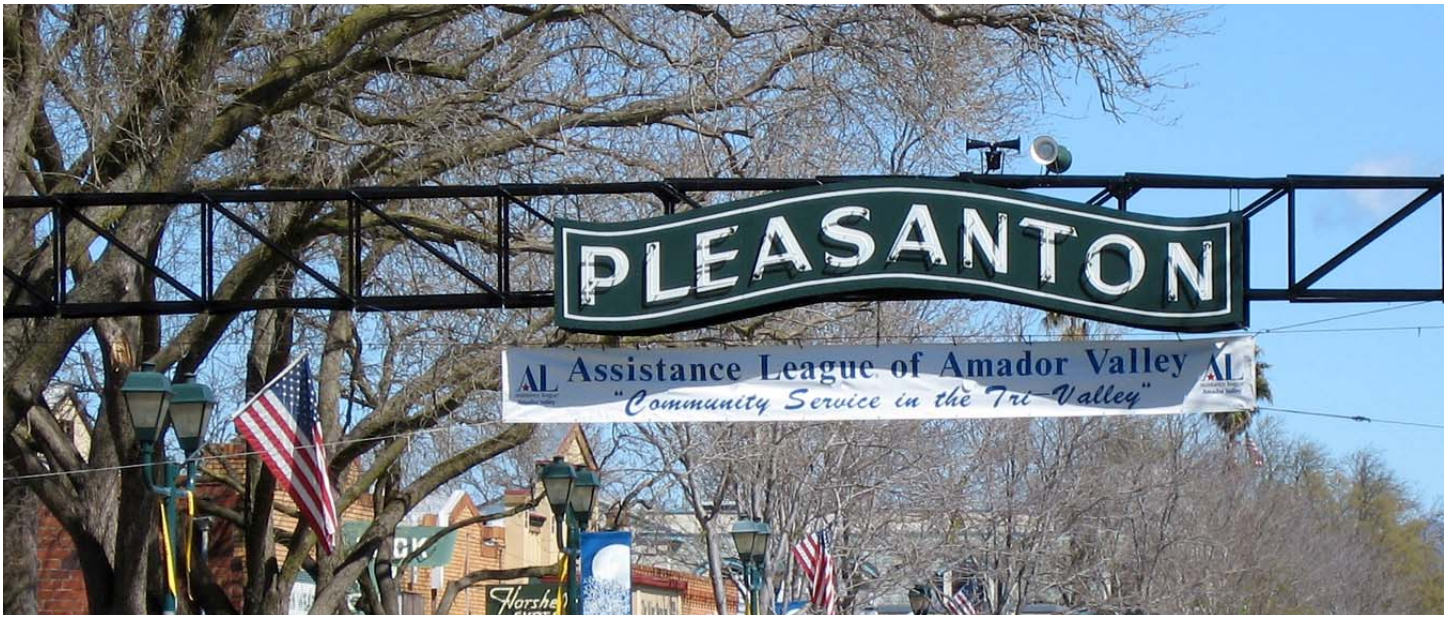
# Climate Action Plan

CITY OF PLEASANTON

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We thank the residential and business community for their participation in community meetings and for their thoughtful suggestions.

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# Glossary of Terms and Acronyms

| | |
|---|---|
| AAAS | The American Association for the Advancement of Science |
| ABAG | The Association of Bay Area Governments |
| AB1493 | Assembly Bill 1493: The Pavley Regulations, which reduce passenger vehicle emissions. |
| BAAQMD | Bay Area Air Quality Management District |
| BAU | Business as usual |
| CARB | The California Air Resources Board |
| CAP | Climate Action Plan |
| CAPCOA | California Air Pollution Control Officers Association |
| CCA | Community choice aggregation |
| CCAR | California Climate Action Registry |
| CEC | California Energy Commission |
| CEQA | The California Environmental Quality Act |
| $CH_4$ | Methane: A greenhouse gas with approximately 21 times more global warming potential per unit weight than carbon dioxide. |
| CIP | Capital Improvement Project |

| | |
|---|---|
| $CO_2$ | Carbon dioxide |
| $CO_2e$ | Carbon dioxide equivalent, or the amount of $CO_2$ that would have the same global warming potential (GWP), when measured over a specified timescale (generally, 100 years). |
| Decarbonize | Reduce the carbon intensity of. |
| DOE | U.S. Department of Energy |
| EECS | Energy Efficiency and Conservation Strategy: The U.S. Department of Energy program that outlines specific programs and initiatives to achieve near-term energy savings and GHG emissions reductions. |
| EIA | Energy Information Administration |
| EMFAC | EMission FACtors Model: A model used to calculate emission rates from all motor vehicles in California, including passenger cars and heavy-duty truck. EMFAC2007 is the most recent version of this model. |
| EPA | United States Environmental Protection Agency. The mission of EPA is to protect human health and to safeguard the natural environment—air, water and land—upon which life depends. |
| FAR | Floor area ratio |
| FIRST | Financing Initiative for Renewable and Solar Technology |
| GHG | Greenhouse gas |
| Greenhouse Gas | A gas that absorbs infrared radiation in the atmosphere, causing a planet-wide greenhouse effect. |
| GWP | Global warming potential measures the atmospheric heat-absorbing ability of a gas relative to that of carbon dioxide ($CO_2$) |
| ICLEI | International Council for Local Environmental Initiatives: A membership association of local governments committed to advancing climate protection and sustainable development. |
| IPCC | Intergovernmental Panel on Climate Change: The leading body for the assessment of climate change, established by the United Nations. |
| kWh | Kilowatt hours |
| LCFS | Low Carbon Fuel Standard: Executive Order S-1-07, which calls for a 10 percent reduction in the carbon intensity of California's transportation fuels by 2020. |
| LED | Light emitting diode |
| LEED | Leadership in Energy and Environmental Design: An internationally recognized green building certification system, which provides third-party verification that a building or community was designed and built using sustainable approaches, with particular regard to energy savings, water efficiency, CO2 emissions reductions, and improved indoor environmental quality, among others. |
| $MTCO_2e$ | Metric tons of carbon dioxide equivalent |

| | |
|---|---|
| NOAA | National Oceanic and Atmospheric Administration |
| NextBus technology | NextBus is a vehicle tracking system which uses GPS data to predict when the next bus will arrive at any given bus stop, eliminating or reducing wait times and any need for schedules for all transit riders. |
| $N_2O$ | Nitrous oxide. A colorless, odorless greenhouse gas with approximately 310 times more global warming potential than $CO_2$. |
| PG&E | Pacific Gas and Electric Company: The City's energy utility. |
| PPA | Power Purchase Agreement |
| ppm | Parts per million |
| PV | Photovoltaic |
| RPS | Renewable Portfolio Standard |
| SB97 | Senate Bill 97: Requires the Governor's Office of Planning and Research (OPR) to develop and adopt CEQA guidelines for the mitigation of emissions. |
| SB375 | Senate Bill 375: Enhances California's ability to reach its AB 32 goals by promoting good planning with the goal of more sustainable communities. |
| SB1078 | Senate Bill 1078: The Renewable Portfolio Standard, requires California to generate 20% of its electricity from renewable resources no later than 2017. |
| SBX7-7 | The California Water Conservation Bill of 2009, which sets a target of a 20% reduction in Statewide water use by 2020. |
| SCS | Sustainable Communities Strategy |
| Service Population | The combined total of residents and employment in a community. |
| Scoping Plan | AB32-required planning document developed by the Air Resources Board that provides the outline for actions to reduce California's GHG emissions. |
| TDM | Transportation Demand Management: The application of strategies and policies to reduce travel demand through reduction in single-occupancy private vehicle use. |
| TOD | Transit Oriented Development: Development structured around mixed-use transportation hubs meant to maximize access to public transport and thereby increase efficiencies and reduce community-wide greenhouse gas emissions. |
| URBEMIS | URBan EMISsions Model: A model that estimates air pollution emissions, including CO2, from a variety of land use projects. |
| UWMP | Urban Water Management Plan |
| VMT | Vehicle miles traveled |
| Zone 7 | Pleasanton's Regional Water Agency |


# 1 Introduction

*Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has.*

***Margaret Mead***

# A Letter to the Community

*It is a pleasure to present the City of Pleasanton's Climate Action Plan, the result of nearly a year of collaborative efforts among community leaders, concerned citizens, industry experts, renowned scientists, and city staff. This plan describes the effects climate change could have on our city and suggests ways we can work together to address these challenges and reduce our collective carbon footprint.*

*Years ago, the City of Pleasanton made a commitment to protect our environment and make Pleasanton the greenest city in the state. Back then, the terms "climate change" and "carbon footprint" weren't commonplace for most cities and states – or even for most people. We are pleased to say that the City of Pleasanton was an early adopter of climate-friendly, sustainable management. For years the City has employed green practices and embraced clean technology throughout its operations. It is no surprise that Pleasanton placed in the top 100 (63rd) on the "Best Places to Live" in the nation, garnering accolades for our schools, beautiful parks, cultural amenities, and highly desirable climate and locale. We believe that when you do such things as planting trees and maintaining beautiful parks, investing resources to remove pollution from the air, and promoting the construction of energy-efficient buildings, you enhance the quality of life for the entire community.*

*We are proud that Pleasanton has been recognized for its environmental leadership and that it is being modeled by other cities. We believe our efforts demonstrate that implementing sustainable practices in government is not only good for the environment, but it creates green jobs and a better economy, and makes our city a cleaner, safer place to live. As you will see when you read this plan, some of the things we need to do – such as investing in transportation infrastructure – require the involvement of the state and federal government. But other important steps are much simpler and within reach of us all. These steps include driving less and walking more, using energy-efficient light bulbs, supporting local farmers and businesses, or turning down the thermostat a few degrees in the winter.*

*Each of us has a critical role to play in this effort by changing our behavior to do what is right instead of what is easy. It is important that we protect our environment for future generations by identifying and implementing regenerative (or sustainable) qualities into all that we do. To that end, this Climate Action Plan provides a roadmap – a set of bold ideas – to help expand on our successes to slow the effects of climate change. It's no secret that this will require an enormous amount of hard work and cooperation. It will require the commitment of not only government, but of every individual and business in our fine city.*

*Our goal is to make Pleasanton a vibrant example of how a city can live in harmony with nature and, as a result, be a better place for all its residents and businesses. We are confident that if we address this challenge together, with creativity and commitment, the City of Pleasanton will continue to lead the effort toward sustainability and a more secure future.*

*Respectfully,*

*Mayor and City Council*
*City Manager*
*City Staff*

# Plan Purpose and Goals

This Climate Action Plan serves to outline strategies, goals, and actions for reducing municipal and community-wide greenhouse gas (GHG) emissions. This Climate Action Plan has been structured to ensure that the City does its part to meet the mandates of California's Global Warming Solutions Act of 2006 (AB 32), while taking into account the City's General Plan vision and its goal to become the "greenest" city in California.

AB 32 directs the state to reduce state-wide GHG emissions to 1990 levels by 2020. In order to achieve these reductions, the California Air Resources Board (CARB) recommends that local governments target their 2020 emissions at 15% below 2005 levels, consistent with the state-wide commitment, to account for emissions growth that has occurred statewide since 1990.

The baseline 2005 GHG Emissions Inventory for Community of Pleasanton includes 770,844 metric tons of $CO_2$ equivalents (MT $CO_2e$), with 5,370 MT of that (approximately 0.7%) coming from municipal operations. To meet its goal, the City must reduce its annual emissions to approximately 655,000 MT $CO_2e$ per year by the year 2020.

Several initiatives at the state level will help the City reduce GHG emissions, but they alone will not be sufficient to meet the 2020 target. This Climate Action Plan provides a roadmap for the City to be proactive in reducing GHGs through a schedule of local actions, so that the City can do its part to mitigate climate change while meeting the requirements of state law.

The City of Pleasanton conducted an analysis of hundreds of potential GHG-reduction strategies and actions. Best-suited measures were chosen primarily based on their GHG-reduction and cost-benefit characteristics, with additional considerations for funding availability and feasibility of implementation. The selected measures impact transportation and land use, energy consumption and generation, water use and wastewater treatment, community engagement, and solid waste disposal. For each emissions sector, the Climate Action Plan presents goals, strategies, and specific actions for reducing emissions, along with quantified cost-benefit impacts where possible. An implementation and monitoring plan is also provided. The initial implementation timeframe will span approximately fifteen years, from 2011 through 2025.

## Relationship to the General Plan and Pleasanton's Commitment to Sustainability

This Climate Action Plan, in presenting measures for reducing community GHG emissions and increasing resilience to climate change, is closely aligned with the goals and policies outlined in the City's General Plan 2005-2025, placing a strong emphasis on community economic development, community values, and quality of life.

Most elements of the General Plan contain two overarching goals: preserve Pleasanton's character and encourage sustainable development. The General Plan articulates the vision that "Pleasanton is committed to sustainable community principles and will meet the needs of the current generation without compromising the ability of future generations to meet their needs."

The measures presented in Chapter 3 of this Climate Action Plan are consistent with the goals and strategies included in the General Plan. The General Plan acknowledges Pleasanton's responsibility in reducing its community-wide carbon footprint, and includes policies for reducing energy usage and carbon-dioxide emissions associated with the built environment and the everyday activities of its residents

and businesses. This includes reducing automobile trips, energy use, traffic noise, and air pollution by integrating higher density, well-designed, in-fill mixed-use development with transit.

## How this Climate Action Plan addresses the terms of the Final Settlement Agreement with the State of California

In August 2009, the State Attorney General filed a complaint with the City of Pleasanton objecting to several aspects of its Environmental Impact Report (EIR) prepared for the City's adopted General Plan 2005 – 2025 update. The Attorney General found that the City's 29,000-unit "Housing Cap" was inconsistent with its inclusionary duties under state law to provide sufficient housing for the region's growing population. The complaint also stated that the City's General Plan favored commercial development at the expense of housing, leading inevitably to a jobs/housing imbalance that would exacerbate traffic jams and increase GHG emissions as locally employed people were forced to move to the outer reaches of the metropolitan area to find affordable housing, and thus face longer commutes. Finally, the Attorney General alleged that the EIR was flawed in its analysis of climate change and the cumulative impact that the General Plan buildout would have on GHG emissions.

In August 2010, the City reached agreement with the State of California and others over how to address these issues. Under the Settlement Agreement and Covenant Not to Sue, dated August 2010, the City is directed to adopt a Climate Action Plan no later than February 17, 2012, and to prepare a Supplemental Environmental Impact Report (SEIR) for the Climate Action Plan. As stipulated under the Settlement Agreement, this Climate Action Plan addresses the Attorney General's allegations and analyzes the City's GHG emissions and reduction strategies for the life of the City's General Plan (through 2025), and fulfills this requirement of the Settlement Agreement.

# Strategies for Managing Sustainability

As stated in *A Guide for Local Government Executives on Energy Efficiency and Sustainability*, there are six critical strategies for managing sustainability.[1] The City of Pleasanton will incorporate these strategies into its planning and implementation of GHG emission reduction measures:

Strategy One: Local government executives should formulate specific targets and performance measures as benchmarks in local climate action plans.

Strategy Two: Promote citizen and stakeholder participation in administrative design decisions for energy efficiency and sustainability.

Strategy Three: Engage interested parties and share knowledge through sustainability networks and regional collaboration initiatives.

Strategy Four: Establish a dedicated sustainability office with appropriate funding.

Strategy Five: Coordinate sustainability and energy programs with traditional services and economic development functions.

Strategy Six: Lead by example – increase sustainability initiatives by first practicing sustainability within local government operations and activities.

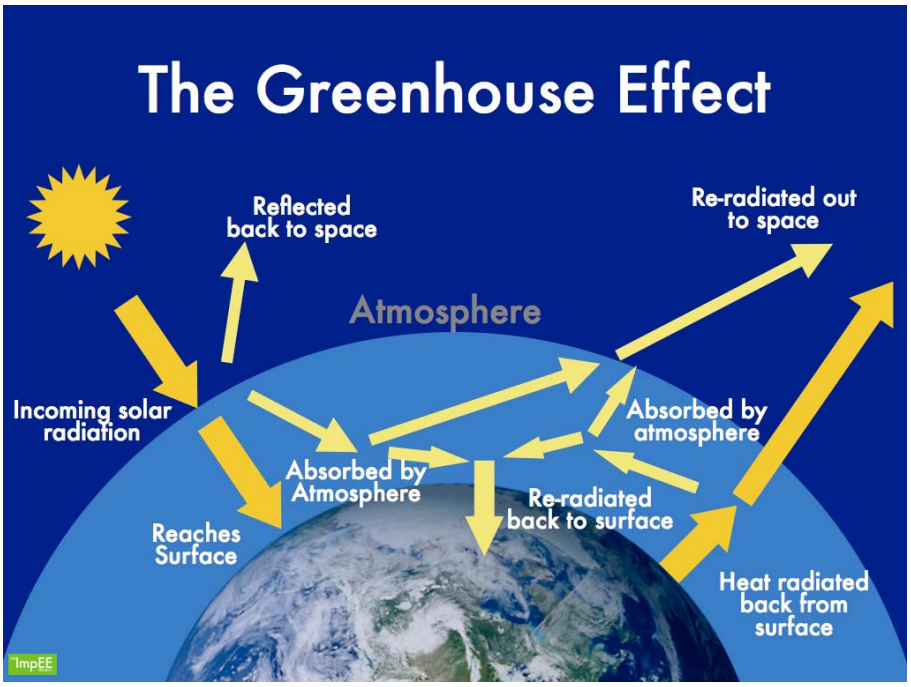
[1] Francis, Nathan, and Richard C. Feiock, 2011. *A Guide for Local Government Executives on Energy Efficiency and Sustainability*. Available at: http://www.businessofgovernment.org/report/guide-local-government-executives-energy-efficiency-and-sustainability

# Climate Change Science

The scientific community has reached a consensus that climate change is occurring. According to the Intergovernmental Panel on Climate Change (IPCC), "warming of the climate system is unequivocal, as is now evident from observations of increases in global average air and ocean temperatures, widespread melting of snow and ice and rising global average sea level."[2] Regional climate changes, particularly temperature increases and changing precipitation patterns, will affect natural systems worldwide, with widespread impacts. Water availability, food production, ecosystem biodiversity, and human health will all be impacted.

Greenhouse gases (GHGs) are gases that trap heat in the atmosphere and regulate the Earth's temperature. This effect, known as the Greenhouse Effect, is responsible for maintaining a habitable climate. Climate change is occurring because of the ever-rising rate of emissions of warming-inducing gases into the atmosphere. According to the IPCC, it is very likely that human-generated greenhouse gas (GHG) emissions, which have increased considerably since the mid-20th century, are a primary cause of climate change. Since the dawn of the Industrial Revolution around 1750, human activities have created marked increases in atmospheric concentrations of greenhouse gas emissions, levels of which now far exceed atmospheric concentrations from the past several thousand years. Land use changes, burning of fossil fuels, and agricultural practices all contribute to these increasing concentrations. Global climate models clearly show the effect of human-induced changes on global temperatures.

Figure 1-1.
The Greenhouse Effect




Source: (University of Cambridge, 2006)[3]

[2] Intergovernmental Panel on Climate Change Fourth Assessment Report, 2007. Available at: http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml

[3] University of Cambridge, 2006. The Greenhouse Effect. Accessed on June 14, 2011 from: http://www-g.eng.cam.ac.uk/impee/?section=topics&topic=ClimateChange&page=materials

The most common GHGs are carbon dioxide ($CO_2$) and water vapor, but there are several others that are important, including methane ($CH_4$), nitrous oxide ($N_2O$), chlorofluorocarbons (CFCs), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6). These are released into the Earth's atmosphere through a variety of natural processes and human activities. Salient points regarding GHGs include the following:

- Carbon dioxide and nitrous oxide are byproducts of fossil fuel combustion;
- Nitrous oxide is also associated with agricultural operations such as fertilization of crops;
- Methane is commonly created by off-gassing from agricultural practices (e.g., keeping livestock), anaerobic composting, and landfills;
- Chlorofluorocarbons were widely used as refrigerants, propellants, and cleaning solvents, but their production has been mostly eliminated by international treaty;
- Hydrofluorocarbons are now used as a substitute for chlorofluorocarbons in refrigeration and cooling; and
- Perfluorocarbons and sulfur hexafluoride emissions are commonly created by industries such as aluminum production and semi-conductor manufacturing.

Each GHG has its own potency and effect upon the Earth's energy balance. This is expressed in terms of a global warming potential (GWP), with carbon dioxide being assigned a value of 1 and sulfur hexafluoride being several orders of magnitude stronger with a GWP of 22,800. In GHG emission inventories, the weight of each gas is multiplied by its GWP and is measured in units of carbon dioxide equivalents ($CO_2e$). Table 1-1 lists the six primary GHGs (also known as the Kyoto GHGs), their chemical formula, the lifetime of the compound, and their GWPs relative to $CO_2$.

Though $CO_2$ has the lowest GWP per unit weight in the atmosphere, it is the largest contributor to observed warming over the last century because of the volume of $CO_2$ emissions over that time. Figure 1-2 shows the strong correlation between atmospheric $CO_2$ levels and observed global temperatures over the past 130 years. Concentrations have risen most rapidly since 1980, closely tracking the steep rise in temperature.

As shown in Figure 1-3, atmospheric $CO_2$ levels have periodically risen and fallen over the past 800,000 years, within a relatively narrow range of approximately 180 to 300 parts per million (ppm), corresponding to repeating cycles of carbon uptake and release as continental ice sheets advance and retreat. The current era, already at the peak of a warming cycle, is experiencing atmospheric $CO_2$ levels far higher than at any time over the past 800,000 years. Current concentrations are at about 380 ppm, compared to approximately 280 ppm just 250 years ago.

Table 1-1.
Greenhouse Gases Covered by the Kyoto Protocol
Lifetime and Global Warming Potentials from IPCC[1]

| GHG | Chemical Formula | Lifetime (years) | Global Warming Potential for 100-year horizon |
|---|---|---|---|
| Carbon Dioxide | $CO_2$ | 1 | 1 |
| Methane | $CH_4$ | 12 | 25 |
| Nitrous Oxide | $N_2O$ | 114 | 298 |
| Sulfur Hexafluoride | $SF_6$ | 3,200 | 22,800 |
| Hydrofluorocarbons | HFCs | 1.4–270 | 77–14,400 |
| Perfluorocarbons | PFCs | 1,000–50,000 | 7,390–22,800 |

[1] IPCC Fourth Assessment Report: Climate Change 2007 (AR4). Available at: http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml#1

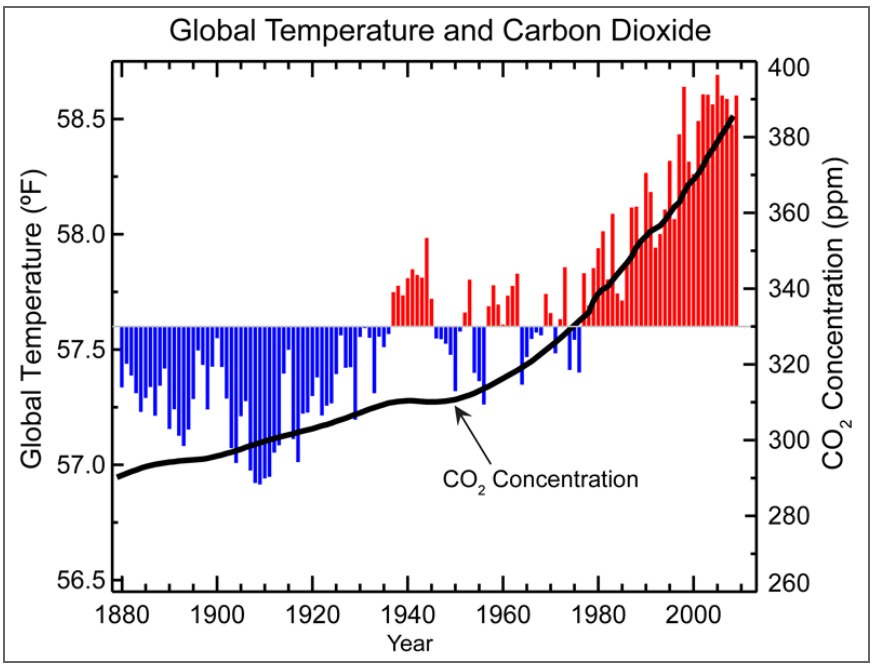



Figure 1-2.
Global Temperature and Carbon Dioxide[4]

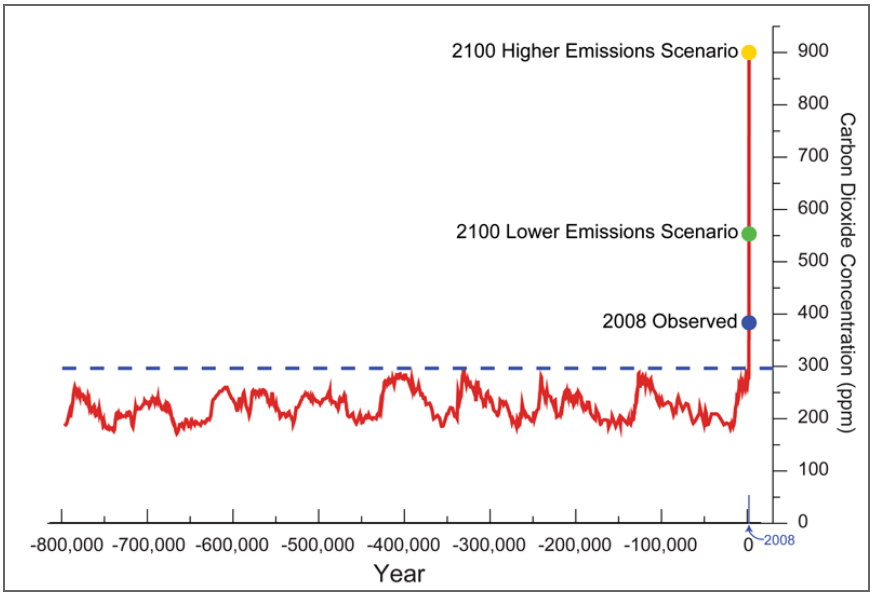



Figure 1-3.
800,000 Year Record of Carbon Dioxide ($CO_2$) Concentrations[5]

[4] NOAA Satellite and Information Service, 2010. Available at: http://www.ncdc.noaa.gov/indicators/
[5] Ibid.

By the end of the 21st Century, even the minimum expected levels of $CO_2$ will far exceed known levels going back more than a million years. Climate models cited by the IPCC predict that by 2100, average atmospheric $CO_2$ concentrations will increase to 540 - 970 ppm, while global average temperatures are expected to rise by between 1.1 and 6.4 °C (2.0 and 11.5 °F), with the greatest increases occurring at the poles. Already, observed average temperatures have increased by about 3 degrees C at the poles, compared with 0.7 degrees C in the Earth's more temperate zones. Climate dynamics are complex, and predictions about our future climate are fraught with uncertainly. Even so, current observations are consistent with modeling predictions, and in many cases prove that the models are conservative.

An expanding body of scientific research supports the theory that human activity is a major contributor to observed increases in atmospheric $CO_2$ and other GHGs. As shown in Figure 1-4, climate model experiments that include only natural factors, such as cycles of solar radiation variability, show a relatively stable global temperature over the past century, while models that include human influences produce results that track very closely to the observed temperature increases over that same time period.

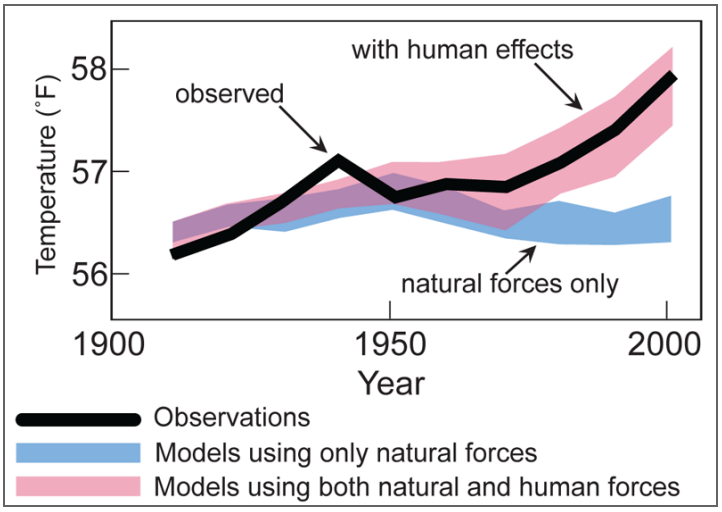



Figure 1-4.
Climate Model Indications and the Observed Climate

Source: NOAA, 2010

## Impacts of Climate Change

In 2009, a consortium of U.S.-based science organizations led by the National Oceanic and Atmospheric Administration (NOAA) released a comprehensive study of climate impacts in the United States.[6] Its key findings are summarized as follows:

1. Global warming is unequivocal and primarily human-induced.

   Average global temperature has increased over the past 50 years. This observed increase is due primarily to human-induced emissions of heat-trapping gases.

2. Climate changes are underway in the United States and are projected to grow.

   Climate-related changes have already been observed in the United States and its coastal waters. These changes include increases in heavy downpours, rising temperatures and sea level, rapidly retreating glaciers, thawing permafrost, lengthened growing seasons, lengthened ice-free seasons in the ocean and on lakes and rivers, earlier snowmelt, and alterations in river flows.

[6] U.S. Global Change Research Program, 2009. *Global Climate Change Impacts in the United States*. Page 12. Available at: http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts

3. Widespread climate-related impacts are occurring now and are expected to increase.

   Climate changes are already affecting water, energy, transportation, agriculture, ecosystems, and health. These impacts are different from region to region and will grow under projected climate changes.

4. Climate change will stress water resources.

   Access to clean water is an issue in every region, but the nature of the potential impacts varies. Drought, related to reduced precipitation, increased evaporation, and increased water loss from plants, is an important issue especially in the West. Floods and water quality problems are likely to be amplified by climate change in most regions. Declines in mountain snowpack are important in the West and Alaska, where snowpack provides vital natural water storage.

5. Crop and livestock production will be increasingly challenged.

   Agriculture is considered one of the sectors most adaptable to changes in climate. However, increased heat, pests, water stress, diseases, and weather extremes will pose adaptation challenges for crop and livestock production.

6. Coastal areas are at increasing risk from sea-level rise and storm surge.

   Sea-level rise and storm surges place many U.S. coastal areas at increasing risk of erosion and flooding, especially along the Atlantic and Gulf Coasts, Pacific Islands, and parts of Alaska. Energy and transportation infrastructure and other property in coastal areas are very likely to be adversely affected.

7. Threats to human health will increase.

   Health impacts resulting from climate change are related to heat stress, waterborne diseases, poor air quality, extreme weather events, and diseases transmitted by insects and rodents. A robust public health infrastructure can reduce the potential for negative impacts.

8. Climate change will interact with many social and environmental stresses.

   Climate change will combine with pollution, population growth, overuse of resources, urbanization, and other social, economic, and environmental stresses to create larger impacts than from any of these factors alone.

9. Thresholds will be crossed, leading to large changes in climate and ecosystems.

   There are a variety of thresholds in the climate system and ecosystems. These thresholds determine for example the presence of sea ice and permafrost and the survival of species, from fish to insect pests, with implications for society.

10. Future climate change and its impacts depend on choices made today.

    The amount and rate of future climate change depend primarily on current and future human-caused emissions of heat-trapping gases and airborne particles. Responses involve reducing emissions to limit future warming and adapting to the changes that are unavoidable.

According to the IPCC Fourth Assessment Report, a 2°C increase in average global temperature over the next century is a “safe” level of global warming. To keep warming at this level, GHG concentrations must be stabilized at less than 450 parts per million (ppm). Currently, global atmospheric concentration of GHGs averages 380 ppm. Avoiding dangerous warming requires reducing global GHG emissions by at least 50 percent below 1990 levels by the year 2050. A target this aggressive is made especially challenging due to the rapid rise of emissions in the developing world.

Many of California's important natural resources are threatened by the global warming trend. Increased precipitation and sea level rise could increase coastal flooding, saltwater intrusion (a particular concern in the low-lying Sacramento–San Joaquin Delta, where potable water delivery pumps could be threatened), and degradation of wetlands. Mass migration and/or loss of plant and animal species, many unique to our Mediterranean climate, could also occur.

The City of Pleasanton, like the rest of the cities in California, is likely to face extreme challenges in the 21st Century due to climate change, with its expected widespread economic, social, and environmental consequences. Although Pleasanton is not susceptible to the projected rises in sea level due to melting ice caps and warming oceans, it will still be impacted directly and indirectly on many fronts as global temperatures rise. Heat waves, extreme weather events, increased levels of air pollution, water supply challenges resulting from a diminishing Sierra snowpack, and higher electricity demand in the hot summer months are a few examples of potential direct impacts to the City.

More information is available on the science of climate change from the following organizations:

- Intergovernmental Panel on Climate Change Fourth Assessment Report: http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml
- National Ocean and Aeronautical Administration (NOAA) http://www.climate.gov/#climateWatch
- Pew Center on Climate Change: http://www.pewclimate.org/
- U.S. Environmental Protection Agency: http://www.epa.gov/climatechange/indicators.html
- U.S. National Academy of Sciences http://americasclimatechoices.org/
- The American Association for the Advancement of Science (AAAS) http://www.aaas.org/

# State and Regional Regulatory Setting

A myriad of strategies for monitoring and addressing climate change have emerged at the international, national, and state levels, but California has been a leader in developing mitigation and adaptation strategies. Since 2005, California has been developing policy and passing legislation that seeks to control emissions of gases that contribute to global warming. These have included regulatory approaches such as mandatory reporting for significant sources of GHG emissions and caps on emission levels, as well as market-based mechanisms, such as cap-and-trade. Voluntary actions are also increasing, such as conducting emissions inventories, implementing practices to reduce emissions, and purchasing offsets and renewable energy certificates. Though many actions are currently voluntary, as policies regulating GHG emissions are implemented, more monitoring and mitigation of GHG emissions will be required. Given the increasing regulation of GHG emissions by Federal, State, and local bodies, it is in a City's best interest to understand and manage its GHG risks.

## State of California Executive Order S-3-05

In June 2005, the Governor of California signed Executive Order S-3-05, which identified the California Environmental Protection Agency (Cal/EPA) as the lead coordinating state agency for establishing climate change emission reduction targets in California. A "Climate Action Team," a multi-agency group of state agencies, was set up to implement Executive Order S-3-05. The Governor's Executive Order established aggressive emissions reductions goals: by 2010, GHG emissions must be reduced to 2000 levels; by 2020, GHG emissions must be reduced to 1990 levels; and by 2050, GHG emissions must be reduced to 80

percent below 1990 levels. GHG emission reduction strategies and measures to reduce global warming were identified by the California Climate Action Team in 2006.

## Global Warming Solutions Act of 2006 (AB 32)

In 2006, the California legislature adopted AB 32, requiring that California cap GHG emissions state-wide at 1990 levels by 2020. AB 32 requires CARB to establish a program for statewide GHG emissions reporting, and monitoring/enforcement of that program.

CARB's Climate Change Scoping Plan,[7] 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 Pleasanton.

### Low Carbon Fuel Standard (LCFS)

The Low Carbon Fuel Standard (LCFS) requires fuel providers in the State to decrease lifecycle fuel carbon intensity by 2020. It is expected that the LCFS will reduce tailpipe carbon emissions from passenger vehicles and heavy duty trucks by 10% by 2020.[8] CARB identified specific eligibility criteria in April 2009, and implementation is expected to begin by January 2011.

### Assembly Bill 1493 (Pavley)

Assembly Bill 1493, known as the Pavley Bill, directed CARB to adopt regulations to reduce emissions from new passenger vehicles. CARB's AB 32 Early Action Plan released in 2007 included a strengthening of the Pavley regulation for 2017. AB 1493 requires GHG emission reductions from passenger trucks and light cars beginning in 2011. CARB will be implementing the Pavley standards in two phases, mandating increasingly higher efficiency standards on cars manufactured through 2020. In March 2008, the EPA had denied CARB's initial request for implementation. However, a waiver was approved in June 2009, allowing the State to move forward as scheduled.

### Senate Bill 1078 (Renewable Portfolio Standard)

California's Renewable Portfolio Standard (RPS) was established in 2002 under SB 1078 and accelerated in 2006 under SB 107. Under AB 32, 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. As of 2005, about 12% of PG&E's portfolio qualified as renewable, so a 21-percent gain should occur by 2020 under the RPS.[9]

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7 Available at http://arb.ca.gov/cc/scopingplan/scopingplan.htm

8 Equal to 7% when full lifecycle impacts are considered.

9 PG&E, 2005. http://www.pge.com/b2b/energysupply/wholesaleelectricsuppliersolicitation/renewables2005.shtml. Accessed on June 14, 2011.

### Senate Bill 97

Recognizing that AB 32 did not discuss how GHGs should be addressed in documents prepared under the California Environmental Quality Act (CEQA), the legislature enacted SB 97 to require the Governor's Office of Planning and Research (OPR) to develop and adopt CEQA guidelines for the mitigation of emissions. The draft guidelines were formalized on March 18, 2010, and all CEQA documents prepared after this date are required to comply with the OPR-approved amendments to the CEQA Guidelines.

### Senate Bill 375

In 2008, SB 375 was enacted to address indirect GHG emissions caused by urban sprawl. SB 375 develops emissions-reduction goals that regions can apply to planning activities. SB 375 provides incentives for local governments and developers to create new walkable and sustainable communities, revitalize existing communities, and implement conscientiously planned growth patterns that concentrate new development around public transportation nodes. CARB has been working with the state's metropolitan planning organizations (MPOs) to align their regional transportation, housing, and land use plans to reduce vehicle miles traveled and demonstrate the region's ability to attain its GHG reduction targets. The legislation also allows developers to bypass environmental review of the project's GHG impact under CEQA if they build projects consistent with the MPO's Sustainable Community Strategy (SCS). SB 375 enhances CARB's ability to reach the goals of AB 32 by directing the agency to develop regional GHG emission reduction targets to be achieved from the land use and transportation sector for 2020 and 2035.

In September 2010, CARB adopted per capita emissions reduction targets for the Bay Area of 7% and 15%, respectively, to be accounted for in the Bay Area SCS. It is projected that this SCS will focus new growth on priority development areas (PDAs) that are currently being finalized by the Association of Bay Area Governments (ABAG) and the Metropolitan Transportation Commission (MTC).

## Bay Area Air Quality Management District (BAAQMD)

In 2005, the Bay Area Air Quality Management District (BAAQMD) initiated a Climate Protection Program that integrates climate protection activities into existing BAAQMD programs and functions. BAAQMD has direct and indirect regulatory authority over sources of air pollution in the San Francisco Bay Area air basin. Current BAAQMD climate-related activities include grant programs, CEQA commenting, regulations, inventory development, and outreach. BAAQMD provides technical assistance to local governments and other interested parties, and promotion of collaborative efforts among stakeholders.

A regional GHG emission inventory for 2002 was developed by BAAQMD and recently updated for 2007 conditions.[10] This inventory provides an overview of GHG emission sources in the Bay Area, including a breakdown by county levels and emission sectors. In 2008, BAAQMD adopted a fee program that applies to permitted stationary sources. These fees are used to fund BAAQMD's climate protection programs, while providing an incentive for sources to reduce their emissions.

In June 2010, BAAQMD adopted a new update to its CEQA Guidelines[11] that includes thresholds of significance for GHG emissions from projects and plans that are based on meeting the statewide AB 32 GHG emissions reduction targets established by CARB. BAAQMD adopted an efficiency measurement that can be applied to the evaluation of general plans (and climate action plans) in Bay Area jurisdictions. Under these thresholds, a plan would have a significant environmental impact if it allowed development that

[10] BAAQMD, 2010. Source Inventory of Bay Area. Available at: http://www.baaqmd.gov/~/media/Files/Planning%20and%20Research/Emission%20Inventory/regionalinventory2007_2_10.ashx. Updated February 2010.

[11] BAAQMD, 2010. *CEQA Thresholds of Significance*. Adopted June 2, 2010.

would generate more than 6.6 metric tons of $CO_2e$ per service population per year by 2020.[12] Alternatively, the significance of the plan's impact could be evaluated based on the consistency of the plan with an adopted GHG Reduction Strategy that is found to be consistent with AB 32 reduction goals; if the plan is consistent, it would not result in a significant impact. The BAAQMD CEQA Guidelines lay out the requirements that qualify an acceptable GHG Reduction Strategy. The requirements for establishing a "qualified" GHG Reduction Strategy are laid out in the 2010 CEQA Guidelines, and summarized in the next Chapter.

[12] Service population is defined as the sum of population and employment.

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# 2 Greenhouse Gas Emissions Baseline, Future Projections, and Reduction Targets

## Overview

A city's greenhouse gas (GHG) inventory serves multiple purposes. It quantifies the GHG emissions resulting from activities taking place throughout the community by the city's residents, businesses, and local government, and creates an emissions baseline against which the city can set emissions reduction targets and measure future progress. It also provides an understanding of where GHG emissions are originating and allows the city to develop effective policies, strategies, and programs to reduce emissions.

In 2008, ICLEI[1] developed the City of Pleasanton's first GHG inventory to establish baseline emissions for 2005. As part of the Climate Action Plan development process, ICLEI's 2005 inventory was reviewed and was found to be deficient in some important areas. A revised baseline inventory builds on ICLEI's effort using robust methodologies appropriate for climate action plans and data that more accurately represents emissions-generating activities in the City of Pleasanton. The revised 2005 baseline inventory provides a breakdown of GHG emissions by category to illustrate the contribution of various sources in the community and in municipal operations.

The revised baseline inventory details emissions from the following sectors: transportation, residential energy use, commercial/industrial energy use, water and wastewater, and solid waste. It includes emissions from residential, commercial, and industrial activities, as well as the operations of the city government.

In addition to accounting for baseline emissions, future emissions projections have been developed using best estimates for population and job growth within the City under "business-as-usual" conditions. A reduction goal for 2020 has been established using guidance from the California Air Resources Board (CARB) and the Bay Area Air Quality Management District (BAAQMD).

[1] ICLEI - Local Governments for Sustainability, founded in 1990 as the International Council for Local Environmental Initiatives.

The boundaries of analysis, along with the methodology and assumptions used to develop Pleasanton's revised baseline GHG Inventory and future projections, are included as Appendix A. The technical report on transportation modeling of base year and future conditions in Pleasanton, provided by Fehr & Peers, is included as Appendix B.

# 2005 Base Year Community-Wide Emissions

The City of Pleasanton's community-wide inventory encompasses the GHG emissions resulting from activities taking place within the City's geopolitical boundary, where the local government has jurisdictional authority. Although the City government has limited control over many of the emissions-producing activities of its residents and businesses, the jurisdictional boundary is appropriate for a community-wide inventory because it represents the entire city's emissions, not just the local government's emissions.

The revised baseline 2005 GHG Inventory for the Community of Pleasanton totals 770,884 metric tons (MT) of carbon dioxide equivalents ($CO_2e$), including emissions from municipal operations. Figure 2-1 and Table 2-1 describe total GHG emissions by sector. As shown, transportation (both on-road and off-road vehicles) accounted for a majority of overall community-wide emissions in 2005 (55.4% combined). Contributions from other sectors include: commercial/industrial energy (electricity and natural gas) 19.7%, residential energy 14.8%, water and wastewater 4.4%, solid waste 5.0%, and municipal operations 0.7%.

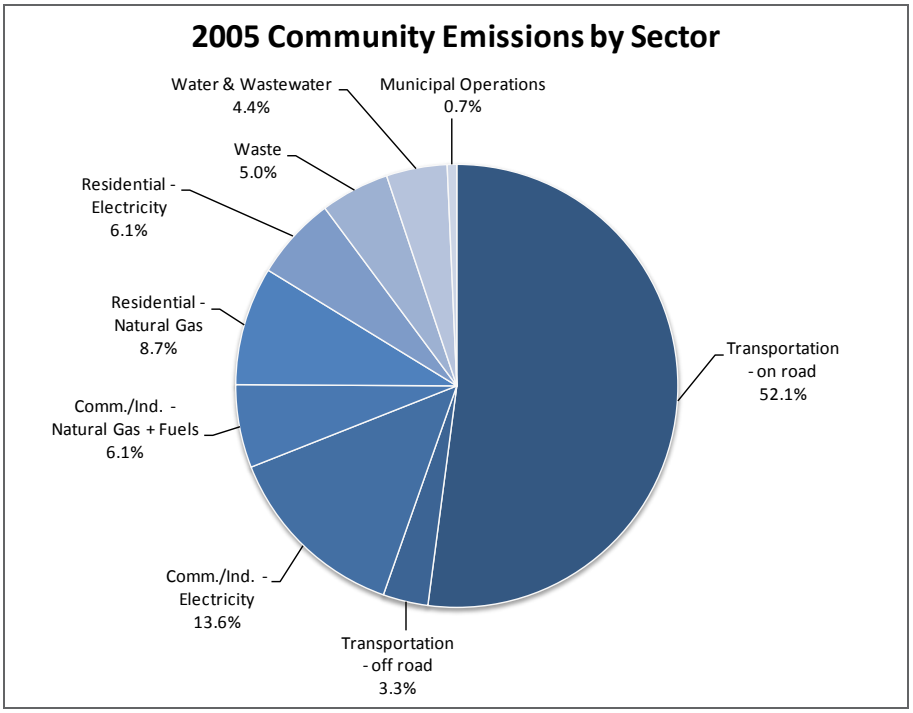



Figure 2-1. 2005 Community Emissions by Sector

Table 2-1.
2005 Revised Community Emissions by Sector ($CO_2e$ MT)

| Emission Sector | Total | % Total |
|---|---|---|
| Transportation (on-road) | 401,550 | 52.1% |
| Transportation (off-road) | 25,410 | 3.3% |
| Commercial/Industrial Electricity | 105,107 | 13.6% |
| Commercial/Industrial Natural Gas | 46,753 | 6.1% |
| Residential Electricity | 46,881 | 8.7% |
| Residential Natural Gas | 66,684 | 6.1% |
| Solid Waste Disposal | 38,826 | 5.0% |
| Water and Wastewater Systems[2] | 34,264 | 4.4% |
| Municipal Operations | 5,370 | 0.7% |
| Total | 770,844 | 100% |

Previously, ICLEI estimated 2005 community-wide emissions, including municipal operations, to be 818,720 MT $CO_2e$, which is approximately 6.5% higher than the revised baseline inventory. The biggest difference, as shown in Table 2-2, is ICLEI's higher estimate for transportation emissions due to the use of a different transportation model for estimating vehicle miles traveled (VMT). On-road transportation accounts for a total of 525,650 MT $CO_2e$ in the ICLEI inventory, compared to 401,550 MT $CO_2e$ in the revised 2005 inventory – a substantial difference.[3]

In addition to the sources included in the ICLEI inventory, the revised community-wide inventory includes emissions estimates for off-road vehicles, direct access electricity, stationary combustion of fuels other than utility-provided natural gas, wastewater treatment processes, and upstream water conveyance (electricity used outside Pleasanton city boundaries to deliver water).

Table 2-2.
2005 ICLEI Community Emissions By Sector ($CO_2e$ MT)

| Emission Sector | Total | % Total |
|---|---|---|
| Transportation (local roads) | 236,554 | 28.9% |
| Transportation (highways) | 289,096 | 35.3% |
| Commercial/Industrial Electricity | 89,848 | 11.0% |
| Commercial/Industrial Natural Gas | 43,455 | 5.3% |
| Residential Electricity | 46,881 | 5.7% |
| Residential Natural Gas | 66,684 | 8.1% |
| Solid Waste Disposal | 40,819 | 5.0% |
| Municipal Operations | 5,383 | 0.7% |
| Total | 818,720 | 100% |

[2] Includes power used for upstream water conveyance that occurs beyond the City limits, and indirect process and fugitive emissions from septic tanks and wastewater treatment processes. Note that indirect emissions from electricity used to convey water and wastewater within the City is included in Municipal Operations.

[3] The ICLEI analysis uses a geographical approach that includes all vehicular travel within the jurisdictional boundary, whereas the revised inventory uses an origin/destination approach that considers trip origins and destinations both within and outside of the jurisdictional boundary. The origin/destination approach is consistent with the emerging best practice in estimating VMT, as evidenced by recent guidelines developed by the Regional Targets Advisory Committee (RTAC) for implementation of SB 375, in its recent report to CARB, available at: http://www.arb.ca.gov/cc/sb375/rtac/report/report.htm.

# 2005 Base Year Municipal Operations Emissions

In total, the municipal government operations of the City of Pleasanton in 2005 were responsible for approximately 5,370 MT $CO_2e$ (Table 2-1). This estimate essentially matches ICLEI's inventory of the City's 2005 municipal government operations emissions, which accounted for 5,383 metric tons of $CO_2e$ (Table 2-2). As shown in Figure 2-1, emissions from municipal operations represent approximately 0.7% of total emissions in the City of Pleasanton's 2005 community-wide inventory.

In 2005, the primary sources of municipal operations emissions were building energy use, streetlights, traffic signals and controllers, water conveyance, and the City's vehicle fleet, as indicated in Table 2-3 and Figure 2-2. Building energy use accounted for the largest portion (44.0%) of municipal emissions, followed by the City's vehicle fleet at approximately 25%.

Table 2-3.
2005 Municipal Emissions by Sector ($CO_2e$ MT)

| Emission Sector | Emissions | % Total Emissions |
|---|---|---|
| Buildings | 2,356 | 44.0% |
| Vehicle Fleet | 1,341 | 24.9% |
| Public Lighting | 581 | 10.8% |
| Water | 1,057 | 19.6% |
| Waste | 35 | 0.7% |
| Total | 5,370 | 100% |

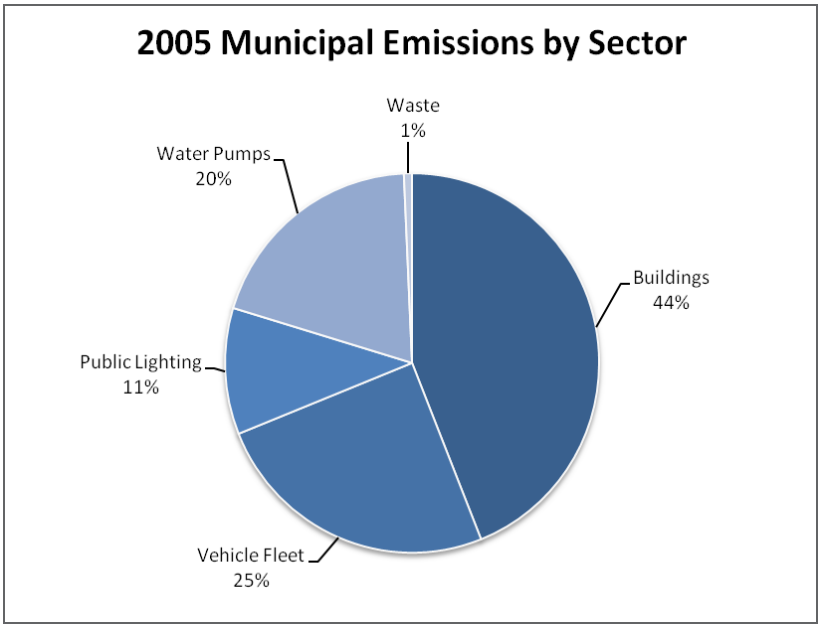



Figure 2-2
2005 Municipal Emissions by Sector

# Emissions Forecast

If the City were to continue its 2005 patterns of travel, energy consumption, waste generation and disposal, and water consumption, it would be business-as-usual. Business-as-usual emissions are described as GHG emissions that would take place in the absence of mitigation measures designed to reduce emissions over time. Programs, policies and measures developed after 2005 are considered "beyond business-as-usual."

In its recent legal settlement with the State of California,[4] the City of Pleasanton is required, as part of the required environmental review process under the California Environmental Quality Act (CEQA), to analyze its community-wide GHG emissions and develop reduction strategies through the life of the City's 2025 General Plan. Thus, emissions are projected out to 2025 in addition to 2020.

The business-as-usual scenario includes the City of Pleasanton programs, policies, and measures that existed in the base year 2005. These include:

- Commercial Irrigation Rebates: In 2002, the City implemented a commercial irrigation rebate program. The Program provides rebates for rain sensors, drip retrofits, irrigation controllers, and sprinkler head retrofits.
- City Facility Retrofits: Since 2004 the City has participated in local government partnership programs to evaluate and upgrade heating, ventilation and air-conditioning (HVAC) and lighting systems in multiple facilities.
- Commercial Green Building Ordinances: Since 2002, the City has had a Green Building Ordinance (GBO) that requires new and significantly remodeled buildings to incorporate measures from the U.S Green Building Council's Leadership in Energy and Environmental Design (LEED) certification system.
- Traffic Signal LEDs: In 2000-2001, the City replaced incandescent bulbs with light-emitting diodes (LEDs) in traffic signals.

Under a business-as-usual scenario, which includes the measures listed above, Pleasanton community-wide emissions are projected to increase to approximately 961,549 MT $CO_2e$ in the year 2020, and 1,032,990 in 2025. Relative to the baseline year 2005, this represents increases of 24.7% and 34.0% by 2020 and 2025, respectively.

Table 2-4 summarizes community-wide GHG emissions by sector for 2005, 2020, and 2025. As projected, transportation will continue to contribute the largest share of emissions through 2025, although its relative contribution will diminish slightly as commercial/industrial energy-related emissions are expected to grow faster. Figures 2-3 and 2-4 provide graphical representations of 2020 and 2025 community inventories.

Figure 2-5 provides a graphical depiction of the projected growth in business-as-usual community emissions from 2005 to 2020, and from 2020 to 2025.

[4] The terms of the legal settlement are described in the Settlement Agreement and Covenant Not to Sue, dated August 2010.

