APPENDIX F:
Climate Action Plan

Climate Action Plan

City of Upland

Climate Action Plan

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AB	Assembly Bill
APS	Alternate Plan Strategy
BAU	business as usual
BRT	bus rapid transit
BTA	Bicycle Transportation Account
BTP	Bicycle Transportation Plan
CACP	Clean Air Climate Protection
CAFE	corporate average fleet fuel economy
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCAP	Center for Clean Air Policy
CCAR	California Climate Action Registry
CCR	California Code of Regulations
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CFCs	Chlorofluorocarbons
CH_4	Methane
CIWMB	California Integrated Waste Management Board
CO_2	Carbon Monoxide
CPUC	California Public Utilities Commission
CRC	California Residential Code
CVWD	Cucamonga Valley Water District
CWIB	California Workforce Investment Board
EIR	Environmental Impact Report
EMFAC2007	California Air Resource Board Emission Factors Model
EO	Executive Order
EPA	Environmental Protection Agency
FCAA	Federal Clean Air Act
FEMA	Federal Emergency Management Agency

GCJC	Green Collar Jobs Council
GHG	Greenhouse Gas
GVW	gross vehicle weight
GWP	Global Warming Potential
H_2O	Water Vapor
HCFCs	Hydrochlorofluorocarbons
HFCs	Hydrofluorocarbons
IEUA	Inland Empire Utilities Agency
ICLEI	International Council for Local Environmental Initiatives
IPCC	International Panel on Climate Change
LCFS	Low Carbon Fuel Standard
LEED	Leadership in Energy and Environmental Design
LVW	loaded vehicle weight
MERV	Minimum Efficiency Rating Value
MMT	million metric tons
MPOs	Metropolitan Planning Organizations
MPG	miles per gallon
MSL	mean seal level
MT	metric tons
$MTCO_2eq$	metric tons of carbon dioxide equivalents
N_2O	Nitrous Oxide
NF_3	nitrogen trifluoride
O_3	Ozone
OAL	Office of Administrative Law
OPR	Office of Planning and Research
PFCs	Perfluorocarbons
PPM	parts per million
PPT	parts per trillion
RAP	recycled asphalt pavement
RPS	Renewable Portfolio Standard
SAWCo	San Antonio Water Company
SANBAG	San Bernardino Associated Governments
SB	Senate Bill

SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SF_6	Sulfur hexafluoride
SCS	Sustainable Communities Strategy
SOI	Sphere of Influence
Tg	Teragram
TOD	transit oriented development
UNFCCC	United Nations Framework Convention on Climate Change
VMT	vehicle miles traveled

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CHAPTER 1.0
INTRODUCTION

PURPOSE OF THE CLIMATE ACTION PLAN

In order to address potential global climate change impacts, the City of Upland recognizes the efforts needed in order to incorporate more sustainable practices in its future. As one component of these efforts, the City has developed a Climate Action Plan (CAP) as next steps toward a path to sustainability. This CAP provides a framework for reducing greenhouse gas (GHG) emissions. The CAP recommends GHG emissions targets that are consistent with the reduction targets of the State of California and presents a number of strategies that would make it possible for the City to meet the recommended targets. The CAP also suggests best practices for addressing climate change impacts, and provides recommendations for measuring progress.

The CAP is intended to address the main sources of the emissions that cause climate change, which include emissions from the energy consumed in buildings and for transportation, as well as the solid waste sent to landfills. The purpose of the CAP is to guide the development, enhancement, and ultimately the implementation of actions that will reduce the City's GHG emissions. The CAP has been designed to support the following functions:

- Describe Upland's emissions sources;
- Provide projections of future emissions based on growth allowed by the General Plan;
- Provide clear guidance to City staff regarding when and how to implement key provisions of the plan;
- Recommend strategies, measures, and actions to achieve GHG reductions;
- Demonstrate Upland's commitment to comply with State GHG reduction efforts; and
- Define a strategy for turning this plan into action and transparently tracking and reporting progress toward the GHG reduction goals.

RELATIONSHIP TO THE GENERAL PLAN

The CAP implements policies that have been identified in the Upland General Plan Update. Major components of the updated General Plan include:

- Update of existing conditions with year 2008 serving as the baseline year.
- Update of General Plan development projections to the year 2035. Projections for population, employment, residential, and non-residential development have been updated for the projected horizon year.
- Additions, deletions, or modifications to the existing General Plan Goals, Policies, and implementation.
- Update of the Land Use Element with reorganized and new land use designations.

- Amendment and addition of the remaining General Plan Elements to reflect current conditions and account for new development projections.

The Upland General Plan update includes specific goals and policies that guide the City's growth. The CAP provides an approach to climate change, including emissions reductions targets, guidelines for preparing inventories or plans, and general reduction strategies. As climate change is a cross-cutting issue that could be addressed by many elements of the General Plan, the CAP as a whole is considered an implementation measure for the policies described in this CAP. This structure allows the City to update the CAP on an on-going, as-needed basis to ensure that the City's climate protection efforts reflect both current legislation and emerging best practices.

RELATIONSHIP TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

The City's approach to addressing GHG emission reductions within the General Plan Update is parallel to the climate change planning process being followed by more than 50 California jurisdictions. This process includes:

- Completing a baseline GHG emissions inventory and projecting future emissions;
- Identifying a community-wide GHG reduction target;
- Preparing a CAP to identify strategies and measures to meet the reduction target;
- Identifying targets and reduction strategies in General Plan Update and evaluating the environmental impacts of the CAP in Upland General Plan Update Environmental Impact Report (EIR);
- Monitoring effectiveness of reduction measures and adapting the plan to changing conditions; and
- Adopting the CAP in a public process following environmental review.

This approach is consistent with the California Environmental Quality Act (CEQA) Guidelines Section 15183.5(a), which states that lead agencies may adopt a plan for the reduction of GHG emissions that can then be used for project-specific environmental documents to tier from and/or incorporate by reference that existing programmatic review pursuant to CEQA Guidelines Sections 15183.5(b), 15064(h) (3), and 15130.

One of the primary uses for a CAP is to establish significance thresholds for reviewing projects under CEQA. CEQA requires the City to identify the significant environmental impacts of its discretionary actions and to avoid or mitigate those impacts if feasible. The *CEQA Guidelines*, as updated pursuant to Senate Bill (SB) 97, acknowledges that climate change is an environmental issue that requires analysis under CEQA and encourages the use of a plan consistency threshold for cumulative impacts on climate change. Projects that demonstrate consistency with the strategies, actions, and emission reduction targets contained in the CAP would have a less than significant impact on climate change.

When the City undertakes a discretionary action, such as approval of a proposed development project, plan, policy, or code change, the City will evaluate whether that action would result in a significant climate change impact.

Adoption of the CAP itself by the City is considered a project under CEQA. The overall purpose of the CAP is to reduce the impact that the community will have on global climate change to reduce the impact on the environment. However, implementation of the CAP could potentially result in adverse impacts on the physical environment, such as degrading visual resources, biological resources, or cultural resources. The potential impacts of the CAP are being evaluated as part of the EIR for the General Plan Update. With completion and adoption of the General Plan Update EIR, the CAP will have undergone environmental review under CEQA. The General Plan Update is expected to be adopted in 2014. The CAP is intended to reduce the City's impact on climate change; therefore, determining the consistency of a proposed project with the CAP is one way to evaluate whether a project would have a significant climate change impact.

PUBLIC PARTICIPATION

City of Upland residents and staff participated in the formulation of the CAP through participation in the General Plan community workshop and stakeholder meetings. The General Plan elements are being updated simultaneously with this CAP. Community members have provided valuable input that has been used to select GHG reduction measures. As part of the General Plan Update, a visioning process was conducted in order to engage staff, elected officials, business leaders, community representatives, and residents. This process included stakeholder interviews, educational workshops, and outreach at community events.

Fundamental to the City's vision for its future is the preservation and enhancement of the "small town" community character described by participants during the process. Key themes identified during the visioning process include: maintaining an excellent quality of life, strengthening community identity, growing the local economy, responsive leadership, and growing green. The growing green theme focuses specifically on a proactive approach to reduce GHG emissions, grow in sustainable ways, and comply with regulatory requirements. Information gathered from these meetings and survey was used to formulate goals and policies, as well as the strategies, objectives, measures, and actions in this CAP. Through the workshop and survey, community members have provided valuable input that has been used to select GHG reduction measures.

Upland values citizen input on the future of our community and the City's residents and City staff have played an important role in the formulation of this CAP through the community workshop and stakeholder meetings. Community members have provided their input and have stressed several points of change they would like to see in their City. Community support is vital to the success of this CAP and community members will need to take an active role in implementing the CAP and monitoring its success over time. The City of Upland is dedicated to becoming a more sustainable community through the vision for its future.

Community Outreach

STAKEHOLDER INTERVIEWS

At the beginning of the General Plan Update process in October 2008, a series of interviews were conducted with key community stakeholders, including leaders from all City departments and commissions, community organizations, public agencies, School District, businesses, developers, non-profit groups, and others. The purpose of the interviews was to introduce them to the General Plan Update process and gain their perspective and insight into what some of the key advantages and opportunities are for change in the City, as well as what needs and challenges face Upland.

Key Findings

Feedback provided by key community stakeholders covered a wide range of City issues, challenges, opportunities, and potential enhancements that would increase the air quality and reduce GHG emissions in the City. Stakeholders expressed particular interest in sustainable/smart growth, Transit Oriented Development (TOD), and reducing vehicle miles traveled (VMT) as being vital components of the future development of the City. Sustainable growth strategies advocated by stakeholders included increasing densities along major commercial corridors and districts, providing a variety of housing types in close proximity to commercial centers, allowing for mixed-use development near downtown, and even enhancing the Cable Airport to include a three-story mixed-use development containing “live-work-fly” space.

Establishing Upland as an innovative transportation hub, expanding development and increasing densities near major thoroughfares, and developing high density housing and commercial uses along the Metrolink corridor were discussed as potential for future TOD development. As suggested by the stakeholders, incorporating TOD in the City of Upland would help reduce VMT, and GHG emissions by encouraging alternative transportation options and increasing accessibility to goods and services through the strategic location of housing, commercial, residential, and recreational uses near transit corridors. Other means of reducing VMT, as determined by the stakeholders, included attracting name brand restaurants and stores to Upland, providing employment opportunities near housing, revitalizing existing retail on Foothill Boulevard, upgrading underserved parks, creating a trolley system along Foothill Boulevard, and developing a comprehensive public transit system.

Community Events

The City publicized the General Plan Update process at the annual Upland Scary-A-Fair on Halloween and at the Craft Fair and Christmas Parade in 2008. The City organized a booth, displayed informative posters and surveyed participants at each event about aspects of the City they appreciated and what issues they felt were most important to address in the General Plan. The exercises effectively advertised the General Plan Update process and helped solidify common themes important for the General Plan.

Public Workshops

The City held four workshops over the course of the General Plan Update process. The first two workshops were educational in nature and presented information on each topic covered in the General Plan. The third workshop allowed meeting attendees to examine different land use alternatives and development choices. Participants analyzed and discussed the trade-offs associated with different development patterns and provided input as to how they thought the City should grow. The final workshop presented the draft goals and policies for each element of the General Plan to allow the community to comment on future policy that will guide the community towards achieving their vision.

Key Findings

Upland citizens provided a variety of input regarding air quality and reducing GHG emissions during the public workshops. Feedback included the discussion of incentives, principles, goals, and objectives to improve the air quality in Upland and reduce the carbon output of existing emission sources. Various topic areas were discussed by the public including more park space, electricity costs, the City recycling program, and planting more trees in the city limits. In addition, four community themes were identified in Upland:

- Alternative Energy Use
- Sustainable Development Programs
- Strategic Reuse of Underutilized Land
- Transportation and Circulation Network Improvement

Alternative Energy Use. The recommendations from the public included exemplary alternative energy use projects by the City, increasing the number of alternative fuel vehicles in the City fleet, incentives for existing and new development to incorporate renewable energy and energy efficient design (LEED), and integrating alternative/energy efficiency provisions into the City Municipal Code.

Sustainable Development Programs. Community members suggestions included: water conservation programs, drought tolerant landscaping incentives and regulations.

Strategic Reuse of Underutilized Land. Using active mine sites for joint use of open space trails, wildlife habitat and/or open space/parks, mixed-use development, and increasing densities in urban areas were popular topic areas conversed during the public workshops.

Transportation and Circulation Network Improvement. Improving the City's transportation and circulation network was also a popular topic, as Upland citizens provided propositions to improve congested intersections, incorporate more walking and biking infrastructure, develop alternative transportation to Metrolink, and upgrade the movement of vehicles along popular transit corridors.

GREENHOUSE EFFECT AND GREENHOUSE GASES

The natural process through which heat is retained in the troposphere is called the "greenhouse effect."[1] The greenhouse effect traps heat in the troposphere through a three-fold process as follows: Short wave radiation emitted by the Sun is absorbed by the Earth; the Earth emits a portion of this energy in the form of long wave radiation; and GHGs in the upper atmosphere absorb this long wave radiation and emit this long wave radiation into space and toward the Earth. This "trapping" of the long wave (thermal) radiation emitted back toward the Earth is the underlying process of the greenhouse effect. This process is illustrated in Exhibit 1, *The Greenhouse Effect*.

The most abundant GHGs are water vapor and carbon dioxide (CO_2). Many other trace gases have greater ability to absorb and re-radiate long wave radiation; however, these gases are not as plentiful. For this reason, and to gauge the potency of GHGs, scientists have established a Global Warming Potential (GWP) for each GHG based on its ability to absorb and re-radiate long wave radiation.

GHGs include, but are not limited to, the following:[2]

- ***Water Vapor (H_2O).*** Although water vapor has not received the scrutiny of other GHGs, it is the primary contributor to the greenhouse effect. Natural processes, such as evaporation from oceans and rivers, and transpiration from plants, contribute 90 percent and 10 percent of the water vapor in our atmosphere, respectively.

  The primary human related source of water vapor comes from fuel combustion in motor vehicles; however, this is not believed to contribute a significant amount (less than one percent) to atmospheric concentrations of water vapor. The Intergovernmental Panel on Climate Change (IPCC) has not determined a GWP for water vapor.

- ***Carbon Dioxide (CO_2)*** Carbon Dioxide is primarily generated by fossil fuel combustion in stationary and mobile sources. Due to the emergence of industrial facilities and mobile sources in the past 260 years, the concentration of CO_2 in the atmosphere has increased 39 percent.[3] Carbon dioxide is the most widely emitted GHG and is the reference gas (GWP of 1) for determining GWPs for other GHGs.

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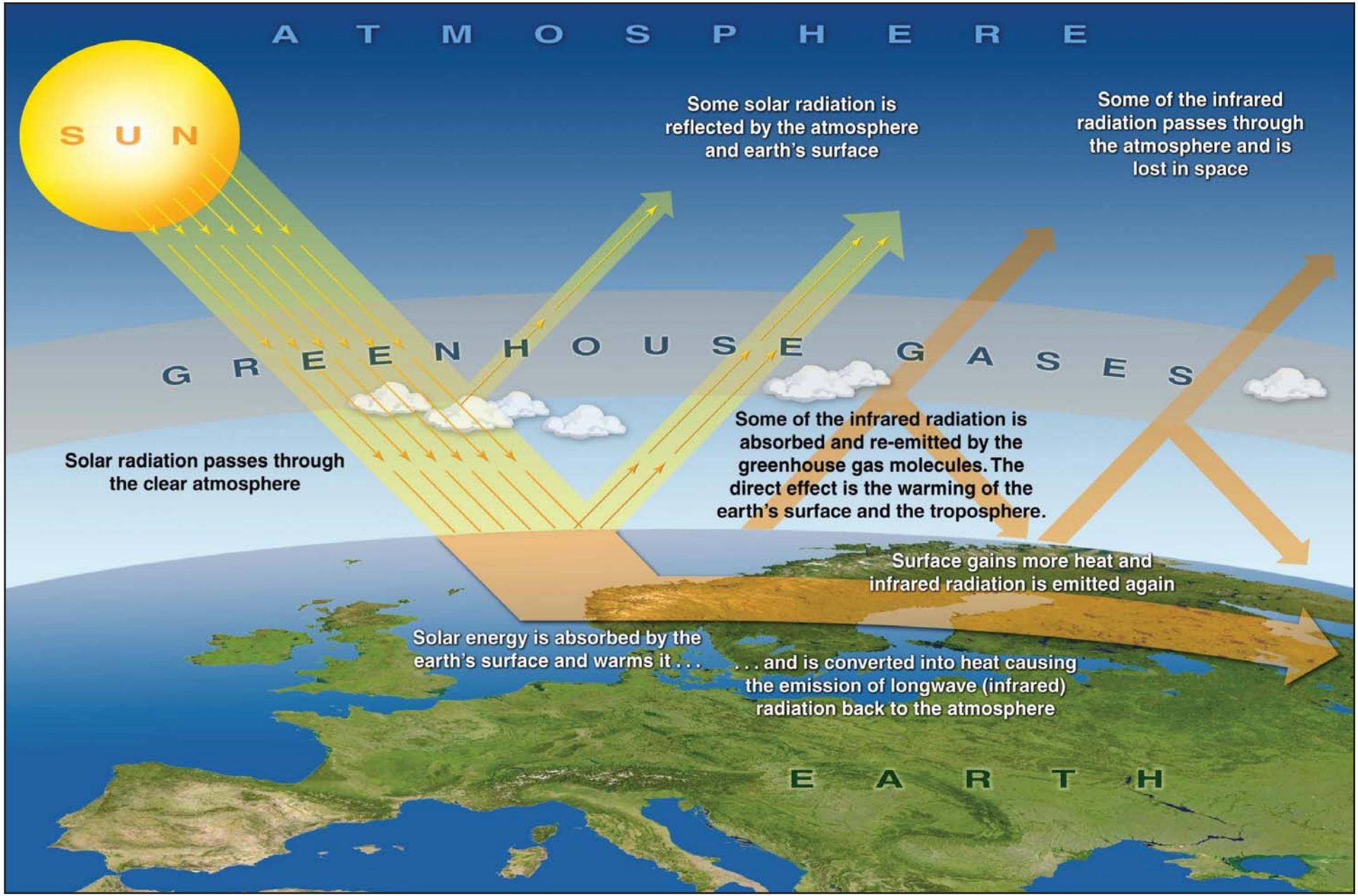
[1] The troposphere is the bottom layer of the atmosphere, which varies in height from the Earth's surface to 10 to 12 kilometers.

[2] All Global Warming Potentials are given as 100-year Global Warming Potential. Unless noted otherwise, all Global Warming Potentials were obtained from the Intergovernmental Panel on Climate Change. (Intergovernmental Panel on Climate Change, *Climate Change, The Science of Climate Change – Contribution of Working Group I to the Second Assessment Report of the IPCC*, 1996).

[3] U.S. Environmental Protection Agency, *Inventory of United States Greenhouse Gas Emissions and Sinks 1990 to 2011*, April 2013.



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UPLAND CLIMATE ACTION PLAN

The Greenhouse Effect

Exhibit 1

- ***Methane (CH_4).*** Methane is emitted from biogenic sources, incomplete combustion in forest fires, landfills, manure management, and leaks in natural gas pipelines. In the United States, the top three sources of methane are landfills, natural gas systems, and enteric fermentation (the digestive process in animals with a rumen, typically cattle, causing methane gas). Methane is the primary component of natural gas, which is used for space and water heating, steam production, and power generation. The GWP of methane is 21.

- ***Nitrous Oxide (N_2O).*** Nitrous oxide is produced by both natural and human related sources. Primary human related sources include agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic acid production (for the industrial production of nylon), and nitric acid production (for rocket fuel, woodworking, and as a chemical reagent). The GWP of nitrous oxide is 310.

- ***Hydrofluorocarbons (HFCs).*** HFCs are typically used as refrigerants for both stationary refrigeration and mobile air conditioning. The use of HFCs for cooling and foam blowing is growing, as the continued phase out of chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) gains momentum. The GWP of HFCs range from 140 for HFC-152a to 11,700 for HFC-23.[4]

- ***Perfluorocarbons (PFCs).*** Primary aluminum production and semiconductor manufacturing are the largest known man-made sources of two perfluorocarbons: tetrafluoromethane (CF_4) and tetrafluoromethane (C_2F_6). Perfluorocarbons are potent GHGs with a Global Warming Potential several thousand times that of CO_2, depending on the specific PFC. PFCs are also relatively minor substitutes for ozone-depleting substances. The estimated atmospheric lifetimes for CF_4 and C_2F_6 are 50,000 and 10,000 years respectively. The GWPs of CF_4 and C_2F_6 emissions are approximately 6,500 and 9,200, respectively.[5]

- ***Sulfur hexafluoride (SF_6).*** Sulfur hexafluoride is a colorless, odorless, nontoxic, nonflammable gas. It is most commonly used as an electrical insulator in high voltage equipment that transmits and distributes electricity. Sulfur hexafluoride is the most potent GHG that has been evaluated by the Intergovernmental Panel on Climate Change with a GWP of 23,900. However, its global warming contribution is not as high as the GWP would indicate due to its low mixing ratio compared to carbon dioxide (4 parts per trillion [PPT] in 1990 versus 365 parts per million [PPM], respectively).[6]

In addition to the six major GHGs discussed above (excluding water vapor), many other compounds have the potential to contribute to the greenhouse effect. Some of these substances were previously identified as stratospheric ozone (O_3) depletors; therefore, their gradual phase out is currently in effect. The following is a listing of these compounds:

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[4] U.S. Environmental Protection Agency, *Greenhouse Gas Emissions*, June 14, 2012. http://epa.gov/climatechange/ghgemissions/gases/fgases.html, accessed on July 15, 2013.

[5] Ibid.

[6] Ibid.

- ***Hydrochlorofluorocarbons (HCFCs).*** HCFCs are solvents, similar in use and chemical composition to CFCs. The main uses of HCFCs are for refrigerant products and air conditioning systems. As part of the Montreal Protocol, all developed countries that adhere to the Montreal Protocol are subject to a consumption cap and gradual phase out of HCFCs. The United States is scheduled to achieve a 100 percent reduction to the cap by 2030. The GWPs of HCFCs range from 93 for HCFC-123 to 2,000 for HCFC-142b.[7]

- ***1,1,1 trichloroethane.*** 1,1,1 trichloroethane or methyl chloroform is a solvent and degreasing agent commonly used by manufacturers. The GWP of methyl chloroform is 110 times that of CO_2.[8]

- ***Chlorofluorocarbons (CFCs).*** CFCs are used as refrigerants, cleaning solvents, and aerosols spray propellants. CFCs were also part of the United States Environmental Protection Agency's (EPA's) Final Rule (57 FR 3374) for the phase out of O_3 depleting substances. Currently, CFCs have been replaced by HFCs in cooling systems and a variety of alternatives for cleaning solvents. Nevertheless, CFCs remain suspended in the atmosphere contributing to the greenhouse effect. CFCs are potent GHGs with GWPs ranging from 4,000 for CFC 11 to 14,420 for CFC 13.[9]

GLOBAL GHG EMISSIONS

Atmospheric data for GHG concentrations over the past 800,000 years demonstrates that concentrations of CO_2 (which comprises the majority of GHG emissions) have increased since pre-industrial times. Concentrations have increased from approximately 280 PPM to approximately 353 PPM in 1990 and to approximately 379 PPM in 2005.

In 2000, the IPCC outlined potential global emission scenarios for the coming century. The scenarios vary from a best case scenario with a low population growth, clean technologies, and low GHG emissions, to a worst case scenario of a high population growth and fossil fuel dependence resulting in extreme levels of GHG emissions. While some degree of climate change is inevitable, most climate scientists agree that in order to avoid excessive climate change, atmospheric GHG concentrations should be stabilized at 350 to 400 PPM.

NATIONWIDE GHG EMISSIONS

Based on data produced by the EPA's *2010 Inventory of U.S. Greenhouse Gas Emissions and Sinks*, GHG emissions in the United States were 6,702.3 teragrams (Tg) CO_2eq[10] in 2011.[11] As

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[7] U.S. Environmental Protection Agency, *Protection of Stratospheric Ozone: Listing of Global Warming Potential for Ozone Depleting Substances*, dated October 29, 2009. http://www.epa.gov/EPA-AIR/1996/January/Day-19/pr-372.html, accessed on July 15, 2013.

[8] Ibid.

[9] U.S. Environmental Protection Agency, *Class I Ozone Depleting Substances*, August 19, 2010. http://www.epa.gov/ozone/ods.html, accessed on July 15, 2013.

[10] Carbon Dioxide Equivalent (CO_2eq) - A metric measure used to compare the emissions from various greenhouse gases based upon their global warming potential.

