosphere let in light yet prevent heat from escaping.

GHG are naturally occurring gases such as water vapor, carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O) that absorb heat radiated from the Earth’s surface. Greenhouse gases – carbon dioxide, methane, nitrous oxide, and others – are transparent to certain wavelengths of the sun’s radiant energy, allowing them to penetrate deep into the atmosphere or all the way to the Earth’s surface. Clouds, ice caps, and particles in the air reflect about 30 percent of this radiation, but oceans and land masses absorb the rest (70 percent of the radiation received from the sun) before releasing it back toward space as infrared radiation. GHG and clouds effectively prevent some of the infrared radiation from escaping; they trap the heat near Earth’s surface where it warms the lower atmosphere. If this natural barrier of atmospheric gases were not present, the heat would escape into space, and Earth’s average global temperatures could be as much as 61 degrees Fahrenheit cooler (NASA, 2007).

In addition to natural sources, human activities are exerting a major and growing influence on climate by changing the composition of the atmosphere and by modifying the land surface. Particularly, the increased consumption of fossil fuels (natural gas, coal, gasoline, etc.) has substantially increased atmospheric levels of greenhouse gases. Measured global GHG emissions resulting from human activities, especially the consumption of fossil fuels, have grown since pre-industrial times, with an increase of 70 percent between 1970 and 2004 (IPCC, 2007).

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This increase in atmospheric levels of GHG unnaturally enhances the greenhouse effect by trapping more infrared radiation as it rebounds from the Earth's surface and thus trapping more heat near the Earth's surface. Prominent GHGs contributing to the greenhouse effect and climate change include carbon dioxide, methane, ozone, nitrous oxide, and chlorofluorocarbons (CFCs). Emissions of these gases are attributable to human activities associated with the industrial/manufacturing, utilities, transportation, residential, and agricultural sectors (CEC, 2006a).

According to the U.S. Environmental Protection Agency (USEPA), the Earth's average surface temperature has increased by about 1.2 to 1.4°F since 1900. The warmest global average temperatures on record have all occurred within the past 15 years, with the warmest two years being 1998 and 2005. Eleven of the years between 1995 and 2006 ranked among the hottest years on record since 1850, when reliable worldwide temperature measurements began (IPCC, 2007). Most of the warming in recent decades is likely the result of human activities. Other aspects of the climate are also changing, such as rainfall patterns, snow and ice cover, and sea level.

### Global Implications

Recognizing the problem of global climate change, the World Meteorological Organization (WMO) and the United Nations Environment Programme (UNEP) established the Intergovernmental Panel on Climate Change (IPCC) in 1988. It is open to all members of the United Nations and WMO. The role of the IPCC is to assess on a comprehensive, objective, open, and transparent basis the scientific, technical, and socioeconomic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation. IPCC projects that the Earth's average surface temperature should rise 1.8 to 6.3 °F before the year 2100 (IPCC, 2007). At a more local level, the California Climate Action Team found that California-specific models estimate an average warming increase of 2.7 to 10.5 °F throughout California before the year 2100 (CAT, 2009). This may not seem like a significant increase, yet even at the lowest projected global increase of 1.8 °F, the Earth would be warmer than it has been for 10,000 years (Miller, 2000).

The IPCC Fourth Assessment Report's Working Group I Summary for Policymakers (Report) synthesizes current scientific understanding of global climate change and projects future climate change using the most comprehensive set of well-established global climate models. The report incorporates findings of the current effects of global climate change. These findings include:

- The intensity of tropical cyclones (hurricanes) in the North Atlantic has increased over the past 30 years, which correlates with increases in tropical sea surface temperatures.
- Droughts have become longer and more intense and have affected larger areas since the 1970s, especially in the tropics and subtropics.
- Since 1900 the Northern Hemisphere has lost 7 percent of the maximum area covered by seasonally frozen ground.
- Mountain glaciers and snow cover have declined worldwide.
- Satellite data since 1978 show that the extent of Arctic sea ice during the summer has shrunk by more than 20 percent.

- Since 1961, the world's oceans have been absorbing more than 80 percent of the heat added to the climate, causing ocean water to expand and contributing to rising sea levels. Between 1993 and 2003, ocean expansion was the largest contributor to sea level rise.
- Melting glaciers and losses from the Greenland and Antarctic ice sheets have also contributed to recent sea level rise.

An enhanced greenhouse effect will generate new patterns of microclimate and will have significant impacts on the economy, environment, and transportation infrastructure and operations due to increased temperatures, intensity of storms, sea level rise, and changes in precipitation. Impacts may include flooding of tunnels, coastal highways, runways, and railways, buckling of highways and railroad tracks, submersion of dock facilities, and a shift in agriculture to areas that are now cooler. Such prospects will have strategic security as well as transportation implications.

Climate change affects public health and the environment. Increased smog and emissions, respiratory disease, reduction in the state's water supply, extensive coastal damage, and changes in vegetation and crop patterns have been identified as effects of climate change. The impacts of climate change are broad-ranging and interact with other market failures and economic dynamics, giving rise to many complex policy problems. The findings are the latest in a string of reports warning that the rate of carbon dioxide accumulating in the atmosphere is increasing at an alarming pace.

### California Implications

Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants and TACs, which are pollutants of regional and local concern. Worldwide, California is the 12<sup>th</sup> to 16<sup>th</sup> largest emitter of CO<sub>2</sub> and is responsible for approximately 2 percent of the world's CO<sub>2</sub> emissions (CEC, 2006a, 2006b). In 2004, California produced 492 million gross metric tons of carbon dioxide-equivalent (CEC, 2006a).

Increased ocean temperature could result in increased moisture flux into the state; however, since this would likely increasingly come in the form of rain rather than snow in the high elevations, increased precipitation could lead to increased potential and severity of flood events, placing more pressure on California's flood control system.

The San Francisco Bay Conservation and Development Commission (BCDC) issued a report on sea level rise in April, 2009, which states that sea level along the west coast rises approximately 7.9 inches per century, or approximately 0.08 inches per year (BCDC, 2009). However, the rate of sea level rise is increasing (See **Figure 4.13-1** for Future Sea Level Rise). During the period of 1993–2003, the rate was approximately 0.12 inches per year, which could demonstrate the result of human-induced warming on sea level. The BCDC uses the same sea level rise estimates that are used by California Climate Action Team-funded assessments. These estimates anticipate the sea level in the Bay Area will rise 16 inches by mid-century and 55 inches by the end of the century. This data was used to make maps of projected flood areas but does not take into consideration existing shoreline protections; if an area is below sea level it is shown as vulnerable on their maps despite any existing projections. By mid-century, approximately 180,000 acres of the Bay Area could be flooded and 213,000 acres could be flooded by the end of the century. A large amount of development along the shoreline is vulnerable to flooding. Due to Bay Area topography, 100 percent of the development located in 100-year floodplain areas will likely flood by the year 2050. Also, different parts of the Bay Area are more vulnerable to flooding than

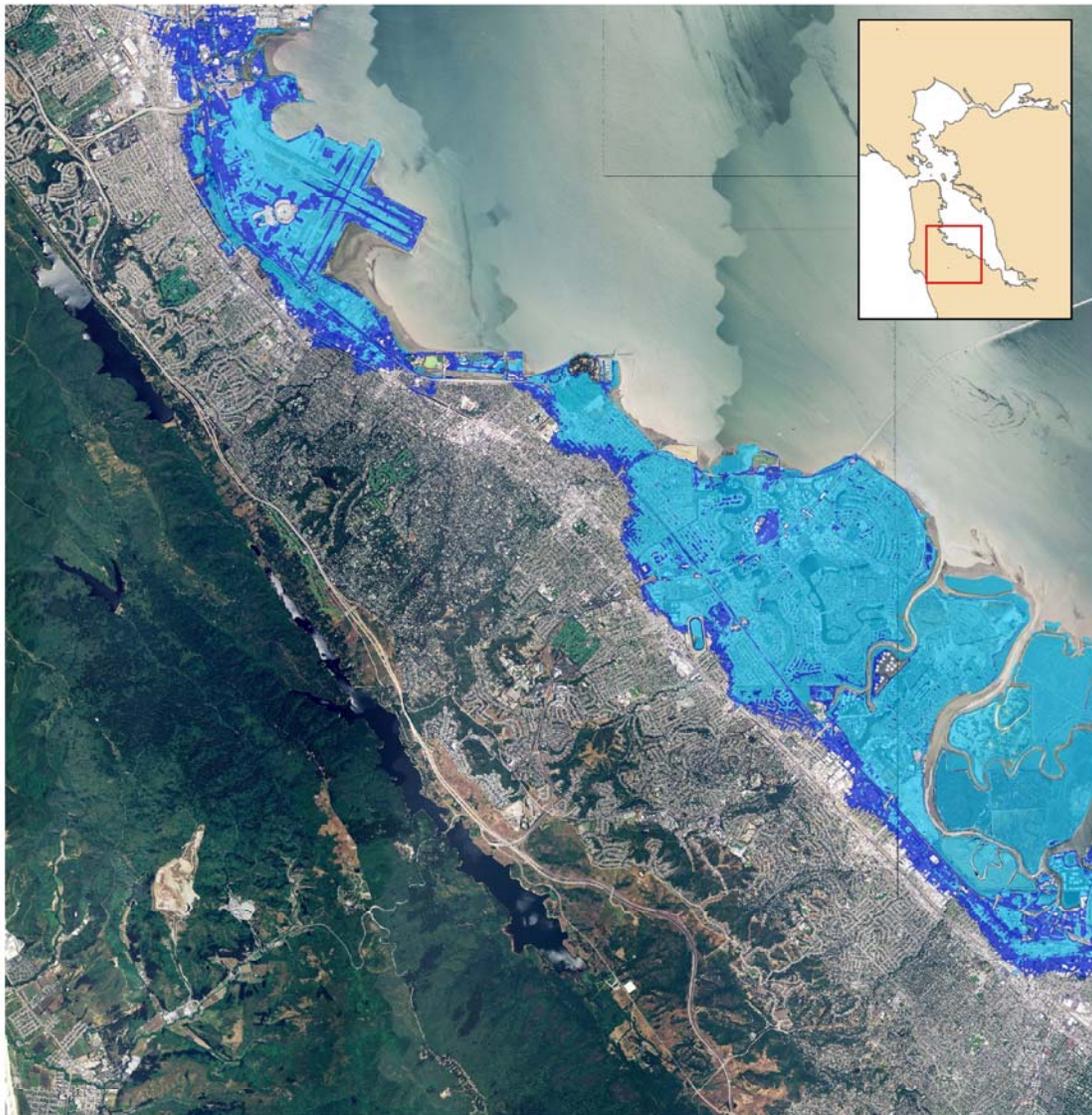
FIGURE 4.13-1  
FUTURE SEA LEVEL RISE



## Central Bay West Shore Shoreline Areas Vulnerable To Sea Level Rise

-  Area vulnerable to an approximate 55 - inch sea level rise
-  Area vulnerable to an approximate 16 - inch sea level rise

0 0.5 1 2 Miles ↑



NOTE: Inundation data from Knowles, 2008. Additional salt pond elevation data by Siegel and Bachand, 2002. Inundation data does not account for existing levees or other shoreline protection. Aerial imagery is NAIP 2005 data.

others. In particular, due to differing tides, the South Bay will likely experience amplified storm surge events. In the vulnerable areas are several large commercial and industrial developments, including 93 percent of both the Oakland and the San Francisco airports that may be inundated by 2100. Half of the vulnerable development is residential and approximately 270,000 people would be at risk of flooding. Approximately 4,300 acres of waterfront parks are expected to flood by 2100 (BCDC, 2009).

If anticipated flooding occurs, resultant effects could include increased coastal flooding, saltwater intrusion, and disruption of wetlands (CEC, 2006c). Many communities could experience compromised wastewater treatment due to inundation from rising sea levels (BCDC, 2009). Climate change and global warming could negatively affect agriculture, forestry, water resources, coastal areas, energy production, air quality, public health, public infrastructure, natural protections, sensitive species and habitats, public safety, and the economy (CAT, 2009; BCDC, 2009). The estimated economic value of shoreline development that could be impacted by a 55-inch rise in sea level is \$62 billion. Other anticipated economic impacts relate to movement of goods and people in and around the Bay Area that would be disrupted by flooding of ports, airports, highways, and rail lines (BCDC, 2009). As the existing climate throughout California changes over time, mass migration of species, or worse, failure of species to migrate in time to adapt to the perturbations in climate, could also result.

### Agriculture

Potential impacts, such as reduced water supply, more severe droughts, more winter floods, and drier growing seasons will affect California's agriculture. Many farms, especially in the fruit and nut business, require long-term investments, making fast adaptation difficult, and could thus experience serious losses if decisions continue to be made with no regard to expected climate changes.

### Fishing

Studies found that as a result of changes in ocean conditions, the distribution and abundance of major fish stocks will change substantially. Impacts to fisheries related to El Niño/Southern Oscillation illustrate how climate directly impacts marine fisheries on short-term scales. Higher sea surface temperatures in 1997–1998 during the El Niño had a great impact on market squid, California's largest fishery by volume. The California Regional Assessment reports that landings fell to less than 1,000 metric tons in that season, down from 110,000 tons in the 1996–1997 season. Other unusual events also occurred such as poor salmon returns, a series of plankton blooms, and seabird die-offs.

### Coastline

With climate changes, recreational facilities and developed coastlines will also be more vulnerable to hurricanes, storm surges, and flooding. Increasing population growth in coastal areas is a reason for further concern, since these areas could be more vulnerable to climate change impacts. Impacts of expected sea level rise and increased storm surges are numerous. Beachfront homes and harbors as well as wetlands may flood. Sewage systems may be overwhelmed by storm runoff and high tides. The Bay Area currently has approximately 300 miles of public access to and along the Bay shoreline. Eighty-seven (87) percent of that access is located in areas vulnerable to flooding by 2100. It may be very hard to relocate or recreate access opportunities in areas further inland. Jetties and seawalls may have to be raised and strengthened to protect harbors which are used for shipping, recreation, and tourism. As discussed above, by the year 2050, 100 percent of 100-year floodplain areas are expected to be

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flooded, and by the year 2100 an estimated 213,000 acres of Bay Area land, much of which is in the Central and South Bay areas, could be impacted. The City of San Mateo is located in the Central Bay West Shore area of the Bay Area. BCDC has produced a map showing the expected flooding that may occur in this area by the end of the century, and this map predicts that approximately half of the City of San Mateo, and much of the surrounding area, can expect to flood by the end of the century. Much of the developed Bay Area shoreline will require enhanced shoreline protection, which will be developed regionally to maximize safety and minimize impacts on sensitive Bay resources including public access, visual resources, and soil stability. Structural shoreline protections common to the Bay Area include seawalls, riprap revetments, and levees. These protections are reliable but expensive to build and maintain and often cause significant impacts to resources. Incorporating ecosystem elements with engineering elements would provide balanced and long-term shoreline protection.