Table 2-4.
Projected Business-as-Usual Community-wide GHG Emissions by Sector ($CO_2e$ MT)

| Emission Sector | 2005 | % Total | 2020 | % Total | 2025 | % Total |
|---|---|---|---|---|---|---|
| Transportation (on-road) | 401,550 | 52.1% | 481,769 | 50.1% | 502,161 | 48.6% |
| Transportation (off-road) | 25,410 | 3.3% | 28,459 | 3.0% | 29,663 | 2.9% |
| Commercial/Industrial Electricity | 105,107 | 13.6% | 163,183 | 17.0% | 188,953 | 18.3% |
| Commercial/Industrial Natural Gas | 46,753 | 6.1% | 72,622 | 7.6% | 87,458 | 8.5% |
| Residential Natural Gas | 46,881 | 8.7% | 74,686 | 7.8% | 77,848 | 7.5% |
| Residential Electricity | 66,684 | 6.1% | 52,506 | 5.5% | 54,729 | 5.3% |
| Solid Waste Disposal | 38,826 | 5.0% | 43,482 | 4.5% | 45,326 | 4.4% |
| Water and Wastewater Systems | 34,264 | 4.4% | 38,489 | 4.0% | 40,146 | 3.9% |
| Municipal Operations | 5,370 | 0.7% | 6,354 | 0.7% | 6,707 | 0.6% |
| Total | 770,844 | 100% | 961,549 | 100.0% | 1,032,990 | 100% |

Figure 2-3.
2020 Community Emissions by Sector

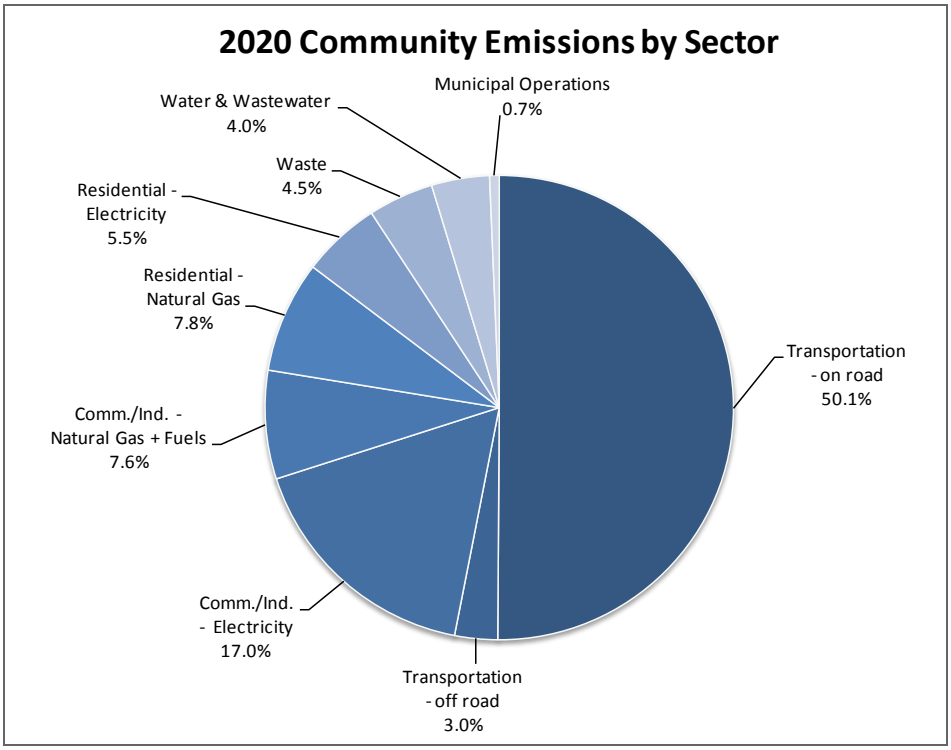


Figure 2-4
2025 Community Emissions by Sector

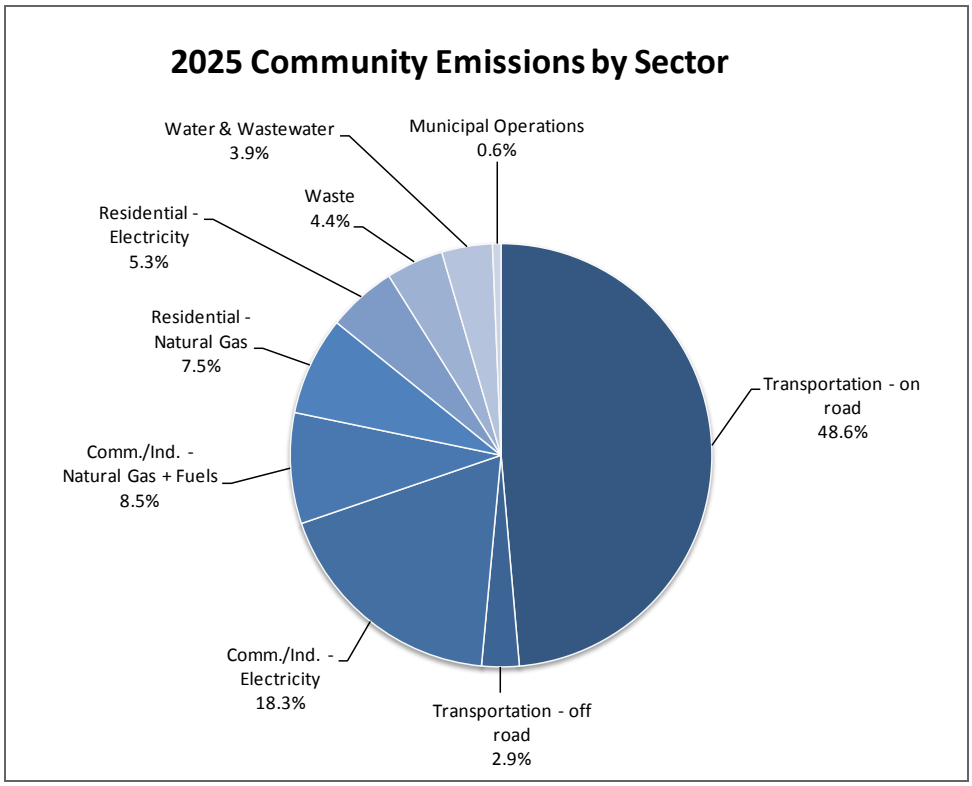
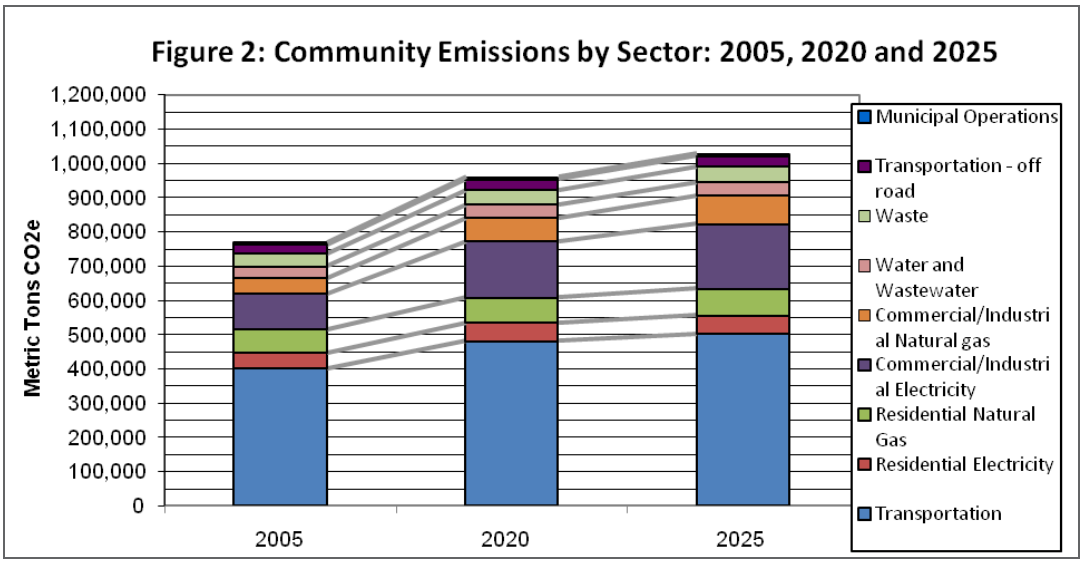



Figure 2-5
Community Emissions by Sector:
2020 and 2025 Projections



# Emissions Reduction Target

The City of Pleasanton is adopting a community-wide emissions reduction target of 15% below its 2005 baseline by the year 2020. This is deemed by CARB, the BAAQMD, and the California Attorney General to be consistent with the state-wide AB 32 goal of reducing emissions to 1990 levels.[5] The 15% reduction target is in line with current best practice for climate action plans developed for the County of Alameda and several Bay Area cities, many of which use a 2005 baseline. It also meets a key requirement of the BAAQMD's new CEQA Guidelines that provide regulatory streamlining of future development projects (see "Qualified Climate Action Plan" discussion below).

Although the City's municipal operations currently contribute less than 1% of community-wide emissions, the City has the direct authority to affect a much larger portion, in particular the emissions associated with land use patterns and their integration with transportation systems. However, for many sources including motor vehicles, the authority to control emissions is shared by multiple agencies and many stakeholders (not least the residents and businesses located in the City). For example, the effort to reduce emissions from personal vehicles is shared by the State's lawmakers through fuel and vehicle efficiency standards, the City's land use and transportation planners, and those with mobility needs who live, work or spend time within the City.

Through a mix of prescriptive and voluntary measures, Pleasanton is committed to reducing to its emissions to the 1990 level of 655,218 MT $CO_2e$ per year by the year 2020. Since the City is largely built out, and there are few infill locations available for dense mixed use development near transit (an effective strategy for reducing the GHG impacts of growth), the near-term opportunities to reduce emissions through land use changes are limited. The Climate Action Plan includes many prescriptive measures addressing land use, but relies on reductions from other sectors (e.g., energy conservation) and on reductions associated with changes in personal behavior, as described in the following chapter.

Progress toward achieving the 2020 emissions reduction target will be monitored over time through regular updates of the community-wide inventory and review of individual programs (see the monitoring plan presented in Chapter 5). At each monitoring juncture, the measures included in the Climate Action Plan will be adjusted or modified as needed to achieve the reductions needed to reach the target. Among many possibilities, these adjustments may include more prescriptive measures, different allocations in funding, and adjusting the 2020 target based on revised population and job growth estimates.

## Qualified Climate Action Plan

The BAAQMD's newly adopted CEQA Guidelines include a provision for streamlining GHG analysis of future projects that are consistent with a "qualified" GHG Reduction Plan (or Climate Action Plan) that can be shown to meet or exceed AB 32 mandates. BAAQMD considers a qualified Climate Action Plan as one accommodates growth in a manner that does not hinder the State's ability to achieve AB 32 goals. If a project under CEQA is consistent with a qualified plan, then the GHG emissions impact of that project is presumed to be insignificant.

[5] In its Climate Change Scoping Plan of September 2008, CARB recommends that local governments adopt a GHG reduction target consistent with the State's commitment to reach 1990 levels by 2020. This is identified as equivalent to 15% below "current" levels at the time of writing (2008).

The City of Pleasanton Climate Action Plan is designed to be qualified per the BAAQMD's guidelines, which includes meeting the following provisions:

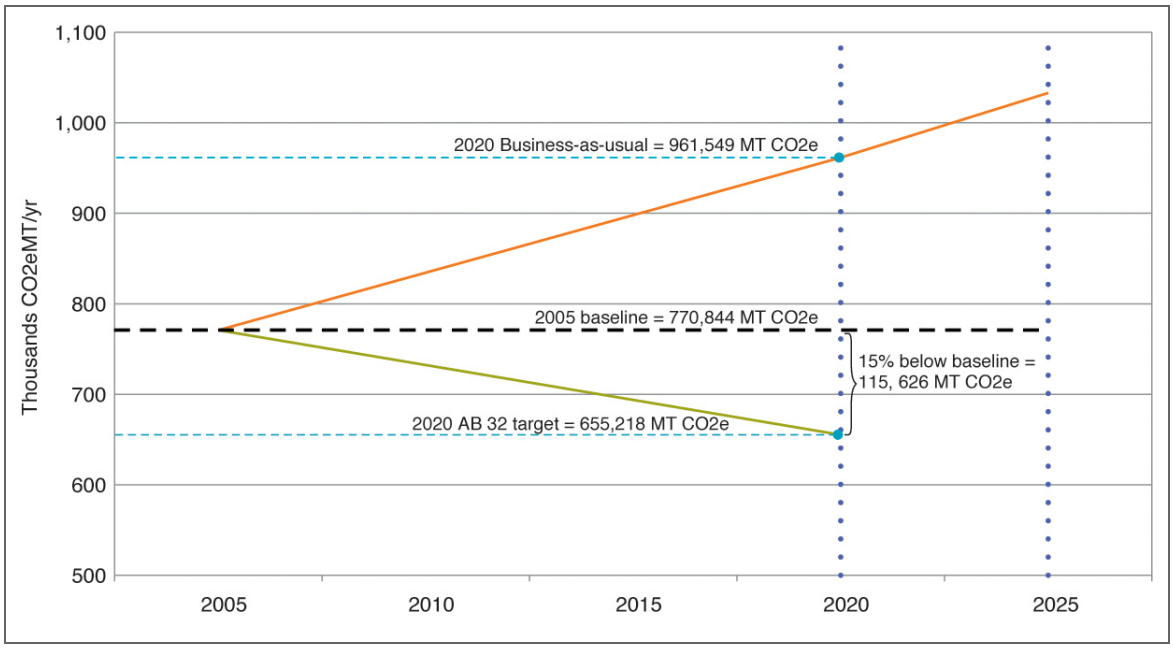
- A GHG inventory for current year and a forecast for 2020.
- An adopted GHG reduction goal for 2020 for the jurisdiction from all sources (existing and future) which is at least one of the following (these performance thresholds are considered to be equivalent in terms of AB 32's 2020 state-wide emission target):
  - 1990 GHG emission levels; or
  - 15 percent below 2008 emission levels (or earlier); or
  - A plan-level efficiency of 6.6 metric tons of $CO_2e$ per service population per year. The service population approach is based on the community emissions divided by the sum of the population and employment in the city.
- Identification of feasible reduction measures to reduce GHG emissions for 2020 to the identified target.
- Application of relevant reduction measures included in the AB 32 Scoping Plan that are within the jurisdiction of the local land use authority (such as building energy efficiency, etc.).
- Quantification of the reduction effectiveness of each of the feasible measures identified including disclosure of calculation method and assumptions.
- Identification of implementation steps and financing mechanisms to achieve the identified goal by 2020.
- Procedures for monitoring and updating the GHG inventory and reduction measures at least twice before 2020 or at least every five years.
- Identification of responsible parties for implementation.
- Schedule of implementation.
- Certified CEQA document, or equivalent process.

As explained previously, the City is adopting a GHG reduction goal equivalent to 15 percent below its 2005 community-wide baseline, a target that is more aggressive than the alternative threshold target of 6.6 metric tons of $CO_2e$ per service population per year.

## Community Emissions

The City's target of 15% below 2005 baseline by 2020 equates to 655,218 MT $CO_2e$ per year for community emissions, which is 115,626 MT $CO_2e$ below the baseline, and 306,331 MT $CO_2e$ below the projected 2020 business-as-usual emissions (a reduction of approximately 32%). The community-wide emissions reduction target is depicted graphically in Figure 2-6.

Figure 2-6.
Community GHG Reduction Target for 2020




## Municipal Operations Emissions

Though municipal operations emissions are included in the community emissions inventory, a reduction target for municipal operations is appropriate because many of the measures included in this Climate Action Plan apply to facilities or operations under the direct control of the City, and because the City intends to lead by example in meeting the mandates of AB 32.

Emissions from municipal operation are projected to rise commensurate with the City's population growth, from a 2005 baseline of 5,370 MT $CO_2e$ to 6,354 MT $CO_2e$ in 2020, and to 6,707 MT $CO_2e$ in 2025. Applying the 15% reduction to the 2005 baseline emissions results in a 2020 target of 4,565 MT $CO_2e$, representing a reduction below business-as-usual of 1,789 MT CO2e per year 2020.

# Impact of State Emissions Reductions Measures

Several high-impact state-wide measures included in the AB 32 Scoping Plan target emissions from transportation and power generation. As described in Chapter 1, the Low Carbon Fuel Standard (LCFS), the Pavley Bill for reducing passenger vehicle emissions (Assembly Bill 1493), and the Renewable Portfolio Standard (RPS) are each expected to provide significant emissions reduction benefits for the City of Pleasanton. Two additional state-wide measures in the AB 32 Scoping Plan are expected to reduce emissions from passenger vehicles and heavy/medium-duty trucks because of efficiencies gains realized by manufacturers.

The impact of the Pavley Bill is projected to reduce on-road transportation GHG emissions state-wide by 19.7% by 2020. The corresponding impact on Pleasanton's emissions would be a 9.9% reduction from 2020 business-as-usual conditions. The impact by 2025 is projected to be a 24.3% reduction form business-as-usual, based on analysis of Pavley using the BAAQMD Bay Area Greenhouse Gas Emissions Model (BGM) guidelines. Additional efficiency gains by vehicle manufacturers and operators (e.g., lower friction oils, reducing aerodynamic drag) are expected to reduce emissions of passenger vehicles and heavy/medium duty vehicles by 2.8% and 2.9% respectively. The collective impact of these additional efficiency gains translates to a 1.5% reduction in Pleasanton's business-as-usual emissions for 2020 and 2025.[6]

The impact of the LCFS is projected to reduce on-road transportation emissions by 7.2% by 2020.[7] The resulting impact would be a 3.6% reduction from Pleasanton's 2020 business-as-usual emissions. The 7.2% impact is expected to remain the same through 2025.

RPS rules require the renewable energy portion of a utility's electricity portfolio to be 33% by 2020. For PG&E, approximately 12% of its current portfolio qualifies under the RPS rules and thus the impact of the RPS is projected to result in an additional 21% of its portfolio coming from renewables. This is a 25% improvement over 2005 for reducing GHG emissions from electricity. The impact on the total inventory would be an approximate 5.1% from the 2020 business-as-usual projection, and 5.3% from the 2025 business-as-usual projection. This RPS is expected to remain at 33% through 2025.

BAAQMD estimates that by 2020, the impact of periodic efficiency improvements to building and appliance energy standards and incentives will reach 9.5% and 15.7% percent for natural gas and electricity respectively. State-wide Scoping Plan measures related to energy efficiency of residential and non-residential buildings (such as efficiency improvements through periodic updates to Title 24) were not analyzed here because Pleasanton-specific measures related to those aspects of energy efficiency are already included in the Climate Action Plan. The same is true of Scoping Plan measures related to local generation of renewable energy.

The collective impact of state-wide Scoping Plan measures (other than energy efficiency and renewable energy measures) on the city-wide business-as-usual inventory projection is presented in Table 2-5. By 2020, these measures are expected to reduce city-wide GHG emissions by an estimated 20.2%; by 2025 that percentage increases to 22.7%.

Table 2-5.
Predicted Effect of State-wide Measures on City-wide GHG Emissions (MT $CO_2e$/yr)

| Year | Total Business-as usual (BAU) | Pavley Impact | LCFS Impact | RPS Impact | Vehicle Efficiency Impacts | Total with State Measures | Reduction from BAU | Reduction from BAU |
|---|---|---|---|---|---|---|---|---|
| 2005 | 770,844 | - | - | - | - | 770,844 | 0 | 0% |
| 2020 | 961,549 | -95,221 | -34,802 | -41,215 | -14,928 | 775,383 | 194,017 | -20.2% |
| 2025 | 1,032,990 | -126,279 | -37,387 | -46,380 | -15,605 | 807,339 | 234,485 | -22.7% |

[6] CARB, 2009. *Climate Change Scoping Plan*. Available at: http://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf

[7] Proposed Regulation to Implement the Low Carbon Fuel Standard, Volume I; Staff Report: Initial Statement of Reasons, CARB, March 5, 2009.

The collective impact of the state-wide Scoping Plan measures on the municipal operations inventory is presented in Table 2-6. Only the impacts from the RPS and LCFS are considered here. Similar to the wider community, government building energy efficiency is targeted by specific measures in the Climate Action Plan. Also, since the City has a fleet vehicle replacement plan for reducing total tailpipe GHG emissions, the Pavley bill is considered redundant and its effect is not applied to municipal operations emissions. By 2020, the RPS and LCFS are expected to reduce municipal operations business-as-usual emissions by an estimated 14.6%, an impact that should remain constant through 2025.

Table 2-6.
Predicted Effect of State-wide Measures on Municipal Operations GHG Emissions (MT $CO_2e$/yr)

| Year | Total Business-as usual (BAU) | Pavley Impact | LCFS Impact | RPS Impact | Vehicle Efficiency Impacts | Total with State Measures | Reduction from BAU | Reduction from BAU |
|---|---|---|---|---|---|---|---|---|
| 2005 | 5,370 | | | | | 5,370 | 0 | 0% |
| 2020 | 6,354 | na | -114 | -814 | na | 5,426 | 928 | -14.6% |
| 2025 | 6,707 | na | -120 | -859 | na | 5,727 | 979 | -14.6% |

# Impact of Fuel Prices on Driving Behavior

Based on recent trends and expected global developments over the next decade, it is reasonable to expect that petroleum fuel prices will rise significantly (i.e., a faster rate than inflation), and have a resulting impact on driving behavior. For regional transportation planning (e.g., SB 375) The Metropolitan Transportation Commission (MTC) is developing a new activity-based travel demand model[8] for the nine-county San Francisco Bay Area that is sensitive to changes in real fuel prices.[9] This will be an improvement to the ACCMA's four-step travel demand model[10] used to project Pleasanton's future vehicle miles traveled (VMT), which is insensitive to such fuel price changes. The ACCMA model forecasts trip generation, estimates trip distribution and mode choice, and assigns those trips to specific travel paths. Jobs and population are important inputs, while fuel pricing has little to no effect on the model output.

The U.S. Energy Information Administration (EIA) Annual Energy Outlook for 2011[11] assumes fuel prices will rise much higher by 2020. The EIA report presents long-term projections of energy supply, demand, and prices through 2035, based on results from EIA's National Energy Modeling System. Acknowledging that energy market projections are complex and subject to much uncertainty, EIA makes annual market projections based on Federal, State, and local laws and regulations in effect at the time, examining several scenarios. EIA's reference case is a business-as-usual trend estimate, based on existing technology and technological and demographic trends. The 2011 reference case shows worldwide demand for petroleum rising rapidly, particularly as emerging economies become more energy-intensive, and recovery from known reserves becomes more expensive. According to EIA, the global price of oil is expected to rise

[8] Travel Model One; http://mtcgis.mtc.ca.gov/foswiki/Main/Development

[9] The price increase built into MTC's model assumes 2020 vehicle fuel prices will be approximately 70% higher than 2005 prices, after accounting for inflation; based on a conversation with MTC staff, August 26, 2011.

[10] Alameda County CMA Travel Demand Model (ACCMA Model).

[11] U.S. Energy Information Administration (EIA), 2011. *Annual Energy Outlook 2011*. DOE/EIA-0383, April 2011. Available at http://www.eia.gov/forecasts/aeo/pdf/0383(2011).pdf

approximately 39% between 2005 and 2020, adjusted for inflation.[12] This is equivalent to a 116% increase in actual price from 2005 to 2020.

Although the direct relationship between fuel prices and travel behavior is difficult to quantify with precision, there have been a number of studies over the last three decades, based on data from California and other parts of the United States, that have quantified fuel price elasticity of demand (the percent change in quantity demanded divided by the percent change in price) to range from -0.02 to -0.30 in the short run, and -0.4 to -0.8 in the long run.[13] In 2008, the Sacramento Area Council of Governments (SACOG) evaluated historical VMT and transit boardings with respect to gas prices, and through the use of its SACSIM model, it was able to calculate an elasticity range of -0.17 to -0.21, which is within the range of other available data.[14]

There are numerous other societal factors that play a role in changing travel behavior, such as the availability of affordable housing in a jobs-rich area, the availability of alternative travel options, such as convenient transit or safe bicycle/walking facilities, and the purchase of more fuel efficient vehicles.

Since the Climate Action Plan includes many demand-related measures that are expected to decrease VMT (such as the provision of additional affordable housing opportunities, improvements to the non-motorized transportation system, and potential expansions of transit service), isolating the effect of fuel pricing and determining an accurate estimate of VMT/fuel price elasticity is difficult at best without an improved travel demand model. However, to illustrate the potential impact of fuel pricing by the year 2020, an assumed 39% fuel price increase combined with an conservative elasticity value of -0.10 (i.e., a a 10% reduction in VMT resulting from a 100% increase in fuel prices) results in an estimated daily reduction of 107,439 VMT for Pleasanton, equivalent to annual emissions reductions of 18,729 MT $CO_2e$.

# Pleasanton's GHG Reduction Goal

To be consistent with AB 32 goals, Pleasanton must reduce its city-wide GHG emissions to 1990 levels. This equates to 655,218 MT $CO_2e$, which is 306,331 MT $CO_2e$ below projected 2020 business-as-usual emissions. After crediting emissions reductions of 194,017 MT $CO_2e$ from the expected impact of state-wide measures included in the AB 32 Scoping Plan, Pleasanton is left with the challenge of reducing city-wide emissions by 112,314 MT $CO_2e$ per year below business-as-usual by 2020. As outlined in the next chapter, planned measures are expected to reduce city-wide emissions by 117,436 MT $CO_2e$ per year by 2020. This will reduce city-wide emissions approximately 5,000 MT $CO_2e$ beyond the AB32 target. Figure 2-7 depicts this graphically.

The corresponding challenge for city government is to reduce emissions from municipal operations to 4,565 MT $CO_2e$ by 2020, a target equivalent to reducing annual emissions by 1,789 MT $CO_2e$ from business-as-usual projections.

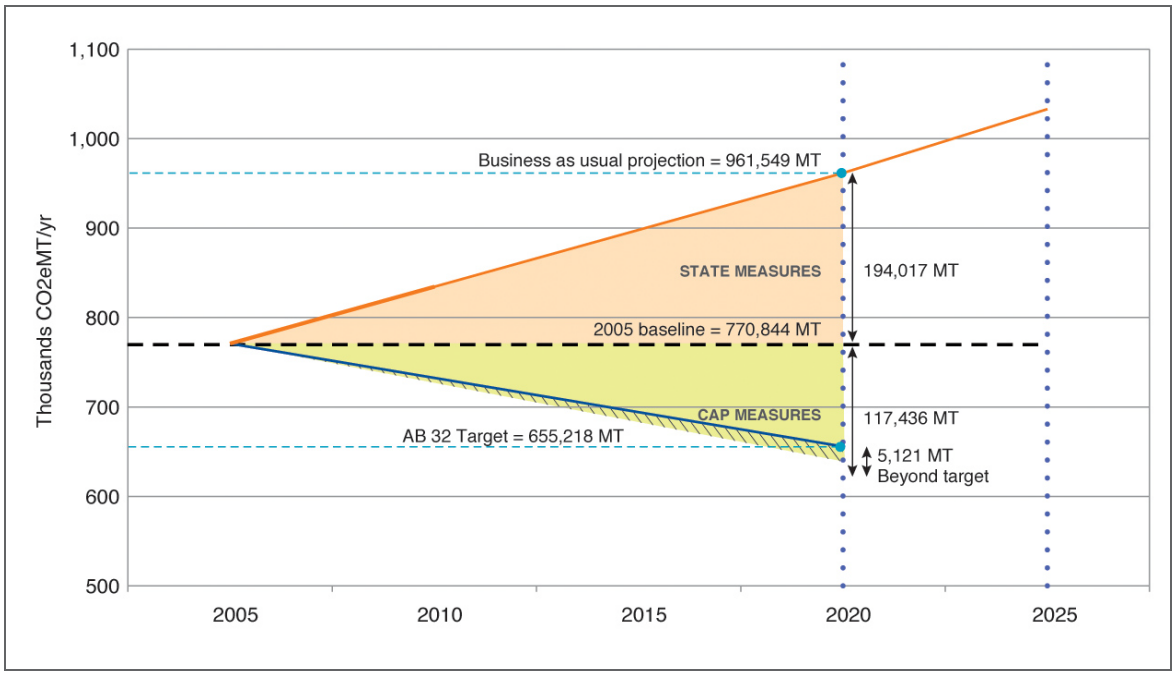
The emissions reduction measures presented in the following chapter of this Climate Action Plan are designed to enable the City of Pleasanton to achieve these targets.

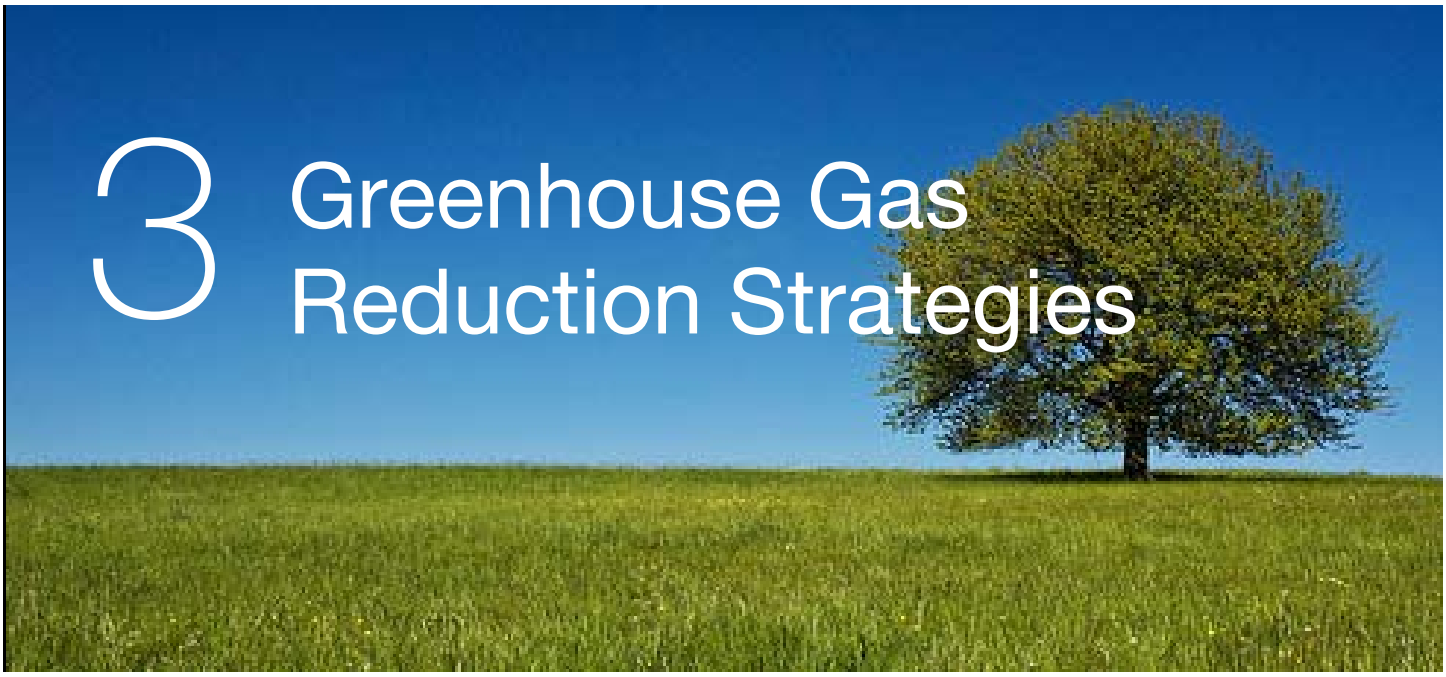
[12] Assumes 10.2% inflation from 2005 to 2009, and 3% annual rate thereafter.

[13] Littman, Todd, Victoria Transport Policy Institute, Changing Vehicle Travel Price Sensitivities, June 8, 2011.

[14] Sacramento Area Council of Governments (SACOG), Impact of Gas Prices on Travel Behavior, August 20, 2008. Available at: http://www.sacog.org/calendar/2008/08/27/rpp/pdf/05-Gas%20prices.pdf

Figure 2-7.
Predicted Effect of State-wide Measures on City-wide GHG Emissions (MT $CO_2e$/yr)





# 3 Greenhouse Gas Reduction Strategies

## Overview

This chapter describes the goals, supporting strategies and actions that the City of Pleasanton will implement to reduce greenhouse gas (GHG) emissions and work toward its reduction targets. As presented in the previous chapter, to be in compliance with AB 32, Pleasanton must reduce its citywide GHG emissions to 1990 levels by 2020, which equates to 306,331 MT $CO_2e$ below projected business-as-usual emissions. Figure 3-1 shows where expected reductions will come from, with climate action plan measures highlighted in green. The impacts of statewide measures included in the AB 32 Scoping Plan account for annual emissions reductions of 194,017 MT $CO_2e$.. Over the next decade, the City's climate strategies and implementing actions are expected to result in annual emissions reductions of 117,436 MT $CO_2e$, bringing total expected reductions to 311,453 MT $CO_2e$ per year by 2020. This exceeds the total reductions needed by more than 5,000 MT $CO_2e$ per year.

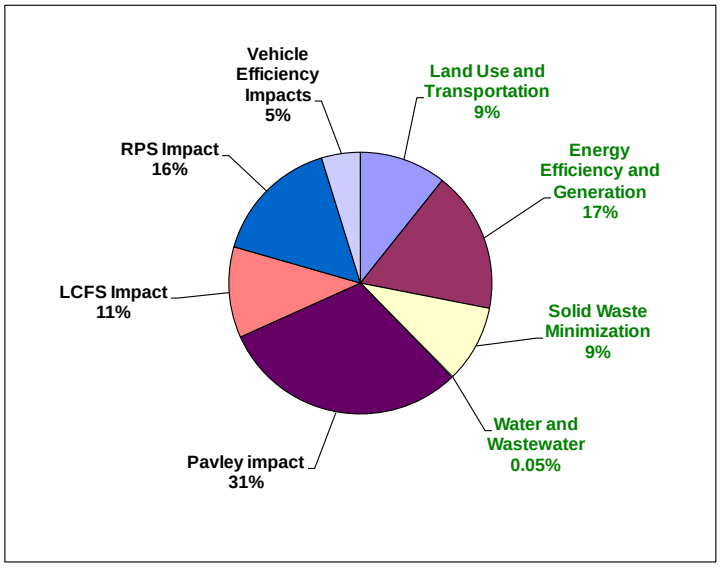



Figure 3-1.
Relative Impacts of Fuel Price, and State and City Measures to Reduce GHG Emissions

Total reductions = 306,908 MT $CO_2e$ per year

Table 3-1, below summarizes the expected contribution from each emissions reduction sector included in the Climate Action Plan. Table 3-2 lists the corresponding strategies by their identification code and their GHG reduction impact.

### Table 3-1.
### Estimated GHG Reduction Potential of Climate Action Plan Sectors

| Reductions from: | MT $CO_2e$ | Relative Contribution |
|---|---|---|
| Energy measures | 54,116 | 46% |
| Land Use and Transportation measures | 33,345 | 28% |
| Solid Waste Minimization measures | 29,605 | 25% |
| Water and Wastewater measures | 371 | <1% |
| Community Engagement | NA | NA |
| Totals | 117,436 | 100% |

### Table 3-2.
### Emissions Reductions Impact of Pleasanton Climate Action Plan Strategies

| | Strategy | Annual GHG Reduction Potential (MT $CO_2e$) |
|---|---|---|
| SW2 | Increase recycling, organics diversion, and waste reduction associated with the entire community | 29,605 |
| EC2 | Leverage state and local programs to increase energy efficiency | 19,449 |
| TDM2 | Promote alternatives to work and school commutes | 11,257 |
| ER2 | Develop programs to promote on-site renewable energy to the community | 10,518 |
| EC4 | Develop programs to increase energy efficiency | 9,342 |
| EC3 | Establish and promote financing and financial incentive programs to support energy efficiency | 7,416 |
| LU1 | Support infill and higher density development | 6,898 |
| LU2 | Support mixed-use infill and new development near local-serving commercial areas | 5,845 |
| EC1 | Use city codes, ordinances, and permitting to enhance green building and energy efficiency | 3,807 |
| TDM1 | Use parking pricing/policy to discourage SOV travel | 3,174 |
| ER1 | Implement local ordinances and permitting processes to support renewable energy | 2,389 |
| TR1 | Improve transit system and ridership | 2,377 |
| LU3 | Improve transportation efficiency through design improvements | 2,202 |
| NM1 | Create and maintain a safe, convenient, and effective system for pedestrians and bicyclists | 1,280 |
| EG1 | Promote green building and energy efficient development for government operations and city infrastructure | 1,194 |
| VE2 | Develop a city fleet replacement program | 312 |
| WA1 | Conserve community water through building and landscape design and improvements | 272 |
| WA3 | Increase or establish use of reclaimed/grey water systems | 98 |
| WA2 | Conserve municipal operations water | 1 |
| | Total | 117,436 |

## Energy

Energy use represents the second largest segment of citywide emissions at 35% of the 2005 baseline. Measures included in the energy category account for reductions of 54,116 MT $CO_2e$ per year by 2020. Opportunities to reduce energy use include reducing energy demand in the commercial/industrial, residential, and municipal sectors, and increasing the use and generation of renewable energy. The implementation of green building codes and ordinances will play a significant role in reducing energy emissions. Public outreach and financial incentives for energy efficiency and renewable energy projects are also important.

## Land Use and Transportation

Emissions associated with land use and transportation represent the largest source of emissions in the citywide GHG inventory (55%). Measures included in this category account for reductions of 33,345 MT $CO_2e$ per year by 2020. In general, the measures are designed to reduce vehicle miles traveled (VMT) through more energy-efficient land use patterns and transportation systems, to increase fuel efficiency, and to switch to non-petroleum or cleaner fuels. Strategies include infill and higher density development, improving the public transit system, improving non-motorized mobility, reducing overall vehicle trips by single-occupancy vehicles in particular, improving traffic flow, and decreasing the carbon intensity of motorized vehicular travel.

## Solid Waste Minimization

Emissions associated with solid waste represent approximately 5% of the 2005 citywide baseline. Measures included in the solid waste category account for reductions of 29,605 MT $CO_2e$ per year by 2020. The primary goal of solid waste strategies is to reduce the total amount of material sent to landfill. Strategies include expanding and improving recycling and composting programs and encouraging people to consume and waste less.

## Water and Wastewater

Emissions associated with water use and wastewater treatment represent 4.4% of the 2005 citywide baseline. Measures included in this category account for reductions of 371 MT $CO_2e$ per year by 2020. The primary goal of water and wastewater strategies is to reduce the amount of water used by the City's residents, businesses, and municipal operations. Any reduction in use lowers the energy required for upstream water collection, conveyance, and treatment, and reduces the energy requirements and the process emissions associated with wastewater treatment.

## Community Engagement

The purpose of community engagement is to provide opportunities for residents, businesses, and other stakeholders to learn about and contribute to the City's sustainability initiatives. The following strategies are supportive of the overall effort to reduce emissions in the City of Pleasanton:

- Partner with schools to promote sustainability efforts;
- Implement outreach programs for residents and local businesses;
- Provide information and resources to the community.

Though the impact of these strategies and their supporting measures is difficult to quantify, they are considered critical to the overall success of reducing citywide emissions.

## Measure Selection and Nomenclature

Selection of emissions reduction measures was an iterative process involving City and public input, review of the Pleasanton General Plan 2005 – 2025, review of prior City actions, and review of measures (individual programs, policies, or actions) included in Climate Action Plans developed for other similar cities. Measures were evaluated for their community acceptance, cost effectiveness, time frame of implementation, and ease of implementation.

In the following sections, measures are presented as supporting actions under emissions reduction strategies, which in turn support high-level goals for each major category (e.g., Land Use and Transportation). The following example illustrates the organizational hierarchy used to present the measures.

Figure 3-1.
Organizational Hierarchy of CAP Measures (sample)

### Goal: Increase non-motorized mobility

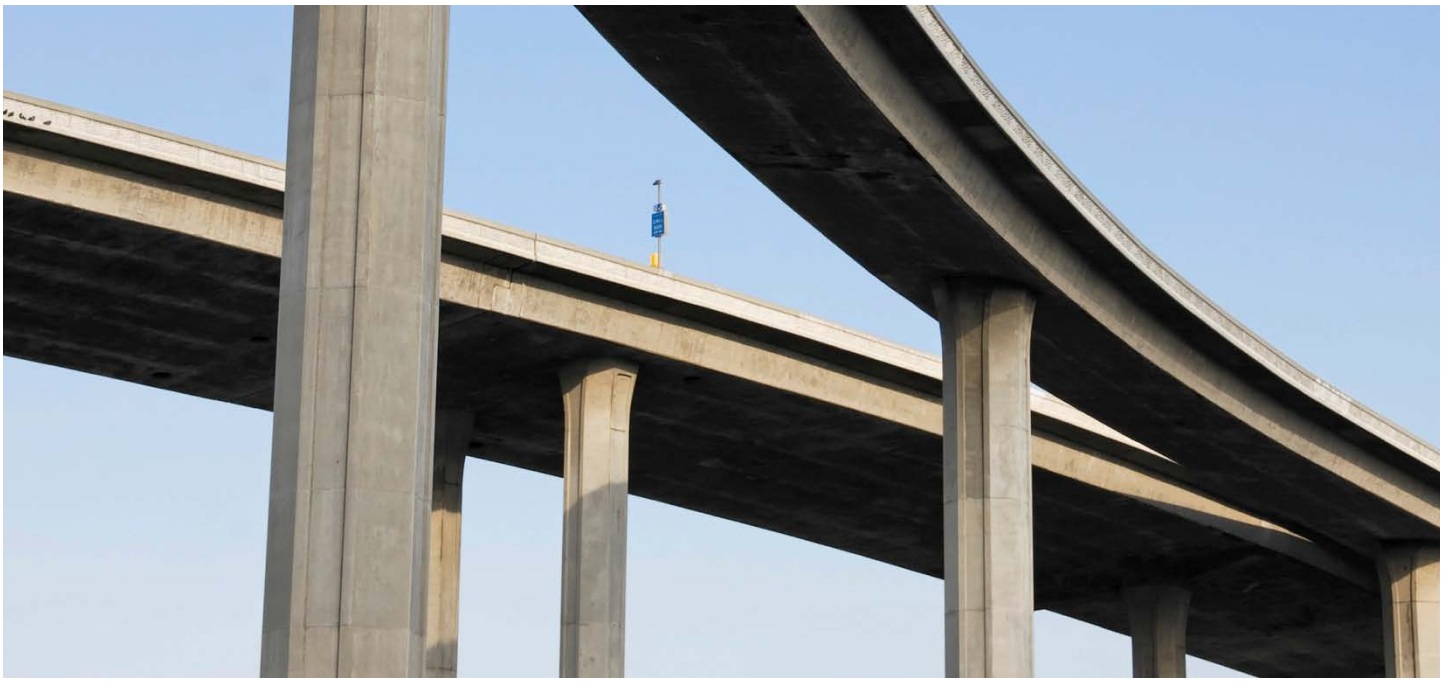
**Supporting Strategy**: **Create and maintain a safe, convenient, and effective system that encourages increased bicycle use**

Implementing Action (Measure): Close sidewalk gaps on key routes

The following sections provide background for each emissions reduction category, including a discussion of the category's importance to the Climate Action Plan, a breakdown of Pleasanton's emissions sources contributing to the category, and a general discussion that includes justification for the emission reduction strategies that follow. For each strategy, a full description is followed by a summary of the estimated costs and GHG reduction benefits, funding and implementation considerations, and a table of supporting measures that identifies the time frame for implementation and implementation responsibility. A cost-benefit analysis was performed for each measure where possible, based on the best information and methodology available. This analysis is presented in Appendix D.

*By replacing the 5 most used light bulbs in your home with Energy-Star rated bulbs, you could save $60 a year in energy costs. If every US household did this, the change would prevent greenhouse gas emissions equivalent to the annual emissions from more than 8 million cars.*

*US EPA*



# Land Use and Transportation

## 2020 Business-as-usual GHG Emissions: 511,815 MT $CO_2e$
## Annual Reductions by 2020: 33,345 MT $CO_2e$

## Introduction

Pleasanton's GHG inventory is dominated by emissions from motor vehicles on major freeways and City streets. Emissions associated with consumption of on-road and off-road transportation fuels account for approximately 55% of the City's 2005 GHG emissions inventory. The vast majority of these emissions (52%) are from on-road vehicles, with about 3% from off-road vehicles (e.g., construction and agricultural equipment). Municipal operations from the City's vehicle fleet use contribute to less than 0.5% of total transportation emissions.

The total vehicle miles traveled (VMT) by Pleasanton residents and business employees are expected to increase as new housing units are development and new jobs are created, with VMT per capita expected to increase by approximately 3% under the business-as-usual scenario by 2020. However, the presence of two BART stations and plans for transit-oriented development around one of those, plus a thriving downtown area surrounded by traditional neighborhoods, will provide the City with significant potential emission reductions.

The City of Pleasanton's annual vehicle traffic is estimated at 2.60 million VMT on roadways within the City, regardless of the trip origin and/or destination. In the absence of any GHG reduction strategies, VMT for the City is expected to increase by 25% from 2005 to 2020, vehicle hours traveled would increase by 41%, and vehicle hours delayed would increase by 141%.[1] With implementation of the Climate Action Plan, transportation measures are expected to reduce overall daily VMT in 2020 by 167,730 miles (6% reduction), as compared to the 2020 business-as-usual scenario, and reduce VMT per capita by over 9%. Although total VMT will still increase, VMT per capita is expected to decrease by 7% as compared to the base year.

[1] See Appendix B for the full Fehr & Peers report: Pleasanton Vehicle Miles of Travel with Climate Action Plan (CAP) Implementation, June 9, 2011.

## Background

As of 2005, Pleasanton encompassed about 4,100 businesses (excluding home occupations) which together employed about 58,110 full- and part-time workers. Approximately 21% of these workers lived in Pleasanton, another 29% lived elsewhere in the Tri-Valley, and the remaining 50% commuted from the greater outlying area. As of January 2007, Pleasanton provided 25,765 housing units for approximately 68,800 residents. Most Pleasanton residents live in single-family homes and have two or more vehicles. Households with two or more vehicles are less likely to use transit. 30% of Pleasanton residents work within the city limits. In recent decades, while local jobs grew to match the number of employed residents, most of the new workers did not take up residence in Pleasanton. Minimal undeveloped land remains within the city, though the majority consists of commercial/office/industrial zoned areas and low density residential. The housing units added were too few to accommodate many new workers. The current plan to add at least 2,000 new housing units will help mitigate this trend.

Table 3-3.
Summary Table of GHG Reduction Impacts for Land Use and Transportation Strategies

| | Goal / Supporting Strategy | Annual GHG Reduction Potential (MT $CO_2e$) | Percent of Category |
|---|---|---|---|
| **LU** | **Reduce VMT through mixed-use, infill, and higher density development** | | |
| LU1 | Support infill and higher density development | 6,898 | 21% |
| LU2 | Support mixed-use infill and new development near local-serving commercial areas | 5,845 | 17% |
| LU3 | Improve transportation efficiency through design improvements | 2,202 | 7% |
| **NM** | **Increase non-motorized mobility** | | |
| NM1 | Create and maintain a safe, convenient, and effective system for pedestrians and bicyclists | 1,280 | 4% |
| TR | Improve transit system and ridership | | |
| TR1 | Improve and increase transit ridership with incentives, partnerships, and related investments | 2,377 | 7% |
| **TDM** | **Improve transportation demand management** | | |
| TDM1 | Use parking pricing/policy to discourage SOV travel | 3,174 | 9% |
| TDM2 | Promote alternatives to work and school commutes | 11,257 | 34% |
| TDM3 | Improve traffic flow to relieve congestion | 0 | 0% |
| **VE** | **Increase motor vehicle efficiency** | | |
| VE1 | Develop a supportive community infrastructure for alternative fuel vehicles | 0 | 0% |
| VE2 | Develop a city fleet replacement program | 312 | 1% |
| | Total for Category | 33,345 | 100% |

## Land Use and Transportation

Transportation will continue to contribute a large percentage of California's GHG emissions as long as the internal combustion engine-powered automobile remains our primary means of mobility. For over half a century, a motor vehicle dependent society has been created in Pleasanton and beyond, through the following systems and mechanisms:

- Motor vehicle-dependent, public policies, practices, zoning, and development codes;
- Street standards and circulation patterns primarily focused on motor vehicle mobility;
- Public and private policies and practices that incentivize single-occupant automobile use; and
- The prevalence of carbon-rich fuels, and fuel-inefficient vehicles and roadways.

Pleasanton's shift towards single-use zoning and lower density development that began decades ago, complemented by its street pattern of "superblocks" or widely space intersections and multi-lane arterials, constrains walkability, reduces the opportunities for transit-supportive population densities, and increases the frequency of vehicle trips for school, recreation, shopping, and other daily need destinations. Extensive employee and shopping parking areas and minimum parking space requirements incentivize driving.[2]

Pleasanton's conventional network planning emphasizes automobile travel on a hierarchy of streets. This system channels automobile traffic into large arterial streets based on system patterns scaled to the automobile and large areas of auto-oriented development. Ever-growing streets and intersections to accommodate growth in traffic become significant barriers to walking and bicycling. Typically, pedestrians and bicyclists are required to use the same routes designed for automobile travel.[3] However, the two BART stations, and plans to increase transit-oriented development around each, will reduce the demand for and use of individual motor vehicles.

The following describes the conditions of Pleasanton's current land use and transportation systems relative to GHG emission impacts:

### Connectivity

Connectivity refers to the density or frequency of connections in path or road network and the directness of links, calculated as the number of surface street intersections within a given area, such as a square mile. The more intersections there are per square mile, the greater the degree of connectivity. Pleasanton's connectivity averages about nine intersections per square mile, though the street patterns in the downtown and surrounding neighborhoods almost double that number. Reducing Pleasanton's intersection spacing will reduce VMT by improving roadway and pathway connectivity which tends to improve accessibility and reduce vehicle travel distances by increasing walkability.[4]

### Street Design

Street design or streetscape refers to urban roadway design and conditions as they impact street users and nearby residents. Multifunctional or "complete streets" should accommodate automobiles, public transit traffic, bicycle and pedestrian traffic; provide access to adjacent buildings and other destinations; provide space for commercial and recreational activities; and may function as linear parks. A complete street should include wider sidewalks, street trees, shared or dedicated bicycle lanes, bus pullouts, and improved on-street parking design.

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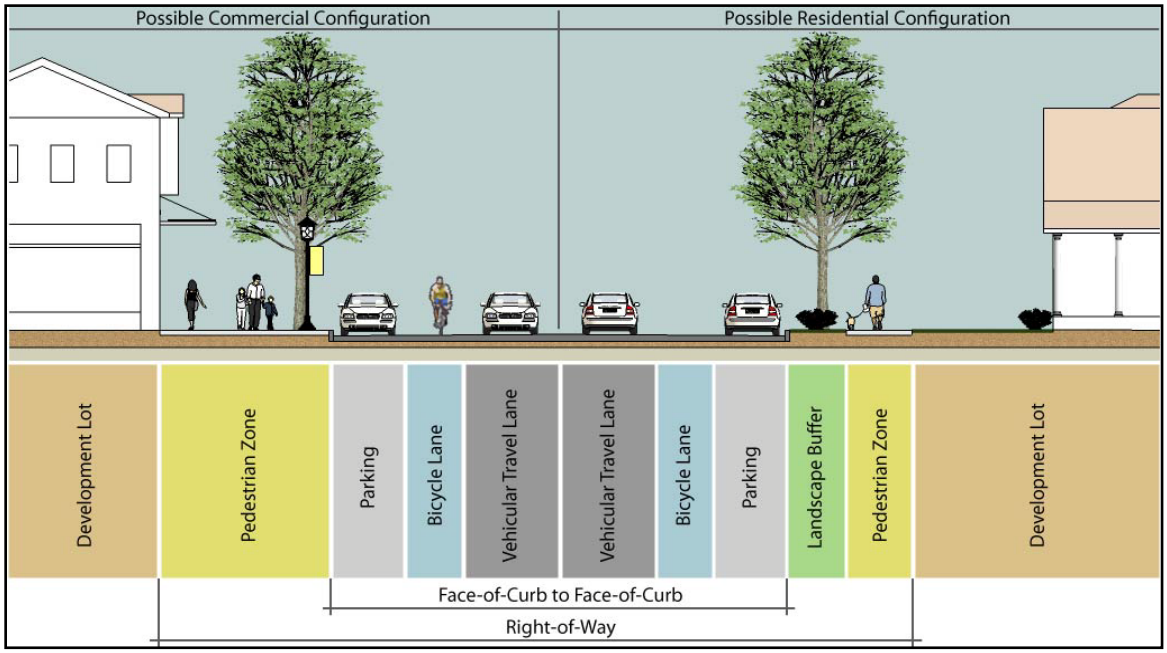
2 Ewing et al, 2008. *Growing Cooler – The Evidence on Urban Development and Climate Change, Urban Land Institute*.

3 Pleasanton Pedestrian and Bicycle Master Plan, 2009. Available at: https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf

4 Victoria Transport Policy Institute, May 2010. *Roadway Connectivity - Creating More Connected Roadway and Pathway Networks.*

A typical network of “complete streets” provides for the needs of all users of the street network




Source: City of Charlotte, NC[5]

Pleasanton’s streets include five and seven lane arterials, most without on-street parking, and two and three lane collectors, with intermittent sections of bike lanes. Bikes can share drive lanes on streets where actual travel speeds do not exceed 25 mile per hour, though most city streets without bike lanes exceed the shared lane, speed thresholds. Urban design research demonstrates that people walk more and drive less in pedestrian-oriented commercial districts when compared with automobile-dominated commercial centers. Pleasanton can encourage use of alternative low-carbon modes of transportation by designing streets that reduce vehicle traffic speeds, improve walking and cycling conditions, and enhance the pedestrian experience.

### Parking

Parking refers to the demand, supply, price, and regulation of motor vehicle parking facilities. Pleasanton’s predominance of free and abundant parking increases automobile use. The lack of street parking on arterial streets increases vehicle speeds on these streets and shifts parking onto building sites. Large parking lots at shopping and employment centers virtually eliminate walking and biking as a desirable choice; they disperse destinations, and reduce public transit convenience and use. Conversely, the extensive parking areas, caused in part by minimum City parking space requirements, increase driving convenience and result in more cars on the road and more pollution, while the petroleum-based pavement absorbs heat and constrains rainwater infiltration.

