This section of the Draft Environmental Impact Report (Draft EIR or DEIR) addresses climate change and energy use and associated environmental effects. The reader is also referred to Section 4.12, Public Services and Utilities, for additional discussion regarding electrical and natural gas service.

4.14.1 EXISTING SETTING

GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

To fully understand global climate change, it is important to recognize the naturally occurring "greenhouse effect" and to define the greenhouse gases (GHGs) 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_2), methane (CH_4), and nitrous oxide (N_2O) that absorb heat radiated from the Earth's surface. GHGs — CO_2, CH_4, N_2O, 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 the 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 (°F) cooler (NASA, 2009).

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). 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 traps more heat near the Earth's surface. Prominent GHGs contributing to the greenhouse effect and climate change include carbon dioxide, methane, ozone (O_3), 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 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 6.3ºF 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 10.5ºF 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 ºF, 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 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

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.

If anticipated flooding occurs, resultant effects could include increased coastal flooding, saltwater intrusion, and disruption of wetlands (CEC, 2006b). 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. 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.

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 or 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 to 400 miles, as well as upwards in elevation by 500 to 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.

Wildfire Risk

With climate change, the potential for wildfires may increase due to changes in fuel conditions, such as forests transitioning to chaparral and grasslands; precipitation, including longer dry seasons and higher extreme temperatures; wind, which affects the spread of wildfire; and other variables. Wildfire intensity and frequency have increased in recent years across the western United States, with the total area burned increasing nearly seven times for the period between 1987 and 2003 as compared to the period between 1970 and 1986 (CEC, 2009a). The wildfire season in the western United States has increased by 78 days since 1979 (CEC, 2009a). Land management is often blamed for the increase in wildfire frequency. A century of fire suppression has led to increased forest densities and accumulation of fuel wood that can result in more severe fires when this excess buildup of fuel is ignited. Yet climate also plays an important role. Warmer temperatures and longer dry seasons are the main reasons for the increasing trend in forest wildfire risk (CEC, 2009a). Reduced winter precipitation and early spring snowmelt deplete the moisture in soils and vegetation, leading to longer growing seasons and drought. These increasingly dry conditions provide more favorable conditions for ignition. In addition, higher temperatures increase evaporative water loss from vegetation, increasing the risk of rapidly spreading and large fires.

Climate change research predicts increased numbers and acres of wildfire. Wildfire occurrence statewide could increase from 57 percent to 169 percent by 2085 and by more than 100 percent in most northern California forests (Cal Natural Resources Agency, 2009). Fire severity is also predicted to increase as a result of more frequent severe fire weather. The wildfire season already appears to be starting sooner, lasting longer, and increasing in intensity (California Natural Resources Agency, 2009). Burned wildland acreage has increased in the last several decades. Over 48 million acres, or nearly half of the state, is at a high to extreme level of fire threat (California Natural Resources Agency, 2009).

Increases in the frequency and intensity of wildfires will make forests more susceptible to vegetation conversions from trees to brush or grasslands (California Natural Resources Agency, 2009). In order for trees to reestablish after wildfires, patches of living trees must be left to provide seeds for the recruitment of new seedlings. As wildfires increase in size, they can result in "stand-replacing" burns that are too big for natural regeneration. More frequent fires may also result in vegetation conversion by repeatedly killing regeneration. Vegetation conversions of chaparral and forest vegetation will impact biodiversity, habitats, watershed conditions, timber resources, and other goods and services.

On rangelands, climate-change-induced wildfire increases are predicted to increase grassland acreage, while decreasing brush and oak woodlands (California Natural Resources Agency, 2009). Wildfires may increase invasion by annual and brush non-native species, which are generally less palatable to livestock and wildlife than native grass and brush species. Annual grasses also increase fire risk and hazard by producing "flashy fuels" that ignite easily and carry fire quickly across the landscape.

Larger and more frequent wildfires will impact California's economy by increasing fire suppression and emergency response costs, damages to homes and structures, interagency post-fire recovery costs, and damage to timber, water supplies, recreation use, and tourism. The California Department of Forestry and Fire Protection (Cal-Fire) spent over $500 million on fire suppression during fiscal year 2007/2008. As climate change continues, these costs are expected to increase (California Natural Resources Agency, 2009).

Air Quality

Projected climate changes will impact the quality of California's air, public health, and environment. Higher temperatures increase the formation of O_3, PM_{10}, and $PM_{2.5}$, making it more difficult to meet the health-based air quality standards for these pollutants. 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 O_3, PM_{10}, and $PM_{2.5}$ 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.

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 (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) (CalEPA, 2007). The Sierra Nevada snowpack currently acts as natural water storage by holding winter precipitation and releasing it during the spring and early summer months as the snow melts. According to the California Natural Resources Agency (2009), nearly 75 percent of California's available water supply originates in the northern third of the state (north of Sacramento), mainly from water stored in the Sierra Nevada snowpack. 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.

The state's water supply system already faces challenges to provide water for California's growing population. Climate change is expected to exacerbate these challenges through increased temperatures and possible changes in precipitation patterns. The trends of the last century, especially increases in hydrologic variability, will likely intensify in this century (California Natural Resources Agency, 2009). Californians can expect to experience more frequent and larger floods and deeper droughts. Increasing average temperatures may have several impacts on water supply and demand, affecting California's farms, municipalities, and ecosystems.

First, increasing winter and early spring temperatures will cause earlier melting of the Sierra Nevada snowpack, the most important seasonal surface reservoir of water in California. Historically this snowpack has released about 15 million acre-feet of water slowly over the warming spring and summer months (one acre-foot provides the annual water needs of one to two families) (California Natural Resources Agency, 2009). California's water storage and conveyance infrastructure gathers this melting snow in the spring and delivers it for use during the drier summer and fall months. This same infrastructure is also used for flood control in the winter and early spring by keeping lower reservoir levels. With earlier snowmelt and heavy winter/spring rains possibly coinciding, difficult tradeoffs may need to be made between water storage and flood protection.

Concerns over the availability, quality, and distribution of water are not new to California, but these concerns are growing and solutions are becoming more complex as water managers navigate competing interests and regulations to reliably provide quality water to farms,

businesses, and homes, while also protecting the environment and complying with legal and regulatory requirements. Water adaptation strategies are primarily driven by the possibility of reduced future water supplies and increased flood threat brought about by climate change.

The California Water Service Company (Cal Water) provides water service in the Planning Area as part of Cal Water's Chico-Hamilton City District (Chico District). The sole source of water supply for the customers of the Chico District is groundwater extracted from subbasins of the Sacramento Valley Groundwater Basin that underlie the district: the Vina Subbasin, the West Butte Subbasin, and the East Butte Subbasin (see Section 4.12, Public Services and Utilities, for an expanded discussion of water supply). 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. 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.

It is no simple matter to figure out how regional changes in precipitation, expected to result from global climate change, may affect water supplies. New analysis led by Massachusetts Institute of Technology (MIT) researchers has found that the changes in groundwater may actually be much greater than the precipitation changes themselves (MIT, 2008). For example, in places where annual rainfall may increase by 20 percent as a result of climate change, the groundwater might increase as much as 40 percent. Conversely, the analysis showed in some cases just a 20 percent decrease in rainfall could lead to a 70 percent decrease in the recharging of local aquifers (MIT, 2008). The analysis combines computer modeling to determine how precipitation, soil properties, and vegetation affect the transport of water from the surface to the aquifers below. The analysis focused on a specific semi-arid region near Lubbock, Texas, in the southern High Plains (MIT, 2008).

However, the exact effects of climate change on groundwater recharge depend on a complex mix of factors, including soil type, vegetation, and the exact timing and duration of rainfall events, so detailed studies will be required for each local region in order to predict the possible range of outcomes (MIT, 2008). According to the Butte County Groundwater Management Plan (2004), the Butte County Department of Water and Resource Conservation in coordination with the California Department of Water Resources, has developed and monitors the Sacramento Valley Groundwater Basin through an extensive monitoring network. Ongoing groundwater monitoring provides information needed to document current conditions, assess long-term trends, and efficiently respond to the effects of climate change.

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.

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).

Current Greenhouse Gas Emissions

The following is a summary of current estimates of greenhouse gas emissions for the state, Butte County, and the City of Chico.

California Emissions

The California Energy Commission estimates that California is the second-largest state emitter of GHG emissions in the United States, behind Texas in absolute emissions (CEC, 2006a). However, the state has relatively low carbon intensity when considering GHG emissions per person or GHG emissions per unit gross state product. Worldwide, California is estimated to be the 12th to 16th largest emitter of CO_2 and is responsible for approximately 2 percent of the world's CO_2 emissions (CEC, 2006a). The California Air Resources Board (CARB) released estimates of California's 1990 emissions inventory, which amounted to 433.29 million gross metric tons of carbon dioxide equivalent (MMT CO_2e) (CARB, 2009). CARB has also estimated that 2006 emissions levels were 483.87 MMT CO_2e. Factoring in the reduction in GHG emissions due to the functioning of existing forests and rangeland as carbon sinks, California's GHG emissions in 2006 were 479.80 MMT CO_2e. Greenhouse gas emissions for California were apportioned to the following sectors in 2006: transportation (38.4 percent), electric power (21.9 percent), commercial and residential energy usage (9.2 percent), industrial (19.9 percent), recycling and waste (1.3 percent), high global warming potential gases (3.1 percent), agriculture (6.2 percent), and forestry (0.04 percent) (CARB, 2009).

Butte County Emissions

A 2006 GHG inventory for Butte County was prepared as part of the Butte County General Plan. In 2006, GHG emissions in Butte County totaled 601,266 $MTCO_2e$ (Butte County, 2010). On-road vehicles contributed 295,750 $MTCO_2e$, or 49.2 percent, and off-road equipment contributed an additional 6.8 percent, or 40,939 $MTCO_2e$ (Butte County, 2010). Approximately 28.1 percent of the 2006 GHG emissions can be attributed to electricity and natural gas used to power or heat residences, homes, and industries (Butte County, 2010). Industrial sources (stationary sources) related to the burning of other fuels or fugitive emissions accounted for 4,093 $MTCO_2e$, or 0.7 percent (Butte County, 2010). Waste generated by Butte County residents in 2006 will produce 17,873 metric tons of GHGs (due to landfill methane) over the next 30 years, roughly the decompositional lifetime of the landfilled waste (Butte County, 2010). Waste currently in place at the Neal Road Recycling and Waste Facility will result in 14,247 $MTCO_2e$ in the form of landfill methane that year; this amount is 2.4 percent of the 2006 total. The burning of fuel to power agricultural equipment in 2006 contributed 77,019 $MTCO_2e$, roughly 10 percent of the on-road vehicle emissions and 12.8 percent of the county total for 2006 (Butte County, 2010).

City of Chico Emissions

In April 2008, the City of Chico completed a GHG inventory for calendar year 2005 titled *City of Chico Greenhouse Gas & Criteria Air Pollutant Emissions Inventory*. The inventory analyzed carbon dioxide (CO_2) emissions from fuel use, electricity use, and waste.

Community-Wide Inventory

The community-scale GHG inventory included the CO_2 generated from all residences and businesses in the city and all traffic that drives on roads in the city. The largest source of CO_2 was transportation (54 percent), followed by the commercial sector (23 percent), the residential sector (19 percent), the waste sector (4 percent), and the industrial sector (less than 1 percent). The report concluded that Chico was responsible for approximately 610,951 metric tons of CO_2 in 2005.

The GHG inventory also provided an analysis of GHG emission by fuel type and a summary of energy use. The majority of GHG emissions generated by the Chico community originated from gasoline, which generated nearly half of all GHG emissions (44.8 percent). The next largest amount of GHG emissions generated by Chico originated from the use of generated electricity (23.3 percent), followed by natural gas consumption (18.4 percent).

Municipal Operations and Facilities Inventory

City operations and facilities accounted for about 1 percent of the overall community emissions. Within the City operations and facilities, the key contributors to CO_2 were emissions associated with the vehicle fleet (26 percent), followed by the water/sewage sector (25 percent), the employee commute sector (22 percent), the streetlights sector (13 percent), the buildings sector (12 percent), and the waste sector (2 percent).

ENERGY CONSUMPTION

Electricity

California

In 2008, California used over 285,574 gigawatts of electricity (CEC, 2009b).[1] California's electricity generation system currently generates over 290,000 gigawatt hours of electricity each year, which is transported over California's 32,000 miles of transmission lines (CEC, 2007a). By 2020, electricity consumption in the state is projected to reach almost 320,000 gigawatts (CEC, 2009b). In 2008, this electricity was produced from power plants fueled by natural gas (45.7 percent), hydrologic sources (11.0 percent), coal (18.2 percent), nuclear (14.4 percent), and renewable methods (10.6 percent). Approximately 68.1 percent of the electricity was generated within California, with the balance imported from other states, Canada, and Mexico (CEC, 2009b). Overall electricity use in California is projected to grow by 1.2 percent annually (CEC, 2009b). However, peak demand is growing at a rate of 1.30 percent (850 megawatts) per year (CEC,

[1] Energy usage is typically quantified using the British thermal unit (BTU). As points of reference, the approximate amount of energy contained in a gallon of gasoline, a cubic foot of natural gas, and a kilowatt hour (kWhr) of electricity are 124,884 BTUs, 1,000 BTUs, and 3,400 BTUs, respectively.

2009b). This increase in peak demand is the result of a population that is moving inland to the warmer areas of the state, prompting higher demand for electricity for air conditioning.

Electricity usage varies substantially by the type of uses, type of construction materials used, and the efficiency of all electricity-consuming devices within a building. The average annual usage of electricity is roughly 6,500 kilowatt hours (kWhr) per residence. The average annual usage of electricity is roughly 13 kWhr per square foot for all commercial buildings and roughly 18 kWhr per square foot for office/research and development buildings (CEC, 2007a).

Electricity supply in California involves a complex grid of power plants and transmission lines located in the western United States, Canada, and Mexico. Almost 32 percent of the electricity used in California is imported from 11 other western states as well as from Canada and Mexico. The issue is complicated by market forces that have become prominent since 1998, when a new regulatory environment commonly referred to as "deregulation" took effect in California. Supply is further complicated by the fact that the peak demand for electricity is significantly higher than the off-peak demand. For example, in August 2004, peak electric demand — due in large part to hot weather — reached a record high of 44,497 megawatts, which is almost double the lowest demand period.

City of Chico

Electric service within the City of Chico is provided by Pacific Gas and Electric (PG&E). PG&E provides electric service to approximately 15 million people throughout a 70,000 square mile service area in northern and central California (PG&E, 2009). Electricity purchased from PG&E by local customers in Butte County, including Chico, is generated and transmitted to the area by a statewide network of power plants and transmission lines. Various transmission and distribution lines traverse Butte County, serving to carry electrical power from power plants within and outside the county to electrical substations where power is converted to voltages suitable for distribution to end users. Please refer to Section 4.12, Public Services and Utilities, for an expanded discussion of electric services in Chico.

In 2008, the City of Chico released the *Greenhouse Gas & Criteria Air Pollutant Emissions Inventory,* which provides an estimate of GHG emissions produced within Chico. The primary data used to determine the amount of GHG emissions for the residential, commercial, and industrial sectors within Chico was electrical and natural gas consumption information obtained through PG&E. In 2005, Chico residential, commercial, and industrial uses consumed a combined 1,220,809,991 kilowatt hours of electricity and natural gas (City of Chico, 2008).

