Climate Action Plan

City of Monterey

March 2016

EXECUTIVE SUMMARY

The City of Monterey Climate Action Plan (CAP) represents our local effort to address the City's contribution to a global environmental problem with community-level impacts. The CAP includes the following: 2005 Greenhouse Gas (GHG) emissions inventory; 2012 GHG emissions inventory; existing and planned GHG emissions reduction strategies for both the community (within our City geopolitical boundary) and government operations (associated with operations and management of City real properties and programs; also known as municipal), and recommendations to make further reductions to meet future goals. The CAP sets emission reduction goals for 2020, 2030, and 2050 according to California AB 32, the Urban Environmental Accords (UEA), and Executive Order S-3-05. The CAP also outlines progress made toward the goals of the U.S. Mayors Climate Protection Agreement (MCPA) and the UEA, to which the City became a signatory in 2007. Finally, the CAP identifies existing activities that contribute to local climate adaptation and priority steps for adaptation planning. The City of Monterey CAP is a living document - community members, business owners, and public employees should continue to reference and provide input to the CAP to improve the plan and integrate its attributes into City planning.

Emissions Inventory

The CAP establishes a 2005 baseline emissions inventory. This inventory categorizes emissions as either "community" or "government operations." It identifies community emissions as residential, commercial, industrial, transportation & mobile sources, water and wastewater, or solid waste. The government operations inventory, due to higher resolution data, includes building and facilities, streetlights and traffic signals, vehicle fleet, employee commute, and wastewater treatment facilities. The 2005 community baseline inventory reports 321,911 metric tons of carbon dioxide equivalents ($MTCO_2e$). The 2005 government operations baseline inventory reports 5,511 $MTCO_2e$. Together, 2005 emissions total 327,422 $MTCO_2e$.

The CAP also includes a 2012 update inventory. The 2012 community inventory reports 297,942 $MTCO_2e$ emitted and the 2012 government operations inventory reports 3,872 $MTCO_2e$. These total 301,814 $MTCO_2e$ for 2012, a reduction of 7.8% overall and significantly, 29.7% for government operations.

Emission Reduction Targets and Strategies

The City has established an emission reduction target of 15% below 2005 levels (as an estimate of 1990 levels) by 2020. This represents an estimated reduction of 827 $MTCO_2e$ and 48,286 $MTCO_2e$ from government operations and the community, respectively from 2005 levels. The goals match recommendations in AB 32.

Reduction strategies for both emissions inventories include existing programs and policies, as well as recommendations for new measures. The reduction strategies address all emissions categories. The programs and policies offer short-term and long-term strategies that, together, set Monterey on a course to meet or exceed its ambitious reduction targets.

Additionally, the City actively participates in regional planning conducted in compliance with Senate Bill 375 to address emissions resulting from regional activity, including transportation and land use.

Implementation and monitoring of strategies outlined and recommendations made in the CAP will enable the City to achieve its objectives to reduce GHG emissions and improve the sustainability of our community, while setting the stage for building additional climate resilience.

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ACRONYMS

AMBAG - Association of Monterey Bay Area Governments
CACP – Clean Air and Climate Protection
CAP – Climate Action Plan
CAPPA – Climate and Air Pollution Planning Assistant
CARB – California Air Resources Board
CEC – California Energy Commission
CEMS – Climate and Energy Management Suite
CEQA – California Environmental Quality Act
CIWMB – California Integrated Waste Management Board
COS – Center for Ocean Solutions
CPUC – California Public Utilities Commission
CSUMB – California State University Monterey Bay
EPA – Environmental Protection Agency
GDP – Gross Domestic Product
GHG - Greenhouse gas(es)
GWP – Global Warming Potential
HFC – Hydrofluorocarbons
HVAC – Heating, Ventilation and Air Conditioning
ICLEI – Local Governments for Sustainability
IPCC - Intergovernmental Panel on Climate Change
LCFS – Low Carbon Fuel Standard
LED – Light-Emitting Diode
LEED – Leadership in Energy and Environmental Design
LGOP – Local Government Operations Protocols
MBNMS – Monterey Bay National Marine Sanctuary
MBUAPCD – Monterey Bay Unified Air Pollution Control District
MCPA – Mayors Climate Protection Agreement
MMT – Million Metric Tons
MPO – Metropolitan Planning Organization
MPWMD – Monterey Peninsula Water Management District
MRWPCA – Monterey Regional Water Pollution Control Agency
$MTCO_2e$ – Metric ton of CO_2 equivalent
NACAA – National Association of Clean Air Agencies
OD – Origin Destination
PG&E – Pacific Gas and Electric
RPS – Renewable Portfolio Standard
RTAC – Regional Targets Advisory Committee
SCS – Sustainable Communities Strategy
SEEC – Statewide Energy Efficiency Collaborative
SWRCB – State Water Resources Control Board
TAMC – Transit Agency of Monterey County
UEA – Urban Environmental Accords
VMT – Vehicles Miles Traveled

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CLIMATE CHANGE & THE CITY OF MONTEREY

Background

By many accounts, global climate change presents the most significant environmental challenge we face today. The international scientific community agrees that human activities represent the overwhelming contributor to global climate change.[1] The continuation of business-as-usual activities that emit greenhouse gases (GHG) into the atmosphere at historically unprecedented rates is not an option. Already, climate change will yield many economic, environmental, and social costs. Communities and governments at all levels of society must address their actions and make changes to reduce impacts on the climate and communities. Yet preparing for climate change will provide myriad opportunities to make not only environmental gains, but economic and social progress as well.

The greenhouse effect describes the earth's natural ability to regulate global surface temperature. The earth's atmosphere contains numerous gases known as greenhouse gases. These gases, which include carbon dioxide, methane, nitrous oxide, chlorofluorocarbons (CFC), and water vapor, allow a portion of incoming solar radiation to reach the earth's surface, but trap some outgoing infrared radiation emitted by the earth's surface. This trapped infrared radiation returns to the earth's surface, warming the atmosphere and the planet. This greenhouse effect is essential to establish the necessary conditions for life on earth. However, as GHG concentrations in the atmosphere have increased over the last 150 years, the surfeit of atmospheric GHG has led to excessive trapping of infrared radiation. This has caused increased global average surface temperatures and global climate change.

Major causes of anthropogenic climate change include the following:

- Fossil fuel combustion for transportation and electricity production
- Land conversion and land use change
- Population growth
- Waste management

We address expected impacts of anthropogenic climate change in the following section.

Objectives

In response to global climate change and under the guidance of the regulatory framework that has developed in California, the City of Monterey has prepared this Climate Action Plan (CAP) to achieve the following:

(1) Identify the source and amount of GHG emissions in 2005, the selected baseline year for the inventory, within the geographic boundaries of the City of Monterey (community), and produced by government operations for the City (government/municipal operations) and project future business-as-usual GHG emissions,

[1] IPCC, 2013: *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.

(2) Describe existing City policies, programs, and actions that reduce business-as-usual emissions,

(3) Establish achievable and aggressive reduction targets consistent with State and regional regulations and guidance,

(4) Recommend strategies to reduce GHG emissions to reach those targets and carry out ongoing monitoring of emissions, and

(5) Discuss the City's current understanding of climate change vulnerabilities and outline initial adaptation strategies for responding to these effects.

Climate Change Impacts

Rising global average surface temperatures affect global climate patterns, resulting in myriad and varied outcomes. Impacts range from desertification to longer monsoon and hurricane seasons, changing precipitation patterns to sea level rise. This warming trend also affects agricultural growing seasons and water supply. We describe the effects of climate change in our state and city below.

California

The State of California has already begun to experience the effects of climate change. Measured decreases in snowpack have affected water availability and increased the quantity and severity of wildfires. Terrestrial and marine wildlife have exhibited shifts in both migration timing and destination. Decreased water supply and changing temperatures have impacted agricultural production. Based on scientific models, these effects will likely continue to increase in severity. The level of severity depends on the projected increase in temperature.[2,3]

California is taking steps to both mitigate for and adapt to climate change. We describe key mitigation policies (AB 32, SB 375 and SB 97), and the GHG reduction targets they set, below. The State has also produced the California Climate Adaptation Strategy that provides recommendations for building climate resilience at all levels of government within the State. Examples of recommended adaptation strategies include collaborating among regional jurisdictions and updating emergency plans.[4]

Monterey Bay Region

Local level impacts in Monterey Bay will mirror those experienced by the rest of the State. Sea level rise in particular presents a significant threat. In 2011, the Center for Ocean Solutions (COS) and Monterey Bay National Marine Sanctuary (MBNMS) sponsored a regional adaptation collaborative workshop and study in the Monterey Bay area and provided an analysis of climate change effects related to sea level rise on the City of Monterey. Local level impacts will include increased shoreline erosion, coastal inundation, storm and wave damage, and salt water intrusion. Between 1973 and 1999, relative sea level in Monterey Bay rose at 0.31 ft/50 yrs (1.86 mm/yr).[5] From 1900 to 2005, relative sea level rose 0.18 m (0.59 ft).[6] A study by Philip Williams and

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[2] The Future is Now: An Update on Climate Change Science Impacts and Response for California (May 2009) Prepared by Moser, Susan et al. For California Energy Commission. http://www.energy.ca.gov/2008publications/CEC-500-2008-071/CEC-500-2008-071.PDF Last visited December 17, 2009.

[3] California Climate Adaptation Strategy (2009) California Natural Resources Agency. http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F-ES.PDF Last visited August 2012.

[4] California Climate Adaptation Strategy (2009)

[5] Planning for the Future: Climate Change and the Monterey Bay Shoreline (December, 2011) Center for Ocean Solutions and National Marine Sanctuaries Monterey Bay.

[6] Cayan, D., Bromirski, P., Hayhoe, K., Tyree, M., Dettinger, M., & Flick, R. (2008). Climate change

Associates, Ltd. found that sea level rise will cause increased shoreline recession and erosion at a rate of 0.8 ft/year (0.24 m/yr) over the next 50 years, and 1.6 ft/yr (0.49 m/yr) during the following 50 years.[7] Sea level rise and associated impacts such as flooding, erosion, and saltwater intrusion into groundwater supplies represent the major climate change threats to Monterey Bay.

In 2013, the California Coastal Commission released a detailed sea level rise guidance document, including localized projections for the southern and northern halves of the state as demarcated by Cape Mendocino. Based on the best available scientific modeling from the National Research Council, these estimates project a 4-30 cm (1.56-11.76 in) sea level rise by 2030, with as much as 61 cm (24 in) and 167 cm (65.76 in) by 2050 and 2100, respectively. Although the Monterey Peninsula is not particularly seismically active compared to other regions of California, it is worth noting that uplift or subsidence from seismic activity can also have a large impact on sea level relative to coastal land forms.

City of Monterey

The state-wide physical, economic and public health disruptions caused by climate change will have an impact on Monterey. However, due to our geographic location and natural resources, Monterey will be at a greater risk of the following effects from climate change:

- Sea-level rise and loss of beach sand
- Risk of wildfire
- Acidification and warming of the oceans affecting the Monterey Bay marine life with impacts to the tourism and fishing industries.
- Warming of the submarine canyon under Monterey Bay will lead to warmer nights and hotter summers, impacting the agricultural industry.
- Saltwater intrusion in to the region's potable groundwater basins will continue to increase, affecting agricultural activities
- Rainfall is likely to increase to the north of Monterey County and decrease to the south; it is unclear how the City of Monterey will be affected.

Like the State, Monterey is taking steps to mitigate for and adapt to climate change. This CAP describes mitigation measures in Chapter 5. Adaptation measures address both fire hazards and sea level rise, and the CAP describes these in Chapter 7.

projections of sea level extremes along the California coast. Climatic Change, 87(0), 57-73.

[7] Coastal Regional Sediment Management Plan for Southern Monterey Bay. (November, 2003) Prepared by Philip Williams and Associates Ltd. For The Association of Monterey Bay Area Government. http://www.dbw.ca.gov/csmw/pdf/SMontereyBay_CRSMP_3Nov2008.pdf. Last visited November 20, 2013.

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REGULATORY CONTEXT

State Laws

California Global Warming Solutions Act (Assembly Bill 32)

The California Global Warming Solutions Act (September 2006) recognizes that climate change poses a serious threat to the economic well-being, public health, and natural resources of the State of California. The Act establishes a goal to reduce statewide GHG emissions to 1990 levels by 2020. AB 32 required the CARB to develop a scoping plan for meeting AB 32 requirements. The Climate Change Scoping Plan recommends that local governments perform greenhouse gas inventories and reduce their emissions to 15% below current levels by 2020. For this CAP, current levels are defined as the 2005 baseline emissions inventory.

CEQA & Greenhouse Gas Emissions (Senate Bill 97)

The Senate Bill amends CEQA statue to clearly establish that GHG emissions and effects of these emissions are appropriate subjects for CEQA analysis. This CAP will undergo CEQA review as part of its adoption.

Senate Bill 375

Senate Bill 375, passed in late 2008, establishes stronger goals to link regional transportation planning and the regional housing needs allocation process. The legislation has three goals: 1) use the regional transportation planning process to help achieve AB 32 goals; 2) use CEQA streamlining as an incentive to encourage projects which help achieve AB 32 goals to reduce GHG emissions; and 3) coordinate regional housing needs allocation process with the regional transportation planning process. Senate Bill 375 requires the 18 Metropolitan Planning Organizations in California to reduce per capita vehicle miles traveled and related greenhouse gases for their respective regions through a coordinated land use and transportation plan called the Sustainable Communities Strategy. The SCS shapes each region's long range transportation plan, including the financing of transportation projects. Under SB 375, the SCS must identify a regional development pattern and transportation system that can meet the regional greenhouse gas (GHG) targets from the automobile and light truck sectors for 2020 and 2035.

Executive Order S-3-05

In 2005, due to the threats of climate change to water sources, air quality, heat stress, infectious disease, rising sea levels, respiratory issues, and other impacts to human health and the environment, the Governor of California enacted Executive Order S-3-05. Two main components of this order were to reduce greenhouse gas emissions levels to 1990 levels by 2020 and to reduce emissions to 80% below 1990 levels by 2050.

Regional Policies

Envisioning the Monterey Bay Area: A Blueprint for Sustainable Growth and Smart Infrastructure / Sustainable Community Strategy

In June of 2014, the Association of Monterey Bay Area Governments (AMBAG) released the Metropolitan Transportation Plan/Sustainable

Communities Strategy to address GHG emissions regionally. The 2035 MTP/SCS is built on a set of integrated policies, strategies and investments to maintain and improve the transportation system to meet the diverse needs of the region through 2035.

A sustainable growth pattern emphasizes pedestrian and transit focused transportation with fewer people driving alone in their cars. It includes neighborhood centers that meet the daily needs of citizens and visitors (grocery stores, employment centers, community centers) that are walkable and bikeable. In addition, higher density neighborhood designs support pedestrian mobility and transit services.

This AMBAG document represents the initial steps our region is taking to meet the goals defined in SB375 and develop a Sustainable Communities Strategy (SCS) for the Monterey Bay region.