[5] The Charlotte Department of Transportation, 2007. *Urban Street Design Guidelines*. Available at: http://charmeck.org/city/charlotte/

### Pedestrian and Bicycle Network

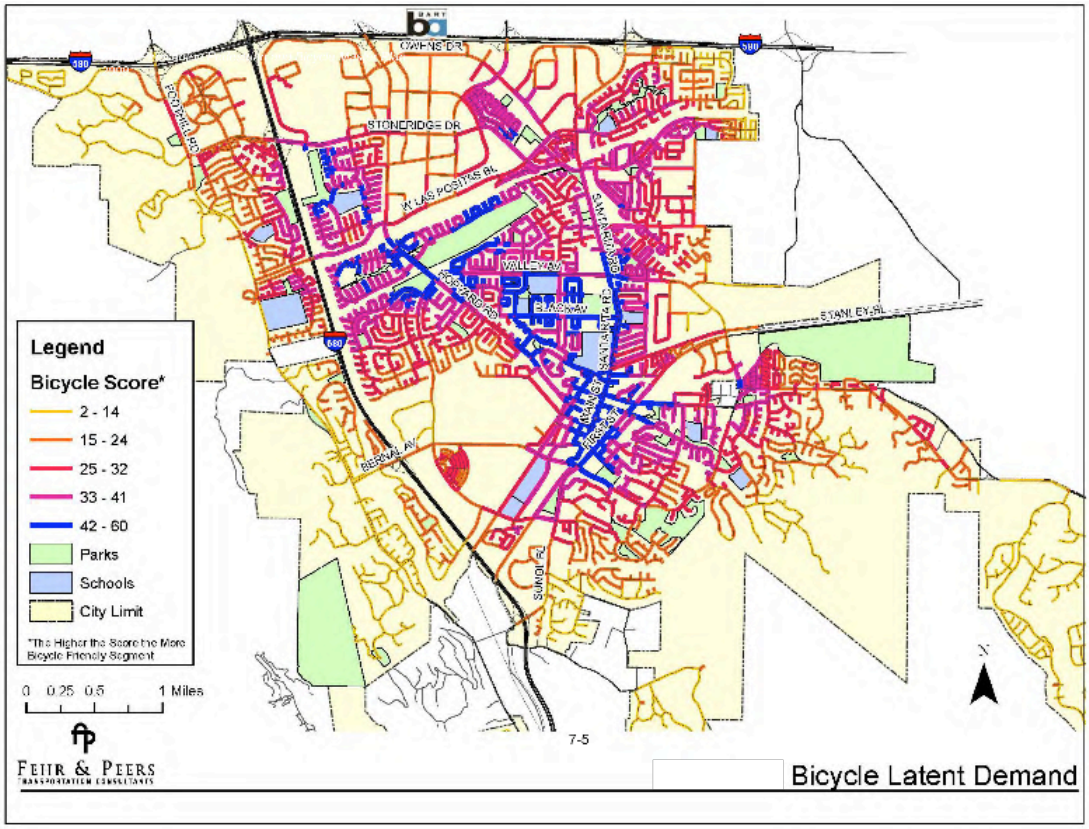
Pedestrian and bicycle network refers to the quantity and quality of sidewalks, crosswalks, paths and bike lanes, racks/storage facilities, and the level of pedestrian and bike safety, convenience, and accessibility. A well-developed pedestrian and bicycle infrastructure and pedestrian-friendly design are essential for increasing walking and biking. Highly connected sidewalks and bicycle infrastructure reduce travel distances between destinations and improve access and safety.

The Pleasanton Pedestrian and Bicycle Master Plan, prepared in June 2009, builds on the current system of citywide pedestrian-bicycle trails by establishing citywide design guidelines for bicycle and pedestrian facilities, educates residents about bicycling and walking opportunities in Pleasanton, and improves safety for pedestrians and bicyclists. However, in areas dominated by large arterial streets scaled to the automobile, large blocks of auto-oriented development, and circuitous residential subdivisions with minimal external connections constrain both pedestrian and biking efficiency, attractiveness, and safety.

### Diversity and Proximity of Uses

Diversity and proximity of uses refers to the mix and quantity of commercial, industrial, institutional, and recreational facilities, and the proximity of those facilities to residential areas. By increasing the diversity of neighborhood-serving uses and employment within a "walkable catchment" or walking distance of about ¼ mile, Pleasanton could help reduce the community's transportation-related GHG emissions by facilitating more walking and cycling trips.

The Bicycle Latent Demand map below, from Pleasanton's Pedestrian and Bicycle Master Plan, highlights the areas of Pleasanton that are more bike friendly




Source: Pleasanton Pedestrian and Bicycle Master Plan

The rezoning of land to mixed-use, particularly close to BART stations, around key intersections served by transit, and along well-traveled corridors will create the opportunities to reduce trip generation and commute distances, particularly if affordably priced housing is located in areas with a high number of jobs, and employees can commute to work by foot and bike. Redevelopment and infill possibilities include the major regional mall, Stoneridge Shopping Center, and smaller shopping centers.

### Intensity of Development

Intensity of development refers to the number of residents, workers, and/or building square footage area in a given development area. The greater the intensity, the greater the opportunities for walking and transit use, and the lesser the amount of land consumed. The City's population density in 2000 was 2,938 people per square mile. However, conventional density measured as the number of people (or housing units or workers) per square mile includes undeveloped or sparsely developed land. Weighted density takes this unevenness into account by measuring the number of people (or housing units or workers) in the areas where people actually live or work. Weighted density better reflects the land use patterns experienced by a typical person or worker.

Relative to sustainability and quality of life, population densities should be "weighted" or graduated from lowest to highest in accordance with the circulation infrastructure and other contextual conditions. Optimally, Pleasanton's greatest densities should be around BART stations and other transit-served nodes.

## Reducing Emissions Associated with Land Use and Transportation

In order to achieve its GHG emission reduction targets, the City must emphasize measures that address land use and transportation. Existing land-use patterns are responsible for the large number of daily vehicular trips generated in Pleasanton that account for a majority of the City's GHG emissions. These development patterns and the supporting transportation infrastructure are major factors in the transportation habits of residents because they limit transportation choices, helping to create an auto-dependant culture that relies less on walking, biking, and public transit and more on personal daily motor vehicle trips. Gradually changing land-use regulations, increasing transit choices, and improving pedestrian and bicycle infrastructure will help reduce the GHG emissions associated with transportation and land-use.

Low mileage, single-occupant vehicles, and traffic congestion contribute to tail pipe emissions. The lack of extensive pedestrian and bicycle amenities functions as a disincentive to choose no-emission mobility alternatives. In response, the land use and transportation measures focus on reducing the amount of motor vehicle miles traveled (VMT) and vehicle trips required each day per person, and reducing the petroleum content and consumption of motor vehicle fuels.

To achieve these goals, this Plan outlines actions to:

- Create the building and site context that allows people to walk, bike, or take public transit rather than drive single occupancy vehicles (SOVs);
- Locating dense mixed-use development in near proximity to transit stops, particularly at fixed rail or dedicated bus rapid transit stations;
- Create the infrastructure incentives for people to walk, bike, or take public transit, and reduce the need to rely on individual motor vehicles by implementing the City's Pedestrian and Bicycle Master Plan, initiating a complementary Complete Streets program, and developing and implementing a public transit system master plan, responsive to resident and employee travel patterns and needs;

- Create incentives for people to walk, bike, or take public transit, and reduce the need to rely on individual motor vehicles by expanding transportation demand management programs, expanding alternatives for commuting and local travel, charging for motor vehicle parking, and providing secure bike parking and related amenities;
- Decarbonizing transportation by promoting the use of hybrid and non-petroleum-fueled vehicles, and incentivizing their use through alternative fuel infrastructure and parking preference programs.

Since VMT and fuel efficiency represent two key important factors in emission reduction, Climate Action Plan strategies should help decrease automobile use and increase the use of more efficient/alternative fuel vehicles. For instance, carpooling is exponentially more efficient than single-occupancy-vehicle (SOV) use. Providing more pedestrian and bicycle amenities, supporting mixed-use and transit-oriented development, and providing alternatives to commuting and transit services decreases VMT and reduces traffic congestion. State transportation-related requirements will increase fuel efficiency within the next few years. However, though State-mandated improvements in vehicle fuel efficiency and reductions in fuel carbon content are critical to reducing vehicle emissions, these alone will not be enough to adequately reduce emissions from transportation.

## Goal 1: Reduce VMT through Mixed-use, Infill, and Higher Density Development

While the State fuel and vehicle efficiency requirements will slow the increase in emissions compared to the business-as-usual scenario, transportation emissions would still exceed Pleasanton's goals without further measures by the City. Increasing the density of housing, employment, and retail uses across Pleasanton, and their proximity to each other, will reduce household and employee VMT, and reduce GHG emissions. According to study from the National Academy of Sciences (NAS), a private nonprofit chartered by Congress and other studies,[6] more compact mixed-use development of residential and employment centers can result in overall GHG reductions of up to 25%. The report suggests how this can be accomplished:

- Smaller lots for detached houses could shorten vehicle trip distances in low-density urban fringes;
- Smaller lots and multiple-unit housing could support public transportation and encourage walking and bicycling in moderate density suburbs; and
- Redevelopment of strategically located underused parcels could support investment in rail transit in urban-core areas.

Walkable, mixed-use, infill development at transit stations will help to capture a larger share of work trips, which are the longest. Finally, mixed use, higher-density, or infill development will facilitate fewer and shorter car trips by providing more diverse land uses within close proximity of those users.

#### Strategy LU1: Support Infill and High Density Development

Pleasanton will support mixed-use, infill, and higher density development by:

- Modifying General Plan zoning and development codes to allow the raising of densities in a graduated and context-sensitive manner to increase the efficiency of and proximity to transit; and
- Continuing to restrict development outside designated areas and constrain the pressure for leap-frog development.

[6] "Driving and the Built Environment: The Effects of Compact Development on Motorized Travel, Energy Use and CO2 Emissions," examines trends in national and metropolitan-area development patterns, effects of land-use patterns on VMT, and the potential effects of more compact development on VMT, energy use, and CO2 emissions.

Measures for supporting infill and high density development are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimate cost and reduction potential.

### LU1: Support Infill and High Density Development

Annual GHG Reduction Potential (MT $CO_2e$): 6,898
Estimated Annual Cost to the City: $1,050
Estimated Cost per MT: $0.15

| Supporting Actions | | Timeframe |
|---|---|---|
| LU1-1 | Modify municipal development codes to incentivize the reuse of residential and non-residential vacant and underutilized parcels. Development within the existing urban fabric can help complete, reinforce, and repair the surrounding area. | Since 2002; upgrade in 2012 |
| LU1-2 | Modify municipal development codes where feasible to incentivize residential in-fill, such as the zoning standards and opportunities to improve pedestrian amenities, since their absence presents a barrier to infill residential development. Infill development within the existing urban fabric helps complete, reinforce, and repair the surrounding area. | 2012 |
| LU1-3 | In the downtown area, modify municipal development codes where feasible to implement mixed-use development which incorporates higher density and affordable residential units consistent with the Downtown Specific Plan. | 2012 |
| LU1-4 | Modify municipal development codes as necessary to incentivize transit-oriented development near BART stations, along transportation corridors, in business parks and the downtown area. | 2012 |
| LU1-5 | Modify municipal development codes where feasible to incentivize higher density development near and around transportation hubs and employment centers. | 2012 |
| LU1-6 | Modify City land-use policies, programs, and related development codes to increase transit oriented development around commuter rail, BART, and other transportation hubs. | 2012 |
| LU1-7 | Modify municipal development codes where feasible to increase densities at vacant infill sites to facilitate development, including affordable housing, while protecting the character of surrounding uses. | 2012 |

### Strategy LU2: Support Mixed-use Infill and New Development near Local-serving Commercial Areas

Local-serving commercial areas are typically supported by commercial anchors, and by their proximity to adjacent residential or employment areas.

Pleasanton has designated priority sites or site-specific standards to encourage mixed use, higher-density, or infill development near BART and the downtown area. However, redevelopment and infill targets should include the major regional mall, Stoneridge Shopping Center, and smaller shopping centers.

In addition to adding mixed use zoning to local-serving commercial areas, the City will encourage density by reducing developer costs (e.g., preferential fees or permit streamlining for qualifying development) in these areas.

Measures for supporting mixed-use infill and new development near local-serving commercial areas are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

### LU2: Support Mixed-use Infill and New Development near Local-serving Commercial Areas

Annual GHG Reduction Potential (MT $CO_2e$): 5,845
Estimated Annual Cost to the City: $9,160
Estimated Cost per MT : $1.57

| Supporting Actions | | Timeframe |
|---|---|---|
| LU2-1 | Modify municipal development codes where feasible to locate work, residences, and services within a convenient walking distance of each other. | 2012 |
| LU2-2 | Modify municipal development codes where feasible to locate new housing and/or new employment within ½-mile walking/biking proximity of complementary land uses, including retail, employment, institutional, or recreational. | 2012 |
| LU2-3 | Modify municipal development codes to incentivize an expansion of mixed use and employment in appropriate infill locations. | 2012 |
| LU2-4 | Modify municipal development codes where feasible to provide Mixed Use/Business Park, and Mixed Use land use designations for the Hacienda Business Park, portions of Stoneridge Mall, and other areas. Allow new building types and mix of appropriate zoning-uses and densities; reconnect streets and add streets; minimize parking requirements; and include attractive and functional urban plazas. | 2012 |
| LU2-5 | Modify City land-use policies, programs, and related development codes to increase transit oriented development around commuter rail, BART, and other transportation hubs. | 2012 |
| LU2-6 | Modify municipal development codes to incentivize or help establish a well-planned mixture of land uses around the BART stations. | 2012 |
| LU2-7 | Create a comprehensive planned unit development amendment for the Hacienda Business Park with special emphasis on creating a mixed-use, pedestrian-friendly area around the East Pleasanton/Dublin BART station. | 2012 |
| LU2-8 | Create incentives program(s) that attract and support local-serving shopping opportunities and services, including programs for business attraction; training and education for desired employee and managers; review and modification or elimination of city business rules and regulations where value does not exceed short and long-term cost; and a program to review and assess incentives from other successful communities. | 2012 |
| LU2-9 | Create incentive program(s) and modify municipal development codes where feasible to allow an expansion of live-work and work-live uses in existing and future residential developments. | 2012 |
| LU2-10 | Promote use of *LEED for Neighborhood Development* (LEED ND) as an incentive for developers seeking better market appeal and municipal support; or for municipal leaders looking to create tax and zoning incentives; or for community members trying to assess a new development; Consider getting LEED ND adopted into municipal code. | 2012 |

### Strategy LU3: Improve Transportation Efficiency through Design Improvements

The two BART stations, along with Altamont Commuter Express (ACE) train service, should receive a significant share of the Pleasanton's growth in order to provide greater local and regional accessibility for residents and jobs, and to reduce the carbon footprint of growth. The City has already targeted the Hacienda Business Park as a mixed-use, transit-oriented development, and standards and design guidelines were adopted on March 1, 2011. However, the second BART station and other potential bus rapid transit, commuter rail, and other priority transit sites should receive site-specific zoning and building standards, and consider other incentives to increase density in close proximity to transit and commercial service areas to minimize auto travel.

Transit-oriented development works best around fixed-line transit stations, rail or bus rapid transit with fixed stations and dedicated bus lanes. In contrast to areas around ordinary bus lines, developers have greater certainty that the transit service will remain in perpetuity, and fixed-line transit also offers higher speeds and greater regional accessibility than the typical bus system.

Measures for improving transportation efficiency through design improvements are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

### LU3: Improve Transportation Efficiency through Design Improvements

Annual GHG Reduction Potential ($CO_2e$): 2,202
Estimated Annual Cost to the City: $127,450
Estimated Cost per MT : $57.87

| Supporting Actions | | Timeframe |
|---|---|---|
| LU3-1 | Modify the development codes to encourage the location of key services within a ½-mile walking distance of residential clusters or areas. | 2012 |
| LU3-2 | Incorporate building, landscape, and streetscape development design features that encourage transit, bicycle, and pedestrian access. | 2013 |
| LU3-3 | Create incentive program(s) to assure adequate transit service and pedestrian and bicycle facilities at new and existing major commercial, office, and institutional centers. | 2013 |
| LU3-4 | Require that new projects that include two or more seated bus shelters to include infrastructure to incorporate 'NextBus' technologies for tracking buses and predicting arrival times. | 2014 |
| LU3-5 | Modify the municipal street standards to incorporate AB 1358 Complete Streets to increase the safety, convenience, and efficiency of pedestrians, bicyclists, motorists, and transit riders. | 2013 |
| LU3-6 | Modify the municipal development codes to require that new projects include pedestrian and bicycle access through cul-de-sacs in new projects, except where prohibited by topography. | 2013 |
| LU3-7 | Implement neighborhood traffic calming projects to slow traffic speeds, reduce cut-through traffic and traffic-related noise, improve the aesthetics of the street, and increase safety for pedestrians, bicyclists, and vehicles. | 2013 |

## Goal 2: Improve Transit Systems and Ridership

Transit in Pleasanton achieves multiple goals, from providing mobility for thousands of workers daily to and from the two BART stations, to offering mobility to the young and low-income, disabled, and elderly residents without cars. The goal should include accommodating choice riders, or those who choose to use transit for their trip-making even though they have other means of travel, in particular a motor vehicle. Many commuters choose transit over other modes due to an unwillingness to deal with traffic congestion in their motor vehicle during peak periods. Improved mobility for riders and non-riders alike includes:

- Access to jobs, health care, shopping, and recreation for individuals of all ages and incomes;
- Increased demand for public transit service in a down economy as agencies with tight budgets cut back on transportation expenses and individuals seek affordable transportation;
- Congestion mitigation for commuters. Public transportation takes cars off the road – 60 cars for a full bus, 12 cars for a full van, and up to 100 cars for a full BART car;
- Improved productivity for truckers and delivery vehicles; and
- Enhanced mobility without the need to build more lane miles of roads. A single subway line can carry 30,000 passengers in one hour, eliminating the need for ten additional highway lanes.

Rail and bus transit will help reduce congestion, air pollution, and GHG emissions on the City's roadways during peak periods.[7] This goal also supports SB 375's efforts to reduce GHG emissions from passenger vehicles. Transit provides a positive economic development impact by:

- Improving employers' access to workers and labor markets. The majority of Pleasanton's transit trips are work trips;
- Investing transit capital in suppliers and manufacturers across the entire state;
- Improving productivity and reducing lost time by mitigating traffic congestion;
- Making better use of existing infrastructure; and
- Investment in public transport also stimulates the economy locally, with between $4 and $9 of economic activity resulting from every dollar spent.[8]

However, cost is a major challenge for transit. A recent analysis of transit systems in the Bay Area found that operating costs have been increasing much more rapidly than inflation.[9] Even so, transit trips can be both time and cost competitive to the auto under the right operating conditions.

Use of transit also provides direct co-benefits:

- Air quality improvements, by taking cars off the road.
- Reducing Pleasanton's fuel consumption through public transit – a 20-mile commute on transit saves a gallon of gas per passenger. Converting transit fleets to clean fuels will deliver an even bigger environmental benefit.

### Strategy TR1: Improve and Increase Transit Ridership with Incentives, Partnerships, and Related Investments

In addition to BART and ACE Commuter Rail, bus services fall into two other major operating categories. *Local services* (Livermore Amador Valley Transit Authority) provide service to all stops along a route and consequently provide relatively slow service and are best for short-distance trips. *Limited-stop* or Bus Rapid Transit services (Livermore Amador Valley Transit Authority's Rapid Bus Program) overlaid over local routes that provide a higher speed service by stopping only at major destinations, such as key transfer points and major activity centers.

This strategy requires that the City, in collaboration with civic organizations and businesses, work closely with BART to approve extensions to Downtown Livermore and/or Downtown San Jose. It also requires that the City partner with other transit agencies to meet emerging transit needs from an intensification of development and commute patterns. This may include addressing increased frequency of buses, and pursuing all potential funding sources for alternative transportation modes.

Subsidies may take the form of finding public and private sources of funding to discount transit passes to support the City's Dial-A-Bus program, as well as indirect subsidies. Incentives can include programs that offer benefits to Pleasanton residents or employees who use commute alternatives. The City can require that new residential and non-residential developments offer discounted transit passes as part of

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7 Views from the Street - Linking Transportation and Land Use, February 2011, Louise Bedsworth, Ellen Hanak, and Elizabeth Stryjewski; Making the Most of Transit (Kolko 2011). Driving Change – Reducing Vehicle Miles Traveled in California, 2011 Louise Bedsworth, Ellen Hanak, Jed Kolko

8 http://www.publictransportation.org/aboutus/default.asp

9 For the seven largest transit systems in the San Francisco Bay Area, operating costs increased 83% between 1997 and 2008, whereas the consumer price index increased by 39%. Over this same period, transit service (measured as hours in service) increased only 15% and ridership increased only 7% (Metropolitan Transportation Commission Transit Sustainability Project, 2010. Available at www.mtc.ca.gov/planning/tsp/ABAG_Focus_presentation.pdf).

homeowner association (HOA) amenities, or that new non-residential developments offer employees discounted transit passes in lieu of a parking space.

Measures for improving and increasing transit ridership with incentives, partnerships, and related investments are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

### TR1: Improve and Increase Transit Ridership with Incentives, Partnerships, and Related Investments

Annual GHG Reduction Potential (MT $CO_2e$): 2,377
Estimated Annual Cost to the City: $32,511
Estimated Cost per MT: $13.68

| Supporting Actions | | Timeframe |
|---|---|---|
| TR1-1 | Create carpool programs to/from transit station parking, and incentivize bike rental vendors at transit station (see NM1-20). | 2012 |
| TR1-2 | Support Livermore Amador Valley Transit Authority's Rapid Bus Program through frequent ridership and promotion of the LAVTA on the City's websites. | 2012 |
| TR1-3 | Promote a more direct and convenient connection between BART and ACE rail service. | 2012 |
| TR1-4 | Increase frequency of buses that access BART or other destination centers such as Hacienda Business Park and Lawrence Livermore National Lab. | 2012 |
| TR1-5 | Provide transit service within ½ mile of all residents in the city where and when the gross density surrounding or adjacent to feasible transit routes meets or exceeds 10-12 units/acre. | 2015 |
| TR1-6 | Modify the municipal code to require new residential developments within 1/2 mile of transit to offer discounted transit passes as part of HOA amenities, payable through the HOA dues. | 2012 |
| TR1-7 | Identify underused parking lots and/or other available paved areas that could serve as park-and-ride lots accessed by buses that access BART or other destination centers such as Hacienda Business Park or Lawrence Livermore National Lab. | 2012 |
| TR1-8 | Create incentives to develop park and ride lots identified in TR1-7. | 2012 |
| TR1-9 | Introduce a bus idling policy and ordinance to limit commercial and public diesel vehicle idling, where feasible. | 2012 |
| TR1-10 | Develop a resource on the City's web site (www.pleasantongreenscene.org) that describes and promotes transportation alternatives that reduce motor vehicle emission, for planned events, concerts, festivals, and conventions. | 2011 |
| TR1-11 | Develop and implement a transit system master plan for the city that provides a context for planning decisions based on access to transit, that integrates regional (BART, ACE, LAVTA) and local [bus] transit systems and explores adding new systems [e.g., Pleasanton trolleys] to provide the infrastructure needed to reduce travel by single-occupancy vehicles. | 2014 |

## Goal 3: Increase Non-motorized Mobility

Mobility refers to physical movement. Accessibility refers to people's ability to reach desired goods and activities. Non-motorized transportation refers to walking, bicycling, and variants such as wheelchair, scooter and handcart use. In Pleasanton, non-motorized modes will provide an increasingly important role in an efficient transportation system, for:

- Basic, affordable mobility;
- Access to motorized modes;
- Exercise/physical fitness;
- Reducing automobile travel; and
- Supporting compact, connected development.

Non-motorized improvements can leverage additional motor vehicle travel reductions. A mile of increased non-motorized transport reduces several motor-vehicle miles, particularly if walking and bicycling improvements are integrated with complementary land use and transportation policies. Bicycling can replace a significant share of motorized travel, typically 5-15% with good facilities.

Conventional transportation impact analyses tend to overlook and undervalue non-motorized transportation modes such as multiple short and non-motorized trips. Non-motorized trips are undercounted because they do not include off-peak trips, non-work trips, travel by children, recreational travel, and non-motorized links of automobile and public transit trips.[10] Non-motorized transportation represents a relatively large portion of Pleasanton's total trips and travel time, as high as 15%, and many of the trips would be costly to perform by motor vehicles.

The strategies to increase non-motorized mobility only affect a portion of total travel so their impacts may appear modest. However, they provide multiple and synergistic benefits, when all impacts are considered, and allow the Climate Action Plan to justify greater emphasis on walking and cycling.

### Strategy NM1: Enhance and Maintain a Safe, Convenient, and Effective System for Pedestrians and Bicyclists

Bicycle and pedestrian improvements provide synergistic effects, where the total impacts are greater than the sum of their individual impacts. Therefore, it's generally best to implement and evaluate integrated programs. A single bicycle lane generally provides little benefit since it will connect few destinations, but a network of bicycle lanes and shared travel lanes that connect most destinations in an area can be very beneficial. Accordingly, this strategy includes:

- Continue to implement the Pleasanton Pedestrian and Bicycle Master Plan to improve sidewalks, crosswalks, paths, and other walking amenities, and bike lanes, bicycle parking, and changing facilities;
- Increase the amount of connected roadway and pathway systems to allow more direct travel between destinations, and provide walking and cycling shortcuts to encourage motorized to non-motorized travel shifts.
- Implement the State's Complete Streets program and institute other traffic calming design modifications in roadways to balance pedestrian, bicycle, and motor vehicle levels of service, and increase safety and convenience, particularly on urban arterials. For pedestrians, buffer sidewalks from traffic through on-street parking and wider sidewalks with landscape strips where appropriate.
- Continuing to encourage and, where-appropriate, require transit-oriented and location-efficient development land use policies and development codes. Compact, mixed use, and well-connected developments reduce parking demand and improve walkability.
- Maintaining and/or developing non-motorized transportation education and health programs that encourage people to walk and bike for mobility, and teach bicycle safety skills.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

[10] Evaluating Non-Motorized Transportation - Benefits and Costs, June 2011, Todd Litman, Victoria Transport Policy Institute, Peter R. Stopher and Stephen P. Greaves (2007), "Household Travel Surveys: Where Are We Going?" Transportation Research A, Vol. 41/5 (www.elsevier.com/locate/tra), June, pp. 367-381.

## NM1: Enhance and Maintain a Safe, Convenient, and Effective System for Pedestrians and Bicyclists

Annual GHG Reduction Potential ($CO_2e$): 1,280
Estimated Annual Cost to the City: $121,320
Estimated Cost per MT: $94.78

| Supporting Actions | | Timeframe |
|---|---|---|
| NM1-1 | Implement the Community Trails Master Plan through the creation of incentive program(s), inclusion in the City's CIP, and/or modification of municipal development codes. | 2012 |
| NM1-2 | Implement the Pleasanton Pedestrian and Bicycle Master Plan, June 2009, through the creation of incentive program(s) and/or modification of municipal development codes. | 2012 |
| NM1-3 | Develop the Downtown Transportation Corridor for pedestrian, bicyclists and parking, consistent with the 2002 Master Plan for the Downtown Parks and Trails System and with the Downtown Specific Plan. | June 2009 |
| NM1-4 | Require appropriate bicycle-related improvements (i.e., work-place provision for showers, bicycle storage, bicycle lanes, etc.) with new development. | 2012 |
| NM1-5 | Modify municipal development codes to require bike parking for non-residential and multi-family uses. | 2012 |
| NM1-6 | Maintain bicycle routes with adequate sweeping and pavement repairs. | 2012 |
| NM1-7 | Incorporate bicycle detection at signalized intersections. | 2012 |
| NM1-8 | Encourage schools, businesses and office parks to provide safe, convenient bike racks. | 2012 |
| NM1-9 | Work with East Bay Park District to complete Iron Horse Trail through Hacienda Business Park (HBP). | 2012 |
| NM1-10 | Install a bicycle/pedestrian underpass at 580/680 interchange (Johnson Drive canal) for connection to Dublin. | 2012 |
| NM1-11 | Place more bike racks throughout the city through the creation of incentive program(s), inclusion in the City's CIP, and/or modification of municipal development codes. | 2012 |
| NM1-12 | Provide secure, covered bicycle parking at major transit hubs including BART stations through the creation of incentive program(s), inclusion in the City's CIP, and/or modification of municipal development codes. | 2012 |
| NM1-13 | As part of the Pleasanton Pedestrian and Bicycle Master Plan, target the development of a pedestrian trail system that connects all major areas of the City. | 2012 |
| NM1-14 | Cooperate and collaborate with East Bay Regional Parks District to complete the regional trail system, and with Zone 7 in completing its Arroyo Management Plan. | 2012 |
| NM1-15 | As part of the Pleasanton Pedestrian and Bicycle Master Plan, provide educational opportunities for residents about bike/pedestrian safety. Increase safety and induce non-motorized travel by enforcing pedestrian, bicycle, and motor vehicles laws. | 2012 |
| NM1-16 | Investigate feasibility of installing locking skateboard racks at schools. | 2012 |
| NM1-17 | Work with School District to continue Rides to School program. | 2012 |
| NM1-18 | Preserve rights-of-way needed for local and regional roadway “complete streets” improvements and increased connectivity through dedication of land, as adjacent properties develop. | 2012 |
| NM1-19 | Modify municipal development codes to develop complete street standards to maximize transportation opportunities that serve all mobility modes. | 2012 |
| NM1-20 | Provide incentives for attracting private self-service bicycle renting businesses, including the installation of bike rental vendors at BART and ACE stations. | 2012 |

# Goal 4: Improve Transportation Demand Management

Transportation Demand Management (TDM) is application of strategies and policies to reduce travel demand, particularly for single occupancy vehicle (SOV) travel. Pleasanton's Climate Action Plan is consistent with the City's General Plan transportation policies for reducing vehicle trips. Reductions in vehicle trip generation can be accomplished through mixed land use that enhances multipurpose and pass-by trips and contributes to development efficiency and environmental protection. In addition, the use of alternative transportation modes (walking, cycling, and public transit) and implementing public and private travel demand management programs contributes to a reduction in single occupant vehicle trips per capita and shifts traffic to off-peak travel hours.

### Strategy TDM1: Use Parking Policy/Pricing to Discourage Single Occupancy Vehicle (SOV) Travel

Parking management and parking pricing are effective ways to reduce automobile travel, and tend to be particularly effective in urban areas where congestion problems are greatest. Driving and parking are complementary: you need a parking space at virtually every destination. In particular, since most urban-peak highway trips are for commuting, employee parking pricing can have a similar effect as a road toll. A recent analysis[11] indicates that more efficient pricing of on-street parking would make urban driving more expensive but more efficient, due to lower levels of traffic congestion and the relative ease in finding a parking space near destinations, as well as providing new revenues.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

#### TDM1: Use Parking Policy/Pricing to Discourage Single Occupancy Vehicle (SOV) Travel

Annual GHG Reduction Potential (MT $CO_2e$): 3,174
Estimated Annual Cost to the City: $61,981
Estimated Cost per MT: $19.53

| Supporting Actions | | Timeframe |
|---|---|---|
| TDM1-1 | Provide shared parking lots to reduce paved areas that contribute to urban heat islands and reduce stormwater infiltration, through the creation of incentive program(s) and modification of municipal development codes where feasible. | 2012 |
| TDM1-2 | Modify municipal code to separate fee-based parking from home rents/purchase prices or office leases within 1/2 mile of BART stations to increase housing affordability for those without a car or cars. | 2013 |
| TDM1-3 | Work with large employers (new and existing) to provide incentive-based programs that encourage employees to choose alternative transportation to work. | 2012 |
| TDM1-4 | Implement residential area parking permits to prevent spill-over parking into neighboring residential areas from shopping, events, and sporting events. | 2013 |
| TDM1-5 | Assist companies, and facility owners and managers in developing and operating parking demand management programs. | 2012 |
| TDM1-6 | Dedicate public parking spaces that contain electric charging stations for plug-in vehicles, in coordination with Measure VE1-1. | 2012 |
| TDM1-7 | Provide designated motorcycle and scooter parking downtown. | 2012 |

[11] Roth, Gary, 2004. *An Investigation Into Rational Pricing For Curbside Parking: What Will Be The Effects Of Higher Curbside Parking Prices In Manhattan?* Masters Thesis, Columbia University. Available at http://anti-bob.com/parking/Rational_Pricing_for_Curbside_Parking-GRoth.pdf).

### Strategy TDM2: Promote Alternatives to Work and School Commutes

Trip generation can be reduced by implementing TDM strategies that include telecommuting options, alternative work and school schedules, on-site amenities, pricing strategies, and land use strategies. For example, commute trip reduction programs can encourage use of alternative modes, particularly for commuting to work and school. These often include features that encourage non-motorized travel such as improving bicycle parking or financial rewards such as parking cash out.

In terms of overall cost efficiencies, it is important to consider how reducing trip generation can reduce the need for new traffic signals (typically costing $200,000 each), or land for new parking spaces. This does not factor in lower maintenance costs, lower environmental impacts, or the higher employee satisfaction benefits that TDM provides.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

#### TDM2: Promote Alternatives to Work and School Commutes

Annual GHG Reduction Potential (MT $CO_2e$): 11,257
Estimated Annual Cost to the City: $183,974
Estimated Cost per MT: $16.25

| Supporting Actions | | Timeframe |
|---|---|---|
| TDM2-1 | Promote the use of flextime and other measures by employers and employees through the City's Transportation Systems Management (TSM) Ordinance. | 2012 |
| TDM2-2 | Encourage employers to allow employees to telecommute. | 2012 |
| TDM2-3 | Encourage (employers) or offer (City government) alternative work week (e.g., 9/80, work from home, 10-hour shifts) to reduce employee commutes. | 2012 |
| TDM2-4 | Create incentive program(s) that encourage the development of neighborhood telecommuting centers. | 2012 |
| TDM2-5 | For municipal employees, create incentives for non-single-auto commute modes (e.g., carpool programs, transit vouchers, alternative work week plans, telecommuting) through City programs and community outreach. | 2012 |
| TDM2-6 | Create an incentive program for City employees who use non-single-auto commute alternatives. | 2012 |
| TDM2-7 | Modify municipal codes to require new and substantial developments within 1/4 mile of transit to provide transit passes or other transit use incentives for an interim period sufficient to establish transit use patterns. | 2012 |
| TDM2-8 | Strengthen community-based carpool and ride share programs for residents and businesses through education and engagement. | 2012 |
| TDM2-9 | Modify municipal development codes to require new non-residential projects over a certain size and configuration to implement a TDM program capable of reducing weekday peak period vehicle trips by at least 20%. | 2012 |
| TDM2-10 | Modify municipal codes to require dedicated parking spaces in new and modified developments for carpool, vanpool, alternative-fuel, and car-share vehicles. | 2012 |
| TDM2-11 | Develop incentives to attract car-sharing services at the Pleasanton BART stations. | 2012 |

### Strategy TDM3: Traffic Smoothing

Pleasanton's transportation policies include objectives to improve traffic flow and relieve congestion. Traffic congestion refers to the incremental costs resulting from interference among road users. These impacts are most significant under urban-peak conditions when traffic volumes approach Pleasanton's roads' capacity. The resulting congestion reduces mobility and increases driver stress, vehicle costs, and pollution. Potential TDM strategies for reducing congestion problems include reducing peak-period travel demand or improving transportation alternatives, and increasing roadway capacity. Congestion can be measured in various ways, including roadway Level of Service (LOS), average traffic speed, and average congestion delay compared with free-flowing traffic.

Traffic signal synchronization has long been recognized as one of the most effective techniques for cutting traffic congestion on arterials and on the arterials network. Some studies show that the benefit of reduced delay compared to the cost of synchronization may be as high as forty to one. Full funding of traffic synchronization work is one of the easiest and cheapest ways to help relieve traffic congestion. Ramp meters pace the incoming flow, so the merging takes on the quality of a smoothly functioning zipper, decreasing accident rates. Mainline flows improve and overall volumes increase both on the mainline and the ramp.

Road pricing involves charging motorists directly for driving on a particular road or in a particular area. Congestion pricing is road pricing with higher rates during congested periods. It can reduce traffic congestion on a particular roadway, particularly if implemented as part of a comprehensive TDM program, for example, with transit improvements and rideshare programs. Road pricing applied on just one roadway may cause traffic to shift routes, increasing traffic congestion on other roads.

Demand management can have a sizeable impact on congestion, even if total volume changes are modest. When a road network is at capacity, adding or subtracting even a single vehicle has disproportionate effects for the network.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

#### TDM3: Traffic Smoothing

Annual GHG Reduction Potential (MT $CO_2e$): variable
Estimated Annual Cost to the City: variable[12]
Estimated Cost per MT: variable

| Supporting Actions | | Timeframe |
|---|---|---|
| TDM3-1 | Traffic smoothing through congestion management; upgrade signal timers to improve traffic flow and reduce traffic congestion. | 2013 |

[12] Highly dependent on funding availability.

# Goal 5: Increase Motor Vehicle Efficiency

The goal of increasing motor vehicle efficiency and reducing the carbon-intensity (or amount of GHG emissions released per mile) will be accomplished by encouraging people to switch to vehicles with higher fuel economy or cleaner-fueled vehicles, by improving their existing vehicle efficiency, and by adhering to State and Federal programs and policies that would reduce the carbon-intensity of vehicles. This goal aims to reduce carbon-intensity of all vehicles that travel in or through Pleasanton, not just vehicles owned by its residents or owned by the City government.

### Strategy VE1: Develop a Supportive Community Infrastructure for More Fuel-Efficient and Alternative Fuel Vehicles

Strategies include the purchase of, or conversion to, natural gas or biodiesel vehicles through incentives and programs as funding permits. Natural gas and biodiesel-fueled vehicles have a lower per-mile carbon footprint than gasoline- and diesel-powered vehicles. Also, as crude-oil derived fuels (including gasoline and diesel) increase in cost and as natural gas and biodiesel fuel sources become more readily available, these vehicles could become less expensive to operate than traditional vehicles. Alternative-fueled vehicles may also save fuel costs over time, as petroleum-based fuels increase in costs, and as alternative fuels become a market commodity.

The adoption rate for zero- and low-carbon fuel vehicles is difficult to predict in the face of uncertainty with respect to market conditions, carbon pricing (through taxes or cap-and-trade), and availability of funding. For the near-term, implementing programs and policies for alternative fuel vehicles will be difficult without incentive programs, or without better access and lower cost of alternative fuels through market forces and/or subsidies.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure.

#### VE1: Develop a Supportive Community Infrastructure for More Fuel-Efficient and Alternative Fuel Vehicles

Annual GHG Reduction Potential (MT $CO_2e$): NA[13]
Estimated Annual Cost to the City: NA
Estimated Cost per MT: NA

| Supporting Actions | | Timeframe |
|---|---|---|
| VE1-1 | Develop a public/private partnership to develop a convenient and reliable electric and plug-in hybrid vehicle infrastructure including publicly available charging stations in both on- and off-street parking locations. | 2013 |
| VE1-2 | Modify City municipal code to permit biodiesel service or fueling stations. | 2012 |
| VE1-3 | Implement a waste oil collection program to provide feedstock for biodiesel fueling stations. Coordinate with VE1-2. | 2013 |
| VE1-4 | Develop a public/private program with local service stations and automotive repair shops to provide free "mileage booster" inspections that include checking tire pressure. | 2012 |
| VE1-5 | Develop a "Green Guide" web page on the Pleasanton Green Scene website that describes and promotes ways to improve vehicle fuel efficiency and promotes the use of alternative fuel vehicles and biodiesel conversions. | 2012 |

[13] Difficult to predict in the face of uncertainty over market forces, carbon pricing and/or program funding.

### Strategy VE2: City Fleet Replacement Program

The City should continue to procure fuel-efficient and alternative fuel vehicles for its municipal vehicle fleet. Examples of vehicles with low carbon-intensities the City could consider include:

- Hybrid vehicles
- Plug-in hybrid vehicles
- All-electric vehicles
- Compressed natural gas vehicles
- Ethanol-powered vehicles
- Bio-diesel vehicles and conversions from petro-diesel
- Propane vehicles
- Fuel-cell vehicles
- Ultra-high fuel economy gasoline internal combustion vehicles

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

#### VE2: City Fleet Replacement Program

Annual GHG Reduction Potential (MT $CO_2e$): 312
Estimated Annual Cost to the City: $4,320
Estimated Cost per MT: $13.85

| Supporting Actions | | Timeframe |
|---|---|---|
| VE2-1 | City gasoline-fueled fleet replacement program: Planned initiative to upgrade the City fleet to include more hybrid-electric and alternative fuel vehicles to reduce emissions associated with City operations. | 2011 |
| VE2-2 | City diesel-fueled fleet and equipment replacement program: Convert the municipal diesel vehicles, generators, and other diesel powered equipment to run on biodiesel and/or diesel/biodiesel blend where feasible. Promote biodiesel in the City fleet replacement program. Implement the planned initiative to upgrade the City fleet to include more electric, hybrid-electric, and alternative fuel vehicles to reduce emissions associated with City operations. Create a "Green Ride" section on the Green Scene website. | 2014 |

# Energy

## 2020 Business-as-usual GHG Emissions: 367,724 MT $CO_2e$
## Annual Reductions by 2020: 54,116 MT $CO_2e$

## Introduction

Emissions associated with consumption of electricity and natural gas account for approximately 35% of the City's 2005 GHG emissions inventory. A little more than half of this is from commercial buildings and industrial use, and a little less than half is from residential buildings. Municipal operations contribute a small fraction (approximately 1.6%) of total energy use, including the energy used for street lighting and traffic lights.

For buildings, the amount of energy consumed and the resultant GHG emissions are generally related to square footage, building type, age of building, building materials, and construction, with considerable efficiencies associated with denser and more compact development. Nationwide, single family detached homes consume twice the energy of multi-unit dwellings, and individuals living in single family homes consume about one and a half times as much as those living in multi-unit dwellings, on average. Typically, the best strategies for reducing emissions related to energy consumption start with conservation (reducing demand) and energy efficiency, then assess opportunities to add renewable energy generation capacity.

Examples of energy efficiency and conservation programs include requirements or incentives for "green building" and energy efficient development. New state standards now require such provisions for new construction. Renewable sources of energy are becoming more available and affordable through tax incentives and technological advances.

## Background

Energy is a critical component to modern society and fuels all aspects of our lives today. The City of Pleasanton has made significant strides to move towards a sustainable energy future. The Energy Element of the General Plan and the *Energy Efficiency and Conservation Strategy* (EECS) are key documents that outline policies and programs to meet the community's energy needs while maintaining the highest quality environment and quality of life.

The Energy Element of the General Plan was adopted by City Council in 2009 to outline policies to guide the growth and land development for City of Pleasanton. The Energy Element addresses the infrastructure that provides natural gas and electricity for the community, including transmission and distribution. Included in the Energy Element is the following goal: *"Move toward a sustainable future that increases renewable energy use, energy conservation, energy efficiency, energy self-sufficiency, and limits energy-related financial burdens in Pleasanton."* This goal and associated policies and programs have been incorporated into this Climate Action Plan.

The EECS was developed in 2010 to address the requirements of the U.S. Department of Energy's Energy Efficiency and Conservation Block Grant program. These projects are intended to be consistent with the goals and policies outlined in the Energy Element of the General Plan, as well as statewide goals and policies established through state legislation for emissions reductions and renewable energy.

Table 3-4
Summary Table of GHG Reduction Impacts for Energy Strategies

| | Goal / Supporting Strategy | Annual GHG Reduction Potential (MT $CO_2e$) | Percent of Category |
|---|---|---|---|
| **EC** | **Reduce Community Energy Use** | | |
| EC1 | Use city codes, ordinances, and permitting to enhance green building, energy efficiency, and energy conservation. | 3,807 | 7% |
| EC2 | Leverage state and local programs to increase energy efficiency and conservation. | 19,449 | 36% |
| EC3 | Establish and promote financing and financial incentive programs to support energy efficiency and conservation. | 7,416 | 14% |
| EC4 | Develop programs to increase energy efficiency and conservation. | 9,342 | 17% |
| **EG** | **Reduce Energy Used by Municipal Operations** | | |
| EG1 | Promote green building and energy efficient development for government operations and city infrastructure. | 1,194 | 2% |
| **ER** | **Increase Renewable Energy Generation** | | |
| ER1 | Implement local ordinances and permitting processes to support renewable energy. | 2,389 | 5% |
| ER2 | Develop programs to promote on-site renewable energy to the community. | 10,518 | 19% |
| ER3 | Promote use of renewable energy for municipal operations. | NA | 0% |
| | Total for Category | 54,116 | 100% |

## Energy Sources

Pacific Gas and Electric (PG&E) Company serves as the City's energy utility, providing both electricity and natural gas for residential, commercial, industrial, and government customers. The types of energy sources utilized for the generation of electricity has a significant impact on the City's GHG emissions. As of 2009, PG&E's electric power mix was comprised of approximately 47% natural gas, 20% nuclear, 16% large hydroelectric, 15% renewable energy, and 2% coal.[14]

In the effort to reduce statewide GHG emissions, the State of California has enacted one of the most ambitious renewable energy standards in the country. The California Renewable Portfolio Standard (RPS) seeks to reduce the proportion of fossil fuel based electric generation, and increase the amount of clean, low emission renewable energy to the power grid. Under California Senate Bill 1028 and Senate Bill 107, the RPS program requires PG&E to increase its use of renewable energy resources by at least 1% of its retail sales annually until it reaches 20% by 2010.

As a regulated energy market, the City's alternatives to purchasing PG&E power are limited. The two principle alternatives are to either form a municipal utility district or community choice aggregation program. Both of these options may require significant effort.

### Renewable Energy

As with most communities, in Pleasanton there exist opportunities to supplement or offset centrally generated grid electricity with distributed generation (small-scale power generation located in close proximity to the load being served). While distributed generation can utilize a variety of energy sources, including natural gas, oil, diesel and propane, this Climate Action Plan focuses on opportunities related to low GHG emission sources such as solar and wind.

### Solar Energy

The two main distributed generation technologies for capturing solar energy are solar photovoltaic and solar water heating. National Renewable Energy Laboratory (NREL) data indicate that solar energy is a promising option for renewable energy generation.[15]

One key benefit of solar energy is that its peak resource availability corresponds to peak system loads for conventional electricity. Therefore, solar energy systems have the potential to offset electricity usage when it is the most expensive – and typically the most carbon-intensive – as older, less efficient power plants are brought online to meet peak loads.

### Wind Energy

NREL data indicate that the average wind energy potential for the City of Pleasanton is low. The wind resource is expressed in terms of wind power classes, ranging from class 1 (the lowest) to class 7 (the highest). Each class represents a range of mean wind power density or approximate mean wind speed at specified heights above the ground. Areas designated class 3 or greater are suitable for most wind energy applications, whereas class 2 areas are marginal, and class 1 areas are generally not suitable.

However, local terrain features may cause the wind power to vary as much as ~ 50% to 100% from the assessment value. Therefore, there may be local areas of higher wind power potential and conversely, some local areas may have lower wind power than that shown by this assessment.

[14] PG&E 2009. http://www.pge.com/includes/docs/pdfs/shared/edusafety/systemworks/dcpp/trifold_v02_05_07_10.pdf
[15] NREL 1961 – 1990 data. http://rredc.nrel.gov/solar/old_data/nsrdb/redbook/atlas/

### Other Technologies

Other renewable energy sources include biogas, geothermal, concentrating solar, tidal and wave power. Biogas digester systems can be installed at any type of industry where waste containing organic material is produced. The City of Pleasanton's wastewater is treated at the Dublin San Ramon Services District (DSRSD) plant on Johnson Drive, where biosolids are anaerobically digested to produce methane that, in turn, is used to generate power. The nearby presence of agricultural and farming operations suggests the potential of capturing energy from related waste organic materials.

The other technologies mentioned above are not being considered at this time due to a variety of reasons. Geothermal and concentrating solar are both large scale renewable energy technologies not deemed appropriate at this time. Tidal and wave power are still emerging technologies, not yet commercially available.

## Building Stock

Buildings comprise the largest source of demand for electricity and natural gas. Residential and commercial buildings have very different energy consumption characteristics, both in terms of time of use and energy intensity. In addition to size, building type and occupancy characteristics, the only major factor in how much energy a building uses is the age of the building.

Prior to 1978, there were no energy codes for buildings. Therefore, the greatest energy efficiency improvement opportunities are typically found in the oldest buildings. Starting in 1978, the State of California adopted Title 24, Part 6 of the California Code of Regulations for Energy Efficiency Standards for Residential and Nonresidential buildings. While the Title 24 code is typically updated every 2 to 4 years, major updates and revisions occurred in 1992 and then again in 2001.

In PG&E's territory, the majority of buildings were built before Title 24 was enacted, or during the early years of the building energy codes. The City of Pleasanton experienced significant growth in recent years, however, and much of its building stock may be newer than the average for the PG&E service territory.

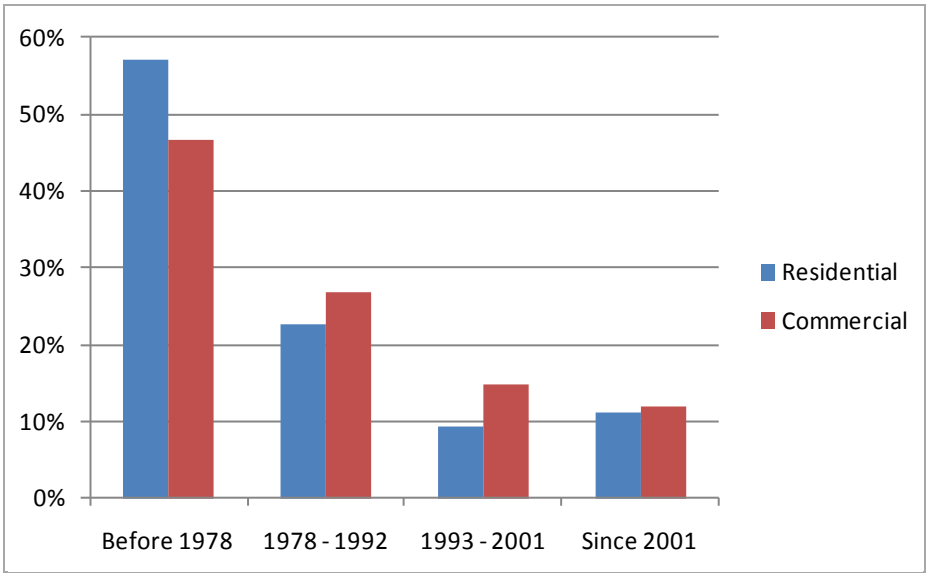



Figure 3-2
Distribution of Building Construction Date, by Building Type for PG&E Territory

# Goal 1: Reduce Energy Used by the Community

The vast majority of electricity and natural gas-related GHG emissions in the City are related to residential and commercial buildings. Following the principle of "Reduce, then Produce," it is prudent to first reduce energy demand and maximize energy efficiency, and then look to generate electricity with low carbon fuels and renewable resources.

This goal is focused on assisting the community to reduce its energy usage through efficiency improvements. While energy efficiency is generally the most cost-effective approach for reducing GHG emissions, and has numerous co-benefits including cost savings and promotion of local, green collar jobs, nothing is "greener" than eliminating or lowering demand for energy by changing consumptive behavior. For example, using an outdoor line to dry clothes lowers energy demand more effectively than purchasing and using a more efficient dryer. The City is making a concerted effort to influence behavior and promote efficiency programs. See the Community Engagement section for details.

The following strategies seek to promote energy efficiency through streamlined city processes, leveraging existing programs, enabling financing, and developing new programs.

### Strategy EC1: Use City Codes, Ordinances and Permitting to Enhance Green Building, Energy Efficiency, and Energy Conservation

Municipal code defines regulations to ensure the health and safety of the community, and to improve the quality of life of the citizens of Pleasanton. The Pleasanton Municipal Code is a body of law that, among other things, regulates the manner in which a property owner can develop his or her property and the types of uses allowed on that property. Reducing consumption of electricity, natural gas and water, as well as promotion of environmentally sustainable material use, will require implementation of green building practices in the City.

The existing Green Building Ordinance is a specific law found in the municipal code. In 2002, the City was at the forefront of the green building movement when it adopted green building requirements for new commercial buildings of 20,000 square feet or more. The ordinance requires new and significantly remodeled buildings to incorporate measures from the U.S Green Building Council's LEED™ certification system. In 2006, the City again continued as a local government leader in the green building field and expanded its green building requirements to new single family residential projects of 2,000 square feet or larger.

With the State of California enacting mandatory Green Building Standards Code (CALGreen) for all new buildings, the City is now working to coordinate its compliance and to determine whether to adopt the additional optional tiers to go beyond the minimum requirements of the code. The Community Development Department is taking the lead to develop amendments to the Pleasanton Municipal Code to incorporate CALGreen as the standard.

A construction permit or building permit is required for new construction, or adding on to pre-existing structures, and in some cases for major renovations. This represents an opportunity to ensure that non-building related streetscapes also support energy efficiency and reduced energy use. The City may also consider developing sustainable mitigation measures for proposed projects or developments that are valuable to the community, but do not strictly conform to the requirements of a qualified climate action plan. These alternative mitigation measures would include projects that would benefit the community in general, such as providing electric vehicle charging stations, solar installations, roadway repairs using light-colored materials, or other measures designed to reduce the community's carbon footprint. Amendments or a new ordinance

related to the municipal code can support measures to reduce heat island effects and further decrease energy used for cooling buildings during warm weather days.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

### EC1: Use City Codes, Ordinances and Permitting to Enhance Green Building, Energy Efficiency, and Energy Conservation

Annual GHG Reduction Potential (MT $CO_2e$): 3,807
Estimated Annual Cost to the City: $10,983
Estimated Cost per MT: $2.88

| Supporting Actions | | Timeframe |
|---|---|---|
| EC1-1 | Continue to implement and improve the City's existing Green Building Ordinance for **commercial** buildings, according to the California Green Building Standards Code. Include new requirements for shade trees, cool roofs, and landscape lighting. Achieve 25% beyond Title 24. | Since 2002; upgrade in 2011 |
| EC1-2 | Implement the 2006 residential Green Building Ordinance requiring new and significantly remodeled **residential** buildings to incorporate measures from Build It Green (BIG) green building guidelines. Continue to implement and update according to the California Green Building Standards Code, and include requirements for shade trees and cool roofs. Achieve 25% beyond Title 24. | Since 2006 |
| EC1-3 | Modify municipal code to reduce heat island effects in the City by requiring light-colored paving material for roads and parking areas, as well as parking lot shade trees. | 2012 |

### Strategy EC2: Leverage State and Local Programs to Increase Energy Efficiency and Conservation

The California Public Utilities Commission has set the ambitious goal to reduce energy use in existing homes by 40% and install low-energy heating and cooling systems in 50% of new and existing homes by 2020.[16]

One simple but effective way to promote energy efficiency in existing buildings is to make residents and business owners aware of the various programs available that defray the up-front cost of energy-efficiency retrofits.