### Forests

The California Regional Assessment notes an increase in the number and extent of areas burned by wildfires in recent years, and modeling results under changing climate conditions suggest that fires may be hotter, move faster, and be more difficult to contain under future climate conditions. The factors which contribute to the risk of catastrophic fires (fuel loads, high temperatures, dry conditions, and wind) are typically present already in summer and fall seasons in California, but can exist at other times of the year, especially in drought conditions. Public safety is an issue as more home and tourism developments on coastal hills and mountains, and the foothills and higher elevations in the Sierra Nevada are highly susceptible to catastrophic wildfires.

### Ecosystems

The current distribution, abundance, and vitality of species and habitats are strongly dependent on climatic (and microclimatic) conditions. Climate change is expected to result in warmer temperatures year-round, accompanied by substantially wetter winters. Rising sea level will significantly affect coastal wetlands because they are mostly within a few feet of sea level. As the sea rises, these wetlands will move inland. The overall acreage of wetlands will be reduced due to constraints by existing urban development and steeper slopes immediately inland of existing wetlands. Tidal rivers, estuaries, and relatively flat shoreline habitats will be more subject to damage by flooding and erosion. More severe storm surges from the ocean, due to higher sea levels, combined with higher river runoff could significantly increase flood levels by more than the rise in sea level alone. Erosion of beaches would decrease habitat for beach-dependent species, such as seals, shorebirds, and endangered species (for example, snowy plover and least tern).

The timing and amounts of water released from reservoirs and diverted from streams are constrained by their effects on various native fish, especially those that are listed under the federal and state endangered species acts as threatened or endangered. Several potential hydrological changes associated with global climate change could influence the ecology of aquatic life in California and have several negative effects on cold-water fish (DWR, 2006). For example, if climate change raises air temperature by just a few degrees Celsius, this change could be enough to raise the water temperatures above the tolerance of salmon and trout in many streams, favoring instead non-native fishes such as sunfish and carp (DWR, 2006). Unsuitable summer temperatures would be particularly problematic for many of the threatened and endangered fish that spend summers in cold-water streams, either as adults, juveniles, or both (DWR, 2006). In short, climate change could significantly affect threatened and

endangered fish in California. It could also cause non-threatened and non-endangered fish to reach the point where they become designated as such (DWR, 2006).

Changes in temperature and precipitation patterns would also shift California's current climate zones, and thus habitats associated with these zones, northward by approximately 100–400 miles, as well as upwards in elevation by 500–1,500 feet. Global climate change would alter the composition, structure, and arrangement of the vegetation cover of the state (forest and wildland). Species distribution would move geographically as the climate changes, with forest stands, woodlands, and grassland species predicted to move northward and higher in elevation. The entire vegetative community may be affected if non-native invasive species occupy sites and replace native plants. Outbreaks of insects and diseases could compromise forest health and the capability of the forest stands to reproduce and to store carbon on a landscape basis. Forest fires are likely to become more frequent and severe if soils become drier. Changes in pest populations could further increase the stress on forests.

### Air Quality

Projected climate changes will impact the quality of California's air, public health, and environment. Higher temperatures increase the formation of ground-level ozone and particulate matter, making it more difficult to meet the health-based air quality standards for these pollutants. Ground-level ozone has been shown to aggravate existing respiratory illnesses such as asthma, reduce lung function, and induce respiratory inflammation. Ambient ozone also reduces agricultural crop yields and impairs ecosystem health.

The particulate matter of most concern – PM<sub>10</sub> – has a diameter smaller than 10 micrometers and can easily pass into the lungs, contributing to the development of lung tissue damage. PM<sub>10</sub> has been implicated in exacerbation of cardiovascular disease, asthma, and other respiratory diseases and associated with increased mortality. Air pollution is also made worse by increases in natural hydrocarbon emissions and evaporative emissions of fuels and solvents which lead to higher levels of ozone and PM<sub>10</sub> during hot weather. Warmer temperatures that cause increased use of air conditioners can cause increased air pollutants from power plants and from vehicle operation. In addition, warming, drying, and increased winds could mean hotter, harder-to-control wildfires. These wildfires could result in increased levels of fine particulate matter that could also exceed state and federal standards and harm public health.

### Electricity Generation

California's electricity generation is currently relatively efficient when it comes to emissions of greenhouse gases. The national average for the electricity generation share of total greenhouse gas emissions is approximately 40 percent, while California electricity accounts for only 16 percent of statewide emissions. This is in part due to California's significant amount of imported electricity, mild climate, and lack of energy-intensive industry. Over the past two decades, California has developed one of the largest and most diverse renewable electricity generation industries in the world. However, changes in climate of the magnitude predicted by the Intergovernmental Panel of Climate Change would substantially affect electricity generation throughout California and the entire western states grid, particularly for hydroelectric facilities.

Less snowpack would result in lower levels of hydro-generation in the summer and fall seasons due to reduced runoff in those seasons. Additional hydropower may be available during the winter and the spring. However, on balance hydropower is more useful and valuable within the grid mix of generation sources when it is available throughout the peak summer and fall seasons. Flooding could also impact pipelines, wells, and related petroleum extraction equipment.

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Warmer weather would result in an increased demand for electricity for cooling appliances in homes and businesses.

### Water Supply

While most climate model simulations project relatively moderate changes in precipitation over this century, rising global temperatures are expected to result in reductions in snowpack for the Sierra Nevada Mountains (i.e., precipitation changing in the form of rain from snow). By the 2035 to 2064 period, the Sierra Nevada snowpack could decrease from 12 percent to 40 percent as compared to historic levels (depending on the climate scenario) (Cal/EPA, 2007a). The Sierra Nevada snowpack currently acts as natural water storage (equal to approximately half of the storage capacity of California's major human-made reservoirs) by holding winter precipitation and releasing it during the spring and early summer months as the snow melts. The reduction of this natural water storage during the winter could mean water shortages in the future and would require the alteration of the management of existing reservoirs (while not losing flood control capacity or hydropower generation capacity) and/or the construction of additional human-made reservoirs to compensate for this storage loss.

Potential impacts of climate change on water supply and availability could directly and indirectly affect a wide range of institutional, economic, and societal factors (Gleick, 1997). Much uncertainty remains, however, with respect to the overall impact of global climate change on future water supplies. For example, models that predict drier conditions (i.e., parallel climate model [PCM]) suggest decreased reservoir inflows and storage and decreased river flows, relative to current conditions. By comparison, models that predict wetter conditions (i.e., HadCM2) project increased reservoir inflows and storage, and increased river flows (Brekke, 2004). Both projections are equally probable based on which model is chosen for the analyses. Much uncertainty also exists with respect to how climate change will affect future demand of water supply (DWR, 2006). Still, changes in water supply are expected to occur and many regional studies have shown that large changes in the reliability of water yields from reservoirs could result from only small changes in inflows (Kiparsky and Gleick, 2003; see also Cayan et al., 2006a).

The California Water Supply Company purchases all water for San Mateo from the San Francisco Public Utilities Commission. Per a San Mateo report completed in February 2009, the City of San Mateo may face the following impacts to water supply:

*Through its potable water supplier, California Water Service, San Mateo is indirectly dependent on the storage of water in snow pack. Global warming is expected to have significant impacts to snowpacks, resulting in decreased water supply. San Mateo may take steps to lessen its reliance on snowpack-provided drinking water through increased water efficiency, and exploring various alternative water supply sources such as rainwater harvesting, groundwater, or desalinization. Except for rainwater harvesting, development of these alternative supplies are appropriate to consider on a regional, not City-wide basis.*

Minimal research has been conducted on the effects of climate change on specific groundwater basins, groundwater quality, or groundwater recharge characteristics. Changes in rainfall and changes in the timing of the groundwater recharge season would result in changes in recharge. Warmer temperatures could lead to higher evaporation as well as prolonged drought periods that would reduce the amount of water entering the ground that could further limit deficient water supply conditions. However, warmer and wetter winters could increase the amount of runoff available for groundwater recharge. Additional winter runoff, however, could

be occurring at a time when groundwater basins are being recharged at their maximum capacity. However, the extent to which climate will change and the impact of that change on groundwater are both unknown at this time.

### Increased Flooding

Currently, there is no accurate information to accurately assess the impact of climate change for flood frequency or severity, because of the absence of detailed regional precipitation information from climate models and because water-management choices can substantially influence overall flood risk. However, increased amounts of winter runoff could be accompanied by increases in flood event severity and warrant additional dedication of wet season storage space for flood control as opposed to water supply storage. This need to manage water storage facilities to handle increased runoff could in turn lead to water shortages during high water demand. It is recognized that these impacts would result in increased challenges for reservoir management and balancing the competing concerns of flood protection and water supply. As discussed above, according to the updated BCDC sea level rise maps based on data from the U.S. Geological Survey (USGS), approximately half of the area of the City of San Mateo and much of the surrounding area is vulnerable to flooding by the year 2100. Though San Mateo has an existing levee system, it is not anticipated that the system will be adequate to protect all vulnerable areas.

### Sudden Climate Change

Most global climate models project that anthropogenic climate change will be a continuous and fairly gradual process through the end of this century (DWR, 2006). California is expected to be able to adapt to the water supply challenges posed by climate change, even in some of the warmer and drier projections for change. Sudden and unexpected changes in climate, however, could leave water managers unprepared and could, in extreme situations, have significant implications for California and its water supplies. For example, there is speculation that some of the recent droughts that occurred in California and the western United States could have been due, at least in part, to oscillating oceanic conditions resulting from climatic changes. The exact causes of these events are, however, unknown, and evidence suggests such events have occurred during at least the past 2,000 years (DWR, 2006).

### **San Mateo Implications**

In October 2007, the City of San Mateo completed a Baseline Greenhouse Gas Inventory, or “carbon footprint,” for calendar year 2006. The inventory analyzed carbon dioxide (CO<sub>2</sub>) emissions from municipal and community-wide sources in the transportation, waste, and energy sectors.

### Community-Wide Inventory

The community-scale footprint includes the CO<sub>2</sub> generated from all residences and businesses in the City of San Mateo and all traffic that drives on roads in the City. The largest source of CO<sub>2</sub> is transportation (55 percent), followed by the built environment (42 percent), and waste disposal (3 percent). The report concluded that San Mateo was responsible for approximately 625,009 metric tons of CO<sub>2</sub> in 2006.

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### Municipal Operations and Facilities Inventory

City operations and facilities (O&F) account for less than 2 percent of the overall community emissions, but efforts to reduce these impacts indicate the seriousness with which the City is addressing its contribution to global warming. Within the O&F, the key contributors to CO<sub>2</sub> are the built environment – natural gas and electricity (59 percent), fuels (19 percent), and commuting (19 percent). Waste disposal makes a small contribution of 3 percent. A Climate Action Plan to reduce the CO<sub>2</sub> of operations and facilities will be developed from the information in this inventory.

**TABLE 4.13-1  
GREENHOUSE GAS EMISSIONS FROM CURRENT CITY OPERATIONS**

Source	Metric Tons
Electricity	4,427.0
Natural Gas	1,864.7
Gasoline	1,015.7
Biodiesel (B20)	463.2
Disposal	328.9
Commute	1,968.5
Diesel	531.5
Total	10,599.6

Of these sources, electricity is the predominant generator of CO<sub>2</sub>. Electricity is used to power the Wastewater Treatment Plant (WWTP), pumps, irrigation, and traffic lights and signals as well as for lighting and cooling buildings.

The City of San Mateo recently completed a report entitled “Climate Change Impacts for San Mateo” dated February 2, 2009. The purpose of this report is to “detail the potential impacts of climate change to San Mateo water resources, both in magnitude and uncertainty, and discuss conceptual mitigation activities.” The report parallels many of same discussions related to the state as a whole outlined above but is more specific about water resource issues. A brief summary of the report is below:

*The global climate is currently experiencing a warming trend is indisputable. This warming trend will have impacts to water resources in San Mateo. However quantitative estimates of those impacts offer a range at best, with many impacts not understood except in general trend or qualitative terms. Projections of climate change and its impacts are strongly scenario- and model-dependent and the range of impacts grows broader the further into the future those impacts are projected. Given this wide range of impacts, particularly in sea level rise and extreme event predictions, and San Mateo's location adjacent to the Bay, structural solutions are not recommended. If San Mateo were to increase levee heights, even drastically, it might help advance certification efforts with future regulatory changes, but it would not actually offer San Mateo residents increased flood protection unless carried out in concert with raised levees in Burlingame to the north and Foster City to the south.*

*In addition to sea level rise, both storm surge and wave heights, and therefore runup, are expected to increase by 2100 due to climate change, although quantitative estimates for these impacts are not available. Although precipitation is expected to shift in timing and intensity, mean annual precipitation is not predicted to change significantly. The increase in precipitation may be offset by additional drying time between storms, and impacts to watershed runoff cannot be quantitatively assessed at this time. Thus, the only quantifiable flood risk impact to San Mateo due to climate change is the increase in sea level rise, and a wide range, with no assigned certainties or upper bounds to that range, is projected.*

*Through its potable water supplier, California Water Service, San Mateo is indirectly dependent on the storage of water in snow pack. Global warming is expected to have significant impacts to snowpacks, resulting in decreased water supply. San Mateo may take steps to lessen its reliance on snowpack-provided drinking water through increased water efficiency, and exploring various alternative water supply sources such as rainwater harvesting, groundwater, or desalinization. Except for rainwater harvesting, development of these alternative supplies are appropriate to consider on a regional, not City-wide basis.*

California Water Service issues a yearly report on water quality and supply status in their service area. The most recent report from 2008 contained a warning about shrinking water supply and an encouragement for water users to increase efficiency and conservation efforts. California Water Service also runs programs to teach and encourage customers in conservation efforts.