The SCS will be developed by the region together with the Regional Transportation Plan that builds on regional planning to meet the goals (including the targets above) of SB 375 through regional transportation and land use planning. SB 375 requires each Metropolitan Planning Organization (MPO) to include a SCS in the regional transportation plan that demonstrates how the region will meet the GHG emission targets. If the sustainable communities' strategy falls short of meeting the targets, the region must prepare an "alternative planning strategy" that, if implemented, would meet the targets.

Municipal Policies

U.S. Mayor's Climate Protection Agreement

The City Council signed the U.S. Mayor's Climate Protection Agreement on July 9, 2007. The agreement includes a series of recommendations and a goal to inventory GHG emissions in City operations and in the community, set reduction targets, and create an action plan. Appendix B – City of Monterey Sustainability Achievements analyzes achievements the City government has accomplished under each of the following categories: Water, Environmental Health, Urban Design, Transportation, Urban Nature, Waste, and Energy (consistent with the categories identified by the Urban Environmental Accords). A summary of the expected emissions reductions from these activities can be found in Table 4. The actions span multiple city government departments and disciplines. The analysis in Appendix B further categorizes each effort by its projected outcome: Educational, Quantitative, and Supportive Policy to capture the City's response to the variety of approaches that are needed to adequately address the issues, and GHG Reduction Component and Adaptation Component to address the expected impact of the action. Many actions fit into more than one category; actions are defined below. The environmental actions taken to date will form the basis for future GHG reduction strategies:

Educational - Methods of outreach to educate internal staff and/or community members on actions they can take to address environmental concern in the office or at home.

Examples: Green Building Expo, Storm Drain Stenciling, and Sustainable Plant Demonstration.

Quantitative - Actions that can be quantifiably measured in order to receive an estimated level of impact (financially and environmentally).

Examples: Lighting upgrades in City facilities to LEDs, converting to City fleet to electric and hybrid vehicles, and tree planting.

Supportive Policy **-** Legislative actions or policies (formal and informal) that support environmental initiatives.

Examples: Green Building Ordinance and Mixed-Use / Smart Growth Zoning.

Urban Environmental Accords

In 2007, the City signed the Urban Environmental Accords (UEA) which list 21 strategies, and related actions, for green communities. These strategies address energy, waste reduction, urban design, urban nature, transportation, environmental health, and water. Action 3 of the UEA encourages the City to account and inventory its GHG emissions and adopt a citywide GHG reduction plan that reduces the jurisdiction's emissions by 25% below baseline by 2030. The City is well on its way to meeting many of the strategies.

City Energy Reduction Programs

The City has implemented various lighting upgrades throughout the City. The City uses the latest light technologies available to replace old lighting fixtures, reducing average energy consumption by 35% and reducing GHG emissions of the City. Rebates from the California Public Utilities Commission partially funded the projects. The projects were completed within budget at $640,000. The City received rebates in the amount of $75,000. By tracking energy consumption and associated costs, the City anticipates a cost savings of approximately $50,000 annually. The Monterey Sport Center project began in 2005 by replacing the lighting in the Gymnasium. In 2007, induction lighting replaced the high-pressure sodium lights in the swimming pool area. The anticipated yearly savings from these changes equal approximately $47,000.

Since January 2011, the City has purchased all its electricity from a green energy service provider, through PG&E's Direct Access Program and the EPA Green Power Partnership. Under the agreement, renewable sources, such as wind, biomass, geo-thermal, small hydro-electric, and solar, generate 100% of the electricity supplied to municipal buildings and facilities. Currently, wind provides 80% of the City's power and biomass provides the remaining 20%. During the first 2-year contract period of this agreement, the City purchased 6,190,000 kWh per year. The origin of this electricity is certified by Green-e, a third-party initiative of the Center for Resource Solutions. For the purposes of the relevant inventories, this grid electricity is assumed to produce 0 $MTCO_2e$, and upstream impacts of renewable electricity production are ignored.

Office of Planning and Research

The California Governor's Office for Planning and Research (OPR) has issued detailed guidelines to assist local municipal governments in creating robust and consistent climate action plans. Furthermore, the Statewide Energy Efficiency Collaborative (SEEC), a project of California government agencies and the state's major electric utilities, provides a series of online tools to inventory and forecast greenhouse gas emissions. This initiative is supported and administered by the international alliance, Local Governments for Sustainability (ICLEI).

Monterey's climate action plan adheres to all OPR guidelines with the explicit goal of directing city actions and policies toward meeting statewide mandated emissions reduction targets by 2020. The use of SEEC emissions calculators and nationally agreed-upon reporting protocols, namely the U.S. Community Protocol, ensure the Monterey CAP is comparable with those of peer communities in California and nationwide. For a comprehensive comparison of the regulatory context of the CAP please refer to Appendix A.

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GREENHOUSE GAS EMISSIONS AND REDUCTION ANALYSIS

ICLEI's SEEC Clearpath and Climate and Energy Management Suite (CEMS) tool was used for developing the 2005 and 2012 GHG inventories. Two tools were used to develop the GHG emissions and reduction analysis component of the CAP: Clean Air and Climate Protection (CACP) and the Climate and Air Pollution Planning Assistant
(CAPPA).

Emissions Calculation Methodology

SEEC was developed by three statewide nonprofits (ICLEI, Local Government Commission, Institute for Local Government) and California's four investor-owned utilities (Pacific Gas and Electric Company, Southern California Edison, San Diego Gas and Electric Company, Southern California Gas Company. The SEEC CEMS software is recognized as the industry standard; it is used across California, and is designed for use by local communities. The State of California Office of Planning and Research also recommends this model in the *CEQA and Climate Change Technical Advisory*.

The CEMS CACP/CAPPA emissions management tool calculates and tracks emissions of GHGs from electricity usage, fuel use and waste disposal. This includes carbon dioxide, methane, and nitrous oxide, as well as criteria air pollutants (carbon monoxide, volatile organic compounds, PM_{10}). It quantifies the effect of existing and proposed mitigation measures, predicts future emissions levels and helps set and track progress towards meeting reduction targets and goals.

The SEEC CEMS tool creates two emissions inventories; community and government operations. The community inventory includes emissions produced within the jurisdictional boundaries of Monterey. It includes all of the buildings, roads and waste produced within these boundaries. The government operations inventory includes emissions that are produced as a result of activities needed for City services to function (Police, Finance, Public Works, etc), and City buildings and facilities.

While this program is useful, the changing natures of both the political landscape and the technology pose certain challenges. The SEEC Climate and Energy Management Suite, including the inventory and forecast modules, has undergone multiple updates in recent years. It is recommended that emission calculations for business-as-usual and future 2020 and 2050 scenarios with implementation of City reduction strategies are updated every 3-5 years. Future updates can enable the City to demonstrate success at progress toward meeting goals, and may also potentially provide an opportunity to gain emission reduction credits for future involvement in carbon trading programs.

Scopes of GHG Inventory

In accordance with the Local Government Operation Protocol (LGOP, Version 1.1, 2010), the emissions categories included in the government operations inventory are further defined into three different scopes.

Scope 1 – All direct GHG emissions. This includes activities that emit GHGs directly and that the local government owns or controls such as vehicle fleet, manufacturing, stationary combustion to produce electricity and fugitive emissions (i.e. refrigerants and solid waste landfills).

Scope 2 – Indirect GHG emissions. This includes GHGs emitted by others, but associated with the consumption of energy by the City. For example emissions associated with electricity use in a city building but originating from a power plant are Scope 2 emissions.

Scope 3 – All other indirect emissions not included in Scope 2. Example of indirect emissions not included in Scope 2 include: (1) emissions resulting from employee commutes and (2) waste generated within the government but disposed of outside its boundaries.

Categorizing the emissions into the three different scopes prevents double counting among entities. For example a city's energy use is captured in Scope 2 but an energy producer would be expected to account for the energy production and associated GHG emissions as Scope 1 within their geopolitical boundary GHG reduction plan.

Emissions Not Included in the Inventory

As previously indicated, city-wide inventories do not capture all GHG emissions, and actual emissions may differ from those calculated herein. Efforts were made to account for all significant emissions sources so that informative decisions regarding effective control measures could be made by each jurisdiction. Where appropriate, calculations were performed using conservative numbers to reduce the likelihood of underestimating emissions. Appendix B displays all the potential sources of GHG emissions, their emissions (if included), and reason for exclusion (if not included). Reasons for excluding potential emissions sources or activities include that the activity or source does not occur in the City (not occurring), it produces negligible emissions (not estimated), it is included under another category (included elsewhere), or it does not contribute greenhouse gases in the context of the City of Monterey (not applicable).

Residential, commercial, and industrial sources from non-utility-based fuels (such as propane, stationary diesel, fuel oil, etc.) were not included because of the resource intensive nature of collecting non-utility based fuel consumption data. Future efforts should be made to characterize the relative magnitude of these emissions sources before undertaking these data collection efforts. These emission inventories also exclude certain trans-boundary activities that could be considered attributable to the community, but for which there is currently no guidance for quantification, such as life cycle emissions and emissions associated with renewable energy production (described as upstream impacts of activities in CEMS).

The ICLEI LGOP recommends that government operations inventories include fugitive emissions from refrigerants and fire suppression equipment from buildings and facilities as well as vehicles. Because the city does not track use of refrigerants, fire suppression substances, or other substances that result in high GWP GHG emissions, high GWP GHG emissions from these and other uses in the City are not included in the inventories. For future efforts, data regarding HFC-using equipment including HFC storage, purchases, sales, and equipment charging and capacity could be collected internally and maintained by a centralized source.

Please see the Community Inventory and Government Inventory sections below for further details on included categories.

Reductions Methodology

The CACP/CAPPA is a tool used to estimate the GHG reduction effects of proposed policies and strategies. ICLEI created the tool to assist local governments in quantifying the costs and benefits of various reduction strategies. The program currently offers over 100 reduction strategies. City-specific data were entered into CEMS and combined with reduction coefficients and research. Some recommended reduction

strategies are not currently offered in the CEMS CACP/CAPPA software (such as implementing an eco-budget and various education efforts). In these instances, data from past experience and additional research is used to estimate reduction impacts.

COMMUNITY INVENTORY

The community inventories include six of the ten sectors identified in SEEC CEMS and listed below:

1) Residential energy;
2) Commercial energy;
3) Industrial energy;
4) Transportation and mobile source;
5) Water and wastewater;
6) Agriculture (not occurring);
7) Solid waste;
8) Process and fugitive emissions (not estimated);
9) Upstream impacts of activities (not estimated);
10) Consumption based (not estimated)

These sectors determine the community-wide GHG emissions as described in detail, below.
The sections below provide detailed information on how the data for each section was collected and analyzed. The 2005 and 2012 inventories do not include categories 6, 8, 9, or 10 (agriculture, process and fugitive emissions, upstream impacts of activities, and consumption based) because they are either not occurring (6) or not estimated (8-10). Please see Appendix B for further details.

Each sector described below meets or exceeds the standard evaluation methods used by other California communities and is consistent with current State guidelines. Furthermore, each section was internally reviewed by relevant staff, including: City Traffic Engineer (Transportation), Sustainability Coordinator (Waste), and Building and Planning staff (Residential, Commercial and Industrial Energy).

Sources vs. Activities

Under the ICLEI U.S. Community Protocol for Accounting and Reporting Greenhouse Gas Emissions, Version 1.0, community emissions are divided into two categories: sources and activities. The Scope 1/2/3 method used to classify government emissions is not used for the community as a whole. Instead, sources and activities are defined as such:

*Sources: Any physical process **inside the jurisdictional boundary** that releases GHG emissions into the atmosphere (e.g., combustion of gasoline in transportation; combustion of natural gas in electricity generation; methane emissions from a landfill).*

*Activities: The use of energy, materials, and/or services by members of the community that result in the creation of GHG emissions either **directly** (e.g., use of household furnaces and vehicles with internal combustion engines) or **indirectly** (e.g., use of electricity created through combustion of fossil fuels at a power plant, consumption of goods and services whose production, transport and/or disposal resulted in GHG emissions).*

(Source: ICLEI U.S. Community Protocol for Accounting and Reporting Greenhouse Gas Emissions, Version 1.0. 2010. Emphasis added.)

Residential Energy

Community residential energy use data were provided by PG&E's Community Energy Manager in the form of an Excel spreadsheet with 2005 – 2012 electricity and natural gas use. The data includes all accounts categorized by PG&E as residential when the account was established. It does not include any unincorporated areas that share the same zip code as the City of Monterey. However, it does include residential accounts that are owned by

the City and/or County of Monterey and are located in Monterey.

Commercial energy

Commercial energy use data were provided by PG&E's Community Energy Manager in the form of an Excel spreadsheet with 2005 – 2012 electricity and natural gas use. PG&E's15/15 rule requires that PG&E not release the identity of any individual account holder that uses 15 percent or more of total energy within a jurisdiction – this was relevant for one entity in the City of Monterey. Although reductions in energy use by that user might have a significant impact on the overall community emissions, these restrictions regarding confidentiality might limit the extent to which the City may target such large commercial users for reduction programs.

Industrial energy

Industrial energy was entered as 0 electricity use and 0 natural gas use based on data from PG&E's Community Energy Manager in the form of an Excel spreadsheet with 2005 – 2012 electricity and natural gas use.

Transportation

Fehr & Peers prepared a Monterey Climate Action Plan Vehicle Miles Traveled (VMT) Analysis, included in Appendix D, for the purpose of quantifying City-specific transportation GHG emissions. The 2005 base year Association of Monterey Bay Area Governments (AMBAG) travel demand forecasting model was used to develop City-wide daily VMT estimates. VMT is typically an output from travel demand forecast models and is calculated based on the number of automobile trips multiplied by the distance traveled by each car trip. As such, the estimated VMT is dependent on the level of detail in the network and other variables related to vehicle movement through the network. The volume and distance of traffic depends on land use types, density/intensity, and patterns as well as the supporting transportation system. A travel demand forecasting model is normally used to represent this relationship when forecasting vehicle trips and VMT.

Although the calculation of VMT is simply the number of automobile trips multiplied by the distance traveled by each trip, VMT performance measures can be reported differently. These performance measures can be calculated for the entire roadway network, which may extend beyond a specific geographic area such as the physical limits of a city or project area. Specifically, the current state of the practice technique for determining the VMT estimates from municipalities is the "origin-destination" (OD) method.

The OD method tracks the vehicle trips being generated by a geographic area (i.e., a city) across the entire regional transportation network to their ultimate destinations. The OD method excludes trips that pass through the City – with neither an origin nor destination within the City.

Fehr and Peers recommended use of the OD method to account for all the VMT generated in a jurisdiction such as the Monterey, as it directly accounts for trips that may be affected by actions to reduce travel taken by the City. Because a portion of the external to internal trips are typically employment trips during the morning and evening peak periods, the VMT per service population was calculated using the total residential population and employment within the City. This method is consistent with the Air Resources Board Regional Targets Advisory Committee recommendation for estimating VMT.

