

## 3.4 Energy and Greenhouse Gases

This section analyzes the effect of the proposed Pacifica General Plan on energy resources and greenhouse gas emissions. The section identifies energy laws, plans, and policies; identifies energy sources; and describes existing and projected energy consumption and trends in the Planning Area. This section also analyzes quantitatively how implementation of the proposed General Plan may contribute to global climate change (GCC) through greenhouse gas (GHG) emissions related to land use changes and transportation. The analysis of sea level rise impacts is provided in Section 3.5: Hydrology, Flooding, and Water Quality.

### Environmental Setting

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#### PHYSICAL SETTING

##### Energy Use

###### **United States**

According to the Energy Information Administration (EIA) Annual Energy Review of 2011 (published in 2012), 28 percent of nationwide energy consumption occurred in the transportation sector, 21 percent in the industrial sector, 11 percent of in residential and commercial sectors, and 40 percent in electric power generation. In terms of supply sources, petroleum provided 37 percent of the nation's energy, natural gas 26 percent, coal 20 percent, renewable energy 9 percent, and nuclear power 8 percent. 71 percent of all the petroleum consumed in the U.S. was used in the transportation sector.<sup>1</sup>

###### **California**

California is the second largest consumer of energy in the country, second only to Texas. However, California's population is large and the State has one of the lowest *per capita* energy consumption rates in the country (higher only than Hawaii, New York and Rhode Island, as of 2012), in part due to mild weather that reduces energy demand for heating and cooling, and in part due to the government's energy-efficiency programs. In California, 38 percent of energy consumption—the largest share by any sector—is in the transportation sector.<sup>2</sup> More

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<sup>1</sup> EIA.2012. Source: [http://www.eia.gov/totalenergy/data/annual/pdf/sec2\\_3.pdf](http://www.eia.gov/totalenergy/data/annual/pdf/sec2_3.pdf)

<sup>2</sup> EIA, 2012. Source: <http://www.eia.gov/state/?sid=CA>

motor vehicles are registered in California than any other State, and worker commute times are among the longest in the country.<sup>3</sup> Other energy-intensive industries include chemical, forest products, glass, and petroleum.

Petroleum and natural gas supply most of the energy consumed in California. Petroleum products provide approximately 43 percent of the state's energy demand, and natural gas provides approximately 11 percent. Renewable sources, including hydropower, biomass, wind, and solar, provide 31 percent of the total energy. Nuclear provides 15 percent of statewide demand, and biofuels approximately 1 percent.<sup>4</sup>

### **Bay Area and San Mateo County**

Commercial and residential space heating (including onsite co-generation facilities at commercial buildings) comprise a large share of direct energy end use in the Bay Area. Other major energy users include industrial facilities (including oil refineries that consume energy in the production of gasoline and other fuels) and electricity-generating power plants, which burn fossil fuels (generally natural gas) to convert those fuels to electricity. Electricity generation is typically classified as "indirect" energy use because the end product, electricity, is consumed at a location distinct from the power plant where it is produced.

In the Bay Area, as in most other places in the United States, automobiles and commercial vehicles (composed of small, medium, and large trucks) are the largest energy consumers in the transportation sector. Automobiles and commercial vehicles are generally fueled by diesel or gasoline. Other transit modes in the Bay Area include ferries, buses, light rail, BART, and commuter rail. These transit modes also consume gasoline, diesel, and electricity.

Pacific Gas and Electric Company (PG&E) provides most of the electricity for San Mateo County. In 2006, the County totaled approximately 41 trillion British thermal units (Btu) in energy use from electricity and natural gas. Natural gas accounted for 55 percent of that energy usage.<sup>5</sup>

### **Pacifica Energy Use**

Pacific Gas & Electric (PG&E) provides gas and electric services to Pacifica homes and businesses. The utility company obtains energy from power plants, natural gas fields, and renewable energy sources in northern California and beyond and delivers electricity through high voltage transmission lines. Electrical power is delivered to homes via various distribution feeders located throughout the city. The availability of electricity and gas services is not expected to become an issue during the General Plan planning horizon since all homes

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<sup>3</sup> *Ibid.*

<sup>4</sup> *Ibid.*

<sup>5</sup> Sustainable San Mateo, 2013, <http://www.sustainablesanmateo.org/home/indicators/2008-indicators-report/energy-use/>, accessed July 2013.

are located within urban infill areas close to existing development. While supply is not anticipated to be an issue in Pacifica, reducing demand for these resources will help reduce carbon emissions. The majority of electricity and natural gas is used in buildings, and green building techniques can result in less energy demand in new and retrofitted structures.

## **Energy Types and Sources**

### **Natural Gas**

According to the CEC Energy Almanac, four regions supply California with natural gas. Three of them—the Southwestern U.S., the Rocky Mountains, and Canada—supply 87 percent of all the natural gas consumed in California.<sup>6</sup> The remainder is produced in California itself. Approximately 45% of all the natural gas consumed in California is used to generate electricity, and residential consumption represented one-fifth of California natural gas use.<sup>7</sup> PG&E is the primary electricity and natural gas provider for much of California, including San Mateo County. PG&E obtains its energy supplies from power plants and natural gas fields in northern California and from energy purchased outside its service area.

### **Electricity**

Power plants in California meet approximately 70 percent of the in-state electricity demand; power plants in the southwestern U.S. provide another 22 percent and the Pacific Northwest provides 8 percent.<sup>8</sup> The relative contribution of in-state and out-of-state power plants depends upon, among other factors, the precipitation that occurred in the previous year and the corresponding amount of hydroelectric power that is available. The electricity generated by the PG&E plants is used throughout PG&E's service area, which extends, with a few exceptions, north to south from Eureka to Bakersfield, and east to west from the Sierra Nevada to the Pacific Ocean. Smaller power plants and cogeneration facilities are located throughout the Bay Area. San Mateo County is home to three power plants, including two natural gas pipeline plants and one landfill gas plant.<sup>9</sup>

### **Petroleum**

Transportation is the largest sector of energy consumption in the state, accounting for about 38 percent of total energy use, and most—93 percent—of that demand is met with petroleum.<sup>10</sup> Nearly 26 million vehicles are registered in California, consuming about 380 million barrels of gasoline and almost 100 million barrels of diesel annually.<sup>11</sup>

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<sup>6</sup> CEC, 2010. [http://energyalmanac.ca.gov/overview/energy\\_sources.html](http://energyalmanac.ca.gov/overview/energy_sources.html)

<sup>7</sup> CEC, 2010. <http://energyalmanac.ca.gov/naturalgas/overview.html>

<sup>8</sup> CEC, 2008.

<sup>9</sup> CEC, Energy Almanac, 2012. <http://www.energyalmanac.ca.gov/electricity/index.html#table>

<sup>10</sup> EIA. 2012. Source: [http://www.eia.gov/totalenergy/data/annual/pdf/sec2\\_3.pdf](http://www.eia.gov/totalenergy/data/annual/pdf/sec2_3.pdf).

<sup>11</sup> *Ibid.*

In 2007, approximately one-half of the crude oil came from in-state oil production facilities, one-fifth came from Alaska, and just under one-third came from foreign sources. Most gasoline and diesel fuel sold in California for motor vehicles is refined in California to meet state-specific formulation standards required by the California Environmental Protection Agency's Air Resources Board. Major petroleum refineries in California are concentrated in three counties: Contra Costa, Kern, and Los Angeles counties. There are no petroleum refineries in the Pacifica Planning Area.

According to the transportation energy forecasts and analyses for the 2011 Integrated Energy Policy Report, California average daily gasoline demand for the first six months of 2011 is 2.0 percent lower compared to the same period in 2010, continuing a declining trend since 2004. Over the 12-month period from July 2008 through June 2009, gasoline demand is down 3.4 percent compared to the previous 12-month period. Between 2009 and 2030, CEC staff estimates in the low-demand case that total annual gasoline consumption in California will fall 4.2 percent from 2009 to 14.2 billion gallons in 2030, largely as a result of high fuel prices, efficiency gains, and competing fuel technologies. In the high-demand case, the recovering economy and lower relative prices lead to gasoline consumption growing 15.8 percent to 17.1 billion gallons in 2030. These forecasted volumes have not been adjusted to account for compliance with the revised federal Renewable Fuel Standard (RFS) II fair share obligations that further decrease demand for gasoline (E10) and greatly increase the demand outlook for E85. With adjustments under the RFS II, CEC staff estimate that the final forecast of gasoline consumption in the low-demand case to decline 15.6 percent from 2009 to 12.5 billion gallons by 2030. In the high-demand case, the gasoline demand forecast increases to about 16 billion gallons by 2030, an 8 percent increase from 2009..<sup>12</sup>

### ***Alternative Transportation Fuels***

The U.S. Department of Transportation currently recognizes the following as alternative fuels: methanol and denatured ethanol (alcohol mixtures that contain no less than 70 percent of the alcohol fuel), natural gas (compressed or liquefied), liquefied petroleum gas, hydrogen, coal-derived liquid fuels, fuels derived from biological materials (i.e., biomass), and electricity. The liquid fuel referred to as Methanol (M85) consists of methanol and gasoline and is derived from natural gas, coal, or woody biomass. The liquid fuel referred to as Ethanol (E85) consists of ethanol and gasoline and is derived from corn, grains or agricultural waste. Natural gas consists of a high percentage of methane (generally above 85 percent), and varying amounts of ethane, propane, butane, and inerts (typically nitrogen, carbon dioxide, and helium) and comes from underground reserves. Liquefied petroleum gas (LPG) consists mostly of propane and is a byproduct of petroleum refining or natural gas processing. Currently available alternative fuel vehicles include electric, flexible fuel (can be fueled with ethanol), natural gas, propane, biodiesel, hybrid electric, plug-in hybrid electric, and fuel cell

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<sup>12</sup> California Energy Commission. 2012. Integrated Energy Policy Report Update. Source: <http://www.energy.ca.gov/2012publications/CEC-100-2012-001/CEC-100-2012-001-CMF.pdf>

(fueled with hydrogen).<sup>13</sup> The use of electricity, depending on the method of production, could have secondary and potentially significant impacts where the electricity is produced. The cost of substituting electricity for diesel could make its use infeasible.

### Global Climate Change

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

GCC is now generally accepted; however, the precise extent and speed of change to be expected, and the exact contribution from human sources, remains under debate. Nonetheless, the Intergovernmental Panel on Climate Change (IPCC)<sup>14</sup>—made up of the world’s leading climate scientists—are 95 percent confident that humans are responsible for at least half of the observed increase in global average temperatures since the 1950s. There has been an unprecedented increase in carbon dioxide concentrations that, along with increases in other emissions, have driven up average temperatures by about 0.6 degrees Celsius since 1950. In particular, human influences have:

- *very likely* contributed to sea level rise and increased storm surge during the latter half of the 20th century;
- *likely* contributed to changes in wind patterns, affecting extra-tropical storm tracks and temperature patterns;
- *very likely* increased temperatures of extreme hot nights, cold nights, and cold days;
- *likely* increased the risk of heat waves, area affected by drought since the 1970s, and frequency of heavy precipitation events.<sup>15</sup>

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<sup>13</sup> U.S. Department of Energy. 2013. Alternative Fuels and Advanced Vehicles. Source: <http://www.afdc.energy.gov/fuels/>

<sup>14</sup> The Intergovernmental Panel on Climate Change (IPCC) is a scientific intergovernmental body set up by the World Meteorological Organization (WMO) and by the United Nations Environment Programme (UNEP). Its role is to assess on a comprehensive, objective, open and transparent basis the latest scientific, technical and socio-economic literature produced worldwide relevant to the understanding of the risk of human-induced climate change, its observed and projected impacts, and options for adaptation and mitigation.

<sup>15</sup> IPCC. 2013. Summary for Policymakers. [http://www.climatechange2013.org/images/uploads/WGIAR5-SPM\\_Approved27Sep2013.pdf](http://www.climatechange2013.org/images/uploads/WGIAR5-SPM_Approved27Sep2013.pdf)

The IPCC predicts that the increase in global mean temperature in 2100 relative to 1850 to 1900 is likely to exceed 2.7 degrees Fahrenheit. The same report projects a sea level rise of 10.3 to 21.7 inches by 2100, relative to 1986-2005, with a greater rise possible depending on the rate of polar ice sheet melting.