The report issued by BCDC in April 2009 agrees with several points from the City's report, as discussed in more detail above. San Mateo's location near the South Bay area puts it in a low-lying location more vulnerable to flooding as sea level rises and during periods of storm surge. Despite the City's existing levee system, increased shoreline protection throughout the Bay Area is needed to protect development and sensitive resources and provide some measure of safety.

### Energy Efficiency Conservation Block Grant

On June 24, 2009, the City of San Mateo submitted a block grant application to the U.S. Department of Energy for the Energy Efficiency and Conservation Block Grants (EECBG) Program. The EECBG Program is funded by the American Recovery and Reinvestment Act (ARRA) of 2009 and represents a presidential priority to deploy the cheapest, cleanest, and most reliable energy technologies the United States has. It is intended to assist U.S. cities, counties, states, territories, and Indian tribes to develop, promote, implement, and manage energy efficiency and conservation projects and programs designed to:

- Reduce fossil fuel emissions.
- Reduce the total energy use of the eligible entities.
- Improve energy efficiency in the transportation, building, and other appropriate sectors.
- Create and retain jobs.

Through a comprehensive process, the City's Sustainability Team narrowed various program options designed to meet the EECBG program objectives and the City's Sustainability Goals. Ultimately, the team designed a program that would not only meet the program objectives, but would save the City money, help educate residents about alternative energy, and allow individual residents to analyze their home's carbon footprint and identify ways for improved efficiency. The City's submitted EECBG block grant included the replacement of street lighting

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with LED bulbs, installation of renewable energy on the library, and implementation of a residential energy audit. Upon receipt of the grant and the implementation of the programs, the combined program is estimated to save, on an annual basis, 3,372.53 Mbtu and 302.03 tons of CO<sub>2</sub> annually. This will assist the City of San Mateo in meeting its target of reducing its greenhouse gas emissions to 1990 levels by the year 2020. The submitted block grant programs are outlined below:

### Replacement of street lighting with LED bulbs

The City of San Mateo Department of Public Works is proposing a project to replace 193 post-top and teardrop-style street lights with LED bulbs. The goal of the project is to conserve energy and reduce costs associated with ongoing maintenance. This project aligns directly with the three program goals of the energy block grants specifically: improving energy efficiency in the transportation, building, and other sectors. Replacing 193 streetlights with LED bulbs will generate, on an annual basis, approximately 80,296 kilowatt-hour (kWh) which is equivalent to 23.53 Mbtu. The estimated annual cost savings to the City of San Mateo is \$26,268.

### Installation of on-site renewable energy technology on civic facility

The City of San Mateo is proposing the installation of a renewable photovoltaic solar system on the roof of the City's Main Library. Completed in 2006, the Main Library has been certified by the U.S. Green Building Council as a Leadership in Energy and Environmental Design (LEED) Gold building. As part of the original design of the building, plans were included to install a photovoltaic solar system on the roof of the library, but as the project neared completion, funding for this installation was unavailable. Through an allocation of \$400,000 from the EECBG funding, it is possible to install a partial solar system on the roof of the library. Conservatively, the 53.2-kilowatt system would produce 80,964 kWh per year which is equal to 11 percent of the library's current electricity needs and is equivalent to 24 MBtu per year. The annual CO<sub>2</sub> savings would equal 48 tons per year, or 1,440 tons of CO<sub>2</sub> over 30 years.

Implementation of a residential energy audit with tune-up program

The City of San Mateo is proposing establishing an energy audit program for residential, single-family homes. This program supports the EECBG goal of improving energy efficiency in the residential building sector. Through an allocation of \$100,000 from the EECBG, the energy audit program would subsidize energy audits for approximately 665 single-family households over three years. The audit would also include minor home tune-ups with the installation of energy- and water-saving devices such as compact fluorescent lamps, low-flow faucets and shower heads, and programmable thermostats.

Currently, the built environment in the City of San Mateo generates approximately 42 percent of the total carbon emissions within the City. Implementing a citywide energy audit and tune-up program targeting 665 homes would reduce emissions by approximately 233 tons of CO<sub>2</sub> and 3,325 Mbtu per year. The average energy savings generated per home would be equal to \$335 a year with a simple payback of one year. Each residential energy audit will provide homeowners with an action plan of how emissions and energy consumption can be reduced within their homes, as well as assist the City of San Mateo in meeting its target of reducing its greenhouse gas emissions to 1990 levels by the year 2020.

### CLIMATE CHANGE REGULATORY FRAMEWORK

#### **Federal**

##### Greenhouse Gases

The U.S. Environmental Protection Agency (USEPA) is the federal agency responsible for implementing the federal Clean Air Act (CAA). Previous to 2007, USEPA did not have regulations addressing GHGs. The U.S. Supreme Court ruled on April 2, 2007, that CO<sub>2</sub> is an air pollutant as defined under the CAA and that USEPA has the authority to regulate emissions of GHGs. However, there are no federal regulations or policies regarding GHG emissions applicable at the time of this writing.

#### **State**

##### Assembly Bill 1493

Assembly Bill (AB) 1493 required that the California Air Resources Board (CARB) develop and adopt, by January 1, 2005, regulations that achieve “the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty truck and other vehicles determined by the CARB to be vehicles whose primary use is noncommercial personal transportation in the state.”

##### Executive Order S-3-05

Executive Order S-3-05 proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra’s snowpack, further exacerbate California’s air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total greenhouse gas emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

The Executive Order directed the Secretary of the California Environmental Protection Agency (Cal/EPA) to coordinate a multi-agency effort to reduce greenhouse gas emissions to the target levels. The secretary will also submit biannual reports to the governor and state legislature describing (1) progress made toward reaching the emission targets, (2) impacts of global warming on California’s resources, and (3) mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the Secretary of the Cal/EPA created a Climate Act Team (CAT) made up of members from various state agencies and commission. CAT released its first report in March 2006. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government and community actions, as well as through state incentive and regulatory programs.

##### Assembly Bill 32, the California Global Warming Solutions Act of 2006

Assembly Bill 32 requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. The gases that are regulated by AB 32 include carbon dioxide, methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>). The reduction to 1990 levels will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in starting in 2012. To effectively implement the cap, AB 32 directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG

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emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that CARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap, institute a schedule to meet the emissions cap, and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

### Climate Change Proposed Scoping Plan

In October of 2008, CARB published its Climate Change Proposed Scoping Plan, which is the State's plan to achieve GHG reductions in California required by AB 32 (CARB, 2009f). The proposed scoping plan contains the main strategies California will implement to achieve reduction of 169 million metric tons (MMT) of CO<sub>2</sub>e, or approximately 30 percent from the state's projected 2020 emission level of 596 MMT of CO<sub>2</sub>e under a business-as-usual scenario (this is a reduction of 42 MMT CO<sub>2</sub>e, or almost 10 percent, from 2002–2004 average emissions). The proposed scoping plan also includes CARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The largest proposed GHG reduction recommendations are from improving emission standards for light-duty vehicles (estimated reductions of 31.7 MMT CO<sub>2</sub>e), implementation of the Low-Carbon Fuel Standard (15.0 MMT CO<sub>2</sub>e), energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO<sub>2</sub>e), and a renewable portfolio standard for electricity production (21.3 MMT CO<sub>2</sub>e). CARB has not yet determined what amount of GHG reductions it recommends from local government operations; however, the proposed scoping plan does state that land use planning and urban growth decisions will play an important role in the state's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions. (Meanwhile, CARB is also developing an additional protocol for community emissions.) CARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. The proposed scoping plan states that the ultimate GHG reduction assignment to local government operations is to be determined (CARB, 2009f). With regard to land use planning, the proposed scoping plan expects approximately 5.0 MMT CO<sub>2</sub>e will be achieved associated with implementation of SB 375, which is discussed further below. The Climate Change Proposed Scoping Plan was approved by CARB on December 11, 2008.

### Senate Bill 1368

Senate Bill (SB) 1368 is the companion bill of AB 32. SB 1368 requires the California Public Utilities Commission (CPUC) to establish a greenhouse gas emission performance standard for baseload generation from investor-owned utilities by February 1, 2007. The bill also required the California Energy Commission (CEC) to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the greenhouse gas emission rate from a baseload combined-cycle natural gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC.

### California Climate Action Registry

The California Climate Action Registry (CCAR) was established in 2000 by Senate Bill 1771 and modified in 2001 by Senate Bill 527 as a nonprofit voluntary registry for GHG emissions [see Stats. 2000, ch. 1018 (enacting Health & Safety Code, Sections 42800–42870 and Public Resources Code, Section 25730) and Stats. 2001, ch. 769 (amending Health and Safety Code, Sections 42810, 42821–42824, 42840–42843, 42860, and 42870)]. The purpose of CCAR is to help companies and organizations with operations in the state to establish GHG emissions baselines against which any future GHG emissions reduction requirements may be applied. CCAR has developed a general protocol and additional industry-specific protocols that provide guidance on how to inventory GHG emissions for participation in the registry. The California Climate Action Registry has now merged its GHG emissions registry with the climate registry and is primarily focused on offset projects and research.

### Senate Bill 97

Senate Bill (SB) 97, signed August 2007, acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA [Stats. 2007, ch. 185 (enacting Public Resources Code, Sections 21083.05 and 21097)]. This bill directs the State Office of Planning and Research (OPR) to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA by July 1, 2009. The Resources Agency is required to certify and adopt those guidelines by January 1, 2010. This bill also removes, both retroactively and prospectively, as legitimate litigation causes of action any claim of inadequate CEQA analysis of effects of GHG emissions associated with environmental review for projects funded by the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006, or the Disaster Preparedness and Flood Protection Bond Act of 2006 (Proposition 1B or 1E). This provision will be repealed by operation of law on January 1, 2010, at which time such projects, if any remain unapproved, will no longer enjoy the protection against litigation claims based on failure to adequately address climate change issues.

### Senate Bill 1078 and Governor's Order S-14-08

SB 1078 addresses electricity supply and requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide a minimum 20 percent of their supply from renewable sources by 2017. SB 1078 changed the target date of this bill's implementation to 2010. This senate bill would affect statewide GHG emissions associated with electricity generation. In 2008, Governor Schwarzenegger signed Executive Order S-14-08, which set the Renewable Portfolio Standard target to 33 percent by 2020. It directed state government agencies and retail sellers of electricity to take all appropriate actions to implement this target.

### Senate Bill 375

SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional Transportation Plan (RTP). CARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every 8 years, but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned

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targets. If MPOs do not meet the GHG reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012.

This bill also extends the minimum time period for the Regional Housing Needs Allocation (RNHA) cycle from 5 years to 8 years for local governments located within an MPO that meets certain requirements. City or county land use policies (including general plans) are not required to be consistent with the RTP (and associated SCS or APS). However, new provisions of CEQA would incentivize qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects."

### Executive Order S-13-08: The Climate Adaptation and Sea Level Rise Planning Directive<sup>1</sup>

On November 14, 2008, Governor Schwarzenegger issued Executive Order (EO) S-13-08 in order to reduce and assess California vulnerability to climate change and sea level rise. The EO initiated four major actions:

1. Initiate California's first statewide climate change adaptation strategy that will assess the state's expected climate change impacts, identify where California is most vulnerable and recommend climate adaptation policies by early 2009;
2. Request the National Academy of Science establish an expert panel to report on sea level rise impacts in California to inform state planning and development efforts;
3. Issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new projects; and
4. Initiate a report on critical existing and planned infrastructure projects vulnerable to sea level rise.

The EO will provide consistency and clarify to state agencies on how to address sea level rise in current planning efforts.

### **Local**

#### San Francisco Bay Conservation and Development Commission

The 27-member San Francisco Bay Conservation and Development Commission (BCDC) was created by the California Legislature's McAteer-Petris Act in 1965 and is made up of appointees from local governments and state and federal agencies. BCDC's jurisdiction includes:

- Open water, marshes and mudflats of greater San Francisco Bay, including Suisun, San Pablo, Honker, Richardson, San Rafael, San Leandro, and Grizzly bays and the Carquinez Strait;
- The first 100 feet inland from the shoreline around San Francisco Bay;

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<sup>1</sup> California Climate Change Portal, "California Climate Adaptation Strategy", <http://www.climatechange.ca.gov/adaptation/index.html>

- The portion of the Suisun Marsh – including levees, waterways, marshes and grasslands – below the 10-foot contour line;
- Portions of most creeks, rivers, sloughs, and other tributaries that flow into San Francisco Bay; and
- Salt ponds, duck hunting preserves, game refuges, and other managed wetlands that have been diked off from San Francisco Bay.

The McAteer-Petris Act confers upon BCDC a limited authority which consists of requiring “maximum feasible public access,” ensuring that public benefits of projects clearly exceed public detriments, and preserving water-oriented uses. BCDC also issues permits for certain types of development activity within their jurisdiction. However, BCDC does have an important advisory role in regard to protecting resources within their jurisdiction. To address growing concerns about the effects of climate change in the Bay Area, BCDC used data from the United States Geological Survey to update sea level rise maps to show low-lying areas around the Bay that are in the most danger from sea level rise caused by global warming. Though BCDC lacks the regulatory authority to begin implementing other strategies, BCDC then developed a draft report in April 2009 that examines vulnerabilities to climate change in the Bay and along the shoreline and recommends new and updated findings and policies for the Bay Plan. Public hearings have been held to review and discuss the report, but the matter was continued to a future hearing and no decision has been made as of June 4, 2009.

### Bay Area Air Quality Management District

In 2005, the Bay Area Air Quality Management District (BAAQMD) initiated a Climate Protection Program. On June 1, 2005, the Air District Board of Directors adopted a resolution establishing a Climate Protection Program and acknowledging the link between climate protection and programs to reduce air pollution in the Bay Area. The Board of Directors also formed a standing Committee on Climate Protection to provide direction on District climate protection activities.