2012 transportation emissions were estimated using the same VMT figures and fleet composition from 2005, as a review of the California Highway Performance Monitoring

System data for the City of Monterey revealed that vehicle traffic had remained unchanged over the period 2005 to 2012. However, in the SEEC emissions calculator, the gas mileage factors were updated using Monterey County-specific information from the California Air Resources Control Board EMFAC database.

Water and wastewater

California American Water provided electricity and natural gas data for energy used in providing potable drinking water to the City of Monterey community. To estimate per capita water usage, the volume of water provided to the Monterey Peninsula for 2005 was obtained from the Monterey Peninsula Water Management District (MPWMD) hearing before the State Water Resources Control Board by way of a 2011 report from California State University Monterey Bay's (CSUMB) Watershed Institute. 2012 water provision was obtained directly from California American Water. These data were converted to reflect water provision exclusively to the City of Monterey based on the percentage that the City represents of the total population served on the peninsula.

The Monterey Regional Water Pollution Control Agency (MRWPCA) provided electricity and natural gas data for energy used in treating the community's wastewater. The water treatment plant uses co-generation, burning methane gas produced as process emissions during water treatment, to provide additional energy. Additionally, the plant helps operate a 1.12 MW solar plant. Electricity and natural gas used in the pumping of wastewater was collected using the Utility Manager software employed by the City, which receives data from PG&E meters. This provided data on energy use by the sewer lift stations that the City operates.

Solid Waste

CalRecycle, formerly the California Integrated Waste Management Board (CIWMB), provided waste data information. While most waste in the City of Monterey is taken to the Marina Landfill, additional landfills throughout California also accept waste that originates in Monterey. Each landfill facility reports the origin of the waste entering their facility to CalRecycle, who then aggregates and reports the total waste per city and county statewide. CalRecycle also establishes waste mix percentages, which determine percentages for how much waste is paper, food, plant debris, etc.

The Marina Landfill uses a capture system to prevent the release of methane, a potent GHG, into the atmosphere and burns that gas to power some of the plant's operations. Based on data filed with the Monterey Bay Unified Area Pollution Control District, the methane recovery system in Marina succeeds in capturing 81.7% of emissions. However, in the interest of accuracy, this analysis uses the more conservative 75% default capture factor in SEEC.

Government Operations Inventory

The government operations inventories include six of the nine sectors identified in SEEC CEMS and listed below.

1. Buildings & facilities;
2. Streetlights and traffic signals;
3. Vehicle fleet;
4. Transit fleet (not applicable);
5. Employee commute;
6. Electric power production (not occurring);
7. Solid waste facilities (included elsewhere in community inventory);
8. Wastewater treatment facilities;
9. Process and fugitive emissions (not estimated)

SEEC automatically categorized each sector into

one of three scopes as defined in Chapter 3 and allowed user designation of Scope 3 activities:

The sections below provide detailed information on how the data for each section was collected and analyzed.

Buildings and Facilities

Via the Utility Manager software, PG&E provided data on each building and facility owned and/or operated by the City of Monterey. These data included grid electricity and natural gas usage and cost for each building or facility. This category includes the following buildings and facilities:

1) City Hall,
2) Police and Fire Departments,
3) Public Restrooms,
4) Harbor Buildings,
5) Housing Department,
6) Recreation Department,
7) Public Works Department and
8) Cemetery Facilities

Streetlights and Traffic Signals

Data on streetlights and traffic signals were received from PG&E in the same manner as buildings and facilities. The data include three (3) subcategories:

1) Traffic signals/controllers (includes: signals, flashing beacons, control devices);
2) Streetlights (includes lights on roadways and sidewalks);
3) Bike path lights

Vehicle Fleet

Vehicle fleet data were derived from an internal reporting system (Hansen), which originated from an external reporting system (GasBoy). GasBoy records the amount of gas dispensed from City facilities. This record is sent to Hansen, where a report was generated which included each vehicle owned by the City of Monterey. Data were reported per vehicle from January 1, 2005 to December 31, 2005, and again from January 1, 2012 to December 31, 2012. Due to inefficiencies in output, data were hand evaluated and an additional report was created that allowed further analysis. Specifically, sub-categories were created per department for vehicle use, to disaggregate, by department, type of fuel used, cost of fuel (per vehicle) during 2005 and 2012, as well as the vehicle year and type.

Employee Commute

2005 employee commute data are based on the following analysis conducted in 2008. The human resources department provided a listing of City and Zip Codes of employee residence (in separate full-time (FT) and part-time (PT) listings). The distances between each residence zip code and Monterey was found using Google maps (set to trip by car). Further details on analysis are included in Chapter 4 and the Supplemental Technical Report in Appendix C. The distances between each residence zip code and Monterey was found using Google maps (set to trip by car). Further details on analysis are included in Chapter 4 and the Supplemental Technical Report in Appendix C.

These data were refined and updated in 2013 using a more accurate commute survey sent to all full- and part-time city employees, querying them on the mode, efficiency and distance of travel to and from work. A copy of the survey is included in Appendix C.

Wastewater Facilities

This category contains just two entries: both sewer lift stations that pump wastewater from City of Monterey land uses, as well as from areas outside Monterey. The Monterey

Regional Water Pollution Control Agency (MRWPCA),) operates eight lift stations that serve the peninsula, however the City of Monterey only owns two lift stations. Data were entered as one category into ICLEI software. This category does not account for treating wastewater generated by city facilities at the wastewater treatment located within unincorporated Monterey County north of Marina; however, wastewater treatment emissions are included in the community inventories.

4

GREENHOUSE GAS EMISSIONS INVENTORY RESULTS

Results of the data collection and analysis produced two separate reports, a community report and a government operations report. The results are described in the community and municipal results sections below. Community emissions and government operations emissions are recorded separately; any overlap in emissions is presumed negligible.

Community Results

Total CO_2e released by the City of Monterey community in 2005 reached 321,911 MT CO2e. For 2012, this total figure is 297,942 MT CO2e, a reduction of 7.4%. Figure 1 and Table 1 on the following pages show additional detailed breakdown by sector. The largest sectors are Transportation followed by Commercial Energy. These results are in-line with communities of similar size. As in most other communities, Transportation is the largest sector. The City's large educational and military institutions contribute to the high commercial sector, as well as a relatively large tourism industry. Furthermore, Monterey is a compact city with relatively few miles of roadway, which reduced our transportation sector results.

2005 Community Greenhouse GasEmissions

Government Operations Results

Total CO2e released by City of Monterey government operations in 2005 reached 5,511 MTCO2e and in 2012 reached 3,872 MTCO2e, a reduction of 29.7%. The city's power purchasing agreement with Commerce Energy (formerly Three Phases Renewables) is the main cause of these significant reductions. The results of the Government Operations Inventory contain greater detail, because the data received from PG&E were more specific and some of the analysis used internal data. It should be noted, however, that streetlight data from PG&E were not usable due to the reliance on estimated rather than metered charges. In addition, the retrofits made to the streetlight system in 2012 were not accounted for by PG&E until the following year resulting in an overestimation of energy use. Due to this fact, the streetlight data from 2012 is an estimated value based on expected kwh reductions. Detailed information by sector is included in Appendix C.

Total Results

Community and government operations inventories account for distinct emissions categories, and are thus quantified independently. Together, 2005 emissions for both the non-municipal community and government operations total 327,422 $MTCO_2e$. These total 301,814 $MTCO_2e$ for 2012, a reduction of 7.8% overall.

Figure 1 Community GHG Emissions by Sector (MT CO2e)

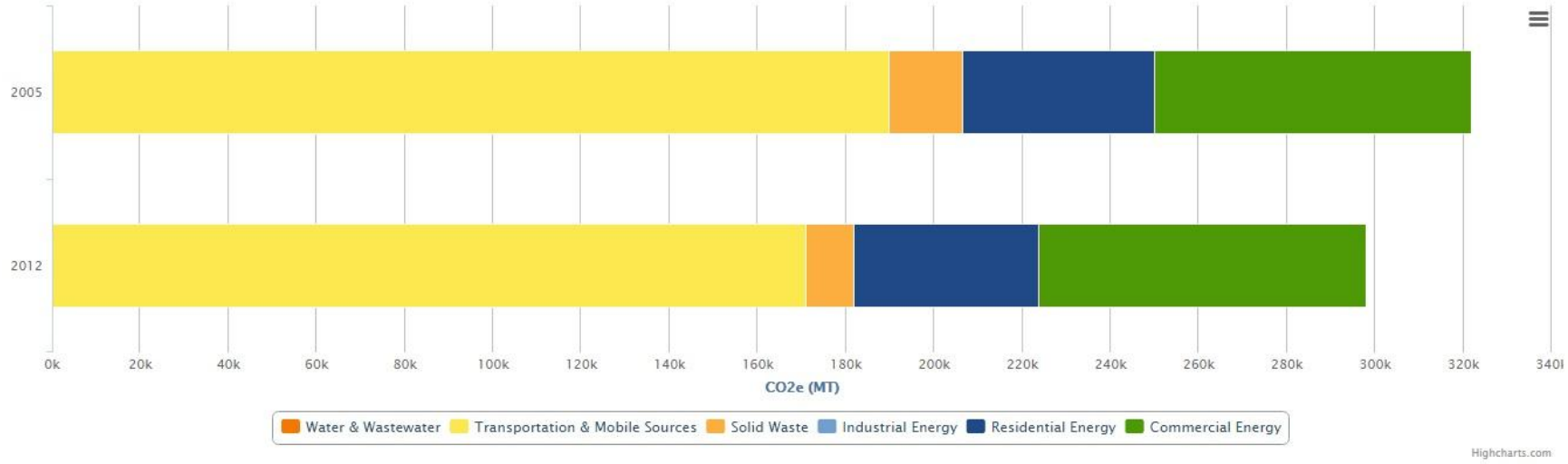


Table 1 Community GHG Emissions by Sector (MT CO2e)

Year	Commercial Energy	Industrial Energy	Residential Energy	Solid Waste	Transportation & Mobile Sources	Water & Wastewater
2005	71988.0	0.0	43466.0	16774.0	189469.0	214.0
2012	74218.0	0.0	41853.0	10995.0	170676.0	200.0

Figure 2 Government Operations GHG Emissions by Sector (MT CO2e)

Table 2 Government Operations GHG Emissions by Sector (MT CO2e)

Year	Vehicle Fleet	Employee Commute	Buildings & Facilities	Street Lights & Traffic Signals	Water & Wastewater Treatment Facilities
2005	1316.0	1316.0	2596.0	277.0	6.010635
2012	1136.0	1715.0	887.0	134.0	0.015952

5

PROJECTIONS & REDUCTION GOALS

Projections

The U.S. Environmental Protection Agency (EPA) estimates nationwide GHG emissions to increase approximately 0.9% each year. This increase corresponds to Gross Domestic Product (GDP) increase of 2.9%, population increase of 1.1%, electricity consumption growth of 1.9%, as well as fossil fuel and energy consumption increases of 1.1% each.[8]

As of 2011, the California Public Utilities Commission has imposed a moratorium on new connections to the municipal water supply. Despite these challenges, growth in the City will continue at a controlled rate. Projections from AMBAG's 2014 Regional Growth Forecast indicate that the City population will grow, on average, 0.39% per year over the next twenty years, while housing stock will increase 0.12% annually. AMBAG predicts total employment in Monterey will grow at roughly 1% per year for the next two decades, with significant job losses in the industrial sector offset by job creation in construction and the public sector. As employment in the city continues to outpace growth in housing and population, the influx of workers who live in surrounding communities and commute to Monterey will also continue to rise.

Regional projections will be influenced by the outcome of the sustainable community strategy. AMBAG board approved the regional GHG percent reduction in daily per capita GHG emissions associated with land use and transportation as established by the California Air Resources Board at 15% reduction by 2020 and 25% reductions by 2035. Additionally, in Executive Order 3-05, the governor's office has declared a state-wide emissions reduction goal of 80% by 2050. The City of Monterey CAP will be updated as significant regional policies develop.

From 2005 to 2012, total emissions in Monterey, including community and government operations, fell 7.8%. This is a significant reduction and does meet the stated target of 7% by 2012 in the Urban Environmental Accords. In addition, during this same period, government operations have reduced their emissions by 29.7%, a substantial reduction. These significant reduction achievements on the part of government operations highlight the success of numerous municipal programs, including reduced carbon intensity of the vehicle fleet and most significantly, the switch to renewable energy sources for municipal buildings and facilities.

The 7.4% reduction in community emissions is significant and further reduction efforts point to the challenges in incentivizing a switch to renewable power sources for residential and commercial users in reducing community VMT, while demonstrating the success of the City's waste diversion programs. Future Monterey programs should focus on community impact, and are outlined in Chapter 8 (Recommendations).

[8] U.S. Greenhouse Gas Inventory Report (April, 2009) U.S. Environmental Protection Agency http://www.epa.gov/climatechange/emissions/downloads09/TrendsGhGEmissions.pdf Last visited December 17, 2009.

Reduction Goals

The Climate Change Scoping Plan (Scoping Plan) adopted in December 2008, is the State's comprehensive plan to achieve GHG reductions in California. The Scoping Plan has a range of GHG reduction actions developed to achieve a reduction of 169 million metric tons (MMT) CO_2e emissions, approximately 28 percent below the State's projected 2020 emission level of 596 MMT of CO_2e under a "business-as-usual" scenario. These actions include direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, and market-based mechanisms such as a cap-and-trade system. This set of actions, including measures taken by local jurisdictions, would allow the State to return to 1990 emission levels as required by AB 32.

While many of the measures identified in the Scoping Plan will be implemented by state government or at a statewide-level, the primary responsibility of local and regional government is to implement changes to local land use patterns and to improve local transportation systems. These actions, which fall within areas of local government policy control, in combination with the statewide measures are a relatively small component of the total body of policy actions that will be necessary to achieve the total statewide GHG emissions reduction targets by 2020.

The State's Scoping Plan suggests that local governments adopt voluntary 15% reduction below 2005 levels to achieve 1990 levels by 2020.

1) AB32 recommends an approximate 15% reduction below 2005 levels (as an estimate of 1990 levels) by 2020.

2) The Urban Environmental Accords suggests a 25% reduction below a baseline (set as 2005) by 2030;

3) Mayor's Climate Protection Agreement recommends a 7% reduction below 1990 levels by 2012.

4) In Executive Order S-3-05, the governor's office has declared a state-wide emissions reduction goal of 80% by 2050.

Like many communities, Monterey does not have sufficient available data to determine GHG emissions in 1990. However, the State of California estimates that state-wide emissions will need to be reduced by 15% from 2005 levels to meet 1990 levels. [9] Monterey therefore sets its AB 32 target at 15% below the 2005 baseline emissions levels by 2020.

Reduction Guidelines and Targets

Table 3 outlines the City's multiple reduction targets. The program sets reduction guidelines which are expressed as a percent reduction from a specified baseline year by a specific date.

[9] Climate Change Scoping Plan (December, 2008) California Air Resources Board, Pg ES-1 http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf. Last visited August 18, 2009.