Natural Gas

California

In 2007, California consumed about 12,494 million (MM) therms of natural gas. The California natural gas demand for 2010 is projected to be just slightly less than this (CEC, 2009b). As a state, California is the second largest natural gas consumer in the United States, representing more than 10 percent of national natural gas consumption. Customers in the residential and commercial sectors, referred to as "core" customers, accounted for 29 percent of the state's natural gas demand in 2008 (CEC, 2009b). Large consumers such as electricity generators and the industrial sector, referred to as "noncore" customers, accounted for about 71 percent of demand in the same year. California remains heavily dependent on natural gas to generate electricity, which accounted for more than 40 percent of natural gas demand in 2008 (CEC, 2009b). Approximately 13.5 percent of the natural gas produced in 2006 was within California,

with the balance imported via pipeline from other states and Canada (CEC, 2007a). California is at the farthest end of those pipelines, forcing it to compete with other states that are located closer to generation plants in Canada for supplies.

As with electricity, natural gas usage in California for different land uses varies substantially by the type of use, type of construction materials, and the efficiency of all gas-consuming devices in a given building. The average annual usage of natural gas is roughly 45,000 cubic feet per residence. The average annual usage of natural gas is roughly 37 cubic feet per square foot for commercial buildings and roughly 29 cubic feet per square foot for office buildings.

According to the California Energy Commission's 2009 Integrated Energy Policy Report, natural gas has become an increasingly important source of energy since more of the state's power plants rely heavily on this fuel. While California's successful efficiency programs and its reliance on renewable sources of electricity should slow the demand of natural gas, competition for the state's imported supply is increasing. This reliance on imported gas leaves the state vulnerable to price shocks and supply disruptions.

The annual forecast of North American natural gas production has decreased each year since 2002, a difference of about eight trillion cubic feet a year (CEC, 2007a). PG&E has publicly commented that it believes that western Canadian natural gas production will be less than predicted while another energy company, Sempra/SoCalGas, believes that several supply basins throughout North America will produce less than forecast.

Natural gas is critical in meeting the state's energy demand. California's growing population requires more natural gas for residential heating and cooking, industrial processing, and most importantly, electricity production. Natural gas, like petroleum, has become a global commodity and California competes not just with other U.S. states for access to less abundant natural gas supplies, but also with Western Europe and Asia Pacific consumers in a world market for natural gas. The result is that prices are likely to continue increasing (CEC, 2007a).

Peak electricity demand in California is expected to grow at about 1.30 percent each year through 2017 and will be the sector with the largest natural gas increase over the next decade. Before 1997, natural gas consumption for electricity averaged 500 billion cubic feet each year (1,400 million cubic feet per day); however, future demand is anticipated to average 2,500 million cubic feet each day (CEC, 2007a).

City of Chico

Natural gas service in Chico is also provided by PG&E. Much of PG&E's natural gas supply comes from Canada and is supplied to the region through the Hershey station in Colusa County. Wild Goose Storage Inc. operates an underground natural gas storage facility in Butte County. A 25-mile pipeline carries gas between the main PG&E pipeline in Colusa County and the Wild Goose facility, which stores natural gas in an underground rock formation that previously produced natural gas. Compressors are used to inject gas into the reservoir, where it is stored until subsequently withdrawn and delivered to customers over the PG&E natural gas transmission and distribution system. Please refer to Section 4.12, Public Services and Utilities, for an expanded discussion of natural gas services in Chico.

Vehicle Energy Consumption

California

California's transportation system includes 33.5 million registered vehicles (cars, trucks, trailers, and motorcycles) and almost 170,000 miles of roads maintained by local, state, and federal governments. A total of 2,453 miles are U.S. interstate freeways. The state's motor vehicle fleet includes private passenger cars as well as buses, motorcycles, and light- and heavy-duty trucks, which are used for passenger and freight movement respectively (CEC, 2007b). In 2007, taxable gasoline sales (including aviation gasoline) in California accounted for 15,672,334,029 gallons of gasoline (CEC, 2007b). For more information regarding state transportation energy, go to the CEC website at http://energyalmanac.ca.gov/transportation/summary.html#fuel

City of Chico

Chico's transportation network is characterized by two state highways, State Route 99 and State Route 32. Arterial streets provide regional and local access. Compared with other cities, mobility within Chico is generally good with an average commute time of 17.4 minutes (City of Chico, 2008). The low commute time is a result of the city's compact form and the availability of commercial centers, educational institutions, medical facilities, and recreational site within the city limits (City of Chico, 2008). Despite efforts to create a balanced transportation system that serves bicyclists and pedestrians, roughly 70 percent of commuters commute in single-occupancy vehicles (City of Chico, 2008). According to the *Greenhouse Gas & Criteria Air Pollutant Emissions Inventory*, the City of Chico consumed 34,220,413 gallons of automotive gasoline and diesel fuel in 2005**.**

4.14.2 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, the USEPA did not have regulations addressing greenhouse gases. The U.S. Supreme Court ruled on April 2, 2007, that CO_2 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 (Pavley) of 2002, (Health and Safety Code Sections 42823 and 43018.5), requires CARB to develop and adopt the nation's first GHG emission standards for automobiles. These standards are also known as "Pavley I." The California Legislature declared in AB 1493 that global warming is a matter of increasing concern for public health and the environment. It cites several risks that California faces from climate change, including a reduction in the state's water supply, an increase in air pollution caused by higher temperatures, harm to agriculture, an increase in wildfires, damage to the coastline, and economic losses caused by higher food, water, energy, and insurance prices. The bill also states that technological solutions to reduce

GHG emissions would stimulate California's economy and provide jobs. In 2004, the State of California submitted a request for a waiver from federal clean air regulations, as the State is authorized to do under the CAA, to allow the State to require reduced tailpipe emissions of CO_2. In late 2007, the USEPA denied California's waiver request and declined to promulgate adequate federal regulations limiting GHG emissions. In early 2008, the State brought suit against the USEPA related to this denial.

In January 2009, President Obama instructed the USEPA to reconsider the Bush Administration's denial of California's and 13 other states' requests to implement global warming pollution standards for cars and trucks. In June 2009, the USEPA granted California's waiver request enabling the State to enforce its GHG emissions standards for new motor vehicles beginning with the current model year.

Also in 2009, President Obama announced a national policy aimed at both increasing fuel economy and reducing GHG pollution for all new cars and trucks sold in the United States. The new standards would cover model years 2012 to 2016 and would raise passenger vehicle fuel economy to a fleet average of 35.5 miles per gallon (mpg) by 2016. When the national program takes effect, California has committed to allowing automakers who show compliance with the national program to also be deemed in compliance with state requirements. California is committed to further strengthening these standards beginning in 2017 to obtain a 45 percent GHG reduction from the 2020 model year vehicles.

Executive Order S-3-05

Executive Order S-3-05 (state of California) 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 (CalEPA) 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 CalEPA created a Climate Action Team (CAT) made up of members from various state agencies and commissions. 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 (AB 32) [2], requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. The gases that are regulated by AB 32 include CO_2, CH_4, N_2O, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. The reduction to 1990 levels will

[2] Assembly Bill 32 is codified at Health and Safety Code Sections 38500, 38501, 28510, 38530, 38550, 38560, 38561-38565, 38570, 38571, 38574, 38580, 38590, 38592-38599

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 , (Health and Safety Code Sections 42823 and 43018.5), should be used to address GHG 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 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, (Health and Safety Code Sections 38500, 38501, 28510, 38530, etc.). The scoping plan contains the main strategies California will implement to achieve reduction of 169 million metric tons (MMT) of CO_2e, or approximately 30 percent from the state's projected 2020 emission level of 596 MMT of CO_2e under a business-as-usual scenario (this is a reduction of 42 MMT CO_2e, or almost 10 percent, from 2002–2004 average emissions). The 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_2e), implementation of the Low-Carbon Fuel Standard (15.0 MMT CO_2e), energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO_2e), and a renewable portfolio standard for electricity production (21.3 MMT CO_2e). 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. With regard to land use planning, the proposed scoping plan expects approximately 5.0 MMT CO_2e 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 1368 (SB 1368) (codified in Public Utilities Code, Section 8340(h)) 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[3] and modified in 2001 by Senate Bill 527[4] as a nonprofit voluntary registry for GHG emissions. 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 97 (SB 97) (Public Resources Code Sections 21083.05 and 21097), signed August 2007, acknowledges that climate change is a prominent environmental issue that requires analysis under the California Environmental Quality Act (CEQA). This bill directs the California 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.

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

Senate Bill 1078 (SB 1078)[5] 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.

[3] Senate Bill 1771 is codified at Health and Safety Code Section 42800 et seq. and Public Resources Code Section 25730 et seq.

[4] Senate Bill 527 is codified at Health and Safety Code Sections 42400.4, 42801, 42810, 42821-42824, 42840-42843, 42860, 42870, 43021, 42410, 42801.1, 43023

[5] Senate Bill 97 is codified at Public Utilities Code Sections 387, 390.1, 399.25 and Section 399.11 et seq.)

Senate Bill 375

Senate Bill 375 (SB 375)[6], 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 eight years, but can be updated every four 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 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 five years to eight 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

On November 14, 2008, Governor Schwarzenegger issued Executive Order S-13-08 in order to reduce and assess California's vulnerability to climate change and sea level rise. The Executive Order 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 Executive Order will provide consistency and clarify to state agencies on how to address sea level rise in current planning efforts.

[6] Senate Bill 375 is codified at Government Code Sections 65080, 65400, 65583, 65584.01, 65584.02, 65584.04, 65587, 65588, 14522.1, 14522.2, and 65080.01 as well as Public Resources Code Sections 21061.3, 21159.28, and Chapter 4.2.

California Building Energy Efficiency Standards

Title 24, Part 6 of the California Code of Regulations, known as the Building Energy Efficiency Standards, was established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The Energy Commission adopted the 2008 Standards on April 23, 2008, and the Building Standards Commission approved them for publication on September 11, 2008. The new standards went into effect on July 1, 2009 (CEC, 2008).

LOCAL

City of Chico

As part of a separate but related process, the City is developing a Climate Action Plan (CAP). The CAP will provide direction to ensure the City fulfills its commitment to the U.S. Conference of Mayors Climate Protection Agreement to reduce greenhouse gas emissions by 25 percent from 2005 levels by the year 2020. The plan will include a summary of the recently conducted Community Greenhouse Gas Emissions Inventory as well as programs and actions to reduce greenhouse gas emissions in the energy, transportation, solid waste, water, and land use and development sectors that will help achieve Chico's emission reduction target. Financial analysis of the emission reduction strategies will also be included. The CAP will implement the policy direction of the proposed General Plan Update to reduce greenhouse gases. Specifically, the proposed Sustainability Element includes a policy with a supporting action (SUS-6.1) to continually update the citywide greenhouse gas inventory and the CAP as necessary to achieve the City's emission reduction goal. The CAP relied on the public participation process for the General Plan Update and responds to the community desires outlined in the vision, goals, policies, and actions of the proposed General Plan Update.

4.14.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Per Appendix G and Appendix F of the California Environmental Quality Act (CEQA) Guidelines and Butte County Air Quality Management District (BCAQMD) recommendations, impacts related to energy use and climate change are considered significant if implementation of the proposed project would result in any of the following:

1) Inefficient, wasteful, and unnecessary consumption of energy.

2) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment.

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

The reader is referred to Section 4.12, Public Services and Utilities, regarding potential infrastructure impacts associated with servicing development under the proposed General Plan Update.

BCAQMD does not currently have an adopted threshold of significance for GHG emissions. Instead, BCAQMD recommends that local agencies discuss GHG emissions consistent with the

California Air Pollution Control Officers Association's (CAPCOA) CEQA and Climate Change white paper (see CAPCOA 2008) and illustrate consistency with CAPCOA's Model Policies for Greenhouse Gases in General Plans (CAPCOA, 2009). In addition the BCAQMD recommendations, significance thresholds developed by the Bay Area Air Quality Management District (BAAQMD) for General Plans are employed for purposes of this analysis. The primary objective in employing BAAQMD's GHG thresholds is to identify a GHG significance threshold. BAAQMD's GHG thresholds are based on statewide climate protection planning processes under AB 32 and thus provide a methodology that could be replicated elsewhere in the state. According to Appendix D, *Threshold of Significance Justification* of the BAAQMD CEQA Guidelines (June 2010), BAAQMD's approach to developing a threshold of significance for GHG emissions is to identify the emissions level for which a project would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions.

If a plan would generate GHG emissions above the threshold level, it would be considered to contribute substantially to a cumulative impact and would be considered significant. If mitigation can be applied to lessen the emissions such that the plan meets its share of emission reductions needed to address the cumulative impact, the project would be considered less than significant. BAAQMD's general plan emission threshold is 6.6 metric tons of CO_2 equivalent (CO_2e) per service population (residents plus employees) per year in 2020 (BAAQMD, 2010). The BAAQMD thresholds were chosen based on the substantial evidence that such thresholds represent quantitative and/or qualitative levels of GHG emissions, compliance with which means that the environmental impact of the GHG emissions will normally not be cumulatively considerable under CEQA (BAAQMD, 2010). Compliance with such thresholds will be part of the solution to the cumulative GHG emissions problem, rather than hinder the state's ability to meet its goals of reduced statewide GHG emissions.

Utilization of this threshold was considered reasonable and appropriate by BCAQMD staff due to the fact that the BCAQMD does not currently have an adopted threshold of significance for GHG emissions (Williams, 2010). Furthermore, BCAQMD recommendations that local agencies illustrate consistency with the California Air Pollution Control Officers Association's (CAPCOA) Model Policies for Greenhouse Gases in General Plans has still been completed (see **Table 4.14-1**) in conjunction with the BAAQMD significance threshold.

GHG emissions contribute, on a cumulative basis, to the significant adverse environmental impacts of global climate change. No single land use project could generate enough GHG emissions to noticeably change the global average temperature. The combination of GHG emissions from past, present, and future projects contribute substantially to the phenomenon of global climate change and its associated environmental impacts and as such is addressed only as a cumulative impact.

METHODOLOGY

Evaluation of potential electricity or natural gas impacts was based on information from the California Energy Commission and the California Public Utilities Commission. A detailed list of reference material used can be found at this end of this section. This material was compared to the proposed General Plan Update's specific electricity and natural gas impacts.

Direct area source and mobile source GHG emissions were quantified using the URBEMIS model. Indirect emissions from electricity and natural gas demand and water conveyance were quantified in accordance with the methodology outlined in CAPCOA's CEQA and Climate Change white paper (CAPCOA, 2008).

As noted in Section 3.0, Project Description, the proposed General Plan Update seeks to reduce the environmental impact of land use development by limiting the amount of land consumed and increasing the viability of walking, biking, and transit by balancing growth and conservation through the reinforcement of the city's compact urban form, establishing urban growth limits, and managing where and how growth and conservation will occur. These "smart growth" strategies have well-documented benefits in terms of lower energy use and fewer and shorter vehicle trips since residents and employees of these areas have more home, work, and shopping opportunities within walking or biking distance. Transit is also a more viable form of transportation since these developments have a larger number of potential transit users and can support more frequent transit service to regional destinations. The City of Chico 4D Model Development and Results prepared for the proposed General Plan Update focused on how smart growth developments increase the viability of non-auto modes of travel and thereby decrease the number of vehicle trips and the amount of vehicle miles traveled (VMT), and thus GHG emissions from mobile sources.