### **Other Climate Change Impacts and Adaptation**

According to the California Climate Action Team (CCAT), accelerating GCC has the potential to cause a number of adverse impacts in California, including but not limited to: a shrinking Sierra snowpack that would threaten the state's water supply; public health threats caused by higher temperatures and more smog; damage to agriculture and forests due to reduced water storage capacity, rising temperatures, increasing salt water intrusion, flooding, and pest infestations; critical habitat modification and destruction; eroding coastlines; increased wildfire risk; and increased electricity demand.<sup>16</sup> These impacts have and will continue to have considerable costs associated with them. The following paragraphs describe in more detail some of the most relevant impacts to the environment that could result from continued global warming.<sup>17</sup>

#### *Increased Temperatures and Extreme Heat Events*

Climate change is expected to lead to an increase in ambient (i.e., outdoor) average air temperature, with greater increases expected in summer than in winter months. Larger temperature increases are anticipated in inland communities as compared to the California coast. Climate models predict a 4°F temperature increase in the next 20 to 40 years, with an increase in the number of long dry spells.

The potential health impacts from sustained and significantly higher than average temperatures include heat stroke, heat exhaustion, and the exacerbation of existing medical conditions such as cardiovascular and respiratory diseases, diabetes, nervous system disorders, emphysema, and epilepsy. Over the past 15 years, heat waves have claimed more lives in the state than all other declared disaster events combined. According to the IPCC's Fourth Assessment Report (2007), heat-related morbidity and mortality is projected to increase in the future as the number of heat waves increases.<sup>18</sup>

Increased temperatures also pose a risk to human health when coupled with high concentrations of ground-level ozone and other air pollutants, which may lead to increased rates of asthma and other pulmonary diseases. The incidence of bad air days in California's urban areas has increased, mostly in the summer. On long, hot, stagnant days, ground level ozone can build up to levels that violate federal and state health-based standards. Recent studies indicate that hot days correlate with poor air quality days, and air pollution is

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<sup>16</sup> CCAT, 2006.

<sup>17</sup> California Natural Resources Agency, 2009.

<sup>18</sup> Intergovernmental Panel on Climate Change, IPCC Fourth Assessment Report: Climate Change 2007. [http://www.ipcc.ch/publications\\_and\\_data/ar4/wg2/en/ch8s8-4-1-3.html](http://www.ipcc.ch/publications_and_data/ar4/wg2/en/ch8s8-4-1-3.html)

contributing to more annual deaths and cases of respiratory illness and asthma.<sup>19</sup> For more discussion of air quality impacts, see Section 3.3: Air Quality. Other impacts related to increased temperatures and heat waves include:

- **Increased urban heat island effect:** urban heat islands are especially dangerous because they are both hotter during the day and do not cool down at night, increasing the risk of heat-related illness;
- **Reduced freezing events:** too few freezes could lead to increased incidence of disease as vectors and pathogens do not die off. In addition, certain agricultural crops depend on freezing as part of the life-cycle, so fewer such events would impact California's food production and indirectly the food supply in Pacifica;
- **Increased energy demand:** it is expected that energy, particularly electricity, demand will increase in order to meet increasing demands for air conditioning and refrigeration.

#### *Changes in Precipitation and Extreme Events*

Climate change is anticipated to cause 20-30 percent increase in precipitation in the spring and fall in California. More frequent and heavier precipitation events cause flooding and mudslides, which would incur considerable costs in damages to property, infrastructure and even human life. Such events also are associated with drinking water contamination outbreaks; contamination of shellfish and other food-borne illnesses; and overloading of wastewater and storm water systems.

With warmer average temperatures, more winter precipitation will fall in the form of rain instead of snow, shortening the winter snowfall season and accelerating the rate at which the snowpack melts in the spring. Not only does such snow melt increase the threat for spring flooding, it will decrease the Sierras' capacity as a natural water tower, resulting in decreased water availability for agricultural irrigation, hydro-electric generation and the general needs of a growing population. The decrease in snow-pack is particularly relevant in California, as the Sierra snow-pack provides approximately 80 percent of California's annual water supply. A decreased snowpack would result in increased drought conditions; water supply and quality impacts; and food production impacts.

Drought conditions also result in increased frequency, intensity, and duration of wildfires. In these conditions, fires burn hotter and spread faster. According to the California Department of Forestry and Fire Protection, between January 1, 2013 and August 31, 2013 there were 5,135 fires in California, burning a total of 122,682 acres; this is significantly larger than the 3,731 fires in the five year average in the same time interval (nearly 30 percent increase).<sup>20</sup> In addition to fatalities and property damage, smoke from wildfires impairs air quality and can cause acute and chronic health impacts.

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<sup>19</sup> Jacobson, 2008.

<sup>20</sup> CAL FIRE, [http://cdfdata.fire.ca.gov/incidents/incidents\\_stats?year=2013](http://cdfdata.fire.ca.gov/incidents/incidents_stats?year=2013), accessed September 2013.

### *Impacts on Plants and Vegetation*

Native plants and animals are also at risk as temperatures rise. Scientists are reporting more species moving to higher elevations or more northerly latitudes in response. Increased temperatures also provide a foothold for invasive species of weeds, insects and other threats to native species. The increased flow and salinity of water resources could also seriously affect the food web and mating conditions for fish that are of both of economic and recreational interest to residents. In addition, the natural cycle of plant's flowering and pollination, as well as the temperature conditions necessary for a thriving locally adapted agriculture could be affected, with perennial crops such as grapes taking years to recover. In California, the impacts of climate change on agriculture are estimated by the Farm Bureau to be \$30 billion, mostly due to changes in chill hours required per year for cash crops.

### *Diseases*

Warming temperatures, fewer freezing spells, and increased precipitation are likely to change the distribution and quantity of common disease vectors, such as mosquitos, ticks, and rodents.

### *Sea Level Rise*

Sea level rise as a consequence of global warming has received considerable attention in the scientific community and the media. Higher global temperatures will lead to the melting of polar ice caps, which in turn will cause global sea levels to rise. The analysis of sea level rise impacts is provided in Section 3.5: Hydrology, Flooding, and Water Quality.

## **Greenhouse Gases**

Gases that trap heat in the Earth's atmosphere are called greenhouse gases (GHGs). These gases play a critical role in determining the Earth's surface temperature. Some of the solar radiation that enters Earth's atmosphere is absorbed by the Earth's surface, and some is reflected back toward space. Of the radiation reflected back toward space, GHGs will absorb a part. As a result, radiation that otherwise would have escaped back into space is retained, resulting in a warming of the atmosphere. Some level of GHGs is essential for maintaining temperatures supportive of life on Earth. Without naturally-occurring GHGs, the Earth's surface would be about 61°F cooler.<sup>21</sup> This phenomenon is known as the greenhouse effect, and is not, of itself, a bad thing. However, many scientists believe that emissions from human activities—such as electricity generation, vehicle emissions, and even farming and forestry practices—have elevated GHGs in the atmosphere beyond naturally-occurring concentrations, contributing to global climate change. The six primary GHGs are:

- **Carbon dioxide (CO<sub>2</sub>)**, emitted when solid waste, fossil fuels (oil, natural gas, and coal), and wood and wood products are burned;

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<sup>21</sup> CCAT, 2006.

- **Methane (CH<sub>4</sub>)**, produced through the anaerobic decomposition of waste in landfills, animal digestion, decomposition of animal wastes, production and distribution of natural gas and petroleum, coal production, and incomplete fossil fuel combustion;
- **Nitrous oxide (N<sub>2</sub>O)**, typically generated as a result of soil cultivation practices, particularly the use of commercial and organic fertilizers, fossil fuel combustion, nitric acid production, and biomass burning;
- **Hydrofluorocarbons (HFCs)**, primarily used as refrigerants;
- **Perfluorocarbons (PFCs)**, originally introduced as alternatives to ozone depleting substances (such as HFCs) and typically emitted as by-products of industrial and manufacturing processes; and
- **Sulfur hexafluoride (SF<sub>6</sub>)**, primarily used in electrical transmission and distribution systems.

Though there are other gases that can contribute to global warming, these six are identified explicitly in California legislation and litigation as being of primary concern. GHGs have varying potentials to trap heat in the atmosphere. The potential is typically measured using two parameters: global warming potential (GWP), and atmospheric lifetimes. Measurements of GWP range from 1 for CO<sub>2</sub> to 23,900 for SF<sub>6</sub>. GHG emissions with a higher GWP have a greater global warming effect on a molecule-by-molecule basis. For example, one ton of CH<sub>4</sub> has the same contribution to the greenhouse effect as approximately 21 tons of CO<sub>2</sub>.<sup>22</sup> GWP is alternatively described as “carbon dioxide equivalents”, or CO<sub>2</sub>e. The second parameter, “atmospheric lifetime” describes how long it takes to restore the system to equilibrium following an increase in the concentration of a GHG in the atmosphere. Atmospheric lifetimes of GHGs can range from tens to thousands of years.

### **California GHG Emissions**

GHG emissions contributing to GCC are attributable in large part to human activities associated with the industrial/manufacturing, utility, transportation, residential, and agricultural sectors.<sup>23</sup> The State of California alone produced almost 500 million metric tons of CO<sub>2</sub>, making California the second largest emitter in the United States after Texas, and about 12<sup>th</sup> in the world. Major sources in California include fossil fuel consumption from transportation (38 percent), industry (20 percent), electricity production (25 percent), residential (6 percent), and agricultural (6 percent) sectors.<sup>24</sup> Much like nations around the world, the California government is looking at options and opportunities for drastically reducing GHG emissions with the hope of thereby delaying, mitigating, or preventing some of the anticipated impacts of GCC on California communities.

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<sup>22</sup> California Climate Action Registry, 2009.

<sup>23</sup> CEC, 2007, 19.

<sup>24</sup> CEC, 2007.

The Global Warming Solutions Act of 2006 (AB 32) required that the California Air Resources Board (CARB) determine the statewide greenhouse gas emissions level in 1990. Based on its 1990-2004 inventory work, ARB staff set 427 million metric tons of carbon dioxide equivalent emissions (MMTCO<sub>2</sub>e) as the total statewide greenhouse gas 1990 emissions level, and the 2020 emissions limit. The CARB approved the 2020 limit on December 6, 2007.<sup>25</sup> This would be about 9.7 MTCO<sub>2</sub>e per capita, based on the Department of Finance's state population projection of 44 million.

### **Bay Area GHG Emissions**

Local and regional agencies in the Bay Area have also taken steps to measure/quantify, evaluate, and mitigate their contributions to GHG emissions and global warming. For example, the cities of San Francisco, San Jose, and Palo Alto, the East Bay Municipal Utility District, UC Berkeley and Stanford University, and numerous other water and power utilities, public agencies, foundations, and individual businesses are voluntary members of the Climate Action Registry, a private non-profit organization formed by the State of California in 2001 that serves as a voluntary greenhouse gas (GHG) registry to protect and promote early actions to reduce GHG emissions by organizations. Additionally, a number of cities and counties in the Bay Area have recently developed or are in the process of completing their own climate/greenhouse gas reduction action plans and inventories.

In 2008, the Bay Area Air Quality Management District (BAAQMD) completed a region-wide baseline inventory of GHG emissions for the year 2007. According to that inventory, updated most recently in February of 2010, 95.8 million metric tons of CO<sub>2</sub>e were emitted in the Bay Area that year, which is about 13.6 metric tons CO<sub>2</sub>e per person.<sup>26</sup>

The Bay Area's transportation sector and industrial/commercial sector were the primary source of greenhouse gas emissions in 2007, each contributing about 36.4 percent of the region's total emissions of CO<sub>2</sub>e. These two sectors were followed by electricity/co-generation (15.8 percent), residential fuel usage (7.1 percent), off-road equipment (3 percent), and agriculture/farming (1.2 percent).<sup>27</sup> Absent any policy changes, the Bay Area's greenhouse gas emissions are expected to grow at a rate of approximately 1.4 percent a year in the future due to population and economic growth.<sup>28</sup> Variations in economic activity and the fraction of electric power generation in the region will cause year-to-year fluctuations in the emissions trends. According to the historical emissions data, total CO<sub>2</sub>e emissions have

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<sup>25</sup> CARB, 2008.

<sup>26</sup> BAAQMD, 2010, [http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/Emission%20Inventory/regionalinventory2007\\_2\\_10.ashx](http://www.baaqmd.gov/~media/Files/Planning%20and%20Research/Emission%20Inventory/regionalinventory2007_2_10.ashx), accessed July, 2013.