Table 3 Reduction Targets		**Community** 2005 baseline 321,911 MT CO2e	**Government operations** 2005 baseline 5,511 MT CO2e
Program	**Recommended reduction target**	**Reduction needed** (MT CO2e)	**Reduction needed** (MT CO2e)
AB 32	15% below 2005 levels (i.e. 1990 levels) by 2020	48,287	827
Urban Environmental Accords	25% below 2005 levels by 2030	80,478	1,378

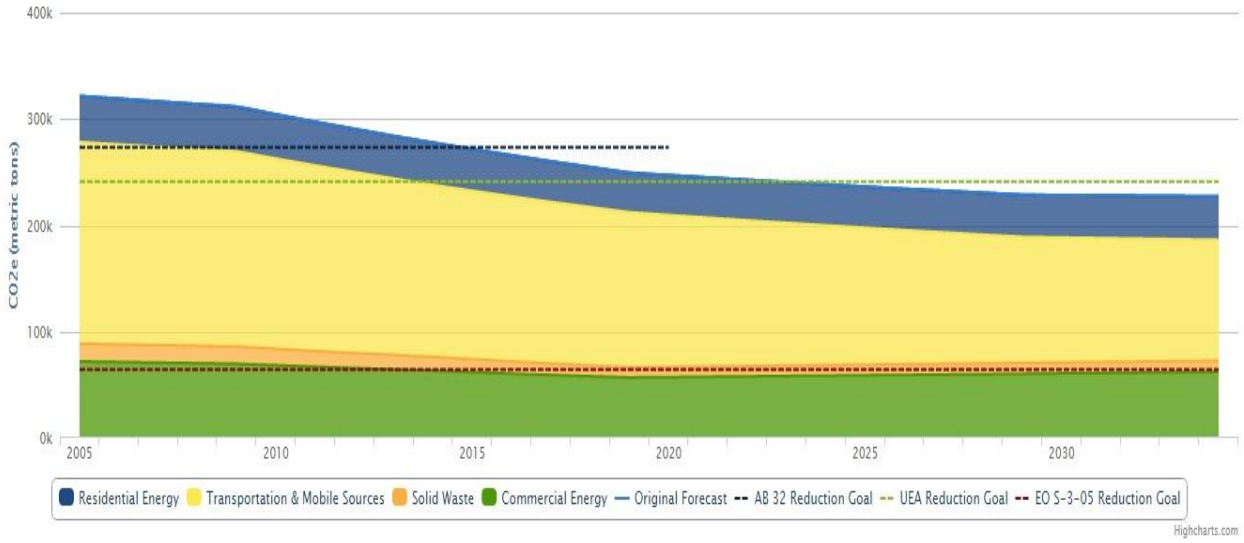
Figure 3. Total Emissions Forecast shows projected reductions based on the measures described in Appendix B and outlined specifically in Table 4. It does include a 24.98% decrease in transportation emissions based on the adoption of all City Controlled traffic measures and statewide implementation of Pavley and Low Carbon Fuel Standards (Fehr and Peers) as outlined in Appendix D. It also indicates when reduction goals are expected to be met. **This scenario projects 2020 Monterey total emissions at 250,211 MTCO2e, a reduction of 23.6% below 2005 levels and 17.1% below 2012 levels.** This signifies that the City of Monterey is on track to meet Goal 1 (15% below 2005 levels by 2020). A projected total of 231,427 MTCO2e for 2030 also indicates that Goal 2 (25% below 2005 levels by 2030) will also be met or exceeded. This projected 2030 level would be a 29.3% decrease from 2005 levels. However, the Monterey government and community will need to make very significant emission reductions to meet the Goal 3 level of 80% below 2005 levels by 2050. The business-as-usual (BAU) pathway projects a gradual increase in emissions based on population growth. Figure 3 includes each reduction target (AB32, MCPA and UEA) described in Table 3 (Reduction Targets), denoted as Goal 1, Goal 2, and Goal 3. Figure 3 focuses on the community forecast as government emissions account for less than 1.5% of the total emissions for the Monterey area.

Community emissions, as noted above in Chapter 4, decreased 7.4% from 2005 to 2012. These reduction achievements result primarily from the installation of electric vehicle charging stations, statewide vehicle emission controls, a green building ordinance, green business certification, retrofits conducted in the City through AMBAG Energy Watch Program and PG&E renewable energy purchase programs. Energy retrofits contribute significantly to achieved reductions. Specifically, government efforts in this category include parking garages throughout the City, HVAC system upgrades, and pool lighting retrofits at the Monterey Sports Center.

Moving beyond 2012 in the projections, short term reductions will result from continuing current programs and policies, including expanding the waste diversion program and developing mixed use neighborhoods in our business districts. However, the success of reaching build-out potential for redevelopment depends on factors such as a limited water supply.

Medium term reductions are the result of two main projects that will impact vehicle miles travelled. The first project is implementation of the Multimobility Plan. The second is the Downtown Specific Plan, North Fremont Specific Plan and future Lighthouse Specific Plan. These plans encourage and strategize for non-motorized transportation options, implement traffic calming measures, and increase ease of pedestrian access.

Figure 3 Total Emissions Forecast Goal 1 (AB 32: 1990 levels by 2020), Goal 2 (UEA 25% reduction by 2030), Goal 3 (EO S-3-05 80% reduction by 2050)



The majority of reductions achieved since 2005 can be attributed to the improved policies and technologies at government facilities. Specifically, beginning in January 2011, the City signed a renewable energy purchase supply agreement with PG&E, and the carbon intensity of municipal energy consumption is presumed to be zero. This program allows the 30 largest energy users on the City account to source their energy from certified renewable energy sources.

Regional and State Emissions Reductions

In addition to local efforts, the State and the Monterey Bay region are taking the following steps to reduce GHG emissions.

Regional Efforts

Various regional agencies including AMBAG, Transportation Agency for Monterey County

(TAMC) and the Monterey Bay Unified Air Pollution Control District (MBUAPCD) are working with local governments on coordinated efforts to reduce GHG emissions, including:

a. Developing a Regional Transportation Plan and Sustainable Community Strategy;
b. Promoting and managing education and public awareness activities that encourage alternative transportation;
c. Promoting and planning for mass transit alternatives; and

Table 4: Emission Reduction Measures

Reduction Measure	Start Year	End Year	2005 Levels ($MTCO_2e$)	Total Estimated Reduction ($MTCO_2e$)	2035 Levels ($MTCO_2e$)
Residential					
Energy Watch (AMBAG)	2014	2035		252	
CFL Distribution	2010	2015		180	
PG&E Energy Efficiency (EE) Programs	2006	2012		3,417	
PG&E EE Programs	2015	2030		7364	
Total			43,466	11,214	32,253
Commercial					
Green Business Program (Current)	2014	2035		2,336	
Green Business Program (Growth)	2014	2035		4,088	
Right Lights and Lodging Saver	2013	2035		819	
Hospitality EE Campaign	2013	2035		6,720	
Total			71,988	13,963	58,025
Transportation					
Pavley and Low Carbon Fuel Standard	2012	2020		47,329	
Vehicle Miles Reduction (Appendix D)	2012	2020		25,199	
Electric Vehicle Charging	2010	2035		1,670	
Total			189,469	74,198	115,271
Solid Waste					
Construction and Demolition Recycling	2005	2035		49	
Expand Recycling (Mandatory Measures)	2012	2035		2,870	
Organics Composting	2012	2035		2,192	
Total			16,774	5,111	11,663
City Government					
Streetlight Upgrade (LED) (Buildings)	2011	2035		376	
Lighting Retrofits (Buildings)	2014	2035		74	
Solar Power Generation (Buildings)	2013	2035		225	
Hybrid Vehicles (Fleet)	2012	2035		2,139	
Total			5,511	2,814	2,697
Water and Wastewater			214	4	210
Grand Total			327,422	107,303.5	220,119

d. Developing emissions monitoring software and completing training on new programs for local jurisdictions.

State Efforts

The Climate Change Scoping Plan, adopted in 2008, outlines the State's plan to achieve the GHG reductions required in AB 32. The actions vary by type, which include direct regulations, alternative compliance mechanisms, incentives, voluntary actions, and other mechanisms. The Scoping Plan identifies local governments as "essential partners" in achieving California's goals to reduce GHG emissions, encouraging the adoption of reduction targets for community and municipal operations emissions that are consistent with the State's commitment (identified as equivalent to 15% below "current" levels). The Scoping Plan includes the following high-impact State measures that target emissions from transportation and power generation. Each is expected to provide significant emissions reduction benefits for the City of Monterey.

Assembly Bill 1493 (Pavley)

Assembly Bill 1493, known as the Pavley Bill, directed CARB to adopt regulations to reduce GHG emissions from new passenger vehicles. CARB's AB 32 Early Action Plan, released in 2007, strengthened the Pavley regulation for 2017. AB 1493 requires GHG emission reductions from passenger trucks and light cars beginning in 2011. CARB will implement the Pavley standards in two phases, mandating increasingly higher efficiency standards on cars manufactured through 2020. In March 2008, the EPA denied CARB's initial request for implementation. However, a waiver was approved in June 2009, allowing the State to move forward as scheduled. See Appendix D for a discussion and analysis of the effects of this state standard on the transportation GHG emissions from the municipal and community sources.

Low Carbon Fuel Standard (LCFS)

In order to help California achieve the carbon emission reductions laid out in AB32, Governor Schwarzenegger signed Executive Order S-01-07 in 2007, requiring a 10% decrease in the carbon intensity of transportation fuels sold in California by 2020. These standards would apply specifically to gasoline and diesel; natural gas, hydrogen and electricity are presumed to meet the carbon intensity standard already. This Low Carbon Fuel Standard (LCFS) was challenged in court by oil companies.

However, in September 2013, the Ninth Circuit Court of Appeals upheld LCFS as constitutional, ruling that the state has the right to regulate the carbon intensity of fuels to address climate change. The implementation of this standard will result in greater use of ethanol, especially from low-carbon sources like sugar cane, in California's fuel mix.

As a result, GHG emissions from community and city transportation will decline significantly by 2020; together with the increased prevalence of hybrids and electric vehicles, these reductions will form an important component of an overall emissions strategy. This Climate Action Plan includes emissions reductions based on the assumptions of the LCFS, but distinguishes between city initiatives and measures like the LCFS that will affect all Californians regardless of local commitments to climate change mitigation.

Senate Bill 1078 - California's Renewable Portfolio Standard (RPS)

Established in 2002 under SB 1078 and accelerated in 2006 under SB 107, the Renewable Portfolio Standard requires

increased production of energy from renewable sources, like solar, wind, geothermal, and biomass generation. Electricity providers must increase their renewable portfolio by 1% each year until reaching 20% by 2010, and 33% by 2020. However, PG&E has failed to meet these targets: as of 2012, about 19.04% of PG&E's portfolio qualified as renewable under the RPS.

The City municipal (government operations emissions due to electricity use have been converted to 100% renewable sources, and with the successful compliance of PG&E with the RPS by 2020, the community-wide emissions due to electricity demand will continue to be reduced through 2020.

6

MONITORING & EVALUATION PROGRAMS

The City of Monterey will adopt an adaptive management approach to monitoring and evaluating implementation of the Climate Action Plan. Monitoring and evaluating the CAP will allow the City of Monterey to track its progress towards meeting the reduction targets and achieving its sustainability goals. Monitoring will be an ongoing process and will incorporate new technologies and policies. It is recommended that the City continue with the ICLEI Clearpath or other comparable evaluation method to ensure the most accurate comparison to emission levels evaluated in the past.

A comprehensive inventory of annual emissions should be completed at a regular interval. Standard practice according to the State's Local Government Operations Protocol is to inventory emissions on an annual basis. The City of Monterey does not have the capacity to carry out annual GHG inventories. Instead, a complete GHG inventory should be completed every three years, or more frequently when possible, to provide multi-year trend data for inventories, address baseline recalculations based on more accurate methodologies, and update GHG emissions projections and reductions based on new programs and data reduction policies. This step was completed for this CAP, which includes a 2012 status update inventory in addition to the 2005 baseline inventory.

7

CLIMATE ADAPTATION PLANNING

Whereas mitigation represents efforts to reduce the extent to which climate change occurs, adaptation is the process of reducing the impacts associated with climate change. Despite the uncertainty surrounding these impacts, the City can take measureable action to reduce its climate change risk. A certain degree of climate change impact is unavoidable. With this in mind, the City of Monterey must prepare for these inevitable consequences.

Climate change risk is composed of several factors: exposure (entities exposed to climate change hazards), susceptibility (likelihood of hazards to cause harm, loss, or disruption), coping capacity (ability to minimize negative impacts of hazards), and adaptive capacity (long-term strategies to address negative impacts). Susceptibility, coping capacity, and adaptive capacity together form an entity's vulnerability.[10] Adaptation efforts can reduce exposure, such as by restricting development in flood zones, or reduce vulnerability, such as by improving water distribution and access to reduce the impact of droughts.

Many of the City of Monterey's existing programs and planned mitigation actions support increased climate resilience. These include water use reduction measures, energy efficiency retrofits, green roof retrofits, transportation efficiency upgrades and fuel switches, support for walkable and bikeable communities, and many components of the City's Specific Plans encouraging mixed use development. Appendix B, the City's Sustainability Achievements, provides a complete list of activities that contribute directly or indirectly to climate adaptation.

In April 2009, Monterey adopted an updated report and map detailing fire hazard zones within and surrounding Monterey.[11] City staff also participates in regional efforts to evaluate and address sea level rise and the loss of shoreline.

Following the adoption of the CAP, the City of Monterey should develop a comprehensive Climate Adaptation Plan. The State has provided numerous resources to guide local governments through the adaptation planning process. These resources, found on the California Climate Change Portal, outline a step-by-step process as follows[12]:

1. Vulnerability assessment
    i. Exposure
    ii. Sensitivity
    iii. Potential impacts
    iv. Adaptive capacity
    v. Risk and onset
2. Adaptation strategy development
    i. Prioritize adaptation needs
    ii. Identify strategies
    iii. Evaluate and prioritize
    iv. Phase and implement

[10] World Risk Report 2012, Alliance Development Works, United Nations University Institute for Environment and Human Security, and The Nature Conservancy

[11] General Plan Fire Hazard Severity Zones Map March 2009 City of Monterey. http://www.monterey.org/enus/departments/planspublicworks/planning/developmentregulations/generalplan.aspx. Last visited November 20, 2013.

[12] California Adaptation Planning Guide: Planning for Adaptive Communities. Cal EMA, California Natural Resources Agency, FEMA. July 2012.

8

RECOMMENDATIONS

As the preceding sections of this report illustrate, the City of Monterey has improved and reformed its own policies since 2005, thus greatly reducing carbon emissions from government operations. However, while government-related emissions have dropped over 29.7% from 2005 to 2012, community-wide emissions have fallen roughly 7.8%. An encouraging reduction, but leaving room for additional decreases. In order to meet the long term emissions goals of the City, there will be a heavy reliance on factors affecting transportation emissions. Specifically, the improvements and statewide legislation mentioned in Appendix D will need to perform as projected.