The following proposed General Plan Update policies and actions address impacts related to energy consumption and the city's contribution to greenhouse gases:

Policy SUS-3.4 *(Sustainable Fleet) – Support sustainable modes of transportation for City vehicles.*

Policy SUS-4.1 *(Green Public Buildings) – Incorporate green building techniques in the site design, construction, and renovation of public projects.*

Action SUS-4.1.1 *(Green Facilities) – Construct new municipal facilities greater than 5,000 square feet in size to at least the baseline certification level of Leadership in Energy and Environmental Design (LEED), or its equivalent.*

Policy SUS-5.1 *(Energy Efficient Retrofits) – Encourage energy efficient retrofit improvements in existing buildings.*

Policy SUS-5.2 *(Energy Efficient Design) – Support the inclusion of energy efficient design and renewable energy technologies in public and private projects.*

Action SUS-5.2.1 *(Integration of Energy Efficiency Technology) – Suggest the integration of energy efficiency measures and renewable energy devices, in addition to those required by the state, during early project review.*

Action SUS-5.2.3 *(Passive Solar) – Incorporate passive solar design principles (e.g., building materials, high-albedo roofs, eaves, window placement, and building orientation) into the City's Design Guideline Manual.*

Action SUS-5.2.4 *(Remove Barriers to Renewable Energy) – Revise the Municipal Code to allow deviations from normal requirements such as height limits, setbacks, or screening when doing so is necessary to allow the efficient use of renewable energy devices.*

Policy LU-1.3 *(Growth Plan) – Maintain balanced growth by encouraging infill development where City services are in place, and allowing expansion into Special Planning Areas.*

Action LU-2.3.3 *(Encourage Mixed-Use) – Allow horizontal and/or vertical mixed-uses in the following land use designations:*

- *Residential Mixed Use*
- *Neighborhood Commercial*
- *Commercial Mixed Use*
- *Regional Commercial*
- *Office Mixed Use*
- *Industrial Office Mixed Use*

Action LU-2.3.4 *(Require Mixed-Use) – Require horizontal or vertical mixed-use in the following land use designations:*

- *Special Mixed Use*
- *Mixed Use Neighborhood Core*
- *Special Planning Areas (with the exception of the Bell-Muir SPA)*

Policy LU-3.1 *(Complete Neighborhoods) – Direct growth into complete neighborhoods with a land use mix and distribution to reduce auto trips and support walking, biking, and transit use.*

Policy LU-3.2 *(Neighborhood Serving Centers) – Promote the development of strategically located neighborhood serving centers with commercial, employment or entertainment uses; provide housing opportunities; are within walking distance of surrounding residents; and are served by transit. Neighborhood center designations are Neighborhood Commercial (NC) and Mixed Use Neighborhood Core (MUNC).*

Policy PPFS-5.1 *(Protect Aquifer Resources) – Protect the quality and capacity of the Tuscan Aquifer underlying Chico.*

Action PPFS-5.1.1 *(Groundwater Supplies and Budgeting) – Support Cal Water's periodic evaluation of groundwater availability using the Butte Basin Groundwater Model and their work to establish a water supply budget with specific measures to assure sustainable levels of groundwater.*

Policy PPFS-5.2 *(Future Water System) – Consult with Cal Water to ensure that its water system will serve the City's long-term needs and that State regulations SB 610 and SB 221 are met.*

Action PPFS-5.2.1 (Water Flow and Pressure) – Ensure that new City infrastructure provides for water flow and pressure at sufficient levels to meet domestic, commercial, industrial, institutional, and firefighting needs.

Action PPFS-5.2.2 (Wells and Private Water Systems) – Where public water delivery systems are available, discourage use of wells and private water systems for domestic water use.

Action PPFS-5.2.3 (Water Services for New Development) – Work with Cal Water to ensure that water treatment and delivery infrastructure are in place prior to occupancy or assured through the use of bonds or other sureties to the City and Cal Water's satisfaction.

Policy PPFS-5.3 (Water Conservation) – Work with Cal Water to implement water conservation management practices.

Action PPFS-5.3.1 (Recycled Wastewater) – Explore the feasibility of using recycled wastewater to provide irrigation to parks, landscaped areas and other suitable locations to reduce the demand for treated water.

Policy PPFS-5.4 (Large Water Users) – Encourage large water users such as CSU Chico, Chico Unified School District, and Enloe Medical Center, to implement water conservation practices.

Action PPFS-6.1.1 (Update the Storm Drainage Master Plan) – Update, adopt and implement an updated Storm Drainage Master Plan that identifies areas with infrastructure deficiencies and establishes a program to amend the deficiencies. Address drainage issues on a basin or sub-basin scale. Identify opportunities to increase infiltration, based on such factors as existing infrastructure, geology, the hydrology and hydraulics of the receiving waters, and planned land uses.

Action PPFS-6.1.2 (Development Fees) – Update the development fee program as needed to ensure that storm water drainage development fees are equitable and adequate to pay for the storm water drainage infrastructure needed for future development.

Policy PPFS-6.5 (Flood Control) – Manage the operation of the City's flood control and storm drainage facilities and consult with local and state agencies that have facilities providing flood protection for the City.

Action PPFS-6.5.1 (Flood Management) – Consult with Butte County and other flood control agencies to ensure that all possible actions are taken to prevent floodwaters from entering the City.

Action PPFS-6.5.3 (Flood Impacts) – Require that new development not increase flood impacts on adjacent properties in either the upstream or downstream direction.

Action PPFS-6.5.4 *(Flood Zones) – Require new development to fully comply with State and Federal regulations regarding development in flood zones.*

Policy OS-1.1 *(Sensitive Habitats and Species) – Preserve native species and habitat through land use planning, cooperation, and collaboration.*

Action OS-1.1.1 *(Development/Preservation Balance) – Direct development to appropriate locations consistent with the Land Use Diagram, and protect and preserve areas designated Open Space.*

Action OS-1.1.2 *(Regional Conservation Planning) – Actively participate in regional conservation planning efforts, in particular the Butte County Habitat Conservation Plan process, which seeks the preservation of habitat areas needed for the ongoing viability of native species, sponsored by the Butte County Association of Governments.*

Action OS-1.1.3 *(Sustainable Community Strategy) – Work with Butte County Association of Governments to implement the Sustainable Community Strategy (SB 375), which directs smart growth development to urbanized areas.*

Policy S-1.1 *(Emergency Preparedness) – Promote public safety from hazards that may cause death, injury, or property damage through emergency preparedness and awareness.*

Action S-1.1.1 *(Emergency Plan Maintenance) – Maintain and update, as needed, the City's Emergency Plan to guide emergency management in the City.*

Action S-1.1.2 *(Emergency Response Awareness) – Promote community awareness and preparedness for hazards.*

Action S-1.1.3 *(Incident Training) – Continue to participate in the National Office of Emergency Services' National Incident Management System program, which provides a standardized approach to emergency incidents.*

Policy S-2.1 *(Potential Flood Hazards) – When considering areas for development, analyze potential impacts of flooding.*

Action S-2.1.1 *(Flood Hazard Analysis) – As part of project review, analyze potential impacts from flooding and require compliance with appropriate building standards and codes for structures subject to 200-year flood hazards.*

Action S-2.1.2 *(Flood Hazard Designations) – Continue efforts to work with the Federal Emergency Management Agency and state and local agencies to evaluate the potential for flooding, identify areas susceptible to flooding, accredit the flood control levees in the*

City, and require appropriate measures to mitigate flood related hazards.

Policy S-4.1 *(Fire Safety Staffing) – Maintain adequate fire suppression and prevention staffing levels.*

Action S-4.1.1 *(Fire Response Time) – Strive to maintain an initial response time of 4 minutes or less for at least 90 percent of emergency response calls for urbanized areas.*

Policy S-4.2 *(Interagency Coordination) – Continue to maintain interagency relationships to maximize fire protection services and support programs that reduce fire hazards.*

Action S-4.2.1 *(Interagency Programs) – Continue to work with CalFire and the Butte County Fire Department on programs that will enhance fire protection and firefighting capabilities in the Planning Area, including maintaining aid agreements.*

Policy S-4.3 *(Fire Safety Standards and Programs) – Support the development and implementation of standards and programs to reduce fire hazards, and review development and building applications for opportunities to mitigate fire hazards and ensure compliance with relevant codes.*

Action S-4.3.1 *(Standards to Protect Structures) – Maintain, and update as needed, the standards manual for protecting structures in wildland fire areas.*

Action S-4.3.2 *(Structural Standards) – Incorporate building construction standards for the Local Resource Area, areas which are provided City fire suppression services, that are consistent with the requirements for the State Responsibility Area, areas that are provided State and County fire suppression services for State-designated Very High, High and Moderate Fire Hazard Severity Zones.*

Action S-4.3.3 *(Project Design) – As part of project review process in wildland fire areas, require consideration of emergency evacuation routes and defensible buffer areas.*

Action S-4.3.4 *(Development Standards) – Encourage the County to require development in unincorporated area within the City's Sphere of Influence to conform to the City's development standards.*

Action S-4.3.5 *(Fire Sprinklers, New Structures) – Consider adoption of an ordinance that exceeds state standards requiring automatic fire sprinklers in new construction.*

Policy S-4.4 *(Vegetation Management) – Support vegetation management and weed abatement programs that reduce fire hazards.*

Policy S-5.4 *(Collaboration and Coordination) – Maintain strong relationships with local and state law enforcement agencies, and participate in disaster preparedness planning.*

Action S-5.4.3 *(Disaster Planning) – Through the Butte County Office of Emergency Services, participate with area public safety agencies to plan and train for disaster preparedness.*

The impact analysis provided below utilizes these proposed policies and actions to determine whether implementation of the proposed General Plan Update would result in significant impacts. The analyses identify and describe how specific policies and actions as well as other City regulations and standards provide enforceable requirements and/or performance standards that address climate change and energy use and avoid or minimize significant impacts.

IMPACTS AND MITIGATION MEASURES

Inefficient, Wasteful, and Unnecessary Consumption of Energy (Standard of Significance 1)

Impact 4.14.1 Development under the proposed General Plan Update would increase the consumption of energy associated with electrical, natural gas, and vehicle fuel. However, implementation of proposed General Plan Update policies and state programs and requirements would ensure that energy usage is not inefficient, wasteful, or unnecessary. This is considered to be a **less than significant** impact.

Residential and Nonresidential Energy Use

Full buildout of the 2030 General Plan Land Use Diagram would result in an increase of 21,495 housing units and 51,588 persons in the SOI, for a total of 62,933 housing units and a population of 151,039. This increase in population and housing units, as well as nonresidential growth associated with the proposed General Plan Update, would increase demand for electrical and natural gas service and associated infrastructure. As previously mentioned, in 2005, Chico residential, commercial, and industrial uses consumed a combined 1,220,809,991 kilowatt hours of electricity and natural gas (City of Chico, 2008).[7]

According to the energy consumption analysis conducted for the proposed General Plan Update (**Appendix F**), the City of Chico consumed a combined 1,431,704,000 kilowatt hours of electricity and natural gas in 2008, and it is projected to consume a combined 2,181,775,000 kilowatt hours of electricity and natural gas in 2030 with implementation of the proposed General Plan. This is an increase of 750,071,000 kilowatt hours of energy consumed over existing conditions.

The Energy Efficiency Standards for Residential and Nonresidential Buildings (Title 24) were established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. The most recent update of

[7] Natural gas, typically measured in therms or BTUs, has been converted to kilowatt hours in order to achieve consistency between electricity and natural gas units.

these standards is contained in the *2008 Building Energy Efficiency Standards for Residential and Nonresidential Buildings*. According to the U.S. Department of Energy, California's building efficiency standards (along with those for energy-efficient appliances) have saved more than $56 billion in electricity and natural gas costs since 1978. The updated standards contained in these 2008 Building Energy Efficiency Standards are expected to save an additional $23 billion by 2013 (USDE, 2009). These projections are based on the standards' provisions to:

- Respond to the Global Warming Solutions Act of 2006, which mandates that California must reduce its greenhouse gas emissions to 1990 levels by 2020.

- Pursue California energy policy that energy efficiency is the resource of first choice for meeting California's energy needs.

- Act on the findings of California's Integrated Energy Policy Report (IEPR) that standards are the most cost-effective means to achieve energy efficiency, expects the Building Energy Efficiency Standards to continue to be upgraded over time to reduce electricity and peak demand, and recognizes the role of the standards in reducing energy related to meeting California's water needs and in reducing greenhouse gas emissions.

- Meet the West Coast Governors' Global Warming Initiative commitment to include aggressive energy efficiency measures into updates of state building codes.

- Meet the Executive Order in the Green Building Initiative to improve the energy efficiency of nonresidential buildings through aggressive standards (CEC, 2008).

The *2008 Building Energy Efficiency Standards for Residential and Nonresidential Buildings* include code regulations for lighting; windows; roofing; skylights; swimming pool and spa equipment; heating, ventilation, and air conditioning equipment and controls; and the New Solar Homes Partnership (NSHP). Part of the California Solar Initiative, NSHP provides financial incentives and other support to home builders to encourage construction of energy-efficient solar homes. High-performance windows that are more resistant to heat and better insulated will now be required in new homes. Heating, ventilating, and air conditioning systems for homes and businesses must now be more efficient. "Cool roof" standards have also been upgraded to include residential and nonresidential buildings. Cool roofs are made of highly reflective, insulated roofing materials that stay up to 40 degrees cooler than normal roofing materials under a hot summer sun. Cool roof standards are designed to reduce air conditioner demand, save money, and reduce the urban heat island effect. A cool roof can reduce a homeowner's electricity consumption by as much as 20 percent (USDE, 2008).

The new standards also require energy-efficient lighting, including expanded use of skylights in large nonresidential buildings. For example, the old requirement to install skylights in commercial warehouses larger than 25,000 square feet has been changed to include warehouses starting at 8,000 square feet. As a result, businesses will use more natural daylight and save on electricity costs.

Many of the changes in the standards are tailored to help reduce not only overall energy use, but peak energy use (electricity demand on hot summer days when air conditioning loads can nearly double California's need for power). The latest efficiency standards are expected to cut the state's peak energy demand by 129 megawatts the first year the standards are in effect and increase cumulatively in subsequent years (USDE, 2008). By some estimates, the new standards will save as much as 500 megawatts by 2013 (USDE, 2008).

As previously mentioned, the proposed General Plan Update would result in an increase of 750,071,000 kilowatt hours of energy consumed over existing conditions. However, future residential and nonresidential development under the proposed General Plan Update would be required to adhere to the energy efficiency requirements of the *2008 Building Energy Efficiency Standards for Residential and Nonresidential Buildings.* New development will be more energy efficient per square foot than existing energy use modeling data can quantify. Therefore, the projected increase of energy consumed over existing conditions would most likely be much less than 750,071,000 kilowatt hours.

Transportation Energy Use

While an increase in population as anticipated under the proposed General Plan Update would result in an increase in vehicle trips, these trips would be reduced in length due to the increased density proposed under the proposed General Plan Update, thus reducing the amount of automobile fuel consumed. Strategies in the proposed General Plan Update include promoting compact, walkable, infill, and mixed-use development and focusing redevelopment along transit corridors and at other key locations. As shown in the City of Chico 4D Model Development and Results (the 4D analysis identifies the smart growth enhancement developed for the City of Chico VISUM TDF model and presents the results of the traffic travel demand forecast [TDF] model run when the smart growth enhancement is enabled), vehicle miles traveled (VMT) per household for build-out conditions under the proposed General Plan Update would be reduced by 11 percent as compared to build-out under the 1994 General Plan (see **Appendix B**).

According to a fuel consumption analysis conducted for the proposed General Plan Update (**Appendix F**), the City of Chico consumed approximately 165,509 gallons of automotive fuel (diesel and gasoline) per day in 2008. As a consequence of the proposed General Plan Update policy provisions and the Land Use Diagram that result in the reduction of vehicle miles traveled per household (as compared to build-out under the 1994 General Plan), as well as the fuel efficiency requirements of AB 1493, automobile use in the City of Chico is projected to result in the consumption of 159,932 gallons of automotive fuel per day at build-out under the proposed General Plan Update. This is a reduction of 5,577 gallons of automotive fuel used per day over existing conditions (refer to **Appendix F** for detailed assumptions and modeling output files).