[11] U.S. Environmental Protection Agency, *Inventory of United States Greenhouse Gas Emissions and Sinks 1990 to 2011*, April 2013.

indicated by the EPA, total nationwide emissions have risen by approximately 8.4 percent from 1990 to 2011. Emissions declined from 2010 to 2011, decreasing by 1.6 percent (108 Tg CO_2eq.). This decrease is primarily a result of a decrease in the carbon intensity of fuels consumed to generate electricity due to a decrease in coal consumption, with increased natural gas consumption and a significant increase in hydropower used. Additionally, relatively mild winter conditions, especially in the South Atlantic region of the U.S. resulted in a decrease in electricity demand in most sectors. Overall, from 1990 to 2011 total GHG emissions increased by 519 Tg CO_2eq (8.4 percent), while CH_4 emissions decreased by 52.7 Tg CO_2eq (8.2 percent), and N_2O emissions increased by 12.6 Tg CO_2eq (3.7 percent), respectively.

STATEWIDE GHG EMISSIONS

In March 2013, the California Air Resources Board (CARB) prepared a GHG inventory that compiles statewide anthropogenic GHG emissions and sinks. It includes estimates for CO_2, CH_4, N_2O, SF_6, nitrogen trifluoride (NF_3), HFCs, and PFCs for the years 2000 through 2010. According to the CARB GHG emission inventory estimates, California emitted approximately 450 million metric tons (MMT) of CO_2eq emissions in 2010.[12] California's total GHG emissions are larger than every other state with the exception of Texas. However, California has a relatively low carbon emission intensity. In 2001, California ranked the fourth lowest per-capita CO_2 emissions from fossil fuel combustion in the country, due to the success of its energy efficiency and renewable energy programs. California's energy programs and policies have had multiple benefits that include not only reducing GHG emissions, but reducing energy demand and improving air quality and public health.[13] If emissions continue to increase at business as usual (BAU)[14] rates, statewide emissions are expected to increase to approximately 600 metric tons (MT) CO_2eq by 2020, which represents a 40 percent increase above 1990 levels. In order for the State to participate in global efforts to avoid dangerous climate change, California's GHG emissions need to be reduced to at least 1990 levels by 2020[15] and 80 percent below 1990 levels by 2050.[16] CARB prepared an update for the Climate Change Scoping Plan in October 2013 (discussion draft). This update, required by AB 32, the California Global Warming Solutions Act of 2006, continues with the approach that a balanced mix of strategies is the best way to cut emissions and grow the economy in a clean and sustainable direction. This update builds upon the initial Scoping Plan with new strategies and expanded measures while identifying opportunities to leverage existing and new funds to drive GHG emission reductions through strategic planning and targeted program investments. Specifically, this update describes progress made toward the objectives of AB 32, defines California's climate change priorities and activities for the next several years, and frames activities and issues facing the State as it develops an integrated framework for achieving both air quality and climate goals in California beyond 2020.

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[12] California Air Resources Board, *Greenhouse Gas Inventory Data - 2000 to 2010*, March 4, 2013.

[13] California Energy Commission, *Inventory of California Greenhouse Gas Emissions and Sinks: 1990 to 2004 - Final Staff Report, publication # CEC-600-2006-013-SF*, December 22, 2006, and updated January 23, 2007.

[14] "Business as Usual" refers to emissions that would be expected to occur in the absence of GHG reductions. See http://www.arb.ca.gov/cc/inventory/data/forecast.htm, accessed on April 20, 2011. Note that there is significant controversy as to what BAU means. In determining the GHG 2020 limit, CARB used the above as the "definition." It is broad enough to allow for design features to be counted as reductions.

[15] California Air Resources Board, *Climate Change Scoping Plan,* 2008.

[16] Ibid.

GLOBAL EFFECTS OF CLIMATE CHANGE

The primary effect of global climate change has been a rise in average global tropospheric temperature of 0.05 degrees Celsius per decade, determined from meteorological measurements worldwide between 1998 and 2012. The warming trend for this period is smaller than the trend since 1951, which is 0.12 degrees Celsius per decade.[17] However, climate change modeling shows that further warming would occur, which would include further changes in the global climate system during the current century.[18] Changes to the global climate system and ecosystems and to California would include, but would not be limited to:

- The loss of sea ice and mountain snowpack resulting in higher sea levels and higher sea surface evaporation rates with a corresponding increase in tropospheric water vapor due to the atmosphere's ability to hold more water vapor at higher temperatures;[19]

- Rise in global average sea level primarily due to thermal expansion and melting of glaciers and ice caps and the Greenland and Antarctic ice sheets;[20]

- Changes in weather that include widespread changes in precipitation, ocean salinity, and wind patterns, and more energetic extreme weather including droughts, heavy precipitation, heat waves, extreme cold, and the intensity of tropical cyclones;[21]

- Decline of the Sierra snowpack (which accounts for approximately half of the surface water storage in California) by 70 percent to as much as 90 percent over the next 100 years;[22]

- Increase in the number of days conducive to ozone formation by 25 to 85 percent (depending on the future temperature scenario) in high ozone areas of Los Angeles and the San Joaquin Valley by the end of the 21st century;[23] and

- High potential for erosion of California's coastlines and sea water intrusion into the Delta and levee systems due to the rise in sea level.[24]

While there is broad agreement on the causative role of GHGs to climate change, there is considerably less information or consensus on how climate change would affect any particular location, operation, or activity. The IPCC has published numerous reports on potential impacts of climate change on the human environment. These reports provide a comprehensive and up-to-date assessment of the current state of knowledge on climate change. The IPCC notes the fact that there is little consensus as to the ultimate impact of human interference with the climate

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[17] Intergovernmental Panel on Climate Change, *Working Group I Contribution to the IPCC Fifth Assessment Report Climate Change 2013: The Physical Science Basis*, 2013.
[18] Ibid.
[19] Ibid.
[20] Ibid.
[21] Ibid.
[22] California Environmental Protection Agency, *Climate Action Team, Climate Action Team Report to Governor Schwarzenegger and the Legislature (Executive Summary)*, March 2006.
[23] Ibid.
[24] Ibid.

system and its causal connection to global warming trends; however, current evidence indicates that human interference in the climate system exacerbates natural climate change.

LEGISLATION AND REGULATORY CONTEXT

Federal

The Federal government is extensively engaged in international climate change activities in areas such as science, mitigation, and environmental monitoring. The EPA actively participates in multilateral and bilateral activities by establishing partnerships and providing leadership and technical expertise. Multilaterally, the United States is a strong supporter of activities under the United Nations Framework Convention on Climate Change (UNFCCC) and the IPCC.

In 1988, the United Nations and the World Meteorological Organization established the IPCC to assess the scientific, technical, and socioeconomic information relevant to understanding the scientific basis of human-induced climate change, its potential impacts, and options for adaptation and mitigation. The most recent reports of the IPCC have emphasized the scientific consensus around the evidence that real and measurable changes to the climate are occurring, that they are caused by human activity, and that significant adverse impacts on the environment, the economy, and human health and welfare are unavoidable.

The Federal Clean Air Act (FCAA) requires the EPA to define national ambient air quality standards (national standards) to protect public health and welfare in the United States. The FCAA does not specifically regulate GHG emissions; however, on April 2, 2007 the U.S. Supreme Court in *Massachusetts v. U.S. Environmental Protection Agency*, determined that GHGs are pollutants that can be regulated under the FCAA. The EPA adopted an endangerment finding and cause of contribute finding for GHGs on December 7, 2009. The final findings were published in the Federal Register on December 15, 2009 under Docket ID No. EPA-HQ-OAR-2009-0171. The final rule was effective January 14, 2010.

Under the endangerment finding, the Administrator found that the current and projected atmospheric concentrations of the six, key, well-mixed GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) threaten the public health and welfare of current and future generations. Under the cause of contribute finding, the Administrator found that the combined emissions of these well-mixed GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

Based on these findings, on April 1, 2010, the EPA finalized the light-duty vehicle rule controlling GHG emissions. This rule confirmed that January 2, 2011, is the earliest date that a 2012 model year vehicle meeting these rule requirements may be sold in the United States. On May 13, 2010, the EPA issued the final GHG Tailoring Rule. This rule set thresholds for GHG emissions that define when permits under the Prevention of Significant Deterioration and Title V Operating Permit programs are required for new and existing industrial facilities. Currently, EPA rules do not cover residential construction projects. Implementation of the Federal rules is expected to reduce the level of emissions from new motor vehicles and large stationary sources. The EPA annually publishes the *Inventory of U.S. Greenhouse Gas Emissions and Sinks* for estimating sources of GHGs that is generally consistent with the IPCC methodology developed in its *Guidelines for National Greenhouse Gas Inventories*.

In December 2007, Congress passed the first increase in corporate average fleet fuel economy (CAFE) standards. The new CAFE standards represent an increase to 35 miles per gallon (MPG) by 2020. In March 2009, the Obama Administration announced that for the 2011 model year, the standard for cars and light trucks will be 27.3 MPG, the standard for cars will be 30.2 MPG; and standard for trucks would be 24.1 MPG. Additionally, in May 2009 President Barack Obama announced plans for a national fuel-economy and GHG emissions standard that would significantly increase mileage requirements for cars and trucks by 2016. The new requirements represent an average standard of 39 MPG for cars and 30 MPG for trucks by 2016. In July 2011, President Obama announced the next phase to increase fuel efficiency. These new standards cover cars and light trucks for model years 2017 through 2025, requiring performance equivalent to 54.5 MPG in 2025, while reducing GHG emissions to 163 grams per mile.

In September 2009, the EPA finalized a GHG reporting and monitoring system that began on January 1, 2010. In general, this national reporting requirement will provide the EPA with accurate and timely GHG emissions data from facilities that emit 25,000 MT or more of CO_2 per year.[25] This publicly available data will allow the reporters to track their own emissions, compare them to similar facilities, and aid in identifying cost-effective emissions reduction strategies. This new program covers approximately 85 percent of the nation's GHG emissions and applies to approximately 10,000 facilities. The reporting system is intended to provide a better understanding of where GHGs are coming from and will guide development of the best possible policies and programs to reduce emissions.

State of California

Various statewide and local initiatives to reduce California's contribution to GHG emissions have raised awareness that, even though the various contributors to and consequences of global climate change are not yet fully understood, global climate change is occurring, and that there is a real potential for severe adverse environmental, social, and economic effects in the long term. Every nation emits GHGs and as a result makes an incremental cumulative contribution to global climate change; therefore, global cooperation will be required to reduce the rate of GHG emissions enough to slow or stop the human-caused increase in average global temperatures and associated changes in climatic conditions.

There are currently no state regulations in California that establish ambient air quality standards for GHGs. However, California has passed laws directing CARB to develop actions to reduce GHG emissions, and several state legislative actions related to climate change and GHG emissions have come into play in the past decade.

[25] The majority of individual sources within the City would not emit more than 25,000 MT of CO_2 per year. Facilities that produce more than 25,000 MT of CO_2 per year include refineries, power plants, or cement production facilities, or other large scale processing/production facilities.

ASSEMBLY BILL 32 (CALIFORNIA GLOBAL WARMING SOLUTIONS ACT OF 2006)

California passed the California Global Warming Solutions Act of 2006 (AB 32; *California Health and Safety Code* Division 25.5, Sections 38500 - 38599). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and establishes a cap on statewide GHG emissions. AB 32 requires that statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating that if the AB 1493 regulations cannot be implemented, then CARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

ASSEMBLY BILL 341

AB 341 (Chesbro) was signed into law on October 6, 2011. AB 341 makes a legislative declaration that it is the policy goal of the state that not less than 75 percent of solid waste generated be source reduced, recycled, or composted by the year 2020. The goal primarily targets commercial or public entities that generate more than four cubic yards of commercial solid waste per week, or is a multifamily residential dwelling of five units or more to arrange for recycling services. AB 341 also requires the California Department of Resources Recycling and Recovery to provide a report to the Legislature that provides strategies to achieve that policy goal and also includes other specified information and recommendations by January 1, 2014.

ASSEMBLY BILL 1493

AB 1493 (also known as the Pavley Bill) requires that CARB develop and adopt, by January 1, 2005, regulations that achieve “the maximum feasible reduction of GHG emitted by passenger vehicles and light-duty trucks and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the State.”
To meet the requirements of AB 1493, CARB approved amendments to the California Code of Regulations (CCR) in 2004 by adding GHG emissions standards to California’s existing standards for motor vehicle emissions. Amendments to CCR Title 13, Sections 1900 and 1961 and adoption of 13 CCR Section 1961.1 require automobile manufacturers to meet fleet-average GHG emissions limits for all passenger cars, light-duty trucks within various weight criteria, and medium-duty weight classes for passenger vehicles (i.e., any medium-duty vehicle with a gross vehicle weight rating less than 10,000 pounds that is designed primarily to transport people), beginning with the 2009 model year. Emissions limits are reduced further in each model year through 2016. When fully phased in, the near-term standards will result in a reduction of about 22 percent in GHG emissions compared to the emissions from the 2002 fleet, while the mid-term standards will result in a reduction of about 30 percent.

ASSEMBLY BILL 3018

AB 3018 established the Green Collar Jobs Council (GCJC) under the California Workforce Investment Board (CWIB). The GCJC will develop a comprehensive approach to address California’s emerging workforce needs associated with the emerging green economy. This bill will ignite the development of job training programs in the clean and green technology sectors.

EXECUTIVE ORDER S-1-07

Executive Order S-1-07 proclaims that the transportation sector is the main source of GHG emissions in California, generating more than 40 percent of statewide emissions. It establishes a goal to reduce the carbon intensity of transportation fuels sold in California by at least ten percent by 2020. This order also directs CARB to determine whether this Low Carbon Fuel Standard (LCFS) could be adopted as a discrete early-action measure as part of the effort to meet the mandates in AB 32.

EXECUTIVE ORDER S-3-05

Executive Order S-3-05 set forth a series of target dates by which statewide emissions of GHGs would be progressively reduced, as follows:

- By 2010, reduce GHG emissions to 2000 levels;
- By 2020, reduce GHG emissions to 1990 levels; and
- By 2050, reduce GHG emissions to 80 percent below 1990 levels.

The Executive Order directed the secretary of the California Environmental Protection Agency (Cal/EPA) to coordinate a multi-agency effort to reduce GHG emissions to the target levels. The secretary will also submit biannual reports to the governor and California Legislature describing the progress made toward the emissions targets, the impacts of global climate change on California's resources, and mitigation and adaptation plans to combat these impacts. To comply with the executive order, the secretary of Cal/EPA created the California Climate Action Team (CAT), made up of members from various State agencies and commissions. The team released its first report in March 2006. The report proposed to achieve the targets by building on the voluntary actions of California businesses, local governments, and communities and through State incentive and regulatory programs. The CAT released its most recent report in 2010, which included updates of the climate action programs implementation strategies consistent with the emissions reduction targets set forth in the 2006 report.

EXECUTIVE ORDER S-13-08

Executive Order S-13-08, seeks to enhance the state's management of climate impacts including sea level rise, increased temperatures, shifting precipitation, and extreme weather events by facilitating the development of State's first climate adaptation strategy. This will result in consistent guidance from experts on how to address climate change impacts in the State of California.[26]

EXECUTIVE ORDER S-14-08

Executive Order S-14-08 expands the State's Renewable Energy Standard to 33 percent renewable power by 2020. Additionally, Executive Order S-21-09 (signed on September 15, 2009) directs CARB to adopt regulations requiring 33 percent of electricity sold in the State come from renewable energy by 2020. CARB adopted the "Renewable Electricity Standard" on

[26] California Natural Resources Agency. *2009 California Climate Adaptation Strategy*, December 2009.

September 23, 2010, which requires 33 percent renewable energy by 2020 for most publicly owned electricity retailers.

EXECUTIVE ORDER S-20-04

Executive Order S-20-04, the California Green Building Initiative, (signed into law on December 14, 2004), establishes a goal of reducing energy use in state-owned buildings by 20 percent from a 2003 baseline by 2015. It also encourages the private commercial sector to set the same goal. The initiative places the California Energy Commission (CEC) in charge of developing a building efficiency benchmarking system, commissioning and retro-commissioning (commissioning for existing commercial buildings) guidelines, and developing and refining building energy efficiency standards under Title 24 to meet this goal.[27]

EXECUTIVE ORDER S-21-09

Executive Order S-21-09, 33 percent Renewable Energy for California, directs CARB to adopt regulations to increase California's Renewable Portfolio Standard (RPS) to 33 percent by 2020. This builds upon SB 1078 (2002) which established the California RPS program, requiring 20 percent renewable energy by 2017, and SB 107 (2006) which advanced the 20 percent deadline to 2010, a goal which was expanded to 33 percent by 2020 in the 2005 Energy Action Plan II. On April 12, 2011, Governor Brown reinforced the requirements of Executive Order S-21-09, and signed SB X1-2 requiring California's electric utilities to procure 33 percent of their energy from renewable resources by 2020.

SENATE BILL 1368

SB 1368 (Chapter 598, Statutes of 2006) is the companion bill of AB 32 and was signed into law in September 2006. SB 1368 required the California Public Utilities Commission (CPUC) to establish a performance standard for baseload generation of GHG emissions by investor-owned utilities by February 1, 2007. SB 1368 also required CEC to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards could not exceed the GHG emissions rate from a baseload combined-cycle, natural gas–fired plant. Furthermore, the legislation states that all electricity provided to California, including imported electricity, must be generated by plants that meet the standards set by CPUC and CEC.

SENATE BILL 97

SB 97, signed in August 2007 (Chapter 185, Statutes of 2007; PRC Sections 21083.05 and 21097), acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. This bill directs the Governor's Office of Planning and Research (OPR), which is part of the state Natural Resources Agency, to prepare, develop, and transmit to CARB guidelines for the feasible mitigation of GHG emissions (or the effects of GHG emissions), as required by CEQA. SB 97 also removes, both retroactively and prospectively, the legitimacy of litigation alleging inadequate CEQA analysis of effects of GHG emissions in the environmental review of projects funded by the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006 or the Disaster Preparedness and Flood Protection Bond Act of 2006

[27] California Energy Commission, *Green Building Initiative, State of California Executive Order S-20-04,* http://www.energy.ca.gov/greenbuilding/, accessed on July 15, 2013.

(Proposition 1B or 1E). This provision was repealed by operation of law on January 1, 2010. Therefore, any projects that remain unapproved are no longer to be protected against litigation claims of failure to adequately address climate change issues. In the future, this bill will only protect a handful of public agencies from CEQA challenges on certain types of projects, and only for a few years' time.

OPR published a technical advisory recommending that CEQA lead agencies make a good-faith effort to estimate the quantity of GHG emissions that would be generated by a proposed project. Specifically, based on available information, CEQA lead agencies should estimate the emissions associated with project-related vehicular traffic, energy consumption, water usage, and construction activities to determine whether project-level or cumulative impacts could occur, and should mitigate the impacts where feasible.[28] OPR requested CARB technical staff to recommend a method for setting CEQA thresholds of significance as described in Section 15064.7 of the *CEQA Guidelines* that will encourage consistency and uniformity in the CEQA analysis of GHG emissions throughout the State.

The Natural Resources Agency adopted the *CEQA Guidelines Amendments* prepared by OPR, as directed by SB 97. On February 16, 2010, the Office of Administration Law approved the *CEQA Guidelines Amendments*, and filed them with the Secretary of State for inclusion in the California Code of Regulations. The *CEQA Guidelines Amendments* became effective on March 18, 2010.

SENATE BILLS 1078 and 107

SB 1078 (Chapter 516, Statutes of 2002) requires retail sellers of electricity, including investor-owned utilities and community choice aggregators, to provide at least 20 percent of their supply from renewable sources by 2017. SB 107 (Chapter 464, Statutes of 2006) changed the target date to 2010.

SENATE BILL 375

SB 375, signed in September 2008 (Chapter 728, Statutes of 2008), aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a sustainable communities strategy (SCS) or alternative planning strategy (APS) that will prescribe land use allocation in that MPOs regional transportation plan. CARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every eight years but can be updated every four years if advancements in emissions technologies affect the reduction strategies to achieve the targets. CARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets.

[28] Governor's Office of Planning and Research, *CEQA AND CLIMATE CHANGE: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review*, June 19, 2008.

CARB SCOPING PLAN

On December 11, 2008, CARB adopted its Scoping Plan, which functions as a roadmap to achieve GHG reductions in California required by AB 32 through subsequently enacted regulations. CARB's Scoping Plan contains the main strategies California will implement to reduce CO_2eq emissions by 174 MMT, or approximately 30 percent, from the State's projected 2020 emissions level of 596 MMT CO_2eq under a business as usual BAU scenario. This is a reduction of 42 MMT CO_2eq, or almost ten percent, from 2002 to 2004 average emissions, but requires the reductions in the face of population and economic growth through 2020.

CARB's Scoping Plan calculates 2020 BAU emissions as the emissions that would be expected to occur in the absence of any GHG reduction measures. The 2020 BAU emissions estimate was derived by projecting emissions from a past baseline year using growth factors specific to each of the different economic sectors (e.g., transportation, electrical power, commercial and residential, industrial, etc.). CARB used three-year average emissions, by sector, for 2002 to 2004 to forecast emissions to 2020. At the time CARB's Scoping Plan process was initiated, 2004 was the most recent year for which actual data was available. The measures described in CARB's Scoping Plan are intended to reduce the projected 2020 BAU to 1990 levels, as required by AB 32.

In August 2011 CARB approved the Final Supplement to the Scoping Plan that provided an updated BAU analysis. The updated analysis is based on a three year average between 2006 and 2008 and considers the influence of the recent recession and emission reduction measures that had been implemented since the 2005 baseline identified in the original Scoping Plan. The result of the analysis indicates that a 16 percent GHG emissions reduction from base year (average of 2006 through 2008) levels is required to meet the AB 32 goals.

SOUTHERN CALIFORNIA ASSOCIATION OF GOVERNMENTS

The Southern California Association of Governments (SCAG) is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties, and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. SCAG serves as the federally designated metropolitan planning organization for the Southern California region and is the largest metropolitan planning organization in the United States. SCAG is responsible under the Federal Clean Air Act for determining conformity of projects, plans, and programs with the South Coast Air Quality Management District (SCAQMD).

With respect to air quality planning, SCAG adopted the *2012-2035 Regional Transportation Plan/Sustainable Communities Strategy* (*2012-2035 RTP/SCS*) in April, 2012. The RTP/SCS focuses on improving the transportation network and managing anticipated growth in the SCAG region through a number of sustainable growth goals, objectives, and scenarios, including the incorporation of GHG reduction targets. SB 375 requires SCAG to reduce per capita GHG emissions from passenger vehicles by 8 percent in 2020, and by 13 percent in 2035 compared to 2005 levels. In accordance with SB 375, the RTP/SCS calls for GHG per capita emission reduction targets of 9 percent below 2005 levels by 2020, and 16 percent below 2005 levels by 2035. These reduction targets will be reached through a comprehensive effort by the municipalities in the SCAG region, including the City of Upland. The City of Upland General

Plan Update and this CAP will be completed in conjunction with the SCAG RTP/SCS to reach SCAG's goals, and to comply with SB 375.

Local

SAN BERNARDINO COUNTY

In September 2011, the County of San Bernardino prepared a *GHG Emissions Reduction Plan* (GHG Plan). The GHG Plan addresses the County's internal operations and land use jurisdiction area operations. The internal operations include those operational activities, services and facilities that the County has direct responsibility for and control over (such as County vehicles and equipment, as well as buildings and other County owned facilities). External operations include those that the County has indirect influence or regulatory authority over. External sources include private sector development, industry and business in the unincorporated portion of San Bernardino County that are subject to the County's land use authority.

The GHG Plan provides different emissions reduction goals, objectives and strategies for these two operations categories. External emissions are further differentiated into six sectors that include Building Energy, Transportation and Land Use, Solid Waste Management, Stationary Sources, Agriculture and Resource and Conservation, and Water Conservation. The Internal emissions are differentiated into Building Energy, Fleet/Fuel Emissions, Solid waste Management/Landfill Emissions, Employee Commute, Carbon Sequestration, and County Purchasing. The use of these sectors allows for application of more discrete reduction strategies.

The GHG Plan consists of a GHG emission inventory, a reduction target to reduce existing GHG emissions by 15 percent by 2020, and the strategies to reduce existing emissions to meet the reduction target. The County's GHG Plan and its reduction target are based on AB 32 and the CARB recommendations to ensure that California emissions are reduced to 1990 levels by the year 2020. CARB has recommended a GHG reduction goal for local governments of 15 percent below 2005 levels (16 percent below 2006 – 2008 levels) by 2020 to ensure that their municipal and community-wide emissions match the State's reduction plan. For the purpose of defining "existing" emission levels, the County chose the emissions in the year 2007 as the existing emissions conditions.

The GHG emissions reduction measures identified in the GHG Plan include existing and proposed state, regional, county and other local measures that will reduce GHG emission in the Internal and External categories. Reduction measures have been organized into a classification system that recognizes both the origin of the measures (i.e., state, regional, local), and also whether the measure is quantifiable in terms of calculating a volume of emission reduction.