A central element of the District’s Climate Protection Program is the integration of climate protection activities into existing District programs. The District is continually seeking ways to integrate climate protection into current District functions, including grant programs, CEQA commenting, regulations, inventory development, and outreach. In addition, the District’s climate protection program emphasizes collaboration with ongoing climate protection efforts at the local and state level, in public education and outreach, and by offering technical assistance to cities and counties.

### Joint Policy Committee

The Joint Policy Committee (JPC) coordinates the regional planning efforts of the Association of Bay Area Governments (ABAG), the Bay Area Air Quality Management District, the Bay Conservation and Development Commission, and the Metropolitan Transportation Commission (MTC). Among the JPC’s current initiatives are focused growth, climate protection, and development of a sustainable communities strategy pursuant to SB 375. The JPC serves as a coordinating body for these agencies to work together to address the challenges of climate change and other cross-agency issues.

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### City of San Mateo Sustainable Initiatives Plan

In December 2007, the City of San Mateo approved the Sustainable Initiatives Plan developed for the City Council by the Sustainability Advisory Committee. This plan contained a number of policy recommendations, in addition to the emissions target reduction goal mentioned in the previous section, and is included in its entirety in the updated General Plan. The policy recommendations outlined in the Sustainable Initiatives Plan are listed in the General Plan Policy section below.

### City of San Mateo Municipal Climate Action Plan for Operations and Facilities

The City of San Mateo adopted the Municipal Climate Action Plan (CAP) for Operations and Facilities in January 2009, which is incorporated in its entirety into the General Plan. The CAP for Operations and Facilities has the following goal: "Reduce greenhouse gas emissions each year, beginning with 2009 emissions being less than the 2006 baseline and then exceed the 2020 state target (emissions at 1990 level in 2020) and meet the 2050 state target (emissions at 80% below 1990 level)." State emission targets are defined by AB 32, the Global Warming Solutions Act of 2006, and Governor's Order S-03-05.

Major policy recommendations of the CAP for Operations and Facilities include:

1. Establish a solid measuring and reporting system for all sources of CO<sub>2</sub> from City operations and facilities in order to provide management with the tools and data needed to achieve the CO<sub>2</sub> emission reduction goals.
  - Implement Utility Manager Pro
  - Update warehouse database to include more information
  - Establish metrics for programs as needed
2. Take the steps that are needed to accomplish the suggested actions in the Climate Action Plan. These steps may include further investigation, pilot studies, or life cycle analysis before final decisions are made to move forward.
  - Finance: Develop fleet policy
  - Finance: Establish EPP Group to review and update EPP
  - Finance: Establish Energy Water Efficiency Fund when appropriate
  - Finance: Prepare a soft fleet order for plug-in hybrids
  - Library: Develop a process for sharing information on the Main Library's energy and water use with the public as an educational tool
  - Parks & Rec: Investigate landscaping decisions discussed in the plan and develop proposals for switching some lawn areas to demonstration landscaping projects
  - Parks & Rec: Research synthetic turf options for soccer fields
  - Parks & Rec: Work with Public Works to review green waste handling and to increase recycling opportunities

- Parks & Rec: Investigate options for programs that support energy efficiency, water conservation, increased bicycling, and other sustainability topics
  - Public Works: Do all actions in PW Package 1: Facilities and Parking Garages – Efficiency
  - Public Works: Commit to doing a LEED EB process for City Hall
  - Public Works: Do HVAC design study for City Hall (in PW Package 2)
  - Public Works: Do all actions in PW Package 3: Wastewater Treatment Plant
  - Public Works: Finish analysis on actions in PW Package 4: Pilot Programs (LED streetlights and converting lagoon pumps to B20)
  - Public Works: Prioritize programs needed to achieve the goals of PW Packages 5 and 6 (waste diversion and commute options), and implement as appropriate to accomplish goals
3. Create a staff position that is responsible for emerging water issues and water conservation, both in facilities and the community, and incorporate an understanding of adaptive strategies into future planning and programs, as recommended in the Sustainable Initiatives Plan.
- Do water analysis on facilities after data is readily available
  - Work with Parks & Recreation and Public Works Departments to reduce landscaping and building water consumption
  - Page 33 of 49 City of San Mateo – Climate Action Plan for Operations & Facilities January 29, 2008, Page 34 of 49
  - Fire: Check hydrant usage to ensure testing uses only what is necessary
4. Assign responsibility for internal communications about sustainability and climate action efforts and develop a regular pattern of keeping people informed and engaged.
- Focus on changing the behaviors discussed in this document and informing staff of opportunities to participate in reducing CO2 emissions and helping the City to set an example of environmental stewardship.
  - Overall, the City is in a strong position to reduce its CO2 emissions and to take steps to become more proactive on environmental and climate related issues. Adopting the recommendations in the Sustainable Initiatives Plan and the Climate Action Plan for Operations & Facilities will certainly invigorate the City's new climate action and sustainability efforts.
5. Re-evaluate these targets in the year prior to any General Plan revision but no less than every five years in regard to current scientific data and performance to determine if the City needs to increase the targets or its efforts to achieve them and to set interim targets.

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If these goals are applied to City operations and facilities, the targets would be:

- 2009 emissions < 10,600 metric tons (baseline for 2006)
- 2020 emissions < 9,724 metric tons (a decrease of 876 metric tons)
- 2050 emissions = 1,945 metric tons (a decrease of 8,655 metric tons)

The metric ton decreases that are noted above do not reflect any growth in City staff or responsibilities. Added staff or services will increase CO<sub>2</sub> emissions related to the City and therefore the numbers above should be seen as base numbers, or minimum reductions. In order to reach the goals, the increase in CO<sub>2</sub> that would occur by adding staff or services will also need to be offset.

### GREENHOUSE GAS AND CLIMATE CHANGE IMPACTS AND MITIGATION MEASURES

#### Thresholds of Significance

Under CEQA, an environmental impact report must identify and focus on the significant environmental effects of a project. Significant effect on the environment means a substantial, or potentially substantial, adverse change in the environment (Public Resources Code, Section 21068). CEQA further states that the CEQA Guidelines shall specify certain criteria to be used in determining whether projects would have a significant effect on the environment. However, as of the writing of this Draft Environmental Impact Report (DEIR), the agencies with jurisdiction over air quality regulation and GHG emissions such as CARB and BAAQMD have not established regulations, guidance, methodologies, significance thresholds, standards, or analysis protocols for the assessment of GHG emissions and climate change. A standardized, statewide methodology to establish an appropriate baseline, such as a project-level (regional GHG emissions) inventory, to evaluate the significance of GHG emission changes has not yet been established. This places the burden for establishing a methodology, and determining significance standards, on local lead agencies, such as the City of San Mateo.

To meet GHG emission targets of AB 32, California would need to generate in the future less GHG emissions than current levels. It is recognized, however, that for most projects there is no simple metric available to determine if a single project would substantially increase or decrease overall GHG emission levels or conflict with the goals of AB 32. Moreover, emitting CO<sub>2</sub> into the atmosphere is not itself an adverse environmental effect. It is the increased concentration of CO<sub>2</sub> in the atmosphere resulting in global climate change and the associated consequences of climate change that results in adverse environmental effects (e.g., sea level rise, loss of snowpack, severe weather events). Although it is possible to generally estimate a project's incremental contribution of CO<sub>2</sub> into the atmosphere, it is typically not possible to determine whether or how an individual project's relatively small incremental contribution might translate into physical effects on the environment. Given the complex interactions between various global and regional-scale physical, chemical, atmospheric, terrestrial, and aquatic systems that result in the physical expressions of global climate change, it is impossible to discern whether the presence or absence of CO<sub>2</sub> emitted by the project would result in any altered conditions.

However, the State of California has established GHG reduction targets and has determined that GHG emissions as they relate to global climate change are a source of adverse environmental impacts in California that should be addressed under CEQA. Although AB 32 did not amend CEQA, it identifies the myriad environmental problems in California caused by global warming (Health and Safety Code, Section 38501[a]). SB 97, however, did amend CEQA by directing OPR to prepare revisions to the State CEQA Guidelines addressing the mitigation of GHGs or their consequences. As an interim step toward development of required guidelines, in

June of 2008, OPR published a technical advisory, entitled "CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review." OPR recommends that the lead agencies under CEQA make a good-faith effort, based on available information, to estimate the quantity of GHG emissions that would be generated by a proposed project, including the emissions associated with vehicular traffic, energy consumption, water usage, and construction activities, to determine whether the impacts have the potential to result in a project or cumulative impact, and to mitigate the impacts where feasible (OPR, 2008).

In the advisory document, OPR acknowledged that "perhaps the most difficult part of the climate change analysis will be the determination of significance" and noted that "OPR has asked ARB technical staff to recommend a method for setting thresholds which will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the state." CARB has not yet completed this task at the time of writing.

AB 32 requires CARB, the state agency charged with regulating statewide air quality, to adopt rules and regulations that by 2020 would achieve a reduction in greenhouse gas emissions equivalent to the statewide inventory levels of 1990. On or before June 30, 2007, CARB was required to publish a list of discrete GHG emission reduction measures that can be implemented. On April 20, 2007, CARB published their proposed early actions (CARB, 2007a), which include discrete early action measures, additional greenhouse gas reduction strategies, and criteria and toxic control measures.

The California Environmental Protection Agency (Cal/EPA) Climate Action Team developed a report that "proposes a path to achieve the Governor's targets [established in Executive Order S-3-05] that will build on voluntary actions of California businesses, local government and community actions, and State incentive and regulatory programs" (CAT, 2009) needed to reduce activities that contribute to global climate change. The report indicates that the strategies will reduce California's emissions to the levels proposed in Executive Order S-3-05.

Given this information, AB 32, Executive Order S-3-05, and the CAT report all indicate that development projects need to reduce GHG emissions to the target levels by adopting the reduction measures in order to find that the project's incremental contribution to global climate change impacts are not significant. If the project is not consistent with those strategies that a lead agency deems feasible, then a project could potentially be deemed to have a significant impact on global climate change.

For the purposes of this DEIR, the City has decided to quantify total GHG emissions from the proposed General Plan Update, compare the proposed General Plan Update, together with existing City policies currently in place, to the currently available set of strategies from the CAT and OPR, and determine whether implementation of the proposed General Plan Update would be consistent with the state's ability to attain the goals identified in Governor's Order S-03-05 and AB 32 (i.e., reduction of statewide GHG emissions to 1990 levels by 2020 and 80 percent reduction by 2050).

In addition to consistency with state efforts to reduce GHG emissions, this section evaluates whether the subsequent development under the proposed General Plan Update would be exposed to significant environmental impacts associated with the effects of global climate change.

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### Methodology

Transportation emissions from local roads and highways were calculated in the 2009 Sustainability Plan approved by the City, which calculates vehicle miles traveled and emissions coefficients for on-road travel within the City of San Mateo. Pacific Gas & Electric (PG&E) provided the kWh of electricity and therms of natural gas consumed within the City in 2006. These figures were multiplied by PG&E emissions coefficients that were verified by the California Public Utilities Commission (CPUC). Waste emissions were calculated using USEPA's Waste Reduction Model (WARM). WARM calculates and totals GHG emissions of baseline and alternative waste management practices—source reduction, recycling, combustion, composting, and landfilling. The model calculates emissions in metric tons of carbon dioxide equivalent (MTCO<sub>2</sub>E) across a wide range of material types commonly found in municipal solid waste (MSW). The California Integrated Waste Management Board (CIWMB) 2004 Waste Characterization Study provided the percentages of waste by type (paper, glass, compostables, etc.) for use in the WARM model.

It is important to note that all CO<sub>2</sub> emissions from General Plan Update implementation may not necessarily be considered “new” emissions, given that the General Plan Update itself does not create “new” emitters (people) of GHGs. In other words, the GHG emissions from residential uses are not necessarily all new GHG emissions; to a large degree, accommodates household relocations. Emissions of GHGs are, however, influenced by the location and design of projects, to the extent that they can influence travel to and from the projects, and to the degree the projects are designed to maximize energy efficiency.

The methodology used in this DEIR to analyze the implementation of the proposed General Plan Update's potential effect on global warming includes a calculation of GHG emissions based on existing City documents and previously completed inventories and action plans. The City's purpose for calculating the City's GHG emissions under buildout is for informational and comparison purposes, as there is no adopted quantifiable threshold.

### Consistency with Greenhouse Gas Reduction Measures

**Impact 4.13.1** Implementation of the proposed General Plan Update would implement a number of policies as well as continue the implementation of existing City programs that would complement and be consistent with the early emission reduction strategies contained in the California Climate Action Team's (CAT) Report to the Governor and Executive Order S-3-05 as well as the recommendations from OPR. This impact is considered to be **less than cumulatively considerable**.

**Table 4.13-2** identifies major GHG emissions from existing (2006) conditions. The City chose a baseline year of 2006 because of the reliability of data and to maintain consistency with neighboring jurisdictions. It should be noted that this inventory includes major emissions and does not factor into smaller GHG emission sources (e.g., miscellaneous maintenance operations in the City such as landscape maintenance and construction activities) that are thought to comprise less than 5 percent of the overall GHG stream of the City. It should also be noted that the 2030 buildout forecast is a business-as-usual estimate, meaning it does not take into account state initiatives or currently planned reduction measures of the City.

GHG emissions generated by subsequent development under the proposed General Plan Update would predominantly consist of CO<sub>2</sub>. In comparison to criteria air pollutants, such as ozone and PM<sub>10</sub>, CO<sub>2</sub> emissions persist in the atmosphere for a substantially longer period of time.

While emissions of other GHGs, such as CH<sub>4</sub>, are important with respect to global climate change, emission levels of other GHGs are less dependent on the land use and circulation patterns associated with the proposed land use development project than are levels of CO<sub>2</sub>.

Mobile sources (vehicle trips and associated miles traveled) would be the primary emission source of GHGs associated with the City, consisting of 55 percent of the total anticipated GHG emissions (see **Table 4.13-2**). However, it should be noted that vehicle miles traveled (VMT) estimated for the proposed General Plan Update include regional traffic moving through the City not associated with the General Plan Update as well as reallocation of trips that currently occur in the City.

The table below shows unmitigated greenhouse gas emissions and anticipated reductions of these emissions as a result of implementation of City-adopted emission reduction measures. The Municipal Climate Action Plan and Sustainable Initiatives Plan have specific targets for emissions reductions that are consistent with both Governor’s Order S-03-05 and Assembly Bill 32. Upon successful implementation of the City’s emission reduction measures, the target reduction goals are expected to be satisfied.