In addition, the proposed General Plan Update contains policies and actions that include requirements and standards that address energy consumption. While Policy SUS-4.1 aims to incorporate green building techniques in the site design, construction, and renovation of public projects, Action SUS-4.1.1 mandates that the construction of new municipal facilities greater than 5,000 square feet in size achieve at least the baseline certification level of Leadership in Energy and Environmental Design (LEED), or its equivalent. LEED is an internationally recognized green building certification system, providing third-party verification that a building or community was designed and built using strategies intended to improve performance in metrics such as energy savings, water efficiency, CO_2 emissions reduction, improved indoor environmental quality, and stewardship of resources and sensitivity to their impacts.

Action SUS-5.2.3 seeks to incorporate passive solar design principles (e.g., building materials, high-albedo roofs, eaves, window placement, and building orientation) into the City's Design Guideline Manual. And Action SUS-5.2.4 would revise the Municipal Code to allow deviations from normal requirements such as height limits, setbacks, or screening when doing so is necessary to allow the efficient use of renewable energy devices.

Implementation of the proposed General Plan Update would result in efficient energy usage in both public and private development (Actions SUS-4.1.1, SUS-5.2.3, SUS-5.2.4) while subsequent development would also be required to comply with energy efficiency standards in Title 24 of the California Code of Regulations. In addition, transportation fuel use would be reduced under build-out of the proposed General Plan Update as a result of implementation of AB 1493. Due to the fuel efficiency requirements of AB 1493, automobile use in the City of Chico is projected to result a reduction of 5,577 gallons of automotive fuel used per day over existing conditions (refer to **Appendix F** for detailed assumptions and modeling output files). Furthermore, Policy LU-3.1 directs growth into complete neighborhoods with a land use mix and distribution to reduce auto trips and support walking, biking, and transit use. Therefore, impacts would be considered **less than significant.**

Generate Greenhouse Gas Emissions that May Have a Significant Impact on the Environment or Conflict with Applicable Adopted Reduction Measures (Standards of Significance 2 and 3)

Impact 4.14.2 Implementation of the proposed General Plan Update would be consistent with the goals of AB 32 (Health and Safety Code Sections 38500, 38501, 28510, 38530, etc.). However, it could still result in greenhouse gas emissions that may further contribute to significant impacts on the environment. This is considered a **cumulatively considerable** impact.

The analysis of greenhouse gas emission and climate change impacts divided below into an analysis of emission estimates and consistency with greenhouse gas reduction efforts.

Greenhouse Gas Emissions Associated with the Proposed General Plan Update

Subsequent development activity anticipated with build-out of the proposed General Plan Update would result in direct emission of GHGs from area and mobile sources and indirect GHG emissions associated with electricity consumption and the conveyance of water. As shown in **Table 4.14-1**, under existing conditions (2008), the City of Chico generates 1,132,311 metric tons of CO_2e annually. With build-out of the proposed General Plan Update, GHG emissions are calculated to grow to 1,611,757 metric tons per year

As noted in the Standards of Significance discussion above, the Butte County Air Quality Management District (BCAQMD) does not currently have an adopted threshold of significance for GHG emissions. For purposes of this analysis, a significance threshold developed by the Bay Area Air Quality Management District (BAAQMD) for general plans is employed. BAAQMD's approach is to identify the emissions level for which a plan would not be expected to substantially conflict with existing California legislation adopted to reduce statewide GHG emissions. BAAQMD's general plan emission threshold is 6.6 metric tons of CO_2e per service population (residents plus employees) per year in 2020 (BAAQMD, 2009). Based on the population and employment figures listed in Section 3.0, Project Description, the 2008 service population was 99,451 and the build-out service population is anticipated to be 151,039 under the proposed General Plan Update. Dividing the GHG emissions for each time period yields a metric ton per service population ratio of 7.96 and 7.34 for existing conditions and build-out conditions, respectively. While the proposed General Plan Update would improve GHG emission per service population, the ratio is greater than the 6.6 metric tons per service population threshold and would still result in a net increase in GHG emissions.

However, it is important to note that the proposed General Plan Update does not include any policy provisions that require that its growth potential be attained. Not all of the identified land will be available for development at any given time based on landowner willingness to sell or

develop, site readiness, environmental constraints, market changes, and other factors. This greenhouse gas emission analysis assumes full growth potential under the General Plan Update in order to present the maximum amount of emissions possible. The more realistic 2030 population projection of 139,713 is far less than that assumed under build-out and therefore the GHG emission will likely be much less than that shown in **Table 4.14-1**.

TABLE 4.14-1
GREENHOUSE GAS EMISSIONS
(METRIC TONS PER YEAR)

Source	Emissions (MT/yr CO_2e)
2008 Existing Conditions	
Direct Emissions	
Area Sources	161,722
Mobile Sources	484,353
Indirect Emissions	
Electricity and Natural Gas Consumption	472,260
Water Conveyance	13,977
Total Unmitigated	1,132,311
2030 Build-Out Conditions	
Direct Emissions	
Area Sources	249,811
Mobile Sources[1]	618,902
Indirect Emissions	
Electricity and Natural Gas Consumption	719,677
Water Conveyance	23,367
Total Unmitigated	1,611,757
Net Difference (2030 Build-Out Conditions – 2008 Existing Conditions)	
Net Difference	479,446

Source: PMC, 2010

Notes: CO_2e = carbon dioxide equivalent; MT/yr = metric tons per year; refer to Appendix F for detailed assumptions and modeling output files.

[1] Year 2030 mobile source emissions estimates do not include mandated future passenger vehicle fuel economy improvements due to limitations in emissions modeling software (see AB 1493 discussion under the Regulatory Framework subsection above).

Other non-quantified GHG sources (at this time) include the following:

1) Industrial combustion and industrial processes;

2) Agricultural and other non-road equipment;

3) Land use changes (urban conversions, etc.);

4) Air travel and City of Chico operations;

5) Emissions from production of materials outside the Chico region that are used in the city;

6) Wastewater and solid waste storage and disposal; and

7) Construction equipment.

Quantification of these sources is subject to substantial uncertainty at this time due to the lack of detailed information on future industrial processes, the extent of equipment activity for future agricultural activity, the change in carbon sequestration from conversion of natural lands to other land covers, how to account for air travel without double-counting, and the actual character of construction activity in the future.

As noted in Section 3.0, Project Description, the proposed General Plan Update seeks to reduce the environmental impact of land use development by limiting the amount of land consumed and increasing the viability of walking, biking, and transit by balancing growth and conservation through the reinforcement of the city's compact urban form, establishing urban growth limits, and managing where and how growth and conservation will occur. These smart growth strategies have well-documented benefits in terms of lower GHG emissions due to fewer and shorter vehicle trips since residents and employees of these areas have more home, work, and shopping opportunities within walking or biking distance. Transit is also a more viable form of transportation since these developments have a larger number of potential transit users and can support more frequent transit service to regional destinations.

According to the City of Chico 4D Model Development and Results conducted for the proposed General Plan Update which compared the "smart growth" strategies of the proposed General Plan Update to the more low-density land use pattern outlined in the current 1994 General Plan, build-out of the proposed General Plan Update would result in an average 56 daily vehicle miles traveled per Chico household compared with an average 64 daily vehicle miles traveled per Chico household under build-out of the current 1994 General Plan (Fehr & Peers, 2010). The resulting reduction in average vehicle miles traveled per Chico household would also equate to a reduction in average GHG emissions from mobile sources per Chico household.

As noted in Section 3.0, Project Description, the City is developing a Climate Action Plan (CAP). The CAP will provide a strategy to ensure the City fulfills its commitment to the U.S. Conference of Mayors Climate Protection Agreement to reduce greenhouse gas emissions by 25 percent from 2005 levels by the year 2020. The CAP will include a summary of the recently conducted Community Greenhouse Gas Emissions Inventory as well as programs and actions to reduce greenhouse gas emissions in the energy, transportation, solid waste, water, and land use and development sectors that will help achieve Chico's emissions reduction target. The CAP implements the policy direction of the proposed General Plan Update to reduce greenhouse gases. Specifically, the Sustainability Element includes a policy with supporting actions (SUS-6.1) to continually update the citywide greenhouse gas inventory and the CAP as necessary to achieve the City's emission reduction goal. As of the preparation of this EIR, a draft of the CAP had not been completed, so no GHG reductions from implementation of the CAP are factored in this analysis.

As identified in the above 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. 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 Planning Area could include the following (which were previously noted above):

- 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.

These potential impacts are real, given the general concurrence in the scientific community about the potential impacts of climate change on the environment. However, the extent and severity of such impacts to the Planning Area is still speculative at this time. Nevertheless, a number of proposed General Plan Update policies and actions are intended to help the City reduce potential exposure of people and projects to future impacts of climate change.

In regard to adverse impact on water supply availability, the General Plan Update contains provisions to evaluate groundwater availability using the Butte Basin Groundwater Model and to establish a water supply budget with specific measures to assure sustainable levels of groundwater (Action PPFS-5.1.1). In addition, Action PPFS-5.3.1 will explore the feasibility of using recycled wastewater to provide irrigation to parks, landscaped areas and other suitable locations to reduce the demand for treated water. Policy PPFS-6.5 and associated Actions PPFS-6.5.1 through PPFS-6.5.4 aim to manage flood waters. For instance, Action PPFS-6.5.3 requires that new development not increase flood impacts on adjacent properties in either the upstream or downstream direction and Action S-2.1.1 requires that as part of project review, the City shall analyze potential impacts from flooding and require compliance with appropriate building standards and codes for structures subject to 200-year flood hazards.

Action S-1.1.1 seeks to maintain and update, as needed, the City's Emergency Plan to guide emergency management in the City. This provision will assist in community readiness to increased natural disaster potential. In addition, Action S-1.1.3 requires continued participation in the National Office of Emergency Services' National Incident Management System program, which provides a standardized approach to emergency incidents, and Policies S-4.1 through S-4.4 and associated Actions all address fire hazard readiness. For example, Action S-4.3.2 requires incorporation of building construction standards for the Local Resource Area, areas which are provided City fire suppression services, that are consistent with the requirements for the State Responsibility Area, areas that are provided State and County fire suppression services for State-designated Very High, High and Moderate Fire Hazard Severity Zones.

Because considerable uncertainty remains with respect to the overall impact of global climate change on California and the Planning Area, 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 Planning Area. However, based on consideration of the recent regional and local climate change studies, and since the city's water sources are anticipated to largely remain intact, in combination with the City's existing standards and proposed General Plan Update policy provisions, it is expected that the environmental effects of global climate change on the City of Chico would not be significant. Furthermore, the environmental effects of climate change are gradual and, as such, it is not

anticipated that substantial changes in the environment resulting from climate change would impact the City within the 20-year timeframe of the proposed General Plan.

Consistency with Greenhouse Gas Reduction Efforts

The proposed General Plan Update includes a number of policies and actions designed to reduce GHG emissions that are consistent with AB 32 (Health and Safety Code Sections 38500, 38501, 28510, 38530, etc.). **Table 4.14-2** summarizes the level of consistency of the General Plan Update policies and actions with CAPCOA's Model Policies for Greenhouse Gases in General Plans that were developed to assist local agencies in addressing climate change and greenhouse gas reduction measures in a manner consistent with State efforts. It is important to note that not all of the model policies will necessarily be applicable to conditions within the City of Chico. Additionally, overall consistency of the proposed General Plan Update policies and actions with the model policies are intended to be indicative of the proposed General Plan Update's self-mitigating capabilities with respect to GHG emissions. Separate and subsequent development of a Climate Action Plan by the City will provide for additional City activities designed to reduce GHG emissions. The table also does not take into account other actions by the City to reduce GHG emissions that are not explicitly documented in policies and actions for the proposed General Plan Update.

TABLE 4.14-2
COMPLIANCE OF PROPOSED GENERAL PLAN UPDATE WITH CAPCOA MODEL POLICIES FOR GREENHOUSE GASES IN GENERAL PLANS

CAPCOA-Recommended Policies	Consistency
Greenhouse Gas Reduction Planning Policies	
Emission Inventories: The City/County will establish GHG emissions inventories including emissions from all sectors within the City/County, using methods approved by, or consistent with guidance from CARB. The City/County will update inventories every 3 years to incorporate improved methods, better data, and more accurate tools and methods, and to assess progress. • The City/County will establish a baseline inventory of GHG emissions including municipal emissions, and emissions from all business sectors and the community. • The City/County will define a "business as usual" scenario of municipal, economic, and community activities, and prepare a projected inventory for 2020 based on that scenario.	Consistent See Policy SUS-1.2; Action SUS-1.2.1; Action SUS-1.2.2; Policy SUS-6.1; Action SUS-6.1.1
Climate Action Plans: The City/County will establish plans to reduce or encourage reductions in GHG emissions from all sectors within the City/County. • The City/County will establish a Municipal Climate Action Plan which will include measures to reduce GHG emissions from municipal activities by at least 30% by 202 compared to the "business as usual" municipal emissions (including any reductions required by ARB under AB 32). • The City/County will, in collaboration with the business community, establish a Business Climate Action Plan, which will include measures to reduce GHG emissions from business activities, and which seek to reduce emissions by at least 30 percent by 2020 compared to "business as usual" business emissions. • The City/County will, in collaboration with the stakeholders from the	Consistent See Policy SUS-1.2; Action SUS-1.2.1; Action SUS-1.2.2; Policy SUS-6.1; Action SUS-6.1.2; Policy OS-5.3

CAPCOA-Recommended Policies	Consistency
community at large, establish a Community Climate Action Plan, which will include measures to reduce GHG emissions from community activities, and which will seek to reduce emissions by at least 30 percent by 2020 compared to "business as usual" community emissions.	
Sustainable Communities Strategy/Regional Blueprint Planning: The City/County will participate in the Sustainable Communities Strategy/Regional Blueprint Planning effort and will ensure that local plans are consistent with the Regional Plan.	Consistent See Policy SUS-6.4; Policy LU-1.1; Policy CIRC-1.6; Action CIRC-1.6.1; Action CIRC-1.6.2; Action OS-1.1.3
Land Use and Urban Design Policies	
Urban Growth Boundary: The City will establish an urban growth boundary (UBG) with related ordinances or programs to limit suburban sprawl; the City County will restrict urban development beyond the UGB and streamline entitlement processes with the UGB for consistent projects. • Urban development should occur only where urban public facilities and services exist or can be reasonably made available. • The improvement and expansion of one urban public facility or service should not stimulate development that significantly precedes the City's, or other jurisdiction's, ability to provide all other necessary urban public facilities and service at adequate levels.	Consistent See Policy LU-1.2; Action LU-1.2.1; Action LU-1.2.2; Action OS-1.1.1; Policy OS-6.1
Reserve Limits: The City/County will redirect new growth into existing city/urban reserve areas.	Consistent See Policy LU-1.3; Action LU-1.3.2; Policy LU-3.1
Infill: The City/County will encourage high-density, mixed-use, infill development and creative reuse of brownfield, under-utilized and/or defunct properties within the urban core.	Consistent See Action LU-1.3.1; Action LU-2.2.2; Action LU-2.2.3; Policy LU-5.1; Policy LU-5.2; Policy LU-6.1; Policy LU-6.2; Policy LU-6.4; Policy LU-6.5; Policy DT-2.1; Policy DT-2.2; Policy DT-2.4; Policy DT-2.5; Action ED-1.5.7
Urban Service Line: The City/Council will maintain a 1 dwelling unit per 10 acre minimum lot size or lower density in areas outside designated urban service lines. • Adopt an urban-rural transition zone along the urban service line to ensure that land uses within the City/County are compatible with adjacent open space and agricultural uses.	Consistent See Policy LU-1.2; Action LU-1.2.1; Action LU-1.2.2; Policy LU-2.4; Action LU-2.4.1; Policy LU-2.5
Density: The City/County will increase densities in urban core areas to support public transit. • Remove barriers to the development of accessory dwelling units in existing residential neighborhoods inside urban service lines.	Consistent See Action LU-1.3.1; Policy LU-3.1; Policy LU-3.2; Action LU-6.1.1; Action LU-6.1.3; Policy LU-6.2; Action LU-6.2.1; Action DT-2.1.1; Policy DT-2.5; Action DT-4.2.1
Road Width: The City/County will reduce required road with standards wherever feasible to calm traffic and encourage alternative modes of transportation.	Consistent See Policy CIRC-2.1; Action CIRC2.1.1; Action CIRC-2.1.3; Action CIRC-3.1.1; Action CIRC-3.1.2; Action DT-3.7.1
Parking Spaces: The City/County will reduce parking space requirements, unbundle parking from rents and charge for parking in new developments.	Consistent See Action LU-2.2.4; Action LU-6.4.3;