SAN BERNARDINO ASSOCIATED GOVERNMENTS

San Bernardino Associated Governments (SANBAG) is currently leading a project partnership to develop the *San Bernardino County Regional Greenhouse Gas Emissions Inventory and Reduction Plan* (SANBAG GHG Reduction Plan). The SANBAG GHG Reduction Plan builds upon the San Bernardino County GHG Reduction Plan and would compile an inventory of GHG emissions and develop reduction measures to be adopted by 21 partnership cities of San

Bernardino County. The SANBAG GHG Reduction Plan would provide regional reduction of GHG emissions and provide the technical information needed for local climate action plans. Once adopted, the SANBAG GHG Reduction Plan would serve as the basis for the partnership cities in the County to develop a more detailed community level climate action plans (CAP).

The City of Upland has elected to prepare a CAP independently from the SANBAG GHG Reduction Plan in order to maintain a consistent process and consistent data associated with the City's General Plan Update efforts. The General Plan Update process began in 2008 and involved various community outreach programs (refer to Chapter 5, *Public Participation*) as well as the collection of data associated with Citywide (including sphere of influence) land uses, demographics, transportation, and municipal activities. The data from the outreach and research process was incorporated into the General Plan Update and this CAP to ensure both of these documents maintain consistency with the City's vision for the future.

It should be noted that the GHG inventories in this CAP (refer to Chapter 2, *Emissions Inventory and Reduction Target*) were prepared using the same protocols and emissions factors as the SANBAG GHG Reduction Plan, including the CARB *Local Government Operations Protocol* (2010) and the California Climate Action Registry *General Reporting Protocol* (2009), as well as research from the EPA and the IPCC. Additionally, this CAP derived measures for the GHG reduction strategies from the policies within Elements of the General Plan Update. General Plan Update policies were used for the GHG reduction measures in order to ensure that emissions reduction activities are consistent with the objectives of the General Plan Update.

INLAND EMPIRE UTILITIES AGENCY

The Inland Empire Utilities Agency (IEUA) provides regional wastewater service and imported water deliveries to eight contracting agencies in the Inland Empire, including the City of Upland. The IEUA supplies imported and recycled water, collects, treats, and disposes of wastewater, and provides other utility-related (renewable electrical energy, compost) services to the Inland Empire communities. Sustainable energy practices and features have been implemented into IEUA facilities and maintenance operations to reduce GHG emissions. As such, IEUA is the first public agency in the U.S. to receive the Platinum rating from the U.S. Green Building Council's Leadership in Environmental and Energy Design LEED.

The IEUA operates and maintains four water recycling facilities and two biosolids treatment facilities. Biosolids generated from three of the water recycling facilities are treated, dewatered, and transferred to the Inland Empire Regional Composting Facility (IERCF). The dewatered biosolids are then converted to Class A compost material for beneficial reuse. IEUA also operates a Solids Handling Facility, which processes dairy manure and food wastes and converts the wastes to usable methane gas. The converted methane gas is used to fuel the electricity-producing engine generators that operate the IEUA water reclamation facilities, biosolids treatment facilities, and recycled pump facilities. IEUA is also in the process of installing solar energy generation systems at several of its facilities, which, in conjunction with methane gas-fueled engine generators, will increase the total renewable energy production to about 65 percent of the IEUA electrical power demand.

CITY OF UPLAND

The City of Upland has implemented a number of policies and programs to assist the community in preserving the local environment. Existing programs and policies relevant to community GHG emissions reductions include the following:

- *Water Conservation Program*. Section 13.16 of the City's Municipal Code, the Water Conservation Program, is intended to promote water efficiency and conservation through provisions of water usage activities, such as the washing of sidewalks and cars, excessive runoff of water, and outdoor landscape irrigation. Water conservation requirements are determined for four scenarios: Year-round shortage, Moderate shortage, High shortage, and severe shortage stages.

- *Water-Conserving Plumbing Fixtures for New Construction*. Section 13.20 of the City's Municipal Code establishes water-conserving plumbing fixture requirements for new construction projects. Requirements include water control flow rates for toilets, urinals, showerheads, and bathroom faucets.

- *Burying, Burial, and Dumping of Solid Waste or Recyclables Ordinance*. Section 13.28.370 of the City's Municipal Code declares it unlawful for any person, including trash collectors, to burn, bury, dump of disposed of any solid waste or recyclables within the City.

- *Household and Green Waste*. The City has contracted Burrtec Waste Industries, Inc. to collect household and green waste. The City offers information on additional waste disposal locations and hazardous waste drop offs.

- *Recycling*. In response to various environmental concerns and the State of California Waste Management Act (AB 939), the City is committed to reduce the amount of waste sent to the landfills. The City provides an abundance of information on locations for recycling materials, green waste, and construction/demolition debris.

- *California Green Building Standards Code Adopted*. The City has adopted the 2010 California Green Building Standards (CALGreen) Code as the green building standards of the city. The CALGreen Code contains environmental goals and standards for water and energy efficiency, water reuse, green building standards, and sustainable building practices.

- *Vehicle Trips Reduction Measures*. The City contains vehicle trip reduction measures in Section 17.22 of the Municipal Code to meet congestion management and air quality goals. Such vehicle trip reduction measures include provisions for bicycle parking facilities, pedestrian walkways, bicycle trails, and transit improvements for multifamily residential, single-family residential, and nonresidential projects.

- *Water Efficient Project Requirements*. Section 17.26 of the City's Municipal Code establishes water efficiency design requirements for landscaping and irrigation plans for construction projects. Water efficiency requirements for construction projects include submittal of design statements, irrigation and water management plans, water efficiency

plans, pressure calculations, water efficient equipment and proposed water conservation methods, amongst others.

HOW TO USE THIS PLAN

This Climate Action Plan includes four chapters: Introduction, Emissions Inventory and Reduction Target, Climate Action Strategies, and Implementation. A summary of each chapter is provided below.

Chapter 1: Introduction

Chapter 1, *Introduction*, provides a brief description of the GHG gases and climate change, the CAP's relationship to the General Plan, and a summary of the various GHG-related regulations on the federal and state level. Regional and local policies and plans are also covered.

Chapter 2 Emissions Inventory and Reduction Target

Chapter 2, *Emissions Inventory and Reduction Target*, describes Upland's baseline (2008) and projected emissions inventory and identifies a reduction target. The CAP includes emissions projections both 2020 (the AB 32 target year) and 2035 (the Upland General Plan Horizon Year and the second target year for the SCAG SCS) projections when reporting the emissions reduction potential of recommended measures. The BAU scenario estimates emissions assuming that statewide emissions reduction measures included in the CAP would not be adopted or implemented.

Chapter 3: Climate Action Strategies

Chapter 3, *Climate Action Strategies*, outlines the specific action steps that will implement each measure for which GHG emission reductions have been quantified. Measures are grouped within the following strategies; Transportation and Land Use, Energy Use and Conservation, Water Use and Efficiency, Solid Waste and Recycling, and Municipal. The City has provided an implementation timeframe, responsible departments, and selected performance indicators and monitoring and reporting requirements for each action step to evaluate the success of each measure. The City's Planning Division will oversee the tracking and reporting of progress toward achieving the City's GHG emission reduction. The City Council will be provided annual reports on the progress made toward achieving the reduction target as a whole, and for each quantified measure. If the measures do not achieve or surpass the expected GHG reductions, the City will examine ways to increase measure performance or create new measures capable to compensate for missed emission reductions.

Chapter 4: Implementation

During the implementation and monitoring process the CAP will be reviewed to evaluate the success of the strategies. A CAP management team or sustainability coordinator will ensure that climate change-related considerations are included as requirements in all relevant decision making processes. Development of a performance monitoring process and a study of the costs and benefits of the CAP strategies will also be required. Additional information regarding the CAP implementation is provided in Chapter 4, *Implementation*.

Plan Adjustments and Flexibility

The CAP represents the City's aggressive effort to respond to the challenge of climate change at the time of preparation. The topic of climate action planning is changing frequently and rapidly evolving. Over the next decade, new information, GHG reduction methods, and legislation are likely to develop. In order to remain effective, the CAP must evolve over time and respond to improvements in climate science, new opportunities for GHG reduction and climate adaptation, and changes in climate policy. Therefore, the CAP will be reviewed and modified on a regular basis to identify potential plan update needs. These reviews will evaluate improvements to climate science, explore new opportunities for GHG reduction and climate adaptation, and respond to changes in climate policy.

The City Council will be provided annual progress reports on the progress implementation of the CAP measures and associated reductions. If the measures do not achieve or surpass the expected GHG reductions, the City will examine ways to increase measure performance or create new measures capable to compensate for missed emission reductions. It should be noted that although a new CAP is not required annually, CAP measures should be implemented according to the timing identified in the Target/Performance Criteria. The reduction measures identified within the CAP are consistent with the policies and actions that have been developed for the General Plan Update and the Zoning Code Update. The CAP identifies performance criteria for each measure, which are primarily designed to be implemented through the General Plan and Zoning Code.

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CHAPTER 2.0
EMISSIONS INVENTORY AND REDUCTION TARGET

This section describes Upland's greenhouse gas (GHG) emissions inventory and reduction target. Emissions were calculated for the City's existing and proposed land uses. The inventory was compiled using consumption rates and emissions factors from multiple sources. The emissions sources represent the total GHG emissions occurring within the City and include the major sources such as residential, commercial, and industrial buildings; transportation; water conveyance; and solid waste generation. The GHG emissions from these sectors are associated with numerous direct and indirect sources. Direct sources are attributed to combustion of fossil fuels and area source emissions from buildings. Indirect sources consist of emissions from electricity generation, solid waste, and water transport. The City's reduction target was chosen to contribute to the stabilization of global GHG emission concentrations and achievement of AB 32 goals.

METHODOLOGY

An inventory of GHG emissions requires the collection of information from a variety of sectors and sources. Community emissions from electricity and natural gas are based on usage rates specific to each land use type and are calculated using emissions coefficients from various sources, including the U.S. Environmental Protection Agency (EPA), the California Energy Commission (CEC), the California Air Resources Board (CARB), and the California Climate Action Registry (CCAR). Transportation data, including vehicle miles traveled (VMT), are based on traffic data provided by Fehr & Peers. Solid waste data was based on generation factors as well as historic and projected generation data identified in Upland General Plan Update EIR and the *California Department of Resources Recycling and Recovery (CalRecycle)*. City staff was instrumental in providing data on municipal operations.

The community inventory represents all the energy used and waste produced within Upland and its contribution to GHG emissions. Municipal sources represent all City operated buildings and vehicles, City employee commute, solid waste, water delivery/treatment facilities, wastewater facilities, and street lights. The municipal inventory is a subset of the community inventory, and includes emissions derived from internal government operations.

Separate emissions inventories for community and municipal operations are generally created since the government is committed to action on climate change, and has a higher degree of control to achieve reductions in its own municipal emissions than those created by the community at large. Additionally, by proactively reducing emissions generated by its own activities, the City of Upland takes a visible leadership role in the effort to address climate change.

When calculating the emissions inventory, all energy consumed in the City was included. As a result, even though the electricity used by Upland's residents is produced elsewhere, the energy and emissions associated with energy consumption appears in the City's inventory. The decision to calculate emissions in this manner reflects the general philosophy that a community should take full ownership of the impacts associated with its energy consumption, regardless of whether the generation occurs within the geographical limits of the community. Additionally, the energy consumption is a result of activities that are within the City's regulatory authority.

GHG EMISSIONS SECTORS

Compiled land use data for Upland's existing land uses as well as proposed land uses together with GHG emissions factors were used to create the City's GHG inventory. Calculated GHG emissions from area sources, energy consumption, transportation, water and wastewater, and solid waste generation, which are further discussed below.

Energy Consumption

Energy related emissions are from the consumption of both electricity and natural gas. These emissions are both direct (e.g., building energy consumption) and indirect (e.g., produced off-site from energy production). The emissions inventory uses electricity usage rates for residential, commercial, and industrial land uses from EPA's Emissions & Generation Resource Integrated Database (eGRID), while the natural gas usage rates are calculated utilizing emissions factors from the CCAR. Southern California Edison (SCE) is the supplier of electricity to the City, while the Southern California Gas Company provides natural gas to the City.

Transportation

ON-ROAD VEHICLES

Upland's transportation sector includes emissions generated from VMT data which has been provided by Fehr and Peers. Based on a review of the available analytical tools for calculating VMT, Fehr and Peers calculated VMT using the City of Upland Travel Demand Model. The model estimates the number of trips for the Existing and Future land uses in the City of Upland. These trips were disaggregated by purpose (work, shopping, school, and recreational) and whether they were peak hour or off-peak hour trips. For each of these trip types, a trip length was estimated using the model. This trip length was then applied to the trip types to provide the Citywide VMT.

It should be noted that these VMT estimates reflect the origin/destination approach which tracks travel based on the beginning and ending point of a trip. Trips that were included in the analysis include:

- Travel that both begin and end in the City of Upland;
- Travel that begin in the City of Upland and then leave the City; and
- Travel that begins outside of the City of Upland and then travel to the City.

This approach excludes through travel that begin and end outside of the City. Additionally, VMT associated with trips that either begin or end outside of the City has been discounted by 50 percent based on the guidance provided by the SB 375 Regional Targets Advisory Committee (RTAC).

Transportation-related emissions were calculated using CARB's Emission Factors model (EMFAC2011) and the VMT data provided by Fehr and Peers. EMFAC2011 was used to obtain San Bernardino County-specific emission coefficients for vehicle fuel distribution, vehicle fuel efficiencies, and emission factors to calculate GHG emissions.

AVIATION EMISSIONS

Located in the southwest portion of the City, northeast of the Foothill Boulevard/Monte Vista Avenue intersection, Cable airport is the largest privately owned airport in the country. Encompassing 105 acres, Cable Airport is a general aviation airport offering private and charter service. There are over 450 aircraft stationed at the airport, where private aircraft tie-down, aircraft rentals, and flying lessons are provided. Cable Airport is classified as an uncontrolled field, given that there is no one in the tower directing traffic into and out of the airport. Except during special events, pilots are responsible for watching for other aircraft in the pattern.

According to the *Cable Airport Master Plan* (dated May 2012)[1] and from supplemental updated information[2], Cable airport currently uses approximately 180,000 gallons of aviation fuel. It should be noted that fuel sales since 1999 show a declining trend; however, Jet A fuel usage has increased in recent years due to increases in emergency helicopter operations. Emissions from airport fuel usage were calculated based on factors from the CCAR General Reporting Protocol.

Water and Wastewater

The amount of water used and wastewater generated by a project has indirect GHG emissions associated with it. These emissions are a result of the energy used to supply, distribute, and treat the water and wastewater. It will often be the case that the water treatment and wastewater treatment occur outside of the project area. In this case, it is still important to quantify the energy and associated GHG emissions attributable to the water use. In addition to the indirect GHG emissions associated with energy use, wastewater treatment can directly emit both methane and nitrous oxide. The City of Upland provides water service to a majority of the City with the exception of approximately 27 acres located east of the Cucamonga Canyon Channel, which is served by the Cucamonga Valley Water District (CVWD). The City's sphere of influence (SOI) receives water from the San Antonio Water Company (SAWCo).

Solid Waste

Emissions from waste result primarily from organic waste occurring at landfills where the waste is disposed. Methane (CH_4) is the primary GHG from waste and the emissions result from chemical reactions and microbes acting upon the waste as the biodegradable materials break down. Solid waste generation rates for residential and non-residential land uses were obtained from the California Integrated Waste Management Board, while the emissions factors utilized to calculate GHG emissions are from the EPA's *Solid Waste Management and Greenhouse Gases: A Life-Cycle Assessment of Emissions and Sinks* document. GHG emissions were quantified from the decomposition of the waste, which generates CH_4 based on the total amount of degradable organic carbon. Trash collection and recycling services in the City are provided by Burrtec Waste Industries, Inc. These services include residential, commercial, and industrial waste services, recycling services, and composting devices. The City, in collaboration with Burrtec Waste, provides residential customers with separate containers for recyclables.

[1] AECOM, *Cable Airport Master Plan*, May 2012.
[2] Email correspondence with Bob Cable, President, Cable Airport Inc., August 21, 2013.

BASELINE GHG EMISSIONS INVENTORY

Community Sector

Table 2-1, *Baseline (2008) GHG Emissions Inventory by Emissions Category*, presents Upland's baseline GHG emissions and the percent contribution of each emissions category (i.e., area sources, energy use, waste generation, water consumption, and transportation sources). As shown below, transportation-related activities account for the majority of the City's GHG emissions (approximately 74.0 percent). Approximately 18.6 percent of Upland's GHG emissions are attributed to energy consumption associated with natural gas and electricity usage. Approximately 1.4 percent and 0.5 percent of Upland's existing GHG emissions are a result of water demand and wastewater treatment, respectively. Emissions from solid waste make up the remaining 5.5 percent.

Table 2-1
Baseline (2008) Community GHG Emissions Inventory by Emissions Category

Community Sector	GHG Emissions	
	Total $MTCO_2eq$/year	Percent of Total $MTCO_2eq$/year
Transportation	493,920	74.0
Energy	124,337	18.6
Water	9,338	1.4
Wastewater	3,151	0.5
Solid Waste	36,771	5.5
TOTAL[1]	**667,517**	**100**

GHG = greenhouse gas; $MTCO_2eq$/yr = metric tons of carbon dioxide equivalent per year

Notes:
1. Totals may be slightly off due to rounding.

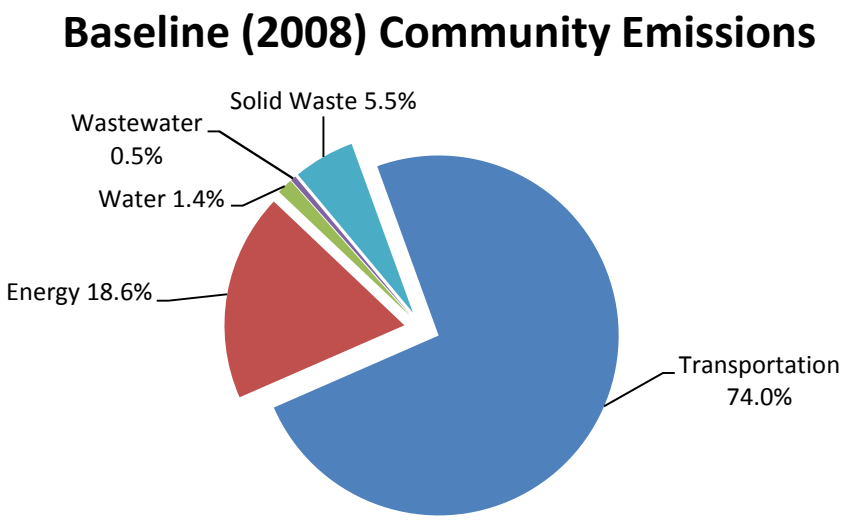


Table 2-2, *Baseline GHG Emissions Inventory by Land Use*, presents Upland's baseline GHG emissions and the percent contribution of each land use from energy, water, and waste sources. As shown below, residential uses are the land use that is the greatest GHG contributor, and accounts for approximately 21.7 percent of the City's GHG emissions. Other land uses make up less than five percent of the City's GHG emissions combined. Transportation emissions are calculated separately and account for approximately 74.0 percent of baseline GHG emissions.

Table 2-2
Baseline (2008) GHG Emissions Inventory by Land Use

Category	GHG Emissions	
	Total $MTCO_2eq$/year	Percent of Total $MTCO_2eq$/year
Residential	144,809	21.7
Commercial	7,327	1.1
Industrial	5,151	0.8
Mixed Use	14,815	2.2
Institutional	1,356	0.2
Specific Plan	139	0.02
Transportation	493,920	74.0
TOTAL[1]	**667,517**	**100**

GHG = greenhouse gas; $MTCO_2eq$/yr = metric tons of carbon dioxide equivalent per year

Notes:
1. Totals may be slightly off due to rounding.

Municipal Sector

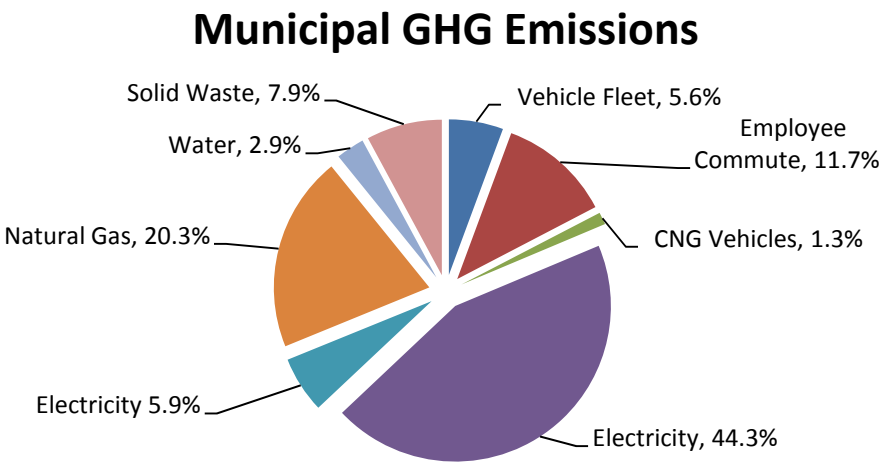
Municipal emissions include energy use from City facilities such as water delivery facilities as well as government buildings, vehicle fleets, streetlights, and City employee commuting. Municipal sector emissions represent an opportunity for the City to demonstrate how to reduce GHG emissions. Table 2-3, *Baseline (2008) Municipal Operations GHG Emissions Inventory*, presents government-related GHG emissions and the percent contribution of each emission sector. Approximately 44.3 percent and 20.3 percent of government-related GHG emissions are from building electricity and natural gas consumption, respectively. Vehicular emissions from employee commuting represent 11.7 percent. Other major municipal sources include electricity consumption of streetlights and traffic signals, which represent 5.9 percent, and the City's vehicle fleet, which represents 5.6 percent of government-related emissions.

Table 2-3
Baseline (2008) Municipal Operations GHG Emissions Inventory

Municipal Sector	GHG Emissions	
	Total $MTCO_2eq$/year	CO_2eq (percent)
Vehicle Fleet	703	5.6
Employee Commute	1,457	11.7
CNG Vehicles (Street Sweepers, Trash Collection)	161	1.3
Buildings (Electricity)	5,509	44.3
Streetlights and Traffic Signals	730	5.9
Building (Natural Gas)	2,528	20.3
Water Usage	366	2.9
Solid Waste	981	7.9
Total[1]	**12,435**	**100**

GHG = greenhouse gas; $MTCO_2eq$/yr = metric tons of carbon dioxide equivalent per year; CNG = Compressed Natural Gas

Notes:
1. Totals may be slightly off due to rounding.



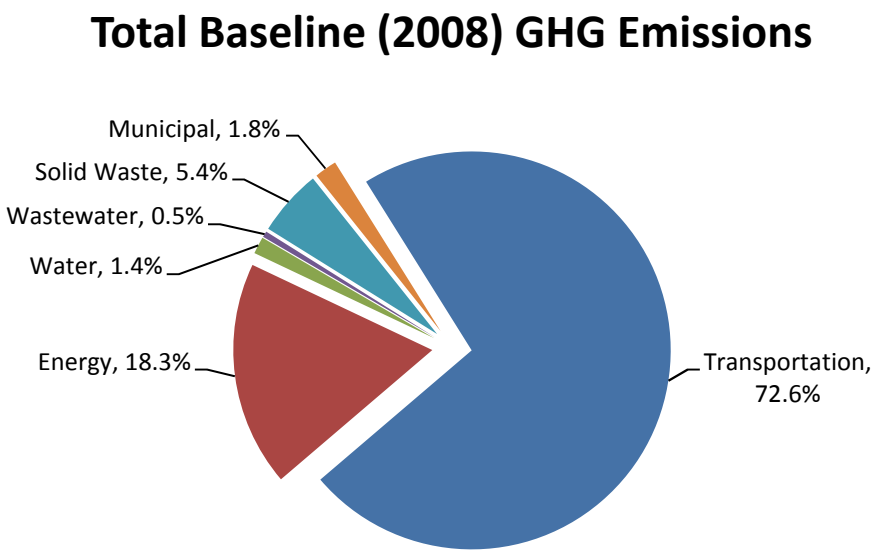
TOTAL BASELINE GHG EMISSIONS

Total Baseline GHG emissions include both the Community Sector and the Municipal Sector. As indicated in Table 2-4, *Total Baseline (2008) GHG Emissions*, the Citywide GHG emissions are 679,952 metric tons (MT) CO_2eq per year. On a per capita basis, the annual emissions for each person in the City is 9.3 $MTCO_2$eq.

Table 2-4
Total Baseline (2008) GHG Emissions

Sector	GHG Emissions	
	Total $MTCO_2$eq/year	CO_2eq (percent)
Community Sector	667,517	98.2
Municipal Sector	12,435	1.8
Total	**679,952**	**100**

GHG = greenhouse gas; $MTCO_2$eq/yr = metric tons of carbon dioxide equivalent per year



PROJECTED EMISSIONS

To determine the GHG emission reductions necessary to achieve Upland's target, the City's GHG emissions were projected for 2020 and the General Plan horizon year (2035). The projected emissions are presented in Table 2-5, *Projected 2020 and 2035 GHG Emissions Inventory by Emissions Category*. The emissions forecast estimates future emissions under a Business As Usual (BAU) scenario. The BAU scenario assumes that no effort has been made to reduce emissions. Therefore, the future emissions depicted in Table 2-5 present how GHG emissions may increase in Upland if no reduction programs are implemented.