**TABLE 4.13-2  
GENERAL PLAN BUILDOUT GREENHOUSE GAS EMISSIONS IN CARBON DIOXIDE (CO<sub>2</sub>) METRIC TONS ANNUALLY**

<b>Source of CO<sub>2</sub></b>	<b>Baseline Conditions (2006)</b>	<b>General Plan Update Buildout Conditions (Year 2030)</b>	<b>Target Reduction Goal – 20% Below Baseline by 2020*</b>	<b>Target Reduction Goal – 80% Below Baseline by 2050*</b>
Transportation	346,201	422,793	317,779	191,645
Electricity	121,055	147,514	111,236	67,663
Natural Gas	141,657	173,686	129,771	77,025
Waste	16,096	20,274	14,546	7,666
<b>Total Emissions</b>	<b>625,009</b>	<b>764,267</b>	<b>573,332</b>	<b>343,999</b>

*\*Consistent with the reduction goals established in Governor’s Order S-03-05 and AB 32. Adopted as City policy in the Sustainable Initiatives Plan (2008) and the Operations and Facilities Climate Action Plan (2009).*

California Governor Schwarzenegger announced on June 1, 2005, through Executive Order S-3-05 (Climate Change) GHG emission reduction targets as follows: 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. Some literature equates these reductions to 11 percent by 2010 and 25 percent by 2020. The City of San Mateo has adopted these goals as their own through the Sustainable Initiatives Plan (2008).

AB 32 requires that by January 1, 2008, CARB was to determine what the statewide GHG emissions level was in 1990, and approve a statewide GHG emissions limit that is equivalent to that level, to be achieved by 2020. CARB staff recommended an amount of 427 million metric tonnes of carbon dioxide equivalent (MMTCO<sub>2</sub>e) as the total statewide greenhouse gas 1990 emissions level and 2020 emissions limit. CARB approved the 2020 limit on December 6, 2007. In

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December 2008, CARB approved the AB 32 Scoping Plan, which contains regulatory and market strategies California will use to reduce GHG emissions to 1990 levels by 2020. The Scoping Plan also confirmed that a local government commitment to reducing current GHG emissions by 15 percent is consistent with the state goal of reducing emissions to 1990 levels (CARB, 2008). This alternate method of achieving consistency with the state 2020 goal was created due to the lack of 1990 data availability at the local or regional level.

As noted previously, in June of 2008, the California Governor’s Office of Planning and Research (OPR) published a technical advisory entitled “CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review.” As a part of this document, OPR included examples of recommended measures that lead agencies may wish to consider to reduce GHG emissions. The recommendations from OPR are shown in **Table 4.13-3**. As with the CAT strategies identified above, the OPR recommendations are broad in their scope and address a wide range of industries and GHG emission sources. Therefore, most of the recommendations are not applicable to the development and operation of any single residential project, but rather as general development policies. Also, for those recommendations that are applicable, specific regulations or detailed guidance regarding their implementation is typically not available. Thus, the proposed General Plan Update’s compliance with these measures was evaluated by the City qualitatively with the understanding that exact compliance can only be determined once specific applicable regulations are adopted.

**TABLE 4.13-3  
GENERAL PLAN COMPLIANCE WITH OPR GREENHOUSE GAS EMISSION REDUCTION RECOMMENDATIONS**

Recommendation and Description	General Plan Update Compliance
<b>LAND USE AND TRANSPORTATION</b>	
Implement land use strategies to encourage jobs/housing proximity, promote transit-oriented development, and encourage high density development along transportation corridors. Encourage compact, mixed-use projects, forming urban villages designed to maximize affordable housing and encourage walking, bicycling and the use of public transit systems.	<b>Compliant.</b>  The subsequent development would be required to comply with applicable General Plan Update policies that encourage smart land use development. These policies are listed below in the impact discussion.
Encourage infill, redevelopment, and higher density development, whether in incorporated or unincorporated settings.	<b>Compliant.</b>  The subsequent development would be required to comply with applicable General Plan Update policies that encourage smart land use development as well as infill development. These policies are listed below in the impact discussion.
Encourage new developments to integrate housing, civic and retail amenities (jobs, schools, parks, shopping opportunities) to help reduce VMT resulting from discretionary automobile trips.	<b>Compliant.</b>  The subsequent development would be required to comply with applicable General Plan Update policies that encourage mixed-use development. These policies are listed below in the impact discussion.
Apply advanced technology systems and management strategies to improve operational efficiency of transportation systems and movement of people, goods and services.	<b>Compliant.</b>  The proposed General Plan Update includes transportation policies to improve and diversify the City’s transportation system. These policies are listed below in the impact discussion.
Incorporate features into project design that would	<b>Compliant.</b>

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Recommendation and Description	General Plan Update Compliance
accommodate the supply of frequent, reliable and convenient public transit.	The subsequent development would be required to comply with applicable General Plan Update policies that encourage smart land use development, infill development, public transportation, pedestrian and bicycle uses. These policies are listed below in the impact discussion.
Implement street improvements that are designed to relieve pressure on a region's most congested roadways and intersections.	<b>Compliant.</b> The proposed General Plan Update includes transportation policies to improve and diversify the City's transportation system. These policies are listed below in the impact discussion.
Limit idling time for commercial vehicles, including delivery and construction vehicles.	<b>Compliant.</b> The City's Public Works Division is taking steps to reduce the City's carbon footprint by retrofitting the fleet with alternative fuel and higher mileage per gallon vehicles, as noted below in the listing of "Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions."
<b>URBAN FORESTRY</b>	
Plant trees and vegetation near structures to shade buildings and reduce energy requirements for heating/cooling.	<b>Compliant.</b> Specific policies regarding urban forestry are included in the City's Sustainable Initiatives Plan. These policies are also incorporated into the General Plan, as noted below in the listing of "Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions" and in the impact discussion.
Preserve or replace onsite trees (that are removed due to development) as a means of providing carbon storage.	<b>Compliant.</b> Specific policies regarding urban forestry are included in the City's Sustainable Initiatives Plan and General Plan, as noted below in the listing of "Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions" and in the impact discussion.
<b>GREEN BUILDINGS</b>	
Encourage public and private construction of LEED (Leadership in Energy and Environmental Design) certified (or equivalent) buildings.	<b>Compliant.</b> The construction and operation of all buildings in the City would be required to comply with the energy efficiency standards included in Title 24 of the California Code of Regulations. Title 24 identifies specific energy efficiency requirements for building construction and systems operations that are intended to ensure efficient energy usage over the long-term life of the building. The City is working toward LEED equivalent facilities in its public buildings, with efforts including changes in cleaning practices, cleaning materials and supplies, energy efficiency, and indoor environmental quality.
<b>ENERGY CONSERVATION POLICIES AND ACTIONS</b>	
Recognize and promote energy savings measures beyond Title 24 requirements for residential and commercial projects.	<b>Compliant.</b> The construction and operation of all buildings in the City would be required to comply with the energy efficiency standards

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Recommendation and Description	General Plan Update Compliance
	<p>included in Title 24 of the California Code of Regulations. Title 24 identifies specific energy efficiency requirements for building construction and systems operations that are intended to ensure efficient energy usage over the long-term life of the building. The City is working toward LEED equivalent facilities in its public buildings, with efforts including changes in cleaning practices, cleaning materials and supplies, energy efficiency, and indoor environmental quality, as noted below in the listing of “Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions” and in the impact discussion.</p>
<p>Where feasible, include in new buildings facilities to support the use of low/zero carbon fueled vehicles, such as the charging of electric vehicles from green electricity sources.</p>	<p><b>Compliant.</b> The City's Public Works Division is taking steps to reduce the City's carbon footprint by retrofitting the fleet with alternative fuel and higher mileage per gallon vehicles, as noted below in the listing of “Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions” and in the impact discussion.</p>
<p>Educate the public, schools, other jurisdictions, professional associations, business and industry about reducing GHG emissions.</p>	<p><b>Compliant.</b> The City has been active locally and regionally in educating citizens about climate change and GHG reduction programs/actions. San Mateo SMART (San Mateo Action Responsibly Together) was developed specifically for the purpose of providing outreach in regard to climate change and has now developed into a program that provides energy audits, speakers to schools, and other awareness and support programs. The City is working with neighboring jurisdictions to implement similar programs.</p>
<p>Replace traffic lights, street lights, and other electrical uses to energy efficient bulbs and appliances.</p>	<p><b>Compliant.</b> The City has undertaken numerous efforts to increase energy efficiency in their buildings and facilities, as noted below in the listing of “Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions” and in the impact discussion.</p>
<p>Purchase Energy Star equipment and appliances for public agency use.</p>	<p><b>Compliant.</b> The City has undertaken numerous efforts to increase energy efficiency in their buildings and facilities, as noted below in the listing of “Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions” and in the impact discussion.</p>
<p>Incorporate on-site renewable energy production, including installation of photovoltaic cells or other solar options.</p>	<p><b>Compliant.</b> The City is actively pursuing on-site renewable energy generation in both municipal and community applications, as noted below in the listing of “Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions” and in the impact discussion.</p>
<p>Execute an Energy Savings Performance Contract with a private entity to retrofit public buildings. This type of contract allows the private entity to fund all energy improvements in exchange for a share of the energy savings over time.</p>	<p><b>Compliant.</b> The City has completed energy audits of municipal facilities and is completing free energy audits citywide as a part of the SMART program, as noted below in the listing of “Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions” and in the impact discussion.</p>

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Recommendation and Description	General Plan Update Compliance
Design, build, and operate schools that meet the Collaborative for High Performance Schools (CHPS) best practices.	<b>Not Applicable.</b> This measure is applicable to the local school districts that are responsible for the design, construction, and operation of school facilities.
Retrofit municipal water and wastewater management systems with energy efficient motors, pumps, and other equipment, and recover wastewater treatment methane for energy production.	<b>Compliant.</b> The City is working with its regional partners to explore more efficient infrastructure and management systems for water and wastewater, as noted below in the listing of "Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions" and in the impact discussion.
Convert landfill gas into energy sources for use in fueling vehicles, operating equipment, and heating buildings.	<b>Not Applicable.</b> This measure is applicable to the landfill operator to the City of San Mateo (the City does not provide its own landfill service).
Purchase government vehicles and buses that use alternative fuels or technology, such as electric hybrids, biodiesel and ethanol. Where feasible, require fleet vehicles to be low emission vehicles. Promote the use of these vehicles in the general community.	<b>Compliant.</b> The City's Public Works Division is taking steps to reduce the City's carbon footprint by retrofitting the fleet with alternative fuel and higher mileage per gallon vehicles, as noted below in the listing of "Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions" and in the impact discussion.
Offer government incentives to private businesses developing buildings with energy and water efficient features and recycled materials. The incentives can include expedited plan checks and reduced permit fees.	<b>Compliant.</b> The City is a member of Build It Green, a nonprofit organization focused on providing education and information to individuals and developers of residential projects on ways they can utilize green technology and products to reduce energy usage, save resources, and build a healthier indoor environment.
Offer rebates and low-interest loans to residents that make energy-savings improvements on their homes.	<b>Compliant.</b> The City has completed energy audits of municipal facilities and is completing free energy audits citywide as a part of the SMART program. The City is also working with its regional partners to explore opportunities for programs that can be implemented region-wide for energy-saving improvements to private homes, as noted below in the listing of "Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions" and in the impact discussion.
Create bicycle lanes and walking paths directed to the location of schools, parks and other destination points.	<b>Compliant.</b> The proposed General Plan Update includes policies for the provision of bicycle and pedestrian facilities, as noted below in the impact discussion.
<b>PROGRAMS TO REDUCE VEHICLE MILES TRAVELED</b>	
Offer government employees financial incentives to carpool, use public transportation, or use other modes of travel for daily commutes.	<b>Compliant.</b> The City is implementing preferred parking for carpoolers and alternative fuel vehicles at its Administration building, as noted below in the listing of "Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions" and in the impact

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Recommendation and Description	General Plan Update Compliance
	discussion.
Encourage large businesses to develop commute trip reduction plans that encourage employees who commute alone to consider alternative transportation modes.	<b>Not applicable.</b>
Develop shuttle systems around business district parking garages to reduce congestion and create shorter commutes.	<b>Compliant.</b> The City works with regional partners to support the provision of transit options and service expansion within the City, as noted below in the listing of “Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions” and in the impact discussion.
Create an online ridesharing program that matches potential carpoolers immediately through email.	<b>Compliant.</b> The City will be implementing preferred parking for carpoolers and alternative fuel vehicles at its Administration building, as noted below in the listing of “Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions” and in the impact discussion.
Develop a Safe Routes to School program that allows and promotes bicycling and walking to school.	<b>Compliant.</b> The City participates in the Safe Routes to School program and has a number of policies that support alternative modes of transportation, as noted below in the listing of “Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions” and in the impact discussion.
<b>PROGRAMS TO REDUCE SOLID WASTE</b>	
Create incentives to increase recycling and reduce generation of solid waste by residential users.	<b>Compliant.</b> The City is an active partner regionally in supporting recycling of household and business waste. The City, through its Sustainable Initiatives Plan, intends to divert 50 percent of its waste by 2020 and 90 percent of its waste by 2050, as noted below in the listing of “Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions” and in the impact discussion.
Implement a Construction and Demolition Waste Recycling Ordinance to reduce the solid waste created by new development.	<b>Compliant.</b> The City is an active partner regionally in supporting recycling of Construction and Demolition waste. The City, through its Sustainable Initiatives Plan, intends to divert 50 percent of its waste by 2020 and 90 percent of its waste by 2050, as noted below in the listing of “Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions” and in the impact discussion.
Add residential/commercial food waste collection to existing greenwaste collection programs.	<b>Compliant.</b> The City is an active partner regionally in supporting recycling of greenwaste. The City, through its Sustainable Initiatives Plan, intends to divert 50 percent of its waste by 2020 and 90 percent of its waste by 2050, as noted below in the listing of “Citywide Programs Currently in Place Reducing Greenhouse Gas Emissions” and in the impact discussion.