CAPCOA-Recommended Policies	Consistency
	Action CIRC-9.1.1; Action DT-7.2.1; Action DT-7.2.2
Bicycle Facilities: The City/County will add bicycle facilities to city streets and public spaces.	Consistent See Policy CIRC 2.1; Action CIRC-2.1.1; Action CIRC-4.1.1; Action CD-2.1.3
Levels of Service: The City/County will discourage the extension of urban levels of service for new development beyond existing urban service lines, and, if necessary, use zoning to assure that development occurs only if public services are adequate.	Consistent See Policy LU-1.4; Action LU-1.4.1; Action LU-1.4.2
Mixed-Use Development: The City/County will plan for and create incentives for mixed-use development. • The City/County will identify sites suitable for mixed-use development within an existing urban service line and will establish appropriate site-specific standards to accommodate the mixed uses. Site-specific standards could include: – Increasing allowable building height or allowing height limit bonuses; – Allowing flexibility in applying development standards (such as floor area ration [FAR] and lot coverage) based on the location, type, and size of the units, and the design of the development; – Allowing the residential component to be additive rather than within the established FAR for that zone, and eliminating maximum density requirements for residential uses in mixed use zones; – Allowing reduced and shared parking based on the use mix, and establishing parking maximums where sites are located within 0.25 mile of a public transit stop; – Allowing for tandem parking, shared parking and off-site parking leases; – Requiring all property owners in mixed-use areas to unbundle parking from commercial and residential leases; – Creating parking benefit districts, which invest meter revenues in pedestrian infrastructure and other public amenities; – Establishing performance pricing of street parking, so that it is expensive enough to promote frequent turnover and keep 15 percent of spaces empty at all times. • The City/County will seek funding to prepare specific plans and related environmental documents to facilitate mixed-use development at selected sites, and to allow these areas to serve as receiver sites for transfer of development rights away from environmentally sensitive lands and rural areas outside established urban growth boundaries. • The City/County will enable prototype mixed-use structures for use in neighborhood center zones that can be adapted to new uses over time with minimal internal remodeling. • The City/County will identify and facilitate the inclusion of complementary land uses not already present in local zoning districts, such as supermarkets, parks and recreational fields, schools in neighborhoods, and residential uses in business districts, to reduce the vehicle miles traveled and promote bicycling and walking to these uses. • The City/County will work with employers developing larger projects to ensure local housing opportunities for their employees, and engage	Consistent See Action LU-2.2.2; Action LU-2.2.3; Action LU-2.2.4; Policy LU-2.3; Action LU-2.3.1; Action LU-2.3.3; Action LU-2.3.4; Policy LU-3.1; Policy LU-3.2; Action LU-3.2.1; Action LU-3.2.2; Action LU-3.2.3; Policy LU-5.1; Policy LU-5.2; Action LU-6.1.2; Action LU-6.2.1; Policy LU-6.5; Action LU-6.5.1; Action LU-6.5.4; Policy DT-2.1; Action DT-2.1.1; Action DT-2.2.1; Policy DT-2.4; Policy DT-2.5

CAPCOA-Recommended Policies	Consistency
employers to find ways to provide housing assistance as part of their employee benefits packages; major projects in mixed-use areas should include work-force housing where feasible. • The City/County will revise zoning ordinance(s) to allow local-serving businesses, such as childcare centers, restaurants, banks, family medical offices, drug stores, and other similar services near employment centers to minimize midday vehicle use. • The City/County will develop form-based community design standards to be applied to development projects and land use plans, using a comprehensive community outreach, for area designated mixed-use. • Mix affordable housing units with market rate units as opposed to building segregated affordable housing developments.	
Transit-Supportive Density: The City/County will implement a Housing Overlay Zone for transit centers and corridors. This shall include average minimum residential densities of 25 units per acre within 0.25 mile of transit centers; average minimum densities of 15 unit per acre within on quarter mile of transit corridors; and minimum FAR of 0.5:1 for non-residential uses within 0.25 mile of transit centers or corridors.	Consistent See Action LU-6.1.3; Policy LU-6.2; Policy DT-2.1; Policy DT-2.2; Action DT-4.2.1
Transit-Oriented Development: The City/County will identify transit center appropriate for mixed-use development, and will promote transit-oriented, mixed-use development within these targeted areas, including: • Amending the Development Code to encourage mixed-use development within one-half mile of intermodal hubs and future rail stations; to offer flexible standards for affordable housing; and to establish minimal residential densities and non-residential FAR; • Rezoning commercial properties to residential and/or mixed-use where appropriate; • Providing expanded zoning for multi-family housing; • Providing maximum parking standards and flexible building height limitations; • Providing density bonus programs; • Establishing guidelines for private and public spaces; • Providing incentives for redevelopment of underutilized areas, such as surface parking lots; • Establishing a minimum pedestrian and bicycle connectivity standard; • Creating parking benefit districts, which invest meter revenues in pedestrian infrastructure and other public amenities; • Establishing performance pricing of street parking, so that it is expensive enough to promote frequent turnover and keep 15 percent of spaces empty at all times; • Discouraging auto-oriented development.	Consistent See Policy LU-3.1; Policy LU-3.2; Policy LU-6.2; Action LU-6.2.1; Policy CIRC-1.1; Action CIRC-2.1.4; Action CIRC-6.4.2; Policy CD-3.2; Policy CD-3.3; Policy DT-2.1; Policy DT-2.2; Policy DT-3.1; Action DT-4.2.1; Action DT-5.1.2
Transit-Oriented Brownfield Development: The City/County will promote the development of brownfield sites and other underused or defunct properties near existing public transportation.	Consistent See Policy LU-6.2; Policy DT-2.4; Policy DT-2.5
Public Transit Development Focus: The City/County will ensure new development is designed to make public transit a viable choice for residents, including: • Locating medium-high density development near activity centers that can be served efficiently by public transit and alternative transportation	Consistent See Policy LU-3.1; Policy LU-3.2; Action CIRC-2.1.4; Action CIRC-6.4.2; Action DT-5.1.2

CAPCOA-Recommended Policies	Consistency
modes; • Locating medium-high density development near streets served by public transit whenever feasible; • Linking neighborhood to bus stops by continuous sidewalks or pedestrian paths.	
City-Centered Corridors: The City/County will establish city-centered corridors, directing development to existing transportation corridors.	Consistent See Policy LU-6.3; Policy CIRC-2.1; Action CD-3.2.3
Transit-Oriented Development Design Standards: The City/County will develop form-based community design standards to be applied to development projects, and land use plans, using a comprehensive community outreach program, for areas designated mixed-use.	Consistent See Action CIRC-2.1.4; Action CIRC-6.4.2
Affordable Housing: Affordable Housing will be located in transit-oriented development whenever feasible.	Consistent Action ED-1.6.3
Pedestrian-Oriented Character: The City/County will create and preserve distinct, identified neighborhoods whose characteristics support pedestrian travel, especially within, but not limited to, mixed-use and transit-oriented development areas, including: • Designing or maintaining neighborhoods where the neighborhood center can be reached in approximately five minutes of walking; • Increasing housing densities from the perimeter to the center of the neighborhood; • Directing retail, commercial, and office space to the center of the neighborhood; • Encouraging pedestrian-only streets and/or plazas within developments, and destinations that may be reached conveniently by public transportation, walking, or bicycling; • Allowing flexible parking strategies in neighborhood activities centers to foster a pedestrian-oriented streetscape; • Encouraging neighborhood parks and recreation centers near concentrations of residential areas (preferably within one quarter mile) and include pedestrian walkways and bicycle paths that encourage non-motorized travel.	Consistent See Policy LU-3.1; Policy LU-3.2; Action LU-3.2.1; Action LU-3.2.2; Action LU-3.2.3; Action LU-6.3.1; Policy CIRC-5.3; Policy CD-2.1; Action CD-2.1.1; Policy CD-3.3; Action CD-3.3.1; Action DT-3.1.1; Action DT-3.2.1; Action DT-3.3.1; Action DT-3.5.1
Pedestrian Access: The City/County will ensure pedestrian access to activities and services, especially within, but not limited to, mixed-use and transit-oriented development areas, including: • Ensuring new development that provides pedestrian connections in as many locations as possible to adjacent development, arterial streets, thoroughfares; • Ensuring a balanced mixed of housing, workplaces, shopping, recreational opportunities, and institutional uses, including mixed-use structures; • Locating schools in neighborhoods, within safe and easy walking distances or residents served; • For new development, primary entrances shall be pedestrian entrances, with automobile entrances and parking located to the rear; • Support development where automobile access to building does not impede pedestrian access, by consolidating driveways between building or developing alley access;	Consistent See Policy LU-3.1; Policy LU-3.2; Action LU-3.2.1; Action LU-3.2.2; Action LU-3.2.3; Policy CIRC-2.1; Action CIRC-2.1.1; Action CIRC-2.1.3; Policy CIRC-3.1; Action CIRC-3.1.1; Action CIRC-3.1.2; Policy CIRC-5.2; Action CIRC-5.2.1; Action CIRC-5.2.2; Action CD-2.1.3; Action CD-3.3.2; Action DT-3.1.1; Action DT-3.2.1; Action DT-3.2.2; Action DT-3.3.1; Action DT-3.5.1

CAPCOA-Recommended Policies	Consistency
• Street parking provided shall be utilized as a buffer between sidewalk pedestrian traffic and the automobile portion of the roadway; • Establish pedestrian and bicycle connectivity standards for new development, with block sizes between 1 and 2 acres; • For existing areas that do not meet established connectivity standards, prioritize the physical development of pedestrians connectors; • Prioritizing grade-separated bicycle/pedestrian crossing where appropriate to enhance connectivity or overcome barrier such as freeways, railways and waterways.	
Developer Fees: The City/County will promote desired land uses by scaling developer fees based on desired criteria, for example: • Increasing or reducing fee proportionally with distance from city center or preferred transit sites; • Increasing or reducing fee based on the degree to which mixed-uses are incorporated into the project; • Reducing fees for creative re-use of brownfield sites; • Increasing fees for the use of greenfield sites.	Consistent See Action ED-1.4.2; Action PPFS-7.1.3
Administrative Fees and Streamlining: The City/County will provide fast-track permitting and reductions in processing fees for desired projects. The City/County will research and implement a program for incentives for development projects that are fully consistent with the Sustainable Communities Strategy/Regional Plan.	Consistent See Action LU-5.2.2; Action LU-5.2.3; Action LU-6.3.2; Action ED-1.4.1
Incentives and Loans: The City/County will provide incentive funding and/or infrastructure loans to support desired projects.	Consistent See Action SUS-4.3.2; Action SUS-5.2.1; Action LU-1.3.1; Action LU-6.1.2; Action LU-6.2.3; Action DT-2.1.1; Action DT-2.2.1; Action DT-2.5.2; Action DT-2.5.2; Action ED-1.5.6
Infrastructure Preference: The City/County will give preference for infrastructure that support or enhance desired land uses and projects.	Consistent See Policy LU-1.4; Action LU-1.4.1; Action LU-1.4.2; Action LU-5.1.2; Action ED-1.5.2
Hardscape Heat Gain: The City/County will reduce heat gain from pavement and other hardscaping, including: • Reduce street rights-of-way and pavement widths to pre-World War II widths (typically 22 to 34 feet for local streets, and 30 to 35 feet for collector streets, curb to curb), unless landscape medians or parkway strips are allowed in the center of roadways; • Reinstate the use of parkway strips to allow shading of streets by trees; • Include shade trees on south- and west-facing sides of structures; • Include low-water landscaping in place of hardscaping around transportation infrastructure and in parking areas; • Install cool roofs, green roofs, and use cool paving for pathways, parking, and other roadway surfaces; • Establish standards that provide for pervious pavement options; • Remove obstacles to xeriscaping, edible landscaping and low-water landscaping.	Consistent See Action SUS-4.3.4; Action SUS-7.3.1; Action DT-3.3.2

CAPCOA-Recommended Policies	Consistency
Transportation Policies	
Transportation Planning: The City/County will ensure that new developments incorporate both local and regional transit measures into the project design that promote the use of alternative modes of transportation. • Project Selection: The City/County shall give priority to transportation project that will contribute to a reduction in vehicle miles traveled per capita, while maintaining economic vitality and sustainability. • Equal Pedestrian Access: The City/County shall include sidewalks, separated sidewalks whenever possible, on both sides of all new street improvement projects, except where there are sever topographic or natural resource constraints. • Public Involvement: Carry out a comprehensive public involvement and input process that provides information about transportation issues, projects, and processed to community members and other stakeholders, especially to those traditionally underserved by transportation services.	Consistent See Policy CIRC-1.1; Policy CIRC-2.1; Action CIRC-2.1.1; Action CIRC-2.1.4; Policy CIRC-3.1; Action CIRC-3.1.1; Policy CIRC-4.3; Action CIRC-4.3.1; Policy CIRC-5.2; Policy CIRC-5.3; Policy CIRC-6.1; Action CIRC-6.1.1; Action CIRC-6.4.2
System Interconnectivity: The City/County will create an interconnected transportation system that allows a shift in travel from private passenger vehicles to alternative modes, including public transit, ride sharing, car-sharing, bicycling and walking. • Ensure transportation centers are multi-modal to allow transportation modes to intersect; • Provide adequate and affordable public transportation choices, including bus routes and service, as well as other transit choices such as shuttles, light rail, and rail; • To the extent feasible, extend service and hours of operation to underserved arterials and population centers or destination such as colleges; • Focus transit resources on high-volume corridors and high-boarding destinations such as colleges, employment centers and regional destinations; • Coordinate schedules and route across service lines with neighboring transit authorities; • Support programs to provide "station cars" for short trips to and from transit nodes (e.g., neighborhood electric vehicles); • Study the feasibility of providing free transit to areas with residential densities of 15 dwelling units per acre or more, including options such as removing service from less dense, underutilized areas to do so; • Employ transit-preferential measures, such as signal priority and bypass lanes. Where compatible with adjacent land use designations, right-of-way acquisition or parking removal may occur to accommodate transit-preferential measures or improve access to transit. The use of access management should be considered where needed to reduce conflicts between transit vehicles and other vehicles; • Provide safe and convenient access for pedestrians and bicyclists to, across, and along major transit priority streets; • Use park-and-ride facilities to access transit stations only at ends of regional transitways or where adequate feeder bus service is not feasible.	Consistent See Policy CIRC-1.1; Policy CIRC-2.1; Policy CIRC-3.1; Policy CIRC-6.2; Policy CIRC-6.2; Policy CD-2.1; Policy DT-6.1
Transit System Infrastructure: The City/County will upgrade and maintain transit system infrastructure to enhance public use, including: • Ensure transit stops and bus lanes are safe, convenient, clean and	Consistent See Action CIRC-2.1.3; Action CIRC-3.1.3; Policy CIRC-6.1; Action CIRC-6.1.1; Policy CIRC-6.2; Action CIRC-