Table 2-5
Projected 2020 and 2035 GHG Emissions Inventory by Emissions Category

Category	2020 GHG Emissions		2035 GHG Emissions	
	Total $MTCO_2eq$/year	Percent of Total $MTCO_2eq$/year	Total $MTCO_2eq$/year	Percent of Total $MTCO_2eq$/year
Transportation	528,730	72.6	574,048	71.3
Energy	147,307	20.2	176,019	21.8
Water	9,442	1.3	9,573	1.2
Wastewater	3,186	0.4	3,230	0.4
Solid Waste	39,425	5.4	42,743	5.3
TOTAL[1]	**728,090**	**100**	**805,612**	**100**

GHG = greenhouse gas; $MTCO_2eq$/yr = metric tons of carbon dioxide equivalent per year

Notes:
1. Totals may be slightly off due to rounding.

Table 2-5 presents Upland's projected 2035 GHG emissions and the percent contribution of each emissions category (i.e., area sources, energy use, waste generation, water consumption, and transportation sources). As shown below, transportation-related activities are projected to account for the majority of the City's GHG emissions (approximately 71.3 percent). Approximately 21.8 percent of Upland's projected 2035 GHG emissions are attributed to energy consumption associated with natural gas and electricity usage. Approximately 1.2 percent of Upland's projected GHG emissions are a result of water demand, and approximately 0.4 percent is from wastewater treatment. Emissions from solid waste are projected to make up the remaining 5.3 percent.

Table 2-6, *2020 and 2035 GHG Emissions Inventory by Land Use*, presents Upland's projected 2035 GHG emissions and the percent contribution of each land use from energy, water, and waste sources. As shown below, residential uses are the land use that is the greatest GHG contributor, and accounts for approximately 19.7 percent of the City's GHG emissions. Other land uses make up approximately nine percent of the City's GHG emissions combined. Transportation emissions are calculated separately and account for approximately 71.3 percent of the 2035 GHG emissions.

Table 2-6
2020 and 2035 GHG Emissions Inventory by Land Use

Category	2020 GHG Emissions		2035 GHG Emissions	
	Total $MTCO_2eq$/year	Percent of Total $MTCO_2eq$/year	Total $MTCO_2eq$/year	Percent of Total $MTCO_2eq$/year
Residential	151,048	20.7	158,846	19.7
Commercial	10,938	1.5	15,453	1.9
Industrial	7,550	1.0	10,549	1.3
Mixed Use	27,486	3.8	43,324	5.4
Institutional	1,356	0.2	1,356	0.2
Specific Plan	983	0.1	2,037	0.3
Transportation	528,730	72.6	574,048	71.3
TOTAL[1]	**728,090**	**100**	**805,612**	**100**

GHG = greenhouse gas; $MTCO_2eq$/yr = metric tons of carbon dioxide equivalent per year

Notes:
1. Totals may be slightly off due to rounding.

Growth and development under a 2035 BAU scenario would continue along a similar trend as under the 2020 BAU conditions. Assuming that the same type of current emissions-generating practices continue to occur within Upland, the City's GHG emissions would be anticipated to increase from 679,952 $MTCO_2eq$ in 2008 to 728,090 in 2020 and 805,612 $MTCO_2eq$ in 2035. This represents an 18.4 percent increase from the 2008 baseline level in 2035. In comparison, the City's projected population is expected to increase 9.4 percent by 2035 from 2008.[3] Therefore, if current emissions-generating practices continue, Upland's GHG emissions are expected to increase at a greater rate than its population in 2035. Although the City's GHG emissions are expected to increase faster than population, General Plan buildout would result in development in three focus areas: Foothill Boulevard, the Southeast Quadrant, and College Heights. Development in these focus areas include infill, mixed use, and multifamily dwelling units. The Southeast Quadrant includes residential, commercial, and industrial uses, and serves as a major employment base in the City. This focus area has the greatest potential to expand and provide high quality jobs. College Heights has a broad range of uses and opportunities for transit oriented development. As a result, an important focus of the Upland General Plan is to enhance compatibility and multi-modal accessibility throughout the area. All of the focus area would include pedestrian and bicycle-friendly amenities. Upland's projected growth is anticipated to occur near or within the focus areas, which would positively impact transportation patterns and therefore would potentially be beneficial to GHG emission reductions.

Existing and Projected Emissions

The City's existing community and municipal GHG emissions total 679,952 $MTCO_2eq$. Transportation-related activities account for the majority of the City's GHG emissions (approximately 72.6 percent). Approximately 18.3 percent of Upland's GHG emissions are

[3] Southern California Association of Governments (SCAG), *Adopted 2012 RTP Growth Forecast by City*, http://www.scag.ca.gov/forecast/index.htm. Accessed October 8, 2013.

attributed to energy consumption associated with natural gas and electricity usage. Approximately 1.4 percent of Upland's existing GHG emissions are a result of water demand, while approximately 5.4 percent of emissions are from solid waste disposal. Wastewater conveyance and treatment make up 0.5 percent, and municipal emissions make up the remaining 1.8 percent.

In the short term, transportation emissions are expected to decrease because of lower emissions from newer vehicles. These decreased emissions would likely outweigh expected increases in VMT. However, in the long term, projected increases in VMT outweigh decreased vehicle emissions resulting from improved fuel efficiency. Thus, the City's total GHG emissions would be expected to increase to approximately 805,612 $MTCO_2eq$ in the General Plan horizon year (2035).

GHG REDUCTION TARGET

The City of Upland recognizes the importance of reducing GHG emissions. Clearly defined emissions reduction targets will provide City decision makers and the community with a clear direction for Upland's GHG emissions management efforts, and will provide milestones against which progress can be evaluated over time. This target coupled with strategies and actions in this CAP the will allow Upland to have greater control of the amount of GHGs emitted into the atmosphere.

Under AB 32, the State has committed to reducing GHG emissions to 1990 levels by 2020. Based on the CARB Scoping Plan, reducing GHG emissions to 1990 levels means cutting approximately 30 percent from BAU emission levels projected for 2020, or about 16 percent from today's levels.[4] The CARB Scoping Plan projects future emissions by comparing potential reductions from various measures to a BAU scenario. The BAU scenario represents future GHG emissions without the implementation of reduction measures.

Consistent with the CARB *Scoping Plan*, the City of Upland has chosen a reduction target of 16 percent below their current (2008 baseline) emissions levels by 2020. This reduction trend would continue through the Upland General Plan horizon year (2035). The 16 percent below current emissions reduction target will contribute to the stabilization of global GHG emission concentrations and achievement of AB 32 goals. To attain the adopted target from total BAU emission levels projected for 2020, Upland will need to reduce Citywide GHG emissions by 156,930 $MTCO_2eq$ by 2020; refer to Table 2-7, *GHG Emissions Summary and Reduction Target*. This represents a 22 percent reduction from projected 2020 GHG emissions levels which take into account population growth and BAU emissions generation.

To achieve these emissions reductions, the City will implement reduction strategies for each category of GHG emissions (e.g., transportation, energy consumption, water consumption, and waste disposal). Chapter 3 identifies GHG reduction measures capable of achieving this target, and describes the relationship of the City's local actions to statewide efforts to curb GHG emissions.

[4] In the CARB Scoping Plan, "today's levels" are based on the statewide GHG inventory for 2006 - 2008. However, cities and counties are encouraged to set a 16 percent GHG reduction target for both municipal operations and the community as a whole based on the most current GHG inventory conducted.

Table 2-7
GHG Emissions Summary and Reduction Target

Scenario[1]	GHG Emissions (MT CO_2eq/yr)
Total 2008 Baseline GHG Emissions	679,952
Total 2020 BAU projected GHG Emissions	728,090
Total 2035 General Plan horizon year projected GHG Emissions	805,612
Emissions Reduction Target (16 percent below 2008 emissions)	571,160
Reduction Needed by 2020	156,930

GHG = greenhouse gas; MTCO_2eq/yr = metric tons of carbon dioxide equivalent per year; BAU = Business As Usual

Notes:
1. All scenarios refer to both community-wide and municipal emissions as the "total" amount of GHG emissions.

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CHAPTER 3.0
CLIMATE ACTION STRATEGIES

Assembly Bill 32, the Global Warming Solutions Act of 2006, requires a reduction of greenhouse gas (GHG) emissions to 1990 levels by 2020. The California Air Resources Board (CARB) is the lead agency for implementing AB 32, which set the major milestones for establishing the program. CARB met the first milestones in 2007: developing a list of discrete early actions to begin reducing GHG emissions, assembling an inventory of historic emissions, establishing GHG reporting requirements, and setting the 2020 emissions limit. As part of its mandate, CARB developed a Scoping Plan which outlined the State's strategy to achieve the 2020 GHG emissions limit. The Scoping Plan proposes a comprehensive set of actions designed to reduce overall GHG emissions in California, improve the environment, reduce dependence on oil, diversify energy sources, save energy, create new jobs, and enhance public health.

This "Approved Scoping Plan" was adopted by CARB at its December 11, 2008 meeting. In setting the reduction goal, the Scoping Plan identifies that reducing GHG emissions to 1990 levels means cutting approximately 30 percent from business-as-usual emission levels projected for 2020, or about 15 percent from 2005 baseline levels. In August 2011, CARB approved the Final Supplement to the Scoping Plan that provided an updated baseline year (emissions averaged between 2006 and 2008). The result of the analysis indicates that a 16 percent GHG emissions reduction from the updated baseline would reduce emissions to 1990 levels. In response to the CARB Scoping Plan, the City of Upland has established a goal to reduce community-wide GHG emissions to 16 percent below baseline levels by 2020.

This chapter describes the five strategies that Upland has crafted to achieve this target. Combined, these strategies will decrease the City's GHG emissions, enabling the community to contribute to global efforts to combat climate change. The strategies and emissions reductions measures within this section take into account projected growth within the City. Each of the strategies contains emission reduction measures to assist in the reduction of GHGs. These measures are consistent with and build upon the Goals and Policies within the General Plan. Implementation of the GHG reduction measures in this CAP would ensure the GHG emissions are significantly reduced from the year 2035 business as usual (BAU) scenario.

The measures were developed from evaluating the General Plan existing conditions, identifying emission reduction opportunities – especially those embraced by the community realized through community outreach, reviewing best practices from other jurisdictions and organizations, and incorporating State and regional laws, guidelines, and recommendations.

The selected measures were recommended on the following criteria:

- *Is it technically possible to implement the measure and would the community support it?*
- *Does this measure create additional co-benefits (i.e., quality of life, public health, jobs/housing balance)?*

Overview of Strategies:

GHG REDUCTION STRATEGIES
Transportation and Land Use Strategy *Promote a balanced transportation system that promotes the use of public transportation and bicycles, reduces congestion, and helps encourage residents to engage in healthy and active lifestyles.*
▪ The transportation and mobility strategy identifies opportunities to improve mobility such as walking, bicycling, and transit use, and to decrease the need to drive.
Energy Use and Conservation Strategy *Reduce energy consumption throughout all sources within the City, and incorporate clean, renewable energy sources.*
▪ The energy use and efficiency strategy recommends ways to increase energy efficiency in existing buildings, enhance energy performance for new construction, and increase use of renewable energy.
Water Use and Efficiency Strategy *Conserve and protect water resources and promote efficiency.*
▪ The intent of this strategy is to conserve water through efficient use and conservation.
Solid Waste Reduction and Recycling Strategy *Manage solid waste generation and diversion.*
▪ The strategy increases waste diversion, reducing consumption of materials that otherwise end up in landfills, and increasing recycling.
Municipal Strategy
▪ This strategy focuses on reductions that the City can implement to reduce municipal emissions.

The strategies were developed to be consistent with the Policies and Actions in the City's General Plan and set forth objectives that are achieved through implementation of the General Plan. Each strategy recommends measures and actions that will make the vision of the CAP a reality. Measures define the direction that the City will take to accomplish its GHG reduction goals. Actions define the specific steps that City staff and decision-makers will take over time.

SECTION STRUCTURE

This section is organized by strategy, objectives, measures, and actions. Each of the four strategies represents the primary ways to reduce GHG emissions in Upland. Each strategy begins with a statement and introduction to the overarching concepts that tie that particular strategy to GHG emission generation and potential reductions. This introduction is then followed by the component objectives, measures, and actions that translate to the City's vision

to implementation. The measures correlate to applicable goals, policies, and actions from the updated General Plan Land Use and Circulation Elements to help the City achieve the objectives of this CAP. Actions are to be carried out by the assigned City employee/position. The following identifies the major components of each GHG reduction strategy:

- *GHG Reduction Strategy.* The five strategies for the Upland CAP are described above and are essentially target areas to be addressed by the objectives and measures.

- *Objective.* Objectives define the programs, policies, and projects that the City would undertake to accomplish its GHG reduction targets.

- *Measure.* The measures directly correlate to goals, objectives, and policies from the General Plan. The measures are numbered to correspond to the GHG Reduction strategy (e.g., T-1 is General Plan Action OSC-4.4).

- *Measure Description.* Measure descriptions provide important background information and describe the City's rationale and policy direction. Additionally, some descriptions provide detailed guidance that will be used in program implementation.

- *Target/Performance Criteria*. Target/Performance Criteria are specific steps that the that the City will take to implement each measure. Fulfillment of the Performance Criteria would ensure the achievement of the identified reduction.

- *GHG Reduction Potential.* GHG reduction potential for each measure was calculated based on research data, findings, and guidance from the California Air Pollution Control Officers Association (CAPCOA). In several instances, combining measures lead to better emissions reductions than implementing a single measure by itself. These measures have been identified as "supporting measures." Supporting measures do not necessarily have a quantifiable GHG reduction potential of their own, but facilitate reductions of other associated measures. Therefore, measures that contribute to the reductions of other measures have been identified as supporting measures.

RESPONSIBILITY

The City's Development Services Department will oversee the implementation and monitoring of the GHG reduction strategies. Through this process, additional City Departments and Divisions (e.g., Planning Division, Building and Safety Division, Public Works Department, etc.) would be engaged to ensure the goal and reduction measures are achieved to realize the City's reduction target. Performance Criteria and the responsible departments are identified for each measure in order to enable staff, the City Council, and the public to track implementation and monitor overall CAP progress. Refer to Chapter 4, *Implementation*, for a further discussion of CAP implementation responsibility and timing.

1. TRANSPORTATION AND LAND USE STRATEGY

Promote a comprehensive, multimodal transportation system that provides all users with safe connections to homes, job centers, schools, community centers, open spaces, recreation areas and visitor destinations.

Emissions from the transportation sector are the largest portion of total emissions. Efficient transportation systems conserve fuel, and reduce travel costs and expensive road repairs. Reducing the number and length of vehicle trips and engine idling reduces emissions. Generally, there are three methods to reduce GHG emissions from the transportation sector. One method is to implement policies that reduce dependence on personal motor vehicles and encourage alternative modes of transportation, such as public transit, cycling, and walking. Another method is to utilize vehicles that release fewer GHGs, such as hybrids, more fuel efficient vehicles, and vehicles that run on alternative fuels.

These reductions can be achieved by shifting transportation and land use development patterns toward mixed use, infill and transit-oriented development (TOD). TOD's feature compact, mixed-use developments that are located near transit stations. Some of the features and benefits of TOD's include:

- Located within walking distance (five to ten minute walk) from transit stations;
- Attract economic development;
- Improve transit ridership;
- Increase activity and safety; and
- Consistent with SB 375 implementation guidelines.

Another method to reduce GHG emissions from the transportation sector is to encourage "smart growth" or policies that promote efficient land use development. Smart growth reduces the need to travel long distances, facilitates transit and other non-automotive travel, increases the availability of affordable housing, employs existing infrastructure capacity, promotes social equity, helps protect natural assets, and maintains and reinforces existing communities. The following objectives and measures aim to reduce emissions from transportation using all three methods.

INCREASE TRANSPORTATION OPTIONS

The City has adopted its *Bicycle and Pedestrian Facilities Master Plan* that sets forth a program for enhancements, improvements, and additions to the City's bikeways network to ensure that it meets the needs of users, now and in the future. These facilities will improve bicycling and walking throughout the city both for transportation and recreation purposes, and encourage use of non-motorized forms of transportation. The *Bicycle and Pedestrian Facilities Master Plan* recommends projects, identifies potential funding sources, and provides design guidelines to ensure a high-quality bicycle network. Goals include developing a safe and efficient bicycle and pedestrian system, designing the bicycle network to provide efficient routes through commercial and residential areas, and working with the Upland Unified School District to identify suggested bicycle routes adjacent to schools that will tie into the bicycle network and effectively serve the students. Implementation of the *Bicycle and Pedestrian Facilities Master Plan* would encourage alternative modes of transportation throughout Upland, reduce vehicle trips, and reduce GHG

emissions. Several of the Transportation and Land Use measures facilitate implementation of the City's *Bicycle and Pedestrian Facilities Master Plan*.

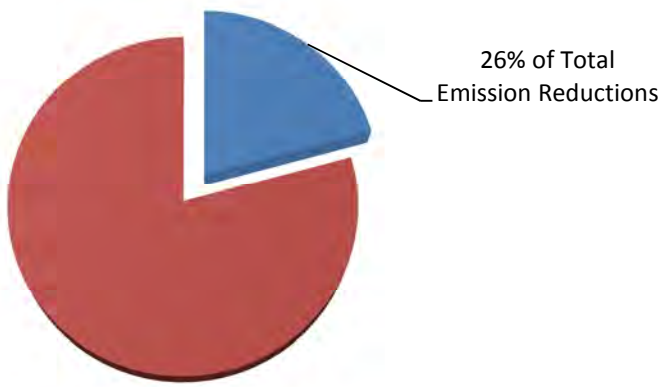
San Bernardino Associated Governments (SANBAG) has prepared a draft Long Range Transit Plan (LRTP), which establishes a vision for transit for the next 25 years. The LRTP prioritizes goals and projects for transit growth and connects land use and transportation strategies. The LRTP also meets legal mandates for planning and programming set by SB 375. The City will work closely with SANBAG to maximize land use efficiency, improve jobs/housing balance, increase mixed use development opportunities, and increase transit oriented development opportunities. The Transportation Strategy of this CAP coincide with several objectives within the LRTP to address current and future travel challenges and provide a comprehensive multimodal transportation system. As indicated in the applicable measures below, the City of Upland can benefit greatly by coordinating with SANBAG to achieve their combined sustainability goals through developing an integrated transportation and land use system.

TRANSPORTATION AND LAND USE MEASURES

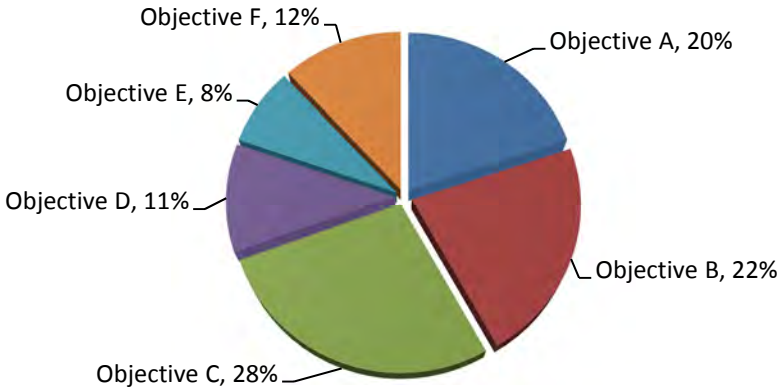
Objective A:	Increase Alternative Transportation Options	General Plan Policy/Action
T-1	Bicycle and Pedestrian Facilities Master Plan	Action OSC-4.4
T-2	Zero- and Low-Emissions Vehicle Use	Policy OSC-5.8
T-3	Preference for Reduced-Emission Equipment	Policy OSC-5.9
T-4	Residential Development	Policy FA-6.3
T-5	Access Improvements to Montclair Station	Policy FA 6.4
T-6	Montclair Transportation Center	Policy FA-6.7
Objective B:	**Maximize Land Use Efficiency**	
T-7	Residential Density	Policy ES-3.9
T-8	Housing	Policy FA-1.6
T-9	High-Density Housing	Policy FA-6.5
T-10	Compact Development	Policy OSC-4.2
Objective C:	**Improve Jobs/Housing Balance**	
T-11	Reduce Commute Times	Policy FA-6.1
T-12	Business/Residential Mixed-Use	Policy FA-6.9
T-13	Jobs-Housing Match	Policy LU-1.6
T-14	Balance Commercial and Residential Development	Policy LU-4.2
T-15	Jobs Housing Balance	Policy LU-4.3
Objective D:	**Increase Mixed Use Development Opportunities**	
T-16	Mixed Use Centers	Policy FA-1.5
T-17	Mixed-Use Development	Policy LU-5.2
T-18	Development Review	Action FA-1.1
T-19	Outreach to Property Owners	Action FA-1.2
T-20	Infill Development	Policy LU-4.1
T-21	Mixed Retail Development	Policy OSC-4.3
Objective E:	**Increase Transit Oriented Development Opportunities**	
T-22	Transit-Oriented Development	Policy FA-1.2
T-23	Transit-Oriented Employment Development	Policy FA-6.2
T-24	Transit Zones	Policy LU-5.3
T-25	Transit-Oriented Development	Policy LU-5.4

Objective F:	Trip Length Reduction	
T-26	Multi-Modal Transportation Connectivity	Policy FA-6.5
T-27	Connectivity	Policy FA-6.10
T-28	Complete Neighborhoods	Policy HC-1.2
T-29	Strategic Growth	Policy LU-1.3
T-30	Incentives	Policy LU-4.4
T-31	Complementary Uses	Policy LU-5.1
T-32	Pacific Electric Trail	Action OSC-3.5
T-33	Land Use Patterns	Policy OSC-4.1
T-34	Reduction in Commuting	Policy OSC-4.8
T-35	Rideshare Incentives	Policy OSC-4.9
T-36	Transit Improvements	Action OSC-4.2
T-37	Traffic Features	Action OSC-4.3

Transportation and Land Use Strategy



Emissions Reduction by Objective



Total Transportation and Land Use Strategy Emission Reductions = 51,127 $MTCO_2eq$

Objective A: Expand Transportation Programs.

Measure	Target/Performance Criteria	GHG Reduction Potential
T-1: Bicycle and Pedestrian Facilities Master Plan. Coordinate with SANBAG to implement the City's Bicycle and Pedestrian Facilities Master Plan to ensure sufficient facilities for non-motorized transportation.	Coordinate with SANBAG by 2015 and identify key facilities. Implement facilities by 2020, subject to funding.	4,071 $MTCO_2eq$
T-2: Zero- and Low-Emission Vehicle Use. Encourage the use of zero-emission vehicles, low-emission vehicles, non-motorized vehicles and bicycles, and car-sharing programs by requiring sufficient and convenient infrastructure and parking facilities in residential developments and employment centers to accommodate these vehicles.	As proposed by the 2014 Zoning Code Update, the building code will include requirements for electric vehicle charging facilities.	Supporting Measure
T-3: Preference for Reduced-Emission Equipment. Give preference to professional maintenance providers using reduced emission equipment for contracts for services (e.g., landscape maintenance), as well as businesses which practice sustainable operations, to the extent that it is economically feasible to do so.	Update applicable City policies by 2018.	Supporting Measure
T-.4: Higher Density Residential Development. Focus light industrial and mixed commercial/industrial uses in College Heights in the southwestern corner of the area near Claremont Colleges and higher density residential around the Metrolink in historic downtown Upland and future Gold Line stations.	As proposed by the 2014 Zoning Code Update and the Upland General Plan 2035, development at these locations will be accommodated. Implement streetscape and connectivity improvements by 2018.	6,080 $MTCO_2eq$
T-5: Access Improvements to Montclair Station. Coordinate with the City of Montclair to implement streetscape and connectivity improvements to support access to the station.		Supporting Measure
T-6: Montclair Transportation Center. Strengthen multi-modal transportation linkages to the Montclair Transportation Center from the College Heights area.		Supporting Measure
Responsibility:	Planning Division and Public Works Department	

Objective B: Maximize Land Use Efficiency.

Measure	Target/Performance Criteria	GHG Reduction Potential
T-7: Residential Density. Increase residential densities in appropriate locations to provide a customer base for new and existing commercial uses.	The proposed 2014 Zoning Code Update and the Downtown Specific Plan would increase land use density in these areas.	10,575 $MTCO_2eq$
T-8: Housing. Allow for and encourage the development of higher density, multi-family residential projects at mid-blocks along Foothill Boulevard.		486 $MTCO_2eq$
T-9: High-Density Housing. Encourage higher-density multi-family housing near the Metrolink Station in historic downtown Upland and mixed-use developments near the Montclair Transportation Center as designated on the Land Use Plan in the southwestern portion of College Heights.		132 $MTCO_2eq$
T-10: Compact Development. Where development opportunities near shopping areas and transit corridors exist, prioritize higher-density residential development.		53 $MTCO_2eq$
Responsibility:	Planning Division	

Objective C: Improve Jobs/Housing Balance.