<sup>27</sup> *Ibid.*

<sup>28</sup> *Ibid.*

increased by about 11 percent (just over half a percent annually, on average) from 1990 to 2008.<sup>29</sup>

### **San Mateo County GHG Emissions**

San Mateo County estimated that in 2006 countywide CO<sub>2</sub> emissions were 5.91 million metric tons, averaging 8.1 metric tons per capita. In addition, according to the BAAQMD, San Mateo County emitted 8.5 million metric tons of CO<sub>2</sub> equivalent in 2007, accounting for 8.9 percent of emissions within the nine Bay Area counties.<sup>30</sup>

## **REGULATORY SETTING**

The regulation of greenhouse gases is changing constantly as nations, and the U.S. federal, state, and local governments work to determine strategies that will work to systematically reduce GHG emissions and the impacts of climate change. GHG regulation is also intertwined with regulation of energy production and distribution. The regulations listed below reflect a tailored list of relevant actions the federal and state governments have taken to address energy, greenhouse gases, and global climate change.

### **Federal Regulations**

#### **U.S. Environmental Protection Agency (EPA)**

On April 2, 2007, in *Massachusetts v. EPA*, 549 U.S. 497 (2007), the Supreme Court found that greenhouse gases are air pollutants covered by the Clean Air Act. The Court held that the Administrator must determine whether or not emissions of greenhouse gases from new motor vehicles cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare, or whether the science is too uncertain to make a reasoned decision.

On December 7, 2009, Administrator Lisa Jackson signed a final action, under Section 202(a) of the Clean Air Act, finding that six key well-mixed greenhouse gases constitute a threat to public health and welfare, and that the combined emissions from motor vehicles cause and contribute to the climate change problem.

This action was a prerequisite for implementing greenhouse gas emissions standards. Current efforts include issuing greenhouse gas emission standards for new motor vehicles, developing and implementing renewable fuel standard program regulations, proposing carbon pollution standards for new power plants, and setting greenhouse gas emissions thresholds to define when permits are required for new and existing industrial facilities under the Clean Air Act, and establishing a greenhouse gas reporting program.

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<sup>29</sup> *Ibid.*

<sup>30</sup> *Ibid.*

### **Section 202 GHG Regulation of Cars and Light Duty Trucks**

This rule was proposed jointly by EPA and the National Highway Traffic Safety Administration (NHTSA) to create a National Program of GHG emission standards and Corporate Average Fuel Economy (CAFE) standards. The standards apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards are designed to achieve a national vehicle fleet whose emissions and fuel economy performance improves year over year. The goal is to reduce CO<sub>2</sub> emissions by 960 million metric tons and save 1.8 billion barrels of oil over the lifetime of the vehicles sold in model years 2012 through 2016.<sup>31</sup> The final rule was signed on April 1, 2010 and became effective 60 days after its publication in the Federal Register.

### **Renewable Fuel Standard Program**

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

### **Greenhouse Gas Findings (2009)**

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

- **Endangerment Finding:** The Administrator finds that the current and projected concentrations of the six key well-mixed greenhouse gases—carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>)—in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The Administrator finds that the combined emissions of these well-mixed greenhouse gases from new motor vehicles and new motor

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<sup>31</sup> US EPA, 2010.

vehicle engines contribute to the greenhouse gas pollution which threatens public health and welfare.<sup>32</sup>

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

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

### **Energy Independence and Security Act of 2007**

The Energy Independence and Security Act of 2007 was designed to improve vehicle fuel economy and help reduce U.S. dependence on oil. The Act establishes several key standards:

- Increases the supply of alternative fuel sources by setting a mandatory RFS requiring fuel producers to use at least 36 billion gallons of biofuel in 2022, which represents a nearly five-fold increase over current levels; and
- Reduces U.S. demand for oil by setting a National Fuel Economy Standard of 35 miles per gallon by 2020—an increase in fuel economy of 40 percent.

### **Energy Policy and Conservation Act, and CAFE Standards**

The Energy Policy and Conservation Act (EPCA) of 1975 declared it to be U.S. policy to establish a reserve of up to 1 billion barrels of petroleum, and established nationwide fuel economy standards in order to conserve oil. Pursuant to this Act, the National Highway Traffic and Safety Administration, part of the U.S. Department of Transportation, is responsible for revising existing fuel economy standards and establishing new vehicle fuel economy standards.

The Corporate Average Fuel Economy (CAFE) program was established to determine vehicle manufacturer compliance with the government's fuel economy standards. Compliance with CAFE standards is determined based on each manufacturer's average fuel economy for the portion of their vehicles produced for sale in the United States. The EPA calculates a CAFE value for each manufacturer based on city and highway fuel economy test results and vehicle sales. The CAFE values are a weighted harmonic average of the EPA city and highway fuel

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<sup>32</sup> US EPA, 2009.

economy test results. Based on information generated under the CAFE program, the U.S. Department of Transportation is authorized to assess penalties for noncompliance.

CAFE rules require the average fuel economy of all vehicles of a given class that a manufacturer sells in each model year to be equal or greater than the standard. CAFE standards apply to passenger cars and light trucks (gross vehicle weight of 8,500 pounds or less). Heavy-duty vehicles (i.e. gross vehicle weight over 8,500 pounds) are not currently subject to fuel economy standards. The EPCA was reauthorized in 2000 (49 CFR 533). The Energy Independence and Security Act of 2007 revised CAFE standards for the first time in 30 years, followed quickly by Section 202 GHG Regulation of Cars and Light Duty Trucks, which calls for further revision of the CAFE standards. Both of those regulations are described above.

### ***Energy Policy Acts of 1992, 2005, etc. (EPAAct)***

The Energy Policy Act of 1992 (EPAAct) was passed to reduce the country's dependence on foreign petroleum and improve air quality. EPAAct includes several parts intended to build an inventory of alternative fuel vehicles (AFVs) in large, centrally fueled fleets in metropolitan areas. EPAAct requires certain federal, state, and local government and private fleets to purchase a percentage of light duty AFVs capable of running on alternative fuels each year. In addition, financial incentives are also included in EPAAct. Federal tax deductions will be allowed for businesses and individuals to cover the incremental cost of AFVs. The Act also requires states to consider a variety of incentive programs to help promote AFVs. The Energy Policy Act of 2005 includes updated provisions for renewed and expanded tax credits for electricity generated by qualified energy sources, such as landfill gas; provides bond financing, tax incentives, grants, and loan guarantees for clean renewable energy and rural community electrification; and establishes a federal purchase requirement for renewable energy.

### ***Tax Credit for Wind-Generated Electricity***

Beginning in the late 1990s, Congress introduced a tax subsidy on the production of renewable wind-generated electricity. The availability, expiration, and potential extension of the Production Tax Credit cause the boom and bust production of energy that typifies wind development in the United States. The Production Tax Credit's limitations have determined the role of the wind energy industry in the United States and contributed to the dominance of electric utility subsidies.

### ***Energy Star Program***

Energy Star is a joint program of the United States Environmental Protection Agency and the Department of Energy. The program establishes criteria for energy efficiency for household products and labels energy efficient products with the Energy Star seal. Homes can be qualified as "Energy Star homes" if they meet efficiency standards. In California, Energy Star homes must use at least 15 percent less energy than standards set by Title 24, pass the California Energy Star Homes Quality Insulation Installation Thermal Bypass Checklist Procedures, have Energy Star windows, and have minimal duct leakage.

### **Global Change Research Act of 1990**

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

### **State Regulations**

#### **California Attorney General Actions**

The California Attorney General's office has taken several actions to ensure that California meets its greenhouse gas reduction targets.<sup>33</sup> Examples of the Office of Attorney General's efforts since 2006 include taking companies in the power industry and the auto industry to task for their contributions to global warming and writing letters or submitting oral testimony in over 50 CEQA environmental review processes involving city general plans, county general plans, regional transportation plans, and specific projects throughout California.

#### **CEQA Guidelines Appendix F: Energy Conservation**

Appendix F of the CEQA Guidelines describes the types of information and analyses related to energy conservation that are to be included in Environmental Impact Reports (EIRs). Energy conservation is described in terms of decreasing per capita energy consumption; decreasing reliance on fossil fuels such as coal, natural gas, and oil; and increasing reliance on renewable energy sources. To assure that energy implications are considered in project decisions, EIRs must include a discussion of the potentially significant energy impacts of proposed projects (to the extent relevant and applicable to the proposed Project), with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy.

#### **Executive Order S-13-08 (Gov. Schwarzenegger, November 2008)**

This Order directs state agencies to plan for sea level rise and climate change impacts. There are four key actions in the Order, including: (1) initiate California's first statewide climate

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<sup>33</sup> The Attorney General's web portal for global warming may be found at <http://ag.ca.gov/globalwarming>. The portal contains information on global warming generally, impacts in California, and documentation of the comments, speeches, op-eds, testimony, and litigation actions he has taken to support AB 32 goals.

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.

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

The Sustainable Communities and Climate Protection Act of 2008, otherwise known as Senate Bill (SB) 375, establishes a process for CARB to implement the state's global warming legislation (AB 32) for the transportation sector by requiring CARB to adopt regional GHG targets for emissions associated with the automobile and light truck sector. SB 375 requires MPOs such as MTC to develop a Sustainable Communities Strategy (SCS)—a new element of the regional transportation plan (RTP)—to strive to reach these GHG reduction targets.

On June 30, 2010, CARB released proposed 2020 targets for the State's four largest MPO regions including the San Francisco Bay area. The targets propose a five to ten percent reduction in per capita GHG emissions from 2005 levels for each region. Although CARB found that there is insufficient technical information to establish firm targets for 2035, the agency has proposed placeholder targets for each of the four largest regions. Based on the work that has already been done on the Bay Area SCS by the Metropolitan Transportation Commission (MTC), the 2035 target for this region is a 3 to 12 percent reduction in GHG levels in addition to the emission reductions expected from the Greenhouse Gas Vehicle Standards and Low Carbon Fuel Standard measures the State adopts to implement AB 1493, the Pavley bill discussed above.<sup>34</sup>

On July 28, 2010, MTC approved a set of "Bay Area Principles for Establishing Regional Greenhouse Gas Reduction Targets" (Resolution 3970). The principles propose, among other things, per-capita GHG reductions of 7 percent by 2020 and 15 percent by 2035. The approved principles are intended to inform CARB in its GHG target-setting deliberations between now and September 30, 2010, when it adopts statewide GHG targets.<sup>35</sup>

SB 375 provides assurance that transportation projects programmed for funding prior to 2012 and contained in the 2009 federal transportation improvement program, funded by Proposition 1B, or a voter approved sales tax measure approved prior to 2009 will not be subject to new environmental scrutiny under the bill's provisions.

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<sup>34</sup> CARB. 2010.

<sup>35</sup> MTC website: [http://www.mtc.ca.gov/news/current\\_topics/7-10/ghg.htm](http://www.mtc.ca.gov/news/current_topics/7-10/ghg.htm)

SB 375 ties the regional housing needs assessment (RHNA) process to the RTP process, requires local governments to rezone their general plans consistent with the updated housing element within three years of adoption, and provides that RHNA allocations must be consistent with the development pattern in the SCS. It moves the RHNA process to an eight-year cycle from the current five-year one. Also, SB 375 provides a California Environmental Quality Act (CEQA) exemption or a streamlined process for housing and mixed-use projects that meet specified criteria, such as proximity to transit.

### **California Building Code**

Title 24, Part 6, of the California Code of Regulations is the California Building Code, governs all aspects of building construction. Included in Part 6 of the Code are standards mandating energy efficiency measures in new construction. Since its establishment in 1977, the building efficiency standards (along with standards for energy efficiency in appliances) have contributed to a reduction in electricity and natural gas costs in California. The standards are updated every three years to allow new energy efficiency technologies to be considered. The latest update to Title 24 standards became effective in January 2014. The standards regulate energy consumed in buildings for heating, cooling, ventilation, water heating, and lighting. Title 24 is implemented through the local plan check and permit process.

CalGreen, the nation's first Green Building Standards Code, became effective in August 2009 for voluntary compliance and local adoption, and is effective for mandatory compliance in Pacifica. This Code establishes minimum standards for new construction that are intended to help the State achieve the AB 32 goal of reducing GHG emissions to 1990 levels by 2020. In addition to energy efficiency standards, CalGreen includes mandatory measures for water conservation, storm water drainage and retention, material conservation, and construction waste reduction. The requirements for nonresidential construction also include parking, landscaping, and other standards. Local jurisdictions have the option of adopting procedures by ordinance to improve the level of construction beyond the CalGreen minimum standard.<sup>36</sup>

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

This Order calls for a statewide goal to be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by 2020 ("2020 Target"), and that a Low Carbon Fuel Standard ("LCFS") for transportation fuels be established for California. Further, it directs CARB to determine if an LCFS can be adopted as a discrete early action measure pursuant to AB 32, and if so, consider the adoption of a LCFS by June 30, 2007, pursuant to Health and Safety Code Section 38560.5. The LCFS applies to all refiners, blenders, producers or importers ("Providers") of transportation fuels in California, will be measured on a full fuels cycle basis, and may be met through market-based methods by which Providers exceeding the performance required by a LCFS shall receive credits that may be applied to future obligations or traded to Providers not meeting the LCFS.