CAPCOA-Recommended Policies	Consistency
efficient; • Ensure transit stops have clearly marked street-level designations, and are accessible; • Ensure transit stops are safe, sheltered, benches are clean, and lighting is adequate; • Place transit stations along transit corridors within mixed-use or transit-oriented development areas at intervals of 3 to 4 blocks, or no less than 0.5 mile.	6.2.1; Action CIRC-6.2.2; Action CIRC-6.2.3; Action CIRC-6.2.4; Policy CIRC-6.4
Customer Service: The City/County will enhance customer service and system ease-of-use, including; • Develop an Regional Pass system to reduce the number of different passes and tickets required of system users; • Implement "Smart Bus" technology, using GPS and electronic displays at transit stops to provide customers with "real-time" arrival and departure time information (and to allow the system operator to responds more quickly and effectively to disruptions in service); • Investigate the feasibility of an on-line trip planning program.	Consistent See Policy CIRC-6.1
Transit Funding: The City/County will prioritize transportation funding to support a shift from private passenger vehicles to transit and other modes of transportation, including: • Give funding preference to improvements in public transit over other new infrastructure for private automobile traffic; • Before funding transportation improvements that increase roadway capacity and VMT, evaluate the feasibility and effectiveness of funding projects that support alternative modes of transportation and reduce VMT, including transit, and bicycle and pedestrian access.	Consistent See Action CIRC-6.2.4
Transit and Multimodal Impact Fees: The City/County will assess transit and multimodal impact fees on new developments to fund public transportation infrastructure, bicycle infrastructure, pedestrian infrastructure and other multimodal accommodations.	Consistent See Policy CIRC-11.1, Policy CIRC-11.2
System Monitoring: The City/County will monitor traffic and congestion to determine when and where the city needs new transportation facilities in order to increase access and efficiency.	Consistent See Policy CIRC-1.3; Action CIRC-1.3.1; Action CIRC-1.3.2
Arterial Traffic Management: The City/County will modify arterial roadways to allow more efficient bus operation, including bus lanes and signal priority/preemption where necessary.	Consistent See Action CIRC-6.4.1
Signal Synchronization: The City/County will expand signal timing programs where emission reduction benefits can be demonstrated, including maintenance of the synchronization system, and will coordinate with adjoining jurisdictions as needed to optimize transit operation while maintaining a free flow of traffic.	Consistent See Action CIRC-1.3.2
HOV Lanes: The City/County will encourage the construction of high-occupancy vehicle (HOV) lanes or similar mechanisms whenever necessary to relieve congestion and reduce emissions.	Consistent See Policy CIRC-1.1; Policy CIRC-1.6
Delivery Schedules: The City/County will establish ordinance or land use permit conditions limiting the hours when deliveries can be made to off-peak hours in high traffic areas.	Consistent See Policy CIRC-10.2; DT-3.7.2
Ride-Share Programs: The City/County will promote ridesharing programs, including:	Consistent

CAPCOA-Recommended Policies	Consistency
• Designate a certain percentage of parking spaces for ridesharing vehicles; • Designate adequate passenger loading, unloading, and waiting areas for ridesharing vehicles; • Provide a web site or message board for coordinating shared rides; • Encourage private, for-profit community car-sharing, including parking spaces for car share vehicles at convenient locations accessible by public transit; • Hire or designate a rideshare coordinator to develop and implement ridesharing programs.	See Policy CIRC-10.1
Employer-Based Trip Reduction: The City/County will support voluntary, employer-based trip reduction programs, including: • Provide assistance to regional and local ridesharing organizations; • Advocate for legislation to maintain and expand incentives for employer ridesharing programs; • Require the development of Transportation Management Associations for large employers and commercial/industrial complexes; • Provide public recognition of effective programs through awards, top 10 lists, and other mechanisms.	Consistent See Action CIRC-10.1.2
Ride Home Programs: The City/County will implement a city/county wide "guaranteed ride home" program for those who commute by public transit, ride-sharing, or other modes of transportation, and encourage employers to subscribe or support the program.	Consistent See Policy CIRC-10.1
Local Area Shuttle: The City/County will encourage and utilize shuttles to serve neighborhoods, employment centers and major destinations. • The City/County will create a free or low-cost local area shuttle system that includes a fixed route to popular tourist destinations or shopping and business centers; • The City/County will work with existing shuttle service providers to coordinate their service.	Consistent See Policy CIRC-6.3; Action CIRC-6.3.1
Low- and No-Travel Employment Opportunities: The City/County will facilitate employment opportunities that minimize the need for private vehicle trips, including: • Amend zoning ordinances and the Development Code to include live/work sites and satellite work centers in appropriate locations; • Encourage telecommuting options with new and existing employers, through project review and incentives, as appropriate.	Consistent See Action LU-6.2.3; Policy DT-2.1; Action DT-2.2.1; Action ED-1.6.3
Congestion Pricing: Advocate for a regional, market-based system to price or charge for auto trips during peak hours.	Consistent See Policy CIRC-1.1; Policy CIRC-1.6
Development Standards for Bicycles: The City/County will establish standards for new development and redevelopment projects to support bicycle use, including: • Amending the Development Code to include standards for safe pedestrians and bicyclist accommodations, including: – "Complete Street" policies that foster equal access by all users in the roadway design; – Bicycle and pedestrian access internally and in connection to other areas through easements; – Safe access to public transportation and other non-motorized uses	Consistent See Policy CIRC-2.1; Action CIRC-2.1.1; Action CIRC-3.1.1; Policy CIRC-4.3; Action CIRC-4.3.1; Policy CIRC-5.2; Action CIRC-5.2.1; Policy CIRC-5.3; Action CIRC-5.3.1; Action CIRC-5.3.2; Action CD-3.3.1; Action CD-3.3.2

CAPCOA-Recommended Policies	Consistency
through construction of dedicated paths; – Safe road crossing at major intersections, especially for school children and seniors; – Adequate, convenient and secure bike parking at public and private facilities and destination in all urban areas; – Street standards will include provisions for bicycle parking within the public right-of-way; • Require new development and redevelopment projects to include bicycle facilities, as appropriate with the new land use, including: – Construction of weatherproof bicycle facilities where feasible, and at a minimum, bicycle racks or covered, secure parking near the building entrances; – Provision and maintenance of changing rooms, lockers, and showers at large employers or employment centers. • Prohibit projects that impeded bicycle and pedestrian access, such as large parking areas that cannot be safely crossed by non-motorized vehicles, and developments that block access on existing or potential bicycle and pedestrian routes; • Encourage the development of bicycle stations at intermodal hubs, with attended or "valet" bicycle parking, and other amenities such as bicycle rental and repair, and changing areas with lockers and showers; • Conduct a connectivity analysis of the existing bikeway network to identify gaps, and priority bikeway development where gaps exist.	
Bicycle and Pedestrian Trails: The City/County will establish a network of multiuse trails to facilitate safe and direct off-street bicycle and pedestrian travel, and will provide bike racks along these trails at secure, lighted locations.	Consistent See Policy CIRC-4.1; Policy CIRC-5.2
Bicycle Safety Program: The City/County will develop and implement a bicycle safety education program to teach drivers and riders the laws, riding protocols, routes, safety tips, and emergency maneuvers.	Consistent See Policy CIRC-4.4; Action CIRC-4.4.1; Action CIRC-4.4.2; Action CIRC-4.4.3; Action CIRC-4.4.4
Bicycle and Pedestrian Project Funding: The City/County will pursue and provide enhanced funding for bicycle and pedestrians facilities and access projects, including, as appropriate: • Apply for regional, state, and federal grants for bicycle and pedestrian infrastructure projects; • Establish development exactions and impact fee to fund bicycle and pedestrian facilities; • Use existing revenues, such as state gas tax subventions, sales tax funds, and general fund monies for projects to enhance bicycle use and walking for transportation.	Consistent Policy CIRC-4.5; Action CIRC-4.5.1; Action CIRC-4.5.2
Bicycle Parking: Adopt bicycle parking standards that ensure bicycle parking sufficient to accommodate 5 to 10 percent of projected use at all public and commercial facilities, and at a rate at least 1 per residential unit in multiple-family developments.	Consistent See Policy CIRC-4.6; Action CIRC-4.6.1; Action CIRC-4.6.2
Parking Policy: The City/County will adopt a comprehensive parking policy to discourage private vehicle use and encourage the use of alternative transportation, including: • Reduce the available parking spaces for private vehicles while increasing parking spaces for shared vehicles, bicycles, and other alternative modes	Consistent See Action LU-6.4.3; Action CIRC-9.1.1; Action DT-7.1.1; Action DT-7.1.2; Action DT-7.2.1; Action DT-7.2.2

CAPCOA-Recommended Policies	Consistency
of transportation; • Eliminate or reduce minimum parking requirements for new buildings; • "Unbundle" parking (require that parking is paid separately and is not included in the base rent for residential and commercial space); • Use parking pricing to discourage private vehicle use, especially at peak times; • Create parking benefit districts, which invest meter revenues in pedestrian infrastructure and other public amenities; • Establish performance pricing of street parking, so that it is expensive enough to promote frequent turnover and keep 15 percent of spaces empty at all times; • Encourage shared parking programs in mixed-use and transit-oriented development areas.	
Event Parking Policies: The City/County will establish policies and programs to reduce onsite parking demand and promote ridesharing and public transit at large events, including: • Promote the use of peripheral parking by increasing onsite parking rates and offering reduces rates for peripheral parking; • Encourage special event center operators to advertise and offer discounted transit passes with event tickets; • Encourage special event center operators to advertise and offer discount parking incentives to carpooling patrons, with 4 or more persons per vehicle for on-site parking; • Promote the use of bicycles by providing space for the operation of valet bicycle parking service.	Consistent See Policy DT-7.1; Action DT-7.1.1
Parking "Cash-Out" Program: The City/County will require new office developments with more than 50 employees to offer a Parking "Cash-Out" Program to discourage private vehicle use.	Consistent See Action CIRC-9.1.1
Electric/Alternative Fuel Vehicle Parking: The City/County will require new commercial and retail developments to provide prioritized parking for electric vehicles and vehicles using alternative fuels.	Consistent See Policy SUS-5.3
Low- and Zero-Emission Vehicles: The City/County will support and promote the use of low- and zero-emission vehicles, including: • Develop the necessary infrastructure to encourage the use of zero-emission vehicles (ZEV) and clean alternative fuels, such as development of electric vehicle charging facilities and conveniently located alternative fueling stations; • Encourage new construction to include vehicle access to properly wired outdoor receptacles to accommodate ZEV and/or plug-in electric hybrids (PHEV); • Encourage transportation fleet standards to achieve the lowest emissions possible, using a mix of alternative fuels, PZEV or better fleet mixes; • Establish incentives, as appropriate, to taxicab owners to use alternative fuel or gas-electric hybrid vehicles.	Consistent See Policy SUS-5.3
Vehicle Idling: The City/County will enforce state idling laws for commercial vehicles, including delivery and construction vehicles.	Consistent See Policy OS-5.1; Action OS-5.1.3

CAPCOA-Recommended Policies	Consistency
Energy Efficiency Policies	
Green Building Ordinance: The City/County will adopt a Green Building Ordinance that requires new development and redevelopment projects for both residential and commercial buildings to incorporate sufficient green building methods and techniques to qualify for the equivalent of a current LEED Certified rating, GreenPoints, or equivalent rating system.	Consistent See Policy SUS-4.1; Action SUS-4.1.1; Policy SUS-4.3; Action SUS-4.3.1; Policy SUS-5.2.1; Action SUS-5.2.2; Action SUS-5.2.5
Green Building Flexibility: The City/County will allow increased height limits and/or flexibility in other standards for projects that incorporate energy efficient green building practices.	Consistent See Policy SUS-5.2
Green Building Barriers: The City/County will identify and remove regulatory or procedural barriers to implementing green building practices within its jurisdiction, such as updating codes, guidelines, and zoning, and will ensure that all pan review and building inspection staff are trained in green building materials, practices, and techniques.	Consistent See Action SUS-5.2.6
Green Building Incentives: The City/County will support the use of green building practices by: • Providing information, marketing, training, and technical assistance about green building practices; • Establishing guidelines for green building practices in residential and commercial development; • Providing financial incentives, including reduction in development fees, and expedited permit processing for projects that use green building practices.	Consistent See Policy SUS-1.4; Action SUS-1.4.1; Policy SUS-4.3; Action SUS-4.3.1; Action SUS-4.3.2; Action SUS-5.2.1; Action SUS-5.2.2; Action SUS-5.2.3
Improved Building Standards: The City/County will adopt energy efficiency performance standards for building that achieve a greater reduction in energy and water use that otherwise required by state law, including: • Standards for the installation of "cool roofs"; • Performance standards for heat transfer across the building envelope that result in increased insulation and the use of low-emissive windows; • Requirements to install high-efficiency plumbing fixtures and tankless water heaters; • Performance standards that specify high-efficiency space heating and cooling systems; • Requirement for improved overall efficiency of lighting systems; • Requirement for the use of Energy Star® appliances and fixtures in discretionary new development; • New lots shall be arrange and oriented to maximize effective use of passive solar energy.	Consistent See Action SUS-4.3.1; Action SUS-4.3.4; Action SUS-5.2.2; Action SUS-5.2.3; Action SUS-5.2.4; Action SUS-5.2.5
Affordable Housing Energy Efficiency: Affordable housing development shall incorporate energy efficient design and features to the maximum extent feasible. • The City/County will target local funds, including redevelopment and community development block grant resources, to assist affordable housing developers in meeting the energy efficiency requirements.	Consistent See Policy SUS-4.1
Outdoor Lighting: The City/County will establish outdoor lighting standards in the Zoning Ordinance, including: • Requirements that all outdoor lighting fixtures be energy efficient, such as:	Consistent See Policy SUS-5.2; Action SUS-5.2.1; Action SUS-5.2.2

CAPCOA-Recommended Policies	Consistency
– Full cut-off light fixtures at parking lots and on buildings; – Photocells or astronomical time switches on all permanently installed exterior lighting; – Directional and shielded (LED) lights for exterior lighting, and install exterior and security lights with motion detectors. • Requirements that light levels in all new development, parking lots, and street lighting not exceed state standards; • Requirement that lighting at the urban-rural boundary be designed to provide one-half the light standard for urban areas; • Prohibition against continuous all-night outdoor lighting in sport stadiums, construction sites, and rural areas unless required for security reasons.	
Residential Wood Burning: The City/County will establish or enhance local ordinances that prohibit solid fuel wood-burning devices in mixed-use high-density development and restrict the installation of wood-burning appliances in new or redeveloped single family residential properties to those that burn pellets, natural gas, or propane, or at a minimum, EPA certified wood-burning units.	Consistent See Policy OS-5.1; Action OS-5.1.2; Action OS-5.1.3; Action OS-5.1.5
Exterior Heat Gain: The City/County will establish standards for new development and for large redevelopment or rehabilitation (for example, additions of more than 25,000 square feet commercial or 100,000 square feet industrial), to reduce exterior heat gain for 50 percent of non-roof impervious site landscape (roads, sidewalks, courtyards, parking lots, and driveways), including: • Achieving 50 percent paved surface shading with vegetation within 5 years, in consultant with city/county arborist; • Use of paving materials with a Solar Reflective Index (SRI) of at least 29, or open grid paving systems; • Covered parking (underground, beneath decking or roofs, or beneath a building), where any roof-covered parking uses roofing material with SRI of at least 29.	Consistent See Action SUS-4.3.4
Heat Island Mitigation: The City/County will adopt a Heat Island Mitigation Plan that requires cool roofs, cool pavements, and strategically placed shade trees, and will actively inspect and enforce-state requirements for cool roofs on non-residential re-roofing projects.	Consistent See Action SUS-4.3.4; Action LU-6.2.2
Energy Audits: The City/County will pursue incentives, grants, and creative financing for projects that improve energy efficiency, including, for example, the option for property owners to pay for such improvements through long-term assessments on their property tax bills.	Consistent See Policy SUS-5.1; Action SUS-5.1.1; Action SUS-5.1.2
Community Energy Program: The City/County will implement an outreach and incentive program to promote energy efficiency and conservation in the community, including: • Launch an "energy efficiency challenge" campaign for community residents; • Implement a low-income weatherization assistance program; • Implement conservation campaigns specifically targeted to residents, and separately to businesses; • Promote the purchase of Energy Star® appliances, including, where feasible, incentive grants and vouchers; • Promote participation in the local "Green Business" program;	Consistent See Policy SUS-4.3; Action SUS-5.1.1; Action SUS-5.1.3; Action SUS-5.2.1