### Citywide Programs Currently in Place that Reduce Greenhouse Gas Emissions

In addition to the General Plan Update's compliance with the applicable CAT strategies and OPR recommendations noted in the above tables, it should be recognize that the City also has existing programs in place, and others that are planned, that reduce and minimize greenhouse gas emissions. The following citywide programs and policies contribute to the reduction of GHG emissions:

#### **Impacting City Operations & Facilities:**

- **The City Council adopted a policy that new City facilities will be as sustainable as possible** (while also economically feasible). The new Main Library and the proposed new Police Station will have the U.S. Green Building Council's Leadership in Energy and Environmental Design (LEED) Silver certification. All new civic buildings are required to be at least LEED Silver.
- **The City Council adopted policies on purchasing alternative fuel vehicles.** There are currently five hybrid and four electric vehicles in the City's fleet. The City has incorporated biodiesel into its fueling program, and almost a third of the City's fleet uses alternative fuels.
- **The Council adopted a green purchasing policy.** Under the policy, the City purchases green items such as:
  - copy paper (white and color) that contains 35% post-consumer content
  - file folders that contain between 30-95% post-consumer waste
  - paper towels and toilet paper that contain 100% post-consumer waste
- **The City conducted an energy audit of City facilities** which led the City to increase its use of energy-efficient lighting and other equipment. The City decreased its electric usage by about five percent between 2001 and 2005, and reduced its gas usage in most of its civic facilities by almost 30 percent during that time.
- **The City has been named a Tree City USA** by the National Arbor Day Foundation for the last 26 years. To achieve this award the City has met the foundation's four standards: a department dedicated to trees, a tree care ordinance, a comprehensive community forestry program, and an Arbor Day observance.
- **The City uses an automated sprinkler system** in most of its parks which conserves water by adjusting the timing and flow of irrigation based on weather conditions.
- **The City's wastewater treatment plant has had several pieces of equipment retrofitted** with energy-efficient alternatives, and staff has altered processes in the plant that have resulted in reduced energy usage. The plant also sends the biosolids it produces to be reused in composting, as a fertilizer, and to create protective landfill caps.

#### **Sustainable Development:**

- **Two large development efforts incorporate substantial sustainability features:** (a) the Bay Meadows Specific Plan Amendment, which proposes mixed-use and transit-oriented

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development features that will lend to a pedestrian- and bicycle-friendly environment; and (b) the Transportation Corridor Plan, which created two transit-oriented development zones, one close to the new Hillsdale train station and one near the Hayward Park train station.

- **The City uses Sustainable Buildings Checklists** to promote sustainable development when discussing potential projects with applicants. These lists include the San Mateo Countywide Sustainable Buildings Checklist, the USGBC LEED checklists, and the Build It Green residential checklists.
- **In June 2008 the City Council accepted the Sustainable Initiatives Plan for the City.** This plan is incorporated in its entirety in the General Plan for full adoption.

### Public Education:

- **The City completed the construction of Shoreline Park**, which is not only a beautiful place to enjoy the outdoors but also fosters greater awareness and understanding of our natural surroundings. The park provides more than 70 acres of outdoor exploration and features educational stations with interpretive signs about the wildlife and natural habitat. The park also includes two outdoor classrooms for hands-on environmental education activities.
- **The City is partnering with the County of San Mateo for the Green Business Program**, a pilot program to encourage small businesses to adopt “green” practices. To obtain the “green” certification, a business must track energy and water use and adopt environmentally sound practices. During the pilot phase of the program (July 1, 2007, through December 31, 2007), the City will be working with a select few businesses from the following sectors: auto service, restaurants, hotels, and office/retail.
- **The City Council adopted a policy to help reduce smoke emission from wood burning stoves within the City.** Part of the policy includes educating residents about the problem and ways they can reduce such pollution. In addition to posting information on the City’s website, staff provides this type of information to residents who are replacing fireplaces or undergoing remodeling projects when they visit the Building and Planning counter in City Hall or apply for a building permit.
- **To help residents recycle and reuse unwanted items**, the City provides information about recycling, composting, and alternative disposal options for hazardous materials on its website.
- **The City encourages residents to conserve energy by walking or biking around town.** The City created a bike map of routes in the City and a wall map of all of its parks and recreation areas as user-friendly resources for residents.
- **The City initiated the San Mateo SMART (San Mateo Acting Responsibly Together) program.** The City developed a climate action outreach program to inform the residents of San Mateo about the benefits of being “green.” The program has since developed into a speakers bureau and energy audit program that is being discussed by neighboring jurisdictions as a model program for climate action outreach.

### Proposed General Plan Update Policies that Provide Mitigation

The following policies include specific performance standards and policy direction that address climate change consistent with state measures to reduce greenhouse gas emissions.

- C/OS 3.2: Low-Impact Development.** Regulate the location, density, and design of development throughout the City in order to preserve topographic forms and to minimize adverse impacts on vegetation, water, and wildlife resources.
- C/OS 4.2: Public Uses.** Provide for public access, study, and recreation opportunities on Sugarloaf Mountain consistent with its natural setting consistent with the adopted management plan which ensures that significant natural qualities and habitat are protected.
- C/OS 6.1: Tree Preservation.** Preserve heritage trees in accordance with the City's Heritage Tree Ordinance.
- C/OS 6.2: Replacement Planting.** Require significant replacement planting when the removal of heritage trees is permitted.
- C/OS 6.3: New Development Requirements.** Require the protection of heritage trees during construction activity; require that landscaping, buildings, and other improvements located adjacent to heritage trees be designed and maintained to be consistent with the continued health of the tree.
- C/OS 6.4: Tree and Stand Retention.** Retain the maximum feasible number of trees and preserve the character of stands or groves of trees in the design of new or modified projects.
- C/OS 6.5: Public Awareness.** Pursue public awareness/education programs concerning the identification, care and regulation of heritage trees.
- C/OS 6.6: New Development Street Trees.** Require street tree planting as a condition of all new developments in accordance with the adopted Street Tree Master Plan.
- C/OS 6.8: Street Tree Preservations.** Preserve existing street trees; ensure adequate siting, selection and regular maintenance of City trees, including neighborhood participation, for the purpose of keeping the trees in a safe and aesthetic condition.
- C/OS 9.4: Interjurisdiction Coordination.** Support the coordination of adjacent jurisdictions in the development of bicycle and pedestrian trails, the connection of trails in San Francisco watershed lands, the development of Bay Trail and Ridge Trail systems and potential connections into the City of Belmont in the development of a trail system with Sugarloaf Mountain.
- C/OS 13.4: Lifecycle Management.** Utilize an infrastructure lifecycle management program that extends the useful life of all park and recreation assets and insures that sufficient funds are available for replacement of major rehabilitation.
- C/OS 13.6: Sustainable Practices.** Establish management and operating practices that are environmentally, socially and economically sustainable.

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- C/OS 14.9: Design Principles.** Establish design principles for all new or renovated parks to maximize productivity, efficiency and community value.
- C/OS 17.1: Public Information.** Communicate the benefits and value park and recreation services bring in making San Mateo a more livable, economically viable, and socially responsible community. Maximize publicity in programs and services that promote public knowledge of the services available.
- UD 2.9: Pedestrian Oriented Design.** On retail commercial projects, designate pedestrian activity as a priority through the design and provision of adequate sidewalk widths, locating windows along ground floor street facades, trees and awnings, and human scale construction materials and features.
- UD 2.14: Sustainable Design and Building Construction.** Require new development and building alterations to conform with the City's Sustainable Initiative Plan and subsequent Council adopted goals, policies, and standards pertaining to sustainable building construction.
- C 2.10: Transportation Demand Management (TDM).** Participate in the TDM Program as outlined by the San Mateo City/County Association of Governments (C/CAG). Encourage TDM measures as a condition of approval for development projects, which are anticipated to cause substantial traffic impacts. C/CAG requires the preparation of a TDM program for all new development that would add 100 peak hour trips or more to
- C 2.11: Transportation Demand Management (TDM) in Rail Corridor Transit Oriented Development Plan (Corridor Plan).** Establish and implement a TDM program consistent with the Corridor Plan policy and program requirements for development within Transit Oriented Development (TOD) areas.
- C 2.12: Transportation Demand Management (TDM) in Downtown.** Establish and implement a TDM program for development within the Downtown Core.
- C 3.1: Increase Bus Ridership.** Strongly promote increased bus ridership and improved accessibility to bus transit by encouraging SamTrans to implement specific bus improvements.
- C 3.2: Caltrain.** Continue the City's strong support of Caltrain as an essential element of the overall circulation system on the Peninsula and in the City. Support the following rail service improvements:
- a. Continue to work with the Joint Powers Board which locally manages and oversees improvement plans for Caltrain.
  - b. Increased service during non-commute periods and increase system capacity.
  - c. Development of a Downtown San Francisco terminal within the vicinity of the Transbay Terminal or Financial District to improve commute service and linkage to other regional transit systems.
  - d. Expenditure of Measure A (1/2-cent sales tax) funds and other available funds for grade crossing improvements at existing at grade crossings and where existing

grade separations have inadequate vertical clearance above the crossing street.

e. Caltrain Shuttle Bus Program.

f. Caltrain's Project 2025 future vision includes three major phases of development: state of good repair, electrification enhancements and post-electrification enhancements. All three phases of the program will provide increased frequency of service to San Mateo and Peninsula residents and commuters.

- C 3.3: Hayward Park Station.** Improve pedestrian and vehicular access to the station. Redevelop the surrounding area with mixed use and transit oriented development.
- C 3.4: Hillsdale Station.** In conjunction with the transit agency, relocate the Hillsdale Station northward to a new location in the vicinity of between 28<sup>th</sup> Avenue and 31<sup>st</sup> Avenue, allow parking lot expansion, improve vehicular circulation and pedestrian access, and facilitate direct on-site bus/train transfer. Establish a circulation system for Hillsdale Station that will safely meet the needs of the station as a major transit hub and heart of a transit village, and will efficiently accommodate the many modes of transit it will serve. Also, incorporate concepts of transit-oriented development into the designs of the areas surrounding the station – i.e. mixed-use development, pedestrian friendly design, a variety of housing within walking distance, etc.
- C 3.5: Grade Separation of Rail Line.** Promote the elimination of existing at grade crossings to improve local circulation and safety.
- C 3.6: Below Grade Rail Line.** Depress the rail line through the downtown with street crossings remaining at grade as Caltrain service is increased and high speed rail through the corridor is implemented. Depressing the rail line in downtown should include examination of a tunnel alternative and potential use of air rights.
- C 3.7: San Mateo Rail Corridor Transit Oriented Development Plan (Corridor Plan ).** Improve east-west access via new grade separated rail crossings at 28<sup>th</sup> and 31<sup>st</sup> Avenues.
- C 3.8: Pedestrian Access to Hillside Train Station Platform from 31<sup>st</sup> Avenue Grade Crossing.** Provide, as a minimum, pedestrian access from the 31<sup>st</sup> Avenue grade crossing to the platform of the relocated Hillsdale Train Station as permitted within the rail alignment project. Access from both 28<sup>th</sup> and 31<sup>st</sup> Avenues is preferred.
- C 3.9: Child Care Facilities Adjacent to Public Transit Stations.** Consider including child care space in, or adjacent to, public transit stations/hubs.
- C 3.10: Child Care Facilities Adjacent to Public Transit Stations.** Consider including child care space in, or adjacent to, public transit stations/hubs.
- C 4.1: Bikeways System.** Develop a bicycle master plan and prioritized capital improvement program that creates and maintains a safe and logical bikeways system; supports the City's Sustainable Transportation Actions; and is coordinated with the countywide system.

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- C 4.2: Bicycle Facilities on Transit.** Encourage bicycle transport on Caltrain and SamTrans (especially to the College of San Mateo). Provide an adequate supply of secure covered bicycle parking at the Caltrain stations.
- C 4.3: Dedication of Needed Right-of-Way for Bikeways.** Require dedication of necessary rights of way for bike lanes and paths shown on Figure C-5, which are deficient in land area. Dedication shall be required where the development project contributes to the need for the bikeways improvement and where the cost of dedication is not so disproportionate to the size of the project to make it unreasonable.
- C 4.4: Pedestrian Circulation.** Develop a pedestrian master plan and prioritized capital improvement program that creates and maintains a walkable environment in San Mateo and supports the City's Sustainable Transportation Actions.
- C 4.6: Wheelchair Access and Pedestrian Accessibility.** Continue to assess and improve wheelchair access throughout the City. Install wheelchair ramps or take other corrective measures where most needed in accordance with the established Citywide Wheelchair Program.
- C 4.7: Pedestrian Safety.** Pedestrian safety shall be made a priority in the design of intersection and other roadway improvements.
- C 4.8: Pedestrian and Bicycle Mobility Needs.** Balance pedestrian mobility and bicycle accessibility and safety with vehicular congestion when considering intersection improvements to address level of service degradation.
- C 4.9: Pedestrian and Bicycle Connections.** Implement an area-wide pedestrian and bicycle circulation plan which will result in convenient and direct connections throughout the Rail Corridor Transit-Oriented Development Plan (Corridor Plan) area and into adjacent neighborhoods and districts.
- C 4.10: Bikeway Systems.** Review the City's planned bikeways systems for adequacy, consistency and connectivity throughout the City to facilitate ease of use and safety for the users.
- C 4.11: Citywide Bikeways and Pedestrian Master Plan.** Develop a Citywide Bikeways and Pedestrian Master Plan to outline strategies for improving bicycling and walking conditions in San Mateo, while raising the profile of bicycling and walking as modes of transportation.
- C 4.12: Hillsdale Bicycle and Pedestrian Over Crossing.** Construct a bicycle and pedestrian over crossing in the vicinity of Hillsdale Boulevard over US 101.
- CC 1:** Reduce greenhouse gas emissions each year, beginning with 2009 emissions being less than the 2006 baseline and then exceed the 2020 state target (emissions at 1990 level in 2020) and meet the 2050 state target (emissions at 80% below 1990 level). State emission targets are defined by AB 32, the Global Warming Solutions Act of 2006. Re-evaluate these targets in the year prior to any General Plan revision but no less than every five years in regards to current scientific data and performance to determine if the City needs to increase the targets or its efforts to achieve them and to set interim targets.