A variety of programs exist to encourage homeowners and renters to upgrade their homes with energy-efficient technology. For example, residents can apply for PG&E rebates on heating, ventilation, and air conditioning (HVAC) equipment, lighting, insulation, cool roofs, energy-efficient appliances, low-income weatherization, and so forth. In addition to rebates, residents can take advantage of federal tax credits, such as the 30% tax credit on efficiency upgrades, up to $1,500. These rebates and credits make energy efficiency very attractive, because they greatly reduce the payback period, after which the renter/owner starts saving money they would have otherwise spent on energy.

In 2010, the City partnered with PG&E to initiate an energy efficiency outreach campaign to small and medium businesses in collaboration with the Business Energy Services Team (BEST) Program. The program is designed to help small businesses save energy and money by providing a "no-cost" business energy use assessment. The assessment covers a detailed proposal of energy saving recommendations, incentives to reduce equipment costs and direct installation of approved energy efficiency measures. The

[16] California Public Utilities Commission, 2008. *California Long Term Energy Efficiency Strategic Plan: Achieving Maximum Energy Savings in California for 2009 and Beyond*.

PG&E area representative, City staff, and the BEST Program contractor canvassed local commercial districts to generate participation in the program.

In 2011, the City initiated its local implementation of Energy Upgrade California (incorporated into a more comprehensive program called Energy Upgrade Pleasanton) to leverage outside financing and rebates available from PG&E, the state of California, Alameda County, and other sources. The basic package available to residents provides for air sealing, attic insulation, duct sealing, hot water pipe insulation, thermostatic control valves for showers, and combustion safety testing for gas appliances. An advanced package provides funding and rebates toward such energy saving equipment as high-efficiency furnaces, energy-efficient cooling, solar water heater systems, energy-efficient windows, duct replacements, external wall insulation and painting, and other custom energy-saving measures.

Additionally, the City partnered with Rising Sun Energy on its California Youth Energy Services program, which sought to provide free "green house calls" to Pleasanton renters and homeowners. Pleasanton youth, aged 16-22, were recruited to fill these paid summer positions. As a result, CYES assessed and retrofit 270 homes with energy efficient CFL light bulbs (over 3,000), power strips, retractable clothes lines, faucet aerators, and high-efficiency showerheads. CYES staff met with each resident and further explained the rebates and incentives available for further improvements. The program was very well received by the community, and the City intends to continue its partnership next summer.

The City will continue to work closely with PG&E and other organizations providing rebates and incentives for energy efficiency to the Pleasanton community. Activities will include coordinating marketing and outreach and leveraging City contacts with area associations such as the Chamber of Commerce, Pleasanton Downtown Association (PDA), Hacienda Business Park (HBP), neighborhood associations, and the school district.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

### EC2: Leverage State and Local Programs to Increase Energy Efficiency and Conservation

Annual GHG Reduction Potential (MT $CO_2e$): 19,449
Estimated Annual Cost to the City: $16,900
Estimated Cost per MT: $0.87

| Supporting Actions | | Timeframe |
|---|---|---|
| EC2-1 | Recruit a manager of energy and sustainability to oversee implementation of a community-wide Climate Action Plan, ensure compliance with reporting requirements, and coordinate outreach activities with the public and other key stakeholders. | Hired in 2010 |
| EC2-2 | PG&E Partnership Program - Implement a multi-year integrated resource strategy that incorporates PG&E's Core, Third Party, Local Government Partnership, Demand Response, Clean Air Transportation, and Distributed Generation, and other pertinent programs. | July 2009 |
| EC2-3 | Provide funding for StopWaste's Green Packages Program - a set of verifiable standards and specifications for retrofit projects. Local participation may include an analysis of local housing stock to target high-impact areas, production of outreach materials to help property owners understand retrofit options, and bundling of incentives and benefits from existing programs (rebates, tax credits, etc). The program also provides training, verification, and progress tracking. | 2010 |
| EC2-4 | Energy Upgrade Pleasanton: Support the Energy Upgrade California Program, through City's concerted community engagement programs, to manage a large-scale residential retrofit program. This program targets 15 to 30 year-old residential subdivisions with large numbers of similar houses that are good candidates for energy efficiency retrofits. The City's Solar Alliance program, initiated in 2011, offers free evaluations, rebates, and financing options for residential and commercial solar installations using local installers. | 2011 |

| Supporting Actions | | Timeframe |
|---|---|---|
| EC2-5 | Participate in Energy Upgrade California. This program, funded in part by grants from the CEC and by California utility customers and administered by utility companies under the auspices of the CPUC, currently offers energy efficiency audits and rebates for home energy upgrades. In the future, the program will also cover commercial buildings. Supports EC2-3. | 2011 |
| EC2-6 | Outreach and education including annual update of Pleasanton Green Guide, and outreach for demand response: work with PG&E to develop targeted outreach to commercial/industrial customers. | Ongoing |

### Strategy EC3: Establish and Promote Financing and Financial Incentive Programs to Support Energy Efficiency and Conservation

A significant number of federal tax incentives are available to the citizens of Pleasanton. These include the Energy-Efficient Commercial Buildings Tax Deduction, the Energy Efficient New Homes Tax Credit for Home Builders, Energy-Efficient Mortgages, and the Residential Energy Efficiency Tax Credit, to name a few.[17] The City will promote and increase awareness of these federal incentives, through the website and other information channels for residents and local businesses.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential. It is expected that the largest savings associated with EC3 will come from commercial buildings.

#### EC3: Establish and Promote Financing and Financial Incentive Programs to Support Energy Efficiency and Conservation

Annual GHG Reduction Potential (MT $CO_2e$): 7,416
Estimated Annual Cost to the City: $7,500
Estimated Cost per MT: $1.01

| Supporting Actions | | Timeframe |
|---|---|---|
| EC3-1 | Assess feasibility of establishing a revolving loan fund for home performance audits and system upgrades. | 2013 |
| EC3-2 | Through City's concerted community engagement programs, promote and increase awareness of available federal rebates and tax credits for energy efficiency upgrades. | 2011 |

### Strategy EC4: Develop Programs to Increase Energy Efficiency and Conservation

In addition to existing programs and tax incentives available to the Pleasanton community, the City seeks to supplement and identify gaps in existing offerings to the community. In 2009 the Pleasanton City Council approved the formation of an advisory committee. The Committee on Energy and the Environment is tasked with tracking and evaluating trends in energy efficiency and sustainability, and making appropriate recommendations to City staff and City Council. Supporting all energy efficiency and conservation programs with strong public outreach is a major goal of the Committee (see section on Community Engagement for more information).

The City will also develop a local Residential Energy Efficiency Program and Commercial Energy Efficiency Program to address the gaps in programs offered by PG&E, Energy Upgrade California, and the federal government. The residential program will focus on providing incentives for energy efficiency measures not

[17] See U.S. Department of Energy's Database of State Incentives for Renewables and Efficiency (DSIRE): http://dsireusa.org/incentives/index.cfm?State=US&ee=1&re=0

covered by existing programs or to customers who are not eligible for incentives through the existing programs. The commercial program will provide a rebate for a comprehensive energy efficiency audit, which is not currently offered through PG&E. These programs will be promoted and supported by the City's outreach efforts.

Other programs include a tree planting and vegetation shading program to reduce cooling loads on buildings in the summer. The City would determine eligibility requirements for different types of trees or green trellises and develop a list of pre-approved tree species. Additionally, the City will promote daylighting to reduce energy related to lighting. Daylighting technologies include solar tubes and skylights. Information and workshops will also be provided to the community.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

### EC4: Develop Programs to Increase Energy Efficiency and Conservation

Annual GHG Reduction Potential (MT $CO_2e$): 9,342
Estimated Annual Cost to the City: $128,583
Estimated Cost per MT: $13.76

| Supporting Actions | | Timeframe |
|---|---|---|
| EC4-1 | Establish a Committee on Energy and the Environment to track and evaluate trends in energy demand, energy efficiency, and sustainability, and to make appropriate recommendations to City staff and City Council. | Since 2009 |
| EC4-2 | Implement a voluntary program that promotes energy and water-efficiency upgrades of existing buildings (residential and/or commercial). Include a municipal incentive program for residential and commercial energy demand reduction, energy efficiency retrofits, and/or renewable energy projects. This is a funded incentive program ($250,000 initially) that goes beyond the City's green building code. | Start in 2011 |
| EC4-3 | Implement a citywide tree planting program, with a focus on shade trees. | Start in 2015 |
| EC4-4 | Promote use of solar tubes, skylights, and other daylighting systems. | 2011 |
| EC4-5 | Consider Home Energy Ratings System scores and fostering recognition of buildings that complete a prescriptive package of actions. | 2012 |

## Goal 2: Reduce Energy Used by Municipal Operations

While municipal operations constitute a small fraction of the total citywide GHG emissions, municipal actions to reduce energy usage will help save money and demonstrate important leadership to the community. The City of Pleasanton has already been proactively promoting environmental responsibility and conservation related to municipal operations.

#### Strategy EG1: Promote Green Building and Energy Efficient Development for Government Operations and City Infrastructure

In July 2001, the City Council adopted a pledge endorsing the Governor's "Energy Conservation Pledge" and committed Pleasanton to pursue a 15% reduction in energy use. To conserve energy, in 2000 and 2001, the City updated its traffic signal lighting by replacing the standard incandescent bulbs with light-emitting-diode (LED) bulbs. In addition, the City enrolled in an Energy Star building performance improvement program and continued to upgrade municipal facilities based on the results of energy audits. It is estimated that the original 15% reduction goal was achieved.

Proposed or in-progress municipal facility upgrades include retrofitting the heating, ventilation and cooling (HVAC) system at the Senior Center, new lighting at the Library, energy efficient variable frequency drives on motors at the Aquatic Center and high-efficiency water heaters at all fire stations. Furthermore, the Fire Station #4 is the only fire station in the United States built to the LEED™ Gold Certification level. Its energy efficiency and sustainability features include being built above Title 24 energy code, use of recycled and sustainable building materials, low volatile organic compound (VOC) emissions, and landscaping that promotes water conservation.

As part of this Climate Action Plan, the City intends to assess opportunities for further energy efficiency upgrades, especially related to HVAC, weatherization, and lighting. The City will replace fluorescent bulbs in the illuminated street signs with LED bulbs and evaluate technologies for upgrading street lights. In addition to municipal facilities, the City will assist the school district with energy audits and green building checklists to promote energy efficiency. These initiatives will require a thorough upfront assessment of specific opportunities for different technologies and equipment to enable energy savings.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

### EG1: Promote Green Building and Energy Efficient Development for Government Operations and City Infrastructure

Annual GHG Reduction Potential (MT $CO_2e$): 1,194
Estimated Annual Cost to the City: Net negative (estimate 6 year payback)
Estimated Cost per MT: Net negative

| Supporting Actions | | Timeframe |
|---|---|---|
| EG1-1 | Eliminate energy demand, where feasible. Perform energy efficiency upgrades for municipal buildings, including lighting and HVAC retrofits. Assess opportunities for weatherization and insulation. Install more efficient heating, cooling, computer, and lighting systems in City infrastructure whenever practical and/or replacement systems are needed. | 2011 |
| EG1-2 | Eliminate illuminated street signs, where feasible. Replace all fluorescent bulbs in illuminated street name signs with more energy efficient systems (e.g., LEDs). | 2011 |
| EG1-3 | Eliminate street lights, where feasible. For new streetlights, and for replacing existing sodium vapor street lights, use more energy efficient systems (e.g., LEDs). | 2011 |
| EG1-4 | Assess opportunities to eliminate energy demand and improve energy efficiency of municipal water/sewer system equipment (e.g., variable frequency drives on well motors). The City has an ongoing motor and pump replacement program to properly maintain this infrastructure. | 2011 |
| EG1-5 | Assist the school district in developing and implementing an energy efficiency and conservation program. | 2011 |

## Goal 3: Increase Renewable Energy Generation

On-site renewable energy systems offer another important lever for reducing emissions. Generally, renewable energy systems should be installed only after all cost-effective efficiency measures have been implemented. The best options for Pleasanton businesses and residents are solar hot water heating and roof-top photovoltaic (PV) systems. Wind energy is also becoming more cost effective on a small scale, with commercially available systems for the built environment.

The two main strategies for increasing renewable energy generation in the community are focused on removing barriers from local ordinances and permitting, and supporting programs that provide financial

assistance and information. For municipal operations, the effective strategies include on-site renewable energy installations on city-owned facilities and Green Power purchase agreements.

### Strategy ER1: Implement Local Ordinances and Permitting Processes to Support Renewable Energy

The City's Generator Siting Ordinance encourages the development of distributed generation facilities by permitting photovoltaic facilities throughout the City. Other types of distributed generation facilities, such as small fuel-cell facilities, wind energy facilities and small natural gas cogeneration facilities are allowed in selected areas of the City, typically away from residential areas where they may generate noise or air quality impacts.

To expand the areas allowable for wind turbine installations, the City plans to develop a zoning ordinance specific to wind energy. The zoning ordinance will provide clear guidelines to allow the installation and use of vertical axis wind turbines. The City will also define the permissible height for wind turbines, locations and setback requirements, and define the necessary permits. Public hearings and meetings with local stakeholders will be held to help the City to develop the new ordinance.

The City will also expedite permits associated with renewable energy installations. Permitting for solar photovoltaic systems has already been streamlined to allow property owners to walk-in without an appointment to submit paperwork and obtain necessary permits within 15 minutes. The City plans to streamline permitting for other technologies such as solar hot water heating, as well as for retrofits and building projects that meet green building standards.

Community choice aggregation (CCA) would require a significant effort by the City to contract for electric service separate from PG&E. CCA was enabled by California Assembly Bill 117 to allow cities and counties to purchase electricity through a third-party instead of PG&E. The electricity purchased would still be delivered by PG&E through its wires and billed through its meter reading and billing department. To pursue this action, the City would need to develop a CCA Implementation Plan that includes the organization structure of the program, its operations and funding, and rate setting and costs to participants.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

#### ER1: Implement Local Ordinances and Permitting Processes to Support Renewable Energy

Annual GHG Reduction Potential (MT $CO_2e$): 2,389
Estimated Annual Cost to the City: $10,125
Estimated Cost per MT: $4.24

| Supporting Actions | | Timeframe |
|---|---|---|
| ER1-1 | Adopt local zoning ordinances that encourage residential renewable energy installations (e.g., wind turbines). | 2013 |
| ER1-2 | Expedite green permits and include outreach materials in all permit applications. "Green" permits include solar and renewable energy permits, and new construction/renovations according to "green building" guidelines. | 2011 |
| ER1-3 | Consider Community Choice Aggregation to increase the proportion of clean, renewable resources in the electric mix used by the City. | 2013 |

### Strategy ER2: Develop Programs to Promote On-Site Renewable Energy in the Community

The largest barriers to on-site renewable energy are access to information, high up-front financing costs and long cost-recovery periods. The City will continue to participate in the Solar Cities Program to educate

consumers with the facts about residential solar energy. Since 2007 (through 2011), there have been more than 400 residential solar systems installed in Pleasanton, providing a total nameplate capacity of more than 4 MW and reducing $CO_2$ emissions by an estimated 2,500 tons annually. Progress with this program far exceeds initial expectations.

The City offers free educational workshops, web resources, and targeted information to help homeowners make decisions about investing in a solar photovoltaic system. In addition to solar photovoltaic technologies, the City plans to provide information on solar hot water heating systems, wind turbines, and fuel cell technologies.

The City is planning to conduct additional workshops and seminars to distribute information about solar photovoltaic systems and associated funding and incentive opportunities. For example, PG&E and the State of California offer incentive programs that help defray the initial investment of energy systems. Starting in 2011, PG&E will be required to pay its customers for the excess energy they generate from on-site solar systems.

In addition to providing information, the City is researching the feasibility of participating in a local solar cooperative to purchase solar panels in bulk and leverage economies of scale in purchase and installation costs. The program will solicit bids from solar contractors contingent on the number of systems to be installed, and enable homeowners to sign up to participate. The City will also look to partner with community members to develop solar projects on parking lots and potentially for electric vehicle charging stations.

Finally, City staff will examine the existing level of renewable energy generated within the City and develop a goal for the installation of new or expanded renewable energy systems in the community.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

### ER2: Develop Programs to Promote On-Site Renewable Energy in the Community

Annual GHG Reduction Potential (MT $CO_2e$): 10,518
Estimated Annual Cost to the City: $36,125
Estimated Cost per MT: $3.43

| Supporting Actions | | Timeframe |
|---|---|---|
| ER2-1 | Evaluate existing installed renewable energy capacity in community and set future installed goal. | 2012 |
| ER2-2 | Solar Cities Program (Solar City Program) - Since 2007, Pleasanton has participated in a customer assistance program designed to facilitate the purchase and installation of photovoltaic and other energy efficient technologies for residential, commercial, and municipal facilities. Outreach activities are currently being planned to enhance the existing program. | 2007 |
| ER2-3 | Increase promotion (rebates, education and outreach, demonstration projects and or other means) of distributed generation, especially PV, solar thermal, solar hot water, and solar cooling. Also consider including bloom box or other fuel cell technologies. | 2013 |
| ER2-4 | Form a Pleasanton solar cooperative to purchase solar panels in bulk and leverage economies of scale in installation costs. | 2013 |
| ER2-5 | Consider installing neighborhood solar grids (use parking lots) for solar EV charging stations. | 2013 |

### Strategy ER3: Promote Use of Renewable Energy for Municipal Operations

Following the principle of "Reduce, then Produce," the City will complement its energy efficiency efforts with initiatives to displace conventional energy with renewable resources. To date, the City has installed 424 kW of solar photovoltaic (PV) systems across four buildings. These include the Operations Service Center (360 kW system), Firehouse Arts Center (30 kW system), Fire Station #4 (20 kW system), and the Pleasanton Police Department (14 kW system). The City also plans to investigate the feasibility of installing additional alternative energy projects at its municipal facilities.

PG&E does not currently offer 100% green electricity to its customers. However, the City could procure renewable energy credits (RECs) associated with specific renewable energy projects that are not being used for the state RPS. The City will also assess the relative costs and benefits of purchasing RECs to match the conventional PG&E power being used for municipal operations.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

#### ER3: Promote Use of Renewable Energy for Municipal Operations

Annual GHG Reduction Potential (MT $CO_2e$): NA
Estimated Annual Cost to the City: $0
Estimated Cost per MT: NA

| Supporting Actions | | Timeframe |
|---|---|---|
| ER3-1 | Evaluate existing installed renewable energy capacity for municipal operations and set future installed goal. | 2012 |
| ER3-2 | Evaluate the feasibility of installing solar (PV) panels or vertical wind turbines at City-owned facilities. | Started in 2009 |
| ER3-3 | Investigate feasibility of purchasing Green Power for municipal operations. | 2012 |

# Solid Waste Minimization

## 2020 Business-as-usual GHG Emissions: 43,521 MT $CO_2e$
## Annual Reductions by 2020: 29,605 MT $CO_2e$

## Introduction

GHG emissions associated with landfilling of solid waste contribute approximately 5% to the City's inventory. The emissions are largely generated by the slow decomposition of organic waste material into methane (a GHG with a much greater warming potential than $CO_2$) at the Vasco Road landfill, much of which escapes to the atmosphere, even at landfills like Vasco Road that are designed to capture and flare the methane. Additional emissions come from the collection, transportation, and handling of waste. Diverting solid waste from landfills is an effective way to reduce GHG emissions associated with landfill disposal and with the energy embodied in material goods and their packaging. Strategies for reducing the amount of solid waste generated by the community include building on existing diversion programs and considering new ways to promote and incentivize the community to work towards zero waste.

Table 3-5
Summary Table of GHG Reduction Impacts for Solid Waste Minimization Strategies

| | Goal / Supporting Strategy | Annual GHG Reduction Potential (MT $CO_2e$) | Percent of Category |
|---|---|---|---|
| **SW** | **Establish Pleasanton as a Zero Waste Community by 2025** | | |
| SW1 | Increase recycling, organics diversion, and waste reduction associated with municipal operations. | (included in community reductions) | 0% |
| SW2 | Increase recycling, organics diversion, and waste reduction associated with the entire community. | 29,605 | 100% |
| | Total for Category | 29,605 | 100% |

## Background

There is an enormous amount of energy (and associated GHG emissions) embodied in the material products that City residents purchase, use, and discard. This energy is expended in the extraction, processing, and transporting of raw materials, and in manufacturing and delivering goods to market. Reuse and recycling helps conserve much of this embodied energy. Many readily recyclable materials such as glass, plastic, metal do not easily decompose, and sending them to landfill represents a loss of resources as many of these materials can be recycled into other products, thereby reducing the demand for virgin materials in manufacturing and production. In addition to being energy intensive, upstream extraction and processing of raw materials (mining, construction, fuel production, metals processing, etc.) generates enormous volumes of waste material. Forty to seventy times more waste (and associated emissions) is generated from the upstream industrial processes associated with product manufacturing than with their disposal to landfill.[18]

Composting organic waste material, including food scraps, non-recyclable paper products, and plant material, keeps these materials out of landfill, thereby avoiding methane emissions. A well-managed composting operation provides a direct reduction of landfill methane emissions while producing a nutrient rich soil amendment that can be used to reduce pesticides and chemical fertilizers, retain water, build soil, and increase food productivity. Compost also helps increase carbon sequestration in soils.

Pleasanton has made great strides in waste diversion in recent years. Waste sent to landfill across all sectors of the community has decreased substantially even though the population has increased. The city reduced its annual waste sent to landfill by 27% from 2000 to 2008, and the citywide diversion rate increased from 53% in 2005 to 71% in 2009.[19] Despite the increased diversion, the Stopwaste.org *2008 Waste Characterization Study* shows that the majority of the material Pleasanton still sends to landfill is compostable or recyclable (organics, yard waste, and paper constitute approximately 64% of waste sent to landfill).[20] This means that there is still ample opportunity for reducing GHG emissions by focusing efforts on the continued improvement of the City's diversion programs.

The City is well positioned to achieve zero waste, commonly defined as 90% diversion of waste from landfill. Recycling and composting are the fundamental elements of a zero waste strategy. The City can attain 90% diversion by focusing on improving recycling and composting programs and increasing participation. Resources available through Alameda County's StopWaste.org and the City's relationship with Pleasanton Garbage Service (PGS) place the City in a strong position to do just that. In 1989, Pleasanton entered into a franchise agreement with PGS to provide exclusive hauling services to the community, establishing a regulatory relationship between the City and its service provider.

Becoming a zero waste city also means that Pleasanton must work toward addressing the portion of the waste stream that cannot be recycled or composted. Supporting and implementing consumer and producer responsibility legislation and an Environmentally Preferable Purchasing Policy are ways that the City can further decrease waste and demonstrate its commitment to sustainability.

[18] Makower, Joel, Strategies for the Green Economy: Opportunities and Challenges in the New World of Business, McGraw-Hill. 2009.
[19] R.W. Beck, 2008 Alameda County Waste Characterization Study, StopWaste.org, June 2009. Appendix A14. http://www.stopwaste.org/docs/acwcs-2008r.pdf
[20] R.W. Beck, 2008 Alameda County Waste Characterization Study, StopWaste.org, June 2009. Appendix A14.

# Goal: Establish Pleasanton as a Zero Waste Community by 2025

The City will prioritize the diversion of waste from landfill as its primary solid waste goal. Achieving zero waste will entail writing and implementing policy, expanding and improving recycling and composting programs, maximizing the use of technical assistance, and increasing public awareness and education about waste reduction and landfill diversion. Although the community and the municipality are considered separately, many actions between the two entities are synergistic and will be implemented contemporaneously.

The City will adopt a "Zero Waste by 2020" goal for municipal operations and a "Zero Waste by 2025" goal for the entire community. To achieve these goals, the commercial, residential, and government sectors will rely on expanded programs from PGS and increased participation in those programs. Incentivization, outreach and education will be essential in increasing community participation in waste reduction, recycling, and composting programs.

### Strategy SW1: Increase Recycling, Organics Diversion, and Waste Reduction Associated with Municipal Operations

It is the City's desire to lead by example in reducing emissions and waste to landfill. To address a long-term sustainable view of discards and resource management, the City should adopt a goal of zero waste for municipal operations by 2020. Setting this goal will require coordination between public and private stakeholders. A key player will be the city's contracted waste hauler, who must partner with the City to provide the hauling and processing infrastructure needed for 90% landfill diversion.

Writing and adopting a Zero Waste Plan will go beyond the actions identified in the 2010 Solid Waste Assessment and provide a detailed strategy and framework for the city and PGS that will shape diversion program building, and provide the outreach tools needed for a cultural shift in how waste is viewed. Pleasanton is already working on actions toward zero waste, with the development of four composting/recycling collection sites for municipal operations and the implementation of an Environmentally Preferable Purchasing policy.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

#### SW1: Increase Recycling, Organics Diversion, and Waste Reduction Associated with Municipal Operations

Annual GHG Reduction Potential: Included in SW2
Estimated Annual Cost to the City: Included in SW2
Estimated Cost per MT: $1.79

| Supporting Actions | | Timeframe |
|---|---|---|
| SW1-1 | Adopt a City resolution to achieve Zero Waste (defined as 90% diversion) for government operations by 2020. | 2011 |
| SW1-2 | Develop strategy and implementation plan to achieve government Zero Waste by 2020. | 2012 |
| SW1-3 | Adopt an Environmentally Preferable Purchasing Policy. | 2011 |
| SW1-4 | Launch compost and/or recycling collection sites for municipal facilities: one at the Operations Service Center, two at City Hall, and one at the Senior Center. | 2012 |

### Strategy SW2: Increase Recycling, Organics Diversion, and Waste Reduction Associated with the Entire Community

To assist in achieving the zero waste goal for the community, Pleasanton will develop a Zero Waste Plan for residents and businesses that will complement the City Government's achievements and delineate a path for future actions. The plan will provide a blueprint for achieving interim goals and a strategy for reaching out to the community. In order to meet the community zero waste goal, a cultural shift will be needed so that both businesses and residents learn to value discards as resources and shift away from the "single use" mentality.

In recent years, PGS has expanded its recycling and organics programs. In 2008, a rate study was conducted to help PGS internalize the costs of expanding services while incentivizing those services for businesses and residents. As programs grow over time, it is expected that rates and incentives will need to be considered again to match and motivate program growth and cost of living increases.

Single family residences in Pleasanton have been offered collection services for organic material including food and yard waste since 2006. There remains an opportunity to expand organics collection to the multi-family residential sector. In 2009, dedicated commingled recycling collection services were implemented for both single and multi-family residential, replacing an existing "blue bag" recycling program where limited materials were bagged and placed in the garbage cart. In other jurisdictions, the introduction of single stream curbside programs have increased recycling participation by facilitating easier disposal, and the same can be expected in Pleasanton. Outreach to the residential sector will include marketing campaigns that target program participation, reduced use of toxics, proper handling of household hazardous wastes such as cleaning products and motor oil, and buying local. Additional issues to address include raising consumer awareness about environmentally preferable product alternatives, reducing unnecessary consumption, and promoting the reuse and sharing of goods within the community.

On the commercial side, many recent changes have also helped boost the City's diversion rate. In 2009, a Construction and Demolition Debris Ordinance was passed, requiring materials from this sector to be recycled. In 2011, commercial single stream commingled recycling was launched, offering carts and the first 96 gallons of collection service at no charge. Also planned for this year is the launch of a commercial organics program, which has the potential to garner the most dramatic GHG emissions reductions from landfill diversion for the City. The City should utilize the technical assistance resources available through StopWaste.org to help recruit and train businesses for this new program. Outreach to businesses will include encouraging them to adopt waste reduction strategies and to increase the use of durable goods.

In addition to landfill diversion programs, the City has also considered implementing ordinances that influence consumer behavior such as banning single-use shopping bags or requiring a bag fee. While the political and legal climate has delayed action on a bag ordinance, continued monitoring of other potential ordinances or bans is recommended. These include local ordinances governing diversion standards for special events and festivals, and requiring adequate space for recycling and compost collection for new construction. Recently, StopWaste.org commissioned a study (including stakeholder engagement and preparation of an Environmental Impact Report) to pursue a county-wide ban on single-use plastic bags. It is estimated that the EIR will be complete by the end of 2011, and adopted in 2012.

The City will assess its progress toward zero waste to landfill. If an interim goal (e.g., 80% diversion by 2015) has not been met, then an additional ordinance to mandate either a landfill ban or diversion program participation should be considered. San Francisco, a city with a similar franchise hauling agreement, found that by requiring universal composting and recycling, participation in their programs increased by 25% in the first quarter of implementation and continues to grow. Additionally, after the first year, mandatory recycling and composting has become a self-propelling mechanism for educating the public.

The City will continue to support state policies for extended producer responsibility and improving the design and recyclability of products and packaging.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

### SW2: Increase Recycling, Organics Diversion, and Waste Reduction Associated with the Entire Community

Annual GHG Reduction Potential (MT $CO_2e$): 29,605
Estimated Annual Cost to the City: $53,000
Estimated Cost per MT: $1.79

| Supporting Actions | | Timeframe |
|---|---|---|
| SW2-1 | Adopt a City resolution to achieve zero waste (defined as 90% diversion) citywide by 2025. | 2011 |
| SW2-2 | Develop community zero waste plan - 75% diversion by 2015; 85% diversion by 2020; 90% by 2025; that includes strategies and implementation timeline for improving diversion and reducing waste generation. | 2012 |
| SW2-3 | Residential Curbside Recycling Program – In 2009, new residential curbside recycling program replaced the blue bag program with a separate collection cart for recyclable materials. Expand residential recycling program to include the collection and processing of more materials including single use plastics. | Ongoing since 2009 |
| SW2-4 | Partner with the PGS to expand commercial recycling program to include the collection and processing of more materials; launch commercial organics program.<br>Note: Commercial recycling will be mandatory by 2012. | 2011 |
| SW2-5 | Expand residential yard and food waste collection program to multifamily residences, a service provided to single family residents since 2006. | 2014 |
| SW2-6 | Implement and enforce Construction and Demolition debris recycling ordinance. | 2009 |
| SW2-7 | Launch outreach campaign to increase participation in residential recycling and composting programs and to promote waste reduction. | 2012 |
| SW2-8 | Utilize resources available through StopWaste.org to promote backyard composting, grasscycling, and low maintenance landscaping. | ongoing |
| SW2-9 | Utilize resources available through Stopwaste.org to provide technical assistance for waste diversion and institute a Zero Waste Schools program. | 2011 |
| SW2-10 | Utilize resources available through Stopwaste.org to promote outreach and education to businesses to use less packaging, and more durable, local, and low-impact goods, and reusable shipping containers. | 2012 |
| SW2-11 | Establish municipal ordinance requiring large and special events producers to plan and divert waste from landfill. | 2011 |
| SW2-12 | For new and remodeled commercial and multifamily buildings, require adequate space and logistics for handling of recyclable and compostable materials. | 2011 |
| SW2-13 | Establish a battery recycling program with various collection centers. | Done |
| SW2-14 | Consider a Landfill Ban or Mandatory Recycling and Composting if zero waste goals are not on track. | 2015 |
| SW2-15 | Support state policies and implement local policy for extended producer responsibility. | Ongoing |
| SW2-16 | Outreach and education:<br>• Implement an education and marketing campaign to increase participation in residential recycling and composting programs and to promote waste reduction.<br>• Provide outreach and education to businesses to use less packaging, and more durable, local, and low-impact goods, including re-usable shopping bags and compostable foodware;<br>• Host free community e-waste and prescription collection events. | Ongoing |

# Water and Wastewater

2020 Business-as-usual GHG Emissions: 38,489 MT $CO_2e$
Annual Reductions by 2020: 371 MT $CO_2e$

## Introduction

Emissions associated with consumption of water and processing of wastewater contribute approximately 5% to the City's 2005 GHG inventory. The vast majority of these emissions are produced from the processing of wastewater. Wastewater emissions for Pleasanton are generated as methane (CH4) by septic system infrastructure and water treatment at the Dublin San Ramon Service District (DSRSD) Wastewater Treatment Plant (WWTP), which treats all of Pleasanton's wastewater. Additional emissions are generated by the conveyance of water within the City and from other jurisdictions to the boundary of the City, as water is transported from the State Water Project (SWP), the Bryon Bethany Irrigation District (BBID), and from non-local groundwater from the Cawelo Water District and the Semitropic Water Storage District. Both water conveyance and wastewater emissions are counted towards the City's water-related emissions.

Water conservation lowers the energy required for upstream water collection, conveyance, and treatment, and reduces the energy requirements and the process emissions associated with wastewater treatment. The energy intensity of water conveyance is dependent on distance and elevation changes. Emissions from wastewater treatment processes largely depend on the amount of wastewater treated and the organic content of the wastewater.

Effective ways of reducing water use include incentivizing reductions in commercial/industrial outdoor irrigation, providing rebates for residential water conservation devices, and utilizing recycled water. Water conservation actions have many benefits beyond reducing GHG emissions. In addition to maintaining water as a sustainable resource for future generations, conservation preserves water quality, buffers communities from the effects of droughts, and sustains wild habitats.

## Background

The Water Element of the General Plan was adopted by City Council in 2009 to outline policies to guide the growth and land development for the City of Pleasanton. The General Plan goals, consistent with the water and wastewater measures included herein, include conservation of water resources (Policy 1); improve water quality through production and conservation practices that do not harm the environment (Policy 3); ensure an adequate water system for future development (Policy 4); provide adequate wastewater treatment services (Policy 5); support environmentally sensitive approaches to wastewater reuse (Policy 7), and ensure an adequate storm drainage system (Policy 8).

Table 3-6
Summary Table of GHG Reduction Impact for Water and Wastewater Strategies

| | Goal / Supporting Strategy | Annual GHG Reduction Potential (MT $CO_2e$) | Percent of Category |
|---|---|---|---|
| **WA** | **Reduce Water Use** | | |
| WA1 | Conserve community water through building and landscape design and improvements | 272 | 73% |
| WA2 | Conserve water used by municipal operations through building and landscape design and improvements | 1 | 0% |
| WA3 | Increase or establish use of reclaimed/grey water systems | 98 | 27% |
| | Total for Category | 371 | 100% |

### Water Demand

The City General Plan 2005-2025 describes 2005 and 2025 (projected) annual water demand, providing a snapshot of opportunities for conservation. Single-family residences represented approximately half of all City water demand in 2005, by far the largest user. Commercial/ institutional and industrial landscape irrigation accounted for approximately one quarter of demand. The General Plan projects a large increase in water demand through 2025, with the largest proportional increase from the irrigation of commercial/institutional and industrial landscapes.

### Water Supply

The City receives approximately 80% of its water from Zone 7 of the Alameda County Flood Control and Water Conservation District (ACFCWCD). The remaining 20% comes from limited groundwater resources that are owned and operated by the City.

Figure 3-3
Annual Daily Per Capita Water Use Through 2005 (gpcd)

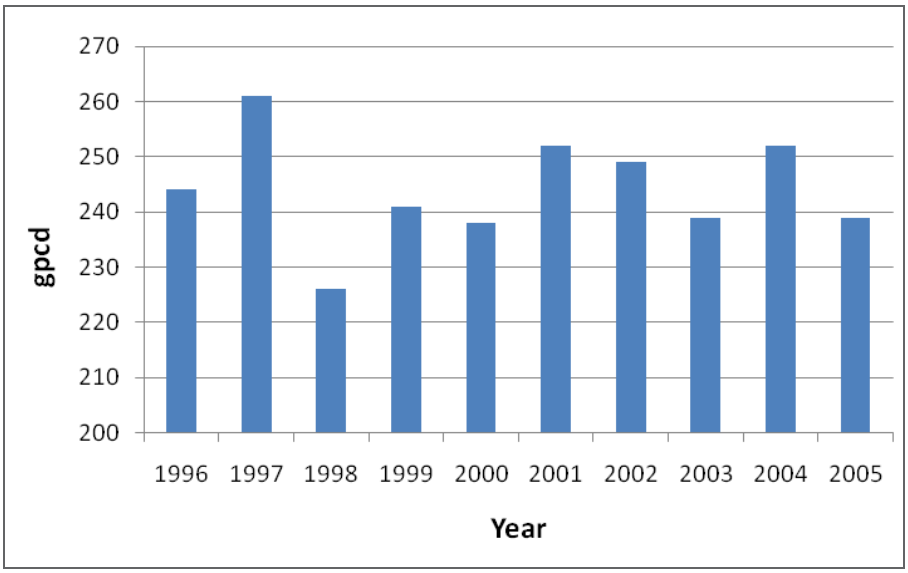
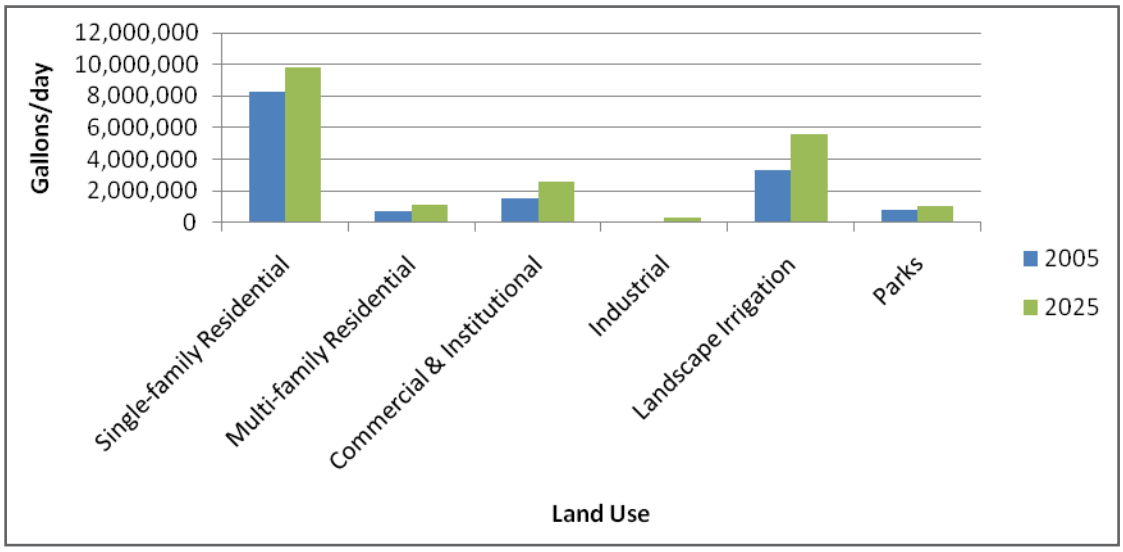



Figure 3-4
Pleasanton Annual Water Demand, 2005-2025




Source: Pleasanton General Plan 2005-2025

The Zone 7 Water District, in collaboration with PG&E, already provides incentives to curb and reduce residential water consumption. Since indoor water use accounts for half of all residential water, the District has offered substantial rebates on large household appliances since 1999. Rebates are provided for new purchases of high-efficiency toilets (HETs) and water-efficient washing machines.

## Water Conservation

The City takes its responsibility to conserve water seriously and actively supports State policies aimed at reducing water use. The California Urban Water Management Planning Act (UWMP Act) requires every

California urban water supplier of more than 3,000 customers to adopt an Urban Water Management Plan (UWMP). In 2009, the State passed the Water Conservation Bill of 2009 (SBX7-7), which requires an updated UWMP every 5 years. It also sets a target of a 20% reduction in State-wide water use by 2020, requiring local jurisdictions to act to meet the Statewide goal.

The City of Pleasanton adopted an updated UWMP, which outlines strategies to meet the 20% reduction goal of SBX7-7 while aligning with the City's water conservation and management policies as described in the General Plan 2005-2025. The City has selected as its baseline the 10-year average of its water consumption from 1996 to 2005, equivalent to 244 per capita gallons of water used per day (gpcd). In 2010, the City met its 10% interim reduction target well ahead of the 2015 target date. The City plans to reach the 20% reduction target (equivalent to 195 gpcd) by 2020.

## Goal: Reduce Water Use

The City aims to reduce building and outdoor water uses from both the community and municipal sectors. In close alignment with the City's 20% reduction goal under SBX7-7, the City will reduce its water use by 20% by 2020 from the 2005 baseline.

### Strategy WA1: Conserve Community Water through Building and Landscape Design and Improvements

Conserving water requires strategic coordination between the community-at-large, policy-makers, and implementers. The City recently hired a water conservation coordinator to direct the City's efforts at reducing water use in compliance with SBX7-7 while also monitoring and implementing additional water conservation activities.

The City has taken steps to save water by focusing on highest demand water use sectors. In 2002, the City enacted provisions to provide 22 rebates to large commercial irrigators to incentivize the transition to high-efficiency irrigation systems. The City also provides free water usage assessments for both residential and commercial customers. In addition, the City offers rebates to residents for high-efficiency appliances – toilets are rebated up to $150 and washing machines up to $125. The City is expanding its program of providing smart water meters to track the effectiveness of water conservation programs over time.

In 2008, the City began running the current Free Indoor Device Program. The program provides City residents with bathroom and kitchen aerators, low-flow showerheads, and toilet flappers. The program has already affected several hundred of the City's water customers; furthermore, increased awareness of the program has the potential to reach many more customers.

Targeted City policies and ordinances will help to reduce emissions further. Expanding the current commercial irrigation program through education, marketing, and incentives will reduce landscape irrigation water use. In 2009 the City introduced a new service to provide free landscape audits for high-water consuming irrigators. Zone 7 works in conjunction with the City on this measure to provide an irrigation upgrade rebate of up to $5,000 per customer. Incentivizing xeriscaping (landscaping and gardening in ways that reduce or eliminate the need for irrigation) is also an important measure, as the use of drought-resistant (low-water) plants will reduce the need for landscape irrigation, particularly effective for business parks.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

### WA1: Conserve Community Water through Building and Landscape Design and Improvements

Annual GHG Reduction Potential (MT $CO_2e$): 272
Estimated Annual Cost to the City: $180,600
Estimated Cost per MT: $486

| Supporting Actions | | Timeframe |
|---|---|---|
| WA1-1 | Hire a water conservation coordinator to administer current and new conservation activities, develop water use policy, set water savings targets concurrent with CA Senate Bill X7-7, and manage outreach activities. | 2009 |
| WA 1-2 | Expand commercial irrigation rebate program. Enhance rebate incentive structure to increase and further provide informational materials on water-conserving gardening practices.<br>Provide large landscape audit support services program for top tier water customers. | 2013 |
| WA 1-3 | Continue to provide City water customers with free indoor water conservation devices. | 2013 |
| WA 1-4 | Implement a landscape ordinance requiring new commercial and residential projects to meet prescribed landscape water budgets and ensure that new construction uses the latest irrigation technology, and meet or exceed AB 1881 requirements. | 2012 |
| WA1-5 | Install/expand installation of smart water meters. | 2011 |
| WA 1-6 | Restrict the use of utility-provided water for cleaning vehicles and outdoor surfaces. | 2013 |
| WA 1-7 | Restrict landscape watering; encourage xeriscaping and drought-resistant planting in lieu of lawns. | 2013 |
| WA 1-8 | Provide incentives for replacing lawn areas at business parks; promote more trees and xeriscaping. | 2013 |

#### Strategy WA2: Reduce Municipal Water Use through Building and Landscape Design and Improvements

Conserving water for City municipal operations will set an example and lay the groundwork for water conservation in the broader community.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

### WA2: Reduce Municipal Water Use through Building and Landscape Design and Improvements

Annual GHG Reduction Potential (MT $CO_2e$): 1
Estimated Annual Cost to the City: Included in WA1
Estimated Cost per MT: $486

| Supporting Actions | | Timeframe |
|---|---|---|
| WA2-1 | City to install "smart" water-efficient irrigation systems and devices for City parks and landscaping, such as soil moisture-based irrigation controls and use water-efficient irrigation methods. | 2012 |
| WA2-2 | Require the installation of water conservation devices in new construction and additions (public facilities). | 2012 |

#### Strategy WA3: Increase or Establish use of Reclaimed/Grey Water Systems

Use of recycled water and captured rainwater reduces the need to supply and convey fresh water from groundwater or far away reservoirs. In 1998, the City commissioned a study to review the feasibility of implementing a recycled water system. The City found the design of such a system worthwhile and will set up recycled water infrastructure at several locations throughout the City by 2016. In particular, The City has

sited Hacienda Business Park, Pleasanton Sports and Recreation Park, and Pleasanton Tennis and Community Park as locations to utilize new recycled water infrastructure for landscape irrigation at full build-out.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure, along with assumptions and methodologies used to estimated cost and reduction potential.

### WA3: Increase or Establish use of Reclaimed/Grey Water Systems

Annual GHG Reduction Potential (MT $CO_2e$): 98
Estimated Annual Cost to the City: Included in WA1
Estimated Cost per MT: $486

| Supporting Actions | | Timeframe |
|---|---|---|
| WA3-1 | Investigate the feasibility of using stormwater runoff, if all water quality measures are in place, for irrigation and groundwater recharge. | 2013 |
| WA3-2 | Utilize reclaimed wastewater for productive community use. | 2014 |
| WA3-3 | Provide incentives for water recycling. | 2013 |
| WA3-4 | Provide equipment and education for rain harvesting. | 2013 |

# Community Engagement

## Goal: Influence Personal Behavior

In general, the measures presented under Community Engagement support the goals, strategies and measures presented in the previous sections by seeking to influence personal behavior to become more carbon friendly. The overarching goal is to promote personal responsibility for residents and businesses to reduce their carbon footprints. Community engagement and education fosters public involvement, information exchange, and transparency into sustainability initiatives that support the Climate Action Plan. It is difficult to account for the emissions reduction impact of these efforts, but such measures are critical to gaining public support and the participation essential to program success.

The City has been engaging with the community over the course of developing the Climate Action Plan, through a dedicated web site and a series of public workshops. The outreach effort has focused on explaining the purpose of the Climate Action Plan, providing background climate science, describing the planning process, providing document drafts as available, soliciting input, and promoting related events and workshops.

Since 2010, the City has pursued and implemented many outreach and education measures that focus on sustainability. For instance, the City has:

- Established a Committee on Energy and the Environment;
- Hired an Energy and Sustainability Manager to oversee development of the City's Climate Action Plan and public outreach efforts;
- Co-hosted (in partnership with Hacienda Business Park) the City's first Green Fair in 2010, with over 85 exhibitors and over 700 attendees;
- Hosted multiple free sustainability lectures;

- Developed a Green Guide to help the community identify small changes they could make to achieve larger, collective benefits;
- Received an award from PG&E for its energy efficiency outreach efforts to local businesses;
- Worked closely with the Pleasanton Unified School District to identify energy efficiency funding opportunities, as well as community outreach coordination activities;
- Hosted a Family Earth Festival to provide information and activities for children and adults.

### Targeting Behavior: Quantifying the Impact

In the previous sections, community engagement is mentioned in supporting actions for specific emission reduction strategies. Where appropriate, the City has considered how the impact of these programs would affect the GHG reductions associated with individual measures. This applied primarily to measures targeting energy efficiency and conservation, but impacts to material discards (e.g. recycling behavior) and water conservation were also considered. The strategies and measures included below are broader in nature, intended to support the Climate Action Plan as a whole.

Table 3-7
Summary Table of GHG Reduction Impact for Community Engagement

| | Goal / Supporting Strategy | Annual GHG Reduction Potential (MT $CO_2e$) | Percent of Category |
|---|---|---|---|
| **PE** | **Community Engagement to Affect Behavior Change** | | |
| PE1 | Provide information and resources to the community. | Supports other measures | NA |
| PE2 | Partner with schools to promote sustainability efforts. | Supports other measures | NA |
| PE3 | Implement outreach programs for local businesses and residents. | Supports other measures | NA |
| | Total for Category | NA | NA |

### Strategy PE1: Provide Information and Resources to the Community

The City recognizes community participation as a critical component to the success of the Climate Action Plan. It is also essential to inform residents and businesses of the many incentives and programs available to help them reduce their energy and resource consumption and generate renewable energy. The City will develop a public outreach and education strategy that includes a dedicated web site and the design and publication of collateral materials that can be distributed at City offices and community events. In general, outreach and education topics will include, but will not be limited to:

- The benefits of well-designed, higher density development;
- Promoting the use of transit, ridesharing, bicycling, and walking;
- Promoting ways to improve vehicle fuel efficiency;
- Encouraging residents to grow food in home and community gardens using methods that reduce GHG emissions, such as using organic inputs and compost;
- Promoting water conservation and use of drought-resistant landscaping; and
- Promoting recycling and composting by single-family and multi-family residents.

Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure.

### PE1: Provide Information and Resources to the Community

Annual GHG Reduction Potential (MT $CO_2e$): Supports other measures
Estimated Annual Cost to the City: See Appendix D
Estimated Cost per MT: NA

| Supporting Actions | | Timeframe |
|---|---|---|
| PE1-1 | Develop a comprehensive public/private education and empowerment program that helps residents, businesses, and visitors take action to reduce their personal carbon footprint. | Annually, starting 2011 |
| PE1-2 | Update the Pleasanton Green Guide annually - a one stop green resource for reducing personal carbon footprints and living more sustainably. Distribute at outreach events, online, and in public offices; incorporate or promote the actions listed below where possible. | Annually, starting 2011 |
| PE1-3 | In conjunction with the www.PleasantonGreenScene.org website, develop a citywide outreach program that engages, educates, and exchanges information on implementing the measures in the Climate Action Plan and related General Plan policies. See PE1-1 | 2011 |
| PE1-4 | Develop user-friendly fact sheets for ways that residents, landlords and/or businesses can reduce GHG emissions by improving energy and water efficiency, reducing waste, and improve home performance using green building techniques; organize information by cost efficiency and type of home or building (apartment, slab foundation, pier foundation, etc.). If available, include funding and implementation resources. Distribute at events and post on web site. | 2011, with periodic updates |
| PE1-5 | Provide community workshops on water and energy conservation, renewable energy systems and rebates, and backyard composting/home management of organics. | 2011, with periodic updates |
| PE1-6 | Identify and empower neighborhood leaders and community champions on climate change and sustainability. | ongoing |
| PE1-7 | Implement a "Buy Local" campaign. | 2013 |
| PE1-8 | Work with PG&E and area organizations to recognize exemplary green buildings and businesses and individuals that save energy. | 2013 |

## Strategy PE2: Partner with Schools to Promote Sustainability Efforts

This strategy supports many of the strategies and measures presented in the previous sections. Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure.

### PE2: Partner with Schools to Promote Sustainability Efforts

Annual GHG Reduction Potential (MT $CO_2e$): Supports other measures
Estimated Annual Cost to the City: See Appendix D
Estimated Cost per MT: NA

| Supporting Actions | | Timeframe |
|---|---|---|
| PE2-1 | Promote community climate action planning through schools; send information home through schools. | 2011 |
| PE2-2 | Leverage StopWaste program to assist schools with on-site waste audits to evaluate and improve current recycling practices, and outreach to promote recycling to schoolchildren. | 2011 |
| PE2-3 | Participate in E-coaches activities to identify opportunities to leverage resources to help the schools. | Ongoing |
| PE2-4 | Develop and offer to present sustainability modules to schools and special interest youth groups. | 2012 |

### Strategy PE3: Implement Outreach Programs for Local Businesses and Residents

This strategy supports many of the strategies and measures presented in the previous sections. Measures for supporting this strategy are summarized below. Appendix D provides more detailed descriptions of each measure.

## PE3: Implement Outreach Programs for Local Businesses and Residents

Annual GHG Reduction Potential (MT $CO_2e$): Supports other measures
Estimated Annual Cost to the City: See Appendix D
Estimated Cost per MT: NA

| Supporting Actions | | Timeframe |
|---|---|---|
| PE3-1 | Foster public-private partnerships, including Sustainability Circles. | 2011 |
| PE3-2 | Support Pleasanton's participation in Alameda County Green Business Program. | 2011 |
| PE3-3 | Provide outreach and education to businesses and residents to use less packaging, and more durable, local, and low-impact goods, including re-usable shopping bags and compostable foodware. | 2011 |
| PE3-4 | Engage the Committee on Energy and the Environment - an advisory committee to track and evaluate trends in energy conservation, energy efficiency, and sustainability, and to make appropriate recommendations to City staff and City Council. | Ongoing |
| PE3-5 | Develop and implement financial aid programs for residential and commercial energy efficiency upgrades/retrofits (incentives or financing options). | 2012 |
| PE3-6 | Raise awareness about the City's large scale residential program to retrofit homes with energy efficiency measures (see EC4-2). | 2011 |
| PE3-7 | Sponsor California Youth Energy Services to perform free "green house calls" to Pleasanton residents. | Done |
| PE3-8 | Continue to host free community events, such as the annual green fair, e-waste/Rx drop off events, sustainability lectures and various workshops. | Ongoing |

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# 4 Preparing Pleasanton for Climate Change

## Overview

This chapter presents an overview of the impacts Pleasanton can expect to experience due to projected changes in the climate, and what the City can do to begin preparing for them. Increasingly, scientific and political communities are acknowledging that global efforts to reduce GHG emissions will fall short of what is needed to avoid significant harmful impacts of climate change. Despite serious efforts by Pleasanton and the State of California to reduce emissions, the global challenge remains daunting. Without a coordinated global commitment, avoiding dangerous levels of atmospheric GHGs becomes more unlikely with each passing year. Even if GHG emissions were reduced to pre-industrial levels today, the GHG emissions that have already been added to the atmosphere will continue to warm the planet for centuries. While mitigation is still the most cost-effective approach to preventing long-term catastrophic impacts of climate change, adaptation efforts are needed to increase the resilience of communities and resources to changes expected over the next few decades.

As outlined in Chapter 1, a recent study of climate impacts in the United States, led by the National Oceanic and Atmospheric Administration (NOAA) presents the following key findings:[1]

1. Global warming is unequivocal and primarily human-induced.

   Average global temperature has increased over the past 50 years. This observed increase is due primarily to human-induced emissions of heat-trapping gases.

2. Climate changes are underway in the United States and are projected to grow.

   Climate-related changes have already been observed in the United States and its coastal waters. These changes include increases in heavy downpours, rising temperatures and sea level, rapidly retreating glaciers, thawing permafrost, lengthened growing seasons, lengthened ice-free seasons in the ocean and on lakes and rivers, earlier snowmelt, and alterations in river flows.