CAPCOA-Recommended Policies	Consistency
• Distribute free CFL bulbs or other efficiency fixtures to community members; • Offer exchange programs for high-energy-use items, such as halogen torchiere lamps; • Adopt an ordinance requiring energy upgrades at the time of property sale.	
Alternative Energy Policies	
Site Designation: The City/County will identify possible sites for production of renewable energy (such as solar, wind, small hydro, and biogas), as compatible with surrounding uses, and will protect and promote that use, including: • Designate suitable sites to prioritize their development for renewable energy generation; • Evaluate potential land use, environmental, economic, and other constraints on that use, and mitigate such constraints, as feasible; • Adopt measures to protect the renewable energy use of the sites and their resource, such as utility easements, right-of-way, and land set-asides.	Consistent See Policy SUS-5.2; Action SUS-5.2.1; Action SUS-5.2.3; Action SUS-5.2.5; Action SUS-5.2.6
Removing Barriers: The City/County will identify and remove or otherwise address barriers to renewable energy production, including: • Review and revise building and development codes, design guidelines, and zoning ordinances to remove such barriers; • Work with related agencies, such as fire, water, health and others that may have policies or requirements that adversely impact the development or use of renewable energy technologies; • Develop protocols for safe storage of renewable and alternative energy products with the potential to leak, ignite or explode, such as biodiesel, hydrogen, and/or compressed air.	Consistent See Policy SUS-5.1; Action SUS-5.1.1; Action SUS-5.1.2; Action SUS-5.1.3; Action SUS-5.2.6
Zoning Flexibility: The City/County will allow renewable energy project in areas zones for open space, where consistent with the Open Space element, and other uses and values.	Consistent See Policy SUS-5.2; Action SUS-5.2.1; Action SUS-5.2.3; Action SUS-5.2.5; Action SUS-5.2.6
On-Site Renewable Energy Generation: The City/County will require that new office/retail/commercial or industrial development, or major rehabilitation (e.g., additions of 25,000 square feet commercial, or 100,000 square feet industrial) incorporate renewable energy generation either on- of off-site to provide 15 percent of more the project's energy need.	Consistent See Action SUS-5.2.5
Co-Generation Projects: The City/County will promote and encourage co-generation projects for commercial and industrial facilities, provided they meet all applicable air quality standards and provide a net reduction in GHG emissions associated with energy production.	Consistent See Action SUS-5.2.5
Green Utilities: The City/County will promote and support green utilities, and will evaluate the creation of a locally or regionally owned green utility, perhaps in coordination with other regional strategies.	Consistent See Action SUS-5.1.3
Solar-Ready Buildings: The City/County will require that, where feasible, all new buildings be constructed to allow for easy, cost-effective installation of solar energy systems in the future, using such "solar-ready" features as: • Designing the building to include optimal roof orientation (between 20 to 55 degrees from the horizontal), with sufficient south-sloped roof surface;	Consistent See Action SUS-5.2.4

CAPCOA-Recommended Policies	Consistency
• Clear access without obstructions (chimneys, heating and plumbing vents, etc.) on the south sloped roof; • Designing the roof framing to support the addition of solar panels; • Installation of electrical conduit to accept solar electric system wiring; • Installation of plumbing to support a solar hot water system and provision of space for a solar hot water storage tank.	
Solar Home Partnership: The City/County will require that residential projects of 6 units or more participate in the California Energy Commission's New Solar Homes Partnership, which provides rebates to developers who offer solar power in at least 50 percent of new units, or a program with similar provisions.	Consistent See Policy SUS-5.2; Action SUS-5.2.1; Action SUS-5.2.3; Action SUS-5.2.5; Action SUS-5.2.6
Passive Solar Design: The City/County will require that any building constructed in whole or in part with City/County funds incorporate passive solar design features, such as daylighting and passive solar heating, where feasible.	Consistent See Action SUS-5.2.4
Protection of Solar Elements: The City/County will protect active and passive solar design elements and systems from shading by neighboring structures and trees, as consistent with existing tree shading requirements.	Consistent See Action LU-6.2.2
Renewable Energy Incentives: The City/County will provide, where possible, grants, rebates, and incentives for renewable energy projects, including reduced fees and expedited permit processing.	Consistent See Policy SUS-5.1; Action SUS-5.1.1; Action SUS-5.1.2; Action SUS-5.2.1
Creative Financing: The City/County will provide, where feasible, creative financing for renewable energy projects, including subsidized or other low-interest loans, and the option to pay for system installation through long-term assessments on individual property tax bills.	Consistent See Policy SUS-5.1; Action SUS-5.1.2
Partnerships: The City/County will pursue partnerships with other governmental entities and with private companies and utilities to establish incentive programs for renewable energy.	Consistent See Policy SUS-1.6; Action SUS-5.1.3
Information and Support: The City/County will establish and maintain a clearinghouse of information on available funding alternatives for renewable energy projects, rates of return, and other information to support developers and community members interested in pursuing renewable energy projects.	Consistent See Action SUS-1.6.1; Action SUS-5.1.3
Green Electricity Purchasing: The City/County will establish target for the purchase of renewable energy, in excess of the state Renewable Portfolio Standards, using such mechanism as green tags or renewable energy certificates.	Consistent See Action SUS-5.1.3
Community Choice Aggregation: The City/County will evaluate the feasibility and effectiveness of using Community Choice Aggregation as a model for providing renewable energy to meet the community's electricity needs, include potential partnerships with other jurisdictions.	Consistent See Policy SUS-2.2
Municipal Operations Policies	
Energy Efficiency Plan: The City/County will prepare and implement a comprehensive plan to improve energy efficiency of municipal facilities, including: • Conduct energy audits for all municipal facilities; • Retrofit for energy efficiency where feasible and when remodeling or replacing components, including increased insulation, installing green or reflective roofs and low-emissive window glass;	Consistent See Policy SUS-3.2; Action SUS-3.2.1; Policy SUS-6.1

CAPCOA-Recommended Policies	Consistency
• Implement an energy tracking and management system; • Install energy efficient exit signs, street signs, and traffic lights; • Install energy efficient lighting retrofits and occupancy sensors, and institute a "lights out at night" policy; • Retrofit heating and cooling systems to optimize efficiency (e.g., replace chillers, boilers, fans, pumps, belts, etc.); • Install Energy Star® appliances and energy efficient vending machines; • Improve efficiency of water pumping and use at municipal facilities, including a schedule to replace or retrofit system components with high-efficiency units (i.e., ultra-low-flow toilets, fixtures, etc.); • Provide chilled, filtered water at water fountains and taps in lieu of bottled water; • Install a central irrigation control system and time its operation for off-peak use; • Adopt an accelerated replacement schedule for energy inefficient system and components.	
Efficiency Requirement for New Facilities: The City/County will require that any newly constructed, purchased, or leased municipal space meet minimum standards as appropriate, such as: • Requirements for new commercial building to meet LEED criteria established by the U.S. Green Building Council; • Requirements for new residential buildings to meet criteria of the Energy Star® New Homes Program established by U.S. EPA; • Incorporation of passive solar design features in new building, including daylighting and passive solar heating; • Retrofitting of existing buildings to meet standards under Title 24 of the California Building Energy Code, or achieve a higher performance standard as established by the City/County; • Retrofitting of existing building to decrease heat gain from non-roof impervious surfaces with cool paving, landscaping, and other techniques.	Consistent See Policy SUS-4.1; Action SUS-4.1.1; Action SUS-5.2.5
Training and Support: The City/County will ensure that staff receives appropriate training and support to implement objectives and policies to reduce GHG emissions, including: • Provide energy efficiency training to design, engineering, building operations, and maintenance staff; • Provide information on energy use and management, including data from the tracking and management system, to managers and others making decisions that influence energy use; • Provide energy design review services to departments undertaking new constriction or renovation projects, to facilitate compliance with LEED standards.	Consistent See Action SUS-1.3.2; Action SUS-4.3.3
Wastewater System Efficiency: The City/County will maximize efficiency of wastewater treatment and pumping equipment.	Consistent See Policy PPFS-6.1
Drinking Water System Efficiency: The City/County will maximize efficiency at drinking water treatment, pumping, and distribution facilities, including development of off-peak demand schedules for heavy commercial and industrial users.	Consistent See Policy PPFS-9.1; Policy PPFS-9.2

CAPCOA-Recommended Policies	Consistency
Fleet Replacement: The City/County will establish a replacement policy and schedule to replace feet vehicles and equipment with the most fuel-efficient vehicles practical, including gasoline hybrid and alternative fuel or electric models.	Consistent See Policy SUS-3.4; Action SUS-3.4.2
Small Tools and Equipment: Install outdoor electrical outlets on buildings to support the use of electric lawn and garden equipment, and other tools that would otherwise be run with small gas engines or portable generators.	Consistent See Action OS-5.1.4
Trip Reduction Program: The City/County will implement a program to reduce vehicle trips by employees, including: • Providing incentives and infrastructure for vanpooling and carpooling, such as pool vehicles, preferred parking, and a website or bulletin board to facilitate ridesharing; • Providing subsidized passes for mass transit; • Offering compressed work hours; off-peak work hours, and telecommuting, where appropriate; • Offer a guaranteed ride home for employees who use alternative modes of transportation to commute.	Consistent See Policy CIRC-10.1; Action CIRC-10.1.1
Bicycle Transportation Support: The City/County will promote and support the use of bicycles as transportation, including: • Providing bicycle stations with secure, covered parking, changing areas with storage lockers and showers, as well as a central facility where minor repairs can be made; • Providing bicycles, including electric bikes, for employee to use for short trips during business hours; • Implementing a police-on-bicycles program; • Providing a bicycle safety program, and information about safe routes to work.	Consistent See Policy CIRC-4.1; Policy CIRC-4.4; Policy CIRC-4.6; Action CIRC-4.6.1; Action CIRC-4.6.2
Municipal Parking Management: The City/County will implement a Parking Management Program to discourage private vehicle use, including: • Encouraging carpools and vanpools with preferential parking and reduced parking fee; • Institute a parking cash-out program; • Renegotiate employee contract, where possible, to eliminate parking subsidies; • Install on-street parking meters with fee structures designed to discourage private vehicle use; • Establish a parking fee for all single-occupant vehicles.	Consistent See Policy CIRC-9.1; Action CIRC-9.1.1; Action CIRC-9.1.2; Policy CIRC-9.2; Action CIRC-9.2.1
Travel Mitigation: The City/County will mitigation business-related travel, especially air travel, through annual purchase of verified carbon offsets.	Consistent See Policy SUS-1.2
Transit Access to Municipal Facilities: Municipal employment and service facilities shall be located on major transit corridors, unless their use is plainly incompatible with other uses located along major transit corridors.	Consistent See Policy CIRC-6.2; Policy CIRC-6.3
Load Management and Demand Response: The City/County will design and implement peak load management and demand response programs for water pollution control, supply and treatment, and distribution, including interface with existing automated system for building energy management and SCADA systems.	Consistent See Policy PPFS-6.1; Policy PPFS-6.2; Policy PPFS-6.4; Policy PPFS-6.5

CAPCOA-Recommended Policies	Consistency
Renewable Energy Installation: The City/County will install renewable energy systems at its facilities where feasible, including: • Solar collection systems on municipal roofs; • Solar water heating for municipal pools; • Waste-to energy systems at waste handling operations.	Consistent See Action SUS-3.2; Policy SUS-4.1;Action SUS-5.2.5
Urban Tree Management: The City/County will conduct a comprehensive inventory and analysis of the urban forest, and coordinate tree maintenance responsibilities with all responsible departments, consistent with best management practices.	Consistent See Policy SUS-6.3; Action LU-6.2.2; Action CD-4.1.1; Action CD-4.1.3; Policy OS-8.1; Action OS-8.1.1; Action OS-8.1.4
Landscaping: The City/County will evaluate existing landscaping and options to convert reflective and impervious surfaces to landscaping, and will install or replace vegetation with drought-tolerant, low-maintenance native species or edible landscaping that can also provide shade and reduce heat-island effects.	Consistent See Policy SUS-4.2; Action SUS-4.2.1
Purchasing Practices: The City/County will adopt purchasing practices and standards to support reductions in GHG emissions, including preferences for energy-efficiency office equipment, and use of recycled materials and manufacturers that have implemented green management practices.	Consistent. See Policy SUS-3.1; Action SUS-3.1.1.
Contracting Practices: The City/County will establish bidding standards and contracting practices that encourage GHG emissions reductions, including preferences or points for the use of low and zero emission vehicles and equipment, recycled materials, and provider implementation of other green management practices.	Consistent See Policy SUS-3.1; Action SUS-3.1.1
Waste Reduction and Diversion Policies	
Methane Recovery: The City/County will establish methane recovery at all wastewater and solid waste treatment facilities.	Consistent See Action SUS-5.2.6
Waste to Energy: The City/County will implement waste-to-energy projects where characteristics meet criteria for effective energy generation.	Consistent See Action SUS-5.2.6
Best Management Practices: The City/County will utilize best management practices at all waste handling facilities.	Consistent. See Policy PPFS-13.1.
Diversion Targets: The City/County will achieve a solid waste diversion of 75 percent of the waste stream by 2020.	Consistent. See Policy PPFS-13.1
Diversion Services: The City/County will expand jurisdiction-wide waste diversion services to include, for example, single stream curbside recycling, and curbside recycling of food and greenwaste.	Consistent See Policy PPFS-13.1.1
Construction and Demolition Waste: The City/County will adopt a Construction and Demolition Waste Recovery Ordinance, requiring building projects to recycle or reuse a minimum percentage of unused or leftover building materials, including: • Require all new developments and major rehabilitation projects (additions of 25,000 square feet commercial or 100,000 square feet industrial) to recycle or salvage XX percent of non-hazardous construction and demolition debris (excluding excavated soil and land-clearing debris); • Require preparation of a construction waste management plan identifying materials to be diverted from disposal, and how material will	Consistent See Action PPFS-13.1.5