Measure	Target/Performance Criteria	GHG Reduction Potential
T-11: Reduce Commute Times. Reduce commute times for Upland residents and employees by providing more local employment near transit.	Implementation of the General Plan Update will facilitate mixed use development to improve the jobs/housing balance. Ensure new development is located as close to existing development as possible and maximize the density and mix of uses by providing more employment in the City and near transit.	2,644 $MTCO_2eq$
T-12: Business/Residential Mixed-Use. Allow parcels south of the Pacific Electric Trail in College Heights to contain both light industrial and residential uses to support opportunities for live/work arrangements in the City.		2,379 $MTCO_2eq$
T-13: Jobs-Housing Match. Encourage new employment opportunities that match the range of housing types to make it possible for people to live and work in Upland.		9,094 $MTCO_2eq$
T-14: Balance Commercial and Residential Development. Strive to balance commercial and residential development within the City to reduce the number of residents commuting long distances for their shopping needs.		Supporting Measure
T-15: Jobs Housing Balance. Encourage a balance between jobs, workforce skills, and housing supply, which will reduce the negative impacts of long commutes.		Supporting Measure
Responsibility:	Planning Division	

Objective D: Increase Mixed Use Development Opportunities.

Measure	Target/Performance Criteria	GHG Reduction Potential
T-16: Mixed-Use Centers. Allow for the intensification of commercial and introduction of residential uses at the intersections of Mountain Avenue, San Antonio Avenue and Euclid Avenue to create vibrant, mixed-use centers. Encourage housing to be set back from the street at the primary intersections of Mountain, San Antonio and Euclid Avenues to allow commercial uses to activate the street front.	As proposed by the 2014 Zoning Code Update, the zoning code will remove impediments to mixed use and intensification of commercial and residential uses.	3,965 $MTCO_2eq$
T-17: Mixed-Use Development. Along major arterials such as Foothill Boulevard, provide opportunities for residential, commercial and employment uses to occupy the same site in mixed-use configurations, and regulate mixed-use development to ensure high-quality development and protection of the occupants.	As proposed by the 2014 Zoning Code Update, the zoning code will include provisions for mixed-use development along major arterials.	1,586 $MTCO_2eq$
T-18: Development Review. Provide expedited review and, if feasible, financial or other means of support, for master planned or mixed-use development projects that meet both the goals and design guidelines provided in the General Plan.	Implementation of the General Plan Update will facilitate mixed-use and infill development.	Supporting Measure
T-19: Outreach to Property Owners. Work with property owners and developers on Foothill Boulevard to ensure that they are aware of the new land uses permitted and how they could benefit from them.		Supporting Measure
T-20: Infill Development. Encourage mixed-use, infill development on brownfields or underutilized parcels near public transit, and within the historic downtown.		Supporting Measure
T-21: Mixed Retail Development. Encourage employment areas to include a mix of retail support services, and allow new small-scale retail and service uses within established residential neighborhoods to reduce vehicle trips.		Supporting Measure
Responsibility:	Planning Division	

Objective E: Increase Transit Oriented Development Opportunities.

Measure	Target/Performance Criteria	GHG Reduction Potential
T-22: Transit-Oriented Development. Encourage the intensification of development in areas that are served by transit and multi-modal opportunities.	Implementation of the General Plan Update will facilitate transit oriented development.	3,965 $MTCO_2eq$
T-23: Transit-Oriented Employment Development. Retain and attract land uses with higher employment intensities that support transit and strengthen linkages between land uses and transit.		Supporting Measure
T-24: Transit Zones. Support transit zones around existing and planned transit stations where transit-oriented development should be facilitated.		Supporting Measure
T-25: Transit-Oriented Development. Support the development of high-density multi-family residential and mixed-use projects around transit stations by allowing deviations in development standards.		Supporting Measure
Responsibility:	Public Works Department, Planning Division	

Objective F: Trip Length Reduction.

Measure	Target/Performance Criteria	GHG Reduction Potential
T-26:Multi-Modal Transportation Connectivity. Create new roadways and improve pedestrian and bicycle facilities and linkages to regional facilities, such as the Pacific Electric Trail, throughout College Heights.	Implement bicycle and pedestrian linkages by 2020.	Supporting Measure
T-27: Connectivity. Incorporate pedestrian design elements including pedestrian-oriented street and sidewalk improvements to improve connectivity throughout College Heights.	Implement pedestrian-oriented street and sidewalk improvements in College Heights by 2020.	3,306 $MTCO_2eq$
T-28: Complete Neighborhoods. Encourage new development to create complete neighborhoods and districts where residents can live within an easy and safe walking distance to daily services, recreational opportunities, and other community amenities that are part of a healthy lifestyle.	Identify opportunities for complete neighborhoods by 2015.	2,207 $MTCO_2eq$
T-29: Strategic Growth. Concentrate growth in strategic locations that strengthens the City's economic base, offers new housing opportunities, maximizes available and planned infrastructure, and fosters the development and use of transit and multi-modal transportation. These areas include Historic Downtown Upland, Foothill Boulevard, the Southeast Quadrant, College Heights, Mountain Avenue, along the Interstate 10 corridor, and in the 9th Street Industrial area.	Implementation of the General Plan Update and other CAP measures will facilitate trip length reductions.	Supporting Measure
T-30: Incentives. Work to identify and support financial and administrative incentives (i.e., fee reductions) to encourage desired land uses, development patterns, and alternative modes of transportation that reduce greenhouse gas emissions.		Supporting Measure
T-31: Complementary Uses. Encourage the development of complementary land uses that reduce the need for car travel, such as grocery stores, basic commercial services, parks and recreational fields, and schools in close proximity to residential uses.		476 $MTCO_2eq$
T-32: Pacific Electric Trail. Maintain and enhance the Pacific Electric Trail with additional landscaping and shade trees to encourage residents to use the existing recreational resource.		Supporting Measure
T-33: Land Use Patterns. Promote land use patterns that reduce the number and length of motor vehicle trips.		106 $MTCO_2eq$
T-34: Reduction in Commuting. Promote expansion of employment opportunities within Upland to reduce commuting to areas outside of the City.		Supporting Measure
T-35: Rideshare Incentives. Encourage employers to offer employees incentives for ridesharing.		Supporting Measure
T-36: Transit Improvements. Coordinate with public transit providers to increase funding for transit improvements to supplement other means of travel.		Supporting Measure
T-37: Traffic Features. Implement traffic features such as integrated signalization to improve traffic flow and reduce emissions from vehicle idling and stop and start.		Supporting Measure
Responsibility:	Public Works Department, Planning Division	

2. ENERGY USE AND CONSERVATION STRATEGY

Increase health and quality of life for citizens of Upland as well as environmental sustainability through conservation of open space and natural resources, and encouraging greenhouse gas reductions and alternatives to the use of non-renewable resources.

ENERGY EFFICIENCY

Energy generation is the second largest source of GHG emissions. Thus, strategies to conserve energy and use it more efficiently in Upland's operations and in the community will help reduce GHG emissions. In addition, energy efficiency and conservation measures save money and resources. City buildings, equipment, and infrastructure all use energy. Typically, newer purchases and installations tend to be more energy efficient, but opportunities to enhance efficiency still exist. Buildings can be made more efficient by upgrading insulation and installing low emissive glass, using high-efficiency lighting with timers and sensors, installing cool roofs, and simply adjusting heating and cooling levels.

Increasing energy efficiency throughout the community has immense potential to both reduce GHG emissions and save money. A wealth of resources exists to assist municipalities in this regard. For example, the Energy Star program offers energy efficient products and tools for improving energy management. Promoting Energy Star resources to both businesses and residents is a good way to achieve increased energy efficiency. Other methods to increase community energy efficiency include subsidizing energy management services such as energy audits for residents and businesses. Ensuring that developers and building contractors are trained on energy conservation and efficiency is also within the City's purview.

A commitment to cost effective highly efficient construction in municipal facilities is one way the City can reduce GHG emissions from the built environment. In addition, the City could adopt the *2013 California Green Building Standards Code* (CALGreen) voluntary measures for residential and non-residential buildings as mandatory. The City could lead by example and encourage the community to reduce their energy consumption.

The CALGreen building standards sets new mandatory measures for minimum standards that all new structures can realize to significantly reduce the state's overall carbon output. The code provides standards for residential and non-residential structures. In addition to the basic mandatory measures, CALGreen provides optional or voluntary measures to further reduce impacts, which are grouped as Tier 1 and Tier 2. Tier 1 measures are not costly and simple to implement. Tier 2 measures are more extreme and can be costly. CALGreen standards will evolve over time to become more stringent. It is likely that Tier 1 measures will become mandatory in the future updates of the CALGreen code.

ALTERNATIVE ENERGY

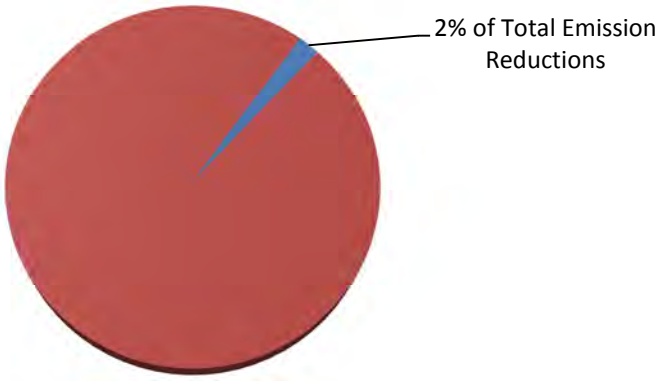
Sources of renewable energy include solar, wind, biomass, and geothermal. Hydrogen fuel cells are renewable energy sources that hold promise but require further research and innovation before they are as practical and possible to implement as other options. Renewable energy sources offer the potential for a clean, decentralized energy source that can significantly impact the municipality's GHG emissions. The City of Upland and Southern California Edison

(SCE) will work to build on current efforts to integrate alternative energy into the community's power scheme. Energy generated from renewable sources produces less GHG emissions than energy generated from conventional sources; low carbon fuels are those that are formulated to produce fewer GHG emissions.

ENERGY USE AND CONSERVATION REDUCTION MEASURES

Objective A:	Energy Efficient Programs and Design	General Plan Policy/Action
E-1	GHG Reduction in New Development	Policy OSC-5.2
E-2	Recruitment of Energy-Efficient Businesses	Policy OSC-6.6
E-3	Compliance with Energy Efficiency Standards	Policy OSC-6.1
E-4	Deciduous Trees	Policy OSC-6.4
E-5	Regional Coordination	Action OSC-6.3
E-6	Assessment Programs	Action OSC-5.6
E-7	Incentives	Action OSC-5.5
Objective:	**Green Building**	
E-8	Green Building	Action OSC-5.3
E-9	Green Businesses	Action OSC-5.4
E-10	Green Building Practices	Policy OSC-4.15
E-11	Minimum Green Building Standards	Policy OSC-5.11
E-12	New Development	Policy OSC-6.2
Objective:	**Renewable Energy Programs**	
E-13	Renewable Energy	Policy OSC-6.3

Energy Use and Conservation Strategy



Total Energy Use and Conservation Strategy Emission Reductions = 3,830 $MTCO_2eq$

Objective A: Energy Efficient Programs and Design

Measure	Target/Performance Criteria	GHG Reduction Potential
E-1: Greenhouse Gas Reduction in New Development. Reduce greenhouse gas emissions from new development by; promoting water conservation and recycling; promoting development that is compact, mixed use, pedestrian friendly, and transit oriented; promoting energy-efficient building design and site planning; improving the jobs/housing ratio; and other methods of reducing emissions.	Implementation of the General Plan Update and the 2014 Zoning Code Update will facilitate reductions in new development.	2,357 $MTCO_2eq$
E-2: Recruitment of Energy-Efficient Businesses. Strive to recruit businesses that research, develop, manufacture, utilize, and promote energy efficiency, conservation and advanced renewable technologies such as waste-to-energy facilities.	Recruit energy efficient and renewable technology businesses through outreach and economic development efforts by 2015.	Supporting Measure
E-3: Compliance with Energy Efficiency Standards. Require existing residential and commercial buildings to meet adopted energy efficiency standards prior to a completion of sale.	Work with the real estate community to encourage point-of-sale requirements by 2015.	Supporting Measure
E-4: Deciduous Trees. Require that deciduous trees be planted on the south- and west-facing sides of new buildings onsite to reduce energy use in the summer and winter months.	Implementation of the 2014 Zoning Code Update and revised Landscape Ordinance will include deciduous tree requirements by 2015.	Supporting Measure
E-5: Regional Coordination. Support the County of San Bernardino in its efforts to create the San Bernardino Valley Clean Energy District, which would make loans for homeowners and businesses seeking to install solar panels or take on other projects related to energy conservation.	Establish and maintain involvement in the San Bernardino Valley Clean Energy District efforts.	Supporting Measure
E-6: Assessment Program. Consider a contractual assessment program (similar to that permitted under AB 811 [Levine, 2008]), for residential and commercial property owners to install renewable energy systems such as solar and wind power, purchase energy efficient appliances and complete building retrofits such as installation of thermally efficient windows, extra insulation and HVAC upgrades, provided that subsidies are covered through grants or other outside funding sources and not from the General Fund.	Offset one percent of City's energy emissions with renewable energy by 2020.	1,473 $MTCO_2eq$
E-7: Incentives. Develop and adopt incentives for the construction of green buildings, such as expedited permitting or reduced building fees, provided that building fee reductions are covered through outside funding sources, such as grants, and not from the General Fund.	Adopt incentives for LEED Certified (or equivalent) buildings by 2016.	Supporting Measure
Responsibility:	Planning Division, Building and Safety Division	

The measures in Objective A focus on achieving energy efficiency with project design. As described above, the CALGreen standards include building concepts that would promote energy efficiency. The CALGreen Tier 1 voluntary measures for new structures are simple and inexpensive ways to improve building efficiency. CALGreen Section 306.1 states that voluntary measures are intended to further encourage building practices that improve public health, safety, and general welfare by promoting the use of building concepts which minimize the

building's impact on the environment, promote a more sustainable design and high-performance educational facilities.

Residential voluntary measures are provided for planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. Implementation of voluntary measures would contribute to the City's overall GHG reduction and would facilitate implementation of the measures in Objective A as well as other measures throughout this CAP.

Examples of voluntary measures include:

Planning and Design

- Site Selection: Use of an infill or greyfield site, or an EPA-recognized and remediated Brownfield site (Section A4.103).
- Deconstruction and Reuse of Existing Materials: Existing buildings on the site are deconstructed and the salvaged materials are reused. Reused materials or products must comply with current building standards requirements or be an accepted alternate method or material (Section A4.105).

Energy Efficiency

- Lighting: Building lighting consists of at least 90 percent ENERGY STAR qualified hard-wired fixtures (Section A4.209.1).
- Appliance Rating: Each appliance provided by the builder meets ENERGY STAR if an ENERGY STAR designation is applicable for that appliance (Section A4.210.1).

Water Efficiency and Conservation

- Indoor Water Use: The maximum flow rate at a kitchen sink faucet shall not be greater than 1.5 gallons per minute at 60 pounds per square inch (psi) (Section A4.303.1).

Material Conservation and Material Recovery

- Efficient Framing Techniques: Beams and headers and trimmers are sized and installed as specified in California Residential Code (CRC) Tables R502.5 (1) and R502.5 (2). Other calculations acceptable to the enforcing agency which use the minimum size member for the tributary load shall be acceptable (Section A4.404.1 Lumber Size).
- Construction Waste Reduction, Disposal and Recycling: Nonhazardous construction and demolition debris generated at the site is required to be diverted (recycled or salvaged) to achieve a 65 percent waste reduction (Section A4.408.1 Enhanced construction waste reduction).

Environmental Quality

- Indoor Air Quality and Exhaust: Filters with a higher value than a Minimum Efficiency Rating Value (MERV) of 6 are installed on central air or ventilation systems. Pressure drop across the filter shall not exceed 0.1 inches water column (Section A4.506.1 Filters).

- Innovative Concepts and Local Environmental Conditions: The provisions of this code are not intended to prevent the use of any alternate material, appliance, installation, device, arrangement, method, design or method of construction not specifically prescribed by this code. This code does not limit the authority of city, county, or city and county government to make necessary changes to the provisions contained in this code pursuant to Section 101.7.1 (Section A4.509.1 Innovative concepts and local environmental conditions).

Objective B: Green Building

Measure	Target/Performance Criteria	GHG Reduction Potential
E-8: Green Building. Design and publish handouts and web-based information describing green building practices and explaining relevant City permitting approval processes.	Publish handouts by 2015.	Supporting Measure
E-9: Green Businesses. Develop and publicize a certified green business/institution program for the City. The program could include existing standards and establish new standards for energy conservation, water conservation, waste reduction and pollution prevention; assisting businesses with understanding and achieving the standards; and recognizing businesses and institutions who meet the standards.	Develop program by 2016.	Supporting Measure
E-10: Green Building Practices. Promote green building practices that support healthy indoor living and working environments that are well-ventilated and contaminant-free.	As proposed by the 2014 Zoning Code Update, the zoning and building code will include provisions for green building practices.	Supporting Measure
E-11: Minimum Green Building Standards. Require new development to comply with the California Green Building Code (CalGreen) adopted by the California Building Standards Commission at the time of building permit application.	As proposed by the 2014 Zoning Code Update, the zoning and building code will include CalGreen standards by 2020.	Supporting Measure
E-12: New Development. Encourage solar-oriented design and passive solar heating and cooling in all new residential, commercial and civic development.	As proposed by the 2014 Zoning Code Update, the zoning and building code will include provisions for solar-oriented design, green roofs, and passive solar heating and cooling for new development.	Supporting Measure
Responsibility:	Planning Division, Building and Safety Division	

Objective C: Renewable Energy Programs

Measure	Target/Performance Criteria	GHG Reduction Potential
E-13: Renewable Energy. Encourage the installation and construction of renewable energy systems and facilities such as wind, solar, hydropower, geothermal, and biomass facilities.	As proposed by the 2014 Zoning Code Update, the zoning and building code will include provisions for renewable energy systems.	Supporting Measure
Responsibility:	Planning Division	

3. WATER USE AND EFFICIENCY STRATEGY

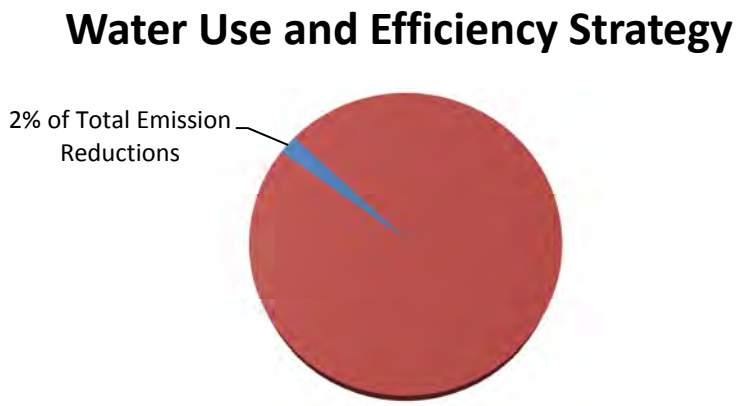
Conserve and protect water resources and promote efficiency.

Water related emissions are mostly caused by energy used to pump, transport, heat, cool, and treat water and wastewater. In a dry desert climate, water demand and resulting emissions are magnified due to a relative shortage of naturally occurring water sources. Therefore, water conservation strategies have a double benefit of reducing energy demand and managing a limited resource. Additionally, movement, storage, and treatment of water and wastewater use significant amounts of energy. Upland can reduce municipal water use by installing low-flow fixtures and by inspecting, repairing, and replacing leaking components. Landscaping irrigation measures such as water reclamation systems and xeriscaping can also reduce water usage.

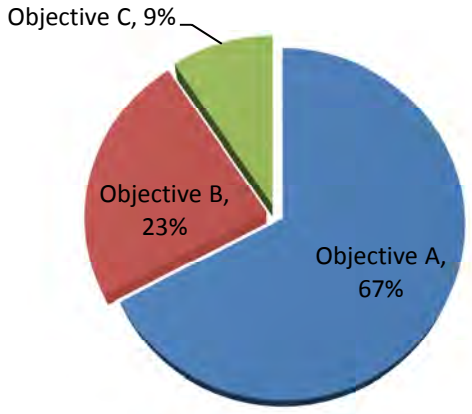
As the water purveyor, the City will work with the San Antonio Water Company, the Cucamonga Valley Water District, and the Inland Empire Utilities Agency (IEUA) to identify community actions that can reduce potable water demand, minimize wastewater generation, explore viable alternative sources of water, manage stormwater runoff, and help to maintain a healthy balance in the local aquatic ecosystem.

WATER USE AND EFFICIENCY REDUCTION MEASURES

Objective A:	**Improve Water Use Efficiency and Conservation**	**General Plan Policy/Action**
Measures:		
W-1	Water Demand	Policy PFS-8.3
W-2	Best Management Practices	Policy PFS-9.1
W-3	Conservation Programs and Standards	Policy PFS-9.2
W-4	Regional Conservation	Policy PFS-9.3
Objective B:	**Reduce Landscape Water Usage**	
W-5	California Friendly Species	Policy OSC-2.3
W-6	Irrigation	Policy PFS-9.5
W-7	Captured Rainwater	Policy PFS-9.7
Objective C:	**Incorporate Recycled Water**	
W-8	Purple Pipe System	Policy PFS-9.4
W-9	Recycled Water Facilities	Policy PFS-9.6



Emissions Reduction by Objective



Total Water Use and Efficiency Strategy Emission Reductions = 4,040 $MTCO_2eq$

Objective A: Improve Water Use Efficiency and Conservation.

Measure	Target/Performance Criteria	GHG Reduction Potential
W-1: Water Demand. Establish water demand reduction standards for new development and redevelopment to reduce per capita and total demand for water.	Reduce water consumption by 10 percent by 2015 and by 20 percent by 2020.	189 $MTCO_2eq$
W-2: Best Management Practices. Require new development projects to adopt best management practices for water use efficiency and demonstrate specific water conservation measures.	Update building code to require best management practices by 2015.	Supporting Measure
W-3: Conservation Programs and Standards. Implement cost-effective water conservation programs, such as the existing rebates and grants for water efficiency and conservation, and enforce the Upland Municipal Code water conservation standards, to improve water-use efficiency, reduce water demand, and preserve the City's supplies.	Implement rebate program by 2015.	2,526 $MTCO_2eq$
W-4: Regional Conservation. Coordinate with neighboring water purveyors to address local and regional water issues and implement regional water conservation programs as part of its water resource management strategy.	Ongoing.	Supporting Measure
Responsibility:	Public Works Department, Planning Division	

Objective B: Reduce Landscape Water Usage.

Measure	Target/Performance Criteria	GHG Reduction Potential
W-5: California-Friendly Species. Encourage new and existing public and private development to incorporate California-friendly and drought-tolerant vegetation into landscape plans to reduce water demand.	Develop incentives to encourage compliance with the City's water efficient requirements by 2016.	635 $MTCO_2eq$
W-6: Irrigation. As appropriate, require all businesses and industries to use recycled water for irrigation.	Install recycled facilities for all business and industrial uses in the City by 2020.	312 $MTCO_2eq$
W-7: Captured Rainwater. Encourage the use of captured rainwater for use in landscapes and irrigation.	Update the City's Municipal Code to include provisions for captured rainwater by 2016.	Supporting Measure
Responsibility:	Planning Division, Public Works Department	

Objective C: Incorporate Recycled Water.

Measure	Target/Performance Criteria	GHG Reduction Potential
W-8: Purple Pipe System. Review new development projects to determine which are appropriate for recycled water piping systems ("purple pipe") and require these projects to incorporate dual potable and recycled water facilities into their design.	Update the City's Municipal Code to include requirements for recycled water by 2020.	378 $MTCO_2eq$
W-9: Recycled Water Facilities. Encourage new industrial/commercial and residential developers to construct recycled water backbone facilities for their development. Additionally, continue to work with the IEUA to provide facilities for recycled water distribution.		Supporting Measure
Responsibility:	Planning Division	

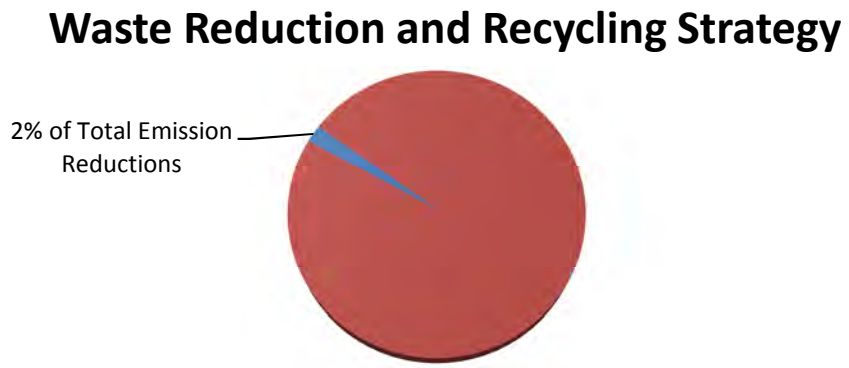
4. SOLID WASTE REDUCTION AND RECYCLING STRATEGY

Manage solid waste generation and diversion.