As additional assurances that the City meets is emission goals, several recommendations are explored here as potential options if the reduction projections in this CAP do not materialize. These recommendations fall into two main categories: community engagement and infrastructure investment. The former will transfer the knowledge and programs that have made the City's own internal environmental initiatives so successful to the community at large, while the latter will push for the kinds of transformational changes that are needed to modernize our energy economy.

Community Engagement

The City of Monterey succeeded in reducing its emissions by 29.7% between 2005 and 2012, while also reducing the City's utility bills. In this way, local government has also benefited taxpayers by reducing waste and driving down overhead costs, much as the Monterey business community strives to produce a return for its investors and customers. This report proposes that the City should share the lessons it has learned about how to implement energy efficiency programs through a series of collaborative workshops with local business owners, as well as staff at key institutions like the Naval Postgraduate School, the Presidio of Monterey, the Defense Language Institute, Monterey Peninsula College, and the Middlebury Institute of International Studies at Monterey (formerly Monterey Institute of International Studies). Many of these organizations already have their own sustainability goals and initiatives in place, but would benefit from exchanging knowledge and expertise, including joining the Monterey Bay Area Green Business Certification Program.

The majority of the City of Monterey's reductions between 2005 and 2012 can be attributed to the Commerce Energy purchasing power agreement with PG&E, which ensures that renewable energy sources provide all the electricity used to power municipal facilities. This report proposes that PG&E extend this same option to purchase low-carbon electricity through green energy providers to other large institutional energy users in Monterey. At the more diffuse scale of individual households and small businesses, Monterey might propose a regional effort together with Santa Cruz and other cities to form a Community Choice Aggregation (CCA), whereby citizens can choose to purchase renewable power and negotiate a competitive rate by pooling their demand. In fact, Santa Cruz's Climate Action Plan recommends creating such a CCA.

Additionally, the Association of Monterey Bay Area Governments' (AMBAG) EnergyWatch program can provide valuable resources and grant funding for local energy consumers like those listed above to invest in improvements to their facilities. Currently, non-disclosure rules

prevent PG&E from listing the electricity and natural gas usage of the city's largest utility customers. However, this report proposes that large energy consumers be given the option to voluntarily disclose their usage through PG&E as part of a collaborative AMBAG program that would channel resources to drive down emissions and achieve both economic and energy efficiency gains.

It will also be critical for the City of Monterey to evaluate new projects, as defined by the California Environmental Quality Act, on a case by case basis to determine their carbon emission potential. This may be accomplished by either adopting Monterey Bay Unified Air Pollution Control District standards and/or through a zoning ordinance amendment.

Infrastructure Investment

With a series of robust reduction targets on the horizon, Monterey must increase the rigor, imagination and political will it brings to transforming its transportation infrastructure and urban landscape. The City's Multi-Mobility Plan outlines improvements needed to create a walkable and bikeable network providing residents and tourists the opportunity to travel via alternative means other than an automobile. Monterey's economy depends heavily on tourism, with destinations like the Monterey Bay Aquarium, Cannery Row, and Portola Hotel and Conference Center drawing visitors from the Bay Area and nationally. Nearby attractions like Mazda Raceway Laguna Seca, Asilomar Conference Grounds and Pebble Beach Resorts also bring hundreds of thousands of visitors to the peninsula annually. In total, the leisure and hospitality industries in Monterey County in 2012 provided more than 21,000 jobs, $500,000 in wages and $1 billion in economic output (GDP), according to the Bureau of Labor Statistics. Visitors to all of the locations listed above share one common characteristic: they reached the Monterey Peninsula by automobile. Although Amtrak serves Salinas, there is currently no direct rail service to downtown Monterey from San Jose or San Francisco, despite repeated proposals for such an offering at the regional and state level.

Proposals connecting Monterey to Castroville using a light-rail system or bus rapid transit line would enable commuters in Seaside and Marina, a key cohort of Monterey's workforce, to reach businesses on the peninsula for the same per-trip fare as riding an MST bus. The improvements would be less expensive per mile to build than widening Highway 1 and would create minimal disturbance to adjacent property owners and ecosystems. From Castroville, riders would be able to connect to faster Amtrak and Caltrain service north all the way to San Francisco and the region's major airports.

Clearly, future infrastructure investments in the Monterey area will need to adequately address the climate risks of sea level rise, storm surges, and eroding shorelines. Decisions to expand Highway 1, or build a new light rail or bus rapid transit system, along the Monterey Bay coastline must consider the long-term implications of such commitments.

Additionally, this report recognizes that residents may have concerns about implementing a light rail strategy, including capital costs, impacts on land values, noise pollution, safety in adjacent neighborhoods and other issues. However, as stated above, if Monterey intends to meet its pledged emission reduction targets, including a long-term goal of 80% by 2050, the City must continue to explore innovative and transformational investments. Put simply, the status quo of transportation and energy use patterns in the Monterey community will not allow the city to meet its state-mandated obligations.

Additionally, further incentivizing small-scale renewable power generation projects, like residential rooftop photovoltaics could contribute a significant share to meeting Monterey's GHG targets. For example, if solar

panels were installed on 1,000 homes in Monterey, with each system capable of offsetting 50% of an average household's electricity usage, the GHG reduction achieved would be 453.69 MTCO2e (an additional 0.14% reduction below 2005 emissions). Energy service providers already offer many advantages to consumers, because they can install photovoltaic systems at no upfront cost to the homeowner and sell electricity at a lower per-kWh price than PG&E. To accelerate adoption of these technologies, the City could offer a rebate program.

However, programs do exist which could up-scale the use of renewable power beyond individual household projects, such as CCA that allow residents to buy electricity from low-carbon sources. For example, in northern California, the Marin Clean Energy (MCE) project allows residents to choose between a "light green" and "dark green" portfolio of electricity generation sources, or opt-out of the program entirely to continue buying power from PG&E. Whereas PG&E's current grid mix is 19% renewables, the "light green" option is 50%, and "deep green" is 100%. The added cost to an average consumer for "deep green" is less than 5%, while "light green" is actually slightly less expensive than the current default rate. The program purchases power from a range of sustainable sources, including hydroelectric dams, wind farms, large-scale solar and landfill biogas.

Assuming one third of residents opted out, another third chose the "light green" option, and the final third chose the "deep green" option, this would result in an additional reduction of 5,577 MTCO2e per year, or 1.7% below 2005 emissions. If commercial operators followed suit, this would result in an additional 16,630 MTCO2e avoided, or 5.1% below 2005 emissions.

As mentioned, Santa Cruz has already proposed creating a CCA in their Climate Action Plan, and doing so in Monterey would be a significant step toward meeting the City's long term GHG targets. The CCA project for the Monterey Bay is currently advancing after the completion of a Technical Feasibility Study. Partners are currently scheduled to review the study through June 2015 and make recommendations for next steps.

APPENDIX A

Comparison - City of Monterey Plans, Agreements and State Legislation					
2005 Monterey General Plan Goals and Policies	U.N. Urban Environmental Accords - Signed 2007	U.S. Mayors Climate Protection Agreement - Signed 2007	Actions supports…		
			AB 32	SB 97	SB 375
Energy					
Encourage energy source which provides part or all of the energy needed for building (Conservation Element, Goal e.1)	Action 1. Adopt and implement a policy to increase the use of renewable energy to meet ten percent of the city's peak electricty load within seven years.	Increase the use of clean, alternative energy. For example, investing in green tags, advocating for the development of renewable energy resources, recovering landfill methane for energy production, and supporting the use of waste to energy technology.	X		
Encourage the effective and efficient use of energy in all its critical forms by public and private users alike. (Conservation Element, Goal e)	Action 3. Adopt a citywide greenhouse gas reduction plan that reduces the jurisdiction's emissions by 25% by 2030 and which includes a system for accounting and auditing greenhouse gas emissions.	Inventory global warming emissions in City operations and in the community, set reduction targets, and create an action plan.	X	X	

Waste Reduction					
Continue to provide facilities to implement cost-effective recycling programs and education for items such as yard waste, vehicle oil, food containers, cardboard, and mixed paper to divert waste generated by residential and commerical customers. (Public Facilities Element, Goal n)	Action 6. Implement "user friendly" recycling and composting programs with the goal of reducing by twenty percent per capita solid waste disposal to landfill and incineration in seven years.	Increase recycling rates in City operations and in the community.			

Urban Design					
Green Building Housing Element (Policy Proposed)	Action 7. Adopt a policy that mandates a green building rating system standard that applies to all new municipal buildings.	Practice and promote sustainable building practices using the U.S. Green Building Council's LEED program or a similar system.	X	X	
Direct future population growth into mixed-use neighborhoods. The City's goal is to create and nurture mixed use neighborhoods that: 1) reduce automobile trips; 2) improve the quality of the pedestrian experience; 3) create walkable neighborhoods; 4) provide more ownership opportunities; 5) increase the stock of housing affordable to Monterey's workforce; 6) require high-quality design to complement Monterey's image;	Action 8. Adopt urban planning principles and practices that advance higher-density, mixed-use land use and transportation with open space systems for recreation and ecological restoration.	Adopt and enforce land use policies that reduce sprawl, preserve open space, and create compact, walkable urban communities.	X		X

Urban Nature					
Maintain the Parks and Recreation Master plan to outline the City's current and further priorities. (Open Space Element, Policy f.1)	Action 10. Ensure that there is an accessible public park or recreational open space within half-a kilometer of every city resident in 2015.	N/A	X		X
Maintain the canyons and their native vegetation throughout lengths. (Urban Design Policy c.1) Development in forested areas should not create obvious holes in the forest. (Urban Design Policy b.5) Preserve greenbelts to ensure an overall visual impression of open space on the hillsides above Monterey, between neighborhoods and along major transportation corridors. (Open Space Element, Goal c)	Action 12. Pass legislation that protects critical habitat corridors and other key habitat characteristics (e.g. water features, food bearing plants, shelter for wildlife, use of native species, etc.) from sustainable development.	N/A	X		

Transportation					
Reduce air pollution generated by motor vehicles by encouraging the use of public transit, carpooling, bicycles and walking as alternatives. (Circulation Element, Policy c.1)	Action 13. Develop and implement a policy which expands affordable public transportation coverage to within half-a-kilometer of all city residents in ten years.	N/A	X		X
Reduce fixed source and transportation-based air pollution. (Circulation Element, Goal c)	Action 14. Pass a law or implement a program that eliminates leaded gasoline (where it is still used); phases down sulfer levels in diesel and gasoline fuels, concurrent with using advanced emission controls on all buses, taxis, and public fleets to reduce particulate matter and smog forming emissions from those fleets by fifty percent in seven years.	N/A	X		X

Water					
Develop long-term water supplies and conservation methods so that there is sufficient water to implement General Plan goals. (Public Facilities Element, Goal m)	Action 19. Develop practices to increase adequate access to safe drinking water, aiming at access for all by 2015. For cities with potable water consumption greater than 100 liters per capita per day, adopt and implement policies to reduce consumptioin by ten percent in 2015.	N/A			
Continue public education and outreach programs to eliminate use of storm drains for dumping hazardous inaproppriate wastes, such as oil. (Conservation Element, Policy b.1) Retain and restore riparian areas and other habitats which provide remediation for degraded water quality. (Conservation Element, b.4)	Action 20. Protect the ecological integrity of the City's primary drinking water sources (i.e. aquifers, rivers, lakes, wetlands, and associated ecosystems).	N/A			

Discourage the proliferation of surface parking and other hard surface, man-made improvements at Lake El Estero. (Urban Design Policy, d.1)	Action 21. Adopt municipal wastewater management guidelines and reduce the volume of untreated wastewater discharges by ten percent in seven years through the expanded use of recycled water and implementation of a sustainable urban watershed planning process that includes participants of all affected communities and is based on sound economic, social and environmental principles.	N/A			

APPENDIX B

Report Summary Table for 2012 Monterey GHG Inventory		Source or Activity?	Included, Required Activities	Local Government	Community-Wide	Excluded (IE, NA, NO or NE)**	Explanatory Notes	Emissions (MTCO2e)
BUILT ENVIRONMENT								
Use of fuel in residential and commercial stationary combustion equipment		Source AND Activity	X	X	X		Natural gas use in residential and commercial.	71657
Industrial stationary combustion sources		Source				NO		
Electricity	Power generation in the community	Source				NO		
	Use of electricity by the community	Activity	X	X	X		Residential and commercial electricity use. Government electricity contributes zero emissions due to purchase of renewable energy.	44688
District Heating/Cooling	District heating/cooling facilities in the community	Source				NO		
	Use of district heating/cooling by the community	Activity				NO		
Industrial process emissions in the community		Source				NO		
Refrigerant leakage in the community		Source				NE		
TRANSPORTATION AND OTHER MOBILE SOURCES								
On-Road Passenger Vehicles	On-road passenger vehicles operating within the community boundary	Source				NA		
	On-road passenger vehicle travel associated with community land uses	Activity	X	X	X		Origin-destination (OD) methodology. Community and government VMT, includes passenger vehicles and freight.	185718
On-Road Freight Vehicles	On-road freight and service vehicles operating within the community boundary	Source				NA		
	On-road freight and service vehicle travel associated with community land uses	Activity	X		X	IE	Included in passenger VMT above.	
On-road transit vehicles operating within the community boundary		Source				NA		
Transit Rail	Transit rail vehicles operating within the community boundary	Source				NO		
	Use of transit rail travel by the community	Activity				NO		
Inter-city passenger rail vehicles operating within the community boundary		Source				NO		
Freight rail vehicles operating within the community boundary		Source				NO		
Marine	Marine vessels operating within the community boundary	Source				NE		
	Use of ferries by the community	Activity				NO		

SOLID WASTE								
Solid Waste	Operation of solid waste disposal facilities in the community	Source				NO	Landfill is in Marina.	
	Generation and disposal of solid waste by the community	Activity	X		X		Community value includes municipal waste.	10995
WATER AND WASTEWATER								
Potable Water - Energy Use	Operation of water delivery facilities in the community	Source		X				200
	Use of energy associated with use of potable water by the community	Activity	X		X	NO		
Use of energy associated with generation of wastewater by the community		Activity	X	X	X		Wastewater treatment plant in Marina is carbon-neutral due to methane capture and on-site solar.	0
Centralized Wastewater Systems - Process Emissions	Process emissions from operation of wastewater treatment facilities located in the community	Source		X		NO		
	Process emissions associated with generation of wastewater by the community	Activity			X	NE		
Use of septic systems in the community		Source AND Activity				NO		
AGRICULTURE								
Domesticated animal production		Source				NO		
Manure decomposition and treatment		Source				NO		
UPSTREAM IMPACTS OF COMMUNITY-WIDE ACTIVITIES								
Not included. Not estimated.								
INDEPENDENT CONSUMPTION-BASED ACCOUNTING								
Not included. Not estimated.								