Potential supportive actions:

- a. Implement all other recommendations in this Plan
- b. Support legislation that will support the City's sustainability goals, such as considering support for odometer readings on annual registration renewals and, if needed, to determine what type of fuel the vehicle uses.
- c. Support regional initiatives and projects that will help support the City's sustainability goals, such as Caltrain electrification
- d. Update the 2006 Footprint by changing the transportation methodology to one based on the T 7 recommendation, as this relates more closely to the behaviors we are trying to change. Include this information in future inventories instead of or in addition to the geography-based footprint for transportation.

**CC 2:** Recognize potential climate change consequences such as increased sea level rise, changing weather events, less snow melt in the Sierras - therefore less drinking water availability, hotter temperatures, changing air quality and more heat related health issues.

- a. Incorporate consideration of these effects in development of General Plan updates, disaster planning, City projects, infrastructure planning, future policies and long-term strategies.
- b. Explore voluntary adjustments of base flood elevation.

**GP 1:** Incorporate sustainability into the General Plan revision process, including but not limited to the following objectives:

- a. Provide a thorough review of the existing Circulation Element. Work with the City's Bikeways and Pedestrian Committee to identify feasible, safe and effective bikeways with good connectivity between activity centers and provision of sufficient convenient bicycle parking and feasible, safe and effective pedestrian walkways to major destinations. Update the bikeways map to reflect changes. Ensure that the General Plan includes efforts to increase the safety and convenience of choosing to travel by bicycle or on foot.
- b. Add or strengthen green building, energy efficiency and water conservation objectives to be in alignment with the strategies and intent of the Sustainable Initiatives Plan.
- c. Review and strengthen the waste and recycling sections to reflect the intent of the waste goals in the Sustainable Initiatives Plan.
- d. Include Climate Change concerns when updating the Plan and ensure that future planning takes climate impacts into consideration.

**GP 2:** Thoroughly review the General Plan to verify that there are no conflicting policies that would limit sustainable planning or green building design, developments and practices. Any conflicts that are identified should be considered and adjusted to

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encourage rather than discourage sustainability, to the extent the adjustments are not inconsistent with local, voter-approved measures.

- a. Ensure that any Green Building Program or energy efficiency requirements that exceed building code are covered in the General Plan, in order that requirements would be found to be legally in compliance with the General Plan.

**GP 3:** Update the General Plan to include any relevant policy directions from the Sustainable Initiatives Plan in the appropriate sections, including but not limited to:

- a. Adaptive strategies to mitigate the potential effects of global warming, such as decreased supply of drinking water, increased intensity of weather patterns, rising sea level and decreasing diversity of species and their habitats.

**GP 4:** Review land use designations for high intensity land uses located outside the Transportation Corridor or other transit nodes. When considering development or redevelopment of these locations, insure that proposed uses meet the City's sustainable transportation goals.

**T 1:** Increase mode share for pedestrian and bicycle travel to 30% for trips of one mile or less by 2020. Bicycle and pedestrian travel currently represents about 3% of all travel.

Potential supportive actions:

1. Improve pedestrian walkways and amenities within commercial areas and within residential neighborhoods and the connections between them.
2. Reduce crossing distances where pedestrians must cross arterial streets through the construction of bulb-outs or other methods.
3. Complete the implementation of the bicycle network as described in the General Plan and expand as appropriate to ensure a complete and convenient network of bicycle facilities.
4. Increase parking costs within the downtown area.
5. Introduce paid parking in other commercial areas outside of the downtown.
6. Price parking in the downtown and other commercial areas to discourage moving of vehicles between parking facilities (e.g. initial hour(s) more expensive than subsequent time when parked).
7. Work with private and public schools to increase the number of students walking or bicycling to school (see T 3).
8. In advance of demand, and to help promote demand, provide adequate, secure, covered parking for bicycles in city garages and as a condition for new multifamily and commercial development.

**T 2:** Reduce single occupant automobile usage for trips less than 5 miles in length by 20% by 2020.

Potential supportive actions:

1. All actions included under Goal T 1.
2. Implement flexible local transit service within San Mateo such as shared taxi, jitney or additional shuttles.
3. Use a significant portion of any increased gas tax revenues or identify an ongoing funding source to fund local flexible transit service and other alternative mode travel options.

**T 3:** Reduce single purpose school trips made by private automobile by 50% by 2020.

Potential supportive actions:

1. Implement "walking pools" to schools.
2. Implement increased carpooling for students.
3. Make flexible local transit available for student travel.

**T 4:** Reduce single occupant commuting by 20% by 2020.

Potential supportive actions:

1. Implement T 1, T 2, T 3, T 5.
2. Expand Transportation Management Association beyond Corridor Plan Area.
3. Require trip reduction of at least 20% for all development.
4. Expand frequency and improve convenience of regional transit services.
5. Implement aggressive congestion pricing during commute times.
6. Require parking cash out programs and paid parking at employment centers.
7. Establish parking maximums.
8. Facilitate the provision of transit passes or other direct transit subsidies for residents and employees within San Mateo.

**T 5:** Concentrate future development near rail transit stations.

Potential supportive actions:

1. Encourage developments within Transit Oriented Development Areas (TOD) to maximize population and employment within allowable zoning limits.
2. Reduce development potential outside of the TOD areas.
3. Provide incentives for development within TOD areas.

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4. Improve development certainty for projects within TOD areas.
5. Provide additional funding for infrastructure upgrades to serve TOD areas.
6. Encourage a broad mix of multi-family housing units sizes in TOD areas.

**T 6:** Reduce fuel consumption and vehicle emissions for trips originating in or destined for the City of San Mateo.

Potential supportive actions:

1. All trip reduction strategies outlined in T 1 through T 5 above will help meet this potential goal.
2. Provide incentives for the purchase and use of fuel efficient vehicles such as recharging stations for electric vehicles or preferential parking for carpools, hybrids and alternative fuel vehicles and develop a way to make this action enforceable.
3. Provide discounted parking rates for carpools, hybrids and other vehicles that help reduce CO<sub>2</sub> emissions.

**T 7:** Develop baseline data and methodology to be used to evaluate progress in achieving the transportation recommendations.

Potential supportive actions:

1. Survey San Mateo residents to determine the number of trips being made in each trip category:
  - a. Trips of less than one mile
  - b. Trips of less than five miles
  - c. School trips
  - d. Commute trips
2. Use the City's transportation forecasting model to estimate trip making characteristics in
3. Test land use and transportation options within 2020/2030 scenarios to identify measures most likely to achieve transportation recommendations and goals

**BE 1:** Develop and implement a pilot program that will survey the existing housing stock and small businesses in the city and provide statistically significant data on the status of energy and water building practices and equipment (such as use of low flow and energy savings equipment and insulation, weather stripping and dual pane windows, air conditioner, heater and water heater efficiency, etc.) Use this information to develop a proposal for a new program that will reach a high percentage of the existing housing stock and small businesses – both rental and owner occupied – to

upgrade one or more of the identified needs and provide data to assess progress. With proposed funding sources, bring this proposal to the City Council.

**BE 2:** Incorporate one or more programs into the work within the Department of Community Development that will provide alternative means of upgrading existing residential units and small businesses to a higher level of sustainability with a focus on reducing CO<sub>2</sub> emissions, water consumption and energy use.

Potential supportive actions:

1. Develop a pilot program of sustainability grants up to \$1,500 from CDBG Funds for the reduction of the use of natural gas through furnace, heater ducts and water heater upgrades. Water conservation programs could include low flow toilets and showerheads.
2. Focus on marketing existing programs of PG&E and Cal Water to encourage residents to take advantage of opportunities to retrofit for water, energy and conservation or to purchase Energy Star appliances,
3. Explore the idea of a program to distribute electric monitors for homes to assist homeowners to better understand energy consumption and costs.
4. Develop a plan for review that would require the upgrading of water flow and hot water heating systems and conversion of light bulbs when applying for a residential remodel project. This would be applicable to the remodels that are below the threshold for GreenPoint Rated Remodels, when that program is implemented.
5. Support and promote through education and outreach any existing programs and businesses in the community that provide solar installations.
6. Increase dissemination of information developed by BAWSCA, SMCWPPP (formerly STOPPP) and other public agencies or nonprofits on drought tolerant landscaping, water efficient irrigation and integrated pest management.

**BE 3:** Adopt a green building policy for the design and construction of new civic facilities to meet or exceed LEED Silver green building standards and for building remodel projects to meet or exceed LEED Certified. For some civic buildings, the GreenPoint Rated program may be applicable; in that case, buildings may be designed and constructed to meet or exceed a GreenPoint Rating of 75 points for new construction and 50 points for remodels in place of a LEED rating.

**BE 4:** Develop a voluntary program to implement the Build it Green GreenPoint Rated System for single family and multi-unit development projects. After initial implementation as a voluntary measure, the program shall require that new construction projects meet or exceed 75 points. When the GreenPoint Rated checklist for remodels is released, add remodels that are larger than 500 square feet to the voluntary and then required program. The mandatory program will begin with building permits issued for multi-family homes in 2009 and building permits issued for single family homes in 2010.

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- BE 5:** Develop a voluntary program for private builders to meet or exceed LEED Silver standards in new developments and buildings. After initial implementation through voluntary participation supported by incentives for participation, the program shall require that new construction projects and major, non-retail remodeling or renovation projects (as defined in the City of San Mateo Green Building Standards of Compliance Table) be designed and constructed to meet or exceed LEED Silver standards. The mandatory program will begin with building permits issued in 2009.
- BE 6:** Prior to making the green building program mandatory, educate builders, developers and homeowners and the public on the proposed new standards and implement the voluntary programs.
- BE 7:** When the City adopts mandatory green building standards, these shall serve as the city's expectations for sustainable development. The City shall promote higher standards through the use of incentives.
- BE 8:** Every three years, in accordance with the review and updating of the GreenPoint Rated system and LEED checklists, the City shall review and update its green building requirements, as it does with Title 24 and Building Code changes. The intention of this periodic review is to work towards continual improvement and strengthening of the standards, to ensure that the changes in LEED and GPR are sufficient to accomplish this and to consider whether a higher level of LEED or increased number of points should be required to meet the City's CO<sub>2</sub> reduction and sustainability goals.
- BE 9:** Increase new annual installations of solar or renewable energy systems for 2008 to 400kW. Increase subsequent year annual installations by 10% each year (2009 = 440kW of newly installed systems), until 2011 and at least 25% per year thereafter.

### Potential supportive actions:

1. Promote or join local partnerships and opportunities that offer renewable energy options to the residents and/or help inform them of rebates and options. For instance, the City could actively support
  - a. Current efforts by Hillsdale High School and Owens Electric & Solar (a San Mateo based business) to provide a discount to homeowners while supporting the High School's solar program
  - b. Build It Green in running a Green Building and Solar Home Tour in the City
2. Ensure that the permit process is quick and inexpensive.
3. Consider development of a solar access ordinance.
4. Establish a reporting system in the Building Division to track the cost and size of the system, the efficiency measures that were done concurrently or prior to the permit and the expected kWh to be produced by the system.
5. Provide basic information to the public – distribute the RecycleWorks solar flier, run the RecycleWorks video, Harnessing the Sun's Energy on the City's cable network, add links and information to the Green Page on the City website.

6. Include a recommendation to address energy efficiency items before installing renewable energy systems in any promotion. Ensure that any solar program has an efficiency component.
7. Ensure that City permitting staff have expertise in solar and energy efficiency actions.
8. Watch for innovative programs and strategies being developed in other cities, such as the Berkeley solar and efficiency loan program, and, after the programs have been implemented and the details addressed, evaluate these programs as potential ideas for San Mateo to copy.

**WR 1:** Increase measured waste diversion to 50% by 2020.

Potential supportive actions:

1. Increase costs for residential and commercial waste collection.
2. Increase degree of progression within collection rates.
3. Use increased waste collection revenue to provide waste reduction incentives.
4. Make recycling mandatory.
5. Require mandatory composting of green and food waste, while maintaining public health safeguards.
6. Set aggressive waste reduction goals for all new development.
7. Require modifications within existing buildings to accommodate recycling bins.
8. Require mandatory segregation of recyclables for all public (on-street, parks, public buildings) waste collection.
9. Provide expanded waste reduction outreach and support for local businesses.
10. Provide expanded waste reduction outreach and support for residential customers.
11. Support backyard composting to minimize transportation impacts while maintaining public health safeguards.

**WR 2:** Achieve maximum diversion (90%) by 2050.

Potential supportive actions:

1. Implement all of WR 1.
2. Require significant change in packaging of all commercial products.
3. Make Styrofoam more easily recyclable or find alternative packing materials that can be recycled.

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4. Improve markets for recycled materials.

**WR 3:** Participate in promoting emerging solutions to health, environmental, and waste management problems caused by consumer products such as Product Stewardship/Extended Producer Responsibility (EPR) and changes in packaging.

Potential supportive actions:

1. Add EPR to the City's Environmental Purchasing Policy; select vendors that sponsor or participate in take-back programs.
2. Support legislation, regulation and other actions that will reduce hazards and environmental impacts caused by products and their packaging, reduce the use of natural resources in packaging or will make products and/or their packaging materials easier to reuse or recycle.

**SF 1:** Expand the Suburban Forest.

Potential supportive actions:

1. Provide information regarding the benefits of trees within a suburban environment.
2. Collaborate with a nonprofit to sponsor a tree planting event, as a celebration of Arbor Day, to bring together and educate the residents interested in tree planting with nonprofits that are active in other cities, such as California ReLeaf (a state organization), Our City Forest (Santa Clara County), City Trees (Redwood City), Canopy (Palo Alto), Friends of Urban Forests (San Francisco), etc.
3. Consider solar access in tree planting programs.

**W 1:** Establish a partnership with CWS and BAWSCA to promote the water reduction strategies that are offered and to create an outreach program that will help to inform residents and businesses of increasing costs and the need for conservation efforts.

**W 2:** Partner with the City of San Carlos (the other city in the water district) to set a target for 2020 to reduce the residential per capita usage to 70 gallons/day and to develop programs to reach that target. Reduce citywide gross water consumption per capita to 102 gallons/day.

Potential supportive actions:

1. Implement W 1 and W 4.
2. Work with CWS to implement progressive water rates.
3. Actively support a strategy to decouple water utility revenues from water consumption and any other regulatory changes that will offer incentives to CWS to actively pursue conservation.