The largest source of human-generated methane comes from improperly managed landfills. Organic waste that is trapped within a landfill without oxygen decomposes and creates methane gas, a GHG that is 23 times more potent than carbon dioxide.[1] In addition, there are GHG emissions associated with the disposal of foam products and refrigerants. Thus, waste reduction and recycling activities reduce the potential to generate methane at landfills, as well as reducing pollutants generated from transporting waste to disposal sites. Waste reduction and recycling activities also conserve natural resources. Emissions from this portion of the waste stream can be reduced through methane recovery, recovery of potent GHGs from foam and refrigerant systems, and other adjustments to collection systems. Reducing the amount of waste sent to landfills would reduce transportation costs, landfill tipping fees, and methane gas production. The success of these measures are not only dependent upon the City's actions, but on starting change in the waste management practices of each citizen in the community.

WASTE REDUCTION AND RECYCLING REDUCTION MEASURES

Objective A:	Reduce Waste and Improve Recycling	General Plan Policy/Action
Measures :		
SW-1	State Diversion Goal	Policy PFS-14.1
SW-2	Business Recycling and Composting	Policy PFS-14.4
SW-3	Disposable, Toxic, or Non-Renewable Products	Policy PFS-14.6
SW-4	Recycle Asphalt Pavement	Policy PFS-14.7
SW-5	Recycled Materials in New Construction	Policy PFS-14.8
SW-6	Recycling	Action PFS-14.1
SW-7	Educational Programs	Action PFS-14.2
SW-8	Composting	Action PFS-14.3
SW-9	School Partnerships	Action PFS-14.4



Total Waste Reduction and Recycling Emission Reductions = 9,943 $MTCO_2eq$

[1] U.S. Environmental Protection Agency, *Greenhouse Gas Equivalencies Calculator*, http://www.epa.gov/cleanenergy/energy-resources/calculator.html.

Objective A: Reduce Waste and Improve Recycling.

Measure	Target/Performance Criteria	GHG Reduction Potential
SW-1: State Diversion Goal. Strive to exceed the State's goal of diverting solid waste from landfills.	Meet and strive to exceed the State waste diversion goal by 10 percent by 2020.	3,943 $MTCO_2eq$
SW-2: Business Recycling and Composting. Support current and future regulations regarding commercial recycling.		Supporting Measure
SW-3: Disposable, Toxic, or Non-Renewable Products. Reduce the use of disposable, toxic or non-renewable products in City operations.		Supporting Measure
SW-4: Recycle Asphalt Pavement. Promote the use of recycled asphalt pavement (RAP) for streets and parking lots, where feasible.		Supporting Measure
SW-5: Recycled Materials in New Construction. Encourage the use of recycled materials in new construction.		Supporting Measure
SW-6: Recycling. Explore potential expansions of the recycling program to determine when new materials can be accepted for recycling and when composting programs can be expanded for both the residential and commercial sectors.		Supporting Measure
SW-7: Educational Programs. Sponsor public educational programs regarding the benefits of solid waste diversion and recycling and encourage residents and businesses to process and redistribute reusable materials.		Supporting Measure
SW-8: Composting. Sponsor solid waste educational programs on backyard waste composting and the use of compost as a fertilizer for landscapes.		Supporting Measure
SW-9: School Partnerships. Partner with local schools to encourage waste reduction and recycling on campus.		Supporting Measure
Responsibility:	Planning Division, Public Works Department	

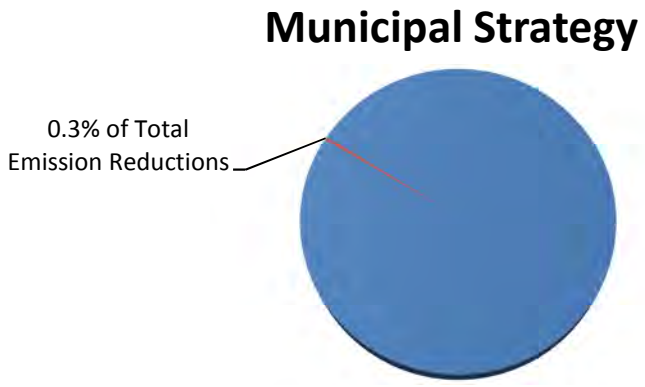
5. MUNICIPAL STRATEGY

Reduce municipal emissions and provide an example to the community.

The City of Upland has an opportunity to serve as an example for the community by taking a leadership role in reducing emissions from municipal operations. As indicated below, emissions reductions can be achieved by transitioning to more energy-efficient buildings and operations.

MUNICIPAL REDUCTION MEASURES

Objective A:	Municipal Green Building	General Plan Policy/Action
Measures :		
M-1	Energy Efficiency	Action OSC-4.7
M-2	LEED Standards for Public Buildings	Policy OSC-5.12
M-3	Staff Training	Action OSC-5.7
M-4	CalGreen Standards	Action OSC-5.8
M-5	City Facilities	Policy OSC-6.5
M-6	Inter-Agency Collaboration	Action OSC-6.2
M-7	Site Selection	Action OSC-6.4
M-8	City Facilities	Action OSC-6.5
M-9	Purchasing Policies	Action OSC-6.6
Objective B:	**Public Education**	
M-10	Citizen Education	Policy OSC-6.7
M-11	Public Outreach	Action OSC-6.7
M-12	Homeowner Education	Action OSC-4.8
Objective C:	**Municipal Transportation**	
M-13	Reduced Emissions for City Operations	Policy OSC-5.6
M-14	Fleet Operations	Policy OSC-5.7
M-15	Transportation Systems Management and Trip Reduction	Policy OSC-5.10
Objective D:	**Sustainable Parks**	
M-16	Lawn Alternatives	Action OSC-3.7
M-17	Gas-Powered Equipment	Action OSC-3.6



Total Municipal Emission Reductions = 626 $MTCO_2eq$

Objective A: Municipal Green Building.

Measure	Target/Performance Criteria	GHG Reduction Potential
M-1: Energy Efficiency. Utilize the latest energy-efficient technologies for City owned and operated street lights, parking lot lights and traffic signals to reduce the City's electricity consumption. Encourage Southern California Edison (SCE) to convert the SCE owned and operated lighting systems to use energy efficient lighting.	Retrofit city owned street lights, parking lights, and traffic signals to reduce energy consumption by 10 percent by 2020.	73 $MTCO_2eq$
M-2: LEED Standard for Public Buildings. Evaluate the feasibility of constructing new public buildings to meet, at a minimum, a LEED-Silver building standard or an equivalent standard, and construct said buildings toward meeting this standard to the extent feasible, using these buildings to demonstrate green building practices to builders, developers, homeowners and others, as funding permits.	Develop LEED requirements for City buildings by 2016.	Supporting Measure
M-3: Staff Training. Train all plan review and inspection staff in green building materials, techniques and practices.	Develop and implement training program by 2016.	Supporting Measure
M-4: CalGreen Standards. Adopt CalGreen Tier 1 Standards for all new development in the City.	Adopt standards by 2016.	Supporting Measure
M-5: City Facilities. Set an example for others to follow by using alternative energy sources such as solar for City facilities.	Offset the City's municipal energy consumption by 10 percent by using renewable energy sources by 2020.	551 $MTCO_2eq$
M-6: Inter-Agency Collaboration. Collaborate with local energy suppliers and distributors to establish energy conservation programs, Energy Star appliance change-out programs, rebates, vouchers, and other incentives to install energy-efficient technology and products.	Develop incentive programs by 2016.	Supporting Measure
M-7: Site Selection. Identify possible sites and resources for the production of energy using local renewable resources such as solar, wind, small hydro, and biogas.	Identify sites by 2016.	Supporting Measure
M-8: City Facilities. Pursue grants to address existing energy inefficiencies in City facilities.	Ongoing.	Supporting Measure
M-9: Purchasing Policies. Institute City purchasing policies that give preference to the purchase of energy-efficient products, renewable energy resources, products that contain recycled materials, and products that reduce waste generation, when feasible.	Develop purchasing policies by 2015.	Supporting Measure
Responsibility:	Public Works Department and Building Division for M-4.	

Objective B: Public Education.

Measure	Target/Performance Criteria	GHG Reduction Potential
M-10: Citizen Education. Work with appropriate agencies to proactively inform, educate and assist residents and developers regarding the objectives and techniques of sustainable development and resource conservation.	Ongoing.	Supporting Measure
M-11: Public Outreach. Organize workshops on steps to increase energy efficiency in the home or business, such as weatherizing the home or building envelope, installing smart lighting systems, and how to conduct a self-audit for energy use and efficiency.		Supporting Measure
M-12: Homeowner Education. Provide homeowner education regarding air quality standards, health effects, and efforts they can make to improve air quality and reduce greenhouse gas emissions in the region.		Supporting Measure
Responsibility:	Planning Division	

Objective C: Municipal Transportation.

Measure	Target/Performance Criteria	GHG Reduction Potential
M-13: Reduced Emissions for City Operations. Promote reduced idling, trip reduction, routing for efficiency, and the use of public transportation, carpooling, and alternate modes of transportation for operating City departments.	Review City policies and identify improvements by 2015.	Supporting Measure
M-14: Fleet Operations. Purchase low-emission vehicles for the City's fleet and use available clean fuel sources for trucks and heavy equipment, where economically feasible.	Increase hybrid/alternative fuel vehicles from 13 to 20 percent by 2020.	2 $MTCO_2eq$
M-15: Transportation Systems Management and Trip Reduction. Encourage all City employees to use means other than a single-occupant vehicle for their daily work commute.	Ongoing.	Supporting Measure
Responsibility:	Planning Division, Public Works Department	

Objective D: Sustainable Parks.

Measure	Target/Performance Criteria	GHG Reduction Potential
M-16: Lawn Alternatives. Study the feasibility of minimizing the use of new lawns in City parks and the replacement of some existing lawns with meadows or no-mow turf alternatives.	Complete feasibility study by 2016.	Supporting Measure
M-17: Gas-Powered Equipment. Study the feasibility of reducing or eliminating the City's use of gasoline-powered landscape maintenance equipment.	Complete feasibility study by 2016.	Supporting Measure
Responsibility:	Planning Division	

ADDITIONAL EMISSIONS REDUCTIONS FROM STATEWIDE LEGISLATION

Implementation of the recommended measures and actions will result in a potential reduction in GHG emissions of 63,566 $MTCO_2eq$. As a result, the City of Upland would not achieve the emission reduction target of 16 percent below 2008 emission levels with these measures alone (a reduction target of approximately 156,930 $MTCO_2eq$ from total BAU emission levels projected for 2020). Therefore, the community will assume credit for a portion of the GHG emission reductions that will occur through legislation being implemented at the state-wide level.

The State of California has established companion legislation that will reduce statewide generation of GHG emissions across all emissions sectors in order to implement AB 32. Senate Bill 107 (SB 107) establishes performance standards for GHG emission reductions from electric utilities. Assembly Bill 1493 (AB 1493) establishes performance standards for GHG emission reductions from motor vehicles. Executive Order S-1-07 (EO S-1-07) and EO S-1-09 establishes performance standards for the carbon intensity of transportation fuels. At the time of CAP preparation, the City only has confidence in estimating the GHG emission reductions associated with SB 107, AB 1493, and EO S-1-07. As the regulatory framework surrounding AB 32 grows in the future, it may be possible to evaluate a wider range of statewide reductions.

Senate Bill 1078, Senate Bill 107, and Senate Bill X1-2

California utilities must meet increasingly stringent renewable energy requirements set by SB 1078 and SB 107. SB 1078 required investor-owned utilities to provide at least 20 percent of their electricity from renewable resources by 2020. SB 107 accelerated the timeframe by ten years to take effect in 2010. Sources of renewable energy include wind, solar, geothermal, or any Renewable Portfolio Standard (RPS) eligible sources.

Southern California Edison (SCE), Upland's electricity provider, delivers 19.9 percent of its electricity from renewable sources, and has contracts in place to deliver 20 percent by 2020 as required by law.[2] At a minimum, this performance criterion would also be in effect at the CAP target year (2020) as well as the General Plan buildout year. Additionally, EO S-14-08 would increase the RPS further to 33 percent by 2020. In response to EO S-14-08, CARB adopted the "Renewable Electricity Standard" on September 23, 2010, which requires 33 percent renewable energy by 2020 for most publicly owned electricity retailers. On April 12, 2011, Governor Jerry Brown reinforced the requirements of Executive Order S-21-09, and signed SB X1-2 requiring California's electric utilities to procure 33 percent of their energy from renewable resources by 2020.

Table 3-1, *Electricity Emission Reductions from State Legislation*, provides the estimated emissions reduction effect of SB 107, SB X1-2, EO S-14-08, and EO S-21-09 on Upland's 2020 and 2035 GHG emissions.

[2] Southern California Edison, *Renewable Power Summary,* https://www.sce.com/wps/portal/home/about-us/environment/renewable-power, accessed July 10, 2013.

Table 3-1
Electricity Emissions Reductions from State Legislation

Emissions Sector	Building Energy Emissions				
	BAU (19.9 Percent Renewable) ($MTCO_2eq$/year)			33 Percent Renewable ($MTCO_2eq$/year)	
	2009	2020	2030	2020	2030
Residential	50,024	52,172	54,866	45,338	47,678
Commercial	4,166	5,788	8,176	5,029	7,105
Industrial	3,998	5,476	7,651	4,759	6,649
Mixed Use	12,650	20,686	32,606	17,976	28,334
Institutional	572	576	576	500	500
Specific Plan	205	725	1,502	630	1,306
Municipal	6,240	7,031	8,163	6,110	7,094
Total	*77,855*	*92,453*	*113,540*	*80,342*	*98,666*

BAU = business as usual; RPS = renewable portfolio standard; $MTCO_2eq$/year = metric tons of carbon dioxide equivalent

Assembly Bill 1493

GHG emissions will be reduced from on-road passenger motor vehicles sold in California with the implementation of Assembly Bill 1493 (AB 1493). The emission reduction potential associated with implementation of the vehicle emission standards would vary depending on the first regulated model year and vehicle turnover between the present fleet and the fleet in 2020 and 2035.

To provide an estimate of the reasonably foreseeable GHG emission reduction potential of motor vehicle emission regulations, the GHG emission reductions associated with AB 1493 were estimated using CARB's EMFAC2011 database. It is expected that implementation of AB 1493 would reduce on-road mobile-source GHG emissions by approximately 23 percent by 2020 and approximately 28 percent by 2035. Table 3-2, *Transportation Emissions Reductions from State Legislation*, shows the estimated GHG emission reduction potential of AB 1493 in Upland.

Executive Order S-1-07

Under Executive Order S-1-07 (EO S-1-07), ARB has developed a Low Carbon Fuel Standard (LCFS) to reduce the carbon intensity of transportation fuels in California's by at least ten percent by 2020. The development of a diverse set of clean, low-carbon transportation fuel options to reduce GHG emissions is incentivized by the LCFS which is a performance standard with flexible compliance mechanisms. Table 3-2, also includes the estimated GHG emission reduction potential of EO S-1-07 on Upland's 2020 and 2035 GHG emissions.

Table 3-2
Transportation Emissions Reductions from State Legislation

Year	Transportation Sector Emissions	GHG Emissions Reductions ($MTCO_2eq$/year)	GHG Emissions After Reductions ($MTCO_2eq$/year)	Percent Change[1]
2020	527,186	119,813	407,373	23%
2030	572,375	161,674	410,701	28%

GHG = Greenhouse Gas; $MTCO_2eq$/year = metric tons of carbon dioxide equivalent per year

Notes:
1. Transportation emissions reductions in this instance are based on EMFAC2011 and City wide vehicle miles traveled data from Fehr and Peers.

Source: California Air Resources Board, *EMFAC2011*, January 2013, and VMT data for the City of Upland provided by Fehr and Peers.

STATEWIDE REDUCTIONS IN RELATION TO THE CAP

The emission reductions shown above in Table 3-1 and Table 3-2 represent the upper bound of the potential emission reductions associated with SB 107 and AB 1493. Similar to the method used to quantify the City's CAP measures, the statewide emissions reduction estimates assume that no other emission reduction activities would occur. In reality, implementation of the City's CAP measures and the State regulations could occur, simultaneously or one preceding another. Thus, GHG reductions from emissions sectors affected by both City CAP measures and State regulations would not have a purely additive effect.

Rather, emission reductions achieved by one (i.e., CAP measures or State regulations) would reduce the capacity of the other to reduce emissions. For example, if SB 107 reduces electricity consumption-related emissions by 6 percent then the potential for additional GHG reduction by the City's electricity conservation-related CAP measures would be reduced. Conversely if the City's CAP measures reduce the quantity of electricity consumption-related GHG emissions the overall effectiveness of SB 107 is reduced.

The timing and synergistic effect of the State regulations in relation to the City's CAP measures are uncertain. Nonetheless, because the focus of the CAP is on actions the City can take to reduce community-wide GHG emissions, the emission reductions achieved by the City's actions were determined first and independent of Statewide reductions.

SUMMARY OF RESULTS

Table 3-3, *Summary of GHG Reduction Measures,* summarizes the GHG reductions anticipated by implementing the quantified measures recommended in the CAP, and provides subtotals for each strategy. The GHG reduction strategies, measures, and actions were based on the Goals and Policies in the General Plan and were designed to include performance criteria that would allow the City to achieve its GHG reduction target of 16 percent below 2008 baseline levels by 2020. As proposed, the CAP meets this target, with a projected 26.9 percent reduction. This level of GHG reduction can only be realized if the targets and performance criteria are achieved throughout the course of implementing the CAP. The CAP includes other supporting measures that contribute to the GHG emission reductions of other related measures. These supporting measures could not be quantified, due either to a lack of substantial evidence or limitations

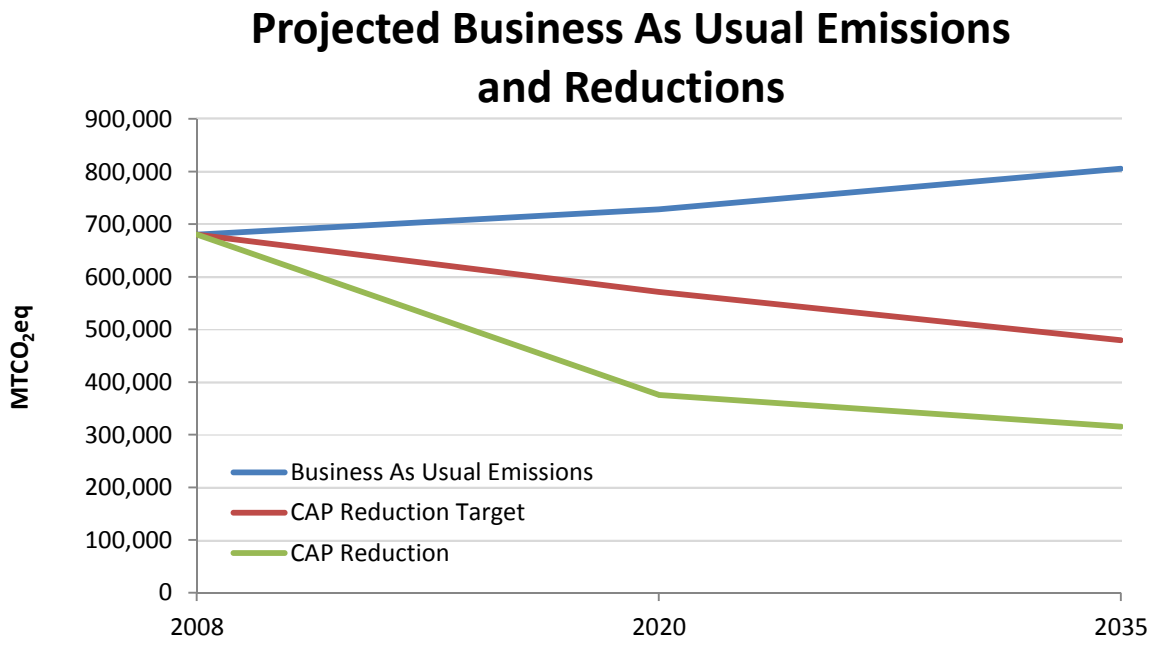
inherent in quantifying the effect of less tangible programs and policies and updating policy documents. In some instances, measures are identified as supporting measures because they are similar to other measures and are not quantified to avoid double counting. The non-quantified supporting measures are included in the CAP because they facilitate the reduction potential of related quantified measures, and/or complement the overall suite of measures in the CAP. Supporting measures remain within the CAP because these actions do reduce global emissions and have important community benefits. For the CAP to successfully guide Upland toward meeting its GHG reduction target, the City must play a prominent role in implementing the CAP's programs and policies. The public also has a role by participating in and ensuring success of the measures and actions.

Table 3-3
Summary of GHG Reduction Measure Performance

Number	Strategy and Measure	2020 GHG Reductions ($MTCO_2eq$ per Year) or Supporting Measure	Percent of Total Reduction
TRANSPORTATION AND LAND USE MEASURES			
Objective A:	**Increase Alternative Transportation Options**		
T-1	Bicycle and Pedestrian Facilities Master Plan	4,071	2.1%
T-2	Zero- and Low-Emissions Vehicle Use	Supporting Measure	N/A
T-3	Preference for Reduced-Emission Equipment	Supporting Measure	N/A
T-4	Residential Development	6,080	3.1%
T-5	Access Improvements to Montclair Station	Supporting Measure	N/A
T-6	Montclair Transportation Center	Supporting Measure	N/A
Objective B:	**Maximize Land Use Efficiency**		
T-7	Residential Density	10,575	5.4%
T-8	Foothill Boulevard Housing	486	0.2%
T-9	High-Density Housing	132	0.1%
T-10	Compact Development	53	0.0%
Objective C:	**Improve Jobs/Housing Balance**		
T-11	Reduce Commute Times	2,644	1.4%
T-12	Business/Residential Mixed-Use	2,379	1.2%
T-13	Jobs-Housing Match	9,094	4.7%
T-14	Balance Commercial and Residential Development	Supporting Measure	N/A
T-15	Jobs Housing Balance	Supporting Measure	N/A
Objective D:	**Increase Mixed Use Development Opportunities**		
T-16	Mixed Use Centers	3,965	2.0%
T-17	Mixed-Use Development	1,586	0.8%
T-18	Development Review	Supporting Measure	N/A
T-19	Outreach to Property Owners	Supporting Measure	N/A
T-20	Infill Development	Supporting Measure	N/A
T-21	Mixed Retail Development	Supporting Measure	N/A
Objective E:	**Increase Transit Oriented Development Opportunities**		
T-22	Transit Oriented Development	3,965	2.0%
T-23	Support Transit Oriented Employment Development	Supporting Measure	N/A
T-24	Transit Zones Near Existing and Planned Stations	Supporting Measure	N/A
T-25	Transit Oriented Development Standards	Supporting Measure	N/A
Objective F:	**Trip Length Reduction**		
T-26	Multi-Modal Transportation Connectivity	Supporting Measure	N/A