CAPCOA-Recommended Policies	Consistency
be stored and handled; • Establish clear and consistent guidelines for calculation methods, recordkeeping, and reporting to document compliance with the plan; • Establish clear and consistent guidelines for how and when used construction materials can be used in new or remodel construction.	
Reuse Center: The City/County will establish a reuse/recycling center where furniture, appliance, building materials, and other useful, non-hazardous items may be dropped off or purchased for a nominal fee.	Consistent See Action PPFS-13.1.2
Program Promotion: The City/County will promote and expand recycling programs, purchasing policies, and employee education to reduce the amount of waste produced.	Consistent See Action PPFS-13.1.2
Regional Coordination: The City/County will coordinate with other agencies in its region to develop and implement effective waste management strategies and waste-to-energy technologies.	Consistent See Action PPFS-13.1.4
Conservation and Open Space Policies	
Water Consumption Reduction Target: The City/County will reduce per capita water consumption by X percent by 2020.	Consistent See Policy PPFS-9.1; Policy PPFS-9.2
Water Conservation Plan: The City/County will establish a water conservation plan that may include such policies and actions as: • Tiered rate structures for water use; • Restrictions on time of use for landscape watering, and other demand management strategies; • Performance standards for irrigation equipment and water fixtures; • Requirements that increased demand from new construction be offset with reductions to that there is not net increase in water use.	Consistent See Policy PPFS-9.1; Policy PPFS-9.2
Recycled Water Use: The City/County will establish programs and policies to increase the use of recycled water, including: • Create and inventory of non-portable water uses within the jurisdiction that could be served with recycled water; • Produce and promote the use of recycled water for agricultural, industrial, and irrigation purposes, including grey water systems for residential irrigation; • Produce and promote the use of treated, recycled water of potable uses where GHG emissions from producing such water are lower than from other potable sources.	Consistent See Action PPFS-9.1.5; Action OS-1.4.2
Water Conservation Outreach: The City/County will implement a public education and outreach campaign to promote water conservation, and will highlight specific water-wasting activities to discourage, such as watering of non-vegetated surfaces and using water to clean sidewalks and driveways.	Consistent See Policy PPFS-9.1; Policy PPFS-9.2
Water-Efficient Design: The City/County will establish building design guidelines and criteria to promote water-efficient building design, including minimizing the amount of non-roof imperious surfaces around the building(s).	Consistent See Action PPFS-9.2.2
Water-Efficient Infrastructure and Technology: The City/County will establish menus and checklist for developers and contractors to ensure water-efficient infrastructure and technology are used in new construction, include low-flow toilets and shower heads, moisture-sensing irrigation, and other such advances.	Consistent See Action PPFS-9.2.2

CAPCOA-Recommended Policies	Consistency
Grey Water System Standards: The City/County will establish criteria and standards to permit the safe and effective use of grey water (on-site water recycling), and will review and appropriately revise, without compromising health and safety, other building code requirements that might prevent the use of such systems.	Consistent See Policy PPFS-9.1; Policy PPFS-9.2; Policy OS-1.4
Water-Efficiency Landscapes: The City/County will install water-efficient landscapes and irrigation, including: • Planting drought-tolerant and native species, and covering exposed dirt with moisture-retaining mulch; • Installing water-efficient irrigation systems and devices, including advanced technology such as moisture-sensing irrigation controls; • Installing edible landscapes that provide local food.	Consistent See Policy SUS-4.2; Action SUS-4.2.1; Action OS-3.4.6
Shade Tree Planting; The City/County will promote the planting of shade trees and will establish shade tree guidelines and specifications, including: • Recommendations for tree planting based on land use (residential, commercial, parking lots, etc.); • Recommendations for tree types based on species size, branching patterns, whether deciduous or evergreen, whether roots are invasive, etc.; • Recommendations for placement, including distance from structures, density of planning, and orientation relative to structures and the sun.	Consistent See Policy SUS-6.3; Action LU-6.2.2; Action CD-4.1.1; Action CD-4.1.3
Urban Forestry Management: The City/County will develop an Urban Forestry Program to consolidate policies and ordinance regarding tree planting, maintenance, and removal, including: • Establishing a tree-planting target and schedule to support the goals of the California Climate Action Team to plant 5 million trees in urban areas by 2020; • Establish guidelines for tree planting, including criteria for selecting deciduous or evergreen trees low-VOC-producing trees, and emphasizing the use of drought-tolerant native trees and vegetation.	Consistent See Policy SUS-6.3; Action LU-6.2.2; Action CD-4.1.1; Action CD-4.1.3; Policy OS-2.7; Action OS-2.7.1; Policy OS-8.1; Action OS-8.1.1; Action OS-8.1.4
Conservation Area Development: The City/County will establish programs and funding mechanisms to create protected conservation areas, including; • Imposing mitigation fees for development on lands that would otherwise be conservation areas, and use the funds generated to protect other areas from development; • Proposing for voter approval a small tax increment (e.g., a 0.25 cent sales tax, perhaps for a finite time period that could be renewed) to fund the purchase of development rights in conservation areas, or purchase of the land outright.	Consistent See Action OS-1.1.2; Action OS-1.1.5; Policy OS-2.1; Action OS-2.1.1; Action OS-2.1.2
Conservation Area Preservations: The City/County will establish policies to preserve existing conservation areas, and to discourage development in those areas.	Consistent See Policy LU-2.4; Action LU-2.4.1; Policy LU2.5; Action OS-1.1.1; Action OS-1.1.4; Action OS-2.1.1
Education and Outreach Policies	
Outreach Methods: The City/County will use a variety of media and methods to promote climate awareness and GHG reduction, including: • TV and radio spots with local celebrities and community leaders; • Advertising "Green Tips" in the local paper;	Consistent See Action SUS-1.1.1; Policy SUS-1.6; Action SUS-1.6.1, Action SUS-1.6.2; Policy SUS-2.1; Action SUS-2.1.1; Policy SUS-2.2; Policy SUS-4.3;

CAPCOA-Recommended Policies	Consistency
• Collaborating with utilities, business associations, civic groups, and non-profits to place tips and articles in billing materials or newsletters; • Designing and maintaining an interactive Climate Protection website and collaborating with other organizations to link to the website.	Action SUS-4.3.1; Action OS-1.1.5; Policy OS-5.2; Action OS-5.2.1
Outreach Topics: The City/County will coordinate with other agencies and outreach efforts to align messages on topics such as: • Energy efficiency and conservation, and green energy; • Trip reduction, public transit, carpooling, vanpooling, and alternative modes of transportation; • Green building and energy-efficient design; • Waste reduction, recycling, and composting; • Water conservation and water-efficient design and products; • The benefits of buying local, and information about locally grown, prepared, and manufactured goods and local services.	Consistent See Policy SUS-1.6; Action SUS-1.6.1, Action SUS-1.6.2; Policy SUS-2.2; Action SUS-5.1.3
Energy Efficiency Campaigns: The City/County will collaborate with local energy suppliers and distributors to establish energy conservation programs, Energy Star® appliance change-out programs, rebates, vouchers, and other incentives to install energy-efficient technology and products to cooperate on advertising.	Consistent See Action SUS-1.6.2; Action SUS-5.1.3; Action SUS-5.2.3
Pedestrian and Bicycle Promotion: The City/County will work with local community groups and downtown business association to organize and publicize walking tours and bicycle events, and to encourage pedestrian and bicycle modes of transportation.	Consistent See Policy CIRC-4.2; Action CIRC-4.4.3
Waste Reduction: The City/County will organize workshops on waste reduction activities for the home or business, such as backyard composting, or office paper recycling, and will schedule recycling drop-off events and neighborhood chipping/mulching days.	Consistent See Action SUS-1.6.2
Water Conservation: The City/County will organize workshops on water conservation activities, such as selecting and planting drought-tolerant, native plants in landscaping, and installing advanced irrigation systems.	Consistent See Action SUS-1.6.2
Energy Efficiency: The City/County will organize workshops on steps to increase energy efficiency in the home or business, such as weatherizing the home or building envelope, installing smart lighting systems, and how to conduct a self-audit for energy use and efficiency.	Consistent See Action SUS-1.6.2; Action SUS-5.1.3
Climate Protection Summit/Fair: The City/County will organize an annual Climate Protection Summit or Fair, to educate the public on current climate science, projected local impacts, and local efforts and opportunities to reduce GHG emissions, including exhibits of the latest technology and products for conservation and efficiency.	Consistent See Action SUS-1.6.2
School Programs: The City/County will develop and implement a program to present information to school children about climate change and ways to reduce GHG emissions, such as school based trip reduction and the importance of recycling.	Consistent See Action SUS-1.6.2
Climate Champions Awards: The City/County will establish a Climate Champions Awards program to acknowledge outstanding private and public efforts to reduce GHG emissions.	Consistent See Action SUS-1.6.2
GHG Reduction/Climate Protection Competitions: The City/County will sponsor competitions and contests with prizes for promoting climate protection and reducing GHG emissions, including such contests as:	Consistent See Action SUS-1.6.2

CAPCOA-Recommended Policies	Consistency
• Poster contests at schools, with winning entrants receiving scholarship grants and recognition a the Climate Protection Summit/Fair, and poster used in outreach campaigns or compiled in calendars; • Waste diversion contest between schools, businesses, civic organizations, and Scout troops or other groups with prizes for the greatest percent waste diverted and recognition at the Climate Protection Summit/Fair, and similar contest for planting trees, reducing vehicle trips, or other desired behaviors. • Walkathons, relays, or other similar fundraising challenges, with funds raised to support community climate protection programs and activities.	

Note: While the CAPCOA Model Policies for GHGs in General Plans includes alternative forms for many of the recommended policies, only one alternative is listed for this analysis.

Implementation of relevant policies and actions from the proposed General Plan Update and associated adoption and implementation of the upcoming CAP could potentially mitigate GHG emissions projected for build-out conditions consistent with the City's GHG reduction goal of 25 percent of 1990 levels by 2020 as well as state efforts to reduce GHG emissions. However, the CAP has not been fully developed at this time and its reduction measures are not currently known. Furthermore, while the proposed General Plan Update would improve GHG emission per service population, GHG calculations predict emissions in excess of the BAAQMD threshold and would still result in a net increase in GHG emissions. Thus, this impact is considered **cumulatively considerable** and **significant and unavoidable.**

REFERENCES

Bay Area Air Quality Management District (BAAQMD). 2010. *California Environmental Quality Act Guidelines Update: Proposed Thresholds of Significance*. http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx

Brekke, L. D., N. L. Miller, K. E. Bashford, et al. 2004. Climate change impacts uncertainty for water resources in the San Joaquin River Basin, California. *Journal of the American Water Resources Association* 40 (1):149–164.

Butte County. 2004. *Butte County Groundwater Management Plan.*

Butte County. 2010. *Butte County General Plan 2030 Draft Environmental Impact Report.* April 8, 2010.

Butte County Air Quality Management District (BCAQMD). 2009. http://www.bcaqmd.org (accessed December 2009).

Butte County Association of Governments (BCAG). 2009. http://www.bcag.org (accessed December 2009).

California Air Pollution Control Officers Association (CAPCOA). 2008. *CEQA and Climate Change: Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act*.

California Air Pollution Control Officers Association (CAPCOA). 2009. *Model Policies for Greenhouse Gases in General Plans: A Resource for Local Government to Incorporate General Plan Policies to Reduce Greenhouse Gas Emissions*.

California Air Resources Board (CARB). 2009. *California Greenhouse Gas Inventory Data 2000 to 2006.* Last Reviewed on December 10, 2009.http://www.arb.ca.gov/cc/inventory/data/data.htm (accessed April 2010).

California Climate Action Team (CAT). 2009. *Draft Climate Action Team Biennial Report to the Governor and Legislator.*

California Department of Water Resources (DWR). 2006. *Progress on Incorporating Climate Change Into Management of California Water Resources.*

California Energy Commission (CEC). 2006a. *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004*. Publication CEC-600-2006-013-D. http://www.energy.ca.gov/2006publications/CEC-600-2006-013/CEC-600-2006-013-SF.PDF (accessed December 2009).

California Energy Commission (CEC). 2006b. *Our Changing Climate: Assessing the Risks to California.* Publication CEC-500-2006-077.

California Energy Commission (CEC). 2007a. *Integrated Energy Policy Report 2007*. http://www.energy.ca.gov/2007_energypolicy/index.html (accessed December 21, 2009).

California Energy Commission (CEC). 2007b. Website: *Energy Almanac*. http://energyalmanac.ca.gov/transportation/summary.html#fuel (accessed April 13, 2010).

California Energy Commission (CEC). 2008. *2008 Building Energy Efficiency Standards for Residential and Nonresidential Buildings*. December 2008. http://www.energy.ca.gov/title24/ (accessed April 2010).

California Energy Commission (CEC). 2009a. *The Future is Now: An Update on Climate Change Science Impacts and Response for California*.

California Energy Commission (CEC). 2009b. *2009 Integrated Energy Policy Report, Final Committee Report*. December 2009.

California Energy Commission (CEC). 2009c. *Climate Change Portal*. Last update December 22, 2006. http://www.climatechange.ca.gov (accessed December 2009).

California Environmental Protection Agency (CalEPA). 2007. *FAQS Frequently Asked Questions About Global Climate Change*. http://www.climatechange.ca.gov/ publications/faqs.html

California Natural Resources Agency. 2009. *California Adaption Strategy Discussion Draft: A Report to the Governor of the State of California in Response to Executive Order S-13-2008.*

City of Chico. 2008. *Greenhouse Gas & Criteria Air Pollutant Emissions Inventory*.

Fehr & Peers Associates. 2010. *City of Chico 4D Model Development and Results.*

Gleick, Peter. 1997. American Water Works Association (AWWA). Climate change and water resources. *Journal of the American Water Works Association*, Vol. 89, No. 11, pp. 107–110.

Intergovernmental Panel of Climate Change (IPCC). 2007. *National Greenhouse Gas Inventories Programme*. http://www.ipcc-nggip.iges.or.jp (accessed June 2007).

Kiparsky, 2003. op. cit; DWR, 2005. op. cit.; Cayan, D., et al, 2006. Scenarios of Climate Change in California: An Overview (White Paper, CEC-500-2005-203-SF), Sacramento, CA. February.

Kiparsky, M. and P. H. Gleick. 2003. *Climate Change and California Water Resources: A Survey and Summary of the Literature.* Oakland, CA: Pacific Institute for Studies in Development.

Massachusetts Institute of Technology (MIT). 2008. *Water Supplies Could Be Strongly Affected by Climate Change: Changes in Rainfall Can Be Amplifed Up Or Down, In Changes to Aquifers."* http://web.mit.edu/newsoffice/2008/agu-groundwater-1218.html (accessed April 6, 2010).

Miller, Tyler G. 2000. *Living In the Environment.* 11th ed. Thomson Learning.

National Aeronautical and Space Administration (NASA). 2009. *NASA Facts Online*. http://www.gsfc.nasa.gov/gsfc/service/gallery/fact_sheets/earthsci/green.htm (accessed June 2009).

Pacific Gas and Electric (PG&E). 2009. http://www.pge.com/ (accessed July 26, 2009).

San Francisco Bay Conservation and Development Commission (BCDC). 2009. (April) Draft Staff Report. *Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline*. http://www.bcdc.ca.gov/proposed_bay_plan/bpa_1-08_cc_staff-rpt_11-05.pdf. (accessed December 2009).

United States Department of Energy (USDE). 2008. *California Energy Commission Updates Building Energy Standards.* May 2008. http://apps1.eere.energy.gov/state_energy_program/update/project_detail.cfm/pb_id=1285(accessed April 12, 2010).

United States Department of Energy (USDE). 2009. *California Preparing for 2008 Building Energy Efficiency Standards for Implementation.* June 2009. http://apps1.eere.energy.gov/state_energy_program/update/project_detail.cfm?pb_id=1409 (accessed April 12, 2010).

Western Region Climate Center (WRCC). 2009. http://www.wrcc.dri.edu.

Williams, Gail. 2010. Butte County Air Management District. Personal communications with PMC staff.