[1] U.S. Global Change Research Program, 2009. *Global Climate Change Impacts in the United States*, page 12. Available at: http://www.globalchange.gov/publications/reports/scientific-assessments/us-impacts

3. Widespread climate-related impacts are occurring now and are expected to increase.

   Climate changes are already affecting water, energy, transportation, agriculture, ecosystems, and health. These impacts are different from region to region and will grow under projected climate changes.

4. Climate change will stress water resources.

   Access to clean water is an issue in every region, but the nature of the potential impacts varies. Drought, related to reduced precipitation, increased evaporation, and increased water loss from plants, is an important issue especially in the West. Floods and water quality problems are likely to be amplified by climate change in most regions. Declines in mountain snowpack are important in the West and Alaska, where snowpack provides vital natural water storage.

5. Crop and livestock production will be increasingly challenged.

   Agriculture is considered one of the sectors most adaptable to changes in climate. However, increased heat, pests, water stress, diseases, and weather extremes will pose adaptation challenges for crop and livestock production.

6. Coastal areas are at increasing risk from sea-level rise and storm surge.

   Sea-level rise and storm surges place many U.S. coastal areas at increasing risk of erosion and flooding, especially along the Atlantic and Gulf Coasts, Pacific Islands, and parts of Alaska. Energy and transportation infrastructure and other property in coastal areas are very likely to be adversely affected.

7. Threats to human health will increase.

   Health impacts resulting from climate change are related to heat stress, waterborne diseases, poor air quality, extreme weather events, and diseases transmitted by insects and rodents. A robust public health infrastructure can reduce the potential for negative impacts.

8. Climate change will interact with many social and environmental stresses.

   Climate change will combine with pollution; population growth; overuse of resources; urbanization; and other social, economic, and environmental stresses to create larger impacts than from any of these factors alone.

9. Thresholds will be crossed, leading to large changes in climate and ecosystems.

   There are a variety of thresholds in the climate system and ecosystems. These thresholds determine, for example, the presence of sea ice and permafrost and the survival of species, from fish to insect pests, with implications for society.

10. Future climate change and its impacts depend on choices made today.

    The amount and rate of future climate change depend primarily on current and future human-caused emissions of heat-trapping gases and airborne particles. Responses involve reducing emissions to limit future warming and adapting to the changes that are unavoidable.

Expected local impacts to the Bay Area are also well-documented. In its recently published *California Climate Adaptation Strategy*, the California Natural Resources Agency outlines the significant climate change impacts facing the Bay Area, including sea level rise, public health problems arising from more extremely hot days and poorer air quality; longer and more intense wildfire conditions; possible disruptions in fresh water supplies; and vastly different natural resource conditions.[2] The report emphasizes that

[2] California Natural Resources Agency, 2009. *2009 California Climate Adaptation Strategy*. Available at: http://www.climatechange.ca.gov/adaptation/

unprecedented levels of leadership and cooperation will be needed amongst multiple stakeholders to effectively address adaptation.

In May 2011, the San Francisco Planning and Urban Research Association (SPUR) released a report called *Climate Change Hits Home: Adaptation Strategies for the San Francisco Bay Area*.[3] SPUR's report is an important new resource for local and regional planners that summarizes the impacts and vulnerabilities that local communities in the Bay Area must address in the coming years related to climate change, and offers recommendations for action around the key areas of Public Health and Safety, Water Management, Energy, Transportation, Ecosystems and Biodiversity, and Sea Level Rise. Many of the planning principles and recommendations provided in the SPUR report are consistent with those presented in this Chapter.

# Expected Local Impacts

For cities like Pleasanton, planning for adaptation centers on the expected economic, social, and environmental impacts that climate change will have on the local community, and what can be done to increase the City's resilience in the face of those threats. Although Pleasanton is not physically threatened by projected rises in sea level due to melting ice caps and warming oceans, the City will still be impacted directly and indirectly on many fronts as global temperatures rise. Heat waves, extreme weather events, increased levels of air pollution, water shortages resulting from a diminishing Sierra snowpack, and higher electricity demand in the hot summer months impact public health, property, and public infrastructure.

## Higher Temperatures and Extreme Weather Events

Pleasanton should expect overall hotter and drier conditions with a reduction in winter rain (and concurrent snow in the mountains), as well as increased average temperatures. At the same time, a warmer atmosphere retains more moisture, which can lead to more powerful storms during the rainy season. There is a high likelihood that extreme weather events, including storms, floods, heat waves, wildfires, and droughts will be among the earliest climate impacts experienced. If more frequent or severe natural disasters occur, more emergency and public health services will be needed to deal with the consequences.

Higher temperatures and heat waves will affect human health, public health systems and the energy grid. The California Climate Adaptation Strategy projects a rise of 2 to 5 degrees Celsius (4 to 9 degrees Fahrenheit) by 2100. Heat waves are expected to increase in frequency and duration. According to recent study by the California Energy Commission (CEC), locations like Pleasanton can expect the number of "extreme heat days" – days that exceed the 90$^{th}$ percentile average temperature – to double from a historical mean of 12 days per summer, to an average of 24 days per summer by 2035. By mid-century (2035–2064), extreme heat days could quadruple from the historical mean, and by century's end the rate is expected to be eight times the historical mean.[4]

Pleasanton experienced a preview of likely future conditions during the July 2006 heat wave, characterized by triple-digit daytime temperatures, higher than normal humidity, and very high nighttime temperatures. Nearby Sacramento recorded 11 consecutive days over 110 degrees, and 2006 was the warmest year to date since California weather records began in 1895.[5]

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[3] SPUR, 2011. *Climate Change Hits Home*. Available at http://www.spur.org/files/policy-reports/SPUR_ClimateChangeHitsHome_0.pdf

[4] CEC, 2007. *Climate Change, Extreme Heat, and Electricity Demand in California*, CEC-500-2007-023. Available at: http://www.fypower.org/pdf/CEC_CC-ElectricityDemand.PDF

[5] CEC, 2007, Ibid

Urban areas are particularly vulnerable to the phenomenon known as “urban heat island” where parking lots, rooftops, and other large paved or constructed areas absorb and retain the sun’s radiation and increase the surrounding temperature. Urban heat islands also retain heat at night, making it more difficult for cities to cool down, and increasing overall cooling energy loads.

## Wildfires

Higher temperatures and extended dry seasons substantially raise the risk of wildfires. The Public Safety Element of the General Plan describes Special Fire Protection Areas representing over 7,000 acres in the Pleasanton Planning Area, located for the most part along the City’s wildland-urban interface. Special Fire Protection Areas identify those areas where a fire may develop and break out of control, resulting in loss of valuable natural resources, soil erosion, and damage to life and property. The severity of fires is affected by wind, relative humidity, and precipitation. As warmer and drier summer conditions become more commonplace, the frequency and severity of wildfires is likely to increase.

## Water Uncertainty

With climate change, precipitation patterns are expected to change. The Sierra snowpack acts as a vast reservoir that supplies the State of California with critical water supply throughout the dry summer months. With warmer winters, more precipitation will fall as rain instead of snow, and Spring snowmelt will occur earlier and more rapidly. Increased drought and higher temperatures will increase evaporation and decrease soil moisture, reducing flows into reservoirs and groundwater aquifers. Higher temperatures are likely to increase demand for fresh water from all users: agricultural, domestic, commercial, and industrial. Lower flows and changes in precipitation may also impair the terrestrial and fluvial ecosystems that support the rich biodiversity of the Bay Area. All of these factors will strain the ability of an already complex water management system to accommodate human and ecosystem needs.

Extreme storm events could exceed the capacity of existing stormwater management systems, resulting in urban flooding and damage to property and ecosystems. 100-year flood zones as represented on hazard maps provided by the Federal Emergency Management Agency (FEMA) may require updating as precipitation patterns become more extreme.

# Local Vulnerabilities

## Public Health

Predicted health impacts of global warming include increased heat illness and mortality, particularly during heat waves, injury or death due to catastrophic weather events and flooding, and spread of infectious diseases, like West Nile virus and Lyme disease. Higher temperatures and drier summer conditions will lead to higher levels of ozone and increase the potential for wildfires, both of which lead to declines in air quality and negative impacts to respiratory and cardiovascular health.

Though extreme heat events in coastal areas like the Bay Area are not expected to be as severe or as long-lasting as further inland, the resident population is not as well prepared or equipped to deal with higher temperatures. Air conditioning is far less common, for example. Elderly and low-income residents are especially vulnerable to extreme heat or poor air quality conditions because they typically have fewer resources to anticipate or cope with such events. People with pre-existing health conditions such as asthma, allergies, heart and respiratory disease are also susceptible to such conditions.

## Water Management

The City is vulnerable to water shortages as precipitation patterns change, the Sierra snowpack becomes less reliable, and regional demand for fresh water increases. Bay Area population is expected to grow significantly through the next 50 years, straining an already complex infrastructure for meeting regional and state water needs.

Water agencies, including Zone 7, are already required by law in their management plans to consider how climate change will affect future supplies. As noted in the previous chapter, the City of Pleasanton has updated its Urban Water Management Plan with strategies to meet a 20% per capita reduction goal by 2020, while aligning with the City's water conservation and management policies as described in the General Plan. In addition to reducing GHG emissions associated with water management and conveyance, such conservation measures will help the City build resilience in the face of potential water scarcity as the climate changes.

## Agriculture and Local Food

Local agriculture is likely to be impacted by extreme weather events, seasonal temperature variations, and uncertain water availability for production, making the local food supply less predictable. Yields may decrease due to less water or increased pest invasions, and some water-intensive crops may become less viable in the local agricultural economy.

## Ecosystems and Biodiversity

Climate change is expected to put multiple stressors on ecosystems, with potentially catastrophic effects on biodiversity. In and around Pleasanton, native wildlife generally inhabits areas of minimally disturbed plant life such as in the Pleasanton, Main, and Sunol Ridges, in the Southeast Hills, and in the Arroyo del Valle and Arroyo de la Laguna, and other creeks. A host of plant and animal species inhabit these areas, including several that are listed as rare, threatened or endangered, including the Alameda whipsnake, California tiger salamander, and bearded clover, among many others.[6] Several creeks and watersheds provide important wildlife corridors that link wildlife habitat areas that are otherwise separated by rugged terrain, changes in vegetation, or human development.

Along with changes in temperatures and precipitation, shifts in livable habitats for various flora and fauna species are likely to occur. Species may seek out cooler temperatures at higher elevations, or disappear altogether. Such shifts can result in further habitat fragmentation, with potential acute impacts on sensitive species. Invasive species may also find it easier to gain a foothold as conditions change. If wildfires become more severe and more frequent, native plant species may find it more difficult to re-germinate.

## Energy Management

Pleasanton's energy system is vulnerable in several ways. Extreme heat events will dramatically increase the load on the electrical grid to meet cooling demands. Since the City is linked into an electric grid that connects with the rest of California, the reliability of the energy supply is vulnerable to demand spikes occurring anywhere in the state. Also, warmer nights could hamper the cooling required by critical electrical

[6] Species of concern are listed in the Conservation and Open Space Element of the Pleasanton General Plan.

equipment to operate efficiently. For example, the July 2006 heat wave caused many of PG&E's transformers to fail, leaving 1.2 million of its 5 million customers without power at some point.[7]

PG&E relies on hydropower for a significant portion of its electricity delivery mix. Long-term, the projected reductions in total precipitation and Sierra snowpack will lower the average generating capacity of existing hydropower facilities.

# Adaptation Planning

While the potential impacts of climate change on community health and welfare are profound, they also present a high degree of uncertainty. Climate science is highly complex, and there are widely ranging estimates on how much warming will occur, how fast it will occur, and how the warming will affect the rest of the climate system including precipitation patterns and storms. The global climate models used by the Intergovernmental Panel on Climate Change (IPCC) and other scientific groups to predict future conditions are based on processes and feedback between different Earth systems that are not fully understood (e.g., effect of cloud cover changes, additional air pollutants, changing ocean currents, etc.). In addition, there is a high degree of uncertainty about future technological breakthroughs, human development, and even human behavior in the face of the climate threat. With all this uncertainly it is important to acknowledge that predictions using current models can be overly optimistic as easily as they can be too gloomy. Since IPCC's Fourth Assessment, released in 2007, studies suggest that sea-ice melt, glacier retreat, and food insecurity have progressed more rapidly than the IPCC predicted.[8] Even in its 'worst case scenario' the IPCC has also underestimated the global GHG emissions that would occur due to a rapid coal-reliant economic expansion in emerging Asian economies, and lower than expected energy efficiency improvements during that time.

In the face of this uncertainty, planning for community resilience should begin now using an adaptive management approach. Adaptation planning requires a long-term process that allows immediate action when necessary and adjusts to changing conditions and new knowledge. Public engagement and education is critical, along with an inclusive planning process that ensures the resulting actions are feasible and widely accepted.

Where possible, adaptation should reinforce mitigation. For example, reducing urban heat islands by planting more shade trees also reduces peak electricity demand for cooling, and sequesters carbon dioxide through plant tree growth. Such "no regret" strategies should be on the front line of early adaptation planning. In other cases, adaptation and mitigation strategies can undermine each other. Increased use of air conditioners during heat waves, for example, provides a public health benefit but requires more energy at peak load times (when the grid energy mix is most carbon-intensive due to the need to bring the oldest and dirtiest power plants on line to meet demand). Tradeoffs between mitigation and adaptation should be carefully considered to achieve the optimal mix benefits where possible.

Since 2009 the State has been advising local government on how to approach adaptation planning. State and regional guidance is being continually updated as policy is developed and projections and vulnerabilities are better understood. Given the scale and potential severity of climate change impacts it is important that adaptation planning be coordinated as a region-wide effort, with partnering between local jurisdictions and collaboration with state and regional agencies.

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[7] Northwest Power and Conservation Council, 2006. *2006 California Heat Storm*. Available at: http://www.nwcouncil.org/energy/resource/meetings/2006/08/2006%20Heat%20CAISO.pdf

[8] Worldwatch Institute, 2011. *Climate Change Outpaces Predictions*. Available at: http://www.worldwatch.org/node/5990

Five important steps to effective adaptation planning are summarized below:

1. Increase Public Awareness; Engage and Educate the Community

   It is critical that the public understand the magnitude of climate change issues and why action is needed. The planning process should be inclusive of all stakeholders. Local outreach campaigns are needed to promote awareness of the dangers of heat exposure and recommend cost-effective adaptation strategies. These efforts should leverage similar efforts undertaken at the regional, state, and federal levels.

2. Assess Vulnerability

   Understanding vulnerability to climate change impacts is critical to developing effective adaptation strategies. A detailed vulnerability analysis should be performed to assess potential climate change impacts to infrastructure and natural systems. Both short-term and long-term adaptation strategies should be identified. Level of risk can be categorized in terms of likelihood of damage within the forecasting period and the severity of the damages. The vulnerability assessment can also provide a framework for agency and community education and participation, feed into other planning documents, and identify funding needs.

3. Establish Goals, Criteria and Planning Principles

   Engage with stakeholders to establish planning priorities, decision criteria, and build community support for taking action. Rank physical and natural assets for preservation efforts. Where possible, look for situations where a mitigation action has adaptation co-benefits (e.g., planting trees to reduce urban heat islands while sequestering carbon and providing habitat).

4. Develop an Adaptation Plan

   Identify specific strategies and actions, develop cost estimates, and prioritize actions to increase local resilience of City infrastructure and critical assets, including natural systems like wetlands and urban forests. Look for synergies between natural processes and engineering solutions, and opportunities for adaptation measures that reinforce mitigation measures, or vice versa. An adaptation plan should include a prioritized list of actions (e.g., projects), with a timeline, capital expenditure plan, and a framework for monitoring and adaptive management.

5. Ongoing Monitoring and Adaptive Management

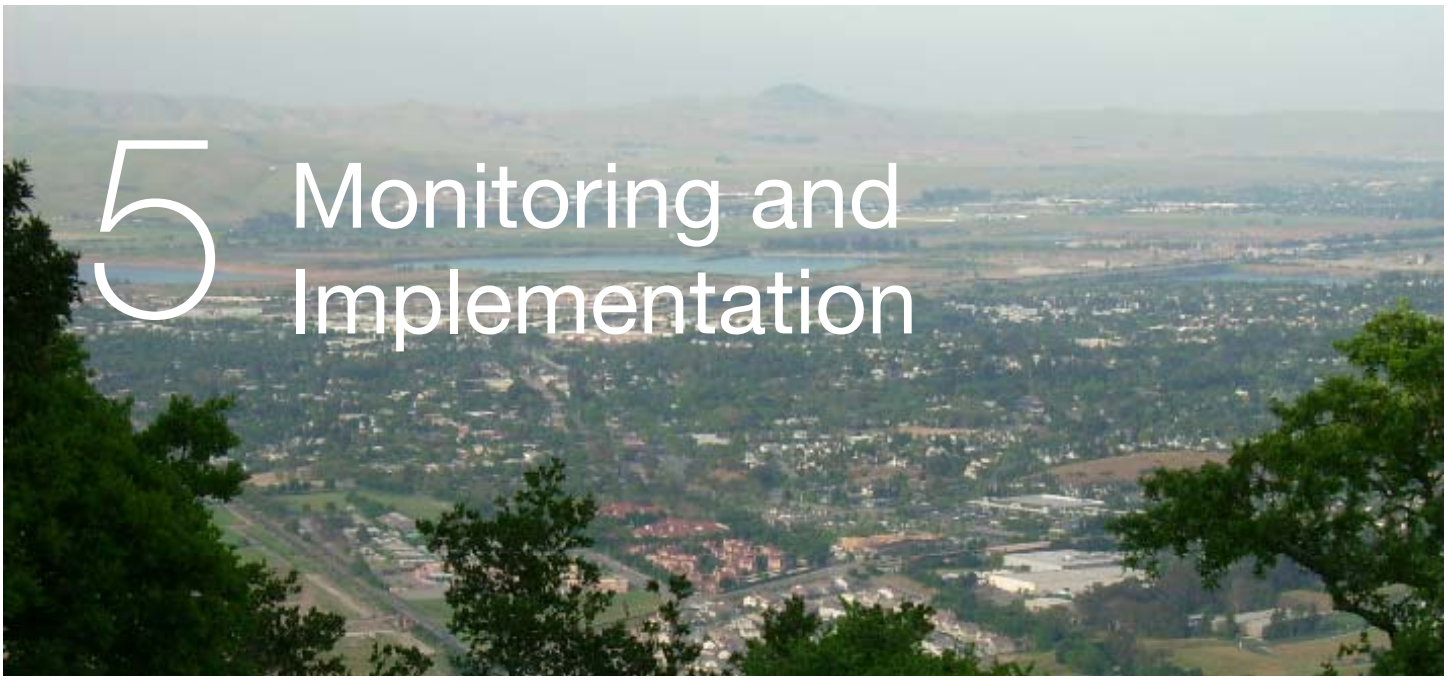
   Reassess climate change vulnerabilities on a regular basis and modify actions accordingly. This includes monitoring the effectiveness of current policies, strategies and actions, and keeping up with changing science, funding opportunities, and regulatory actions.

# Recommended Actions

The following table provides a list of actions that the City is considering as it begins to plan for climate change adaptation.

## Table 4.1.
## Potential Adaptation Measures

| Vulnerability | Identified Actions |
|---|---|
| General | • Educate and engage the community on the need for long-range planning;<br>• Partner or collaborate with other jurisdictions and agencies to increase awareness and build community support for action; |
| Public Health | • Identify vulnerable communities and develop emergency preparedness plan;<br>• Partner with Alameda County Public Health Department to build communications and public warning system and response plans for extreme heat and weather events;<br>• Establish cooling centers, especially for vulnerable populations;<br>• Reduce urban heat islands through use of cool roofs, lightly colored pavements, and other reflective surfaces (consistent with CAP measure EC1-1);<br>• Reduce risk of wildfires through fuels reduction in the urban-wild land interface;<br>• Reduce risk of urban fires with more diligent fire protection efforts, including better fire prevention systems (e.g., automatic sprinklers, fire-resistant construction, and early-warning systems) and more frequent building inspections;<br>• Restrict use of fireplaces and open fires on high-risk days;<br>• Monitor potential disease vectors and develop public awareness;<br>• Design urban forest program to provide heat relief in addition to improving biodiversity and sequestering carbon (consistent with CAP measures EC4-3); |
| Water Management | • Increase capacity for community water (recycled) storage;<br>• Promote local water conservation (consistent with CAP measures WA1, WA2, and the City's Urban Water Management Program);<br>• Make water conservation a top priority for agriculture in the region;<br>• Support water reclamation and reuse projects (consistent with CAP measure WA3 and the City's Urban Water Management Program);<br>• Integrate local flood management plans with adaptation planning;<br>• Establish local land use policies that decrease flood risk to expanded areas; avoid building in high-risk areas;<br>• Modify storm water system routing and storage;<br>• Develop storage areas for peak flows;<br>• Maximize use of bioswales and permeable surfaces in both greenscape and hardscape areas to improve aquifer recharge and mitigate flooding from stormwater; |
| Agriculture and Local Food | • Promote conservation of local agricultural land;<br>• Support local farmers markets; |
| Ecosystems and Biodiversity | • Work with Department of Fish and Game, U.S. Fish and Wildlife Service, and other conservation groups to prioritize land protection, conservation, and restoration to promote biodiversity;<br>• Prioritize protection of wildlife corridors that link habitats, and areas that provide migration paths as climate changes (e.g., large topographical variation);<br>• Design urban forest program to improve or protect biodiversity in addition to providing heat relief and sequestering carbon (consistent with CAP measures EC4-3); |
| Energy Management | • Evaluate existing energy efficiency and demand-response programs for their effectiveness at reducing peak electricity demand during extreme heat events (consistent with CAP strategies EC2 and EC4);<br>• Reduce urban heat islands through use of cool roofs and other reflective surfaces (consistent with CAP measures EC1-1);<br>• Establish targeted tree planting and new requirements for shading in new parking lots and other large paved areas (consistent with CAP measures EC4-3); |



# 5 Monitoring and Implementation

This chapter outlines how the City will monitor the progress of reducing community-wide GHG emissions and meeting its obligations under AB32. Translating measures into actual emission reductions will require municipal code changes, development and funding of programs, and effective management systems for tracking and monitoring program implementation. Coordination between City departments and collaboration with residents, businesses, and other government agencies will be needed to ensure that programs are well-managed and cost-effective.

Community involvement is an essential component of the Climate Action Plan implementation process, as many measures depend on active participation by residents and businesses, especially those that rely on behavior change. The City is making a concerted effort to develop and strengthen community education and outreach programs, as outlined in Chapter 3. These efforts will be closely monitored for their cost-effectiveness in influencing residents, businesses, and visitors to reduce their personal carbon footprints. The Climate Action Plan relies on behavior change to achieve a significant portion of GHG reductions needed to meet the 2020 emissions target. If interim community-wide reduction targets are not met (i.e., as evidenced by the 2015 GHG inventory update), the City will re-evaluate and increase its focus on education and incentives before implementing more prescriptive measures.

The City will monitor progress in meeting its GHG reduction goals in several ways. City staff will present an annual progress report to the City Manager describing the implementation of Climate Action Plan strategies. The City will also update the Climate Action Plan, including revisions to the community and municipal GHG inventories, at least every five years.

The start date for each measure (as provided in Chapter 3) is used in this chapter to present an implementation schedule organized into near-term, mid-term, and long-term actions. Actual implementation will depend on a variety of factors, including availability of funding and City staff time, community priorities, and changing environmental demands. However, each progress report will evaluate program success against the strategy-specific reduction targets outlined in the Chapter 3.

The City's Green Team and the Energy and Environment Committee have played an important role in developing the Climate Action Plan. It is assumed that these groups will continue to play a leadership role in implementing the Plan, and interface with community groups to coordinate action and create beneficial environmental outcomes for all members of the community.

# Monitoring Schedule

Implementation of the Climate Action Plan will be monitored through annual progress updates that focus on program implementation while a comprehensive revision of the Climate Action Plan will occur at least every five years to include an update to the community and municipal GHG inventories.

## Program Monitoring

The City's web site will be periodically updated to communicate program development and gauge the success of Climate Action Plan implementation. The City Sustainability Coordinator will be responsible for developing an annual progress report to the City Manager that evaluates progress toward the City's GHG reduction goals (if possible), assesses the effectiveness of various strategies and programs included in the Plan, and recommends adjustments to programs or tactics as needed.

## GHG Inventory Updates

The community and municipal GHG inventories will be updated at least every five years, beginning with the 2010 emissions year, and including the milestone years 2015 and 2020. Inventory revisions will provide the most complete method for determining the magnitude of emissions reductions over time, as compared to the 2005 baseline.

- 2005 baseline: 770,844 MT $CO_2e$
- 2015 interim target: 700,000 MT $CO_2e$ (9% reduction)
- 2020 target: 655,218 MT $CO_2e$ (15% reduction)

## Climate Action Plan Updates

Every five years the Climate Action Plan will be updated to revise the community and municipal emissions inventories, gauge the success of emissions reduction programs, and make adjustments to strategies and measures as necessary. 2015 will provide an important interim date for comparing actual reductions against the interim target.

# Schedule of Implementing Actions

For the most part, the City will be responsible for initiating the following measures for reducing emissions, but success will ultimately depend on public participation. Many near-term and mid-term actions involve municipal code and/or City ordinance changes that will necessitate stakeholder outreach. Public forums, workshops, and meetings will be administered with the intent to foster an open public input and commenting process. Collaboration and coordination with transit agencies (e.g., BART, ACE, LAVTA) will be essential to improving and increasing transit ridership, and enhancing mobility and transportation efficiency through better planning. Further, coordination with the outside agencies is critical for the success of many measures, including PG&E for energy conservation and renewable energy programs, StopWaste.org and Pleasanton Garbage Service for waste reduction actions, and Zone 7 Water Agency for water saving actions. Dependence on outside agency participation is mentioned explicitly in the measure descriptions included in Chapter 3 or in Appendix D. The City will also be exploring public-private partnerships as a means of funding and implementation.

# Near-term Actions (2011 - 2012)

## Transportation and Land Use

- Modify Municipal Development Codes: The City will modify municipal development codes, where feasible, and develop incentives as described in the following strategies and actions:
  - Strategy LU1: Support infill and high density development (see actions listed in Chapter 3).
  - Strategy LU2: Support mixed-use infill and new development near local-serving commercial areas (see actions listed in Chapter 3).
  - LU3-1: Support location of key services within ½ mile of walking distance of residential clusters or areas.
  - LU3-2: Incorporate building, landscape, and streetscape development design features that encourage transit, bicycle, and pedestrian access.
  - TR1-6: Require new residential developments within ½ mile of transit to offer discounted transit passes as part of HOA amenities, payable through the HOA dues.
  - NM1-1: Implement the Community Trails Master Plan.
  - NM1-2: Implement the Pleasanton Pedestrian and Bicycle Master Plan.
  - NM1-11: Place more bike racks throughout the city.
  - NM1-12: Provide secure, covered bicycle parking at major transit hubs including BART stations.
  - NM1-19: Develop complete street standards to maximize transportation opportunities that serve all mobility modes.
  - TDM2-7: Require new and substantial developments within 1/4 mile of transit to provide transit passes or other transit use incentives for an interim period sufficient to establish transit use patterns.
  - TDM2-9: Require new non-residential projects over a certain size to implement a TDM program capable of reducing weekday peak period vehicle trips by at least 20%.
  - TDM2-10: Require dedicated parking spaces in new and modified developments for carpool, vanpool, alternative-fuel, and car-share vehicles.
  - VE1-2: Permit commercial vehicle biodiesel service or fueling stations.
- LU3-3: Create incentive program(s) to assure adequate transit service and pedestrian and bicycle facilities at new and existing major commercial, office, and institutional centers.
- LU3-5: Modify the municipal street standards to incorporate AB 1358 Complete Streets to increase the safety, convenience, and efficiency of pedestrians, bicyclists, motorists, and transit riders.
- LU2-7: Create a comprehensive planned unit development amendment for the Hacienda Business Park.
- LU2-10: Promote use of LEED for Neighborhood Development (LEED ND) as an incentive for developers.

- TR1: Initiate the following actions to improve and increase transit ridership with incentives, partnerships, and related investments:
  - TR1-1: Create carpool programs.
  - TR1-2: Support LAVTA's Rapid Bus Program.
  - TR1-3: Promote a more direct connection between BART and ACE rail service.
  - TR1-4: Increase frequency of buses.
  - TR1-7, TR1-8: Investigate feasibility of increasing number of Park and Ride lots.
  - TR1-9: Establish a bus idling policy.
  - TR1-10: Develop a web-based "green ride" resource.
- NM1: Initiate the following actions to enhance and maintain routes for bicyclists and pedestrians:
  - NM1-3: Develop the Downtown Transportation Corridor.
  - NM1-4: Require appropriate bicycle improvements with new development.
  - NM1-6: Maintain bicycle routes with adequate sweeping and pavement repairs.
  - NM1-7: Incorporate bicycle detection at signalized intersections.
  - NM1-8: Encourage schools, businesses and office parks to provide bike racks.
  - NM1-9: Work with East Bay Park District to complete Iron Horse Trail.
  - NM1-10: Install a bicycle/pedestrian underpass at 580/680 interchange.
  - NM1-13: Target the development of a pedestrian trail system.
  - NM1-14: Cooperate and collaborate to complete the regional trail system and the Arroyo Management Plan.
  - NM1-15: As part of the Pleasanton Pedestrian and Bicycle Master Plan, provide educational opportunities for residents about bike/pedestrian safety.
  - NM1-16: Investigate feasibility of installing locking skateboard racks at schools.
  - NM1-17: Continue Rides to School program.
  - NM1-18: Support "Complete streets" improvements and increased connectivity.
  - NM1-20: Attract private self-service bicycle renting businesses, including the installation of bike rental vendors at BART and ACE stations.
- TDM1: Initiate the following actions to use parking policy and pricing to discourage single occupancy vehicle travel:
  - TDM1-1: Provide shared parking lots to reduce paved areas that contribute to urban heat islands and reduce stormwater infiltration, through the creation of incentive program(s) and modification of municipal development codes where feasible.
  - TDM1-3: Work with large employers (new and existing) to provide incentive-based programs that encourage employees to choose alternative transportation to work.
  - TDM1-5: Assist companies, and facility owners and managers in developing and operating parking demand management programs.

- TDM1-6: Dedicate public parking spaces that contain electric charging stations for plug-in vehicles, in coordination with Measure VE1-1.
- TDM1-7: Provide designated motorcycle and scooter parking downtown.

- TDM2: Initiate the following actions to promote alternatives to school and work commutes:
  - TDM2-1: Promote the use of flextime and other measures by employers and employees through the City's Transportation Systems Management (TSM) Ordinance
  - TDM2-2: Encourage employers to allow employees to telecommute.
  - TDM2-3: Encourage (employers) or offer (City government) alternative work week options (e.g., 9/80, work from home, 10-hour shifts) to reduce employee commutes.
  - TDM2-4: Create incentive program(s) that encourage the development of neighborhood telecommuting centers.
  - TDM2-5: For municipal employees, create incentives for non-single-auto commute modes (e.g., carpool programs, transit vouchers, alternative work week plans, telecommuting) through City programs and community outreach.
  - TDM2-6: Create an incentive program for City employees who use for non-single-auto commute alternatives.
  - TDM2-8: Strengthen community-based carpool and ride share programs for residents and businesses through education and engagement.
  - TDM2-11: Develop incentives to attract a car-sharing service at the Pleasanton BART stations.
- VE1: Initiate the following actions to develop a supportive community infrastructure for more fuel-efficient and alternative fuel vehicles:
  - VE1-4: Develop a program to provide free "mileage booster" inspections that include checking tire pressure.
  - VE1-5: Develop a "Green Guide" web page on the Pleasanton Green Scene website that describes and promotes ways to improve vehicle fuel efficiency promotes the use of alternative fuel vehicles and biodiesel conversions.
  - VE2-1: Adopt a City gasoline-fueled fleet replacement program.

## Energy

The City will be responsible for initiating the following actions by the end of 2012. Many of these actions are included in the City's Energy Efficiency and Conservation Strategy (EECS), developed in 2010:

- EC1: Initiate the following actions that enhance green building, energy efficiency, and energy conservation:
  - EC1-1: Continue to implement and improve the City's existing Green Building Ordinance for commercial buildings (EECS measure).
  - EC1-2: Implement the 2006 residential Green Building Ordinance (EECS measure).
  - EC1-3: Modify municipal code to reduce heat island effects in the City by requiring light-colored paving material for roads and parking areas, as well as parking lot shade trees.

- EC2: Initiate the following actions to leverage outside programs to increase energy efficiency and conservation:
  - EC2-2: Continue PG&E Partnership Program (EECS measure).
  - EC2-3: Provide funding for StopWaste's Green Packages Program (EECS measure).
  - EC2-4: Support the Energy Upgrade California Program to manage a large-scale residential retrofit program (EECS measure).
  - EC2-6: Continue outreach and education for demand response.
- EC3: Initiate the following actions to promote financing and financial incentive programs to support energy efficiency and conservation:
  - EC3-2: Promote and increase awareness of available rebates and tax credits for energy efficiency upgrades.
- EC4: Develop programs to increase energy efficiency and conservation:
  - EC4-2: Implement a voluntary program that promotes energy and water-efficiency upgrades of existing buildings.
  - EC4-4: Promote use of Solartube, skylights, and other daylighting systems.
- EG1: Initiate the following actions to promote green building and energy efficient development for government operations and city infrastructure:
  - EG1-2: Eliminate illuminated street signs, where feasible. Replace all fluorescent bulbs in illuminated street name signs with more energy efficient systems (e.g., LEDs).
  - EG1-3: Eliminate street lights, where feasible. For new streetlights, and for replacing existing sodium vapor street lights, use more energy efficient systems (e.g., LEDs).
  - EG1-4: Assess opportunities to eliminate energy demand and improve energy efficiency of municipal water/sewer system equipment.
  - EG1-5: Assist the school district in developing and implementing an energy efficiency and conservation program.
- ER1-2: Expedite green permits and include outreach materials in all permit applications.
- ER2: Initiate the following actions to promote on-site community renewable energy:
  - ER2-1: Evaluate existing installed renewable energy capacity in community and set future installed goal.
  - ER2-2: Continue Solar City Program, including outreach activities to enhance the existing program.
- ER3: Initiate the following actions to promote renewable energy for municipal operations:
  - ER3-1: Evaluate existing installed renewable energy capacity for municipal operations and set future installed goal.
  - ER3-2: Continue to evaluate the feasibility of installing solar (PV) panels or vertical wind turbines at City-owned facilities.
  - ER3-3: Investigate feasibility of purchasing green power for municipal operations.

## Waste

The City will be responsible for initiating the following actions by the end of 2012:

- SW1: Increase recycling, organics diversion, and waste reduction associated with municipal operations.
- SW2: Initiate the following actions that increase recycling, organics diversion, and waste reduction associated with the entire community:
  - SW2-1: Adopt a City resolution to achieve zero waste citywide by 2025.
  - SW2-2: Develop a community zero waste plan.
  - SW2-4: Partner with the PGS to expand commercial recycling program.
  - SW2-6: Implement and enforce construction and demolition debris recycling ordinance.
  - SW2-7: Launch outreach campaign to increase participation in residential recycling and composting programs and to promote waste reduction.
  - SW2-8: Utilize resources available through StopWaste.org to promote backyard composting, grasscycling, and low maintenance landscaping.
  - SW2-9: Utilize resources available through Stopwaste.org to provide technical assistance for waste diversion and institute a Zero Waste Schools program.
  - SW2-10: Utilize resources available through Stopwaste.org to promote outreach and education to businesses to use less packaging, and more durable, local, and low-impact goods, and reusable shipping containers.
  - SW2-11: Establish municipal ordinance requiring large and special events producers to plan and divert waste from landfill.
  - SW2-12: For new and remodeled commercial and multifamily buildings, require adequate space and logistics for handling of recyclable and compostable materials.
  - SW2-13: Establish a battery recycling program with various collection centers.
  - SW2-15: Support state policies and implement local policy for extended producer responsibility.
  - SW2-16: Provide community outreach and education.

## Water and Wastewater

The City will be responsible for initiating the following actions by the end of 2012:

- WA1: Initiate actions to conserve community water through building and landscape design and improvements:
  - WA1-1: Hire a water conservation coordinator.
  - WA1-4: Implement a landscape ordinance requiring new commercial and residential projects to meet prescribed landscape water budgets and ensure that new construction uses the latest irrigation technology, and meet or exceed AB 1881 requirements.
  - WA1-5: Install/expand installation of smart water meters.
- WA2: Reduce municipal water use through building and landscape design and improvements.

## Community Engagement

The City will be responsible for initiating the following actions by the end of 2012 :

- PE1: Provide information and resources to the community:
  - PE1-1: Develop a comprehensive public/private education and empowerment program.
  - PE1-2: Update the Pleasanton Green Guide annually.
  - PE1-4: Develop user-friendly fact sheets for ways to reduce GHG emissions.
  - PE1-5: Provide community workshops on water and energy conservation, renewable energy systems and rebates, and backyard composting/home management of organics.
  - PE1-6: Identify and empower neighborhood leaders and community champions on climate change and sustainability.
- PE2: Partner with schools to promote sustainability efforts :
  - PE2-1: Promote community climate action planning through schools; send information home through schools.
  - PE2-2: Leverage StopWaste program to help schools improve recycling practices.
  - PE2-3: Continue participation in E-coaches activities to identify opportunities to leverage resources to help the schools.
  - PE2-4: Develop and offer to present sustainability modules to schools and special interest youth groups.
- PE3: Implement outreach programs for local businesses and residents :
  - PE3-1: Foster public-private partnerships, including sustainability circles.
  - PE3-2: Support Pleasanton's participation in the Alameda County Green Business Program.
  - PE3-3: Provide outreach and education to businesses and residents to use less packaging, and more durable, local, and low-impact goods.
  - PE3-4: Engage the Committee on Energy and the Environment to track and evaluate trends in energy conservation, energy efficiency, and sustainability.
  - PE3-5: Develop and implement financial aid programs for residential and commercial energy efficiency upgrades/retrofits.
  - PE3-6: Raise awareness about the City's large scale residential program to retrofit homes with energy efficiency measures.
  - PE3-7: Sponsor California Youth Energy Services to provide free "green house calls" to Pleasanton residents.
  - PE3-8: Continue to host free community events, such as the annual green fair, e-waste/prescription drug drop off events, sustainability lectures, and various workshops.

# Mid-term actions (2013 - 2014)

## Transportation and Land Use

The City will modify municipal development codes, where feasible, and develop incentives as described in the following strategies and actions:

- LU3-2: Incorporate building, landscape, and streetscape development design features that encourage transit, bicycle, and pedestrian access.
- LU3-3: Assure adequate transit service and pedestrian and bicycle facilities at new and existing major commercial, office, and institutional centers.
- LU3-4: Require that new projects that include two or more seated bus shelters include infrastructure to incorporate “NextBus” technologies for tracking buses and predicting arrival times.
- LU3-5: Modify the municipal street standards to incorporate AB 1358 Complete Streets principals that increase travel safety, convenience, and efficiency for pedestrians, bicyclists, motorists, and transit riders.
- LU3-6: Require new projects to include pedestrian and bicycle access through cul-de-sacs in new projects, except where prohibited by topography.
- LU3-7: Implement neighborhood traffic calming projects to slow traffic speeds, reduce cut-through traffic and traffic-related noise, improve the aesthetics of the street, and increase safety for pedestrians, bicyclists, and vehicles.
- TR1-11: Develop and implement a transit system master plan for the city that provides a context for planning decisions based on access to transit, that integrates regional (BART, ACE, LAVTA) and local [bus] transit systems and explores adding new systems (e.g., trolleys) to provide the infrastructure needed to reduce travel by single-occupancy vehicles.
- TDM1: Initiate the following actions to use parking policy and pricing to discourage single occupancy vehicle travel:
  - TDM1-2: Modify municipal code to separate fee-based parking from home rents/purchase prices or office leases within ½ mile of BART stations to increase housing affordability for those without a vehicle or vehicles.
  - TDM1-4: Implement residential area parking permits to prevent spill-over parking into neighboring residential areas from shopping, events, and sporting events.
- TDM3: Improve traffic smoothing through congestion management.
- VE1-1: Develop a public/private partnership to develop a convenient and reliable electric and plug-in hybrid vehicle infrastructure including publicly available charging stations in both on- and off-street parking locations.
- VE1-3: Implement a waste oil collection program to provide feedstock for biodiesel fueling stations.

## Energy

- EC3-1: Assess feasibility of establishing a revolving loan fund for home performance audits and system upgrades.
- EC4-5: Consider Home Energy Ratings System score and fostering recognition of buildings that complete a prescriptive package of actions.
- ER1-1: Adopt local zoning ordinances that encourage residential renewable energy installations (e.g., wind turbines).
- ER1-3: Consider Community Choice Aggregation to increase the proportion of clean, renewable resources in the electric mix used by the City.
- ER2-3: Increase promotion (rebates, education and outreach, demonstration projects and or other means) of distributed generation, especially PV, solar thermal, solar hot water, and solar cooling. Also consider including bloom box or other fuel cell technologies.
- ER2-4: Form a Pleasanton solar cooperative to purchase solar panels in bulk and leverage economies of scale in installation costs.
- ER2-5: Consider installing neighborhood solar grids (use parking lots) for solar EV charging stations.

## Waste

- SW2: Increase recycling, organics diversion, and waste reduction associated with the entire community:
  - SW2-5: Expand residential yard and food waste collection program to multifamily residences, a service provided to single family residents since 2006.
  - SW2-14: Consider a landfill ban or mandatory recycling and composting if zero waste goals are not on track.

## Water and Wastewater

- WA1: Conserve community water through building and landscape design and improvements:
  - WA1-2: Expand the commercial irrigation rebate program and provide landscape audit support services for top tier customers.
  - WA1-3: Continue the program to provide City water customers with free indoor water conservation devices.
  - WA1-6: Restrict the use of utility-provided water for cleaning vehicles and outdoor surfaces.
  - WA1-7: Restrict landscape watering; encourage xeriscaping and drought-resistant planting in lieu of lawns.
  - WA1-8: Provide incentives for replacing lawn areas at business parks; promote more trees and xeriscaping.
- WA3: Increase or establish use of reclaimed/grey water systems:
  - WA3-1: Investigate the feasibility of using stormwater runoff for irrigation and groundwater recharge.

- WA3-2: Utilize reclaimed wastewater for productive community use.
- WA3-3: Provide incentives for water recycling.
- WA3-4: Provide equipment and education for rain harvesting.

### Community Engagement

- PE1: Provide information and resources to the community:
  - PE1-2: Update the Pleasanton Green Guide annually.
  - PE1-5: Continue to provide community workshops on water and energy conservation, renewable energy systems and rebates, and backyard composting/home management of organics.
- PE1-6: Continue to identify and empower neighborhood leaders and community champions on climate change and sustainability.
- PE1-7: Implement a 'Buy Local' campaign.
- PE1-8: Work with PG&E and area organizations to recognize exemplary green buildings and businesses and individuals that save energy.

## Longer-term Actions (2015 and beyond)

### Transportation and Land Use

- TR1-5: Provide transit service within ½ mile of all residents in the city where and when the gross density surrounding or adjacent to feasible transit routes meets or exceeds 10-12 units per acre.

### Energy

- EC4-3: Implement a citywide tree planting program, with a focus on shade trees.

### Community Engagement

- PE1: Provide information and resources to the community:
  - PE1-2: Update the Pleasanton Green Guide annually.
  - PE1-5: Continue to provide community workshops on water and energy conservation, renewable energy systems and rebates, and backyard composting/home management of organics.
  - PE1-6: Continue to identify and empower neighborhood leaders and community champions on climate change and sustainability.

# Funding Sources

The City will use a combination of City funds and staff time, grant funding, and collaboration with other agencies and organizations to achieve Climate Action Plan goals. The following funding sources are available or potentially available to assist with achieving these goals:

## Existing Funding

### City of Pleasanton

City staff time will be required to successfully implement Climate Action Plan measures. In July 2008 the City hired a full time Manager of Energy and Sustainability, who is expected to spend about 50% of her time managing Energy measures, with volunteer assistance; the rest of her time will be split among measures for Land Use and Transportation, Solid Waste, Water, and Public Engagement.

The City has approved $250,000 in first year funding to implement measure EC4-2 (voluntary program that promotes energy and water-efficiency upgrades of existing buildings). With this funding, the City has launched its Solar Alliance program, offering free evaluations, rebates, and financing options for residential and commercial solar installations. The City's rebates are in addition to incentives available through the California Solar Initiative and participating solar companies.

Pleasanton has also initiated Energy Upgrade Pleasanton to leverage outside funding and rebates. In addition to state rebates for energy efficiency upgrades, Alameda County is offering $300 toward assessments and providing $1,000 for basic upgrades or $2,000 for the advanced upgrade package. The City is offering rebates of $500 (for upgrades over $5,000) or $1,000 (for upgrades $10,000 or higher). Additionally, the City has hosted contractor networking forums to educate local contractors and to help them obtain certification to perform the upgrades.

### CEC Targeted Marketing

Pleasanton was one of three California cities selected by the CEC to benefit from a "targeted marketing program" to support implementation of the Energy Upgrade California program. In addition to the rebates and incentives offered by the State and PG&E ($1000-$4000), the City of Pleasanton will be providing additional incentives in the amount of $500 and $1000, dependent upon the extent of upgrades. Furthermore, the City is working with one of the EUC contractors to incorporate additional (free) water saving measures into the program, such as toilet leak detection, bathroom and kitchen faucet aerators, high-efficiency shower heads, and irrigation assessments and sprinkler programming. The City is also working with the local water agency to include rebates and installation incentives for high-efficiency toilets.

### ARRA Energy Efficiency Block Grant Funds and 1% Energy Efficiency Loan:

Resources for energy efficiency programs, administered by the California Energy Commission on behalf of the Federal government, have helped fund the City's Energy Efficiency and Conservations Strategy (EECS), and this Climate Action Plan.

### SunPower Alliance Partnership

Pleasanton has formed a non-exclusive Alliance Partnership with SunPower Corporation to provide generous rebates and incentives (as well as a myriad of financing options) to Pleasanton home owners who install solar. The incentive amount available through the City will initially be set at $1,000.The City has

already streamlined the solar permitting process so home owners or contractors can obtain a permit in 15 minutes or less.

# Potential Funding

## Grants and low-interest loans

Federal, state, and regional agencies provide grants and loans for investments in a variety of climate-related projects. Grants and loans can provide short-term funding for program development and program testing, and could help pay for the staff time required to develop programs, and then establish an alternative financial framework for the program's continued operation after the grant expires. Pleasanton has already been successful at securing grants for its emissions reductions efforts: this Climate Action Plan was funded, in part, by the American Recovery and Reinvestment Act of 2009.

## State Agencies

For years, the California Energy Commission (CEC) has provided a loan program that supports local government energy retrofits and some new construction projects. The program provides low interest loans for feasibility studies and the installation of cost-effective energy projects in schools, hospitals, and local government facilities. The loans are repaid out of the energy cost savings and the program will finance lighting, motors, drives and pumps, building insulation, heating and air conditioning modifications, streetlights and traffic signal efficiency projects, and certain energy generation projects, including renewable energy projects and cogeneration. Loans can cover up to 100% of project costs and there is a maximum loan amount of $3 million.

In September 2008, California Senate Bill 732 created the Strategic Growth Council, which is a cabinet level committee whose tasks include coordinating the activities of member state agencies to assist state and local entities in the planning of sustainable communities and meeting AB 32 goals. The Strategic Growth Council operates the Sustainable Communities Planning Grant and Incentives Program.

## Regional Organizations

The City can leverage its locally available funding by participating in countywide projects like the programs being coordinated by StopWaste.org, which offers funding assistance to public agencies, non-profit organizations, private businesses, educational institutions and other qualified parties. StopWaste.org provides funding for innovative projects that promote source reduction, decrease the amount of waste disposed in Alameda County landfills, and/or encourage the development, marketing and use of recycled content products.

Bay Area Air Quality Management District (BAAQMD) offers grants that could help fund Pleasanton's measures including the Lower-emission School Bus Program, The Transportation Fund for Clean Air, and the Carl Moyer Memorial Air Quality Standards Attainment. The Strategic Incentives Division (SID) of the BAAQMD provides incentive funding for projects that improve air quality, reduce air quality health impacts and protect global climate. SID oversees approximately 1,000 projects funded by state, federal and local monies every year. These projects are funded by the Transportation Fund for Clean Air (over $20 million per year), the Carl Moyer Program (approximately $20 million per year) when combined with Mobile Source Incentive Fund. Additional programs include a Lower Emission School Bus Program (over $6 million annually), a vehicle retirement program (over $7 million annually), and the California Goods Movement Bond program (up to $35 million annually) for the retrofit and replacement of equipment involved in goods movement.

## Renewable Energy Municipal Financing and Revolving Fund Programs

The City should consider programs that result in direct cash savings after an initial investment, such as energy efficiency retrofits and green building standards, for example, a self-funding loan program where loan payments are equal to, or proportional to, the cost savings. Renewable Portfolio Standards require a specified percentage of electricity generated from renewable sources such as solar, wind, and geothermal. The City can identify, select, and develop one or more renewable energy financing programs for funding conservation and renewable energy technologies including solar water heating, solar electricity generation, and wind energy.

The City may consider requiring efficiency improvements as an incentive and pre-requisite for building owners to qualify for solar financing, since renewable energy tends to generate more public appeal than energy efficiency. If Pleasanton can leverage the appeal of renewable energy to encourage simultaneous investments in efficiency, it will result in even larger emissions reductions.

## Public Financing

The City might consider participating in a regional or state-wide program such as the California Statewide Communities Development Authority which is a joint powers authority sponsored by the California State Association of Counties and the League of California Cities and whose mission is to provide local governments and private entities access to low-cost, tax-exempt financing for projects that provide a tangible public benefit, contribute to social and economic growth and improve the overall quality of life in local communities throughout California.

California Communities® offers a pooled securitization program to assist local agencies in bonding against future payments to obtain funding for more infrastructure and transportation-related projects today that might be used for the implementation of “complete streets” instead of conventional street improvements, for example.

Bond and especially tax measures can be difficult to pass at this time, often requiring approval by two-thirds of voters. In November 2006, the City of Boulder, Colorado’s voters approved Initiative 202 – the Climate Action Tax Plan that went into effect on April 1, 2007. The revenues generated through the tax targeted the reduction of greenhouse gas emissions generated by energy use in buildings, the operation of vehicles, and landfill gas emissions. The tax is a surcharge, based on a per-kilowatt-hour electricity usage charge with an annual cap, is collected by the local utility as part of the normal billing process, except that customers who subscribe to the utility’s premium priced renewable energy portfolio are exempt.

## Municipal Fees

The City may use revenues from public services fees (e.g., parking fees, utility fees) to fund programs such as transit improvements and water use efficiency. The City of Portland, Oregon imposed a 1% surcharge (with a ceiling of $15,000 per department) on departmental energy bills. The money went into a central fund to support a City energy specialist who acts as the representative on energy issues for the departments, interfacing with the energy utilities, staying in touch with current utility energy rebates and other technical assistance available, and providing technical support for departmental energy projects.

## Impact fees

The City retains the authority to include emissions mitigation fees as impact fees on new development and substantial redevelopment. Pleasanton residents are often more receptive to new mitigation fees than they are to increases in taxes or increases to existing fees; however, developers are often opposed to new

mitigation fees increasing the cost of business. As mentioned under EC1 in Chapter 3, the City is considering developing sustainable mitigation measures for proposed projects or developments that are valuable to the community, but do not strictly conform to the requirements of a qualified climate action plan. These alternative mitigation measures would include projects that would benefit the community in general, such as providing electric vehicle charging stations, solar installations, roadway repairs using light-colored materials, or other measures designed to reduce the community's carbon footprint.

## Private and Non-Governmental Support

Community-based non-profits, local businesses, and utilities, businesses, and non-profits should be considered as resources for direct and indirect support, including funding, for project and program activation and operations.

Private investors may provide funding to local governments. For example, energy service companies (ESCOs) can finance the up-front investments in energy efficiency, reimbursed by the local government over a contract period. Private companies may finance solar power installations, and then recoup their investment by selling the resulting power to the building owner.

## Carbon Offsets and Banking

If and when projects are allowed to reduce emissions through the sale or trade of carbon credits, the emerging carbon offset markets could become a potential source of funding for implementing actions. Pleasanton may then be able to sell carbon offsets to other communities or businesses that have not been as successful at reducing GHG emissions.

Pleasanton could develop a "City Carbon Bank" for depositing and selling or loaning carbon credits. Carbon sink or reduction generators deposit their credits - metric tons of $CO_2e$ - with the bank, a simple accounting organization. Emitters can withdraw or "buy" a temporary or permanent credit and pay the bank in return for the credit. Sinks would include sequestration and other carbon reduction methods. The bank would require that City or an independent party manage emissions, establish baselines, and submit reductions using verified reductions made available to others in a Carbon Exchange. The organizers would determine the relative value of $CO_2e$ for purposes of crediting, trading, or selling, and establish a monitoring and certifying process to determine the $CO_2e$ value of each sink or reduction credit.

# Appendix A

## Assumptions and Methodology used to Develop the Community-wide Greenhouse Gas Emissions Baseline Inventory and Future Projections

# Emissions Inventory Boundaries

Establishing the boundaries of an emissions analysis is an important first step in the GHG inventory process. A city exerts varying levels of control or influence over the activities occurring within its borders. The community-wide GHG inventory should be defined broadly enough to include all emissions sources that fall within the local government's direct and indirect control. These sources tend to be those that are affected by land use decisions, municipal codes, and General Plan policies, and correspondingly are included in a city's GHG reduction measures. The BAAQMD has issued inventory guidelines that are consistent with this notion, recommending inclusion of all sources that correlate to a mitigation measure included in the City's Climate Action Plan. In general, the inventory should encompass sources that are within the purview of the city's discretionary actions and regulatory authority, including sources of indirect emissions that can be influenced by the city policies or programs, such as water conservation or waste reduction.

## Pleasanton's Organizational Boundary

Setting an *organizational* boundary for a GHG inventory involves identifying the facilities and operations that are to be included. National and International GHG accounting standards[1] define the organizational boundary as the boundary that determines the operations owned or controlled by the reporting entity. The City of Pleasanton's community-wide inventory encompasses the GHG emissions resulting from activities taking place within the City's geopolitical boundary, where the local government has jurisdictional authority. Although the City government has limited control over many of the emissions-producing activities of its residents and businesses, the jurisdictional boundary is appropriate for a community-wide inventory because it should represent the entire city's emissions, not just the local government's emissions.