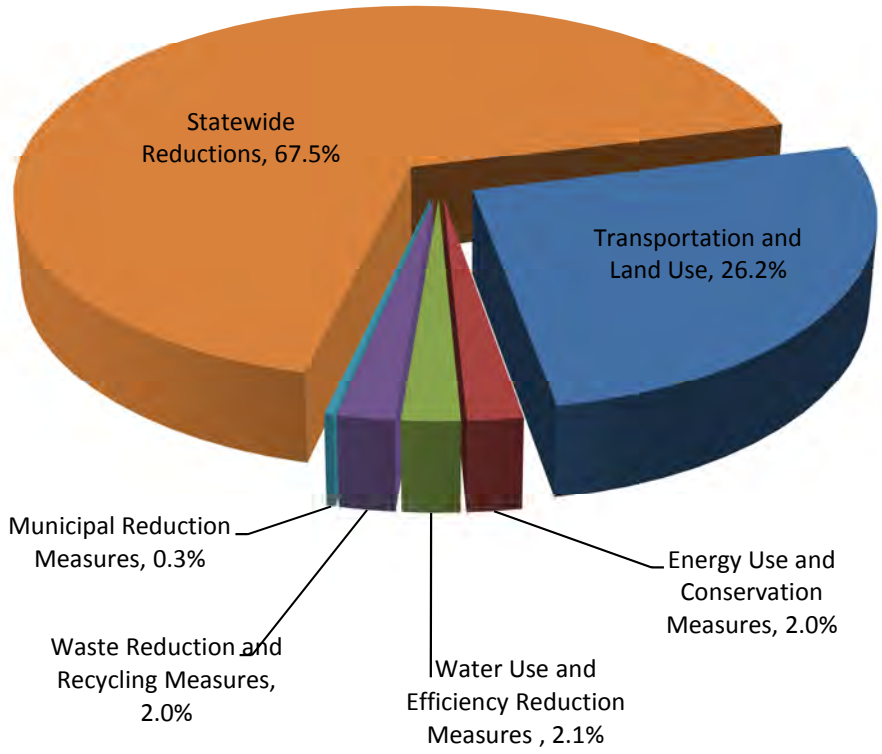
T-27	Incorporate Pedestrian Connectivity	3,306	1.7%
T-28	Encourage Complete Neighborhoods	2,207	1.1%
T-29	Strategic Growth	Supporting Measure	N/A
T-30	Incentives	Supporting Measure	N/A
T-31	Complementary Uses	476	0.2%
T-32	Pacific Electric Trail	Supporting Measure	N/A
T-33	Land Use Patterns	106	0.1%
T-34	Reduction in Commuting	Supporting Measure	N/A
T-35	Rideshare Incentives	Supporting Measure	N/A
T-36	Transit Improvements	Supporting Measure	N/A
T-37	Traffic Features	Supporting Measure	N/A
	Subtotal	**51,127**	26.2%
ENERGY USE AND CONSERVATION MEASURES			
Objective A:	**Energy Efficient Programs and Design**		
E-1	GHG Reduction in New Development	2,357	1.2%
E-2	Recruitment of Energy Efficient Businesses	Supporting Measure	N/A
E-3	Green Business Recruitment	Supporting Measure	N/A
E-4	Deciduous Trees	Supporting Measure	N/A
E-5	Regional Coordination	Supporting Measure	N/A
E-6	Assessment Programs	1,473	0.8%
E-7	Incentives	Supporting Measure	N/A
Objective B:	**Green Building**		
E-8	Green Building	Supporting Measure	N/A
E-9	Green Businesses	Supporting Measure	N/A
E-10	Green Building Practices	Supporting Measure	N/A
E-11	Minimum Green Building Standards	Supporting Measure	N/A
E-12	Compliance with Energy Efficiency Standards	Supporting Measure	N/A
E-13	New Development	Supporting Measure	N/A
Objective C:	**Renewable Energy Programs**		
E-14	Renewable Energy	Supporting Measure	N/A
	Subtotal	**3,830**	2.0%
WATER USE AND EFFICIENCY REDUCTION MEASURES			
Objective A:	**Improve Water Use Efficiency and Conservation**		
W-1:	Water Demand	189	0.1%
W-2:	Best Management Practices	Supporting Measure	N/A
W-3:	Conservation Programs and Standards	2,526	1.3%
W-4:	Regional Conservation	Supporting Measure	N/A
Objective B:	**Reduce Landscape Water Usage**		
W-5:	California Friendly Species	635	0.3%
W-6:	Irrigation	312	0.2%
W-7:	Captured Rainwater	Supporting Measure	N/A
Objective C:	**Incorporate Recycled Water**		
W-8:	Purple Pipe System	378	0.2%
W-9:	Recycled Water Facilities	Supporting Measure	N/A
	Subtotal	**4,040**	2.1%
WASTE REDUCTION AND RECYCLING MEASURES			
Objective A:	**Reduce Waste and Improve Recycling**		
SW-1:	State Diversion Goal	3,943	2.0%
SW-2:	Business Recycling and Composting	Supporting Measure	N/A
SW-3:	Disposable, Toxic, or Non-Renewable Products	Supporting Measure	N/A

SW-4:	Recycle Asphalt Pavement	Supporting Measure	N/A
SW-5:	Recycled Materials in New Construction	Supporting Measure	N/A
SW-6:	Recycling	Supporting Measure	N/A
SW-7:	Educational Programs	Supporting Measure	N/A
SW-8:	Composting	Supporting Measure	N/A
SW-9:	School Partnerships	Supporting Measure	N/A
	Subtotal	**3,943**	2.0%
MUNICIPAL REDUCTION MEASURES			
Objective A:	**Municipal Green Building**		
M-1	LEED Standards for Public Buildings	73	0.0%
M-2	Energy Efficiency	Supporting Measure	N/A
M-3	Staff Training	Supporting Measure	N/A
M-4	CalGreen Standards	Supporting Measure	N/A
M-5	City Facilities	551	0.3%
M-6	City Facilities	Supporting Measure	N/A
M-7	Inter-Agency Collaboration	Supporting Measure	N/A
M-8	Site Selection	Supporting Measure	N/A
M-9	Purchasing Policies	Supporting Measure	N/A
Objective B:	**Public Education**		
M-10	Citizen Education	Supporting Measure	N/A
M-11	Public Outreach	Supporting Measure	N/A
M-12	Homeowner Education	Supporting Measure	N/A
Objective C:	**Municipal Transportation**		
M-13	Reduced Emissions for City Operations	Supporting Measure	N/A
M-14	Fleet Operations	2	0.0%
M-15	Transportation Systems Management and Trip Reduction	Supporting Measure	N/A
Objective D:	**Sustainable Parks**		
M-16	Lawn Alternatives	Supporting Measure	N/A
M-17	Gas-Powered Equipment	Supporting Measure	N/A
	Subtotal	**626**	0.3%
	Total Strategy Reductions	**63,566**	32.5%
STATEWIDE REDUCTIONS			
	AB 1493 and EO S-1-07	119,813	61.3%
	SB 1078 and SB 107	12,111	6.2%
	Subtotal Statewide Reductions	131,925	67.5%
	Grand Total	***195,490***	100%



Implementation of all of the GHG reduction measures would result in a projected 26.9 percent reduction below BAU projected levels. The 26.9 percent reduction is well below the City's 16 percent reduction target.

GHG Emissions Reductions from 2020 Business As Usual Scenario



Upland emissions reductions from the 2020 BAU scenario would be 195,490 $MTCO_2eq$, thereby reducing 2020 emissions from a projected 728,090 $MTCO_2eq$ to 532,600 $MTCO_2eq$. The chart above depicts the proportional contribution of each strategy.

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CHAPTER 4.0
IMPLEMENTATION

APPROACH

The Climate Action Plan (CAP) strategies for reducing greenhouse gas (GHG) emissions and adapting to climate change are described only at a schematic level of detail in Chapter 3, *Climate Action Strategies*. While this level of detail is sufficient for some strategies, others will require an additional, more in-depth round of planning prior to implementation. In this later round of planning, strategies will be described in more detail, including specific priorities for implementation, costs, funding sources, and staffing. It should be noted that the reductions in Chapter 3 were only identified for strategies that had a sufficient level of detail at this time. Credit was not taken for measures that require more in-depth planning at this time. Additionally, the CAP includes other supporting measures that were not quantified because they contribute to the GHG emission reductions of other related measures or because they are similar to other measures and are not quantified to avoid double counting.

The reduction measures identified within the CAP are consistent with the policies and actions that have been developed for the General Plan Update and the Zoning Code Update. The CAP identifies performance criteria for each measure, which are designed to be passive and fulfilled through implementation of the General Plan and Zoning Code. As a result, a majority of the emissions reductions identified in the CAP would be achieved during the development entitlement process, the Capital Improvement Process, and through implementation of the land use changes and policies within the General Plan Update. For example the General Plan Update would revise the City's land use map to focus growth in specific opportunity areas that would promote urban infill development and contribute toward a jobs/housing balance. The Zoning Code Update would implement various density measures, allow mixed use, and include water and energy conservation/efficiency standards for future development. Therefore, the development entitlement process and the Capital Improvement Process would implement measures within the CAP to achieve emissions reductions.

A major concern with implementing the CAP is limitations on funding and staffing. Due to the current state of the economy, it is essential to focus the CAP on affordable solutions while implementing strategies that will move the City closer to the GHG reduction goal of the CAP. By taking a realistic approach and setting achievable goals, the City will increase its chances of implementing a successful plan and demonstrating tangible progress in the future.

Public education is by far the most powerful and affordable tool to overcome this hurdle. In addition to the programs and policies the City has already put in place or is in the process of developing under the General Plan update, strategies may include incorporating relevant information and ideas in existing publications and events, such as the City's website. The schools can be a powerful instrument for change, and working with schools on climate change education programs is considered an essential strategy. Additionally, much can be accomplished by supporting community groups interested in promoting and implementing the CAP.

The CAP provides a framework to begin the community's transition to a low-carbon future. It provides a critical foundation for action, but it is only a first step. Moving forward, the City will need to take specific steps to advance and monitor the CAP's implementation. These include:

- *Assign Responsibility.* The City's Development Services Department will designate a CAP management team or sustainability coordinator to implement the CAP and associated measures. Through this process, additional City Departments and Divisions (e.g., Planning Division, Building and Safety Division, Public Works Department, etc.) would be engaged to ensure the goal and reduction measures are achieved to realize the City's reduction target. Resources (such as funding and staff) should also assist with implementing and ensuring that climate change-related considerations are included as requirements in all relevant decision making processes (e.g., the entitlement process). It is critical that the City clearly assign responsibility for the City's carbon budget and implementation of the CAP roadmap to achieve its GHG reduction goals. Training and support will be required to ensure city staff has the necessary skills and expertise to understand and manage emissions within and between sectors.

- *Study the Costs and Benefits of the CAP Implementation.* Conduct a formal cost estimation study for the most effective emission reduction strategies identified in the CAP.

- *Develop and Implement a Performance Monitoring Process.* To ensure the community stays on course to meet GHG reduction targets, it is ultimately necessary to track progress by conducting regular inventories and monitoring procedures. Chapter 3.0, *Climate Action Strategies*, provides performance criteria that indicate specific actions that need to be completed and timing for implementation of each measure. These performance criteria should be followed for the performance monitoring process.

  Progress reports should be done on an annual basis, with the results presented to the City Council. The reports would identify the progress made toward achieving the reduction target as a whole, and for each quantified measure. If the measures do not achieve or surpass the expected GHG reductions, the City will examine ways to increase measure performance or create new measures capable to compensate for missed emission reductions. It should be noted that although a new CAP is not required annually, CAP measures should be implemented according to the timing identified in the Target/Performance Criteria.

- *Communication and Collaboration.* Work with energy utilities to create durable and interoperable exchanges of city-wide energy performance data. The City should also partners with local, regional, and State agencies to ensure collaboration and achieve future reduction goals.

During the implementation and monitoring process the CAP will be reviewed to evaluate improvements to climate science, explore new opportunities for GHG reduction and climate adaptation, and respond to changes in climate policy. The California Natural Resources Agency and the California Energy Commission have developed a web-based climate adaptation tool called Cal-Adapt (http://cal-adapt.org/). The City can utilize the Cal-Adapt tool to identify potential climate change risks in specific areas. Cal-Adapt combines volumes of climate change research and presents it in a visually graphic, accessible, and intuitive format intended to benefit local planning efforts as well as inform California citizens of potential climate change impacts. This tool fulfills recommendations made in the *California Climate Adaptation Strategy* to provide planners with detailed information regarding potential sea-level rise, wildfire dangers, temperature changes, and fluctuations in snowpack in specific areas, which will help inform how to respond to those impacts.

REGIONAL COORDINATION

The CAP implements policies that have been identified in the various elements of the Upland General Plan Update, as well as CALGreen Standards. The General Plan update includes specific goals and policies that guide the City's approach to climate change, including emissions reductions targets, guidelines for preparing inventories or plans, and general reduction strategies. As climate change is a cross-cutting issue addressed by many elements of the General Plan, the CAP as a whole is considered an implementation measure for the policies described in this CAP. This structure allows the City to update the CAP on an on-going, as-needed basis to ensure that the City's climate protection efforts reflect both current legislation and emerging best practices.

SB 375 enhances California's ability to reach its AB 32 goals by promoting good planning with the goal of more sustainable communities. SB 375 requires the California Air Resources Board (CARB) to develop regional GHG emission reduction targets for passenger vehicles. CARB established reduction targets for 2020 and 2035 for each region covered by one of the State's 18 metropolitan planning organizations (MPOs). Each of California's MPOs then prepare a "sustainable communities strategy (SCS)" that demonstrates how the region will meet its GHG reduction target through integrated land use, housing and transportation planning. Once adopted by the MPO, the SCS will be incorporated into that region's federally enforceable regional transportation plan (RTP). CARB is also required to review each final SCS to determine whether it would, if implemented, achieve the GHG emission reduction target for its region. SB 375 also establishes incentives to encourage implementation of the SCS. Developers can get relief from certain environmental review requirements under CEQA if their new residential and mixed-use projects are consistent with a region's SCS that meets the target (California Public Resources Code Sections 21155, 21155.1, 21155.2, 21159.28.).

On September 23, 2010, CARB adopted Resolution 10-31, establishing SB 375 regional targets for all Metropolitan Planning Organizations (MPOs) in California. The Southern California Association of Governments (SCAG) is the MPO encompassing the counties of Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura. The SB 375 target set for the SCAG is a 13 percent reduction in GHG emissions from automobiles and light duty truck exhaust by 2035 (compared to SCAG's recommended target of 8 percent). SCAG has been responsible for developing the Sustainable Communities Strategy (SCS) for the SCAG Region. SCAG worked with worked with the San Bernardino Associated Governments (SANBAG), elected officials and local jurisdictions in San Bernardino County to develop the *2012-2035 Regional Transportation Plan and Sustainable Communities Strategy* (*2012-2035 RTP/SCS*), a long-range plan that improves overall mobility, reduces GHGs and enhances the quality of life for the region's residents. Approved by State and Federal agencies in June 2012, the plan includes $24.4 billion in transportation projects for San Bernardino County. The *2012-2035 RTP/SCS* is guided by and incorporates projects and programs from SANBAG's planning efforts.

In compliance with the requirements of AB 32 and SB 375, SANBAG has also prepared a GHG Reduction Plan that provides a regional view of GHG emissions. Regional emissions sources include on-road transportation, which is the result of activity that occurs across jurisdictional boundaries. As the regional transportation planning agency for San Bernardino County, SANBAG has a critical role in reducing the region's transportation emissions.

Implementation of SANBAG's region-wide GHG reduction efforts requires coordination with the cities within San Bernardino County, including the City of Upland. SANBAG is spearheading efforts to expand Metrolink and is leading other regional efforts related to energy efficiency and renewable energy. Additionally, SANBAG is planning to implement a regional energy efficiency and water conservation improvement loan program for retrofits to existing buildings and is participating in a regional joint solar power purchase agreement. As a result, the City of Upland may achieve additional GHG reduction benefits through regional coordination efforts with SANBAG.

Long Range Transit Plan

SANBAG's *Long Range Transit Plan* (LRTP) establishes a vision for transit for the next 25 years. The LRTP prioritizes goals and projects for transit growth and connects land use and transportation strategies. The goal of the LRTP is to provide transit facilities and services to support San Bernardino County's growing travel demand. The LRTP prioritizes goals and projects for transit growth and connects land use and transportation strategies. The LRTP also meets legal mandates for planning and programming set by SB 375.

Transit Network Improvements

Transit network improvements are a large focus for Upland as it continues to grow. CAP Measures T-21, T-26, and T-36 focus on improvements to public transportation within the City. These measures will require extensive coordination with Omnitrans and Metrolink.

BICYCLE AND PEDESTRIAN FACILITIES MASTER PLAN

As described in Chapter 3.0, *Climate Action Strategies*, implementation of the Bicycle and Pedestrian Facilities Master Plan would improve and support the City's bikeways network, providing additional opportunities for people to move through and around the City. Goals and objectives support bicycle infrastructure and connectivity throughout the City and surrounding region and encourage programs and policies that make bicycling safer and more convenient for all types of bicyclists. Measures T-1 through T-5 within this CAP would facilitate the implementation of the Bicycle and Pedestrian Facilities Master Plan to reduce City-wide GHG emissions.

LAND USE

The Upland General Plan Update identifies several areas that present opportunities where land use and design change can help fully implement the City's land use strategies. Further planning within the City can catalyze revitalization efforts along corridors; create more options for travel between Upland's major destinations, focus areas, and neighborhoods; guide the enhancement of unique assets such as Downtown, College Heights, Foothill Boulevard, and the Airport; and support the function of business clusters such as medical facilities, commercial development, and industrial areas.

With regard to trip-generating potential, one characteristic of multi-use developments is the potential for beneficial interactions among site uses in terms of walk/bike trips, shared vehicular trips between land uses, and multi-modal accessibility. These interactions represent the potential for a reduction in the number of new trips assumed for the new development.

For example, residents of proposed residential developments may also patronize the proposed new commercial development. Vehicular trips between the residential and commercial zones could be contained within the project area, and would not contribute to traffic growth at off-site intersections. As a result of these factors, the total inbound and outbound vehicular trips for the project may be reduced. CAP Measures T-6 through T-25 specifically address the importance of conscious land use decisions and the resulting GHG reduction benefits. Therefore, implementation of the General Plan would inherently reduce vehicle trips and contribute to a reduction of the City's GHG emissions.

DETERMINING PROJECT CONSISTENCY WITH THE CLIMATE ACTION PLAN

When determining whether a proposed project is consistent with the CAP, the following should be considered:

- ***Step 1:*** Consider the consistency of the discretionary project (magnitude and location of growth) with the Upland General Plan's year 2035 growth projections, which are the basis of the GHG emissions inventory projects (this includes consistency with the planned land use, zoning, and development intensity of a particular site). If the project is consistent with the Upland General Plan Update projections, the project is consistent with the CAP and will not have a potentially significant effect on the environment with respect to greenhouse gas emissions.

If the discretionary project is not consistent with the Upland General Plan's year 2035 growth projections, the project is not necessarily inconsistent with the CAP. The General Plan growth assumptions utilized for the emissions inventories in the CAP are depicted in Table 4-1, *General Plan 2035 Growth Assumptions*. Additionally, Exhibit 4-1, *Focus Areas*, depicts the opportunity areas where the General Plan would focus growth. The following steps must be performed to determine consistency:

- ***Step 2:*** Consider the extent to which the project supports or includes applicable strategies and measures, or advances the action identified in the CAP.

- ***Step 3:*** Consider the consistency of the project with the emission reduction targets set by the CAP.

- ***Step 4:*** Consider the extent to which the project would not interfere with the implementation of CAP strategies, objectives, measures or actions.

A project that can justify its consistency with Steps 2, 3, and/or 4 can be deemed consistent with the CAP by the decision-making body. Consistency is documented in the findings for a project.

The emission reduction targets are a critical factor in determining CAP consistency (refer to Step 3). Project consistency with the Upland General Plan land uses and growth projections will ensure that reduction targets can be achieved. Therefore, the CAP target must be set at a level that demonstrates consistency with State targets, but should be feasible for the vast majority of projects to achieve. If the reduction target percentage is set at a level that is infeasible, EIRs could be required for a large number of projects. A statement of overriding considerations would possibly be required and no additional emission reductions would be achieved if feasible emission reductions were not available.

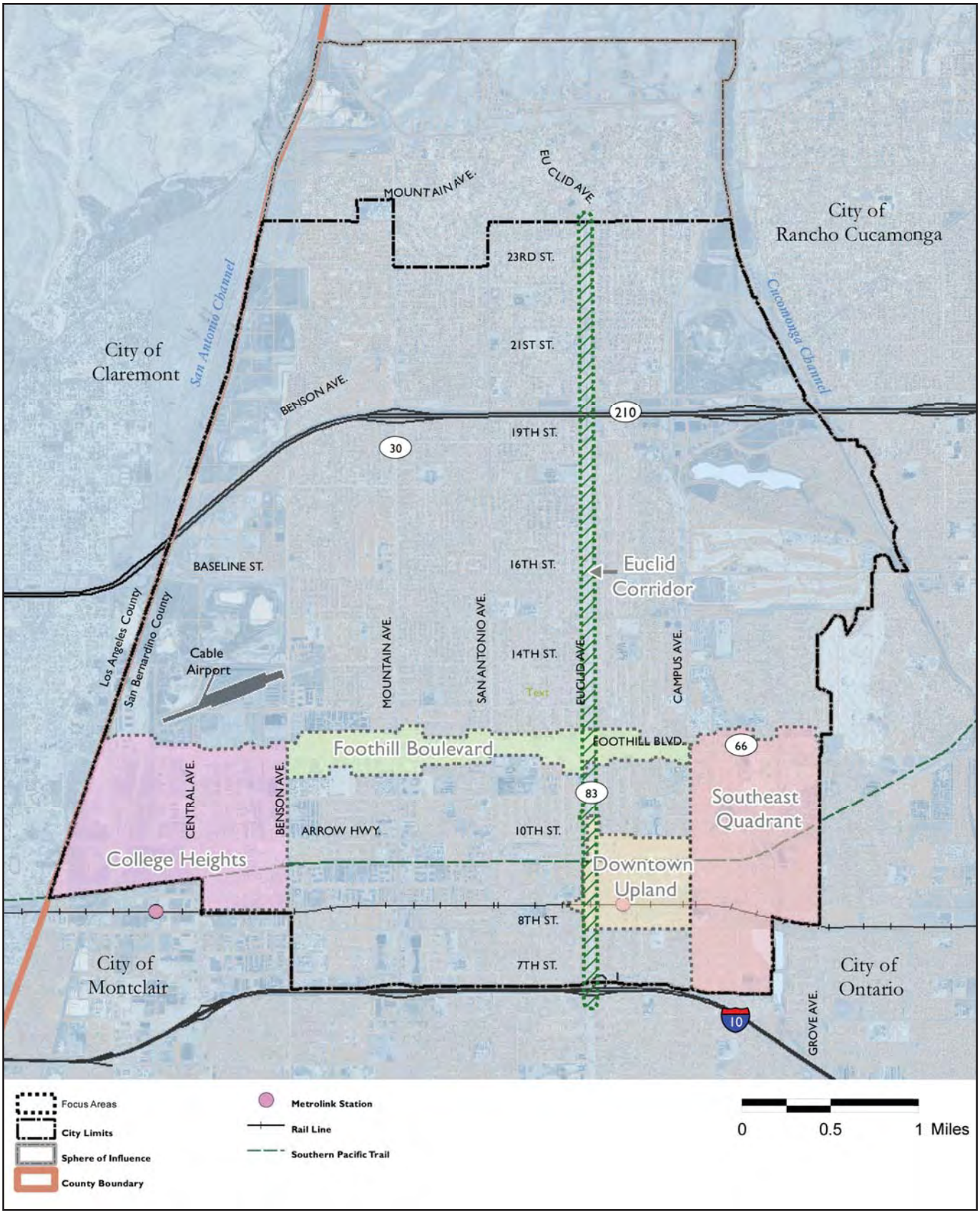
Table 4-1
General Plan 2035 Growth Assumptions

Description	2008 Existing Conditions	2035 General Plan	Change
Housing (Dwelling Units)			
City	26,048	28,478	+2,430
Sphere of Influence	1,226	1,822	+596
Total Housing	*27,274*	*30,300*	*+3,026*
Vacancy Rate	5.0%	5.0%	--
Households (Occupied Dwelling Units)			
City	24,746	27,054	+2,309
Sphere of Influence	1,165	1,731	+566
Total Households	*25,910*	*28,785*	*+2,875*
Average Size (Persons per Household)	2.83	2.83	--
Population (Persons)[1]			
City	70,030	76,563	+6,533
Sphere of Influence	3,296	4,898	+1,602
Total Population	*73,326*	*81,462*	*+8,135*
Non-Residential Uses (Square Feet)			
City	5,834,412	12,209,107	+6,374,695
Sphere of Influence	0	27,323	+27,323
Total Non-Residential Uses	*5,834,412*	*12,236,430*	*+6,402,018*
Employment (Jobs)[2]			
City	12,458	24,182	+11,724
Sphere of Influence	0	63	+63
Total Employment	*12,458*	*24,245*	*+11,787*
Vacant Acreage (Acres)[3]	442.4	22.1	-420.3

Notes:
1. Assumes 2.83 persons per household and 5.0 percent vacancy rate.
2. Assumed employment per 1,000 square feet: 4.0 employees for office; 2.0 to 2.5 employees for retail; and 1.0 to 1.5 employees for industrial uses.
3. Assumes 95 percent of vacant parcels would be developed.

Source: Placeworks, 2014.

If the City determines in its environmental review that the proposed project would conflict with the CAP, the City would be required to prepare additional environmental documentation that could include mitigation measures or lead to a statement of overriding considerations. Mitigation measures, where feasible, would be required for proposed project to minimize its GHG emissions and/or climate change impact to be consistent with the CAP. If a potentially significant impact cannot be reduced to a less than significant level through the application of mitigation, it is categorized as a significant unavoidable impact and the City has the option to adopt a statement of overriding considerations as described in Section 15093 of the State *CEQA Guidelines*.



Source: City of Upland, General Plan Update, February 18, 2013.