- W 3:** Re-evaluate the potential for use of recycled water to replace potable water for appropriate uses.
- W 4:** Establish a staff position to take oversight responsibility for water quality and conservation in San Mateo, whose primary responsibilities would include:
- a. Maintaining partnerships with CWS, BAWSCA, and the City of San Carlos in order to pursue conservation opportunities and programs.
  - b. Identifying ways in which the City can proactively address the issues of declining water supply, water quality and future water demands.
  - c. Developing programs to reduce water consumption in existing housing and commercial establishments.
  - d. Procuring funding for expanded water reduction programs in the City.
  - e. Coordinating with and assisting other staff on public education and outreach about water pollution in sewers (such as prescription drug disposal) and stormwater drains.
- PO 1:** Create a multi-phased information campaign to educate residents and businesses on this Plan and to spark behavioral changes in individual energy and water consumption, transportation mode choices, and recycling.
- Potential supportive actions:
1. Highlight the relationships between health, finances and choices relating to transportation modes or other environmental issues.
  2. Increase utilization of the City website to inform.
  3. Provide materials in other languages as appropriate.
  4. Ensure that each program and recommendation within the Sustainable Initiatives Plan is supported by an appropriate level of outreach and communication.
  5. Continuing sustainability efforts.
- S 1:** Maintain sufficiently frequent reviews of the Sustainable Initiative Plan to ensure its continuing implementation, usefulness and appropriately strong goals, including but not limited to:
- a. An annual CO<sub>2</sub> emissions inventory for communitywide emissions and city operations and facilities, including information on transportation impacts according to trips that originate or end in San Mateo (can replace or supplement the geographical approach taken in the 2006 footprint).
  - b. A publicly available assessment report to the City Council every 2 years, which would include an evaluation of progress on the recommendations, evaluation of the success of specific implementation steps, and recommendations for improvements to ensure the plan is meeting its goals and is in keeping with the

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most current scientific information and public policy approaches regarding appropriate targets and programs.

- c. Adding the CO<sub>2</sub> reduction goals and other appropriate metrics to the City's business plan and departmental work plans.

**S 2:** Assign clear responsibility for each recommendation in this report to specific departments, ensure that needed actions are included in future departmental work plans and that the concept of continual improvement of process and outcomes on all recommendations is internalized.

**S 3:** Assign responsibility for the overall implementation of the Plan and for continuing investigation of opportunities to participate in local actions that will improve the sustainability of the City and region.

Potential supportive actions:

1. Take part in the Pathway to Sustainable Cities program that is under development by Sustainable San Mateo County (SSMC).
2. Nominate businesses in San Mateo that demonstrate leadership in sustainability for the SSMC awards.
3. Participate and/or sponsor the quarterly meetings of Sustainable Silicon Valley (SSV) and act as a liaison for businesses and SSV to connect with the purpose of reducing their GHG footprint.
4. Review and adopt, if appropriate, the Countywide Energy Strategy when finalized.

**LU 1.1:** **Planning Area Growth and Development to 2025.** Plan for land uses, population density, and land use intensity as shown on the Land Use, Heights and Building Intensities and City Image Plans for the entire planning area. Design the circulation system and infrastructure to provide capacity for the total development expected in 2025. Review projections annually and adjust infrastructure and circulation requirements as required if actual growth varies significantly from that projected.

**LU 1.4:** **Development Intensity/Density.** Adopt and maintain the development intensity/density limits as identified on the Land Use Map and Building Intensity Plan, and as specified in Policy LU 6A.2. Development intensity/density shall recognize natural environmental constraints, such as flood plains, earthquake faults, debris flow areas, hazards, traffic and access, necessary services, and general community and neighborhood design. Maintain a density and building intensity range, with densities/intensities at the higher end of the range to be considered based on provision of public benefits such as affordable housing, increased open space, public plazas or recreational facilities, or off-site infrastructure improvements.

**LU 1.8:** **Mixed Use Commercial-Residential.** Facilitate housing production by allowing commercial mixed use development which includes multi-family dwellings in all non-residential land use categories except service commercial, manufacturing/ industrial and parks/open space.

- LU 1.12: Neighborhood Shopping Centers.** Retain neighborhood shopping centers, with retail being the predominant use, at low to medium intensities and locations delineated on the Land Use Plan and Building Intensity Plan.
- LU 1.15: Mixed Use.** Encourage developments which mix commercial retail and office uses with residential uses at locations and intensities/densities as delineated on the Land Use Plan and Building Intensity Plan.
- LU 1.17: Transportation Corridors.** Maintain adequate transportation corridors to accommodate highway and rail transit. Consider redesignation of portions of the railway corridor not required for transportation purposes for development which is compatible with adjacent uses and does not generate significant adverse impacts.
- LU 2.4: Downtown Plan.** Establish downtown San Mateo as the social, cultural, and economic center of the City with a wide range of office, medical, residential, entertainment, and retail uses at high intensities and densities while encouraging pedestrian activity and bicycle connectivity to adjacent neighborhoods.
- LU 3.1: Downtown Plan.** As the social, cultural and economic center of the City, the downtown shall maintain a wide range of office, medical, residential, entertainment, and retail uses at high intensities and densities.
- LU 3.3: El Camino Real.** Retain the general residential and landscaped character of El Camino Real north of Tilton Avenue. Promote the visual upgrading of El Camino Real south of Ninth Avenue through increased landscaping, coordination of public improvements, property maintenance, and sign control, through conformance with the El Camino Real Master Plan. Residential uses shall be encouraged to provide diversity to the existing commercial character, and building setbacks from adjoining residences used to reduce perceived building mass from El Camino Real.
- LU 3.4: Rail Corridor Transit-Oriented Development Plan (Corridor Plan).** Implement the Corridor Plan to allow, encourage, and provide guidance for the creation of world class transit-oriented development (TOD) within a half-mile radius of the Hillsdale and Hayward Park Caltrain station areas, while maintaining and improving the quality of life for those who already live and work in the area. Development within the plan area shall comply with the policies of the Plan.
- LU 3.5: Transit-Oriented Development (TOD) Land Use Designation.** Maintain TOD land use designations for areas in direct proximity to the Hillsdale and Hayward Park Caltrain stations.
- LU 4.3: Location of Critical Facilities.** Encourage active, healthy lifestyles, by promoting pedestrian and bicycle connectivity between civic facilities. Avoid locating critical facilities, such as hospitals, schools, fire, police, emergency service facilities and utilities in areas subject to slope failure, flooding and other hazards as identified in the Safety Element, where feasible.
- LU 4.4: Water Supply.** Seek to ensure a safe and predictable water system for existing and future development by taking the following actions:

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1. As a high priority, work with California Water Company and Estero Municipal Improvement District and adjacent jurisdictions to develop supplemental water sources and conservation efforts.
2. Strongly encourage water conservation by implementing pro-active water conservation methods, including requiring all new development to install low volume flush toilets, low-flow shower heads, and utilize drip irrigation while promoting high-efficiency washing machines and establishing an education program to improve water conservation practices.
3. Investigate the feasibility of developing reclaimed water facilities or ground water or treating stormwater runoff that will enable reuse of water for irrigation purposes, freeing comparable potable water supplies for other uses.

**LU 4.31: Solid Waste Disposal.** Continue to support programs to reduce solid waste materials in landfill areas in accordance with State requirements.

**LU 4.32: Recycling.** Support programs to recycle solid waste in compliance with State requirements. Require provisions for onsite recycling for all new development.

**LU 5.1: Inter-Agency Cooperation.** Promote and participate in cooperative planning with other public agencies and adjacent jurisdictions, especially regarding regional issues such as water supply, traffic congestion, rail transportation, air pollution, waste management, fire services, emergency medical services and climate change

**LU 8.1: Carbon Footprint.** Implement the recommendations in the Sustainable Initiatives Plan.

1. Support legislation that will support the City's sustainability goals, such as considering support for odometer readings on annual registration renewals and, if needed, to determine what type of fuel the vehicle uses.
2. Support regional initiatives and projects that will help support the City's sustainability goals, such as the electrification of Caltrain.
3. Update the 2006 Footprint by changing the transportation methodology to one based on the T 7.1 policy located in the Circulation Element, as this relates more closely to the behaviors we are trying to change. Include this information in future inventories instead of or in addition to the geography-based footprint for transportation.

**LU 8.3: Sustainable Development.** Incorporate sustainability into existing single family and multifamily housing. Require sustainable features and techniques to address energy and water efficiency in remodels off existing structures.

**LU 8.4: Solar Energy.** Promote or join local partnerships and opportunities that offer renewable energy options to the residents and/or help inform them of rebates and options while ensuring that the permit process is quick and inexpensive.

**LU 8.5: Waste Reduction.** Implement actions to achieve Goal 8e. Potential supportive actions include:

1. Increase costs for residential and commercial waste collection and use increased waste collection revenue to provide waste reduction incentives.
2. Mandate recycling.
3. Require modifications within existing buildings to accommodate recycling bins.
4. Require mandatory segregation of recyclables for all public (on-street, parks, public buildings) waste collection.
5. Set aggressive waste reduction goals for all new development.
6. Provide expanded waste reduction outreach and support for local businesses and residential customers.
7. Support backyard composting while maintaining public health safeguards.

**LU 8.6: Water Reduction Strategies.** Establish a partnership with California Water Service (CWS), Bay Area Water Supply Conservation Agency and other mid peninsula cities to promote the water reduction strategies that are offered and to create an outreach program that will help inform residence and businesses of increase costs and the need for conservation efforts.

**LU 8.7: Water Rates.** Actively support a strategy to decouple water utility revenues from water consumption and any other regulatory changes that will offer incentives to CWS to actively pursue conservation while working with CWS to implement progressive water rates.

**LU 8.8: Engaging the Public.** Create a multi-phased information campaign to educate residents and businesses on the Sustainable Initiatives Plan and to spark behavioral changes in individual energy and water consumption, transportation mode choices, and recycling.

**PA 1.1: North El Camino Real.** Retain the high density residential character of the area between Peninsula and Tilton avenues. Commercial sites in the area should redevelop where appropriate to medium scale office uses, as delineated on the Building Height and Intensity Plans, or high density residential. Commercial redevelopment shall be designed to reflect the residential design and character of the area.

**PA 7.11: Transit-Oriented Development (TOD).** Encourage a transit-supportive mix of uses consistent with the San Mateo Rail Corridor Transit-Oriented Development Plan (Corridor Plan).

As identified above, and through other land use policies promoting higher density uses throughout the City, implementation of the proposed General Plan Update as well as existing City programs and emission reduction targets would be consistent with state measures to reduce greenhouse gas emissions. Thus, this impact is **less than cumulatively considerable**.

### Mitigation Measures

None required.

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### Climate Change Environmental Effects on the City

**Impact 4.13.2** Implementation of the proposed General Plan Update could substantially increase emissions of GHGs over existing conditions that could result in environmental effects to the City. This impact is considered to be **less than cumulatively considerable**.

As identified above under the “Climate Setting” discussion, there are many technical studies available regarding the environmental effects of climate change on the Earth as a whole as well as in California specifically. Several adverse environmental effects have been identified that are projected to impact California over the next century and others have been identified that are likely to affect the Bay Area. However, the extents of these environmental effects are still being defined as climate modeling tools become more refined. Potential environmental effects of climate change that could impact the City could include the following (which were previously noted above):

- Sea level rise;
- Adverse impacts on water supply availability;
- Increased severity of flooding events;
- Increased wildland fire hazards;
- Alteration of natural habitats for special-status plant and animal species; and
- Air quality impacts.

The City has been proactive in addressing the potential impacts of climate change on the community, specifically sea level rise. As summarized in the Climate Setting section, the City of San Mateo recently completed a report entitled “Climate Change Impacts for San Mateo” dated February 2, 2009. The purpose of this report is to “detail the potential impacts of climate change to San Mateo water resources, both in magnitude and uncertainty, and discuss conceptual mitigation activities.” The recommendations from this report were incorporated into the General Plan policies listed below.

#### Proposed General Plan Update Policies that Provide Mitigation

The following policies include specific performance standards and policy direction that address climate change consistent with the City’s understanding of the potential challenges climate change poses to the community in the future.

**LU 4.5: Wastewater Treatment Plant Expansion.** Provide adequate waste water treatment for the projected 2025 service area population, employment and development. Require that any future expansion of the Waste Water Treatment Plant (WWTP) be designed to be compatible with the adjacent parks, school, and low-density residential areas by screening views of the WWTP with extensive and tall landscaping and reducing the height of all new structures to the maximum practicably feasible. Additionally, ensure that any future expansion of the WWTP considers the possible rise in sea level.

**LU 4.6: Inter-Agency Coordination.** Coordinate future expansion or modification of the Wastewater Treatment Plant with the other users of the plant including the Estero Municipal Improvement District (Foster City), the Crystal Springs County Sanitation District, Hillsborough and Belmont.

**LU 4.7: Sewer System.** Provide a sewer system which safely and efficiently conveys sewage to the waste water treatment plant. Implement the Sewer System Management Plan

(SSMP) to ensure proper maintenance, operations and management all parts of the wastewater collection system.

- LU 5.1: Inter-Agency Cooperation.** Promote and participate in cooperative planning with other public agencies and adjacent jurisdictions, especially regarding regional issues such as water supply, traffic congestion, rail transportation, air pollution, waste management, fire services, emergency medical services and climate change
- LU 8.2: Effects of Climate Change.** Incorporate consideration of the effects of climate change in development of General Plan updates, disaster planning, City projects, infrastructure planning, future policies and long-term strategies. Explore voluntary adjustments of base flood elevation.

Because considerable uncertainty remains with respect to the overall impact of global climate change on California and the City, it is unknown whether these impacts would be significant. This also includes the uncertainty surrounding to what degree global climate change may adversely impact future water supply and availability in the City of San Mateo. However, based on consideration of the recent regional and local climate change studies, and since the City of San Mateo's water sources are anticipated to largely remain intact (though the form of precipitation is expected to come from rain rather than snow), in combination with the City's existing and proposed policies regarding climate change adaptation and resiliency, it is expected that the impacts of global climate change on the City would be **less than cumulatively considerable**.

### Mitigation Measures

None required.

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