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<sup>36</sup> California Building Standards Commission, 2010.

In June 2007, CARB approved the LCFS as a Discrete Early Action item under AB 32. The LCFS rulemaking package was filed with the Office of Administrative Law (OAL) on November 25, 2009. The OAL approved the LCFS rulemaking and filed with the Secretary of State on January 12, 2010.

***Senate Bill 97 (Chapter 185, Statutes of 2007)***

Senate Bill (SB) 97 directs the Office of Planning and Research (OPR) to prepare, develop, and transmit to the California Resources Agency guidelines for feasible mitigation of GHG emissions or the effects of GHG emissions, by July 1, 2009. The Natural Resources Agency was required to certify and adopt amendments to the Guidelines implementing the California Environmental Quality Act (“CEQA Guidelines”) on or before January 1, 2010. In keeping with SB 97, OPR proposed amendments to the CEQA Guidelines for the mitigation of greenhouse gas emissions and transmitted them to the Resources Agency for rulemaking on April 13, 2009. The Resources Agency adopted the amendments on December 30, 2009. On February 16, 2010, the OAL approved the amendments, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The amendments became effective on March 18, 2010.

***Implementation of the Alternative and Renewable Fuel and Vehicle Technology Program***

AB 118 (Chapter 750, Statutes of 2007) directs the California Energy Commission to develop the Alternative and Renewable Fuel and Vehicle Technology Program. Crucial to implementing the Program is the development and adoption of an Investment Plan. The Investment Plan will establish priorities and opportunities for the Program, and describe how funding will complement existing public and private investments, including existing state programs. The Investment Plan will be updated annually.

***California Global Warming Solutions Act of 2006 (AB 32)***

This Act (Health and Safety Code Section 38500 et. seq.) requires the reduction of statewide total GHG emissions to 1990 levels by the year 2020. This change, which is estimated to be a 25 to 35 percent reduction from current emission levels, will be accomplished through an enforceable statewide cap on GHG emissions that will be phased-in starting in 2012. The Act also directs CARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources and address GHG emissions from vehicles. CARB has stated that the regulatory requirements for stationary sources will be first applied to electricity power generation and utilities, petrochemical refining, cement manufacturing, and industrial/commercial combustion. The second group of target industries will include oil and gas production/distribution, transportation, landfills and other GHG-intensive industrial processes.

***Executive Order S-20-06 (Gov. Schwarzenegger, October 2006)***

This Order establishes the authority and roles of various departments and leadership roles in implementing AB 32.

**Executive Order S-06-06 (Gov. Schwarzenegger, April 2006)**

This Order was to establish biomass production and use targets for California. Biomass is a large but primarily unused resource including residues from forestry, urban, and agricultural wastes and can be used to create electricity, transportation fuels, and biogas. Use of biomass could not only increase energy production but also reduce the waste stream. The Order states that biomass should comprise 20 percent of the State's Renewables Portfolio Standard for 2010 and 2020, and California shall produce a minimum of 20 percent of its biofuels within the state by 2010, 40 percent by 2020, and 75 percent by 2050. Additional funding and research will go to further developing these technologies and integrating them into use.

**Senate Bill 1368 (Chapter 598, Statutes of 2006)**

Senate Bill (SB) 1368 requires the California Public Utilities Commission (CPUC) to establish a GHG emissions performance standard for "baseload" generation from investor-owned utilities by February 1, 2007. The California Energy Commission (CEC) was required to establish a similar standard for local publicly-owned utilities by June 30, 2007. The legislation further required that all electricity provided to California, including imported electricity, must be generated from plants that meet or exceed the standards set by the PUC and the CEC. In January 2007, the PUC adopted an interim performance standard for new long-term commitments (1,100 pounds of CO<sub>2</sub> per megawatt-hour), and in May 2007, the CEC approved regulations that match the PUC standard.

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

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

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

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

percent below 1990 levels. This corresponds to an approximate 27 percent reduction by 2030 to 1990 levels, or 55 CO<sub>2</sub>e in total emissions which correlates to 41 percent reduction over today's levels by 2030.

***Executive Order S-20-04 (Gov. Schwarzenegger, July 2004)***

This Order requires that the State commit to aggressive action to reduce state building electricity use, and more specifically, State agencies, departments, and other entities, take measures to reduce energy use by 20 percent by 2015. In addition, the Order requires that the CEC increase energy efficiency standards by 20 percent by 2015, compared to the 2003 Titles 20 and 24 standards.

***State of California Energy Action Plans***

The CEC is responsible for preparing the State Energy Action Plan, which identifies emerging trends related to energy supply, demand, conservation, public health and safety, and the maintenance of a healthy economy. At the beginning of 2008, the Energy Commission and CPUC determined that an Update to the 2005 California Energy Action Plan would be more appropriate than a new plan given the passage of Assembly Bill 32 and the critical role it will play in energy policy in coming years. The 2008 Update shifts focus to climate change. The nine major action areas, as described in previous Energy Action Plans include: energy efficiency; demand response; renewable energy; electricity adequacy, reliability, and infrastructure; electricity market structure; natural gas supply, demand, and infrastructure; transportation fuels supply, demand, and infrastructure; research, development, and demonstration; and climate change. The report emphasizes the importance of improving fuel standards in order to reduce energy use and greenhouse gas emissions, and notes the importance of also incorporating smart growth and land use policies.

***Integrated Energy Policy Reports***

Senate Bill 1389 (Chapter 568, Statutes of 2002) requires that the CEC prepare a biennial integrated energy policy report that contains an integrated assessment of major energy trends and issues facing the state's electricity, natural gas, and transportation fuel sectors and provides policy recommendations to conserve resources; protect the environment; ensure reliable, secure, and diverse energy supplies; enhance the state's economy; and protect public health and safety (Public Resources Code Section 25301[a]). The 2009 Integrated Energy Policy Report is the most current report to fulfill the requirement of SB 1389. According to the 2009 report: "as California pursues its goal to address climate change by reducing greenhouse gas emissions, the driving force for the state's energy policies continues to be maintaining a reliable, efficient, and affordable energy system that minimizes the environmental impacts of energy production and use. Although the economic downturn has reduced energy demand in the short-term, demand is expected to grow over time as the economy recovers. It is essential that the state's energy sectors be flexible enough to respond to future fluctuations in the economy and that the state continue to develop and adopt the "green" technologies that are critical for long-term reliability and economic growth."

**California Renewables Portfolio Standard Program (2002)**

Senate Bill (SB) 1078 (Chapter 516, Statutes of 2002) establishes a renewable portfolio standard (RPS) for electricity supply. The RPS requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide 20 percent of their supply from renewable sources by 2017. This target date was moved forward by SB 1078 to require compliance by 2010. In addition, electricity providers subject to the RPS must increase their renewable share by at least one percent each year. The outcomes of this legislation will impact regional transportation powered by electricity.

**Assembly Bill 1493 (Chapter 200, Statutes of 2002)**

Assembly Bill (AB) 1493 (Pavley) amends Health and Safety Code sections 42823 and 43018.5 requiring the California Air Resources Board (CARB) to develop and adopt regulations that achieve maximum feasible and cost-effective reduction of GHG emissions from passenger vehicles, light-duty trucks, and other vehicles used for noncommercial personal transportation in California. The regulations prescribed by AB 1493 may not take effect prior to January 1, 2006, and they apply only to 2009 and later model years.

In September 2004, pursuant to AB 1493, the CARB approved regulations to reduce greenhouse gas emissions from new motor vehicles. Under the regulation, one manufacturer fleet average emission standard is established for passenger cars and the lightest trucks, and a separate manufacturer fleet average emission standard is established for heavier trucks. The regulation took effect on January 1, 2006 and set near-term emission standards, phased in from 2009 through 2012, and mid-term emission standards, phased in from 2013 through 2016 (referred to as the Pavley Phase 1 rules). The CARB intends to extend the existing requirements to obtain further reductions in the 2017 to 2020 timeframe (referred to as Pavley Phase 2 rules). EPA at first refused to grant a waiver that would allow California to implement these standards, and California has challenged this action in federal court. On January 26, 2009, President Obama directed that EPA assess whether the denial of the waiver was appropriate. On June 30, 2009, EPA granted the waiver request, which begins with motor vehicles in the 2009 model year. The CARB calculates that in calendar year 2016, the Pavley Phase 1 rules will reduce California's GHG emissions by 16.4 million metric tons of carbon dioxide equivalents, and by 2020, Pavley Phase 2 would reduce emissions by 31.7 million metric tons of carbon dioxide equivalents. The AB 1493 vehicle requirements would cumulatively produce 45 percent more GHG reductions by 2020 compared to the federal CAFE standard in the Energy Independence and Security Act of 2007,<sup>37</sup> but roughly equivalent reductions to the latest national agreement resulting in even more stringent CAFE standards (Section 202 GHG Regulation of Cars and Light Duty Trucks, described under federal regulations, above).

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<sup>37</sup> CARB, 2008.

*Senate Bill 1771 (Chapter 1018, Statutes of 2000)*

Senate Bill (SB) 1771 requires the CEC to prepare an inventory of the State's greenhouse gas emissions, to study data on global climate change, and to provide government agencies and businesses with information on the costs and methods for reducing greenhouse gases. It also established the California Climate Action Registry to serve as a certifying agency for companies and local governments to quantify and register their greenhouse gas emissions for possible future trading systems.

***Reducing Dependence on Petroleum Assembly Bill 2076 (Chapter 936, Statutes of 2000)***

In response to Assembly Bill (AB) 2076, the CEC and the California Air Resources Board prepared and adopted a joint agency report, Reducing California's Petroleum Dependence. Included in this report are recommendations to increase the use of alternative fuels to 20 percent of on-road transportation fuel use by 2020 and 30 percent by 2030, significantly increase the efficiency of motor vehicles, and reduce per capita vehicles miles traveled.<sup>38</sup> Further, in response to the CEC's 2003 and 2005 Integrated Energy Policy Reports, the Governor directed the CEC to take the lead in developing a long-term plan to increase alternative fuel use. A performance-based goal is to reduce petroleum demand to 15 percent below 2003 demand.

***Warren-Alquist State Energy Resources Conservation and Development Act (1974)***

The 1974 Warren-Alquist Act (Public Resources Code Section 25000 et seq.) establishes the California Energy Resources Conservation and Development Commission, now known as the California Energy Commission (CEC). The Act establishes a State policy to reduce wasteful, uneconomical, and unnecessary uses of energy by employing a range of measures.

***California Public Utilities Commission***

The California Public Utilities Commission (CPUC) regulates Investor-Owned Utilities (IOUs) including those that offer electric, natural gas, steam, and petroleum service to consumers. The CPUC regulates both electric and natural gas rates and services provided by these utilities including in-state transportation over the utilities' transmission and distribution pipeline systems, storage, procurement, metering and billing. Natural gas regulations are found in General Orders 58, 94, 96, and 112, while electrical distribution regulations are found in General Orders 95, 128, 131, 165, and 166.

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<sup>38</sup> CEC, CARB, 2003.

## Regional and Local Regulations

### **Joint Policy Committee**

In the Bay Area, the Joint Policy Committee (JPC) coordinates the regional planning efforts of the Association of Bay Area Governments (ABAG), the Bay Area Air Quality Management District (BAAQMD), the Bay Conservation and Development Commission (BCDC) and MTC.<sup>39</sup> The JPC is leading a new initiative entitled *Bay Area Climate and Energy Resilience Project*, which is a collaborative effort of more than 100 public, private, and non-profit stakeholders in the Bay Area. The purpose is to support and enhance the climate adaptation efforts of cities, counties, and other organizations, and it will culminate in a forward-looking Proposed Action Plan.

### **San Mateo County**

San Mateo County adopted the long-term reduction target set by the U.S. Cool Counties Climate Stabilization Declaration in October 2007. This declaration calls for the County to work closely with local, state, and federal governments and other leaders to develop a regional plan to reduce county geographical GHG emissions to 80 percent below current levels by 2050.