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CHAPTER 5.0
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Appendices

City of Upland Climate Action Plan

Appendix A
GHG Emissions Data

Electricity Usage

	Existing Usage			GP Horizon Usage		
Land Use Designations	**Electricity (kWh)**			**Electricity (kWh)**		
Residential	**Residential**	**Non-Residential**	**Total kWh**	**Residential**	**Non-Residential**	**Total kWh**
Single-Family Low	59,912,190		59,912,190	60,642,270		60,642,270
Single-Family Medium	47,470,410		47,470,410	48,378,286		48,378,286
Mobile Home	6,662,520		6,662,520	6,872,598		6,872,598
Multi-Family Low	35,721,752		35,721,752	36,074,381		36,074,381
Multi-Family Medium	1,432,875		1,432,875	2,260,771		2,260,771
Sphere	9,323,730		9,323,730	13,856,310	384,161	14,240,471
Commercial						
Neighborhood Commercial	15,284	1,101,643	1,116,927	15,284	1,452,834	1,468,118
Regional Commercial	0	6,039,453	6,039,453	0	16,798,226	16,798,226
Highway Commerical	22,926	2,659,131	2,682,057	22,926	6,553,304	6,576,230
Office/Professional	271,291	4,698,351	4,969,642	271,291	6,635,746	6,907,037
Industrial						
Light Industrial/Business Park	30,568	10,213,373	10,243,941	30,568	20,424,537	20,455,105
Industrial	61,136	3,701,109	3,762,245	61,136	6,079,150	6,140,286
Gravel Mine (778 acres)						
Mixed-Use						
Business/Residential Mixed-Use	1,627,746	7,598,717	9,226,463	1,778,746	9,858,818	11,637,565
Commercial/Residential Mixed-Use	1,761,481	10,166,252	11,927,733	3,098,119	17,408,519	20,506,637
Commercial/Industrial Mixed-Use	53,494	8,089,446	8,142,940	53,494	59,664,272	59,717,766
Commercial/Office Mixed-Use	382,100	18,173,053	18,555,153	382,100	25,002,104	25,384,204
Special/Institutional						
Institutional (places of worship)		1,989,543	1,989,543		1,989,543	1,989,543
Specific Plan						
Specific Plan	9,354,150	712,537	10,066,687	20,716,020	5,192,425	25,908,445
	174,103,653	75,142,608	249,246,261	194,514,300	177,443,640	371,957,940
	174,104	**75,143**	**249,246**	**194,514**	**177,444**	**371,958**

Electricity Emissions

Existing		CO_2	CH_4		N_2O		Total CO_2eq
	MWh	Metric Tons	Metric Tons	$MTCO_2eq$	Metric Tons	$MTCO_2eq$	Metric Tons
Residential	174,104	50,101	1	12	1	264	50,377
Commercial	14,499	4,172	0	1	0	22	4,195
Industrial	13,914	4,004	0	1	0	21	4,026
Mixed-Use	44,027	12,670	0	3	0	67	12,739
Institutional	1,990	573	0	0	0	3	576
Specific Plan	713	205	0	0	0	1	206
Total	*249,246*	*71,724*	*1*	*17*	*1*	*378*	*72,119*

GP Horizon		CO_2	CH_4		N_2O		Total CO_2eq
	MWh	Metric Tons	Metric Tons	$MTCO_2eq$	Metric Tons	$MTCO_2eq$	Metric Tons
Residential	194,514	55,974	1	13	1	295	56,282
Commercial	31,824	9,158	0	2	0	48	9,208
Industrial	26,504	7,627	0	2	0	40	7,669
Mixed-Use	111,934	32,210	0	8	1	170	32,388
Institutional	1,990	573	0	0	0	3	576
Specific Plan	5,192	1,494	0	0	0	8	1,502
Total	*371,958*	*107,036*	*1*	*26*	*2*	*564*	*107,625*

Natural Gas Usage

	Existing Usage			GP Horizon Usage		
Land Use Designations	**Natural Gas (therms)**			**Natural Gas (therms)**		
Residential	**Residential**	**NonResidential**	**Total therms**	**Residential**	**NonResidential**	**Total therms**
Single-Family Low	3,316,638		3,316,638	3,357,054		3,357,054
Single-Family Medium	2,627,882		2,627,882	2,678,140		2,678,140
Mobile Home	404,766		404,766	417,529		417,529
Multi-Family Low	1,918,840		1,918,840	1,937,782		1,937,782
Multi-Family Medium	85,875		85,875	135,492		135,492
Sphere	516,146		516,146	767,062	1,366	768,428
Commercial						
Neighborhood Commercial	916	3,918	4,834	916	5,167	6,083
Regional Commercial	0	115,206	115,206	0	320,436	320,436
Highway Commerical	1,374	50,724	52,098	1,374	125,008	126,382
Office/Professional	16,259	52,593	68,852	16,259	74,281	90,540
Industrial						
Light Industrial/Business Park	1,832	114,329	116,161	1,832	228,633	230,465
Industrial	3,664	16,474	20,138	3,664	27,059	30,723
Gravel Mine (778 acres)						
Mixed-Use						
Business/Residential Mixed-Use	97,554	85,060	182,614	106,604	110,360	216,964
Commercial/Residential Mixed-Use	105,569	36,153	141,722	185,676	61,908	247,584
Commercial/Industrial Mixed-Use	3,206	90,554	93,760	3,206	667,884	671,090
Commercial/Office Mixed-Use	22,900	203,430	226,330	22,900	279,874	302,774
Special/Institutional						
Institutional (places of worship)		134,775	134,775		134,775	134,775
Specific Plan						
Specific Plan	517,830	7,976	525,806	1,146,804	58,124	1,204,928
	9,641,251	911,192	10,552,443	10,782,295	2,094,874	12,877,169
	964,125	**91,119**	**1,055,244**	**1,078,229**	**209,487**	**1,287,717**

Natural Gas Emissions

2010		CO_2	CH_4		N_2O		Total CO_2eq
	MMBtu	Metric Tons	Metric Tons	$MTCO_2eq$	Metric Tons	$MTCO_2eq$	Metric Tons
Residential	964,125	51,156	1	20	0	30	51,207
Commercial	22,244	1,180	0	0	0	1	1,181
Industrial	13,080	694	0	0	0	0	695
Mixed-Use	41,520	2,203	0	1	0	1	2,205
Institutional	13,478	715	0	0	0	0	716
Specific Plan	798	42	0	0	0	0	42
Total	*1,055,244*	*55,991*	*1*	*22*	*0*	*33*	*56,046*

2035		CO_2	CH_4		N_2O		Total CO_2eq
	MMBtu	Metric Tons	Metric Tons	$MTCO_2eq$	Metric Tons	$MTCO_2eq$	Metric Tons
Residential	1,078,229	57,211	1	23	0	33	57,267
Commercial	52,626	2,792	0	1	0	2	2,795
Industrial	25,569	1,357	0	1	0	1	1,358
Mixed-Use	112,003	5,943	0	2	0	3	5,949
Institutional	13,478	715	0	0	0	0	716
Specific Plan	5,812	308	0	0	0	0	309
Total	*1,287,717*	*68,326*	*1*	*27*	*0*	*40*	*68,393*

Water and Wastewater

	Acre Feet		Million Gallons/Year		Million Gallons/Year 2010		Million Gallons/Year 2035		kWh/year 2010		kWh/year 2035		Total MWh/year	
Water Demand	**2010**	**2035**	**2010**	**2035**	**Local**	**Import**	**Local**	**Import**	**Local**	**Import**	**Local**	**Import**	**2010**	**2035**
Single Family Residential	11,296	11,559	3,681	3,767	2,613	1,067	2,674	1,092	8,266,123	10,362,680	8,458,579	10,603,950	18,629	19,063
Multi-Family Residential	3,418	3,497	1,114	1,140	791	323	809	330	2,501,205	3,135,591	2,559,015	3,208,064	5,637	5,767
Commercial, Industrial, Institutional	2,807	2,872	915	936	649	265	664	271	2,054,091	2,575,075	2,101,656	2,634,704	4,629	4,736
Landscape	2,085	2,133	679	695	482	197	493	202	1,525,749	1,912,729	1,560,875	1,956,763	3,438	3,518
Total	*19,606*	*20,061*	6,389	6,537	4,536	1,853	4,641	1,896	14,347,167	17,986,075	14,680,125	18,403,481	32,333	33,084

	Acre Feet		Million Gallons/Year	
	2010	**2035**	**2010**	**2035**
Local	13,920	14,243	4,536	4,641
Import	5,686	5,818	1,853	1,896
Total	*19,606*	*20,061*	*6,389*	*6,537*

1 gallon = $3.06888328 \times 10^{-6}$ acre foot

Water Source	**kWh/year**	
Local	14,347,167	14,680,125
Import	17,986,075	18,403,481
Total	*32,333,242*	*33,083,606*

	MWh/year	
Wastewater	**2010**	**2035**
Single Family Residential	7,034	7,198
Multi-Family Residential	2,128	2,178
Commercial, Industrial, Institutional	1,748	1,788
Total	10,910	11,164

	kWh/year	
Wastewater Treatment	8,546,088	8,744,418

Note: Approximately 70 percent of overall water consumption is used indoors and would require wastewater treatment.

http://www.epa.gov/WaterSense/pubs/outdoor.html

Water and Wastewater Emissions

	CO_2	CH_4		N_2O	
2010	Metric Tons	Metric Tons	$MTCO_2eq$	Metric Tons	$MTCO_2eq$
Water	9,304	0.11	2.23	0.16	49.01
Wastewater	2,459	0.03	0.59	0.04	12.95
2035					
Water	9,520	0.11	2.28	0.16	50.15
Wastewater	2,516	0.04	0.90	0.04	13.25

2010 Water

	CO_2	CH_4		N_2O		Total CO_2eq
	Metric Tons	Metric Tons	$MTCO_2eq$	Metric Tons	$MTCO_2eq$	Metric Tons
Single Family Residential	5,361	0	1	0	28	5,390
Multi-Family Residential	1,622	0	0	0	9	1,631
Commercial, Industrial, Institutional	1,332	0	0	0	7	1,339
Landscape	989	0	0	0	5	995
Total	*9,304*	*0*	*2*	*0*	*49*	*9,356*

2035 Water

	CO_2	CH_4		N_2O		Total CO_2eq
	Metric Tons	Metric Tons	$MTCO_2eq$	Metric Tons	$MTCO_2eq$	Metric Tons
SF Residential	5,486	0	1	0	29	5,516
MF Residential	1,660	0	0	0	9	1,669
CII	1,363	0	0	0	7	1,370
Landscape	1,012	0	0	0	5	1,018
Total	*9,520*	*0*	*2*	*0*	*50*	*9,573*

2010 Wastewater

	CO_2	CH_4		N_2O		Total CO_2eq
	Metric Tons	Metric Tons	$MTCO_2eq$	Metric Tons	$MTCO_2eq$	Metric Tons
Single Family Residential	2,024	0	0	0	11	2,035
Multi-Family Residential	612	0	0	0	3	616
Commercial, Industrial, Institutional	503	0	0	0	3	506
Total	*3,140*	*0*	*1*	*0*	*17*	*3,157*

2035 Wastewater

	CO_2	CH_4		N_2O		Total CO_2eq
	Metric Tons	Metric Tons	$MTCO_2eq$	Metric Tons	$MTCO_2eq$	Metric Tons
SF Residential	2,071	0	0	0	11	2,083
MF Residential	627	0	0	0	3	630
CII	515	0	0	0	3	517
Total	*3,213*	*0*	*1*	*0*	*17*	*3,230*

Water Use Energy Factors (kWh/MG)

Source	Supply and Conveyance	Treatment	Distribution	Outdoor Total	Wastewater Treatment	Indoor Total
Local	1,780.00	111.00	1,272.00	3,163.00	1,911.00	5,074.00
Import	8,325.00	111.00	1,272.00	9,708.00	1,911.00	11,619.00

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http://www.nrdc.org/water/conservation/edrain/edrain.pdf

Solid Waste

	Existing		Solid Waste Generation		GP Horizon		Solid Waste Generation			
Land Use	**DU**	**Non-Residential SF**	**lbs/day**	**tons/year**	**DU**	**Non-Residential SF**	**lbs/day**	**tons/year**	Existing CO_2eq	GP Horizon CO_2eq
Residential	23,521	--	287,662	52,498	24,068	--	294,352	53,719	33,599	34380.28744
Commercial	--	1,008,733	6,052	1,105	--	2,229,247	13,375	2,441	707	1562.256215
Industrial	--	1,184,286	7,106	1,297	--	2,172,134	13,033	2,378	830	1522.231337
Mixed-Use	--	2,828,859	16,973	3,098	--	7,116,592	42,700	7,793	1,982	4987.307468
Special/Institutional	--	91,684	550	100	--	91,684	550	100	64	64.2521472
Specific Plan	--	44,312	266	49	--	322,912	1,937	354	31	226.2967296
Total	**23,521**	**5,157,874**	**318,609**	**58,146**	**24,068**	**11,932,568**	**365,947**	**66,785**	**37,214**	42,743

	Annual Metric Tons	
GHG Emissions	**CH_4**	**CO_2eq**
Existing	1,772	37,214
General Plan Horizon	2,035	42,743

Transportation

Daily VMT BY SPEED BIN

Speed Bin	%	Existing	%	2020	%	With General Plan
0-10	0.001641223	4,799	0.001634157	5,031	0.001628	5,321
10-20	0.000807997	2,362	0.000927173	2,854	0.001062	3,470
20-30	0.046316081	135,417	0.045610038	140,417	0.044884	146,668
30-40	0.114834028	335,747	0.118270044	364,112	0.122277	399,569
40-50	0.164736854	481,651	0.158285678	487,307	0.151291	494,376
50-60	0.326828425	955,567	0.381840502	1,175,554	0.443898	1,450,538
60-70	0.344835393	1,008,215	0.292776276	901,356	0.23496	767,783
Total		2,923,759		3,078,652		3,267,725

Existing Emissions

g/mi		g/day		MT/day		MT/year	
CO_2 Emissions Factor	CO_2 Pavley Factor	CO_2 Emissions	CO_2 Pavley	CO_2 Emissions Factor	CO_2 Pavley	CO_2 Emissions Factor	CO_2 Pavley
1477.932502	1477.932502	7,092,598	7,092,598	7	7	2,589	2,589
1197.281386	1197.281386	2,827,979	2,827,979	3	3	1,032	1,032
732.155842	732.155842	99,146,348	99,146,348	99	99	36,188	36,188
481.8129058	481.8129058	161,767,238	161,767,238	162	162	59,045	59,045
412.2357469	412.2357469	198,553,760	198,553,760	199	199	72,472	72,472
420.1741712	420.1741712	401,504,572	401,504,572	402	402	146,549	146,549
490.5149366	490.5149366	494,544,517	494,544,517	495	495	180,509	180,509
						498,385	**498,385**

2020 Emissions

g/mi		g/day		MT/day		MT/year	
CO_2 Emissions Factor	CO_2 Pavley Factor	CO_2 Emissions	CO_2 Pavley	CO_2 Emissions Factor	CO_2 Pavley	CO_2 Emissions Factor	CO_2 Pavley
1498.638936	1137.756776	7,539,652	5,724,054	8	6	2,752	2,089
1215.696602	950.9427667	3,470,138	2,714,413	3	3	1,267	991
753.446815	586.4946788	105,797,076	82,354,084	106	82	38,616	30,059
487.3834825	367.1405697	177,462,337	133,680,410	177	134	64,774	48,793
412.9586538	312.6332693	201,237,459	152,348,242	201	152	73,452	55,607
425.1378478	328.4307866	499,772,545	386,088,161	500	386	182,417	140,922
498.2105166	391.8324603	449,065,204	353,180,670	449	353	163,909	128,911
						527,186	**407,373**

2035 Emissions

g/mi		g/day		MT/day		MT/year	
CO_2 Emissions Factor	CO_2 Pavley Factor	CO_2 Emissions	CO_2 Pavley	CO_2 Emissions Factor	CO_2 Pavley	CO_2 Emissions Factor	CO_2 Pavley
1492.111005	1022.910095	7,939,523	5,442,905	8	5	2,898	1,987
1219.956446	882.675327	4,233,249	3,062,883	4	3	1,545	1,118
768.5930006	560.938342	112,727,998	82,271,705	113	82	41,146	30,029
492.9342304	336.604531	196,961,238	134,496,736	197	134	71,891	49,091
430.7976775	301.5673931	212,976,033	149,087,682	213	149	77,736	54,417
428.7314479	304.2799	621,891,257	441,369,557	622	441	226,990	161,100
535.8573931	403.0776564	411,422,197	309,476,172	411	309	150,169	112,959
						572,375	**410,701**

Cable Airport Fuel Usage

Year	Avgas	Jet	Total Fuel Usage (Avgas and Jet Fuel)	Emissions (Metric Tons) CO_2	CH_4	N_2O	CO_2eq
2005	152,116	61,841	213,957	1,857	1.09	0.03	1,888
2006	123,982	38,353	162,335	1,399	0.88	0.03	1,427
2007	134,198	53,932	188,130	1,633	0.96	0.03	1,662
2008	106,963	56,446	163,409	1,430	0.77	0.03	1,454
2009	90,875	53,323	144,198	1,266	0.65	0.03	1,290
2010	90,484	70,522	161,006	1,428	0.66	0.04	1,453
2011	94,820	84,459	179,279	1,597	0.69	0.04	1,624
2012	88,661	96,299	184,960	1,659	0.65	0.00	1,673

Source: AECOM, *Cable Airport Master Plan* , May 2012.

Notes:

The data shows a continued declining trend in fuel sales from 1999 to present with an average decline of 6% a year. The increase in Jet A is due to the increase emergency helicopter operations that use jet A.

	N_2O $MTCO_2eq$	2008 Total $MTCO_2eq$	Percent	2010 Total $MTCO_2eq$	Percent
Transportation					
On-Road		492,465	73.8%	498,385	73.5%
Aviation	7.91	1,454	0.2%	1,458	0.2%
Energy					
Residential Electricity	264	49,904	7.5%	50,377	7.4%
Non-Residential Electricity	114	19,374	2.9%	21,742	3.2%
Residential Natural Gas	30	50,722	7.6%	51,207	7.6%
Non-Residential Natural Gas	3	4,337	0.6%	4,840	0.7%
Water					
Residential	37	7,008	1.0%	7,021	1.0%
Non-Residential	7	1,337	0.2%	1,339	0.2%
Landscape	5	993	0.1%	995	0.1%
Wastewater					
Residential	14	2,646	0.4%	2,651	0.4%
Non-Residential	3	505	0.1%	506	0.1%
Solid Waste	0	36,771	5.5%	37,214	5.5%
Total	484	667,504	100%	677,734	100%

BAU Emissions

	2035 Total $MTCO_2eq$	Percent	2020 Total $MTCO_2eq$	Percent
Transportation				
On-Road	572,375	71.0%	527,186	72.3%
Aviation	1,673	0.2%	1,544	0.2%
Energy				
Residential Electricity	56,282	7.0%	52,739	7.2%
Non-Residential Electricity	51,343	6.4%	33,583	4.6%
Residential Natural Gas	57,267	7.1%	53,631	7.4%
Non-Residential Natural Gas	11,126	1.4%	7,354	1.0%
Water				
Residential	7,184	0.9%	7,086	1.0%
Non-Residential	1,370	0.2%	1,352	0.2%
Landscape	1,018	0.1%	1,004	0.1%
Wastewater				
Residential	2,713	0.3%	2,676	0.4%
Non-Residential	517	0.1%	510	0.1%
Solid Waste	42,743	5.3%	39,425	5.4%
Total	805,612	100%	728,885	100%

Upland Municipal Natural Gas Usage (Therms) (City Buildings)

	2005	2008	2009	2010	2011	2012
2046 N SAN ANTONIO AVE	--	443	381	435	532	549
460 N EUCLID AVE	--	4,199	4,053	5,214	6,959	7,702
151 D ST	--	645	698	739	754	675
450 N EUCLID AVE	--	10,257	9,839	8,830	8,704	8,664
1350 N BENSON AVE	--	523	597	557	588	541
1370 N BENSON AVE	--	4,224	4,639	4,477	4,374	3,439
1499 W 13TH ST	--	16,142	14,560	2,423	28,516	20,651
250 N 3RD AVE	--	3,324	3,315	3,803	3,869	3,523
475 N 2ND AVE	--	7,834	9,388	9,543	8,998	8,811
Total	43,413	47,591	47,470	36,021	63,294	54,555

Municipal Electricity Usage (City Buildings)

	2008	2009	2010	2011	2012
kWh	19,040,564	20,178,316	14,817,476	12,486,668	17,333,710
MWh	19,041	20,178	14,817	12,487	17,334

City Water (City Bldgs, Parks, etc.)

	2008	2009	2010	2011	2012
Total CCF	334,104	302,084	281,960	259,731	302,310
Million Gallons	250	226	211	194	226
kWh (local)	561,269	507,478	473,671	436,328	507,857
kWh (import)	703,625	636,191	593,809	546,995	636,667
Total MWh	1,265	1,144	1,067	983	1,145

Street Lights

Total kWh	2,524,314
MWh	2,524

City Vehicle Fleet (2005 Factors)

$MTCO_2eq$	702.56

City Employee Commute

Total Rd Trip Dist:	11,608
Annual VMT:	3,018,080
CO_2 Emissions Factor (g/mi)	483
CO_2 (grams)	1,456,882,747
$MTCO_2$	1,457

City CNG Vehicles (Street Sweeping and Trash Collection)

Sweeping	14,172
Trash Collection	377,052
Total VMT	391,224

2008 Baseline Municipal Inventory

	CO_2	CH_4		N_2O		Total CO_2eq	
	Metric Tons	Metric Tons	$MTCO_2eq$	Metric Tons	$MTCO_2eq$	Metric Tons	Percent
Transportation							
Vehicle Fleet	703					703	5.6%
Employee Commute	1,457					1,457	11.7%
CNG Vehicles	134	1	25	0	1.52	161	1.3%
Energy							
Electricity - Buildings	5,479	0	1	0	29	5,509	44.3%
Electricity - Streetlights and	726	0	0	0	4	730	5.9%
Natural Gas - Buildings	2,525	0	1	0	1	2,528	20.3%
Water	364	0	0	0	2	366	2.9%
Solid Waste	0	47	981	0	0	981	7.9%
Total Municipal	*11,389*	*48*	*1,009*	*0*	*38*	*12,435*	100.0%

2020 Municipal Inventory

	CO_2	CH_4		N_2O		Total CO_2eq	
	Metric Tons	Metric Tons	$MTCO_2eq$	Metric Tons	$MTCO_2eq$	Metric Tons	Percent
Transportation							
Vehicle Fleet	703					703	5.65%
Employee Commute	1,457					1,457	11.72%
CNG Vehicles	134	1	25	0	1.52	161	1.30%
Energy							
Electricity - Buildings	5,479	0	1	0	29	5,509	44.30%
Electricity - Streetlights and	726	0	0	0	4	730	5.87%
Natural Gas - Buildings	2,525	0	1	0	1	2,528	20.33%
Water	364	0	0	0	2	366	2.94%
Solid Waste	0	47	981	0	0	981	7.89%
Total Municipal	*11,389*	*48*	*1,009*	*0*	*38*	*12,435*	100.00%

2035 Municipal Inventory

	CO_2	CH_4		N_2O		Total CO_2eq	
	Metric Tons	Metric Tons	$MTCO_2eq$	Metric Tons	$MTCO_2eq$	Metric Tons	Percent
Transportation							
Vehicle Fleet	703					703	5.65%
Employee Commute	1,457					1,457	11.72%
CNG Vehicles	134	1	25	0	1.52	161	1.30%
Energy							
Electricity - Buildings	5,479	0	1	0	29	5,509	44.30%
Electricity - Streetlights and	726	0	0	0	4	730	5.87%
Natural Gas - Buildings	2,525	0	1	0	1	2,528	20.33%
Water	364	0	0	0	2	366	2.94%
Solid Waste	0	47	981	0	0	981	7.89%
Total Municipal	*11,389*	*48*	*1,009*	*0*	*38*	*12,435*	100.00%

CNG Emissions Factor	g/mile	Emissions grams/yr	MT/yr	MTCO2eq
CO2	343.442	134,362,753	134.36	
CH4	3.081	1,205,361	1.21	
N20	0.01252	4,898	0.005	

Solid Waste

1,533 Tons/Year
981.12 $MTCO_2eq$/year

Electricity Emissions Factors

Electric Generating Company (EGC) Location (Operator)-based Level Data
Southern California Edison, 2005

CO_2	634.41 lbs/MWh	0.28776355 MT/MWh
CH_4	7.25 lbs/GWh	3.2885E-06 MT/MWh
N_2O	10.78 lbs/GWh	4.8897E-06 MT/MWh

Source: US Environmental Protection Agency, eGRIDweb (http://cfpub.epa.gov/egridweb), Accessed on January 28, 2013.

Natural Gas

CO_2	53.06 kg/MMBtu	0.05306 MT/MMBTU
CH_4	0.001 kg/MMBtu	0.000001 MT/MMBTU
N_2O	0.0001 kg/MMBtu	0.0000001 MT/MMBTU

Source: California Climate Action Registry, *General Reporting Protocol Version 3.1* , January 2009.

Water Use Energy Factors (kWh/MG)

Source	Supply and Conveyance	Treatment	Distribution	Total
Local	1,780.00	111.00	1,272.00	3,163.00
Import	8,325.00	111.00	1,272.00	9,708.00

Climate Action Plan

RBF CONSULTING
A Baker Company

Prepared by RBF Consulting