## Emissions Sources in Pleasanton

The GHG Protocol defines the *operational* boundary as the sum of all sources of direct and indirect emissions that are included in the inventory. The GHG Protocol divides the operational boundary into three different Scopes, defined as follows:

- Scope 1 emissions are those that come from sources that are owned or controlled by the reporting entity. From the community perspective, Scope 1 emissions are direct GHG emissions from sources owned or controlled by residents, businesses, government, and any other property owners or leasers within the entity's jurisdictional boundaries. Such sources include stationary emitters like furnaces and boilers, and mobile emitters like vehicles and construction equipment.
- Scope 2 emissions are indirect GHG emissions related to the consumption of purchased energy (i.e., electricity) that is produced by third-party entities such as power utilities. From the community perspective, the emissions associated with all power purchased by the community (residential, commercial/industrial, and government) are considered Scope 2.
- Scope 3 emissions are other indirect GHG emissions not covered by Scope 2 that are associated with community activities. For a community inventory this generally includes emissions occurring upstream or downstream of a community activity, such as the methane emissions resulting from degradation of the community's solid waste deposited at a landfill outside of city limits; or the

[1] The Greenhouse Gas Protocol (GHG Protocol) from WRI/WBCSD (2008) forms the basis for most GHG accounting protocols, available at: http://www.ghgprotocol.org/

electricity used to pump water to the City from upstream reservoirs. Quantification and reporting of Scope 3 emissions is generally considered optional, but including them in a community-wide inventory is appropriate where there is local control over an activity that has an indirect emissions reduction impact, such as diverting waste from landfills.

Emissions from most sectors within the community derive from multiple sources that sometimes represent more than one scope:

- Transportation: This sector is comprised of emissions from on-road gasoline- and diesel-powered vehicles in addition to emissions from off-road vehicles such as construction equipment and lawnmowers (Scope 1).
- Commercial/Industrial Energy: This sector is comprised of direct stationary emissions from combustion of natural gas and other fuels (Scope 1) and indirect emissions from purchased electricity and/or steam (Scope 2);
- Residential Energy: This sector includes direct stationary emissions from natural gas combustion (Scope 1) and indirect emissions from purchased electricity (Scope 2);
- Water and Wastewater: This sector includes power used for upstream water conveyance that occurs beyond the City limits (Scope 3), and indirect process and fugitive emissions from septic tanks and wastewater treatment processes (Scope 3). Note that indirect emissions from electricity used to convey water and wastewater within the City is included in Municipal Government Operations;
- Solid Waste: This sector includes indirect methane (CH4) emissions from the anaerobic decomposition of organic material sent to landfill (Scope 3);
- Municipal government operations: This sector includes direct and indirect emissions from energy consumed by city-owned or leased buildings, water pumping and heating, wastewater pumping, lighting and other infrastructure (Scope 1 and Scope 2); direct emissions from fuel combustion in fleet vehicles (Scope 1); and methane emissions from the anaerobic decomposition of organic material sent to landfill (Scope 3);

# Emissions Quantification Methodology

Over the past few years, a need has been developing for a standardized approach to quantifying community GHG emissions. ICLEI has worked with CARB, the BAAQMD, and other state and regional agencies to develop standardized methods for inventorying community emissions. ICLEI, along with CARB, the California Climate Action Registry (CCAR), and the Climate Registry (TCR), has co-developed methods for quantifying and reporting GHG emissions from local government sources, which have been incorporated into the Local Government Operations Protocol (LGOP).[2]

The revised City of Pleasanton Community GHG Inventory was developed using elements from ICLEI's 2005 Inventory along with guidance, methodology, and emission factors from the GHG Protocol, the General Reporting Protocol from The Climate Registry (TCR), and the LGOP. Guidance from BAAQMD[3] was also used where appropriate, for local data and regionally-specific methodology.

[2] LGOP version 1.1, published May 2010, available at: http://www.theclimateregistry.org/resources/protocols/local-government-operations-protocol/

[3] GHG Plan Level Quantification Guidance, BAAQMD, April 15, 2010.

## Transportation Emissions

As with many Bay Area cities, vehicle travel in Pleasanton is the City's largest single source of GHG emissions. It is expected that transportation will continue to play this role through 2025, as total vehicle miles traveled (VMT) expand along with expected population and job growth. VMT is an important metric since most methods for estimating transportation emissions are based on VMT. Community-wide VMT estimates are highly dependent on the accounting rules and analytical tools used. For Pleasanton, estimates of VMT for on-road vehicular transportation were derived using the Alameda County Congestion Management Agency Travel Demand Model (ACCMA Model). The methodology used by the ACCMA Model is consistent with guidelines being developed for implementation of SB 375, following the Regional Targets Advisory Committee (RTAC) recommendations for VMT accounting:[4]

- Include 100% of all trips on city roadways traveling between origins and destinations within Pleasanton;
- Include 50% of the trips traveling between Pleasanton and other destinations;
- Exclude trips where the origin and destination are both located outside of Pleasanton, otherwise known as "through" trips.

The ACCMA Model was modified to reflect the City staff's land use projections and network characteristics, and the results were compared with baseline data already developed for the City by others (see full VMT modeling report by Fehr and Peers in Appendix B). Diagnostic tests were performed adding land uses of different types in Pleasanton and noting the increase in City-wide VMT and vehicle hours traveled (VHT). The diagnostic tests provided insight into which emission reduction strategies might be addressed through the travel model and which would be addressed through other methods. The resulting VMT estimates were compared to those in the ICLEI Baseline Greenhouse Gas Inventory Report.

Daily VMT by speed bin was estimated for the base year 2005 and for year 2035 under business-as-usual conditions. The ACCMA model does not include year 2020 traffic data, so interpolation between years 2015 and 2035 was used for Year 2020 and Year 2025 scenarios. Future VMT estimates for years 2020 and 2025 were based on ABAG's future growth estimates for jobs, dwelling units, and residential population in the City of Pleasanton (for more detail see Appendix B).

CARB's EMFAC2007 model was used to calculate base year and future CO2 emissions associated with local conditions and vehicle fleet information. EMFAC2007 emission factors were multiplied by daily VMT, each varying in speed bin by 5 mph increments from 0 to 65 mph. CH4 and N20 emissions were incorporated following EPA guidance, which assumes that 5% of all GHG emissions from passenger vehicles derive from CH4, N20, and HFCs[5].

To estimate mobile off-road emissions, 2005 Alameda County CO2e data were obtained from BAAQMD for lawn and garden equipment, construction equipment, industrial equipment, light commercial equipment, and agricultural equipment. Off-road emissions were apportioned to the City of Pleasanton based on the city's percentage of total County population. Future business-as-usual projections were based on household growth rate projections from ABAG Projections 2009 for 2020 and 2025.

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[4] Recommendations of the Regional Targets Advisory Committee (RTAC ) Pursuant to Senate Bill 375, 2009. Available at: http://www.arb.ca.gov/cc/sb375/rtac/report/092909/finalreport.pdf

[5] Emission Facts: Greenhouse Gas Emissions from a Typical Passenger Vehicle (Step 4), EPA, Updated February 2005. Available at: http://www.epa.gov/otaq/climate/420f05004.htm#step4

## Commercial/Industrial Energy Emissions

Commercial/Industrial energy emissions account for the second largest source of City emissions. Activity data for 2005 data (metered electricity and natural gas use within the City's jurisdiction) were obtained from PG&E. Direct emissions from natural gas combustion were calculated using the standard emission factor for natural gas published by the California Climate Action Registry and others.[6] Indirect emissions from electricity generation were calculated using the verified CO2e emission factor reported by PG&E to the California Climate Action Registry for its 2005 operations.[7]

Estimates of electricity purchased through Direct Access (DA) contracts are derived from county level DA consumption figures provided by the California Energy Commission. Due to the lack of available DA data specific to Pleasanton, the City's ratio of DA electricity to total electricity use is assumed to be the same as Alameda County's (13.9%).

Estimates of stationary combustion emissions from fuels other than utility-supplied natural gas are based on information provided in the BAAQMD's Source Inventory of Bay Area Greenhouse Gas Emissions.[8] This regional inventory lists the 200 facilities in the Bay Area contributing the highest levels of direct GHG emissions, of which three are located in Pleasanton. Of those, two are known to combust natural gas. The third facility (Pleasanton Garbage Service) emits an estimated 3,928 MT CO2e from combustion of diesel, propane, and other fuels other than natural gas.[9] This represents approximately 7.1% of the City's estimated stationary combustion emissions, and less than 0.5% of total city-wide 2005 emissions. Thus, any unidentified sources smaller than this are considered *de minimis*, or inconsequential to the accuracy of the total inventory.

Projected business-as-usual growth in commercial and industrial emissions is based on job growth projections provided in the City of Pleasanton General Plan, equivalent to an annual rate of 2.976%.[10]

## Residential Energy Emissions

Residential energy-related emissions are a large contributor to the City's community inventory. Activity data (metered electricity and natural gas use within the City's jurisdiction) for 2005 were obtained from PG&E. Direct emissions from natural gas combustion were calculated using the standard emission factor for natural gas published by the California Climate Action Registry and others. Indirect emissions from electricity generation were calculated using the verified CO2e emission factor reported by PG&E to the California Climate Action Registry for its 2005 operations.

Projected "business-as-usual" growth in residential emissions is based on population growth estimates provided by Association of Bay Area Governments (ABAG, 2009), which is consistent with the population growth estimate provided in the City of Pleasanton General Plan. ABAG 2009 predicts total population growth over base year 2005 of approximately 12.0% through 2020, and 16.7% through 2025.[11]

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6 53.05 kg per MMBtu.

7 489 lbs CO2 or 493.2 lbs CO2e per MWh generated in 2005.

8 Inventory of Bay Area Greenhouse Gas Emissions, Base Year 2007, BAAQMD, Updated: February 2010, available at: http://www.baaqmd.gov/Divisions/Planning-and-Research/Emission-Inventory-and-Air-Quality-Related/Emission-Inventory/Greenhouse-Gases.aspx

9 This does not include emissions from biogenic fuels such as biodiesel. For inventory accounting purposes, giogenic fuels are considered carbon neutral because they release into the atmosphere the same amount of carbon dioxide (CO2) that was from the atmosphere during growth of the organic constituents that comprise the fuel.

10 *Pleasanton General Plan 2005-2025*, 2009, available at http://www.ci.pleasanton.ca.us/business/planning/genplan-090721-final.html

11 *ABAG Projections 2009*, available at http://www.abag.ca.gov/planning/currentfcst/

## Water and Wastewater Emissions

This category includes indirect emissions from electricity used to convey water from the point of collection to the City boundary (upstream water supply emissions) and emissions that result from wastewater treatment processes and septic system infrastructure. Methane (CH4) is emitted from treatment processes at the Dublin San Ramon Services District (DSRSD) Wastewater Treatment Plant (WWTP) that result in the incomplete combustion of digester gas. $CH_4$ also escapes from septic systems throughout the city. Nitrous oxide ($N_20$) emissions result from the nitrification/ denitrification treatment process and from WWTP effluent discharged to aquatic environments.

2005 water consumption and projected future water consumption estimates for 2020 and 2025 were based on estimates provided by the City of Pleasanton General Plan. Projections for year 2020 were interpolated from 2005 and 2025 data. Compared to 2005, water use is expected to increase 28.6% by 2020, and 38.1% by 2025. Estimates of upstream emissions are based on city-wide water consumption and a regional GHG emission factor for Northern California water supply, provided by the California Energy Commission.[12] An adjustment was made to the regional emission factor to avoid double-counting of water-related emissions that are included in the Municipal Operations Inventory (due to the electricity used by the City to pump and convey water within city limits).

Process, fugitive, and stationary emissions associated with wastewater treatment and septic systems were estimated using the Local Government Operations Protocol (LGOP)[13], developed jointly by the California Air Resources Board (CARB), The Climate Registry, the California Climate Action Registry, and ICLEI – Local Governments for Sustainability. Wastewater emissions were calculated using the relevant population-based method, with estimates of future wastewater flows based on Pleasanton population growth projections from ABAG Projections 2009. Wastewater-related stationary CH4, process CH4, fugitive CH4, and process N20 emissions are included.

Projected business-as-usual growth in wastewater-related emissions is based on ABAG's residential population growth estimates.

## Waste Emissions

Methane (CH4) emissions from solid waste were calculated using EPA's LandGEM software[14] using the following assumptions:

- Landfill disposal of 2005 waste = 121,054 short tons per year[15];
- 100-year timeframe for waste decomposition;
- Landfill gas capture rate = 75%;
- Default LandGEM parameters:
  - Methane generation rate ($k$) = 0.02;
  - Potential methane generation capacity ($L_o$) = 100;
  - NMOC concentration = 4000;
  - Methane content = 50%

[12] California's Water – Energy Relationship, California Energy Commission (CEC), 2005. Available at: http://www.energy.ca.gov/2005publications/CEC-700-2005-011/CEC-700-2005-011-SF.PDF

[13] LGOP (Version 1.1, released May 2010) is available at http://www.arb.ca.gov/cc/protocols/localgov/localgov.htm

[14] EPA's Landfill Gas Emissions Model (LandGEM version 3.02, released May 12, 2005) is available at http://www.epa.gov/lmop/publications-tools/

[15] 2008 Alameda County Waste Characterization Study, 2009. Publically available at:http://www.stopwaste.org/docs/acwcs-2008r.pdf

Projected business-as-usual growth in solid waste emissions for 2020 and 2025 is based on ABAG's Projections 2009, using residential population growth figures.[16] The City uses a Resource Recovery Station on Busch Road, so electricity associated with that facility is included in the Scope 2 emissions associated with community/industrial electricity use.

## Municipal Operations Emissions

Municipal operations emissions result from energy used by buildings, streetlights, traffic signals and controllers, water conveyance, and fuel consumed by the City's vehicle fleet. ESA reviewed the methodology and activity data used in ICLEI's City of Pleasanton Greenhouse Gas Emissions Analysis for the 2005 base year inventory, and found no material errors. Our estimate of municipal operations emissions, based on a recalculation of building energy use, differs by less than 0.3% from ICLEI's estimate. Future business-as-usual emissions projections for municipal operations are based on the same population growth figures used to project residential emissions (population growth rate assumptions from ABAG Projections 2009).

Projected business-as-usual growth in municipal operations emissions is based on ABAG's residential population growth estimates.

[16] 0.758% annual growth from base year 2005 to 2020, and 0.777% from 2005 to 2025.

# Appendix B

## Memorandum: Pleasanton Climate Action Plan Transportation Baseline and Future Year VMT Estimates

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FEHR & PEERS
TRANSPORTATION CONSULTANTS

# MEMORANDUM

Date: November 12, 2010

To: Jeff Caton, ESA

From: Tien-Tien Chan and Mark Feldman, Fehr & Peers

***Subject: Pleasanton Climate Action Plan Transportation Baseline and Future Year VMT Estimates***

*WC10-2758*

This technical memo documents the base year and future business as usual VMT estimated by Fehr & Peers as part of the City of Pleasanton Climate Action Plan. The Alameda County CMA Travel Demand Model ("ACCMA Model"), modified to reflect the City Staff's land use projections and network characteristics, was used to develop the VMT estimates. This memo consists of the following sections:

1. Modifications Made to the ACCMA Model
2. Base Year (2005) VMT Estimates
3. Base Year Comparison to ICLEI Report
4. 2020 Business As Usual VMT Estimates

## *Modifications Made to the ACCMA Model*

Land Use

The City of Pleasanton Engineering Division verified that the use of the ACCMA model land use database was sufficient as a baseline for this project. The 2005 ACCMA model year data was used for our Year 2005 scenarios. The ACCMA model does not have year 2020 data, so it was agreed that for our Year 2020 scenarios, interpolation between years 2015 and 2035 was sufficient for this analysis, both within and outside of the City of Pleasanton. 2020 alternatives will pivot from this interpolated data.

Network

The ACCMA model networks were modified based on instructions provided by the Engineering Division at the City of Pleasanton. The following changes were made to each network:

2005 Roadway Network

1. Made Hopyard Road / St Mary Street south of Black Avenue a 2 lane roadway all the way to Main Street
2. Made Springdale Avenue a 4 lane roadway

3. Verified Stoneridge Drive Between Foothill Road and Stoneridge Mall Road is a 4 lane roadway
4. Made Stoneridge Drive between West Las Positas Boulevard and Santa Rita Road a 4 lane roadway
5. Made Rosewood Drive between Owens Drive and Old Santa Rita Road a 6 lane roadway
6. Made Main Street from Abbie Street to Bernal Avenue a 2 lane roadway
7. Made Old Bernal Avenue a 2 lane roadway
8. Made Bernal Avenue between I-680 and Valley Avenue a 6 lane roadway

2020 Roadway Network (Started with 2015 network and 2005 roadway network changes and made the following updates):

1. Verified that Stoneridge Drive from Stoneridge Mall Road to West Las Positas Boulevard is a 6 lane roadway
2. Extended Stoneridge Drive from its current terminus to El Charro Road
3. Made Vineyard Drive east of Bernal Avenue a 2 lane roadway

***Base Year (2005) VMT Estimates***

After making the above modifications for 2005, Fehr & Peers conducted a model run to calculate base year daily VMT by speed bin and VHT/VHD estimates. Using select link analysis, three types of vehicle trips were tracked separately:

1. Vehicle trips that remained internal to Pleasanton.
2. Vehicle trips with one end in Pleasanton and one end outside of Pleasanton (IX/XI trips).
3. Vehicle trips with neither end in Pleasanton (XX trips).

Using the set of "accounting rules" recommended for VMT inventories in Climate Action Plans by the Bay Area Regional Transportation Advisory Committee (RTAC), VMT from trips of type 1, 2 and 3 were counted 100%, 50%, and 0% respectively towards Pleasanton-generated VMT. Table 1 shows the 2005 Pleasanton Baseline VMT estimates by speed bin. Table 2 shows the estimated daily vehicle hours traveled (VHT) and vehicle hours of delay (VHD) using the same accounting rules.

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**TABLE 1**
**BASE YEAR DAILY VMT BY SPEED BIN**

| Speed Bin | | VMT | | |
|---|---|---|---|---|
| **From** | **To** | **Internal (counted 100%)** | **IX/XI (counted 50%)** | **Total** |
| 0 | 5 | - | 996 | 996 |
| 5 | 10 | - | 1,425 | 1,425 |
| 10 | 15 | - | 1,324 | 1,324 |
| 15 | 20 | 96 | 22,213 | 22,309 |
| 20 | 25 | 9,094 | 29,185 | 38,279 |
| 25 | 30 | 57,907 | 110,550 | 168,457 |
| 30 | 35 | 29,335 | 114,131 | 143,466 |
| 35 | 40 | 82,680 | 200,048 | 282,728 |
| 40 | 45 | 35 | 169,986 | 170,021 |
| 45 | 50 | 426 | 239,188 | 239,614 |
| 50 | 55 | 56 | 228,175 | 228,231 |
| 55 | 60 | 11,116 | 506,752 | 517,868 |
| 60 | 65 | 3,825 | 270,475 | 274,300 |
| 65 | 70 | - | 6 | 6 |
| **Total** | | **194,570** | **1,894,454** | **2,089,024** |

Source: Fehr & Peers, 2010.

**TABLE 2**
**BASE YEAR DAILY VHT AND VHD**

| | Vehicle Hours Traveled (VHT) | Vehicle Hours Delayed (VHD) |
|---|---|---|
| Internal (counted 100%) | 5,504 | 44 |
| IX/XI (counted 50%) | 41,834 | 5,545 |
| Total | **47,338** | **5,589** |

Fehr & Peers, 2010

***Base Year Comparison to ICLEI Report***

The above VMT estimate of approximately 2.1 million per day was compared to the estimate from the *City of Pleasanton Greenhouse Gas Emissions Analysis*, published by ICLEI in 2008. The ICLEI annual estimate of 949 million VMT was divided by 365 to obtain a daily VMT of approximately 2.60 million, about 24% higher than the ACCMA model.

However, the methodology behind the ICLEI estimate differs from the estimate in Table 1 significantly. The ICLEI estimate relied primarily on Caltrans HPMS data, which is tied to traffic

counts. In other words, the 2.60 million VMT represents VMT on roadways within the City of Pleasanton, regardless of the trip origin and/or destination. The differences between this estimate and the 2.09 million estimate from the ACCMA model reflect the following:

1. The ICLEI VMT includes trips which neither start nor end in Pleasanton (XX trips), whereas the ACCMA model VMT does not include these trips.
2. The ICLEI VMT includes only the portion of IX/XI trips which occurs on roadways in Pleasanton, whereas the ACCMA model VMT includes 50% of the *entire* trip lengths from those trips.

As an additional step, we checked the VMT from the model using the ICLEI method, including all VMT on Pleasanton roads, regardless of trip origin or destination. For the purpose of this exercise, we took 50% of the VMT on I-580 between Foothill Road and El Charro Road, which essentially straddles the Dublin / Pleasanton border. The VMT estimate from that analysis was 2.87 million, within 10% of the 2.60 million estimate from ICLEI. This helps confirm that the 2.09 million VMT estimate from the model using the RTAC-recommended method differs from the ICLEI estimate due primarily to the differences between the estimation methods, and that the ACCMA model is a reasonable tool for the analysis, producing similar numbers to previously-established tools.

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***2020 Business As Usual (BAU) VMT Estimates***

Using the modifications discussed for Year 2020, Fehr & Peers ran the resulting ACCMA model and obtained a Year 2020 BAU VMT estimate, representing the future VMT without any specific greenhouse gas-reduction measures. Tables 3 and 4 show the results of this run:

**TABLE 3**
**2020 BUSINESS AS USUAL DAILY VMT BY SPEED BIN**

| Speed Bin | | VMT | | |
|---|---|---|---|---|
| **From** | **To** | **Internal (counted 100%)** | **IX/XI (counted 50%)** | **Total** |
| 0 | 5 | 212 | 4,000 | 4,212 |
| 5 | 10 | 2 | 6,098 | 6,100 |
| 10 | 15 | 255 | 19,253 | 19,508 |
| 15 | 20 | 86 | 12,571 | 12,657 |
| 20 | 25 | 10,844 | 35,559 | 46,403 |
| 25 | 30 | 69,968 | 148,339 | 218,307 |
| 30 | 35 | 37,562 | 270,348 | 307,910 |
| 35 | 40 | 99,705 | 569,853 | 669,558 |
| 40 | 45 | 3,194 | 262,297 | 265,491 |
| 45 | 50 | 1,292 | 313,732 | 315,024 |
| 50 | 55 | 9,997 | 370,906 | 380,903 |
| 55 | 60 | 3,036 | 265,727 | 268,763 |
| 60 | 65 | 904 | 102,802 | 103,706 |
| 65 | 70 | 0 | 3 | 3 |
| **Total** | | **237,057** | **2,381,488** | **2,618,545** |
| **% Increase from Base Year** | | 22% | 26% | 25% |

Source: Fehr & Peers, 2010.

**TABLE 4**
**2020 BUSINESS AS USUAL DAILY VHT AND VHD**

| | **Vehicle Hours Traveled (VHT)** | **Vehicle Hours Delayed (VHD)** |
|---|---|---|
| Internal (counted 100%) | 6,828 | 181 |
| IX/XI (counted 50%) | 59,860 | 13,278 |
| Total | 66,688 | 13,459 |
| % Increase from Base Year | 41% | 141% |

Fehr & Peers, 2010

Tables 3 and 4 show that in the absence of any greenhouse gas reduction strategies, VMT for the City of Pleasanton would increase by 25% from 2005 to 2020, VHT would increase by 41%, and VHD would increase by 141%. The ACCMA model projections, based on ABAG's *Projections* 2007, anticipate the number of dwelling units in the City of Pleasanton to increase by 7%, the number of retail jobs to increase by 23%, and the number of non-retail jobs to increase by 44%. The 25% increase in VMT is reasonable, given these growth assumptions with no accompanying VMT-reduction measures.

# Appendix C

## Memorandum: Pleasanton Vehicle Miles of Travel with Climate Action Plan (CAP) Implementation

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FEHR PEERS

# MEMORANDUM

Date: June 9, 2011

To: Jeff Caton, ESA
Steve Coyle, Town-Green

From: Mackenzie Watten and Kathrin Tellez, Fehr & Peers

***Subject:*** ***Pleasanton Vehicle Miles of Travel with Climate Action Plan (CAP) Implementation***

*WC10-2758*

This memorandum documents the potential reduction in vehicle miles of travel (VMT) that are expected to occur with implementation of the City of Pleasanton Climate Action Plan (CAP) by 2020. Existing and projected future conditions under the future Business as Usual (BAU) scenario were documented in our memorandum dated November 12, 2010 (attached). The Climate Action Plan scenario assumes additional residential units in the City that reflect the proposed Housing Element, increased transit oriented development (TOD) around the City's two BART stations, and implementation of the plans and policies included in the CAP.

## CONCLUSIONS

The total VMT generated by residents and employees of Pleasanton business are expected to increase as new housing units are development and new jobs are created through 2020, with VMT per capita (includes residents and employees) expected to increase by approximately 3 percent under the BAU scenario by 2020.

The CAP transportation measures reduce overall daily VMT in 2020 by 143,870 miles (5 percent reduction), as compared to the 2020 BAU scenario, and reduce VMT per capita by 8 percent. VMT per capita with CAP implementation is also expected to decrease by 6 percent as compared to the Base Year, although total VMT will increase.

## MODEL PREPARATION

The Alameda County CMA Travel Demand Model ("ACCMA Model"), modified to better reflect the City's land use projections and network characteristics, was used to develop the VMT estimates. Modifications to the Base Year (2005) and BAU model were discussed in our November 12, 2010 memo. Under the CAP scenario, the number of housing units was increased with the identification of locations where multi-family dwelling units could be constructed at 20 to 30 units per acre. At some of the locations, job generating land uses that were assumed to be developed under the BAU scenario would not be constructed. The residential population and the number of jobs under each scenario are summarized in Table 1.

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**TABLE 1**
**PLEASANTON POPULATION SUMMARY**

| Scenario | Population | Employment |
|---|---|---|
| 2005 Baseline | 71,375 | 56,730 |
| 2020 BAU | 76,505 | 79,374 |
| 2020 CAP | 82,211 | 78,458 |

Source: ACCMA Model, City of Pleasanton and Fehr & Peers.

## VMT CALCULATIONS

Pleasanton's greenhouse gas inventory is defined as the total amount of VMT generated by Pleasanton land uses. This includes:

a) all of the VMT associated with trips made completely internally within Pleasanton;

b) half of the VMT generated by jobs and residences located within Pleasanton but that travels to/from external destinations (this is consistent with the recent SB 375 Regional Targets Advisory Committee (RTAC) decision that the two generators of an inter-jurisdictional trip should each be assigned half of the responsibility for the trip and its VMT); and

c) none of the responsibility for travel passing completely through the City with neither an origin point or a destination within the City (also consistent with RTAC decision).

This means that Pleasanton will be held responsible for some VMT occurring outside of its borders, if they are related to employees commuting from out of the area to employment centers in Pleasanton.

## CLIMATE ACTION PLAN VMT CALCULATIONS

The ACCMA model was modified to reflect the land use changes planned under the CAP and raw VMT estimates were produced. The raw model results, which include total tips and trip length by purpose were then reviewed and adjusted based on the CAP strategies developed by the Project team. The major CAP trip reduction categories that have proven effectiveness in reducing the potential for vehicle trips, vehicle miles of travel and greenhouse gas emissions are listed below:

1. Density
2. Diversity
3. Design
4. Non-Motorized Transportation
5. Traffic Calming
6. Alternative Work Schedules/ Telecommuting
7. Affordable Housing
8. Live/Work Units
9. Park and Ride Lots
10. Transit
11. Car Sharing
12. Parking Policies
13. Commute Trip Reductions
14. Traffic Smoothing

Discussion with the project team targeted transportation measures under each strategy that could be fully in place by 2020. These measures were then grouped into categories that are both quantifiable and mutually dependent. The final list of grouped measures in each category, their VMT reductions, and data source for the reduction can be found in **Attachment 1.**

Some of the measures were quantified using the ACCMA model, including known land use changes such as those proposed for the CAP housing sites. Other measures were quantified using published documents and research, such as information presented in the publication Growing Cooler, Urban Land Institute, the publication from the California Air Pollution Control Officers Association (CAPCOA), *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures*, August 2010, and projected increases in non-motorized travel documented in the City of Pleasanton Bike Plan were also used. The trip reduction source/analysis method is also noted in Attachment 1. The resulting total VMT and VMT per capita with implementation of the CAP is shown in **Table 2** and compared to the BAU and Base Year condition.

**TABLE 2**
**PLEASANTON VMT PER CAPITA CALCULATIONS**

| Scenario | Total Daily VMT | Population + Employment | Daily VMT per capita |
|---|---|---|---|
| Existing (2005) | 2,089,024 | 128,105 | 16.31 |
| 2020 BAU | 2,618,545 | 155,879 | 16.80 |
| 2020 CAP | 2,474,675 | 160,669 | 15.40 |

Source: Fehr & Peers, April 2011.

The total VMT generated by residents and employees of Pleasanton business are expected to increase as new housing units are development and new jobs are created through 2020, with VMT per capita (includes residents and employees) expected to increase by approximately 3 percent under the BAU scenario. The CAP transportation measures reduce overall daily VMT by 143,870 miles (5 percent reduction), as compared to the 2020 BAU scenario, and reduce VMT per capita by 8 percent. VMT per capita with CAP implementation is expected to decrease by 6 percent as compared to the Base Year, although total VMT will increase. The contribution to VMT reductions from each major strategy is presented in **Table 3**. Some measures are not directly expected to reduce VMT, although they are expected to reduce greenhouse gases by making the transportation system more efficient, such as traffic smoothing which provides for more even traffic flow along regional corridors. Additional GHG reductions are also expected through the changing vehicle fleet that will achieve better fuel economy in the future.

Additional reductions in VMT could occur if fuel prices significantly rise above historic levels or if the gas tax is increased; however, fuel prices and taxes are not dictated by City of Pleasanton. Additionally, it should be noted that many of the CAP measures would only be implemented as new developments occur and no transportation measures are mandatory for existing residents. Many CAP measures strive to encourage behavior, or modify City codes in such a way to facilitate a lifestyle with less driving. Additional VMT reductions could occur with implementation of mandatory measures, but it is not likely that those measures would be implemented over the life of the plan.

**TABLE 3**
**REDUCTIONS SUMMARY**

| Measure | Potential VMT Reduction per day in 2020 |
|---|---|
| Policies, strategies, and incentives for increasing higher intensity infill and new development at key locations (density & affordable housing) | 35,031 |
| Policies, strategies, and incentives for increasing mixed-use infill and new development at key locations (diversity and live/work units) | 29,685 |
| Design strategies and incentives for improving transit, bicycle, and pedestrian-oriented development (design and traffic calming) | 11,184 |
| Policies, strategies, and incentives for increasing transportation options (non-motorized transportation and transit) | 13,004 |
| Policies, strategies, and incentives for providing Single Occupancy Vehicle (SOV) and other commute alternatives (car sharing, alternative work schedules/telecommuting, park and ride lots, commute trip reductions ) | 62,709 |
| Policies, strategies, and incentives for increasing Transportation Demand Management (parking policies, traffic smoothing) | 16,117 |
| ***TOTAL*** | 167,730 |

Source: Fehr & Peers, July 2011.

## VOLUNTARY MEASURES

The VMT reductions that are expected to result with implementation of the CAP mostly apply to new development proposed within the City and the potential for slight modifications to existing resident travel behavior. There are, however, additional modifications to travel behavior that the average citizen can undertake that could result in large VMT reductions should sufficient numbers of people make small changes to their daily travel routines, such as walking their children to school one day a week, working from home one day a month and taking an alternative mode of transportation, such as biking, transit or carpooling, to work one day at month. Table 4 summarizes the potential VMT reductions from voluntary measures.

## RISING FUEL PRICES

The traffic model used to project Pleasanton's future vehicle miles traveled (VMT) does not take into account potential changes in fuel prices. Based on recent trends and expected developments over the next decade, it is reasonable to expect that petroleum fuel prices will rise significantly, and have a resulting impact on driving behavior.

Although the direct relationship between fuel prices and travel behavior is difficult to quantify with precision, there have been a number of studies over the last three decades, based on data from California and other parts of the United States, that have quantified short (less than one year), medium (1 to 5 years) and long-term (5+ years) fuel price elasticity's ranging from -0.02 to -0.30.

This means that with a 100 percent increase in the real cost of fuel (accounting for inflation) VMT is expected to decrease by 2 to 30 percent.

In 2008 the, the Sacramento Area Council of Governments (SACOG) evaluated historical VMT and transit boardings with respect to gas prices, and through the use of their SACSIM model, they were able to calculate an elasticity range of -0.17 to -0.21, which is within the range of other available data. There are numerous other societal factors that play a role in changing travel behavior, such as the availability of affordable housing in a jobs-rich area, the availability of alternative travel options, such as convenient transit or safe bicycle/walking facilities, and the purchase more fuel efficient vehicles.

For the purposes of this analysis, a VMT/fuel price elasticity of -0.10 was selected for use. Other measures that are expected to result in a decrease in VMT have already been accounted for, such as the provision of additional affordable housing opportunities, improvements to the non-motorized transportation system, and potential expansions of transit service. Table 4 shows the potential VMT reduction if the real cost of fuel (accounting for inflation) increased by 100 percent. It should be noted that the strategies presented in Table 4 are provided for informational purposes.

**TABLE 4**
**OTHER MEASURES**

| Strategy | Quantity | Potential Daily VMT Reduction |
|---|---|---|
| Safe Routes to School | For each additional 10% of K-8 students walk/bike instead of being driven to/from school (10% included in CAP) | 4,326 |
| Safe Routes to School | For each 10% of High School students walk/bike instead of being driven to/from school (0% included in CAP) | 3,878 |
| Employment Based TDM | All new employers meet 20 % reduction (5% included in CAP) | 71,583 |
| Voluntary TDM | Each 1 percent participation by residents and workers (Includes employer based reduction above) | 11,435 |
| Fuel Price Increase | Assuming elasticity of -0.10, a 100 percent increase in fuel price would lead to a 10 percent decrease in VMT | 247,468 |

Source: Fehr & Peers, June 2011.

This completes our assessment of the VMT reductions that are likely to occur with implementation of the City of Pleasanton CAP and presents information on the effectiveness of other voluntary strategies. Please call Kathrin or Mackenzie with any questions.

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**ATTACHMENT 1**
**ASSUMPTIONS BY MEASURE**

| Measure | Description | Development Types Affected | | Trip Purposes Affected | Areas Affected | Trip Reduction Method/ Assumptions/Source | VMT Reduction |
|---|---|---|---|---|---|---|---|
| | | All/ New | Residential/ Non-Residential | | | | |
| **A.** | **Policies, strategies, and incentives for increasing higher intensity infill and new development at key locations** | | | | | | |
| | **Density** | | | | | | |
| LU1-1 | Modify municipal development codes where feasible to reuse vacant and underutilized parcels in urban areas | New | Both | All | Citywide | ACCMA Model/ABAG Growth Projections | Quantified as part of proposed Land Use changes |
| LU1-2 | Modify municipal development codes where feasible to provide higher density dwelling unit structures in infill locations (Housing Element update) | New | Residential | Home-based trips | Infill Areas | ACCMA Model assuming development of Housing Element Sites | 4,396 |
| LU1-3 | In the Downtown, modify municipal development codes where feasible to implement mixed-use development which incorporates higher density and affordable residential units consistent with the Downtown Specific Plan | New | Both | All | Downtown | ACCMA Model/Post Processing; for parcels where new development is proposed based on methods described by CAPCOA[1]. | 4,090 |
| LU1-4 | Modify municipal development codes as necessary to provide transit-compatible development near BART stations, along transportation corridors, in business parks and the Downtown | New | Both | All | BART, transport corridors, business parks and Downtown | ACCMA Model/Post Processing; for parcels where new development is proposed based on methods described by CAPCOA[1] | 24,590 |
| LU1-5 | Modify municipal development codes where feasible to provide high density development near transportation hubs | New | Both | All | ACE/BART Stations | | |

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**ATTACHMENT 1**
**ASSUMPTIONS BY MEASURE**

| Measure | Description | Development Types Affected | | Trip Purposes Affected | Areas Affected | Trip Reduction Method/ Assumptions/Source | VMT Reduction |
|---|---|---|---|---|---|---|---|
| | | All/ New | Residential/ Non-Residential | | | | |
| **Affordable Housing** | | | | | | | |
| LU1-7 | Modify municipal development codes where feasible at vacant infill sites to increase densities to appropriate levels that facilitate development, including affordable housing, while protecting the character of surrounding uses. | New | Residential | Home Based | Housing Sites | ACCMA Model/Post Processing; assuming 2/3rds of new multi-family units would be affordable. VMT Reductions based on information provided by CAPCOA[1]. Calculation influenced by auto-ownership rates. | 1,955 |
| *Total VMT Reduction for Policies, strategies, and incentives for increasing higher intensity infill and new development at key locations* | | | | | | | *35,031* |
| **B.** | **Policies, strategies, and incentives for increasing mixed-use infill and new development at key locations** | | | | | | |
| **Diversity** | | | | | | | |
| LU2-1 | Modify municipal development codes where feasible to locate work, residences, and services close together | New | Both | All | Citywide | ACCMA Model/Post Processing; for parcels where new development is proposed based on information provided in the CAPCOA[1] publication. | 4,802 |
| LU2-2 | Modify municipal development codes where feasible to locate new housing and/or new employment within 1/2 mile *walking/biking* proximity of *complimentary land uses* | Both | Both | All | Citywide | | |
| LU2-3 | Modify municipal development codes to expand mixed use and employment in infill locations where appropriate | New | Both | All | Citywide | | |
| LU2-4 | Modify municipal development codes where feasible to provide land use flexibility for the Hacienda Business Park, portions of Stoneridge Mall area, and other areas through the Mixed Use/Business Park, and Mixed Use land use designations | New | Both | All | ID's locations in measure | | 23,875 |

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**ATTACHMENT 1**
**ASSUMPTIONS BY MEASURE**

| Measure | Description | Development Types Affected | | Trip Purposes Affected | Areas Affected | Trip Reduction Method/ Assumptions/Source | VMT Reduction |
|---|---|---|---|---|---|---|---|
| | | All/ New | Residential/ Non-Residential | | | | |
| LU2-5 | City land-use policies, programs, and development codes that increase transit oriented development around rail, BART | New | Both | All | BART/ACE | | |
| LU2-6 | Establish a well-planned mixture of land uses around the BART Stations | New | Both | All | BART/ACE | | |
| LU2-7 | Create and adopt a comprehensive planned unit development amendment for the Hacienda Business Park with special emphasis on creating a *mixed-use*, pedestrian-friendly area around the East Pleasanton/Dublin BART Station | New | Both | All | East Pleasanton/ Dublin BART | | |
| LU2-8 | Create incentive program(s) that attract and support local-serving shopping opportunities | All | Both | All | Citywide | Not Measurable | - |
| **Live/Work Units** | | | | | | | |
| LU2-9 | Create incentive program(s) and modify municipal development codes where feasible to allow and expand live-work and work-live uses in existing and future residential development, and more liberal home occupation requirements. | All | Both | All | All | Assumed that new housing developments with over 100 units, up to 5% of units would allow live/work; in existing areas, creation of an incentive program has an unknown impact on VMT and was not included in this calculation. Reduction based on information provided by Town-Green | 1,008 |
| *Total VMT Reduction for Policies, strategies, and incentives for increasing mixed-use infill and new development at key locations* | | | | | | | *29,685* |

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**ATTACHMENT 1**
**ASSUMPTIONS BY MEASURE**

| Measure | Description | Development Types Affected | | Trip Purposes Affected | Areas Affected | Trip Reduction Method/ Assumptions/Source | VMT Reduction |
|---|---|---|---|---|---|---|---|
| | | All/ New | Residential/ Non-Residential | | | | |
| **C.** | **Design strategies and incentives for improving transit, bicycle, and pedestrian-oriented development** | | | | | | |
| | **Design** | | | | | | |
| LU3-1 | Modify the development codes to encourage the location of key services, such as grocery stores within ¼ (preferred) to ½ mile of walking distance of residential areas | New | Both | All | Citywide | ACCMA Model/Post Processing; for parcels where new development is proposed, based on information provided by CAPCOA[1]. | 10,665 |
| LU3-2 | Incorporate development design features that encourage transit, bicycle, and pedestrian access | New | Both | All | Citywide | | |
| LU3-3 | Create incentive program(s) to assure adequate transit service and pedestrian and bicycle facilities at new major commercial, office, and institutional centers | New | Non-residential | All | Employment Centers | | |
| LU3-4 | Create and adopt a comprehensive planned unit development amendment for the Hacienda Business Park with special emphasis on creating a mixed-use, *pedestrian-friendly* area around the East Pleasanton/Dublin BART Station | New | Both | All | HBP/BART | | |
| LU3-5 | Require that new projects that include the provision of two or more bus shelters include seating in each shelter and infrastructure to incorporate nextbus technologies | New | Both | All | Citywide | | |
| LU3-6 | Modify the municipal street standards to incorporate AB 1358 Complete Streets to improve safe, convenient, and efficient mobility for pedestrians, bicyclists, motorists, and transit riders | All | Both | All | Citywide | | |
| LU3-7 | Modify the municipal development codes to require that new projects include pedestrian and bicycle access through cul-de-sacs, except where prohibited by topography | New | Both | All | Citywide | | |

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**ATTACHMENT 1**
**ASSUMPTIONS BY MEASURE**

| Measure | Description | Development Types Affected | | Trip Purposes Affected | Areas Affected | Trip Reduction Method/ Assumptions/Source | VMT Reduction |
|---|---|---|---|---|---|---|---|
| | | All/ New | Residential/ Non-Residential | | | | |
| **Traffic Calming** | | | | | | | |
| LU3-8 | Neighborhood traffic calming | All | Residential | Residential based | Residential Areas | Assumes 5% of residential neighborhoods implement traffic calming. Source: *Moving Cooler*[2] | 519 |
| *Total VMT Reduction for Design strategies and incentives for improving transit, bicycle, and pedestrian-oriented development* | | | | | | | *11,184* |
| **D. Policies, strategies, and incentives for increasing transportation options** | | | | | | | |
| **Non-Motorized Transportation** | | | | | | | |
| NM1-1 | Create incentive program(s), include in the City's CIP, and/or modify municipal development codes where necessary to implement the Community Trails Master Plan | All | Both | All | Citywide | VMT reductions based on estimated increases in bicycle trips from the City of Pleasanton Pedestrian and Bicycle Master Plan[3]. | 6,500 |
| NM1-2 | Implement that Pleasanton Pedestrian and Bicycle Master Plan , June 2009 | All | Both | All | Citywide | | |
| NM1-3 | Develop Downtown Transportation Corridor for pedestrian, bicyclists and parking, consistent with the 2002 Master Plan for the Downtown Parks and Trails System and with the Downtown Specific Plan. | All | Both | All | Downtown | | |
| | Modify municipal development codes to require developers to finance and install sidewalks and pedestrian and bicycle pathways, where appropriate, in future developments. | New | Both | All | Citywide | | |
| NM1-4 | Require appropriate bicycle-related improvements (i.e., work-place provision for showers, bicycle storage, bicycle lanes, etc.) with new development. | New | Both | All | Citywide | | |

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**ATTACHMENT 1**
**ASSUMPTIONS BY MEASURE**

| Measure | Description | Development Types Affected | | Trip Purposes Affected | Areas Affected | Trip Reduction Method/ Assumptions/Source | VMT Reduction |
|---|---|---|---|---|---|---|---|
| | | All/ New | Residential/ Non-Residential | | | | |
| NM1-5 | Modify municipal development codes to require bike parking for non-residential and multi-family uses | New | Both | All | Citywide | | |
| NM1-6 | Maintain bicycle routes with adequate sweeping and pavement repairs. | All | Both | All | Citywide | | |
| NM1-7 | Incorporate bicycle detection at signalized intersections. | All | Both | All | Citywide | | |
| NM1-8 | Encourage schools, businesses and office parks to provide safe, convenient bike racks. | All | Non-residential | All | Citywide | | |
| NM1-9 | Work with East Bay Park District to complete Iron Horse Trail through Hacienda Business Park (HBP) | N/A | N/A | All | HBP | | |
| NM1-10 | Install bicycle/pedestrian underpass at 580/680 interchange (Johnson Drive canal) for connection to Dublin | N/A | N/A | All | 580/680 interchange | | |
| | Create a bike sharing program in appropriate locations. | All | Both | All | Citywide | | |
| NM1-11 | Create incentive program(s), include in the City's CIP, and/or modify municipal development codes to place more bike racks throughout the city, for secure, covered bicycle parking at major transit hubs | N/A | N/A | All | Transit Hubs | | |
| NM1-12 | Provide secure, covered bicycle parking at major transit hubs including BART stations | N/A | N/A | All | Transit Hubs/BART | | |
| | Use flood control; channels for bikeways | All | Both | All | Citywide | | |
| NM1-13 | Develop a pedestrian trail system which connects all major portions of the Planning Area. | N/A | N/A | All | Citywide | | |

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**ATTACHMENT 1**
**ASSUMPTIONS BY MEASURE**

| Measure | Description | Development Types Affected | | Trip Purposes Affected | Areas Affected | Trip Reduction Method/ Assumptions/Source | VMT Reduction |
|---|---|---|---|---|---|---|---|
| | | All/ New | Residential/ Non-Residential | | | | |
| NM1-14 | Cooperate with EB Regional Parks District to complete regional trail system and with Zone 7 in completing its Arroyo Management Plan. | N/A | N/A | All | Citywide | | |
| NM1-15 | Educate residents about bike/pedestrian safety. Enforce laws. | All | N/A | All | Citywide | | |
| NM1-16 | Skateboard racks (locking) at schools | N/A | Non-residential | School | School Vicinity | | |
| NM1-17 | Work w/ School District to continue Rides to School program. | N/A | Non-residential | School | School Vicinity | | |
| NM1-18 | Preserve rights-of-way needed for local and regional roadway improvements that create "complete streets" through dedication of land, as adjacent properties develop. | New | All | All | Citywide | | |
| **Transit** | | | | | | | |
| 0 | Encourage Carpool and bikeshare programs to / from transit station parking (not a city program) | All | Both | All | Transport Hubs | Assumes 10% of employees eligible. Source: VTPI TDM Encyclopedia[4] | 4,334 |
| TR1-2 | Support Livermore Amador Valley Transit Authority's Rapid Bus Program. | Neither | Neither | All | Stoneridge Mall | Rapid Bus serves Stoneridge Mall area, 1% reduction in total VMT. Source: CAPCOA and NHTS[5]. | |
| TR1-3 | Encourage a more direct and convenient connection of BART with ACE rail service. | All | Both | All | BART/ACE | Part of other measures; increased frequency and transit service. | |
| TR1-4 | Increase frequency of buses that access BART or other destination centers such as Hacienda Business Park LNL | All | Both | All | Citywide | Measure assumes a 25% reduction in headways | |

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**ATTACHMENT 1**
**ASSUMPTIONS BY MEASURE**

| Measure | Description | Development Types Affected | | Trip Purposes Affected | Areas Affected | Trip Reduction Method/ Assumptions/Source | VMT Reduction |
|---|---|---|---|---|---|---|---|
| | | All/ New | Residential/ Non-Residential | | | | |
| TR1-5 | Provide transit service within ½ mile of all residents in the city where the density is 10-12 units/acre | All | Residential | All | Citywide | Most residents (at 10-12 units/acre) already located within ½ mile of some sort of transit. Source: Travel Characteristics of Transit-Oriented Development in California[6] | |
| TR1-6 | Require new residential developments to offer discounted transit passes as part of HOA amenities, payable through the HOA dues. | New | Residential | Home | Citywide | 0.7% reduction in VMT based on Santa Monica Land Use and Circulation Element[7] | 2,170 |
| *Total VMT Reduction for Policies, strategies, and incentives for increasing transportation options* | | | | | | | *13,004* |
| **E.** | **Policies, strategies, and incentives for providing Single Occupancy Vehicle (SOV) and other commute alternatives** | | | | | | |
| | **Alternate Work Schedule / Telecommuting** | | | | | | |
| TDM2-1 | Promote the use of flextime and other measures to employers and employees through the City's Transportation Systems Management (TSM) Ordinance. | All | Non-Residential | Commute | Citywide | The Promotion/ Encourage Incentive programs do not identify specific steps that will be taken to increase the current level of AWS and telecommuting. For CAP purposes, it was assumed that 10 percent of | 3,566 |
| TDM2-2 | Encourage employers to allow employees to telecommute. | All | Non-Residential | Commute | Citywide | | |
| TDM2-3 | Promote or offer alternative work week (e.g. 9/80, work from home, 10-hour shifts) to reduce employee commutes | All | Non-Residential | Commute | Citywide | | |

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**ATTACHMENT 1**
**ASSUMPTIONS BY MEASURE**

| Measure | Description | Development Types Affected | | Trip Purposes Affected | Areas Affected | Trip Reduction Method/ Assumptions/Source | VMT Reduction |
|---|---|---|---|---|---|---|---|
| | | All/ New | Residential/ Non-Residential | | | | |
| TDM2-4 | Create incentive program(s) that encourage neighborhood telecommuting centers. | All | Non-Residential | Commute | Citywide | employees (above current levels) would be eligible to participate. | |
| **Commute Trip Reduction** | | | | | | | |
| TDM2-5 | Create incentives for non-single-auto commute modes (e.g. carpool programs, transit vouchers, alternative work week plans, telecommuting) through City employee programs, public outreach | All | Non-Residential | Commute | Citywide | VMT measurements assume an additional 10 percent of employees Citywide become eligible for transit vouchers. Source: TDM Case Studies[8]. | 3,341 |
| TDM2-6 | Create an incentive program for City employees who use commute alternatives. | All | Non-Residential | Commute | City Employees | | |
| TDM2-7 | Require new development to provide transit passes or other transit use incentives for an interim period | New | Non-Residential | Commute | Citywide | | |
| TDM2-8 | Encourage community-based carpool and ride share programs for residents, businesses, and City employees | All | Non-Residential | Commute | Citywide | | |
| TDM2-9 | Modify municipal development codes to require new non-residential projects over a certain size to implement a TDM program that reduces weekday peak period vehicle trips by 20%. | New | Non-Residential | Commute | Citywide | Although goal stipulates 20% reduction, its effectiveness is unknown. Assumes that 10% reduction is achieved for new workplaces with over 100 employees. | 47,722 |
| TDM2-10 | Require parking spaces in existing and new development for carpool, vanpool, and carshare vehicles. | New | Non-Residential | Commute | Citywide | | |

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**ATTACHMENT 1**
**ASSUMPTIONS BY MEASURE**

| Measure | Description | Development Types Affected | | Trip Purposes Affected | Areas Affected | Trip Reduction Method/ Assumptions/Source | VMT Reduction |
|---|---|---|---|---|---|---|---|
| | | All/ New | Residential/ Non-Residential | | | | |
| **Car Sharing** | | | | | | | |
| TDM2-11 | Encourage a car-sharing service at the Pleasanton BART stations if residential development is added to these areas. | New | Residential | All | Citywide | Trip Reduction Source: *Moving Cooler*[2] | 2,545 |
| **Park and Ride** | | | | | | | |
| TS1-7 | Park and ride lots for key buses that access BART or other destination centers such as Hacienda Business Park or LNL | All | Both | Commute Trips | Region | Expanding park and ride system could result in up to 0.5 % reduction in commute trips based on data from WSDOT[9]. | 5,535 |
| TS1-8 | Identify, evaluate the feasibility of, and create incentives to develop park and ride lots. | All | Both | Commute Trips | Region | | |
| *Total VMT reduction for Policies, strategies, and incentives for providing Single Occupancy Vehicle (SOV) and other commute alternatives* | | | | | | | *62,709* |
| **F. Policies, strategies, and incentives for increasing Transportation Demand Management** | | | | | | | |
| **Traffic Smoothing** | | | | | | | |
| RN6 | Traffic smoothing through congestion management; Upgrade signal timers to improve traffic flow and reduce traffic congestion. | N/A | N/A | All | Arterials | Barth curves can provide estimate; Detailed simulation required for refined estimations. | No VMT reduction, but can reduce GHG by up to 10 % on implementation corridors. |
| **Parking Policies** | | | | | | | |
| TDM1-1 | Create incentive program(s) and modify municipal development codes where feasible to provide shared parking lots. | New | Both | All | Citywide | VMT reduction not quantifiable | -- |

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**ATTACHMENT 1**
**ASSUMPTIONS BY MEASURE**

| Measure | Description | Development Types Affected | | Trip Purposes Affected | Areas Affected | Trip Reduction Method/ Assumptions/Source | VMT Reduction |
|---|---|---|---|---|---|---|---|
| | | All/ New | Residential/ Non-Residential | | | | |
| TDM1-2 | Unbundle parking costs from property costs near BART. Price parking separately from home rents/purchase prices or office leases | New | Both | All | BART | Assumes cost of new parking space at BART station developments is $30,000 a space. | 14,542 |
| TDM1-3 | Require new large employers to offer parking cash-out programs and/or price parking at or above market rates: | New | Non-Residential | Commute | Citywide | Measure assumes that 10% of new employees would be eligible. | 1,575 |
| TDM1-4 | Implement residential area parking permits to prevent spill-over parking into neighboring residential areas. | All | Residential | All | Residential | VMT Reduction potential not quantifiable | -- |
| *Total VMT reduction for Policies, strategies, and incentives for increasing Transportation Demand Management* | | | | | | | *16,117* |

Sources:

1. California Air Pollution Control Officers Association (CAPCOA), *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures*, August 2010.
2. Ewing, et al, 2008. *Growing Cooler – The Evidence on Urban Development and Climate Change*. Urban Land Institute.
3. *City of Pleasanton Pedestrian and Bicycle Master Plan*, Fehr & Peers and RHAA, January 2010.
4. Victoria Transport Policy Institute, TDM Encyclopedia; http://www.vtpi.org/tdm/tdm34.htm
5. National Household Travel Surveys, 2001 http://www.dot.ca.gov/hq/tsip/ tab/documents/travelsurveys/ Final2001_StwTravelSurvey WkdayRpt.pdf, p.150 (Suburban – SCAG, SANDAG, Fresno County.
6. Lund, et al, *Travel Characteristics of Transit-Oriented Development in California*. http://www.csupomona.edu/~rwwillson/tod/Pictures/TOD2.pdf
7. Nelson\Nygaard, 2010. City of Santa Monica Land Use and Circulation Element EIR Report, Appendix – Santa Monica Luce Trip Reduction Impacts Analysis (p.401). http://www.shapethefuture2025.net/
8. Transportation Demand Management Institute of the Association for Commuter Transportation. *TDM Case Studies and Commuter Testimonials*. Prepared for the US EPA. 1997. http://www.epa.gov/OMS/stateresources/rellinks/docs/tdmcases.pdf
9. Washington State Department of Transportation, *Cost Effectiveness of Park-and-Ride Lots in the Puget Sound Area. http://www.wsdot.wa.gov/research/reports/fullreports/094.1.pdf*

Fehr & Peers, 2011.