### **Draft Pacifica Climate Action Plan**

The draft 2012 City of Pacifica Climate Action Plan (CAP) seeks to reduce the City operation's overall carbon footprint through the year 2020. The draft plan presents a preliminary baseline greenhouse gas inventory, energy consumption, emissions forecast, reduction targets, and climate action strategies to meet the reduction targets.

## Impact Analysis

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### **SIGNIFICANCE CRITERIA**

Implementation of the proposed Project would have a potentially significant adverse impact if it would:

- Criterion 1:** Result in a substantial increase in per service population (residents + jobs) energy consumption;
- Criterion 2:** Require a substantial increase in energy supply capacity or infrastructure, the construction of which could cause adverse environmental effects;
- Criterion 3:** Conflict with any existing local, regional, state or federal standards for energy production or efficiency;

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<sup>39</sup> Joint Policy Committee, 2007.

- Criterion 4:** Result in the generation of greenhouse gas emissions (GHGs), either directly or indirectly, in an amount greater than 6.6 metric tons of CO<sub>2</sub> equivalent (MTCO<sub>2</sub>e) greenhouse gases per service population in the year 2020, or 4.0<sup>40</sup> MTCO<sub>2</sub>e per service population in the year 2035, per BAAQMD CEQA guidelines; or
- Criterion 5:** Fail to reduce per capita transportation CO<sub>2</sub> emission by seven percent by 2020 and by 15 percent by 2035 as compared to 2005 baseline, per CARB targets, as mandated by SB 375.

## **METHODOLOGY AND ASSUMPTIONS**

### **Energy**

This energy analysis focuses on the direct energy required to operate vehicles and to run residential and non-residential buildings throughout Pacifica. While energy is used in other ways in the city—including indirect uses associated with the construction and maintenance of buildings, vehicles, and other infrastructure—these other indirect sources are considered too speculative at the General Plan level to justify program EIR analysis. For purposes of this analysis, direct sources are considered reasonably comprehensive in scope and representative of the influence of the proposed Plans.

The energy analysis begins with existing conditions of non-transportation energy use in the city. Meter readings from the Pacific Gas and Electric Company were used to determine the consumption of electricity and natural gas for residential, commercial, and industrial uses. Government buildings are included in these numbers. The analysis then projects non-transportation energy use into the future using per capita (for residential development) and per job (for non-residential development) estimates from existing conditions, and creates an average per service population estimate from those results.

For transportation energy use, the analysis uses DKS Associates estimates of the daily VMT generated in 2010 to interpolate the estimated daily VMT for 2005, and estimates of daily VMT generated for the 2035 proposed General Plan buildout. It applies fuel efficiency assumptions to these VMT figures to obtain total fuel consumption, and multiplies by the amount of energy (in MMBtu) contained within a gallon of fuel to calculate total transportation energy consumption. Fuel efficiency is assumed to be higher in the future than today, as a result of implementation of existing State policy. To the extent that the analysis incorporates transportation energy, it reflects a cumulative impact analysis because the projected future VMT assumes the implementation of the proposed General Plan as well as wider regional growth, development, and regulatory efforts.

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<sup>40</sup> The 4.0 MTCO<sub>2</sub>e figure for the year 2035 is the interpolation of the 2050 emissions goal of 80% reduction of the BAAQMD's 2020 emissions target of 6.6 MTCO<sub>2</sub>e per service population.

Finally, the analysis examines historic data to describe the variability of per capita energy use over time, comparing national, State, and local energy use trends, and drawing conclusions based on trends and the energy use profile of Pacifica in particular.

### **Greenhouse Gases**

For the greenhouse gas emissions analysis, an inventory of citywide GHG emission in 2005 and forecasts of citywide GHG emission in 2020 and 2035 were conducted. Both the inventory and the forecast were calculated using the Statewide Energy Efficiency Collaborative (SEEC) model. The SEEC model is a tool from the International Council for Environmental Initiatives (ICLEI), and is frequently used to produce community emissions inventories and forecasts. The SEEC model incorporates the effects of the RPS for electricity supply and AB 1493 for fuel economy in emissions forecasts. Other state actions that reduce GHG emissions not accounted for in the SEEC model include the Low Carbon Fuel Standard (part of AB 32) and the CALGreen building efficiency code (Title 24, for new construction).

The 2005 citywide inventory tallies emissions from residential, commercial, industrial, transportation and solid waste sectors based on the activity levels for each sector<sup>41</sup>, such as electricity and natural gas used, vehicle miles traveled and solid waste generated.

The 2035 community forecast uses the SEEC model for the same sectors from the 2005 inventory as an initial value. The predicted General Plan growth in each sector was added to the model to project future emission. The growth in residential demand for energy and natural gas was assumed to follow population growth, as well as solid waste generation. Commercial growth was assumed to follow job projections. Industrial growth is assumed to track industrial job growth. Transportation emissions are forecast using the modeled vehicle miles travelled (VMT) projections from DKS Associates in 2035, which incorporate the effects of the Circulation goals and policies in the General Plan. Using the combination of these inputs and growth rates, the SEEC model produces a communitywide emissions forecast for the years 2020 and 2035.

These forecast emission for 2020 and 2035 were then compared to the targets set by CARB and the BAAQMD to determine if GHG emissions impacts are significant.

## **IMPACT SUMMARY**

### **Direct Energy Use**

Implementation of the proposed General Plan, combined with anticipated regional growth and improvements in vehicle technology, would result in a slight increase in per service

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<sup>41</sup> Pacific Gas & Electric (2012) meter readings from 2003 and 2007 for Pacifica provided activity levels (usage) for the residential, commercial, and industrial sectors. Recology of the Coast (2008) provided solid waste data. DKS Associates (2012) provided vehicle miles traveled.

population energy use (relative to existing conditions) related to residential and commercial development. Simultaneously, it would result in a substantial decrease in per service population energy use (relative to existing conditions) from transportation, largely as a result of implementation of existing state policy to increase fuel efficiency and implementation of proposed General Plan policies to reduce daily VMT. The overall conclusion is that the impact of the proposed General Plan on per service population energy use is less than significant.

### **Greenhouse Gas Emissions**

Greenhouse gas emissions under the proposed General Plan buildout are expected to decrease over time for the service population. The total GHG emissions under proposed General Plan buildout with the CAP reduction measures is estimated to be 133,607 MTCO<sub>2e</sub> in 2020 and 131,173 MTCO<sub>2e</sub> in 2035. This forecasted rate of emissions is approximately 2.9 MTCO<sub>2e</sub> per service population in 2020 and 2.7 MTCO<sub>2e</sub> per service population in 2035.

These forecasted figures meet both the BAAQMD and the SB 375 emissions targets for 2020 and 2035. Pacifica's GHG emissions per service population (3.4 MTCO<sub>2e</sub> in 2005) were already less than the threshold of significance for future Plan level impacts established by the BAAQMD (6.6 MTCO<sub>2e</sub> in 2020 and 2.9 MTCO<sub>2e</sub> in 2035); with the CAP reduction measures taken into account, the City's projected GHG emissions fall substantially below the BAAQMD thresholds (2.9 MTCO<sub>2e</sub> in 2020 and 2.7 MTCO<sub>2e</sub> in 2035).

The total GHG emissions are also forecasted to be lower than the targets set by CARB in SB 375 of a reduction in per capita transportation CO<sub>2</sub> emissions by seven percent by 2020 and by 15 percent by 2035, as compared to 2005 baseline. With the CAP reduction measures taken into consideration, the total transportation emissions are forecast to reduce by eleven percent by 2020 and by 23 percent by 2035, compared to the 2005 baseline. These figures easily meet the targets set in SB 375.

There are a number of factors—including availability and choice of transportation modes, the regional distribution of jobs, and traffic patterns—that contribute to GHG emissions within Pacifica. As described in Section 3.2: Transportation, Pacifica has a high usage and dependency on automobiles. The relatively low density makes transit service and usage challenging. Less than 0.5 percent of trips within Pacifica are transit trips. In addition, residents often commute to job centers in San Francisco and the peninsula. There is also a considerable volume of weekend visitors to Pacifica and pass-through traffic along Highway 1. Traffic and associated vehicle idling in intersections throughout the also increase GHG emissions. One factor that reduces citywide emissions is the lack of large inter-regional highways with heavy traffic, such as the US-101 or I-80, that contribute substantially to GHG emissions in other Bay Area communities. Ultimately, despite the factors that serve to increase GHG emissions, the forecasted emission meet both the BAAQMD and SB 375 emission targets for 2020 and 2035; therefore, the impact of the proposed Plan on greenhouse gas emissions is less than significant.

### **Energy Infrastructure Capacity**

In 2010, Pacifica electricity use represented only 3.4 percent of countywide electricity use as reported on the CEC Energy Consumption Data Management System.<sup>42</sup> Likewise, Pacifica natural gas use represented 3.5 percent of countywide natural gas use that year.<sup>43</sup> While overall energy use will increase 4 percent in Pacifica between 2005 and 2035, that increase represents a very small fraction of the overall energy demand (and growth in demand) in the County. This impact is thus not analyzed further in this EIR.

### **Policy Consistency for New Development**

As new development must meet California's Title 24 energy efficiency requirements, development under the proposed General Plan will not result in wasteful, inefficient, or unnecessary consumption of energy. This impact is not analyzed further in this EIR.

## **IMPACTS AND MITIGATION MEASURES**

### **Impact**

#### **3.4.1 Implementation of the proposed Plan would not result in a substantial increase in per service population (residents + jobs) energy consumption. (*Less than Significant*)**

The projection of non-transportation energy use at General Plan buildout uses existing per capita and per job energy use rates multiplied by future population or jobs. Using this approach, the result is a potential 10 percent increase in energy consumption in Pacifica by 2035 as a direct result of population and employment growth. While non-transportation energy use overall (**Table 3.4-1**) is expected to increase, the per service population rate of energy use is expected to remain nearly the same – from the 2005 rate of 25.22 to 25.25 MMBtu per service population per year in 2035. In other words, the amount of energy used per service population will remain roughly the same, but because the size of the service population increases, the overall energy consumed is expected to increase as well.

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<sup>42</sup> San Mateo County Electricity Usage By City 2003 - 2010, <https://data.smcgov.org/Environmentally-Conscious-Community/San-Mateo-County-Electricity-Usage-By-City-2003-20/ikex-2wzw>

<sup>43</sup> San Mateo County Natural Gas Usage By City 2003 - 2010

<https://data.smcgov.org/Environmentally-Conscious-Community/San-Mateo-County-Natural-Gas-Usage-By-City-2003-20/c7yv-r84c>

**Table 3.4-1: Non-Transportation Energy Use in Pacifica by Type and Sector, 2005-2035 (MMBtu)**

Sector	Electricity		Natural Gas		Existing (2005) Conditions Total Energy Use	General Plan (2035) Buildout Total Energy Use	Change in Energy Use
	Energy Use	Rate Per	Energy Use	Rate Per			
Residential (capita)	257,759	6.9	670,000	18.0	927,759	994,742	7%
Commercial (job)	68,531	11.7	80,204	13.7	148,735	186,937	26%
Industrial (job)	3,838	11.0	11,817	33.8	15,655	20,128	29%
Subtotal (service population)	330,129	7.6	762,021	17.6	1,092,149	1,201,807	10%

Source: Pacifica Draft Climate Action Plan, 2012; American Community Survey, 2005 – 5 Year Estimates; Association of Bay Area Governments 2009 Projections; Dyett & Bhatia, 2013.

Transportation energy use, shown in **Table 3.4-2**, shows that per service population energy use will actually decline over time. This is because enforcement of the State’s Pavley fuel efficiency regulations is expected to cause greater fuel efficiency across the fleet, which means using less energy per mile traveled. Simultaneously, the policies in the proposed General Plan are expected to contribute to a substantial decrease in the amount of daily VMT in Pacifica. The result is total direct transportation energy use is expected to decrease by about 4 percent and the transportation energy use per service population is expected to decrease by about 13 percent.

**Table 3.4-2: Transportation Energy Use in Pacifica, 2005-2035 (MMBtu)**

	Daily VMT Generated	Daily Gallons of Fuel Used	Daily MMBtu	Annual MMBtu	MMBtu per Service Population
Existing 2005 Conditions	338,498	17,270	2,159	749,099	17.4
2035 General Plan	451,300	16,531	2,066	717,038	15.1

Notes: Fuel efficiency used for existing conditions is 19.6 mpg, consistent with the Pacifica Draft Climate Action Plan (2011) and regional estimates, while the fuel efficiency used for 2030 is 27.3, based on implementation of Pavley rules.