**Emissions streams may be exluded for the following reasons:
IE: included elsewhere in the inventory
NA: not applicable
NO: not occuring in the community
NE: not estimated due to scale or technical feasibility

City Sustainability Achievements:

CITY OF MONTEREY SUSTAINABILITY ACHIEVEMENTS							
	Action	**Description**	**Quantifiable**	**Educational**	**Supportive Policy**	**GHG Reduction Component**	**Adaptation Component**
1. WATER							
1.5	Green building ordinance	Passed green building ordinance	X			Direct	Direct
2. ENVIRONMENTAL HEALTH							
2.1	Certified green marina	Completed the green business certification for the marina (lighting, energy, etc.)	X	X		Direct	Direct
2.4	Waste oil and filter curbside recycling	Curbside collection pick-up offered by City of Monterey for recycling in Marina	X			Indirect	Very indirect
2.5	Green certified automotive repair facility	City facility (mechanical department at Ryan Ranch) completed green business (automotive) certification. Not open to the public	X	X		Direct	Indirect
2.11	Regular vehicle maintenance, fluid leak prevention	Maintenance program reduces leaks that would contaminate Bay and stormwater runoff		X		Very indirect	Very indirect
2.19	Green Cleaning Products in City Facilities	Cleaning facilities replaced chemical products with certified green cleaning products (GreenWorks?)	X			N/A	Very indirect
2.22	Environmentally Preferable Purchasing Policies	Currently in draft form (10March09) This is needed for certain grant eligibility			X	Direct	Direct

3. TRANSPORTATION							
3.1	Electric Vehicles and Hybrids for City Fleet	As cars age out, they will be replaced with the most efficient vehicle (most cases electric)	X			Direct	Direct
3.4	Weekly Vehicle Inspection	This weekly inspection will be changed to mileage inspection			X	Indirect	Very indirect
3.5	Neighborhood Traffic Calming Measures	Reduce congestion and improve accesability for bikers and pedestrians		X		Direct	Direct
3.6	Electric Vehicle Charging Stations	We have four parking spaces (one more installed in October yr?) 2 type 2 charges (220V) 2 type 1 (110V)	X			Direct	Direct
3.7	Bicycle and Pedestrian Plan Update	Bike Plan currently in review for update. Last updated 1998.	X	X		Direct	Direct
3.8	Commuter Incentive Program (Proposed)	Establish a vanpool program	X	X		Direct	Direct
3.9	Monterey County Bike Week Support	Provide logistical support for Monterey Bike Week		X		Indirect	Indirect
3.10	Bicycle Network Projects; Bike Boulevards, Lanes & Sharrows	Develop an interconnected bikeways system throughout the City, as outlined in the Bike Plan			X	Direct	Direct
3.11	Traffic Management System	Central signal system, coordinated signal timing, roundabout at Hwy 1 exit			X	Direct	Indirect
3.12	Bus Rapid Transit	Queue jumps and priority signals for MST buses on Fremont Street			X	Direct	Indirect

4. URBAN NATURE							
4.1	Sustainable Plant Demonstration at Library	Garden created as a public outreach		X		Very indirect	Very indirect
4.2	1,255 New Plants and 72 New Trees Planted		X			Direct	Direct
4.3	Volunteer Tree Planting Days	Organize tree planing days for community		X		Direct	Direct
4.5	Tree City USA Status for 27 Years	National program to encourage tree cover		X		Indirect	Indirect
4.6	Restoration Projects with Native Plants and No-Mow Turf	Native plants decrease water need and no-mow reduces GHGs			X	Direct	Direct
4.7	Regular Garden Maintenance	Decreases pest issues and lower water use, improved pedestrian use		X		Indirect	Direct
4.10	Community garden	Garden located at the corner of Van Buren and Madison, for use by city employees		X		Direct	Direct
5. URBAN DESIGN							
5.1	Green Remodel at 735 Pacific	Energy efficiency and waste reduction considerations implemented during the remodeling process	X	X		Direct	Direct
5.2	Increased Mixed Use Land Use Designations (Downtown, North Fremont, Lighthouse Ave)	Increasing mixed-use development creates urban infill projects that reduce sprawl and encourage efficiency and public transit improvements	X	X	X	Direct	Direct
5.3	First Green Building Expo on Peninsula	Community event to educate and connect businesses and consumers on green building		X		Indirect	Indirect
5.4	Green Building Workshops	Workshops on green building held for professionals and community members		X		Indirect	Indirect
5.5	Green Property Insurance	Helps cover costs for green building			X	Indirect	Indirect
5.6	Mansionization Ordinance	Encourages smaller homes, using fewer resources			X	Direct	Direct

5.7	Green Building Ordinance	Ordinace 3413; 07/2008 - To conserve natural resources, increase energy efficiency, and improve indoor air quality; Please see www.codepublishing.com/ca/monterey Chapter 38-112.3 for details of the program	X		X	Direct	Direct
5.8	Update all Neighborhood and Area Plans (Mixed Use, Smart Growth concepts)	Modernize Area Plans to reflect current design guidelines and policies.	X	X	X	Very indirect	Very indirect
5.9	Pedestrian Upgrades	Safe routes to schools, improved sidewalks on Via Ladera and Mark Thomas Drive		X	X	Indirect	Indirect
6. WASTE							
6.1	68% Waste Diversion Achieved	Indicates amount of waste diverted from landfill and reused or recycled	X			Direct	Indirect
6.2	www.MontereyRecycles.org Comprehensive Info Website	Pulic information website on recycling		X		Very indirect	Very indirect
6.3	Monterey recognized as California's first Comprehensive Recycling Community 2008	Recognized City's recycling efforts		X		Direct	Indirect
6.4	Recycling Containers in schools and 3,000 Hotel Rooms, 300 Bars & Restaurants	Increased opportunites for coomunity recycling		X		Indirect	Very indirect
6.5	New Mixed Recycling/Trash Containers Throughout City of Monterey	Created easier system for citizens and visitors to recycle	X	X		Indirect	Very indirect
6.6	Large Item Pickup and Metal Recycling	Increased recycling	X			Direct	Indirect
6.7	E-waste Events in City Coordinated with Other Organizations	Diverts hazardous waste from landfill	X	X		Indirect	Very indirect

6.8	Recycling Buyback Centers & Dropoff Locations	2 locations at Nob Hill and Del Monte Center	X			Indirect	Very indirect
6.9	Portable Recycle Bins for Special Events Beach Cleanup Events	Increases recycling opportunies for large waste producing events	X	X		Indirect	Very indirect
6.11	Giveaway 1,000 Cloth Bags	Educated consumers on benefits of reusing bags		X		Indirect	Very indirect
6.12	Public Outreach Once per Month at Farmer's Market	Community awareness building and education opportunity		X		Very indirect	Very indirect
6.14	Environmentally Acceptable Food Packaging Ordinance (biodegradable and recyclable only)	Polystyrene Ban	X		X	Direct	Indirect
6.18	Green Business Certification for Businesses and City Offices	Certification process recognized and implemented for local business and city offices.	X	X	X	Indirect	Indirect
6.2	Anaerobic digester / Food scrap program	Generates electricity from methane, diverts waste from landfill and creates feedstock for compost	X	X	X	Direct	Indirect
7. ENERGY							
7.1	Distributed 5,000 Energy Efficient Light Bulbs to Residents	Distribution of lights to educate public and raise awarenes for cost saving opportunites through energy efficiency	X	X		Direct	Direct
7.2	Joined ICLEI Cities for Climate Change	Provides resources for Community and Municipal Climate Change planning and coordinating		X		Indirect	Indirect
7.3	Library Lighting Upgrade and HVAC Controllers	Installed heating, ventilation, and air conditioning efficiency upgrades	X			Direct	Direct
7.4	Monterey Conference Center Energy Retrofit, HVAC	Installed heating, ventilation, and air conditioning efficiency upgrades	X			Direct	Direct
7.5	Sports Center Interior, Gym & Natatorium Lighting; Dehumidifier, HVAC Controllers and VFD's	Installed heating, ventilation, air conditioning, and lighting efficiency upgrades	X			Direct	Direct

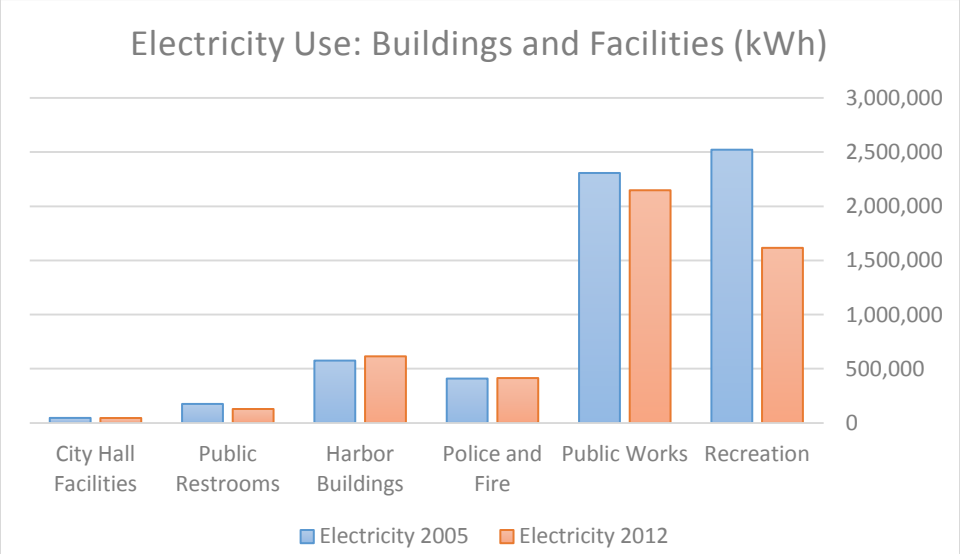
7.6	Presidio Lighting, Heating, Vending Machine, Motor, HVAC, Venting & Showerhead Upgrades	Upgrades were intended to increase efficiency and reduce waste.	X			Direct	Direct
7.7	Police Department Lighting and HVAC Controls	Upgrades were intended to increase efficiency and reduce waste.	X			Direct	Direct
7.8	Parking Garage Lighting	Retrofit garage with LED	X			Direct	Direct
7.9	Variable Frequency Drive and NEMA Motors Installed	Decreases energy demand	X			Direct	Direct
7.10	Senior Center Furnace Retrofit	Replaced inefficient furnace with modern, efficient furnace	X			Direct	Direct
7.11	Cool Roofs Installed Presidio and 735 Pacific Offices	Cool roofs are highly reflective materials that stay 50-60 (F) cooler in the sun, reducing energy and mainenance costs, improving occupant comfort and increasing the life cycle of the roof.	X			Direct	Direct
7.12	LED Traffic Signals	Replaced traffic signal lights with LED lights resulting in $70,000/yr savings	X		X	Direct	Direct
7.13	Solar Powered Traffic Safety Signs	"Your Speed" Radar Signs - about four community wide	X			Direct	Direct
7.14	On-Demand Hot Water Heaters	Box next to faucet to instantly heat water rather than continously	X			Direct	Direct
7.15	Green Certified Computer Network Switches	Allows regulation of energy use for computers.		X		Direct	Direct
7.16	Demand Response Program, Peak Load E Curtailment	PG&E notifies the City when a peak demand will occur, if we reduce by 50% we are paid accordingly	X	X		Direct	Direct

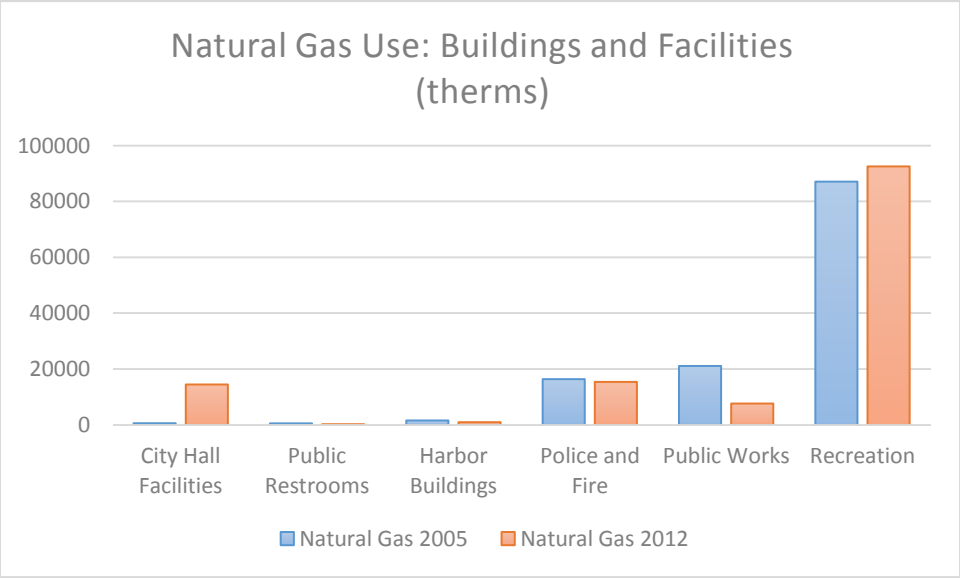
7.17	MCC Interior and Exterior Lighting retrofit	Replaced inefficient lighting with modern, efficient (LED lights)	X			Direct	Direct
7.18	Sports Center Exterior Lighting Retrofit	Replaced inefficient lighting with modern, efficient (LED lights)	X			Direct	Direct
7.19	Baseline GHG Emissions Inventory	Conducted baseline from 2005 data to create a baseline from which to measure future reductions	X	X		Indirect	Indirect
7.20	3 Phases Renewables program with PG&E	PG&E provides 100% renewable energy for City owned and operated buildings & facilities	X			Direct	Direct
7.21	Lighting Retrofit on Recreation Trail Path and Tunnel	Replaced inefficient lighting with modern, efficient (LED lights)	X			Direct	Direct
7.22	FIRST Renewable Energy Program for Residential (Proposed)	Special financing mechanism to boost private ownership of energy effieciency mechanisms	X		X	Indirect	Indirect
7.23	GHG Action Plan (Proposed)	Written document detailing City efforts to reduce GHG emissions		X	X	Indirect	Indirect

APPENDIX C

Supplemental Technical Report – Government Operations Energy Use by Sector:

Figure 4: Buildings and Facilities





	Natural Gas		Electricity	
	2005	2012	2005	2012
City Hall Facilities	614	14,483	46,489	45,585
Public Restrooms	564	251	175,661	128,851
Harbor Buildings	1,607	987	575,807	615,062
Police and Fire	16,398	15,410	409,714	414,501
Public Works	21,107	7,664	2,307,870	2,148,399
Recreation	87,096	92,545	2,522,934	1,616,583
TOTAL	127,386	131,340	6,038,475	4,968,981