# Appendix D

## Cost-Benefit Analysis of GHG Reduction Measures

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## Land Use & Transportation

2020 BAU Projection **511,815 MT CO2e**

Reduction Potential by 2020 **33,345 MT CO2e/year**

Annual CO2e MT reduction =
Daily VMT x 365 days x 0.539504 (average CO2e kilograms) x 0.001 (conversion of kg to metric tons).

**LU1 Support infill and high density development**

Total annual reduction potential by 2020 **6,898** MT CO2e

Average annual cost through 2020 **$1,050** (assume first costs amortized over 15 years: 2005 -2020)

Average cost per MT reduced **$0.15**

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| LU1-1 | Modify municipal development codes to incentivize the reuse of both residential and non-residential vacant and underutilized parcels. | Quantified as part of proposed Land Use changes | Develop and adopt revisions and/or additions to the City's development codes/zoning standards citywide to incentivize the reuse of both residential and non-residential vacant and underutilized parcels. The site should be capable of development within the existing urban fabric that can help complete, reinforce, and repair the surrounding area. | ACCMA Model/ABAG Growth Projections;<br>• Development Types Affected: new, both residential and non-residential;<br>• Trip Purposes Affected: all;<br>• Areas Affected: citywide. | • Pleasanton Municipal Code, http://qcode.us/codes/pleasanton/<br>• Infill Development: Completing the Community Fabric, http://www.mrsc.org/Subjects/Planning/infilldev.aspx;<br>• CITY OF SACRAMENTO INFILL STRATEGY, www.cityofsacramento.org/dsd/planning/division-infill/.../infill-strategy.pdf; • Infill Development Barriers and Incentives, www.tmrpa.org/.../1045697875-Barriers%20%20Incentives%20to%20Infill%20- %20version%209%20FINAL.pdf;<br>• The Future of Infill Housing in California, communityinnovation.berkeley.edu/reports/Future_of_Infill_Vol_1.pdf; | 2012 | $15,750 | $0 | Estimate 175 hrs initial staff time for these 7 measures, apportioned from total staff time needed to revise municipal code for approximately 20 measures (500 hrs);<br>Fully burdened City staff rate = $90 per hour;<br>1 FTE = $180,000 per year<br><br>Based on correspondance with Janice Stern of City of Pleasanton;<br><br>• Barriers to Developing Walkable Urbanism and Possible Solutions, www.cleinberger.com/docs/By_CL/Brookings_Barriers_05302007.pdf;<br>• Compact Development: Changing the Rules to Make It Happen, http://www.uli.org/~/media/Documents/ResearchAndPublications/Reports/Community%20Catalyst/Report%206%20Compact%20Development.ashx;<br>• California Local Government Finance Almanac, http://www.CaliforniaCityFinance.com/#SPENDING: City Expenditures by Category: total expenditures, salary & benefits, contracts, materials & supplies. Percent of total expenditure comparisons and summary statistics. Through FY07-08. July'10 (Excel);<br>• http://www.concordcode.org/ |
| LU1-2 | Modify municipal development codes where feasible to incentivize residential in-fill, such as the zoning standards and opportunities to improve pedestrian amenities, since their absence presents a barrier to infill residential development. | 866 | Develop and adopt revisions and/or additions to the City's development codes to incentivize residential in-fill, such as the zoning standards and opportunities to improve pedestrian amenities, since their absence presents a barrier to infill residential development. Infill development consists of a site capable of new/redevelopment within the existing urban fabric that can help complete, reinforce, and repair the surrounding area. | ACCMA Model assuming development of Housing Element Sites;<br>• Development Types Affected: new, residential;<br>• Trip Purposes Affected: home-based trips;<br>• Areas Affected: in fill areas. | | 2012 | | | |
| LU1-3 | In the Downtown, modify municipal development codes where feasible to implement mixed-use development which incorporates higher density and affordable residential units consistent with the Downtown Specific Plan | 805 | Develop and adopt revisions and/or additions to the City's development codes in the Downtown to implement higher-density, mixed-use development with affordable residential units, such as the zoning standards. The process requires both the modification of zoning/standards and the identification of locations and code that allow the combination of high density housing with local supporting commercial uses and easy access to activity areas by transit, biking or walking. | ACCMA Model/Post Processing; for parcels where new development is proposed based on methods described by California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, August 2010;<br>• Development Types Affected: new, both residential and non-residential;<br>• Trip Purposes Affected: all;<br>• Areas Affected: Downtown;<br>• Affordability portion of measure evaluated as part of LU1-7. | • Affordable Housing Techniques A Primer for Local Government Officials, http://www.mrsc.org/Publications/textaht.aspx;<br>• Mixed-Use Development and Financial Feasibility, www.cre.org/memberdata/pdfs/mixed_used.pdf | 2012 | | | |
| LU1-4 | Modify municipal development codes as necessary to incentivize transit-oriented development near BART stations, along transportation corridors, in business parks and the Downtown | 4842 | Develop and adopt revisions and/or additions to the City's development codes to provide transit-compatible development near BART stations, along transportation corridors, in business parks and the Downtown. Create or improve partnerships between the City, business owners and residents to make property improvements, attract desirable businesses to these areas, and address other community issues. Enhance the visual quality of the areas and corridors by developing a consistent multi-use streetscape. | ACCMA Model/Post Processing; for parcels where new development is proposed based on methods described by California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, August 2010;<br>• Development Types Affected: new, both residential and non-residential;<br>• Trip Purposes Affected: all;<br>• Areas Affected: BART, transport corridors, business parks and Downtown. | • Research at the University of California Transportation Center, www.uctc.net/access/access14.pdf;<br>• Transit Orient Development & the City of Hayward's Recent Major Development Projects, www.lgc.org/events/docs/sb375/sb375_oak_pearsonpatenaude.pdf;<br>• Statewide Transit-Oriented Development (TOD) Study Factors for Success in California, www.reconnectingamerica.org/assets/Uploads/bestpractice028.pdf;<br>• Station Area Planning Manual, ww.bayareavision.org/.../Station_Area_Planning_Manual_Nov07.pdf; | 2012 | | | |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| LU1-5 | Modify municipal development codes where feasible to incentivize higher density development near and around transportation hubs and employment centers. | | Develop and adopt revisions and/or additions to the City's development code to provide high density development near transportation hubs. Code for preferred building and infrastructure (e.g., streets) development typologies that accommodate both pedestrian-oriented commercial areas and neighborhoods. The codes should require the massing of a large building forms to be scaled down or divided into increments that relate to surrounding buildings. | ACCMA Model/Post Processing; for parcels where new development is proposed based on methods described by California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, August 2010;<br>• Development Types Affected: new, both residential and non-residential;<br>• Trip Purposes Affected: all;<br>• Areas Affected: ACE/BART Stations. | • TRANSIT-FOCUSED DEVELOPMENT, www.vatransit.com/.../2.3Porter-1997_Transit-Focused_Development.pdf;<br>• What is Transit-Oriented Development? www.nctr.usf.edu/pdf/473-135.pdf;<br>• Case Studies for Transit Oriented Development, www.lisc.org/files/8185_file_phoenix_tod.pdf;<br>• Developing Parking Policies to Support Smart Growth in Local Jurisdictions: www.tam.ca.gov/Modules/ShowDocument.aspx?documentid=239 | 2012 | | See LU1-1 | See LU1-1 |
| LU1-6 | Modify City land-use policies, programs, and related development codes to increase transit oriented development around commuter rail, BART, and other transportation hubs. | | Develop and adopt revisions and/or additions to City land-use policies, programs, and development codes to increase transit oriented development around rail, BART. Protect and enhance neighborhood-serving businesses supported by commercial anchors, and the compatibility of commercial and mixed uses with adjacent residential areas. | | | 2012 | | | |
| LU1-7 | Modify municipal development codes where feasible to increase densities at vacant infill sites to facilitate development, including affordable housing, while protecting the character of surrounding uses. | 385 | Develop and adopt revisions and/or additions to the City's development code to allow density to appropriate levels that facilitate development infill at vacant infill sites, including affordable housing, while protecting the character of surrounding uses. In response to the development context, the codes should either require that the design of new development blend seamlessly with the compatible adjacent, existing development for continuity and compatibility, or provide a visual seal or boundary between new development and visually or functionally incompatible adjacent development to isolate one from the other, particularly at adjacent edges. | ACCMA Model/Post Processing; assuming 2/3rds of new multi-family units would be affordable, VMT Reductions based on information provided by California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, August 2010. Calculation influenced by auto-ownership rates;<br>• Development Types Affected: new, residential only;<br>• Trip Purposes Affected: home-based trips;<br>• Areas Affected: housing sites. | • Affordable Housing Techniques A Primer for Local Government Officials, http://www.mrsc.org/Publications/textaht.aspx;<br>• Mixed-Use Development and Financial Feasibility, www.cre.org/memberdata/pdfs/mixed_used.pdf | 2012 | | | |
| **LU1** | **TOTALS** | **6,898.07** | | | | | **$15,750** | **$0** | |

**LU2 Support mixed use infill and new development near local-serving commercial areas**

| | | |
|---|---|---|
| Total annual reduction potential by 2020 | **5,845** | MT CO2e |
| Average annual cost through 2020 | **$9,160** | (assume first costs amortized over 15 years: 2005 -2020) |
| Average cost per MT reduced | **$1.57** | |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| LU2-1 | Modify municipal development codes where feasible to locate work, residences, and services within a convenient walking distance of each other. | 946 | Develop and adopt revisions and/or additions to the municipal development codes where feasible to locate work, residences, and services close together. Horizontal mixed-use consists of a diversity of single-use buildings assembled within walkable proximity to each other. Vertical mixed-use projects typically combine residential and nonresidential uses into a single building on the same site, although commercial and office uses may be integrated in a similar vertical format. | ACCMA Model/Post Processing; for parcels where new development is proposed based on information described by California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, August 2010;<br>• Development Types Affected: new, both residential and non-residential;<br>• Trip Purposes Affected: All;<br>• Areas Affected: Citywide; | • Pleasanton Municipal Code, http://qcode.us/codes/pleasanton/<br>• Commercial and Mixed Use Development Code Handbook, http://www.mrsc.org/Subjects/Transpo/MixedUse.aspx;<br>• Mixed-Use Projects Require Planners To Rethink Zoning Standards, http://www.cp-dr.com/node/651;<br>• Green Development Codes / Ordinances, http://www.smartcommunities.ncat.org/greendev/codes.shtml;<br>• Infill Development Barriers and | 2012 | $11,250 | $0 | Estimate 125 hrs initial staff time for these 5 LU2 code measures, apportioned from total staff time needed to revise municipal code for approximately 20 measures (500 hrs);<br>Fully burdened City staff rate = $90 per hour;<br>1 FTE = $180,000 per year<br><br>Based on correspondance with Janice Stern of City of Pleasanton;<br><br>•.http://www.preservationnation.org/main-street/;<br>•.http://www.concordcode.org/ |

| Action | | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| LU2-2 | Modify municipal development codes where feasible to locate new housing and/or new employment within ½-mile walking/biking proximity of complementary land uses, including retail, employment, institutional, or recreational. | | Develop and adopt revisions and/or additions to the municipal development codes where feasible to locate new housing and/or new employment within 1/2 mile walking/biking proximity of complimentary land uses. Create a toolbox of the most relevant zoning changes desired. Where single or multifamily residential developments abut retail, commercial, employment, or institutional uses, where feasible, the codes should require side and rear pedestrian circulation routes to facilitate convenient walking connections to abutting uses or services. | • Assume commute trips account for about 35% of the total external travel, and about 40% of total external VMT;<br>• Typically 80 percent of household trip making is for non-work purposes; having a grocery store nearby makes a significant difference, as do other amenities. "The median square footage of newly built homes SF 2,065 square feet in the first three months of last6 year, compared with the same period last year, according to the U.S. Census Bureau". [Les Christie, CNNmoney.com staff writer Last Updated: August 11, 2009]. | Incentives, www.tmrpa.org/.../1045697875-Barriers%20%20Incentives%20to%20Infill%20- %20version%209%20FINAL.pdf;<br>• The Future of Infill Housing in California, communityinnovation.berkeley.edu/reports/Future_of_Infill_Vol_1.pdf;<br>• Welcome to the City of Concord, California's Development Code, www.concordcode.org/;<br>• Moving Cooler, An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions, http://www.movingcooler.info/; | 2012 | See LU2-1 | $0 | • Barriers to Developing Walkable Urbanism and Possible Solutions, www.cleinberger.com/docs/By_CL/Brookings_Barriers_05302007.pdf;<br>• Compact Development: Changing the Rules to Make It Happen, http://www.uli.org/~/media/Documents/ResearchAndPublications/Reports/Community%20Catalyst/Report%206%20Compact%20Development.ashx;<br>• California Local Government Finance Almanac, http://www.CaliforniaCityFinance.com/#SPENDING: City Expenditures by Category: total expenditures, salary & benefits, contracts, materials & supplies. Percent of total expenditure comparisons and summary statistics. Through FY07-08. July'10 (Excel); |
| LU2-3 | Modify municipal development codes to incentivize an expansion of mixed use and employment in appropriate infill locations. | | Develop and adopt revisions and/or additions to the municipal development codes to expand mixed use and employment in infill locations where appropriate. The codes should include ways to minimize potential adverse impacts from site lighting, noise, and other commercial-use elements, and maximize compatibility and enhance the adjacent and surrounding residential neighborhoods. | | | 2012 | | $0 | |
| LU2-4 | Modify municipal development codes where feasible to provide land use flexibility for the Hacienda Business Park, portions of Stoneridge Mall area, and other areas through the Mixed Use/Business Park, and Mixed Use land use designations. | 4,701 | Develop and adopt revisions and/or additions to the municipal development codes where feasible. Code to allow new building types and mix of appropriate zoning-uses and densities; reconnect streets and add streets; minimize parking requirements; and make usable urban plazas. | ACCMA Model/Post Processing; for parcels where new development is proposed based on information described by California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, August 2010;<br>• Assume commute trips account for about 35% of the total external travel, and about 40% of total external VMT;<br>• Development Types Affected: new, both residential and non-residential;<br>• Trip Purposes Affected: All;<br>• Areas Affected: Identified locations in measure. | • HACIENDA BUSINESS PARK TRANSIT-ORIENTED DEVELOPMENT SPECIFIC PLAN, tod.hacienda.org/.../Hacienda%20Existing%20Conditions%20Report_060706 .puff;<br>• Hacienda Business Park, http://tod.hacienda.org/SP/home.html;<br>• THE PLEASANTON GENERAL PLAN, www.ci.pleasanton.ca.us/pdf/genplan-landuse-1012.pdf;<br>• Stoneridge Mall, http://www.simon.com/mall/?id=1242 | 2012 | | $0 | |
| LU2-5 | Modify City land-use policies, programs, and related development codes to increase transit oriented development around commuter rail, BART, and other transportation hubs. | | Develop and adopt revisions and/or additions to the City's City land-use policies, programs, and development codes that increase transit oriented development around commuter rail and both BART stations. To encourage the development of residential uses in existing and new commercial areas, shared parking should be incorporated into mixed-use projects we well as shared driveways, pedestrian plazas, and walkways. | ACCMA Model/Post Processing; for parcels where new development is proposed based on information described by California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, August 2010;<br>• Assume commute trips account for about 35% of the total external travel, and about 40% of total external VMT;<br>• Development Types Affected: new, both residential and non-residential;<br>• Trip Purposes Affected: All;<br>• Areas Affected: BART/ACE. | • Research at the University of California Transportation Center, www.uctc.net/access/access14.pdf;<br>• Statewide Transit-Oriented Development (TOD) Study Factors for Success in California, www.reconnectingamerica.org/assets/Uploads/bestpractice028.pdf;<br>• Station Area Planning Manual, ww.bayareavision.org/.../Station_Area_Planning_Manual_Nov07.pdf;<br>• TRANSIT-FOCUSED DEVELOPMENT, www.vatransit.com/.../2.3Porter-1997_Transit-Focused_Development.pdf;<br>• What is Transit-Oriented Development? www.nctr.usf.edu/pdf/473-135.pdf;<br>• Case Studies for Transit Oriented Development, www.lisc.org/files/8185_file_phoenix_tod.pdf;<br>• Developing Parking Policies to Support Smart Growth in Local Jurisdictions: www.tam.ca.gov/Modules/ShowDocument.aspx?documentid=239= | 2012 | See LU2-1 | $0 | |
| LU2-6 | Create incentives that help establish a well-planned mixture of land uses around the BART Stations. | | | | | | | $0 | |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| LU2-7 | Create a comprehensive planned unit development amendment for the Hacienda Business Park with special emphasis on creating a mixed-use, pedestrian-friendly area around the East Pleasanton/Dublin BART Station | | Create and adopt a comprehensive planned unit development amendment or overlay zone for the Hacienda Business Park that places special emphasis on creating a mixed-use, pedestrian-friendly area around the East Pleasanton/Dublin BART Station. Plan to introduce new building types and mix of appropriate zoning-uses and densities; reconnect streets and add streets; minimize parking requirements; and make usable urban plazas. | ACCMA Model/Post Processing; for parcels where new development is proposed based on information described by California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, August 2010;<br>• Assume commute trips account for about 35% of the total external travel, and about 40% of total external VMT;<br>• Development Types Affected: new, both residential and non-residential;<br>• Trip Purposes Affected: All;<br>• Areas Affected: East Pleasanton/ Dublin BART;<br>• Mixed use portion of the measure evaluated under LU2; pedestrian design evaluated under LU3; Design elements of the measure evaluated under LU3-3; increased transit evaluated as part of TR. | • HACIENDA BUSINESS PARK TRANSIT-ORIENTED DEVELOPMENT SPECIFIC PLAN, tod.hacienda.org/.../Hacienda%20Existing%20Conditions%20Report_060706 .puff;<br>• Hacienda Business Park, http://tod.hacienda.org/SP/home.html;<br>• THE PLEASANTON GENERAL PLAN, www.ci.pleasanton.ca.us/pdf/genplan-landuse-1012.pdf | 2012 | $15,000 | $7,200 | $15,000 to administer PUD<br>Estimate staff time = 80 hrs annually;<br>Fully burdened City staff rate = $90 per hour;<br>1 FTE = $180,000 per year;<br><br>Based on correspondance with Laura Ryan of City of Pleasanton;<br><br>• Pleasanton completes rezoning to allow more housing in Hacienda Business Park, http://www.contracostatimes.com/real-estate-news/ci_17404252?nclick_check=1<br>•.http://www.preservationnation.org/main-street/;<br>•.http://www.concordcode.org/<br>• Pleasanton completes rezoning to allow more housing in Hacienda Business Park, http://www.contracostatimes.com/real-estate-news/ci_17404252?nclick_check=1 |
| LU2-8 | Create incentives program(s) that attract and support local-serving shopping opportunities and services .including programs for business attraction; training and education for desired employee and managers; review and modification or elimination of city business rules and regulations where value does not exceed short and long-term cost; and a program to review and assess incentives from other successful communities. | Non-quantifiable, but supports other land-use measures. | Create incentive program(s) that attract and support local-serving shopping opportunities such as:<br>• Business attraction program through coordination with the Chamber of Commerce and the business community;<br>• Training and education program for desired employee and managers;<br>• Program consisting of city business review and modification or elimination of rules and regulations where value does not exceed cost; and<br>• Review and assess incentive programs from other successful communities. | • Assume commute trips account for about 35% of the total external travel, and about 40% of total external VMT;<br>• Development Types Affected: new, both residential and non-residential;<br>• Trip Purposes Affected: all;<br>• Areas Affected: Citywide;<br>• Forty to Eighty percent of new jobs come from existing businesses within the community. | • Saving Independent Retail, www.prattcenter.net/sites/default/files/.../PrattCenter_SavingIndependentRetail.pdf;<br>• Strategies to Promote the Availability of Affordable Healthy Food, www.nccor.org/.../CDC_and_IOM_recommendation_comparison_table.pdf;<br>• Seven Steps for Creating a Successful SNAP/EBT Program at your Farmers Market, http://www.pps.org/articles/seven-steps-snap-ebt-market/ | 2012 | $7,200 | $0 | Estimate staff time = 80 hrs initial, ongoing cost covered by existing staff<br>Fully burdened City staff rate = $90 per hour;<br>1 FTE = $180,000 per year;<br><br>Source: Email correspondence with City of Pleasanton, Laura Ryan;<br><br>•.http://www.useful-community-development.org/city-planning.html;<br>•.http://www.concordcode.org/<br>• Scottsdale Incentive Programs—New and Existing Companies, http://www.city-data.com/us-cities/The-West/Scottsdale-Economy.html;<br>• Growing Green Jobs, http://www.sfworks.org/emergingtopics.asp;<br>• Entrepreneurial and Small Business Development Strategies, http://www.iedconline.org/?p=Training_ESBDS_AZ; |
| LU2-9 | Create incentive program(s) and modify municipal development codes where feasible to allow an expansion of live-work and work-live uses in existing and future residential developments. | 198 | Develop and adopt revisions and/or additions to the municipal development codes where feasible and create incentive program(s) to allow, attract, and expand live-work and work-live uses in existing and future residential development. Live/work units provide affordable housing, generate additional economic activity in the community, and improve the jobs/housing balance.<br>• Artist Live Work Space Program: create live-work housing for artists and those with special work needs;<br>• Establish critical mass of live-work zoning at selected locations. | Assumed that new housing developments with over 100 units, up to 5% of units would allow live/work; in existing areas, creation of an incentive program has an unknown impact on VMT and was not included in this calculation.<br>• Assume only new live-work/work-live units, no conversions. Estimates for conversions are anecdotal and cannot be quantified at this time.<br>• Assume commute trips account for about 35% of the total external travel, and about 40% of total external VMT;<br>• Development Types Affected: new, both residential and non-residential;<br>• Trip Purposes Affected: All;<br>• Areas Affected: Citywide. | • Todd Litman, Victoria Transport Policy Institute research <http://www.vtpi.org/sgcp.pdf> suggests that while many consumers want to live in more compact, mixed communities, there is no way to project how much cities will respond to this demand, and will vary from one jurisdiction to another.<br>• Scott Bernstein, Center for Neighborhood Technology: Refer to maps at htaindex.cnt.org, the Affordability Index website. "Live-work is somewhat location efficient, but typically 80 percent of household trip making is for non-work purposes." | 2012 | $7,200 | $0 | Estimate staff time = 120 hrs initial, 80 hrs annually;<br>Fully burdened City staff rate = $90 per hour;<br>1 FTE = $180,000 per year<br><br>Based on correspondance with Laura Ryan of City of Pleasanton;<br><br>• Attracting High-Growth, High-Wage Investment, www.fourtheconomy.com/?p=890;<br>• San Pedro Arts, Culture & Entertainment District Plan, www.spacedistrict.org/_publications/SPACEReportFinal.pdf;<br>• Downtown Fullerton, www.compassblueprint.org/files/htai_fullerton.pdf;<br>• How to Save the Cities—Send in the Artists, www.thefiscaltimes.com › Business and Economy |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| LU2-10 | Promote use of LEED for Neighborhood Development (LEED ND) as an incentive for developers seeking better market appeal and municipal support; or for municipal leaders looking to create tax and zoning incentives; or for community members trying to assess a new development; Consider getting LEED ND adopted into municipal code. | Non-quantifiable, but supports other land-use measures. | The U.S. Green Building Council, the Congress for the New Urbanism, and the Natural Resources Defense Council developed LEED for Neighborhood Development (LEED-ND) to provide a set targets aggregated to give overall performance levels (silver, gold, and platinum) .A builder or developer ca apply for a LEED-ND rating at any or all of the following stages:<br>• Stage 1: Conditional approval of a LEED-ND plan, prior to entitlement. (This is meant to help projects get support from the local government and community.)<br>• Stage 2: Precertification of a LEED-ND plan for fully entitled projects. (This may help projects secure financing, expedited permitting, or tenants.)<br>• Stage 3: Certification of projects once construction has been completed. | LEED-ND standards, like LEED for buildings, rewards developments that offer superior performance in terms of conserving and protecting energy and environmental resources by awarding points to projects based on specific criteria, including:<br>• Choosing an Environmentally Sound Location<br>• Reducing the Need to Drive<br>• Using Less Land to Create More Benefits<br>• Conserving Energy, Water and Other Natural Resources | http://www.gbci.org/leednd LEED-ND standards, like LEED for buildings, rewards developments that offer superior performance in terms of conserving and protecting energy and environmental resources by awarding points to projects based on specific criteria, including:<br>• Choosing an Environmentally Sound Location<br>• Reducing the Need to Drive<br>• Using Less Land to Create More Benefits<br>• Conserving Energy, Water and Other Natural Resources | 2012 | $0 to the City. However, applicant pays a substantial amount in all three stages. | $0 to the City. However, costs for applicants are a minimum of $32,250 in GBCI fees alone. | • Real Life LEED: LEED ND Fees Cost HOW Much?, www.reallifeleed.com/.../leed-and-fees-cost-how-much.html;<br>• JAPA: LEED-ND: New Urbanism 2.0?, www.planning.org/newsreleases/2009/oct08.htm<br>• The Cost and Benefits Factor in Implementing LEED, www.fsskyteamonline.com/the-cost-and-benefits-factor-in-implementing-leed/<br><br>“Land Use and Driving: The Role Compact Development Can Play in Reducing GHG Emissions,” a new report from the Urban Land Institute (ULI), concludes that compact development (or “smart growth”) as promoted through LEED-ND is critical to mitigating climate change. The ULI report argues that there is a potential for reducing VMT by 8 to18 percent between now and 2050, when compact development is expected to reach 60 percent of all future development. |
| **LU2** | **TOTALS** | **5,845.34** | | | | | **$29,400** | **$7,200** | |

**LU3 Improve transportation efficiency though design improvements**

| | | |
|---|---|---|
| Total annual reduction potential by 2020 | **2,202** | MT CO2e |
| Average annual cost through 2020 | **$127,450** | (assume first costs amortized over 15 years: 2005 -2020) |
| Average cost per MT reduced | **$57.87** | |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| LU3-1 | Modify the development codes to encourage the location of key services within ½ mile of walking distance of residential clusters or areas. | 2100 | Develop and adopt revisions and/or additions to the municipal zoning and development codes where feasible to locate key services within 1/2 mile walking distance of residences clusters or intensities. 1/4 mile approximates about a five-minte walk.<br>• Where feasible, the code should require pedestrian connections to abutting residential neighborhoods by through-block walkway or links to sidewalks; commercial loading areas should locate away from residential units and shall be screened from residential view. | ACCMA Model/Post Processing; for parcels where new development is proposed based on information described by California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, August 2010;<br>• Development Types Affected: new, both residential and non-residential;<br>• Trip Purposes Affected: All;<br>• Areas Affected: Citywide | • Pleasanton Municipal Code, http://qcode.us/codes/pleasanton/<br>• Commercial and Mixed Use Development Code Handbook, http://www.mrsc.org/Subjects/Transpo/MixedUse.aspx;<br>• Mixed-Use Projects Require Planners To Rethink Zoning Standards, http://www.cp-dr.com/node/651;<br>• Green Development Codes / Ordinances, http://www.smartcommunities.ncat.org/greendev/codes.shtml;<br>• The Future of Infill Housing in California, communityinnovation. berkeley.edu/reports/Future_of_Infill_Vol_1.pdf;<br>• Welcome to the City of Concord, California's Development Code, www.concordcode.org/;<br>• Moving Cooler, An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions, http://www.movingcooler.info/; | 2012 | $2,250 | $0 | Estimate 25 hrs initial staff time for this measure, apportioned from total staff time needed to revise municipal code for approximately 20 measures (500 hrs);<br>Fully burdened City staff rate = $90 per hour;<br>1 FTE = $180,000 per year<br>Based on correspondance with Janice Stern of City of Pleasanton;<br><br>•.http://www.preservationnation.org/main-street/;<br>•.http://www.concordcode.org/<br>• Barriers to Developing Walkable Urbanism and Possible Solutions, www.cleinberger.com/docs/By_CL/Brookings_Barriers_05302007.pdf;<br>• California Local Government Finance Almanac, http://www.CaliforniaCityFinance.com/#SPENDING |
| LU3-2 | Incorporate building, landscape, and streetscape development design features that encourage transit, bicycle, and pedestrian access. | | Develop and adopt revisions and/or additions to the municipal street standards and/or development codes where feasible to improve access, convenience, and safety for transit, bicycle, and pedestrian users. Site development within non-walkable blocks should be modified to create or improve walkability and biking by inserting new streets or walkways. | | • Pedestrian and Bicycle Facilities in California, A Technical Reference and Technology Transfer Synthesis for Caltrans Planners and Engineers, http://www.dot.ca.gov/hq/traffops/survey/pedestrian/TR_MAY0405.pdf;<br>• Nonmotorized Transportation Planning: Identifying Ways to Improve Pedestrian and Bicycle Transport, http://www.vtpi.org/tdm/tdm25.htm; | 2013 | $0 | $120,000 | Assume 1/2 time staff position for Transit, Pedestrian and Bicycle Facilities Coordinator, allocated across LU3 ($45K) and NM1 ($45K):<br>Assume Capital improvements = $150,000/year allocated across LU3 and NM1 ($75K each); Potential cost savings through reduced pavement maintenance.<br>Fully burdened City staff rate = $90 per hour;<br>1 FTE = $180,000 per year; |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| LU3-3 | Create incentive program(s) to assure adequate transit service and pedestrian and bicycle facilities at new and existing major commercial, office, and institutional centers. | | Create incentive program(s) that provide and/or improve transit service and pedestrian and bicycle facilities at new major commercial, office, and institutional centers:<br>• Provide a dedicated coordinator who oversees the planning and development of the system and ensures that bicycle and pedestrian issues are considered in the construction and rehabilitation of all facilities that affect transit, cyclists and pedestrians.<br>• Review and assess incentive programs from other successful communities.<br>• Education and promotional programs that target current and potential pedestrian and bicyclists;<br>• City business review and modify constraining street standards and development codes. | ACCMA Model/Post Processing; for parcels where new development is proposed based on information described by California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, August 2010;<br>• Development Types Affected: new, non-residential only;<br>• Trip Purposes Affected: All;<br>• Areas Affected: Employment centers | • Smart Growth, Bicycle, Pedestrian and Transit Friendly Land Use Design, www4.uwm.edu/cuts/utp/landuse.pdf;<br>• Designing Transportation Facilities for Pedestrians and Bicycles, http://www.epa.gov/oms/stateresources/policy/transp/tcms/bicycle_ped.pdf | | | | • Costs of Complete Streets http://www.completestreets.org/complete-streets-fundamentals/factsheets/costs/;<br>• Complete Streets Report, http://www.activelivingresources.org/assets/completestreetsreport.pdf;<br>• Complete Streets: Designing Streets for All Users, http://www.co.lancaster.pa.us/toolbox/cwp/view.asp?a=3&Q=641924&PM=1 |
| LU3-4 | Require that new projects that include two or more seated bus shelters to include infrastructure to incorporate 'NextBus' technologies for tracking buses and predicting arrival times. | | Develop and adopt revisions and/or additions to the municipal development codes that require the provision of two or more bus shelters with seating in each shelter and infrastructure to incorporate 'NextBus' technologies, which uses satellite technology and advanced computer modeling to track vehicles fitted with a satellite tracking system that accounts for the actual position of the buses, their intended stops, and the typical traffic patterns, and estimate vehicle arrivals with a high degree of accuracy, updated constantly. | ACCMA Model/Post Processing; for parcels where new development is proposed based on information described by California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, August 2010;<br>• Development Types Affected: new, both residential and non-residential;<br>• Trip Purposes Affected: All;<br>• Areas Affected: Citywide | • NextBus, http://www.nextbus.com/homepage/<br>• MTC Newsletter: http://www.mtc.ca.gov/news/transactions/ta05-0699/next_bus.htm<br>•.www.townhall.townofchapelhill.org/response_to_council_request_for_info_re_nextbus_contract.htm;<br>• www.allbusiness.com/transportation/public.../5854571-1.html | 2014 | $0 | $7,000 | Assume 1 installation per year; Approximately $5,000 to $8,000 per stop plus GPS tracking devices in each bus.<br><br>Fully burdened City staff rate = $90 per hour; 1 FTE = $180,000 per year<br><br>• SG Gate, www.articles.sfgate.com/1999-06-03/news/28595555_1:<br>• Commuter News Column, www.commuterpage.com/cnews/column.cfm?id=1505; • MTC -- News -- Transactions, www.mtc.ca.gov/news/transactions/ta05-0699/next_bus.htm |
| LU3-5 | Modify the municipal street standards to incorporate AB 1358 Complete Streets to increase the safety, convenience, and efficiency of pedestrians, bicyclists, motorists, and transit riders. | | Modify the municipal street standards to incorporate AB 1358 Complete Streets, a transportation facility that is planned, designed, operated, and maintained to provide safe mobility for all users, including bicyclists, pedestrians, transit vehicles, truckers, and motorists, appropriate to the function and context of the facility. Complete street concepts apply to rural, suburban, and urban areas. A walkable street network consists intersections spaced equal to or less 550 feet center-to-center. | ACCMA Model/Post Processing; for parcels where new development is proposed based on information described by California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, August 2010;<br>• Development Types Affected: new and existing, both residential and non-residential;<br>• Trip Purposes Affected: All;<br>• Areas Affected: Citywide | • Update to the General Plan Guidelines: Complete Streets and the Circulation Element, http://www.opr.ca.gov/planning/docs/Update_GP_Guidelines_Complete_Streets.pdf;<br>• The Complete Streets Act, http://www.calbike.org/pdfs/AB1358_Fact_Sheet.pdf;<br>• Complete Streets Implementation Action Plan, http://www.dot.ca.gov/hq/tpp/offices/ocp/complete_streets_files/CompleteStreets_IP03-10-10.pdf; | 2013 | $4,500 | Included in LU3-3 | Estimate 50 hrs initial staff time for these 2 code change measures, apportioned from total staff time needed to revise municipal code for approximately 20 measures (500 hrs);<br><br>Fully burdened City staff rate = $90 per hour; 1 FTE = $180,000 per year;<br>• Employ a 1/2 time transit, pedestrian and bicycle facilities coordinator<br><br>• Costs of Complete Streets http://www.completestreets.org/complete-streets-fundamentals/factsheets/costs/; |
| LU3-6 | Modify the municipal development codes to require that new projects include pedestrian and bicycle access ithrough cul-de-sacs in new projects, except where prohibited by topography. | | | ACCMA Model/Post Processing; for parcels where new development is proposed based on information described by California Air Pollution Control Officers Association (CAPCOA), Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures, August 2010;<br>• Development Types Affected: new, both residential and non-residential;<br>• Trip Purposes Affected: All;<br>• Areas Affected: Citywide | • Moving Cooler, An Analysis of Transportation Strategies for Reducing Greenhouse Gas Emissions, http://www.movingcooler.info/;<br>• The Complete Streets Act, http://www.calbike.org/pdfs/AB1358_Fact_Sheet.pdf;<br>• Complete Streets Implementation Action Plan, http://www.dot.ca.gov/h | | | Included in LU3-3 | • Complete Streets Report, http://www.activelivingresources.org/assets/completestreetsreport.pdf;<br>• Complete Streets: Designing Streets for All Users, http://www.co.lancaster.pa.us/toolbox/cwp/view.asp?a=3&Q=641924&PM=1<br>• Estimate: $500 per cul-de-sac; $7 per square foot of new sidewalk. |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| LU3-7 | Implement Neighborhood traffic calming projects to slow traffic speeds, reduce cut-through traffic and traffic-related noise, improve the aesthetics of the street, and increase safety for pedestrians, bicyclists, and vehicles. | 102 | Traffic calming consists of strategies and tools used to slow traffic speeds, reduce cut-through traffic and traffic-related noise, improve the aesthetics of the street, and increase safety for pedestrians, bicyclists, and vehicles. Traffic calming is best accomplished through the adoption and implementation of Complete Streets standards that can reduce motor vehicle speeds and increase safety and convenience for pedestrians and bicyclists. | Assumes 5% of residential neighborhoods implement traffic calming and from Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change, Urban Land Institute. | | | | Included in LU3-3 | |
| **LU3** | | **2,202.34** | | | | | **$6,750** | **$127,000** | |
| **TR1** | **Improve and increase transit ridership with incentives, partnerships, and related investments** | | | | | | | | |
| | Total annual reduction potential by 2020 | **2,377** MT CO2e | | | | | | | |
| | Average annual cost through 2020 | **$32,511** (assume first costs amortized over 15 years: 2005 -2020) | | | | | | | |
| | Average cost per MT reduced | **$13.68** | | | | | | | |
| | **Action** | **CO2e impact (MT/year)** | **Comments; Description** | **Assumptions, Methodology, and Calculations** | **Background and Data Sources** | **Start Year** | **First Cost to City** | **Avg. Annual Ongoing Cost to City** | **Supporting Comments, Assumptions & Methodology; Data & Funding Source(s);** |
| TR1-1 | Create carpool programs to/from transit station parking, and incentivize bike rental vendors at transit station (see NM1-20) | 853 | Organize a carpool program with local commuter representatives and employers consisting of free or fee private (e.g. shuttle) or public ride services to and from transit station parking (not a city program). Consider local BART, MUNI, or other transit professional to lead the effort. Incentivize the installation of bike rental vendors at transit stations (see NM1-20). | Assumes 10% of employees eligible. Source: Victoria Transport Policy Institute, TDM Encyclopedia; http://www.vtpi.org/tdm/tdm34.htm;<br>• Development Types Affected: new and existing, both residential and non-residential;<br>• Trip Purposes Affected: all;<br>• Areas Affected: Transportation Hubs• Carpool advantages for employers: No cost for employers; reduce traffic congestion; alleviate employee stress and expense; improve employee morale; and use as recruitment and retention tool.<br>• Carpool advantages for employees: Possible tangible incentives (e.g., free transit pass) for passengers carpooling with two other people; share commute costs with other passengers; utilize HOV Lanes with 3 or more passengers; and educe commute time and stress associated with commute. | • Victoria Transport Policy Institute, http://www.vtpi.org/tdm/. The Encyclopedia is produced by the Victoria Transport Policy Institute to help improve understanding of Transportation Demand Management. It<br>• UNH Carpool Parking Program, http://www.unh.edu/transportation/programs/carpool.htm;<br>• SANBAG Car Pool Program, http://www.sanbag.ca.gov/commuter/carpool.html;<br>• CSUF Carpool Program, http://parking.fullerton.edu/transportation/facultystaff/Carpool.aspx | 2012 | $0 | $2,250 | Ongoing staff time = 25 hrs/year<br>Source: Email correspondence with City of Pleasanton, Laura Ryan;<br><br>• CARPOOL INCENTIVE PROGRAM, http://www.commute.org/index.php?option=com_content&view=article&id=53&Itemid=56;<br>• EPA Carpool Incentive Programs: Carpool Incentive Programs, www.cleanairpartnerstx.org/.../Carpool%20Incentive%20Programs%20- %20EPA.pdf;<br>• CAL VANPOOL/CARPOOL PROGRAMS: www.ntis04.hgac.cog.tx.us/.../16.%20VanPool%20&%20CarPool%20Programs- final.html - |
| TR1-2 | Support Livermore Amador Valley Transit Authority's Rapid Bus Program through frequent ridership and promotion of the LAVTA on the City's websites. | | Livermore Amador Valley Transit Authority (LAVTA) Wheels bus system provides public transportation for the Tri-Valley communities of Dublin, Livermore and Pleasanton. Support is best provided through frequent ridership with or without bikes, and through promotion of the LAVTA on the City's websites. | Rapid Bus serves Stoneridge Mall area, 1% reduction in total VMT. Source: CAPCOA and National Household Travel Surveys, 2001 http://www.dot.ca.gov/hq/tsip/tab/documents/travel surveys/Final2001_StwTravelSurvey WkdayRpt.pdf, p.150 (Suburban – SCAG, SANDAG, Fresno County;<br>• Development Types Affected: neither new nor existing, neither residential nor non-residential;<br>• Trip Purposes Affected: all;<br>• Areas Affected: Stoneridge Mall | • Livermore Amador Valley Transit Authority, http://www.wheelsbus.com/;<br>• Gannett Fleming Supporting LAVTA Bus Rapid Transit, http://busride.com/2011/03/gannett-fleming-supporting-lavta-bus-rapid-transit/;<br>• US Bus Station.com - Pleasanton, CA Transit, http://www.usbusstation.com/california/alameda/pleasanton_bus_routes.htm | 2012 | $3,600 | $12,600 | Estimate staff time = 40 hrs initial, 140 hrs annually;<br>Source: Email correspondence with City of Pleasanton, Laura Ryan;<br><br>Livermore Amador Valley Transit Authority's annual Operating Budget for FY 2010 - $13 M.<br><br>LAVTA operates under a Joint Powers Agreement to provide public transit in the cities of Dublin, Livermore, Pleasanton, and in unincorporated areas of Alameda County through a seven member Board of Directors, composed of two elected city officials from each City Council, and one member appointed by the Alameda County Board of Supervisors. |
| TR1-3 | Promote a more direct and convenient connection between BART and ACE rail service. | | Currently, Livermore Amador Valley Transit Authority's Route 53 commenced express service between the Pleasanton ACE Train Station and the Pleasanton side of the new BART Station and the Stoneridge Mall, to provide faster connection between BART and ACE.<br>• Incentivize the installation of bike rental vendors at BART and ACE stations (see NM1-20). | Part of other measures; increased frequency and transit service;<br>• Development Types Affected: new and existing, both residential and non-residential;<br>• Trip Purposes Affected: all;<br>• Areas Affected: BART/ACE | • WHEELS - Route Schedules and Maps - Fixed Route, http://www.wheelsbus.com/news/2011/News%20Release_Jan_2011_Svc_Chges.pdf<br>• Livermore Amador Valley Transit Authority, http://www.wheelsbus.com/; | | | | |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| TR1-4 | Increase frequency of buses that access BART or other destination centers such as Hacienda Business Park and Lawrence Livermore National Lab. | | Create incentives that increase frequency of buses that access BART or other destination centers such as Hacienda Business Park:<br>• Review and assess incentive ideas from other successful services;<br>• Coordinate with Livermore Amador Valley Transit Authority to maximize ridership attraction;<br>• High gas prices could fuel higher bus ridership | Measure assumes a 25% reduction in headways, from source: Lund, et al, Travel Characteristics of Transit-Oriented Development in California. http://www.csupomona.edu/~rwwillson/tod/Pictures/TOD2.pdf;<br>• Development Types Affected: new and existing, both residential and non-residential;<br>• Trip Purposes Affected: all;<br>• Areas Affected: Citywide | • Livermore Amador Valley Transit Authority, http://www.wheelsbus.com/;<br>•.http://wcfcourier.com/business/local/article_28412884-5c9c-11e0-aa1f-001cc4c002e0.html | | | | |
| TR1-5 | Provide transit service within ½ mile of all residents in the city where and when the gross density surrounding or adjacent to feasible transit routes meets or exceeds 10-12 units/acre. | | Create incentives that can provide transit service within ½ mile of all residents in the city where the gross density is 10-12 units/acre. Gross density for a given area of land includes number of dwelling units or an equivalent area of non-residential space that includes public rights-of-way such as roads and parks:<br>• Support higher densities along existing and potential transit routes and stations;<br>• Review and assess incentive ideas from other successful services;<br>• Coordinate with Livermore Amador Valley Transit Authority to maximize ridership attraction;<br>• High gas prices could fuel higher bus ridership | Most residents (at 10-12 units/acre) already located within ½ mile of some sort of transit. Source: Travel Characteristics of Transit-Oriented Development in California;<br>• Development Types Affected: new and existing, residential;<br>• Trip Purposes Affected: all;<br>• Areas Affected: Citywide | • THE PLEASANTON GENERAL PLAN, Circulation Element Map, www.ci.pleasanton.ca.us/pdf/gp-circulation.pdf;<br>• Wheels Transit Maps, http://www.wheelsbus.com/schedules/index.html<br>• The Housing + Transportation Affordability Index, http://htaindex.cnt.org/;<br>• Regional Transit Access (TAI) and Connectivity (TCI) Indexes, http://htaindex.cnt.org/mapping_tool.php#region=Oakland%2C%20CA&theme_menu=1&layer1=10&layer2=33 | 0 | $5,400 | $3,600 | Estimate staff time = 60 hrs initial, 40 hrs annually;<br>Livermore Amador Valley Transit Authority's annual Operating Budget for FY 2010 - $13 M.<br><br>• Regional Annual Transit Costs and Household Monthly Transportation Costs, http://htaindex.cnt.org/mapping_tool.php#region=Oakland%2C%20CA&theme_menu=1&layer1=50&layer2=14 |
| TR1-6 | Modify the municipal code to require new residential developments within 1/2 mile of transit to offer discounted transit passes as part of HOA amenities, payable through the HOA dues. | 427 | This measure would require residential developments within 1/2 mile of transit to offer a reduced fee or to pay for transit passes to all residents that paid HOA dues. This incentivizes transit ridership, decreases auto dependency, and increases pedestrian street activity. | 0.7% reduction in VMT based on Santa Monica Land Use and Circulation Element;<br>• Development types affected, All<br>• Trip purpose affected, Commute Trips<br>• Areas affected, Region | http://www.transformca.org/programs/great-communities-collaborative/san-franciscos-japantown;<br>• City of Santa Monica Land Use and Circulation Element EIR Report, Appendix – Santa Monica Luce Trip Reduction Impacts Analysis (p.401). http://www.shapethefuture2025.net/ | 2012 | $2,250 | $0 | Estimate 25 hrs initial staff time for this measures, apportioned from total staff time needed to revise municipal code for approximately 20 measures (500 hrs);<br>Fully burdened City staff rate = $90 per hour;<br>1 FTE = $180,000 per year<br>Based on correspondance with Janice Stern of City of Pleasanton; |
| TR1-7 | Identify underused parking lots and/or other available paved areas that could serve as park-and-ride lots accessed by buses that access BART or other destination centers such as Hacienda Business Park or Lawrence Livermore National Lab. | 1,090 | Park and ride lots located in walkable proximity to transit allow commuters and others to leave their vehicles and transfer to a bus, BART, or commuter rail, or carpool for the rest of their trip. Identify underused parking lots and areas of town that could benefit from park and ride lots that would provide shuttles to BART from remote locations. | Expanding park and ride system could result in up to 0.5 % reduction in commute trips based on data from WSDOT.<br>• Development types affected, All<br>• Trip purpose affected, Commute Trips<br>• Areas affected, Region | •.http://www.wsdot.wa.gov/Research/Reports/000/094.1.htm;<br>•.http://en.wikipedia.org/wiki/Public_transport | 2012 | $1,800 | $0 | Fully burdened City staff rate = $90 per hour;<br>Assume 20 hours of City staff time to research and provide park and ride lot location information to BART and larger employers or residential developments that may take part in this program. |
| TR1-8 | Create incentives to develop park and ride lots identified in TR1-7. | | | | | | | | |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| TR1-9 | Introduce a bus idling policy and ordinance to limit commercial and public diesel vehicle idling, where feasible. | 6 | Vehicle idling is responsible for millions of dollars per year in wasted fuel. 10 idling minutes per day wastes an average of 26 gallons of gasoline per year. Reducing idling will reduce the emission of nitrous oxides, carbon monoxide and VOCs that are emitted from a vehicle's tailpipe. The tail pipe emissions from diesel vehicles<br>• Although the CO2 emissions are close to gasoline, the production of diesel requires a far greater amount of oil and produces more pollution than the production of gasoline, and research has shown that the toxic emissions from the tailpipe of diesel driven vehicles contains more of the soot particles that cause smog and carry air borne sources of cancer and breathing problems. | Assumptions: Transit and school buses on average consume 0.5 gallon of diesel fuel per hour of idling; commercial trucks and tractor trailers on average consume 1.15 gallon of diesel fuel per hour of idling; www.transportation.anl.gov/pdfs/TA/373.pdf Estimated number of municipal vehicle gallons consumed per year: 24,395. Estimated number of commercial vehicle gallons consumed per year: 24,395. Estimated hours idling: 5.5 hours/day at .8 gal./hour = 4.4 gallons per day per vehicle. CO2 emissions from a gallon of diesel = 2,778 grams x 0.99 x (44/12) = 10,084 grams = 10.1 kg/gallon = 22.2 pounds/gallon. 600 gallons of fuel would be saved if 100 buses each reduced idling by 1 hour per month. The fuel efficiency of a diesel bus is: 5.4 mpg Emission Factor: The GHG Emission Factor for a diesel bus is about: 21 lbs. of CO2e per U.S. gallon (CACP software)<br>Annual Service Miles – 2.0 Million, Total Pleasanton VMT in 2005 = 2,089,024 Gasoline carbon content per gallon: 2,421 grams. Diesel carbon content per gallon: 2,778 grams | • www.brattleboro.org/.../%7B8E554F52-EB49-422F-8E2A-C90242FDF15B%7D.PDF<br>• 31 states across the US have already enacted some form of ordinance. N. Lutsey, C.J.Brodrick, D. Sperling, and C. Oglesby, Heavy-Duty Truck Idling Characteristics — Results from a Nationwide Truck Survey, TRB Annual Meeting (January 2004).<br>• Existing idling ordinances: Cupertino Municipal Code 10.48.05 Motor Vehicle Idling;<br>• Fountain Valley Municipal Code § 6.28.147 Idling motor vehicles; and Palm Desert Municipal Code 10.98.010 Parking prohibitions and restrictions;<br>• Emission Facts: Average Carbon Dioxide Emissions Resulting from Gasoline and Diesel Fuel, www.epa.gov/otaq/climate/420f05001.htm | 2012 | $5,400 | $3,591 | Fully burdened City staff rate = $90 per hour; Assume 20 hours of City staff time to research and modify municipal code.<br><br>Estimated municipal ordinance development and report for City Council: 40 hours staff time. Estimated annual staff time for providing the necessary level of monitoring and enforcement to maintain compliance, offset by fins levied. Other potential costs: Evaluating the need to equip trucks with an auxiliary electrical system for illumination and warning signs where necessary. |
| TR1-10 | Develop a Green Guide Website web-based "Green Ride" resource on the City's www.pleasantongreenscene.org that describes and promotes transportation alternatives that reduce motor vehicle emission, for planned events, concerts, festivals, and conventions. | Non-quantifiable, but supports other transportation and land-use measures. | A planned event is a public activity with a scheduled time, location, and duration. The measure should 1) raise the awareness of general public and event patrons of the potential travel impacts on SOVs, both from traffic and emissions perspectives; 2) provide patrons with opportunities to partner with other attendees to rideshare, van-pool, and explore alternative options to SOVs. | A web page would 1) post event information; 2) describe transportation alternatives (e.g. BART) including digital maps; and provide ridesharing venues such as eRideShare.com. While CO2e reduction is not quantifiable, the measure could • reduce traffic congestion, • improve mobility, • form partnerships and build trust, • promote interagency coordination, resource utilization and sharing, and • incorporate new procedures, plans & practices into day-to-day operation of agencies | • http://www.erideshare.com/;<br>•.http://www.erideshare.com/carpool.php?dstate=CA;<br>• http://www.rideshareonline.com/; http://www.ridenow.org/ | 2011 | $3,600 | $9,000 | Fully burdened City staff rate = $90 per hour; Assume 40 hours of City staff time to create the web resource and 100 hours annually to update the site.<br><br>The web page could be designed and hosted on the City's existing www.pleasantongreenscene.org for approximately $1,500 by a consultant. The cost for uploading files and maintaining the site could be paid for by event sponsors and/or advertisers. |
| TR1-11 | Develop and implement a transit system master plan for the city that provides a context for planning decisions based on access to transit, that integrates regional (BART, ACE, LAVTA) and local [bus] transit systems and explores adding new systems [e.g., Pleasanton trolleys] to provide the infrastructure needed to reduce travel by single-occupancy vehicles. | Non-quantifiable at this time | The Master Plan would act as the backbone for planning decisions based on access to low-carbon transit rather than 'available land' | | | | $3,600 | $2,160 | Estimate staff time = 40 hrs initial, 24 hrs annually; |
| **TR1** | **TOTALS** | **2,376.71** | | | | | **$22,050** | **$31,041** | |