1 gallon of gasoline = 125,000 btu (or 0.125 MMBtu), while 1 gallon of diesel = 138,700 btu (or 0.138 MMBtu)

Sources: DKS Associates, 2013; USDOE, Transportation Energy Data Book, 27th ed.; Table B.4; MTC, 2009; Dyett & Bhatia, 2013.

With non-transportation energy use and transportation energy use taken together, the result is an anticipated decrease in per service population energy use in the future (**Table 3.4-3**).

**Table 3.4-3: Total Energy Use in Pacifica, Existing Conditions to Proposed General Plan Buildout**

	<i>Existing Conditions</i>		<i>Proposed Plan</i>	
	<i>MMbtu</i>	<i>Per Service Population</i>	<i>MMbtu</i>	<i>Per Service Population</i>
Non-Transportation Subtotal	1,092,149	25.2	1,181,922	25.3
Transportation Subtotal	1,258,547	29.1	717,038	15.1
<b>Total Energy Use</b>	<b>2,350,696</b>	<b>54.3</b>	<b>1,898,960</b>	<b>40.3</b>

Source: Dyett & Bhatia, 2013.

National data suggest that per person energy use has fallen since 2007, after holding fairly steady for about two decades starting in 1988. The energy use per person most recently reached a high of 350 million Btu (MMBtu) in 2000, but it had gradually decreased to 312 MMBtu per person by 2011.<sup>44</sup> Total energy consumption in Pacifica was about 63 MMBtu per person in 2005, substantially less than both the national energy consumption rate (339 MMBtu per person) and the state energy consumption rate (209.6 MMBtu per person, the fourth lowest in the nation). The Pacifica per capita consumption rate is lower in part because the city lacks some of the major energy-intensive uses that are present elsewhere in the region, such as large commercial users or large commuter highways.

Furthermore, Pacifica’s per person energy consumption is projected to decrease in the future to about 48 MMBtu per person in 2035. The major contributors to energy use in the city are transportation energy and residential building energy, both of which tend to increase in line with population and job growth. The proposed General Plan calls for a modest amount of population and employment growth consistent with the character of the community and compatible with existing neighborhoods; it does not plan for the development of any new, large-scale energy users. Therefore, the Plan’s modest amounts of population and job growth would likely result in moderate increases in overall energy used absent the implementation of policy changes.

However, the proposed General Plan includes numerous new policies that aim to reduce building and transportation energy use. In conjunction with State and national policies to increase vehicle fuel efficiency and implement green building standards, the General Plan would most likely lead to reduced per capita and per job energy consumption over time. Despite the modest increase in jobs and population, the increase in energy efficiency from the implementation of the policies would, in the end, reduce the consumption of energy in the city. Ultimately, the impact on the service population’s energy use will be less than significant.

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<sup>44</sup> EIA, 2012. <http://www.eia.gov/totalenergy/data/annual/showtext.cfm?t=ptb0105>

**Proposed General Plan Policies that Reduce the Impact**

*Circulation Element*

- CI-G-1     **Comprehensive Circulation System.** Create a comprehensive, multi-modal transportation system with streets and highways; transit facilities; a continuous network of sidewalks and bicycle routes.
- CI-G-2     **Serve All Users.** Plan, design, build, and maintain transportation improvements to support safe and convenient access for all users with priority for “complete streets” projects that facilitate walking, bicycling and transit use wherever possible.
- CI-G-4     **Level of Service (LOS) for All Modes of Travel.** Assess the performance of the transportation system by measuring how well pedestrians, bicycles, and transit vehicles as well as automobiles are able to move within and through the community.
- CI-G-5     **Vehicle Miles Traveled.** Strive to reduce overall vehicle miles travelled by developing higher-density, mixed use areas, designing pedestrian-oriented streets, and improving transit options and efficiency.
- CI-G-7     **Congestion on Highway 1.** In consultation with Caltrans, seek solutions to ease the traffic congestion that occurs on Highway 1 near the Reina Del Mar, Fassler Avenue, and Linda Mar Boulevard intersections. Strive for the greatest benefit with the least environmental impact possible.
- CI-I-1     **Connective Street Network.** Require new streets created as part of new development to continue existing street patterns, and include stub access points to adjacent undeveloped areas.
- CI-I-2     **Complete Streets Design Approach.** Update the City’s engineering design standards to implement Complete Streets concepts, and include Complete Streets design principles in the planning of all circulation improvement projects. These principles include, but are not limited to:
- Maximizing connections with the existing circulation network;
  - Minimizing ingress and egress points and consolidating entries;
  - Providing public transit facilities and improvements;
  - Providing bicycle and pedestrian facilities (bike lanes and sidewalks);
  - Minimizing pedestrian crossing distances by providing curb extensions; medians with safety refuges, and other treatments;
  - Improving safety by providing lighting and traffic calming devices for residential streets;
  - Including landscaping (trees, medians, key intersections and gateways);

- Providing appropriate signage, including street signs, entry signs, and directional signs;
- Providing street furniture; and
- Maintaining on--street parking.

*Any proposed development or transportation project that does not adequately incorporate complete streets concepts should be supported by findings of why all travel modes have not been accommodated. The Complete Streets approach should be applied to new roadway construction as well as to repaving or retrofit projects.*

CI-I-3 **Complete Streets in the Project Development Process.** Incorporate complete streets concepts at each stage of the development process for projects affecting the right-of-way, including the following:

- As part of design review, both at Phase I and Phase II, require documentation of how the “routine accommodation” of bicyclists and pedestrians has been satisfied in planning and design.;
- During project review and approval, ensure that the objectives and purpose are consistent with MTC directives on Complete Streets and Routine Accommodation;
- For projects subject to MTC’s Resolution 3765, as amended, work with MTC to secure approval of the Complete Streets checklist and submittal to MTC of all required documents.

*Integrating Complete Streets considerations should require only minor additions to normal design, acquisitions, and approval guidelines.*

CI-I-4 **Roadway Retrofits.** Identify opportunities to retrofit existing roadways to create complete streets, giving priority to arterial and collector streets where travel lanes may be narrowed or where four lanes may be converted to three, including a center left turn lane, with bicycle facilities added in both cases.

*Linda Mar Boulevard, Terra Nova Boulevard, Fassler Avenue, Palmetto Avenue, Esplanade Avenue, Monterey Road, Hickey Boulevard, Rosita Road, Crespi Drive, Oddstad Boulevard, Everglades Drive, Alicante Drive, Talbot Avenue, Inverness Drive, and Gateway Drive may all present opportunities for roadway retrofits. Roadway retrofits will also help to complete the bicycle network, as described in Section 5.4, and provide safety for cyclists. Ten- and eleven-foot travel lanes are often acceptable for auto and transit use, respectively, without adversely affecting capacity.*

CI-I-6 **Block Size and Maximum Street Spacing.** For new development at the Quarry site or Park Mall site, require streets to be designed to maximize connectivity for automobiles, cyclists, and pedestrians, with blocks between 200 and 600 feet in length. Provide mid-block pedestrian connections where blocks exceed 500 feet in length.

*The intent of these standards is to prevent development of introverted neighborhoods, provide flexibility in circulation, and promote access for bicyclists and pedestrians.*

- CI-I-8 **Bicycle and Pedestrian Advisory Committee.** Create and solicit input from a bicycle and pedestrian advisory committees (BPAC) on planning and funding for transportation improvement projects.
- CI-I-15 **Multi-modal Level of Service (LOS) Performance Measures.** Develop performance measures for LOS for pedestrians, cyclists, and transit users, based on the criteria in this chapter and on “best practices.”
- Measures may be both quantitative (for example, sidewalk width) and qualitative (perceived safety and attractiveness.) Measures should use data that is readily available or can be readily collected, while providing an accurate assessment.*
- CI-I-16 **LOS for Pedestrians, Cyclists and Transit Users.** Strive to maintain LOS C or better for pedestrians, cyclists, and transit users on all roadways, and impose mitigation measures as needed to achieve multi-modal service objectives.
- CI-G-10 **Bicycle and Pedestrian Routes.** Establish trails, bike routes and pedestrian amenities connecting neighborhoods to major shopping and public facility destinations, and fill in gaps in the existing network.
- CI-G-11 **Walkable Neighborhoods.** Improve pedestrian amenities to create more walkable neighborhoods, especially in mixed-use activity centers and around schools.
- CI-G-13 **Mobility for All Users.** Create a safe and attractive walking environment accessible for all users, particularly persons with disabilities, seniors, and younger residents and visitors.
- CI-G-14 **Connections Across Highway 1.** Enhance under- and over-crossings of Highway 1 for pedestrians and bikes to improve accessibility and connect neighborhoods to each other and to the coast.
- CI-G-15 **Coastal Trail and North-South Bikeway.** Complete the Coastal Trail and the north-south bikeway from the north to south end of the City parallel to Highway 1, providing clear, safe and efficient means to traverse coastal Pacifica.
- CI-I-27 **Pedestrian-Oriented Street Improvements.** Reduce curb-to-curb road widths and employ roadway design features, such as wider sidewalks, islands, bulb-outs, improved striping and signage, street trees, pedestrian amenities, pedestrian countdown signals, and pedestrian refuges where feasible and appropriate. Priority locations for pedestrian-oriented design improvements include:
- Pedestrian Priority Zones, shown on Figure 5-1 of the proposed General Plan, which include mixed use and higher-intensity areas;
  - Streets that are part of Pacifica’s proposed trail system improvements;

- Streets adjacent to schools; and
  - Locations where pedestrian-automobile collisions have occurred.
- CI-I-28 **Palmetto Avenue Streetscape Plan.** Complete and implement the Palmetto Avenue Streetscape Plan to widen sidewalks, provide bike lanes, landscaping, and make other improvements that will upgrade the appearance of the avenue and make it more attractive to pedestrians.
- CI-I-29 **Additional Pedestrian Facilities on Large Sites.** Enhance the pedestrian network with an interconnected system of walkways, continuous sidewalks on both sides of the street, and pedestrian crossings as part of higher-intensity redevelopment of large sites.
- CI-I-30 **Safe Routes to Schools.** Partner with Pacifica School District to develop and implement a Safe Routes to Schools program.
- CI-I-32 **Direct North-South Bikeway.** Complete the City’s direct north-south bicycle route to optimize safety and comfort. Improvements should include the following, from north to south:
- Class II bike lanes along Westline Drive north of Palmetto Avenue;
  - A continuous Class II bikeway on Palmetto Avenue between Westline Drive and the San Francisco RV Park;
  - A Class II bikeway on Clarendon Road, Lakeside Road, Francisco Boulevard, and Bradford Way, improving the bikeway between West Sharp Park and Mori Point;
  - A reconstructed Class I path between Mori Point and Reina del Mar Avenue that is wider and more sheltered from the highway than the current trail;
  - A Class II bikeway on SR 1 between Reina del Mar Avenue and San Pedro Creek, providing a direct travel route along SR 1 through southern Pacifica with well-marked and buffered lanes; and
  - A Class III bikeway along SR 1 between San Pedro Creek and the Devil’s Slide bypass.
- CI-I-33 **Parallel North-South Bikeway West of SR 1.** Create and upgrade bicycle facilities that provide an alternative for north-south bicycle travel west of Highway 1. Improvements should include the following, from north to south:
- A Class I trail in a public access easement along the west side of the RV park as part of any development or change in use, ensuring public access along the coast (a previous path was lost to erosion);
  - A Class III route along Beach Boulevard between Paloma Avenue and Clarendon Road;

- A Class III bikeway along Dondee Drive in the Rockaway Beach district, connecting existing Class I trails along Calera Creek to the north and Rockaway Headlands to the south;
  - A Class I trail parallel to and west of SR 1 from San Pedro Creek to the Devil’s Slide bypass.
- CI-I-34 **Parallel North-South Bikeway East of SR 1.** Create and upgrade bicycle facilities for north-south bicycle travel on the east side of SR 1. Improvements should include the following, from north to south:
- A new Class II facility along Oceana Boulevard from Manor Drive to Clarendon Road;
  - A new Class II route on Fassler Avenue, Roberts Road, and Crespi Drive, providing a connection between Rockaway Beach and Linda Mar on the east side of SR 1;
  - An upgraded and extended path on the east side of SR 1 between Crespi Drive and Linda Mar Boulevard meeting the Class I facility on the San Pedro Terrace right-of-way.
- CI-I-35 **Neighborhood Bikeways.** Develop a system of bikeways connecting all neighborhoods to the City's north-south pathway, including Class II routes along Monterey Road and Hickey Boulevard, Rosita Road, Oddstad and Terra Nova Boulevards, and Fassler Avenue and Class III routes as shown on Figure 5-3 in the proposed General Plan.
- CI-I-36 **Class II Facility Design.** Wherever Class II facilities are designated, make bike lanes at least 5 feet wide along local streets and at least 6 feet wide on arterials or highways. Separate Class II facilities from vehicle traffic with a solid stripe and mark them with bike lane symbols.
- A one-foot buffer strip between the bike lane and vehicle traffic should be provided wherever feasible to increase safety. Raised or two-way cycle tracks or other forms of bikeway should also be considered where appropriate.*
- CI-I-37 **Class III Facility Design.** Demarcate Class III bicycle facilities by painting “sharrows” on streets, where appropriate.
- CI-I-41 **Improved Bikeway Visibility.** Use strategies to improve bikeway visibility, including but not limited to:
- Using visual cues such as brightly-colored paint on bike lanes or a one-foot painted buffer strip;
  - Upgrading a Class III facility to Class II and providing additional signage; and
  - Removing on-street parking, if feasible.