Figure 5: Water Delivery Facilities

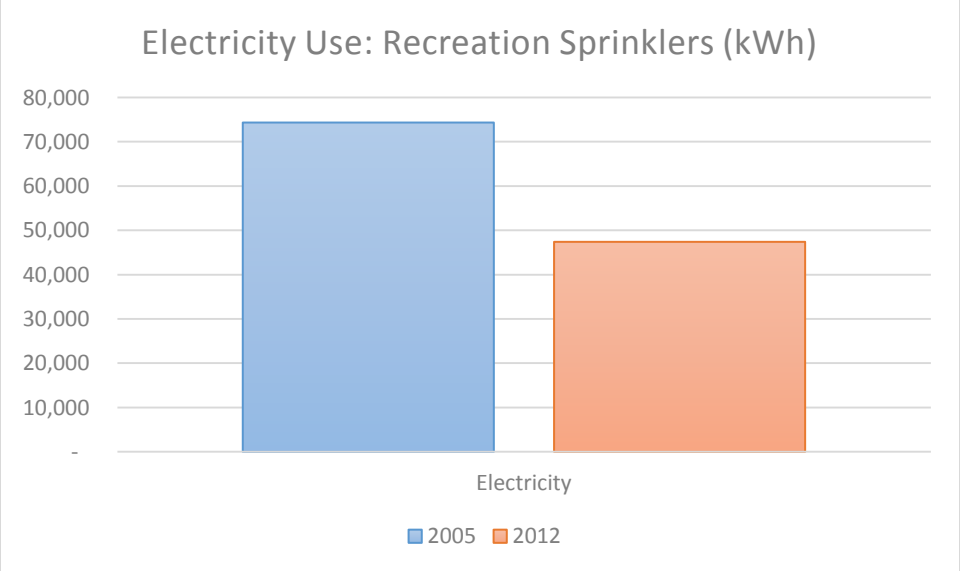
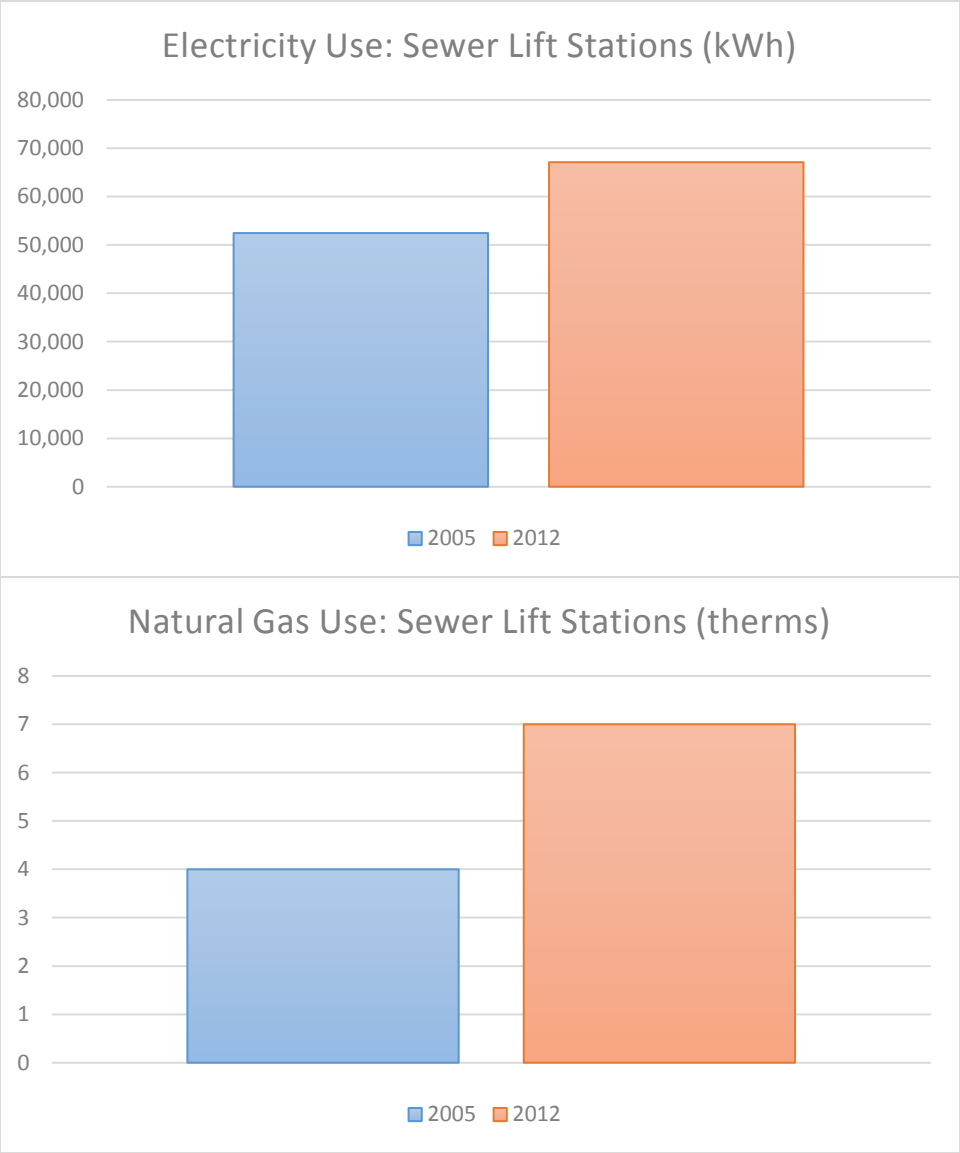


Figure 6 Wastewater Facilities



Vehicle Fleet

The vehicle categories (Light Truck, Motorcycle, Heavy Duty, Electric and Passenger) were based on ICLEI models. The model allows for further breakdown by vehicle year; however we did not distinguish between model years due to the low benefit to high cost ratio (i.e. It would have added an additional 20-30 hours of staff time with very little change in CO2 emissions data output).

The results of each analysis (by mileage, fuel use and costs) all revealed Public Works to have the highest emissions. The Public Works Department includes vehicles used for maintaining roads, parks, streetlights, inspectors etc. Approximately 96% of the fleet vehicles are used continuously throughout the day. Furthermore, by comparing differences between mileage and fuel use it is clear that public works also has the least fuel efficiency, likely due to the type of vehicle, (many utility trucks and vans) taking short trips with frequent

stops. Although the police department (PD) also has low efficiency levels, the type of vehicles (passenger) used by the PD places them slightly more efficient than public works.

These results show a clear area to focus emissions reduction measure. With the largest fleet, and the highest emissions and cost, the Public Works Department would benefit most from the proposed reduction measures described further in Section IV.

Vehicle Fleet Fuel Use

Improvements in internal records will greatly enhance the accuracy of the vehicle fleet data as well as ease in which the necessary reports can be created and analyzed. Suggested areas of improvement include:

- Incorporate fuel charges that do not occur at the City's facility in the output report. For example, if a pool car is used outside of Monterey, that information is not tracked in the same manner the Gas Boy information is tracked. Nor is the same information (fuel price at fill-up, mileage at fill-up, etc.) recorded.
- Many work-related trips are completed using staff's personal vehicles. These data are not included in the analysis. Data could be accounted for by working with staff and management to track mileage records, as well as discouraging the use of personal vehicles for short trips.
- Ongoing tracking efficiency could improve by including a summation of each vehicle's fuel use (gallons) in one excel report along with vehicle type, year and fuel-type. The City has this capability and will be used in future analyses.

Employee Commute

Total miles traveled by City of Monterey employees annually in 2005 are: 2,324,932.
Total miles traveled by City of Monterey employees in 2013 are: 4,070,237.
The large discrepancy between these two figures is likely due to the scope of employees counted. The updated 2013 data account for all 891 full- and part-time city employees.

For 2005 employee commute data, a listing of total City and Zip Codes of employee residences (in separate full-time (FT) and part-time (PT) listings) was obtained from the Human Resources Department. The distances between each residence zip code and Monterey was found using Google Maps (set to trip by car) and was rounded to the nearest whole digit. Residents of Monterey were calculated assuming a 2 mile one-way trip (4 miles for round-trip). Further exceptions were made for workers on disability and others with irregular work schedules. Overall, this proved to be an effective but likely inaccurate method of determining total employee commute emissions.

In 2013, an updated employee commute survey directly queried all full- and part-time city workers via email regarding the length and method of their commute, providing for greater data resolution and accounting for workers with irregular schedules. The survey design is available at the end of this section (Figure 7). With 199 respondents over a 2 week sampling period in December 2013, the survey provides an acceptable snapshot of the commuting habits of the city's 891 total employees. From these data, the following were extrapolated:

Total vehicle miles traveled: 4,070,237
Total fuel use: 194,482 gallons of gasoline
Total CO_2e emissions: 1,715 metric tons

While classified as Scope 3, or indirect emissions, commuting does form a significant fraction of the city government's total operations emissions. Because only a small percentage of employees currently utilize greener commute options (see: Figures 6 and 7), greater incentivizes in this area could produce beneficial results.

Figure 7: 2013 Employee Commute Survey Form

Commute Survey

The City is measuring employee commuting as part of its Climate Action Plan. Please help us by completing this short survey. It will only take a few minutes!

Before beginning the survey, you will need to know the driving distance from your home to your place of work. If you do not know this, you can open Google Maps in a new tab to calculate it here: https://maps.google.com/maps?q=monterey+ca

* Required

How many miles is your commute from home to work?
Please list the distance ONE-WAY, not round-trip.

Are you a full-time or part-time city employee? *
- full-time
- part-time

How many days do you commute to your city job during a typical week? *
- 1
- 2
- 3
- 4
- 5
- 6
- 7

Use the grid below to indicate how you get to work each day during a typical week? *

	Drive alone (car or motorcycle)	Carpool or vanpool	Public transit (bus or train)	Bicycle	Walk	Work from home	Do not work
Monday							
Tuesday							
Wednesday							
Thursday							
Friday							
Saturday							
Sunday							

What is the primary vehicle you use to drive to work? *
If you do not own a vehicle or if you never drive to work, please write N/A.
- Passenger car (sedan, coupe, hatchback, wagon)
- Light truck (SUV, van, minivan, pick-up truck)
- Heavy truck (municipal truck)
- Motorcycle or scooter
- Electric vehicle (Tesla Model S, Chevrolet Volt, Nissan Leaf, etc)
- N/A

OPTIONAL: If you would like to be entered for a drawing for one of three $20 gas cards, please provide your name and email address below.

Thank you for completing this Commute Survey! We appreciate your participation.

Submit
Never submit passwords through Google Forms.

Figure 8: 2013 Employee Commute VMT by Vehicle Type

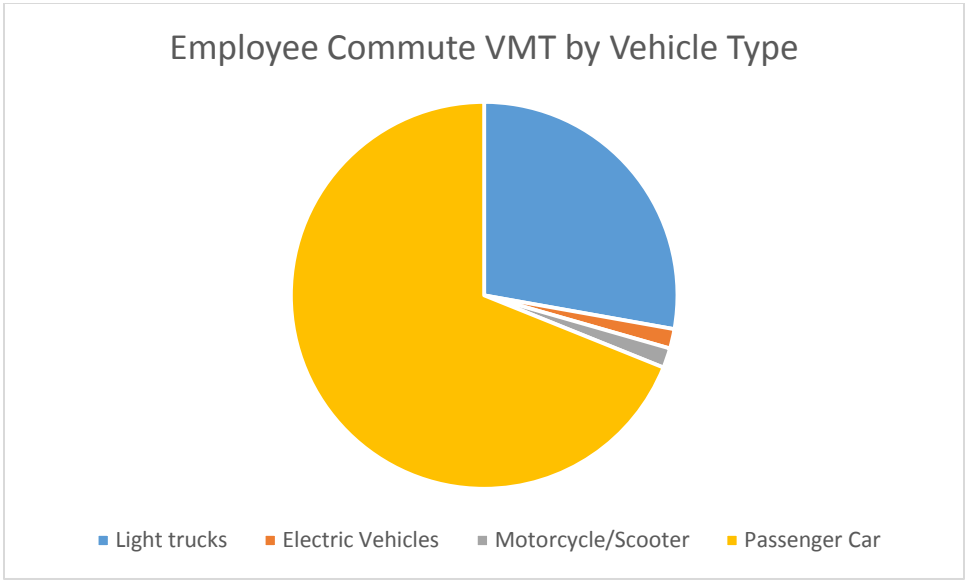
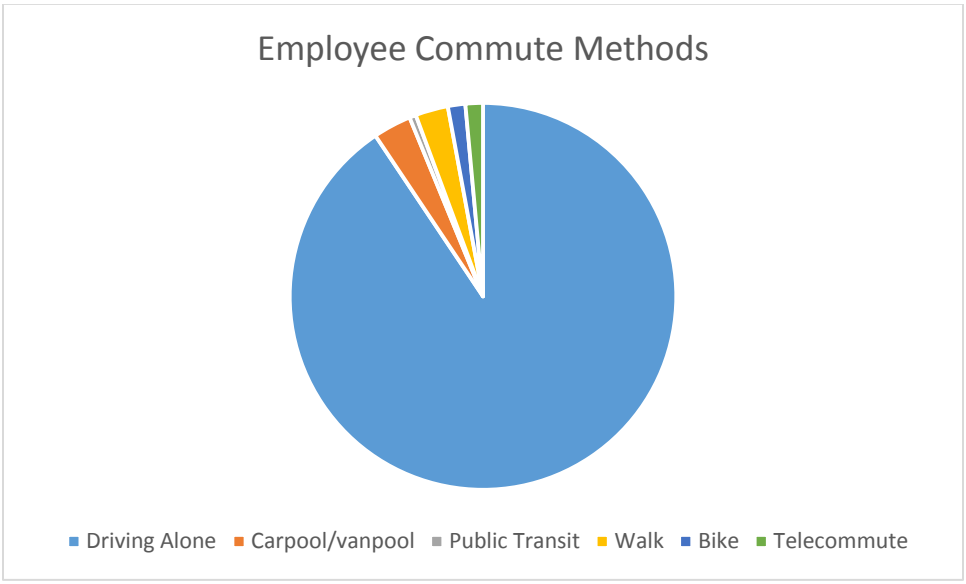


Figure 9: Employee Commute Methods by Days Used



APPENDIX D

FEHR PEERS

MEMORANDUM

Date: August 10, 2012

To: Alison Imamura, Denise Duffy & Associates

From: Matt Haynes, Fehr & Peers

Subject: ***Monterey Climate Action Plan VMT Analysis***

SJ12-1359

This memorandum summarizes the technical approach and results of the vehicle miles traveled (VMT) and greenhouse gas (GHG) reduction estimates for the City of Monterey as part of the City's Climate Action Plan. We have estimated baseline and future year VMT, in addition to expected reductions attributable to statewide policies and City-led actions. VMT reduction measures were developed based on policies, strategies and actions from the City's General Plan and implementation of improvements identified in the Citywide Transportation and Parking Plan.

KEY FINDINGS

- The City's baseline (2005) VMT per service population (defined as employees plus residents) is 14.62 and is expected to increase to 15.38 by 2020 under a "Business as Usual" scenario.
- Implementing City-controlled transportation measures would reduce VMT and GHG emissions by approximately 13.3 percent by the year 2020 compared to business as usual and reduce VMT per service population to 13.34.
- Implementing City-controlled measures would reduce total annual VMT in Monterey by 49.4 million by 2020.
- In addition to City-controlled measures, the implementation of Pavley and Low Carbon Fuel Standards at the statewide level is expected to reduce transportation GHG emissions in the City by 24.98% by 2020.