- CI-I-42 **Bicycle Lockers at Public Parking Lots.** Replace existing bicycle lockers at the public parking lot on Crespi Drive, and add lockers at the park-and-ride lot on Linda Mar Boulevard.
- CI-I-43 **Bicycle Parking at Recreation and Shopping Areas.** Provide bicycle parking at the following locations:
- Park and beach access at the northern end of Esplanade Drive (Lands End Apartments);
  - Manor Plaza shopping area; and
  - Pedro Point Headlands/Devil's Slide.
- CI-I-44 **Bicycle Parking Requirements for New Development.** Continue to require bicycle parking facilities in new non-residential development.
- CI-I-45 **Bicycle Parking at Schools and Workplaces.** Work with the school districts and employers to provide adequate bicycle parking at all schools and workplaces with 30 or more employees.
- CI-I-46 **Bicycle Education.** Distribute appropriate informational material to all schools in Pacifica in conjunction with bicycle education campaigns.
- CI-I-47 **Funding for Bicycle Facilities.** Designate a portion of the City's annual street construction and improvement budget to fund bikeway design and construction, and continue to pursue potential funding from MTC and San Mateo County, as well as appropriate Federal and State programs.
- CI-I-48 **Eligibility Criteria for Improvements.** Review eligibility criteria for funding for improvements from the State, to obtain additional funding for bicycle facilities.
- CI-G-16 **Improved Public Transit.** Advocate for SamTrans and other public transit providers to improve transit service and facilities, to enable trips to be made without use of a car. In particular, advocate for the expansion of public transit services and facilities to improve public access and recreation opportunities along the coast.
- CI-G-17 **Transportation Demand Management (TDM).** Support TDM strategies to reduce congestion and single-occupant vehicle travel.
- CI-I-49 **Service Optimization.** Continue coordination efforts with transit agencies (i.e., SamTrans) to maintain transit service that is safe and efficient, provides convenient connections to high-use activity areas and key destinations outside the City, and responds to the needs of all passengers, including seniors, youth, and persons with disabilities.
- CI-I-50 **Improved Transit Stops.** Work with transit agencies to improve transit stops and access to facilities.

- CI-I-51 **Park-and-Ride Locations and Attributes.** Work with Samtrans to identify changes that would improve the convenience and functionality of Park-and-Ride facilities, and result in increased ridership.
- CI-I-52 **Transit-Oriented Development.** Work with Samtrans to facilitate transit-oriented development on all or part of the Linda Mar Boulevard Park-and-Ride lot.
- CI-I-53 **Promotion of Transit Use.** Lead an initiative to promote transit use and reduce reliance on the private automobile in order to reduce congestion, reduce greenhouse gas emissions, and improve quality of life..
- CI-I-54 **Transportation Demand Management Programs.** Establish a Transportation Demand Management (TDM) program for City employees that may include transit passes or subsidies, preferential carpool parking, car share programs, bicycle lockers, and other incentives to employees choosing transportation modes other than driving..
- CI-I-55 **Local Transportation Services.** Support expanded funding for Local Transportation Services tailored to the schedules and destinations of students, seniors, and recreational visitors.
- CI-I-62 **Environmental Benefits.** Amend the Zoning Ordinance to establish “green” parking design standards that have multiple benefits, including photovoltaic panels to generate energy for parking lot lighting, and pervious paving to improve groundwater recharge.

*See also policies on storm water management and sustainable planning and design in Chapter 7. See Chapter 3: Community Design for additional policies on designing parking to create a strong urban fabric.*

**Conservation Element**

- CO-G-15 **Renewable Energy.** Support the use and development of renewable energy through City purchasing, and facilitation of local renewable energy generation.
- CO-G-16 **Energy Conservation.** Support efforts to reduce energy use by increasing energy efficiency in buildings and promoting awareness of energy use.
- CO-G-17 **Waste Reduction.** Seek to reduce overall solid waste by limiting packaging, controlling construction and demolition waste, and promoting composting and recycling.
- CO-I-60 **Climate Action Plan for Greenhouse Gas Reductions.** Maintain and update the Climate Action Plan that focuses on feasible actions the City can take to reduce greenhouse gas emissions from government, businesses, and residents in Pacifica.

*The CAP should:*

Chapter Three: Settings, Impacts, and Mitigation Measures  
3.4: Energy and Greenhouse Gases

- *Establish a baseline inventory of all known or reasonably discoverable sources of GHGs that currently exist in Pacifica and that existed in 1990;*
- *Projected GHG emissions expected in 2030 under this General Plan and foreseeable municipal operations;*
- *Set a target for the reduction of GHG emissions, in line with targets established by the California Air Resources Board;*
- *Present a list of feasible—and to the greatest extent possible, quantifiable—GHG reduction measures to meet the reduction target, in the areas of energy use (in all sectors), transportation and land use, solid waste, water, and education/outreach; and*
- *Establish an implementation plan, including strategies and funding for monitoring and making improvements.*

CO-I-61 **Green Building.** Monitor the effectiveness of California Green Building Code in bringing about energy efficiency in architectural design and building construction.

CO-I-62 **Solar Orientation.** When possible, require buildings to be oriented such that the use of passive and active solar strategies is maximized, in order to promote energy efficiency.

*To achieve ideal solar orientation conditions, the long axis of the building should be oriented east-west, within 15 degrees.*

CO-I-63 **Encourage Solar Power Generation.** Promote use of passive and active solar devices such as solar collectors, solar cells, and solar heating systems in buildings and parking areas by incentive programs and streamlining review.

CO-I-64 **Clean City Fleet.** Establish City budget for clean fuels and electric or hybrid vehicles to replace and improve the existing fleet of gasoline and diesel powered vehicles.

CO-I-65 **City Purchasing of Renewable Energy.** Pursue opportunities for the City to lower the cost of purchasing and producing renewable energy, such as through Silicon Valley Joint Venture's Aggregate Renewable Energy Project.

CO-I-66 **Waste Collection.** Periodically evaluate the City's waste collection contract to ensure that Pacifica residents and businesses receive high-quality and cost effective service.

CO-I-67 **Waste Reduction and Diversion.** Seek to continually reduce Pacifica's output of solid waste and increase the proportion of waste diverted from landfills, setting targets and monitoring progress.

CO-I-68 **Energy Efficiency in Public Buildings.** Prepare and implement a plan to increase energy efficiency in existing public buildings.

Measures may include:

- Conduct energy audits for all municipal facilities;
- Retrofit municipal facilities for energy efficiency where feasible and when remodeling or replacing components, including increased insulation, installing green or reflective roofs, installing automated lighting controls, and retrofitting heating and cooling systems.
- Require that any newly constructed, purchased, or leased municipal space meet minimum standards, such as exceeding Title 24 energy efficiency by 20 percent;
- Educate employees on energy conservation.

CO-I-69 **Wastewater and Water System Efficiency.** Maximize the efficiency of City-operated wastewater treatment, water treatment, pumping, and distribution equipment.

CO-I-70 **Outdoor Lighting.** Establish outdoor lighting performance standards to minimize energy use while ensuring appropriate light levels. These can be met by:

- Greater use of photocells or astronomical time switches;
- Directional and shielded LED lights;
- Security lights with motion detectors; and
- Prohibitions against continuous all-night outdoor lighting unless required for security reasons.

### **Mitigation Measures**

None required.

### **Impact**

**3.4-2 Implementation of the proposed Plan would not result in the generation of greenhouse gas emissions (GHGs), either directly or indirectly, in an amount greater than 6.6 metric tons of CO<sub>2</sub> equivalent (MTCO<sub>2</sub>e) greenhouse gases per service population in the year 2020, or 4.0<sup>45</sup> MTCO<sub>2</sub>e per service population in the year 2035, per BAAQMD CEQA guidelines. (*Less than Significant*)**

**Table 3.4-4** shows emissions over time by sector for the 2005 inventory and the 2020 and 2035 forecasts calculated using the SEEC model. The total inventoried 2005 emissions under the proposed General Plan buildout are 144,335 MTCO<sub>2</sub>e. 2020 forecast emissions are 133,607 MTCO<sub>2</sub>e, and 2035 forecast emissions are 131,173 MTCO<sub>2</sub>e.

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<sup>45</sup> The 4.0 MTCO<sub>2</sub>e figure for the year 2035 is the interpolation of the 2050 emissions goal of 80% reduction of the BAAQMD's 2020 emissions target of 6.6 MTCO<sub>2</sub>e per service population.

**Table 3.4-4: GHG Emissions By Sector, 2005, 2020 and 2035 (MTCO<sub>2</sub>e)**

<i>Year</i>	<i>Residential</i>	<i>Commercial</i>	<i>Industrial</i>	<i>Transportation</i>	<i>Waste</i>	<b><i>Total</i></b>
2005	56,646	8,963	912	63,545	14,269	144,335
2020	51,072	8,332	899	59,035	14,269	133,607
2035	53,374	10,113	949	52,469	14,269	131,173

*Sources: DKS Associates, 2013; Dyett & Bhatia, 2013.*

**Table 3.4-5** shows emissions targets and SEEC model forecast emissions through General Plan buildout in 2035. The 2020 target of 6.6 MTCO<sub>2</sub>e and the 2035 target of 4.0 MTCO<sub>2</sub>e were set by BAAQMD. The analysis for this impact uses the SEEC model to forecast GHG emissions. The forecast emissions are likely an overestimate of future emissions levels, as the SEEC model does not incorporate emissions reductions from the Low Carbon Fuel Standard and CALGreen building efficiency improvements. Other sources of GHG emissions reductions not included in the modeling include those presented in the draft CAP, which include climate action strategies around energy use, transportation and land use, solid waste, and water use.

Pacifica’s 2005 emissions per service population of 3.4 MTCO<sub>2</sub>e meet the BAAQMD’s 2020 emissions target of 6.6 MTCO<sub>2</sub>e per service population, even without the inclusion of additional reduction measures or those presented in the draft CAP. This could be because the city lacks the large, inter-regional highways with heavy traffic, such as US-101 or I-80, that contribute substantially to GHG emissions in other Bay Area communities. The City’s 2020 projected emissions per service population are substantially lower than the BAAQMD 2020 target, at 2.9 MTCO<sub>2</sub>e. In 2035, the CAP reduction measures reduce Pacifica’s projected emissions per service population to 2.7 MTCO<sub>2</sub>e, easily meeting the BAAQMD’s 2035 target of 2.9 MTCO<sub>2</sub>e per service population for 2035. As these projections meet the emissions targets, the impact is therefore less than significant.

**Table 3.4-5: Community-wide GHG Emissions Targets and General Plan Forecasts (MTCO<sub>2</sub>e)**

Year	BAAQMD GHG Targets (MTCO <sub>2</sub> e per service population)	Service Population	Actual Emissions (2005) and Forecast Emissions (2020 and 2035) (total MTCO <sub>2</sub> e)	Actual Emissions (2005) and Forecast Emissions (2020 and 2035) (MTCO <sub>2</sub> e per service population)	Emissions Target Met?
2005		42,960	144,335	3.4	
2020	6.6	45,446	133,607	2.9	Yes
2035	2.9	47,590	131,173	2.7	Yes

Sources: DKS Associates, 2013; Dyett & Bhatia, 2013.

**Proposed General Plan Policies that Reduce the Impact**

*Land Use Element*

- LU-G-2 **Concentrated Development.** Focus new development in or directly adjacent to already-developed areas, where it can be served by existing public services and where it will not have significant impacts on coastal or other resources.
  