SERVICE POPULATION

To be consistent with the SB 375 Regional Targets Advisory Committee (RTAC) recommendation to the California Transportation Commission (CTC), we have used VMT per service population (residents + employment) as the metric to evaluate transportation GHG emissions. This measurement accounts for the fact that, while there is absolute growth in VMT that is expected to occur over the next decade, the

rate of VMT "per service population" can be reduced. **Table 1** shows the year 2005 and 2020 service population for the City of Monterey.

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TABLE 1: SERVICE POPULATION

	Base Year (2005)	2020 Population
Residential Population	30,757	31,217
Employees	32,415	38,377
Service Population[1]	63,172	69,594

Notes:
[1] Service population within Monterey = residents + employees.
Source: City of Monterey and Association of Monterey Bay Area Governments, July 2012.

DAILY MEASURE OF EFFECTIVENESS APPROACH

Vehicle Miles Traveled Estimates

The 2005 base year Association of Monterey Bay Area Governments (AMBAG) travel demand forecasting model was used to develop City-wide daily VMT estimates. VMT is typically an output from travel demand forecast models and is calculated based on the number of automobile trips multiplied by the distance traveled by each car trip. As such, the estimated VMT is dependent on the level of detail in the network and other variables related to vehicle movement through the network. The volume and distance of traffic depends on land use types, density/intensity, and patterns as well as the supporting transportation system. A travel demand forecasting model is normally used to represent this relationship when forecasting vehicle trips and VMT.

Although the calculation of VMT is simply the number of automobile trips multiplied by the distance traveled by each trip, VMT performance measures can be reported differently. These performance measures can be calculated for the entire roadway network, which may extend beyond a specific geographic area such as the physical limits of a city or project area. Specifically, the current state of the practice technique for determining the VMT estimates from municipalities is the "origin-destination" (OD) method.

The OD method tracks the vehicle trips being generated by a geographic area (i.e., a city) across the entire regional transportation network to their ultimate destinations. The OD method excludes trips

that pass through the City – with neither an origin nor destination within the City. We recommend use of the OD method to account for all the VMT generated in a jurisdiction such as the Monterey, as it directly accounts for trips that may be affected by actions to reduce travel taken by the City.

Because a portion of the external to internal (XI) trips are typically employment heavy trips during the morning and evening peak periods, the VMT per service population was calculated using the total residential population and employment within the City. This method is consistent with the RTAC recommendation for estimating VMT. Daily VMT estimates are presented by year in **Table 2**.

TABLE 2

DAILY VEHICLE MILES TRAVELED ESTIMATES

Scenario	Daily VMT	VMT per Service Population
Base Year (2005)	917,050	14.52
Year 2020 "Business as Usual"	1,070,490	15.38
Source: Fehr & Peers, August 2012		

VMT REDUCTION MEASURES

Several transportation measures were identified that would reduce GHG emissions for the City of Monterey. The measures were developed based on policies, strategies and actions from the City's General Plan and the Citywide Transportation and Parking Study. Some additional measures that may be appropriate for inclusion in the City's CAP are also listed.

Citywide Transportation and Parking Study VMT Reductions

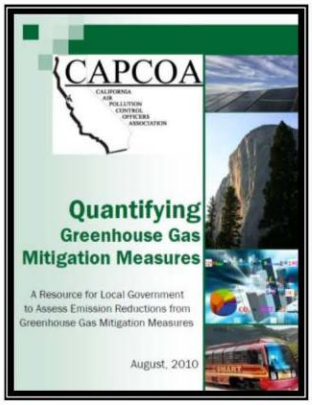
The Citywide Transportation and Parking Study identifies a range of transportation projects and programs to be implemented in Downtown Monterey, the Lighthouse/New Monterey area and along the North Fremont Street corridor. These measures were developed through a collaborative process with City staff that engaged key stakeholders in each part of the City. While some projects contained in the Citywide Transportation and Parking Study do not directly translate to reduced VMT, many projects do serve to reduce the need for automobile travel, shorten trip lengths, and/or provide alternatives transportation choices for residents and employees in the City.

Measures from the Citywide Transportation and Parking Study that provide a contribution to VMT reductions are summarized in **Table 3**. A typical VMT reduction range for each measure is also provided for reference. The VMT reduction is applied to all VMT for the OD estimation method.

VMT Reductions from General Plan and Other Policies

The City's existing General Plan supports the creation of mixed use neighborhoods with a variety of land uses that reduce automobile dependence and increase opportunities for walking. As a result, new development over the life of the General Plan is expected to occur in such a way as to increase land use "diversity", which is a measure directly correlated with reduced VMT.

In addition to General Plan land use policies, additional VMT reduction measures based on the California Air Pollution Control Officers Association (CAPCOA) report titled *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures* (2010) are included. The CAPCOA report was prepared in collaboration with the Northeast States for Coordinated Air Use Management (NESCAUM) and the National Association of Clean Air Agencies. It was also prepared with contracted support from ENVIRON and Fehr & Peers for technical analysis. The report provides methods for quantifying emission reductions from a specified list of mitigation measures, primarily focused on project-level mitigation.



The measures included in the CAPCOA report were selected because they are frequently considered as mitigation for GHG impacts, and standardized methods for quantifying emissions from these projects were not previously available. Measures were screened on the basis of the feasibility of quantifying the emissions, the availability of robust and meaningful data upon which to base the quantification, and whether the measures (alone or in combination with other measures) would result in appreciable reductions in GHG emissions. The report does not suggest that other measures should not be considered, or that they might not be effective or quantifiable; on the contrary, there are many options and approaches to mitigate emissions of GHGs. CAPCOA sought to provide a high quality quantification tool to local governments with the broadest applicability possible, given the resource limitations for the project. CAPCOA encourages local governments to be bold and creative as they approach the challenge of climate change, and does not intend this report to limit the scope of measures considered for mitigation.

The CAPCOA report discusses programs and concepts associated with GHG quantification, which are intended to provide background information for those interested in the context in which reductions are being made. The report also discusses the underpinnings of the quantification methods, limitations in the data used as well as limitations in applying the methods, an overview of the mitigation measure categories including key considerations in the quantification of emission reductions in those categories, and the effectiveness of the measures and how combining measures changes the effectiveness.

Potential reduction measures, along with their expected VMT reduction benefit and party that would typically be responsible for implementation are listed in **Table 3**. A more detailed list is provided as Appendix A.

Summary of Reductions

As shown in **Table 3** on the following page, the total daily VMT reduction under future conditions is approximately 13.3 percent. This reduction corresponds to a decrease of approximately 142,000 daily vehicle miles traveled (VMT) in in Monterey by the year 2020 if all proposed measures are implemented. Annual VMT reductions are also presented.

TABLE 3:
CITY OF MONTEREY VMT REDUCTION MEASURES

Measure	VMT Strategy Typical Reduction Range	Daily Reductions[1]	
		Estimated Percent Reduction in Monterey	Year 2020 VMT Reduction[2,3]
Citywide Transportation and Parking Study Measures			
Implement Downtown Twoway Street Network and Related Improvements	0.3% - 2.5%	2.0%	21,410
Construct New Downtown Transit Center	0.05% - 1.0%	0.6%	6,420
Provide New Bus Rapid Transit (BRT) Service on Fremont Street and Lighthouse Avenue	0.05% - 3.2%	1.2%	12,850
Provide New BRT Service on Del Monte Avenue	0.05% - 3.2%	1.2%	12,850
Implement Pedestrian Network Improvements	0.0% - 0.6%	0.4%	4,280
Implement Key New Bicycle Facilities in Downtown and Other Districts	0.05% - 0.6%	0.5%	5,350
Implement a Citywide Parking Management Strategy	0.5% - 5.0%	3.0%	32,110
Provide Better Wayfinding and Smart Parking Strategies to Reduce Vehicle Circulation Searching for Parking Spaces	0.5% - 5.0%	1.0%	10,700
Subtotal of Measures		*9.9%*	*105,970*
General Plan Policies and Potential Additional Measures			
Land Use / Location			
Increase Land Use Diversity in Mixed Use Neighborhoods	0.3% - 1.5%	0.30%	3,210

Neighborhood / Site Enhancements				
Citywide Pedestrian Network Improvements	0.0% - 0.6%	0.35%		4,280

TABLE 3:
CITY OF MONTEREY VMT REDUCTION MEASURES

New Bicycle Facilities and Connections and Bikeshare Program	0.1% - 1.2%	1.0%		10,700
Traffic Calming and Carshare Programs	0.05% - 0.7%	0.3%		3,210
Transit System Improvements				
Expand and Streamline Transit Network to Integrate with Local Regional Transit Service	0.05% - 1.0%	0.6%		6,420
Commute Trip Reduction Strategies				
Transit Fare Subsidy	0.83% - 1.32%	1.07%	(Maximum Combined Reduction: 0.80%)	8,560
Ride Share Program	0.25% - 1.25%	0.75%		
Marketing & Promotion	0.20% - 1.08%	0.65%		
School Pool	0.90% - 1.80%	1.35%		
Subtotal of Measures		*3.4%*		*36,380*
Total of All Measures	**4.2% - 25.4%**	**13.3%**		**142,350**
Annual Reduction[5]				**49,395,450**

Notes:

1 City VMT based on select zone analysis using one-half external trip approach (Internal to Internal (II), One-Half Internal to External (0.5*IX) and External to Internal (0.5*XI).

2 Values are rounded for presentation purposes.

3 Annual VMT is calculated by multiplying the daily VMT by 347 days to account for reduced vehicle activity on the weekends. This method is consistent with the CARB Pavley I and LCFS postprocessor.

Source: Fehr & Peers, August 2012.

Analysis Results

The base and future year daily land-based VMT, including the VMT per service population, for the City of Monterey are presented in **Table 4**.

TABLE 4:
VEHICLE MILES TRAVELED SUMMARY

Measure[1]	Units[2]	Vehicle Miles Traveled[1]			
		Year 2005	Year 2020		
Before Implementation of Reduction Measures					
Daily vehicle miles traveled (VMT)	mi	917,050	1,070,490		
Daily VMT per service population[3]	mi / capita	14.52	15.38		
After Implementation of Reduction Measures					
Reduction Range			**Low 4.2%**	**Avg 13.3%**	**High 25.4%**
Daily VMT	mi	n/a	1,026,060	928,140	798,590
Daily VMT per service population[3]	mi / capita	n/a	14.74	13.34	11.47
Annual VMT[4]	Million mi	n/a	356.0	322.1	277.1

Notes:

1 City VMT based on select zone analysis using one-half external trip approach (Internal to Internal (II), One-Half Internal to External (0.5*IX) and External to Internal (0.5*XI).

2 mi = miles

3 Service population = residents + employees.

4 Annual VMT is calculated by multiplying the daily VMT by 347 to account for reduced vehicle activity on the weekends. This method is consistent with the CARB Pavley I and LCFS postprocessor.

Source: Fehr & Peers, August 2012.

ADDITIONAL TRANSPORTATION GREENHOUSE GAS REDUCTIONS

Pavley and Low Carbon Fuel Standards

As part of California's efforts to reduce the greenhouse gas (GHG) emissions from vehicles, two state laws sponsored by assemblywoman Pavley were passed mandating better fuel economy (AB 1493) and lower carbon content in gasoline and diesel fuels sold in the state (Low Carbon Fuel Standards-LCFS [AB 1007]).

Our approach for applying the Pavley and Low Carbon Fuel Standard adjustments is based on the methodology developed by Bay Area Air Quality Management District (BAAQMD). Using Pavley and LCFS factors, Fehr & Peers evaluated the additional reduction in CO_2 emissions based on the relative proportion of affected vehicles in each analysis year. The expected fleet mix for Monterey Bay area vehicles in 2020/2025 is as follows:

- 46.7% Light-Duty Autos (LDA)
- 15.9% Light-Duty Trucks (LDT1)
- 19.6% Light-Duty Trucks (LDT2)
- 9.2% Medium-Duty Trucks (MDV)
- 8.5% Other Vehicles

Fehr & Peers adjusted individual CO_2 emissions factors by VMT speed bin based on the relative proportion of affected vehicles in each analysis year. In addition, the EMFAC air pollution estimation software forecasts that gasoline or diesel fuel will power 99.3 percent of the vehicle fleet, with electric vehicles making up the difference.

Based on these calculations, the GHG reduction due to Pavley and LCFS standards for the City of Monterey by 2020 is 24.98%.

APPENDIX A: LISTING OF OTHER POTENTIAL VMT REDUCTIONS

TABLE A-1 – OTHER POTENTIAL VMT REDUCTION MEASURES FOR MONTEREY

Potential Strategy	VMT Reduction Benefit	Implementation Responsibility
Neighborhood / Site Enhancements		
Pedestrian Network Improvements		
Require all new buildings, excluding single-family homes, to include a principal functional entry that faces a public space such as a street, square, park, paseo, or plaza, in addition to any	Low	City Action / Development Action

entrance from a parking lot, to encourage pedestrian foot traffic.		
Seek grant funding to establish a Safe Routes to School (SR2S) Program to increase more student walking and biking trips.	Medium	City / School Action
Implement transit access improvements through sidewalk/crosswalk safety enhancements and bus shelter improvements.	Low / Medium	City Action
Bicycle Network Improvements		
Require bicycle parking facilities and on-site showers in major non-residential development and redevelopment projects.	Low / Medium	City Action
Complete the City's Bikeway Network and install high-quality bicycle-parking facilities Downtown in centralized, safe, and secure areas.	Medium	City Action
Support TAMC and other efforts to create a bicycle-sharing program.	Medium	City Action
Automobile Network Improvements		
Design and implement traffic-calming measures on specific streets to dissuade cut-through traffic and attract pedestrian and bicycle traffic.	Medium	City Action
Support the establishment of and/or partner with non-profit organizations to create or provide a car-sharing program in Monterey.	Medium	City Action
Commute Trip Reduction Strategies		
Implement a required Employer Commute Trip Reduction Program for new development and a voluntary program for existing development. This would be a multi-strategy program that encompasses a combination of individual measures: ride-share programs, discounted transit programs, end-of-trip facilities (e.g. showers and lockers), encouraging telecommuting, and preferential parking permit programs.	Medium	City Action / Development Action

TABLE A-1 – OTHER POTENTIAL VMT REDUCTION MEASURES FOR MONTEREY

Potential Strategy	VMT Reduction Benefit	Implementation Responsibility
Implement a School Pool Program that helps match parents to carpool students to school.	Medium	City Action / School Action
Coordinate with local school districts and universities on marketing, promoting, and educating students about the benefits of using public transit as a mode of travel.	Medium	City Action / School Action
Require designated or preferred parking for vanpools, carpools, and electric vehicles.	Medium	City Action / Development Action
Install electric vehicle charging stations in high traffic areas through grant-funded programs encouraging electric vehicle use.	Low / Medium	City Action

Notes:

1. Additional information on the above measures and other complementary measures can be referenced using the CAPCOA VMT quantification guidelines at:

   http://www.capcoa.org/wp-content/uploads/2010/11/CAPCOA-Quantification-Report-9-14-Final.pdf

Source: Fehr & Peers, 2012.