- LU-G-4 **Higher-Density Housing.** Locate higher-density housing in accessible places close to community shopping areas.
  
- LU-G-6 **Compact Mixed Use Development.** Facilitate compact mixed-use development on sites with good access to transit. Mixed-use development may include housing or office space with retail, restaurants, or personal service businesses.
  
- LU-I-1 **Zoning Consistency.** Update the Zoning Ordinance and zoning map and apply zoning to all land within the City, consistent with General Plan policies and land use designations.
  
- LU-I-8 **Walkable and Transit-Oriented Development.** Facilitate higher-density, mixed use development at specific locations along the coastline where an active, pedestrian environment is desired.  
  
*Future development along Palmetto Avenue and at the Eureka Square site; on lower Linda Mar Boulevard and Crespi Drive in West Linda Mar; at the Manor Shopping Center; and at Rockaway Beach and Quarry are easily accessible along the Highway 1 corridor and transit routes. Such development should help to make the coastline more accessible to residents and visitors.*
  
- LU-I-17 **Height Limit.** Replace a single citywide height limit with height limits that vary by zone, based on community input. These may allow greater heights for buildings in the Mixed Use Center and Visitor-Serving Commercial designations.

*Circulation Element*

Policies CI-G-1, CI-G-2, CI-G-4, CI-G-5, CI-G-7, CI-I-1, CI-I-2, CI-I-3, CI-I-4, CI-G-10, CI-G-11, CI-G-13, CI-G-14, CI-G-15, CI-I-27, CI-I-28, CI-I-29, CI-I-30, CI-I-32, CI-I-33, CI-I-34, CI-I-35, CI-I-36, CI-I-37, CI-I-41, CI-I-42, Cv-I-43, CI-I-44, CI-I-45, CI-I-46, CI-I-47, CI-I-48, CI-G-16, CI-G-17, CI-I-49, CI-I-50, CI-I-51, CI-I-52, CI-I-53, CI-I-54, CI-I-55, as listed under Impact 3-4-1.

CI-G-8 **Congestion on Hickey and Skyline.** Improve travel to and from Pacifica's northern neighborhoods by easing congestion on Hickey Boulevard through coordinated signalization or other changes, and working with the County to improve operations on SR 35 (Skyline Boulevard).

CI-G-9 **Coordination of Local and Regional Actions.** Coordinate local transportation planning and improvements with State, Regional and County agencies to ensure consistency with the Regional Transportation Plan, the Congestion Management Program, and other regional actions.

CI-I-5 **Streetscape in Mixed Use Areas.** Require pedestrian-oriented amenities and design in visitor-oriented commercial and mixed use areas, including wider sidewalks, curb bulb-outs at key intersections, outdoor seating, and public art.

*Priority streetscapes include Palmetto, Montecito, Santa Rosa, and San Jose Avenues in West Sharp Park; Rockaway Beach Avenue and Dondee Way in Rockaway Beach; lower Crespi Drive and Linda Mar Boulevard in Linda Mar; Manor Drive and Aura Vista Drive in West Edgemar-Pacific Manor; and Oddstad and Terra Nova Boulevards and new streets created as part of redevelopment of the Park Mall site.*

CI-I-6 **Block Size and Maximum Street Spacing.** For new development at the Quarry site or Park Mall site, require streets to be designed to maximize connectivity for automobiles, cyclists, and pedestrians, with blocks between 200 and 600 feet in length. Provide mid-block pedestrian connections where blocks exceed 500 feet in length.

*The intent of these standards is to prevent development of introverted neighborhoods, provide flexibility in circulation, and promote access for bicyclists and pedestrians.*

CI-I-7 **Roadway Abandonment and Public Access.** Do not abandon or render unusable any City-owned right-of-way, unless necessary for reasons of public safety or environmental conservation. Whenever public roadways are proposed to be abandoned, assess the value of maintaining public pedestrian and/or bicycle access, especially where coastal access can be maintained or improved. Abandonment of any public right-of-way that may negatively affect public access to the sea will require a coastal development permit. Any public right-of-way that cannot be maintained in a condition suitable for public use shall be offered to

another public agency or private association that agrees to maintain the right-of-way for public use.

CI-I-8 **Bicycle and Pedestrian Advisory Committee.** Create and solicit input from a bicycle and pedestrian advisory committees (BPAC) on planning and funding for transportation improvement projects.

CI-I-9 **SR 1 Improvements Between South of Fassler and North of Reina del Mar.** Continue to work with the California Department of Transportation (Caltrans) and the San Mateo County Transportation Authority (SMCTA) to improve operations along SR 1.

*Improvements to SR 1 should alleviate traffic congestion between north of Reina del Mar and south of Fassler Avenue while minimizing environmental impacts and impacts to adjacent land uses, ensuring adequate local access, and enhancing the community's image.*

CI-I-10 **SR 1 and Linda Mar Operations.** Work with San Mateo County to evaluate, design and implement improvements to the intersection of Linda Mar Boulevard and SR 1. Improvements that would mitigate regional growth may include providing a westbound right turn overlap phase and increasing the overall cycle length, if warranted.

CI-I-11 **Manor Drive Overcrossing Improvements.** Complete planned improvements to the Manor Drive overcrossing to facilitate traffic movement across SR 1 for all modes.

*Improvements should include widening of the overcrossing, signal control at the intersections of Manor Drive with Palmetto Avenue and Oceana Boulevard, and a new on-ramp to SR 1 from Oceana at Milagra Drive.*

CI-I-12 **SR 35 Improvements.** Work with San Mateo County to evaluate, design and implement improvements to SR 35 to relieve congestion along this roadway within Pacifica. Improvements that would mitigate regional growth may include adding one lane of travel in the southbound direction between Timberhill Court and Hickey Boulevard.

*Most growth in traffic along SR 35 is unrelated to expected growth in Pacifica.*

CI-I-13 **SR 35 and Hickey Boulevard Intersection Improvements.** Work with San Mateo County to evaluate, design and implement improvements to the intersection of SR 35 and Hickey Boulevard to ease travel on the primary east-west travel route for Pacifica's northern neighborhoods. Improvements that would mitigate regional growth may include adding westbound right- and westbound left-turn lanes and making all left-turn movements "protected-permitted."

CI-I-15 **Strategies to Reduce School-Related Peak Hour Auto Congestion.** Work with Pacifica School District and Jefferson Union High School District to promote

adoption of staggered hours, car-pooling, and use of transit to reduce traffic congestion during peak hours.

*This policy applies especially to Vallemar School and the Pacifica School District offices, where trips contribute to traffic congestion around SR 1 and Reina del Mar Avenue.*

- CI-I-16 **Multi-modal Level of Service (LOS) Performance Measures.** Develop performance measures for LOS for pedestrians, cyclists, and transit users, based on the criteria in this chapter and on “best practices.”

*Measures may be both quantitative (for example, sidewalk width) and qualitative (perceived safety and attractiveness.) Measures should use data that is readily available or can be readily collected, while providing an accurate assessment.*

- CI-I-17 **LOS for Pedestrians, Cyclists and Transit Users.** Strive to maintain LOS C or better for pedestrians, cyclists, and transit users on all roadways, and impose mitigation measures as needed to achieve multi-modal service objectives.

- CI-I-18 **Vehicle Level of Service on Roadways Included in the Congestion Management Program.** Accept an LOS E on SR 1 and SR 35, consistent with the C/CAG Congestion Management Program (CMP), in planning improvements.

- CI-I-19 **Vehicle Level of Service for Other Roadways and Intersections.** For all roadways and intersections not included in the CMP network, strive to maintain LOS D for vehicles during peak periods. Allow level of service to exceed this threshold under the following circumstances:

- Constraints on development as would be required to achieve or maintain these standards would adversely impede achievement of this Plan’s economic, land use and community development, and environmental goals and policies;
- Mitigation of congestion would negatively affect transit, bicycle or pedestrian circulation, or would conflict with General Plan goals for these alternative modes of circulation, for example by increasing crossing distances, increasing pedestrian safety risk, or restricting bicycle or transit access;
- Traffic congestion is a result of an effort to promote transit ridership and/or access, including the development of higher-density development in mixed use areas; or
- A demonstrated significant increase in transit ridership, carpooling, bicycling, and/or walking is achieved.

- CI-I-20 **Interim Standard for Intersection of Linda Mar Boulevard and SR 1.** Accept LOS F at the intersection of Linda Mar Boulevard and SR 1 during the PM peak periods as an interim standard until feasible traffic improvements can be designed, funded and constructed.

- CI-I-21 **Monitor Traffic Congestion at Key Intersections and Roadway Segments.** Periodically monitor levels of service at intersections and roadway segments where existing LOS is E or lower.
- CI-I-22 **Transportation Improvement Funding.** Ensure that new development pays its fair share of the costs of new and improved transportation facilities.
- CI-I-23 **Improvements for Existing Facilities.** Maintain and upgrade local streets, sidewalks, utilities, and other City infrastructure in a manner that prevents deterioration and corrects existing deficiencies.

*Conservation Element*

Policies CO-G-15, CO-G-16, CO-G-17, CO-I-60, CO-I-61, CO-I-62, CO-I-63, CO-I-64, CO-I-65, CO-I-66, CO-I-67, CO-I-68, CO-I-69, CO-I-70, as listed under Impact 3.4-1.

**Mitigation Measures**

None required.

**Impact**

- 3.4-3 Implementation of the proposed General Plan would not fail to reduce per capita transportation CO<sub>2</sub> emission by seven percent by 2020 and by fifteen percent by 2035 as compared to 2005 baseline, per CARB targets, as mandated by SB 375. (*Less than Significant*)**

The changes in transportation emissions and the service population are shown in **Table 3.4-6**. There is an 11 percent decrease in transportation emissions per service population from baseline (2005) to 2020, and a 23 percent decrease from baseline to 2035. These are both well below the seven and 15 percent emissions reductions, per CARB targets, mandated by SB 375. As described above in Impact 3.4-2, certain state and all local GHG reduction measures (presented in the draft CAP, but have not yet been approved) were not incorporated into emissions forecasts. Including these reduction measures would further decrease GHG emissions. The forecasted figures meet the SB 375 emissions target for 2020 and 2035. Therefore, there is a less than significant impact on per capita transportation GHG emissions.

**Table 3-4.6: Transportation Emissions Per Capita, 2005, 2020 and 2035**

Year	Transportation Emissions (MTCO <sub>2</sub> e)	Actual (2005) and Projected Population	Per Capita Transportation Emissions (MTCO <sub>2</sub> e per person)	SB 375 Targeted Percent Change from 2005	Forecasted Percent Change from 2005	Emissions Target Met?
2005	63,545	37,123	1.71			
2020	59,035	38,462	1.53	-7%	-11%	Yes
2035	52,469	39,800	1.32	-15%	-23%	Yes

Sources: DKS Associates, 2013; Dyett & Bhatia, 2013.

**Proposed General Plan Policies that Reduce the Impact**

(For those listed with policy numbers only, see above for full policy text)

*Land Use Element*

Policies LU-G-2, LU-G-4, LU-G-6, LU-I-1, LU-I-9, LU-I-18, as listed under Impact 3.4-2.

*Circulation Element*

Policies CI-G-1, CI-G-2, CI-G-4, CI-G-5, CI-G-7, CI-G-8, CI-G-9, CI-I-1, CI-I-2, CI-I-3, CI-I-4, CI-I-5, CI-I-6, CI-I-7, CI-I-8, CI-I-9, CI-I-10, CI-I-11, CI-I-12, CI-I-13, CI-I-14, CI-I-15, CI-I-27, CI-I-28, CI-I-29, CI-I-30, CI-I-32, CI-I-33, CI-I-34, CI-I-35, CI-I-36, CI-I-37, CI-I-41, CI-I-42, Cv-I-43, CI-I-44, CI-I-45, CI-I-46, CI-I-47, CI-I-48, CI-G-16, CI-G-17, CI-I-49, CI-I-50, CI-I-51, CI-I-52, CI-I-53, CI-I-54, CI-I-55,, as listed under Impact 3.4-1.

*Conservation Element*

Policies CO-G-15, CO-G-16, CO-G-17, CO-I-60, CO-I-61, CO-I-62, CO-I-63, CO-I-64, CO-I-65, CO-I-66, CO-I-67, CO-I-68, CO-I-69, CO-I-70, as listed under Impact 3.4-1.

**Mitigation Measures**

None required.

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