| NM1 | Enhance and maintain a safe, convenient, and effective system for pedestrians and bicyclists | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total annual reduction potential by 2020 | | **1,280** MT CO2e | | | | | | |
| | Average annual cost through 2020 | | **$121,320** (assume first costs amortized over 15 years: 2005 -2020) | | | | | | |
| | Average cost per MT reduced | | **$94.78** | | | | | | |
| | **Action** | **CO2e impact (MT/year)** | **Comments; Description** | **Assumptions, Methodology, and Calculations** | **Background and Data Sources** | **Start Year** | **First Cost to City** | **Avg. Annual Ongoing Cost to City** | **Supporting Comments, Assumptions & Methodology; Data & Funding Source(s);** |
| NM1-1 | Implement the Community Trails Master Plan through the creation of incentive program(s), inclusion in the City's CIP, and/or modification of municipal development codes. | 1280 | Implementing the Community Trails Master Plan includes completion of detailed mapping, plans and standard construction details for the integration of a linked system of pedestrian and cycling trails throughout the city, a strategy and recommendations to address missing links in the trail and open-space system, and scheduling for the implementation for all recommendations through: 1) incentive program(s), 2) funding through the City's CIP, and/or 3) modification of the municipal development codes where necessary. | VMT reductions based on estimated increases in bicycle trips from the City of Pleasanton Pedestrian and Bicycle Master Plan and from Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change, Urban Land Institute.<br>• Development Types Affected: new and existing;<br>• Trip Purposes Affected: All;<br>• Areas Affected: Citywide | • Pleasanton Pedestrian and Bicycle Master Plan, https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf | 2012 | $2,250 | $0 | Estimate 50 hrs initial staff time for NM1-1 and NM1-2, apportioned from total staff time needed to revise municipal code for approximately 20 measures (500 hrs);<br>Fully burdened City staff rate = $90 per hour;<br>1 FTE = $180,000 per year<br>• Ongoing staff time to help create incentive program(s), include in the City's CIP, and/or modify municipal development codes,<br>• Ongoing staff time to help implement the Pleasanton Pedestrian and Bicycle Master Plan.<br><br>• Pleasanton Pedestrian and Bicycle Master Plan, https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf;<br>• APPENDIX F: PEDESTRIAN IMPROVEMENTS AND COSTS, https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf |
| NM1-2 | Implement the Pleasanton Pedestrian and Bicycle Master Plan, June 2009, through the creation of incentive program(s) and/or modification of municipal development codes. | | | | | | | | |
| NM1-3 | Develop the Downtown Transportation Corridor for pedestrian, bicyclists and parking, consistent with the 2002 Master Plan for the Downtown Parks and Trails System and with the Downtown Specific Plan. | | Developing the Downtown Transportation Corridor includes the following actions:<br>• Continued development of successful trail corridors such as the Tassajara Creek Trail and improved access to the Iron Horse Trail and other trails;<br>• Bicycle lanes and/or routes on several key cross-city corridors, including Hopyard Road, Santa Rita Road and Foothill Boulevard;<br>• Pedestrian and ADA improvements that include upgrades to sidewalks, curbs, crosswalks and bus stops;<br>• Safe Routes to School conceptual plans for Lydiksen, Alisal and Walnut Grove Elementary schools; and<br>• Development of education, encouragement and enforcement programs | VMT reductions based on estimated increases in bicycle trips from the City of Pleasanton Pedestrian and Bicycle Master Plan and from Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change, Urban Land Institute.<br>• Development Types Affected: new and existing, non-residential only;<br>• Trip Purposes Affected: All;<br>• Areas Affected: Downtown | • Pleasanton Pedestrian and Bicycle Master Plan, https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf | | | | |
| NM1-4 | Require appropriate bicycle-related improvements (i.e., work-place provision for showers, bicycle storage, bicycle lanes, etc.) with new development. | | Pleasanton Pedestrian and Bicycle Master Plan, Implement POLICY 22, Program 22.5: Require appropriate bicycle-related improvements (i.e., work-place provision for showers, bicycle storage, bicycle lanes, etc.) with new development. | VMT reductions based on estimated increases in bicycle trips from the City of Pleasanton Pedestrian and Bicycle Master Plan and from Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change, Urban Land Institute.<br>• Development Types Affected: New, both residential and non-residential;<br>• Trip Purposes Affected: All;<br>• Areas Affected: Citywide | • Pleasanton Pedestrian and Bicycle Master Plan, https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf | 2012 | $0 | $0 | Existing staff time |
| NM1-5 | Modify municipal development codes to require bike parking for non-residential and multi-family uses | | Modify codes for:<br>• Short-term Bicycle Parking, low-cost devices that provide a location to secure a bicycle;<br>• Long-term Bicycle Parking, covered storage units that can be locked individually, providing secure parking for one bicycle;<br>• Shower and Locker Facilities, lockers provide a secure place for bicyclists to store their helmets or other riding gear; and<br>• Bicycle Stations, bicycle Stations provide free all-day, attended bicycle parking. | | • Pleasanton Municipal Code, http://qcode.us/codes/pleasanton/;<br>• Pleasanton TOD Standards and Design Guidelines, www.pleasantonca.org/pdf/draftstandards-1101.pdf;<br>• Pleasanton Pedestrian and Bicycle Master Plan, https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf | 2012 | $2,250 | $0 | Estimate 25 hrs initial staff time for this measure, apportioned from total staff time needed to revise municipal code for approximately 20 measures (500 hrs);<br>Fully burdened City staff rate = $90 per hour;<br>1 FTE = $180,000 per year<br>Based on correspondance with Janice Stern of City of Pleasanton; |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| NM1-6 | Maintain bicycle routes with adequate sweeping and pavement repairs. | | Pleasanton Pedestrian and Bicycle Master Plan, Implement POLICY 22, Program 22.6: Maintain bicycle routes with adequate sweeping and pavement repairs. | VMT reductions based on estimated increases in bicycle trips from the City of Pleasanton Pedestrian and Bicycle Master Plan and from Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change, Urban Land Institute.<br>• Development Types Affected: new and existing, both residential and non-residential;<br>• Trip Purposes Affected: All;<br>• Areas Affected: Downtown | • Pleasanton Pedestrian and Bicycle Master Plan, https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf;<br>• Bicycle Parking, http://www.bicyclinginfo.org/engineering/parking.cfm;<br>• SF Bicycle Parking, http://www.sfmta.com/cms/bpark/3176.html;<br>• BART Bike Parking, http://www.bart.gov/guide/bikes/index.aspx | 2012 | $0 | $120,000 | Assume 1/2 time staff position for Transit, Pedestrian and Bicycle Facilities Coordinator, allocated across LU3 ($45K) and NM1 ($45K):<br>Assume Capital improvements = $150,000/year allocated across LU3 and NM1 ($75K each); Potential cost savings through reduced pavement maintenance:<br>Cost of new bicycle facilities and funding and implementation,<br>Fully burdened City staff rate = $90 per hour;<br>1 FTE = $180,000 per year;<br><br>Pleasanton Pedestrian and Bicycle Master Plan, https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf |
| NM1-7 | Incorporate bicycle detection at signalized intersections. | | Pleasanton Pedestrian and Bicycle Master Plan, Implement POLICY 22, Program 22.7: Incorporate bicycle detection at signalized intersections. | | | 2012 | $0 | Included in NM1-6 | |
| NM1-8 | Encourage schools, businesses and office parks to provide safe, convenient bike racks. | | Pleasanton Pedestrian and Bicycle Master Plan, Implement POLICY 22, Program 22.8: Strongly encourage the Pleasanton Unified School District to provide convenient, safe, and attractive bicycle racks at all public schools. | VMT reductions based on estimated increases in bicycle trips from the City of Pleasanton Pedestrian and Bicycle Master Plan and from Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change, Urban Land Institute.<br>• Development Types Affected: new and existing, Non-residential;<br>• Trip Purposes Affected: All;<br>• Areas Affected: Downtown | | 2012 | $0 | Included in NM1-6 | |
| NM1-9 | Work with East Bay Park District to complete Iron Horse Trail through Hacienda Business Park (HBP) | | Pleasanton Pedestrian and Bicycle Master Plan, Implement POLICY 22, Program 22.4: Work with the East Bay Regional Park District to complete the Iron Horse Trail through the Hacienda Business Park. | VMT reductions based on estimated increases in bicycle trips from the City of Pleasanton Pedestrian and Bicycle Master Plan and from Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change, Urban Land Institute.<br>• Trip Purposes Affected: all;<br>• Areas Affected: Hacienda Business Park | | 2012 | $0 | Included in NM1-6 | • Proposed off-street bicycle facilities / pedestrian trail improvements and funding and implementation, Pleasanton Pedestrian and Bicycle Master Plan, https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf |
| NM1-10 | Install bicycle/pedestrian underpass at 580/680 interchange (Johnson Drive canal) for connection to Dublin | | Pleasanton Pedestrian and Bicycle Master Plan, Implement POLICY 22, Program 22.5: Extend the existing Tassajara Creek Trail in Dublin over/under Interstate 580 to connect with the City of Pleasanton, and 22.8: Recommend a trail connection along the Arroyo del Valle to link the existing Centennial Trail and downtown with the Shadow Cliffs Regional Park. | VMT reductions based on estimated increases in bicycle trips from the City of Pleasanton Pedestrian and Bicycle Master Plan and from Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change, Urban Land Institute.<br>• Trip Purposes Affected: All;<br>• Areas Affected: 580/680 interchange | | 2012 | NA | NA | High capital cost - Dependent on outside funding; staff time |
| NM1-11 | Place more bike racks throughout the city through the creation of incentive program(s), inclusion in the City's CIP, and/or modification of municipal development codes. | | Provide more bike racks throughout the city and where unavailable or inadequate at both BART stations, for secure, covered bicycle parking at major transit hubs. Bicycle parking should be visible, accessible, easy to use, convenient, and plentiful. Racks should support the whole bike and enable the user to lock the frame and wheels of the bike with a cable or U-shaped lock. Parking should preferably be covered, well lit, and in plain view without being in the way of pedestrians or motor vehicles. Strategies include incentive program(s), funding through the City's CIP, and/or modification of the municipal development codes where necessary. | VMT reductions based on estimated increases in bicycle trips from the City of Pleasanton Pedestrian and Bicycle Master Plan and from Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change, Urban Land Institute.<br>• Trip Purposes Affected: All;<br>• Areas Affected: Transit Hubs | • Pleasanton Pedestrian and Bicycle Master Plan, https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf;<br>• Bicycle Parking, http://www.bicyclinginfo.org/engineering/parking.cfm;<br>• SF Bicycle Parking, http://www.sfmta.com/cms/bpark/3176.html;<br>• BART Bike Parking, http://www.bart.gov/guide/bikes/index.aspx | 2012 | $2,250 | Included in NM1-6 | Estimate 25 hrs initial staff time for this measure, apportioned from total staff time needed to revise municipal code for approximately 20 measures (500 hrs);<br>Fully burdened City staff rate = $90 per hour;<br>1 FTE = $180,000 per year<br>Based on correspondance with Janice Stern of City of Pleasanton;<br><br>• Proposed off-street bicycle facilities / pedestrian trail improvements and funding and implementation, Pleasanton Pedestrian and Bicycle Master Plan, https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf |
| NM1-12 | Provide secure, covered bicycle parking at major transit hubs including BART stations through the creation of incentive program(s), inclusion in the City's CIP, and/or modification of municipal development codes. | | | VMT reductions based on estimated increases in bicycle trips from the City of Pleasanton Pedestrian and Bicycle Master Plan and from Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change, Urban Land Institute.<br>• Trip Purposes Affected: All;<br>• Areas Affected: Transit Hubs, BART | | 2012 | $0 | Included in NM1-6 | Cost of new bicycle facilities and funding and implementation, Pleasanton Pedestrian and Bicycle Master Plan, https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf |

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| NM1-13 | As part of the Pleasanton Pedestrian and Bicycle Master Plan, target the development of a pedestrian trail system that connects all major areas of the City. | | Pleasanton Pedestrian and Bicycle Master Plan, Implement POLICY 22, Program 22.3: Develop a pedestrian trail system which connects all major portions of the Planning Area, and Program 2-6C: Develop a pedestrian trail system which connects all major portions of the Planning Area. | VMT reductions based on estimated increases in bicycle trips from the City of Pleasanton Pedestrian and Bicycle Master Plan and from Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change, Urban Land Institute.<br>• Trip Purposes Affected: All;<br>• Areas Affected: Citywide | • Pleasanton Pedestrian and Bicycle Master Plan, https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf | 2012 | $0 | Included in NM1-6 | • Proposed off-street bicycle facilities / pedestrian trail improvements and funding and implementation, Pleasanton Pedestrian and Bicycle Master Plan, https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf |
| NM1-14 | Cooperate and collaborate with East Bay Regional Parks District to complete the regional trail system, and with Zone 7 in completing its Arroyo Management Plan. | | Pleasanton Pedestrian and Bicycle Master Plan, Implement POLICY 22, Program 23.3: Cooperate with East Bay Regional Parks District in completing a regional trail system and with Zone 7 in completing its Arroyo Management Plan, a Class I bikeway / multi-use path between Stanley Boulevard and the southern City limits to connect with a proposed East Bay Regional Parks District trail south that avoids the Sunol Blvd crossing of I-680. | | • Pleasanton Pedestrian and Bicycle Master Plan, https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf;<br>• Master Plan for the Downtown Parks and Trails System | 2012 | $0 | Included in NM1-6 | COST ESTIMATES |
| NM1-15 | As part of the Pleasanton Pedestrian and Bicycle Master Plan, provide educational opportunities for residents about bike/pedestrian safety. Increase safety and induce non-motorized travel by enforcing pedestrian, bicycle, and motor vehicles laws. | | Pleasanton Pedestrian and Bicycle Master Plan, Goal 4: Inform and educate the public of the recreational and educational potential of the Master Plan. Policy 4-1: Increase bicycle and pedestrian mode share by increasing public awareness of the available bicycle and trail facilities and programs. Program 23.5: Improve the safety of bicyclists and pedestrians by educating all residents about bicycle and pedestrian safety and by enforcing bicycle and motor vehicle laws and regulations affecting bicyclist and pedestrian safety. Enforcement programs and tools: Increased Fines, Pedestrian Sting Operations, Tattletale Lights, and Photo Red Light. | VMT reductions based on estimated increases in bicycle trips from the City of Pleasanton Pedestrian and Bicycle Master Plan and from Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change, Urban Land Institute.<br>• Trip Purposes Affected: All;<br>• Trip Purposes Affected: All;<br>• Areas Affected: Citywide | • Pleasanton Pedestrian and Bicycle Master Plan, https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf | 2012 | $0 | Included in NM1-6 | ID Length |
| NM1-16 | Investigate feasibility of installing locking skateboard racks at schools. | | City leads a collaboration with parent/teacher organizations, business community representatives and the School District to purchase and install skateboard racks at all elementary and middle schools. Refer to Harvest Middle School's combination bike and skateboard racks. | VMT reductions based on estimated increases in bicycle trips from the City of Pleasanton Pedestrian and Bicycle Master Plan and from Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change, Urban Land Institute.<br>• Development Types Affected: Non-residential only;<br>• Trip Purposes Affected: School;<br>• Areas Affected: School vicinity | • ParkaBike, http://www.parkabike.com/genesis-boardloch-skateboard-series-rack.html;<br>• Hart Middle School, www.206.110.20.121/SupportFiles/bulletin.pdf | 2012 | $0 | Included in NM1-6 | (Miles) Trail Cross Street 1 Cross Street 2 Proposal Class |
| NM1-17 | Work with School District to continue Rides to School program. | | Pleasanton Pedestrian and Bicycle Master Plan, Implement POLICY 22, Program 5-2G: Work with Pleasanton Unified School District to implement the school's traffic-calming and shared-parking solutions in the Rides-to-School Program. The City of Pleasanton and the Pleasanton Unified School District have partnered on Rides to School, a facilitation of carpools, bikepools and walkpools by parents. The database is managed by RIDES for Bay Area Commuters. Several promotional events are held to encourage the use of this program including Hot Chocolate in the Park events. This event recognizes participants in the program at each school. | | • City of Pleasanton - School Transportation, www.ci.pleasanton.ca.us/services/.../school-transportation.html;<br>• Rides to School, http://www.pleasantonschoolpool.org/default.asp;<br>• Pleasanton Pedestrian and Bicycle Master Plan, https://secure.ci.pleasanton.ca.us/pdf/pedbike-all-july09.pdf | 2012 | $0 | Included in NM1-6 | Ongoing staff time to work with the School District to continue the Rides to School program |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| NM1-18 | Preserve rights-of-way needed for local and regional roadway "complete streets" improvements and increased connectivity through dedication of land, as adjacent properties develop. | | Preserve right-of-ways needed for local and regional roadway improvements through dedication of land for "complete streets", to provide safe mobility for all users, including bicyclists, pedestrians, transit vehicles, truckers, and motorists. Though the Municipal Code allows the dedication of streets or rights-of-way for widening purposes, "complete streets" generally do not require widening streets, rather increasing right-of-way for sidewalks and other non-vehicle improvements. | VMT reductions based on estimated increases in bicycle trips from the City of Pleasanton Pedestrian and Bicycle Master Plan and from Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change, Urban Land Institute.<br>• Development Types Affected: new; residential and non-residential;<br>• Trip Purposes Affected: All;<br>• Areas Affected: Citywide | • 2005 Pleasanton Plan 2025, www.ci.pleasanton.ca.us/pdf/pcsr-071024-6a1.pdf;<br>• City of Pleasanton Municipal Code, http://qcode.us/codes/pleasanton/view.php?topic=19-19_16-19_16_050&frames=on;<br>• The Complete Streets Act, www.calbike.org/pdfs/AB1358_Fact_Sheet.pdf<br>•.National Complete Streets Coalition, http://www.completestreets.org/tag/california/ | 2012 | $0 | Included in NM1-6 | Ongoing staff time to administer the preservation of rights-of-way needed for "complete streets" local and regional roadway improvements.<br><br>• CITY OF PLEASANTON GENERAL PLAN EIR |
| NM1-19 | Modify municipal development codes to develop complete street standards to maximize transportation opportunities that serve all mobility modes. | | Develop and adopt revisions and/or additions to the municipal street standards and/or development codes where feasible to improve access, convenience, and safety for transit, bicycle, and pedestrian users. By adopting a Complete Streets policy, Pleasanton directs its transportation planners and engineers to begin to routinely design and operate the entire right of way to enable safe access for all users, regardless of age, ability, or mode of transportation. | VMT reductions based on estimated increases in bicycle trips from the City of Pleasanton Pedestrian and Bicycle Master Plan and from Ewing, et al, 2008. Growing Cooler – The Evidence on Urban Development and Climate Change, Urban Land Institute.<br>• Development Types Affected: new and existing; neither residential nor non-residential;<br>• Trip Purposes Affected: All;<br>• Areas Affected: Citywide; | • The Complete Streets Act, www.calbike.org/pdfs/AB1358_Fact_Sheet.pdf<br>• Pedestrian and Bicycle Facilities in California, A Technical Reference and Technology Transfer Synthesis for Caltrans Planners and Engineers, http://www.dot.ca.gov/hq/traffops/survey/pedestrian/TR_MAY0405.pdf;<br>• Nonmotorized Transportation Planning: Identifying Ways to Improve Pedestrian and Bicycle Transport, http://www.vtpi.org/tdm/tdm25.htm;<br>• Smart Growth, Bicycle, Pedestrian and Transit Friendly Land Use Design, www4.uwm.edu/cuts/utp/landuse.pdf<br>• Designing Transportation Facilities for Pedestrians and Bicycles, http://www.epa.gov/oms/stateresources/policy/transp/tcms/bicycle_ped.pdf | 2013 | $2,250 | Included in NM1-6 | First cost: Estimate 25 hrs initial staff time for this measure, apportioned from total staff time needed to revise municipal code for approximately 20 measures (500 hrs);<br><br>• Costs of Complete Streets http://www.completestreets.org/complete-streets-fundamentals/factsheets/costs/;<br>• Complete Streets Report, http://www.activelivingresources.org/assets/completestreetsreport.pdf;<br>• Complete Streets: Designing Streets for All Users, http://www.co.lancaster.pa.us/toolbox/cwp/view.asp?a=3&Q=641924&PM=1 |
| NM1-20 | Provide incentives for attracting private self-service bicycle renting businesses, including the installation of bike rental vendors at BART and ACE stations. | Non-quantifiable, but supports other NM measures. | Launch a public/private pilot project for rental bicycles available initially from a kiosk at BART and downtown and eventually from depots located throughout the city, where bikes can be rented from automated stations using a credit card.<br>• Self service rentals: Bicycles are kept at self-service terminals throughout the city and check out a bicycle for a short period of time, usually three hours or less. The individual is responsible for any damage or loss until the bike is returned to another hub and checked in.<br>• Bikes can be rented through a membership program where individuals registered with the program identify themselves with their membership card (or a smart card, via cell phone, etc.), or through the use of a valid credit card, along with substantial security deposits for bicycles and mandatory security locks. | Mode share estimates in MTC model predictions suggest that there will be about 11.6 million bike trips made per year by 2025.<br>• If the bike-sharing program leads to a 100 percent increase in bicycle trips citywide, the investments will lead to an additional 11.6 million bike trips.<br>• If we further assume that bike trips will shift away from other modes in proportion to each other mode's current share of all internal San Francisco trips, then about 31 percent of all new bicycle trips will replace driver trips.<br>• At the average internal trip length of 3.3 miles, the investments will save 12.2 million VMT per year, or 4,400 metric tons.<br>• If the program generated as much revenue as the Paris program, it would generate $2,700 for each metric ton of carbon emissions abatement. | • Bike Rental Programs, http://ridethisbike.com/2007/03/self-service-bicycle-rental-programs.html;<br>• How to Start a Bike Rental Business \| eHow.com http://www.ehow.com/how_5851773_start-bike-rental-business.html#ixzz1IEEYuEM1. | 2012 | $10,800 | Users must purchase subscription, and pay additional usage fees for longer trips. Require a base deposit on the user's credit card, maintained for 3 to 10 working days. The public provides the kiosk or depot space rent free for the pilot period. | The average going rate for bicycle rentals is $25 an hour, $60 a day, or $150 to $200 a week. Rates can vary depending on the type of bicycles and equipment you rent, and the community in which you live.<br>Montreal began a limited pilot project of Bixi bike-sharing bicycles in fall 2008. Users must purchase a daily, monthly, or annual subscription, as well as pay additional usage fees for trips lasting longer than 30 minutes. The Bixi program was ranked by Time Magazine as the 19th best invention in their 50 Best Inventions of 2008. Sherwood Stranieri (2008-07-03). "Montreal's New Bicycle Rental Program".<br>Using Bicycles. http://usingbicycles.blogspot.com/2008/07/montreals-new-bicycle-rental-program.html. Retrieved 2008-07-27.<br>How to Start a Bike Rental Business \| eHow.com http://www.ehow.com/how_5851773_start-bike-rental-business.html#ixzz1IEEYuEM1 |
| **NM1** | **TOTALS** | **1,279.97** | | | | | **$19,800** | **$120,000** | |

| TDM1 | Use Parking Policy/Pricing to Discourage SOV Travel | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total annual reduction potential by 2020 | **3,174 MT CO2e** | | | | | | | |
| | Average annual cost through 2020 | **$61,981** (assume first costs amortized over 15 years: 2005 -2020) | | | | | | | |
| | Average cost per MT reduced | **$19.53** | | | | | | | |
| | **Action** | **CO2e impact (MT/year)** | **Comments; Description** | **Assumptions, Methodology, and Calculations** | **Background and Data Sources** | **Start Year** | **First Cost to City** | **Avg. Annual Ongoing Cost to City** | **Supporting Comments, Assumptions & Methodology; Data & Funding Source(s);** |
| TDM1-1 | Provide shared parking lots to reduce paved areas that contribute to urban heat islands and reduce stormwater infiltration, through the creation of incentive program(s) and modification of municipal development codes where feasible. | Non-quantifiable, but supports other transportation and land-use measures. | Sharing parking spaces typically allows 20-40% more users compared with assigning each space to an individual motorist, since some potential users are usually away at any particular time. Even greater reductions are possible with mixed land uses, since different activities have different peak demand times. For example, a restaurant can share parking with an office complex, since restaurant parking demand peaks in the evening while office parking demand peaks during the middle of the day. Incentives could include reduced parking requirements. | VMT reduction not quantifiable<br>• Development types affected, All Non-Residential<br>• Trip purpose affected, Parking<br>• Areas affected, Citywide<br>* City zoning ordinances and parking requirements that enable shared parking by allowing for off-street parking facilities to be located off-site, with a maximum distance from the structure or use within which the off-site parking facility must be located based on acceptable walking distances such as 600 feet. The ordinance should include a reduction in required spaces if a development site is accessible by public transit or close to a public parking lot. | •.http://www.vtpi.org/tdm/tdm28.htm#_Toc128220475;<br>•.http://subregional.h-gac.com/toolbox/Transportation_and_Mobility/Parking_Management/Shared%20Parking-final.html;<br>•.Appendix 8 Shared Parking Program, www.anaheim.net/citydepartments/planning/.../11Appendix8.pdf | 2012 | $3,600 | $0 | Assume 40 hours of City staff time to research and modify parking requirements in municipal code.<br>Fully burdened City staff rate = $90 per hour;<br><br>Based on correspondance with Laura Ryan of City of Pleasanton |
| TDM1-2 | Modify municipal code to separate fee-based parking from home rents/purchase prices or office leases within 1/2 mile of BART stations to increase housing affordability for those without a car or cars. | 2,864 | Current parking standards are a ineffective mechanism for matching parking supply with demand because the number of vehicles per housing unit varies significantly between households and over time. Various parking management strategies can increase affordability, economic efficiency and equity. By allowing residential units and commercial offices around BART to provide fee-based parking separately, the costs of owning a car will help encourage those with cars to decrease their ownership rates and thus decreasing driving. | Assumes cost of new parking space at BART station developments is $30,000 a space.<br>• Development types affected, All<br>• Trip purpose affected, Parking<br>• Areas affected, Within 1/2 mile of BART stations | •.*Parking Requirement Impacts on Housing Affordability* , Todd Litman, Victoria Transport Policy Institute | 2013 | $3,600 | $0 | Assume 20 hours of City staff time to research and modify parking requirements in municipal code.<br>Fully burdened City staff rate = $90 per hour;<br><br>Based on correspondance with Laura Ryan of City of Pleasanton |
| TDM1-3 | Work with large employers (new and existing) to provide incentive-based programs that encourage employees to choose alternative transportation to work. | 310 | Incentive-based program that encourage employees that chose to take alternative transportation could include:<br>• Reward employees through recognition in organizational newsletter, on plaques or other mechanisms inside or outside the building, with gifts of logo wear, bus passes, gift certificates to bike shops or sporting goods stores, and gym passes;<br>• Provide flex- time opportunities to assure safety and comfort while using alternative transportation;<br>• Appoint an alternative transportation coordinator who will help employees determine the best way to commute without using their car and help match employees who wish to carpool or use transit'<br>• Provide carpools and vanpools with dedicated parking spaces in preferred sections;<br>• Aside from providing bike racks and safe bike storage, provide bike safety classes and bike tune-up clinics during lunch hours;<br>• Start a wellness program which includes increased walking like Bank of Utah's "Take Heart" program. | Measure assumes that 10% of new employees would be eligible.<br>• Development types affected, All Non-Residential<br>• Trip purpose affected, Commute<br>• Areas affected, Citywide<br>• The Internal Revenue Service (IRS) allows employers to pay up to $110 per month, tax-free, for employee commuting costs. Employers must provide at least $30 per month in tax-free transit passes to employees (if an employee's monthly commuting cost is less than $30, the employer agrees to pay the full amount of the employee's commuting cost). Transit passes include unlimited ride passes, tokens, farecards, or tickets. Employers may also provide transit vouchers for employees to exchange for passes.<br>• Generation "X" and "Y" workers consider alternative transportation incentives as a significant employee benefit. | •.http://www.arb.ca.gov/research/resnotes/notes/98-3.htm<br>•.Employer Partnership Agreement, www.freshairfriday.com/freshairfriday/.../EmployerPartnershipAgreement.pdf<br>• Provide incentives for employees who carpool to work \| GreenYour.com, www.greenyour.com/transportation/.../provide-incentives-for-employees- who-carpool-to-work<br>•.http://www.cleanairpartnership.com/Commute%20Options.htm | 2012 | $360 | $0 | Most costs would be incurred by private employers.<br><br>Assume 4 hours of City staff time to research and include in TDM BMP brochure.<br>Fully burdened City staff rate = $90 per hour;<br><br>Based on correspondance with Laura Ryan of City of Pleasanton |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
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| TDM1-4 | Implement residential area parking permits to prevent spill-over parking into neighboring residential areas. | Non-quantifiable, but supports other transportation and land-use measures. | There are many residential parking permit programs throughout the country. An example of a program that allows the residents to keep control of whether or not the parking zones are implemented is one that requires the residents of the street that is within this zone to purchase the signage themselves. The City will install them, but the residents must pay for the signs. If they feel the spill-over is a nuisance, this is a way to control it. If they don't want permit parking only on their street and can live with the spill-over parking, then they don't have to pay for it.<br><br>Approval of a the parking permit signage and enforcement requires a 60% petition approval from the residents in each zone.<br><br>This program would require identifying areas of town that are adjacent to more intense areas of commercial/ mixed-use development to ensure spill-over parking from these areas is minimal. | VMT Reduction potential not quantifiable<br>• Development types affected, Residential<br>• Trip purpose affected, Parking<br>• Areas affected, Designated Residential Parking Zones | •.http://www.sfmta.com/cms/pperm/permbg.htm<br>•.http://traffic.ci.lubbock.tx.us/Permits/resParking.aspx | 2013 | $3,600 | $60,000 | Assume 40 hours of City traffic engineer and other staff time to help identify and map areas of the city that are eligible for the "parking zone" designation. Assume 200 hours annually for permitting and installation of signage.<br>Costs associated with enforcement depends on how this is structured. Full-time parking enforcement officer's salary range from $20,000 - $50,000 annually. Parking enforcement vehicles cost of $12,000 per vehicle.<br>The city will receive revenue from this program that could offset some costs.<br><br>•http://traffic.ci.lubbock.tx.us/Permits/resParking.aspx<br>•http://www.careeroverview.com/parketing-enforcement-worker-salaries.html<br>•http://www.nctimes.com/news/local/oceanside/article_3152cd8c-16cd-56b3-a7f6-c32a888445a2.html |
| TDM1-5 | Assist companies, and facility owners and managers in developing and operating parking demand management programs | Non-quantifiable, but supports other transportation and land-use measures. | Develop a customizable manual for companies, and facility owners and managers consisting of documented policies and programs that result in more efficient use of parking resources. Consider reasonable deviation from the standard ITE parking rates, since recent examination of these standards shows that they were derived from a small number of studies located in suburban environments with high car dependency. The broad application of ITE standards in Pleasanton will therefore produce a surplus of parking and lots that are only full during the winter holiday season. | The manual will describe strategies and actions to increase parking facility efficiency by sharing, regulating and pricing; using off-site parking facilities; implementing overflow parking plans; improving user information; and improving walking and cycling conditions within and adjacent to the facility's grounds.<br>• Development types affected, All Non-Residential<br>• Trip purpose affected, Commute<br>• Areas affected, Citywide | • Planetizen Podcast 2006-03-27 Parking Management: Innovative Solutions To Parking Management Problems; www.ci.berkeley.ca.us/.../B-BERKELEY%20PTDM%20Existing%20Conditions%20Report.pdf;<br>• Parking Solutions: A Comprehensive Menu of Solutions to Parking Problems, Victoria Transport Policy Institute, TDM Encyclopedia (http://www.vtpi.org/tdm/tdm73.htm);<br>• Parking Evaluation: Evaluating Parking Problems, Solutions, Costs, and Benefits, Victoria Transport Policy Institute, TDM Encyclopedia | 2012 | $2,340 | $900 | Digital compilations of the best parking management resources with a table of contents and index, posted on the City's Pleasanton Green Guide Website.<br><br>Assume 20 hours of City staff time to create TDM Manual and 6 hours to print and provide on City website. Assume 10 hours a year to update TDM BMP.<br><br>Fully burdened City staff rate = $90 per hour; |
| TDM1-6 | Dedicate public parking spaces that contain electric charging stations for plug-in vehicles, in coordination with Measure VE1-1. | Non-quantifiable, but supports other transportation and land-use measures. | Coordinate the installation of publicly-accessible charging stations for recharging electric vehicles with the dedication of public parking spaces, in coordination with Measure VE1-1, to incentivize the use of electric vehicles. | Limit the dedication to existing spaces, and for new parking facilities that include traffic and parking demand management practices.<br><br>• Development types affected, All<br>• Areas affected, Citywide | www.fremantle.wa.gov.au/files/.../Charge_point_FAQ_-_single_bay.pdf; http://www.cincinnati-oh.gov/cmgr/pages/-36360-/; eaasv.org/eaasv-forms/EPRIReportonEVs.pdf; http://blogs.cars.com/kickingtires/2011/02/electric-cars-park-for-free-at-lax-volt-too.html | 2012 | $0 | Replace every five years | Coordination with VE1-1<br><br>http://www.parkingsigncorner.com/permitparking.html; http://www.autobloggreen.com/2009/03/26/tesla-model-s-50-000-ev-sedan-seats-seven-300-mile-range-0-6/. Retrieved 2009-04-12. http://www.theevproject.com/. |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| TDM1-7 | Provide designated motorcycle and scooter parking downtown | Non-quantifiable, but supports other transportation and land-use measures. | Locate motorcycle and scooter-only parking downtown. Riding a motorcycle or scooter is one of the easiest and most economical ways to travel, reduce traffic congestion, and add space for automobile parking downtown. The first place to locate these motorcycle/ scooter parking spaces are in end-caps or spaces that are too short for cars. These new dedicated spots could be incentivized by providing all day parking in areas where parking is limited to hourly parking. | Convert a number of existing parking spaces or find spaces that are too small for automobile parking but could accommodate a few motorcycles (end-caps to blocks sometimes have this leftover space). Spaces can be metered or un-metered. The smaller size of two-wheel vehicles allows them to fit into unoccupied areas on streets and sidewalks, creating efficiencies in paving areas. Six motorcycles, scooters or limited-access motorcycles carrying from six to twelve people can be parked in the area normally taken up by one automobile. Designate parking spaces in municipal garages for two-wheel vehicles, and recommend a more equitable rate structure for two-wheel vehicle parking in private garages. In special locations, permit scooters and motorcycles to be parked in designated areas on sidewalks and locked to structures which currently accommodate bicycles. | •.http://motorcyclecolorado.com/blog/how-to-get-dedicated-motorcycle-parking-in-your-town/<br>•.http://www.ideasforseattle.org/forums/27772-city/suggestions/385739-provide-affordable-all-day-scooter-motorcycle-onst | 2012 | $2,720 | $0 | Fully burdened City staff rate = $90 per hour; Assume 4 hours of City staff time to locate spaces that can be converted and 4 hours of time to stripe the new parking spaces. $2000 for contractor |
| **TDM1** | **TOTALS** | **3,173.94** | | | | | $16,220 | $60,900 | |

**TDM2 Promote alternatives to work and school commutes**

| | |
|---|---|
| Total annual reduction potential by 2020 | **11,257** MT CO2e |
| Average annual cost through 2020 | **$182,974** (assume first costs amortized over 15 years: 2005 -2020) |
| Average cost per MT reduced | **$16.25** |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| TDM2-1 | Promote the use of flextime and other measures to employers and employees through the City's Transportation Systems Management (TSM) Ordinance. | 700 | These measures intend to promote and enforce Pleasanton's TSM Ordinance. Refer to: Mandatory Transportation Systems Management Ordinance, Pleasanton, California; 199417.24.030 TSM Requirements.<br>• Flextime allows for employees to arrive and depart at different hours within established limits, such as a core work period, as long as the total number of hours logged per day is equal to a traditional work schedule.<br>• Compressed Workweek means that workers may put in fewer, but longer work days, such as four 10-hour days with the fifth day off each week, or five 9-hour days with one day off every two weeks.<br>• Staggered Shifts are designed to reduce the number of employees arriving and leaving at the same time. This method has the same effect as flextime, but does not give the workers control over which schedule they are assigned. | The Promotion/ Encourage Incentive programs do not identify specific steps that will be taken to increase the current level of AWS and telecommuting. For CAP purposes, it was assumed that 10 percent of employees above current levels) would participate.<br>• Development types affected, All Non-Residential<br>• Trip purpose affected, Commute<br>• Areas affected, Citywide<br>• The Internal Revenue Service (IRS) allows employers to pay up to $110 per month, tax-free, for employee commuting costs. Employers must provide at least $30 per month in tax-free transit passes to employees (if an employee's monthly commuting cost is less than $30, the employer agrees to pay the full amount of the employee's commuting cost). Transit passes include unlimited ride passes, tokens, farecards, or tickets. Employers may also provide transit vouchers for employees to exchange for passes. | •.http://www.smartcommunities.ncat.org/codes/pleasnt2.shtml;<br>• Flextime - Best Practices Planning and Implementation Toolbox, www.subregional.h-gac.com/toolbox/.../17.%20Flextime-final.html;<br>•.Provide incentives for employees who carpool to work \| GreenYour.com, www.greenyour.com/transportation/.../provide-incentives-for-employees- who-carpool-to-work<br>•.http://www.cleanairpartnership.com/Commute%20Options.htm | 2012 | $0 | $5,400 | Assume 60 hours annual of City staff time to enforce this code.<br>Fully burdened City staff rate = $90 per hour; |
| TDM2-2 | Encourage employers to allow employees to telecommute. | | | | | | | | |
| TDM2-3 | Encourage (employers) or offer (City government) alternative work week (e.g. 9/80, work from home, 10-hour shifts) to reduce employee commutes | | | | | | | | |
| TDM2-4 | Create incentive program(s) that encourage the development of neighborhood telecommuting centers. | | These measures can be included as outreach information that will be provided to residents and employers to highlight tax incentives available for telecommuting employees.<br>For employers, savings may come in the form of reduced overhead such as office space costs and parking. In addition, telecommuting provides for lower absenteeism, higher productivity and helps businesses attract and retain qualified employees. | • Generation "X" and "Y" workers consider alternative transportation incentives as a significant employee benefit. | •.http://www.groco.com/readingroom/tax_telecommuting.aspx;<br>•.http://www.mwcog.org/commuter2/employer/awards.html | 2012 | $360 | $900 | Assume 4 hours of City staff time to research and 10 hours annually to update outreach resource materials.<br>Fully burdened City staff rate = $90 per hour; |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| TDM2-5 | For municipal employees, create incentives for non-single-auto commute modes (e.g. carpool programs, transit vouchers, alternative work week plans, telecommuting) through City programs and community outreach. | 658 | Potential incentives:<br>• A Carpool Incentive Program (CIP) that offers a gas card to anyone who forms a new carpool or joins one.<br>• A Transit Incentive Program (TIP) that offers free or discounted transit passes for City employees that commit to using transit to get to work.<br>• A Guaranteed Ride Home (GRH) Program that offers free taxi vouchers or a rental car X times per year in the event of personal or family illness, a loss of a rideshare ride home, or unscheduled overtime.<br>• For those employees who are willing to give up their parking permit or privledge, or simply do not want to purchase a parking permit but wish to occasionally drive, an "Occasional Parker Program". Those participants will receive X free one-day parking passes per fiscal year with additional one-day parking passes available for purchase at the parking office with an number of additional permit maximum.<br>• A Carpool Check that allows companies to pay part of their employees' carpool parking costs at selected parking locations in the City where there is a daily or monthly parking fee. Carpool checks are distributed so employees can submit them (with the balance of the payment due) to their parking facility each month. The parking facility bills the participating company for each voucher received. | VMT measurements assume an additional 10 percent of employees Citywide become eligible for transit vouchers.<br>• Development types affected, All/ New Non-Residential<br>• Trip purpose affected, Commute<br>• Areas affected, Citywide, City employees | • TDM Cost Effectiveness: How VMT Reduction Translates to Congestion Mitigation and Improved Air Quality, Lynn Osborn, TDM Program Manager, Contra Costa Commute Alternative Network | 2012 | $18,000 | $175,000 | Assume existing City staff to set up programs.<br><br>Assumed annual program costs:<br>CIP program costs = $50,000<br>TIP program costs = $75,000<br>GRH program costs = $50,000<br><br>Cost savings to participants in these programs are significant- ranging from $500- $10,000 annually depending on commute options.<br>TDM Cost Effectiveness: How VMT Reduction Translates to Congestion Mitigation and Improved Air Quality, Lynn Osborn, TDM Program Manager, Contra Costa Commute Alternative Network |
| TDM2-6 | Create an incentive program for City employees who use for non-single-auto commute alternatives. | | | | | | | | |
| TDM2-7 | Modify municipal codes to require new and substantial developments within 1/4 mile of transit to provide transit passes or other transit use incentives for an interim period sufficient to establish transit use patterns. | | This modification would require new residential development with 20 units or more within 1/4 mile of transit to provide transit passes or other transit use incentives for an interim period. | | •.http://www.dukakiscenter.org/transit-incentives/ | 2012 | $2,250 | N/A | Estimate 25 hrs initial staff time for this measure, apportioned from total staff time needed to revise municipal code for approximately 20 measures (500 hrs);<br>Fully burdened City staff rate = $90 per hour;<br>1 FTE = $180,000 per year |
| TDM2-8 | Strengthen community-based carpool and ride share programs for residents and businesses through education and engagement. | | This measure would provide for City led community outreach to establish a marketing campaign for this effort. | | | 2012 | $0 | $0 | Use existing staff (Sustainability Coordinator) for community outreach. |
| TDM2-9 | Modify municipal development codes to require new non-residential projects over a certain size and configuration to implement a TDM program capable of reducing weekday peak period vehicle trips by at least 20%. | 9397 | An Employer Based Trip Reduction (EBTR) program would require new non-residential projects over 5 acres or that employ more than 100 persons, or new emplyment centers or facilities that employ more than 100 persons, to create a TDM program within the first 6 months of operation. The TDM program would apply to all building tenants would include a mechanism to monitor participation and effectiveness. | Although measure stipulates 20% reduction, its effectiveness is unknown. Assumes that 10% reduction is achieved for new workplaces with over 100 employees.<br>• Development types affected, New Non-Residential<br>• Trip purpose affected, Commute<br>• Areas affected, Citywide | •.http://www.epa.gov/OMS/stateresources/rellinks/docs/tdmcases.pdf;<br>• City of Oakland. 2006. Municipal Code Chapter 17.100 S-15 Transit Oriented Development Zone Regulations. Oakland CA | 2012 | $4,500 | $0 | Estimate 50 hrs initial staff time for these 2 mesures, apportioned from total staff time needed to revise municipal code for approximately 20 measures (500 hrs);<br>Fully burdened City staff rate = $90 per hour;<br>1 FTE = $180,000 per year |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| TDM2-10 | Modify municipal codes to require dedicated parking spaces in new and modified developments or carpool, vanpool, alternative-fuel, and car-share vehicles. | | Requiring dedicated carpool, vanpool, and carshare vehicles parking spaces provide a better use of resources can reduce peak parking demand, and can be preferable to reduce or eliminate parking requirements in areas with high parking demand. | | Developing Parking Policies to Support Smart Growth in Local Jurisdictions: Best Practices, www.tam.ca.gov/Modules/ShowDocument.aspx?documentid=239;<br>• Litman, Todd. 2006. Parking Management Strategies, Evaluation and Planning. Victoria Transport Pol- icy Institute. | 2012 | | | |
| TDM2-11 | Encourage a car-sharing service at the Pleasanton BART stations. | 501 | This measure outlines the City's effort and costs associated with finding a car-share provider, helping to identify parking spaces for the chosen provider and then helping to facilitate a car-sharing program in Pleasanton. The emissions reduction associated with this measure is the annual reduction once the program has been established. | Trip Reduction Source: Moving Cooler<br>Moving Cooler assumed an aggressive deployment of one car per 2,000 inhabitants of medium-density census tracks and of one car per 1,000 inhabitants of high-density census tracks and assumed 20 members per shared car and 50% reduction in VMT per equivalent car.<br>• Development types affected: New Residential<br>• Trip purpose affected: All<br>• Areas affected: Citywide | • CAPCOA: Quantifying Greenhouse Gas Mitigation Measures | 2013 | $0 | $0 | Use existing staff (Sustainability Coordinator) |
| **TDM2** | **TOTALS** | **11,256.68** | | | | | **$25,110** | **$181,300** | |

**TDM3 Traffic Smoothing**

| | | |
|---|---|---|
| Total annual reduction potential by 2020 | **0** | MT CO2e |
| Average annual cost through 2020 | **$0** | (assume first costs amortized over 15 years: 2005 -2020) |
| Average cost per MT reduced | **NA** | |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| TDM3-1 | Traffic smoothing through congestion management; Upgrade signal timers to improve traffic flow and reduce traffic congestion. | No VMT reduction, but can reduce GHG by up to 10% on implementation corridors. | Develop and implement a Signal Coordination Program on specific corridors throughout the City. Consider the efficacy of other traffic smoothing and speed mitigation measures that help vehicles maintain optimum speeds consistent with the corresponding street and intersection designs that should be part of a "complete streets" approach. | Barth curves can provide estimate; Detailed simulation and corridor identification required for refined estimations.<br>• Development types affected, N/A<br>• Trip purposes affected, All<br>• Areas affected, arterials and corridors need to be identified | • Traffic Congestion and Greenhouse Gases, by Matthew Barth and Kanok Boriboonsomsin http://www.uctc.net/access/35/access35_Traffic_Congestion_and_Grenhouse_Gases.shtml;<br>• Research and Innovative Technology Administration (RITA) http://www.benefitcost.its.dot.gov/its/benecost.nsf/DisplaySummarySearchResult?OpenForm&2D374100FC0646F38525786F007EEE01 | 2013 | Depends on number of miles of corridors to include in this program.<br><br>Average First Costs: $23,039.20 per mile of common infrastructure<br><br>$8,367.64 per mile for traffic signalization control | Annual costs will depend on the number of miles of corridors to be included.<br><br>Average annual costs: $41,156.85 per mile of common infrastructure<br><br>$51,716.17 per mile of traffic signalization control | Cost information derived from table found at link below. Assumptions of including Common Infrastructure and Arterial Traffic Signal Control costs only.<br><br>http://www.benefitcost.its.dot.gov/its/benecost.nsf/ID/7AEFEEDBE58A936585257671006D094C?OpenDocument&Query=State<br><br>MTC: Program for Arterial System Synchronization (PASS)<br>The Transportation 2035 Plan provides approximately $1.25 million per year in CMAQ funds for traffic signal coordination under PASS.<br><br>Under the Regional Signal Timing Program (RSTP), MTC provides local jurisdictions with traffic engineering assistance and expertise in retiming and coordinating their traffic signals, including implementing transit signal priority. http://www.mtc.ca.gov/services/arterial_operations/ |
| **TDM3** | **TOTALS** | **0.00** | | | | | $0 | $0 | |

| VE1 | Develop a supportive community infrastructure for more fuel efficient and alternative fuel vehicles | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total annual reduction potential by 2020 | | 0 MT CO2e | | | | | | |
| | Average annual cost through 2020 | | $2,410 (assume first costs amortized over 15 years: 2005 -2020) | | | | | | |
| | Average cost per MT reduced | | NA | | | | | | |
| | **Action** | **CO2e impact (MT/year)** | **Comments; Description** | **Assumptions, Methodology, and Calculations** | **Background and Data Sources** | **Start Year** | **First Cost to City** | **Avg. Annual Ongoing Cost to City** | **Supporting Comments, Assumptions & Methodology; Data & Funding Source(s);** |
| VE1-1 | Develop a public/private partnership to develop a convenient and reliable electric and plug-in hybrid vehicle infrastructure including publicly available charging stations in both on- and off-street parking locations.<br><br>*A plug-in hybrid (PHEV). A PHEV is essentially a regular hybrid with an extension cord. | Non-quantifiable, but supports other transportation and land-use measures. | An electric vehicle network is a proposed infrastructure system of publicly-accessible charging stations and battery swap stations to recharge electric vehicles. Tesla Motors, in March, 2009, announced that they are "working with a government-affiliated partner to set up battery changing stations at various locations" to service their Model S platform cars. The California, Arizona and Nevada along with their Automobile Clubs are funding the Clean Car Maps to list the available stations for alternative fuel. On August 5, 2009, ECOtality North America, a subsidiary of ECOtality, Inc. (NASDAQ:ECTY) was awarded a $99.8 million grant from the U.S. Department of Energy to embark on this Project. The Project officially was launched on October 1, 2009 and will last approximately 36 months. The database contains 381 charging stations in California (367 operational) in August 2010 including Walnut Creek and San Francisco. | Develop a partnership with an infrastructure providers, car manufacturers, the EV Project to create a local EV network. For example, Tesla Motors, in March, 2009, announced that they are "working with a government-affiliated partner to set up battery changing stations at various locations" to service their Model S platform cars. Examples of potential partners are listed to the right. Charging stations should be located at on-street parking, at taxi stands, in parking lots, using 240 Volt AC charging known as level 2 charging. Electric Vehicle Charging Stations are being installed by EV-Charge America, accelerating the deployment of advanced electric vehicle transportation technologies. The network can include a "smart grid" system to advise drivers of charging station locations, system status, and system charging performance via SMS text messages and secure, web site portals. | •.http://www.evchargermaps.com/ Ramsey, Jonathon (2009-03-26), The EV Charger Maps website is a volunteer run effort coordinated by EV Charger News that catalogs EV charging station information across the U.S. It contains information targeted for real-world use by electric vehicle owners;<br>• http://www.theevproject.com/.<br>• General Motors Corp on Monday said it is collaborating with an organization representing U.S. utilities to ready the nation's electric infrastructure for the widespread sale of plug-in electric cars, such as the Chevrolet Volt. http://www.reuters.com/-article/-smallBusinessNews/-idUSN2147289020080723.<br>• The California Cars Initiative (CalCars.org), a Palo Alto-based nonprofit startup of entrepreneurs, engineers, environmentalists and consumers, promotes 100+MPG plug-in hybrid electric vehicles (PHEVs). http://www.calcars.org/about.html | 2012 | $1,800 | $50/unit/year | 20 hr. Staff planner. A single charger will cost approximately $5,000 to $10,000 per unit to purchase and install, depending on rebate EV-Charge America of Las Vegas has developed the first networked charging stations capable of charging up to 4 vehicles simultaneously. They have sold charging stations worldwide and are working to provide the most advanced grid management software tools in the industry for utility companies and vehicle communications.<br><br>See also "ELECTRIFY YOUR BUSINESS, Moving Forward With Electric Vehicles - a Bay Area Business Guide: http://www.bc3sfbay.org/ev-guide-for-businesses.html<br><br>The EV Project home website: list of the 11 participating cities". EV Project. http://www.theevproject.com/. Retrieved 2010-04-27; http://www.ev-chargeamerica.com/electric-vehicle-charging-stations.html. |
| VE1-2 | Modify City municipal code to permit biodiesel service or fueling stations. | Non-quantifiable, but supports other transportation and land-use measures. | Modify the definition of Title 18 Zoning, Chapter 18.08 Definitions, 18.08.485 Service Station to include "biodiesel" as an alternative fuel. Biodiesel is a diesel fuel that's non-petroleum based and is composed of a chain of methyl, propyl, ethyl and esters. It is manufactured by transesterification of animal fat or plant oil which are either used independently or are mixed with petrodiesel in original vehicles. | Biodiesel is defined as mono-alkyl esters of long chain fatty acids derived from vegetable oils or animal fats which conform to ASTM D6751 specifications for use in diesel engines. Biodiesel refers to the pure fuel before blending with diesel fuel; blends are denoted as, "BXX" with "XX" representing the percentage of biodiesel contained in the blend (i.e.: B20 is 20% biodiesel, 80% petroleum diesel). Biodiesel reduces net $CO^2$ emissions by 78 percent compared to petroleum diesel. | • Title 18 Zoning, Chapter 18.08 Definitions, 18.08.485 Service Station; http://www.tcbiodiesel.com/biodiesel-vs-diesel/; "Biodiesel 101 - Biodiesel Definitions" (?).<br>• National Biodiesel Board, http://www.biodiesel.org/resources/definitions/default.shtm. Retrieved 2008-02-16.;<br>• US Department of Energy and the US Department of Agriculture, 1998 Biodiesel Lifecycle Study;<br>• Biodiesel: The official site of the National Biodiesel Board. NBB. http://www.biodiesel.org/pdf_files/fuelfactsheets/Production_Graph_Slide.pdf. Retrieved 2008-04-03. | 2012 | $2,250 | Conventional maintenance costs | Estimate 25 hrs initial staff time for this measure, apportioned from total staff time needed to revise municipal code for approximately 20 measures (500 hrs); Fully burdened City staff rate = $90 per hour; 1 FTE = $180,000 per year |
| VE1-3 | Implement a waste oil collection program to provide feedstock for biodiesel fueling stations. Coordinate with VE1-2. | Non-quantifiable, but supports other transportation and land-use measures. | | | | 2012 | $0 | $0 | For equipping service stations to pump biodiesel: Midlands Biofuels of Winnsboro, SC paid $85,145 to install a biodiesel refueling and blending station; and $52,000 to equip OM Biofuels LLC of Charleston, SC to install a biodiesel refueling station<br><br>http://www.biodiesel.org/buyingbiodiesel/retailfuelingsites/; |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| VE1-4 | Develop a public/private program with local service stations and automotive repair shops to provide free "mileage booster" inspections that include checking tire pressure. | Non-quantifiable, but supports other transportation and land-use measures. | The City would invite regional representatives of the California Service Station & Automotive Repair Association (CSSARA), a non-profit trade association, and owners and managers of local service stations and automotive repair shops to organize a program run that offers free "mileage booster" inspections that include checking tire pressure and offering driving tips to increase mileage. The City would publicize the program and participating stations on the Pleasanton Green Guide Website. The service stations would benefit from the publicity and potential customer contacts. | The service station and repair shop owners/managers would operate the program with oversight by the City and the CSSARA, to monitor its success and to prevent the misuse of the inspections for predatory business practices. The CSSARA will also assist by helping to educate the owners/managers in the proper driving techniques to improve mileage. | •.http://www.cssara.org/;<br>• Estimates for fuel savings from vehicle maintenance, keeping tires properly inflated, and using the recommended grade of motor oil based on Energy and Environmental Analysis, Inc., http://www.fueleconomy.gov/feg/drive.shtml ; • Owner Related Fuel Economy Improvements, Adobe Acrobat Icon, Arlington, Virginia, 2001, http://www.mpgplus.com/;<br>•.www.fhwa.dot.gov/cadiv/Stewardship_Agreement/stewardship_agree.pdf | 2013 | $3,600 | $1,800 | Estimate 40 hours initial and 20 hrs annually; Based on correspondance with Laura Ryan of City of Pleasanton;<br><br>The service station and repair shop owners/managers will provide free evaluation limited to tire pressure and visual inspection, and optionally, a diagnostic computer test to determine engine performance. They will also provide driving tips to boost mileage.<br><br>http://www.cssara.org/;<br>http://hubpages.com/hub/shanesdjserviceblogspotcom |
| VE1-5 | Develop a "Green Guide" web page on the Pleasanton Green Scene website that describes and promotes ways to improve vehicle fuel efficiency promotes the use of alternative fuel vehicles and biodiesel conversions. | Non-quantifiable, but supports other transportation and land-use measures. | A web page would:<br>• post information on "best practices" driving techniques to boost mileage;<br>• describe the "Mileage Booster" program with local service stations and automotive repair shops; and<br>• complement other transportation-related pages. The site would be updated with sufficienct fequency to maintain relevance. | Consumers gather information from a variety of sources for vehicle buying and repair advice and recommendations. Nearly half of consumers visit a vehicle manufacturer's Web site (Capgemini, 2009a), particularly in search of product and price information. Consumers are also increasingly using the web to access fuel economy information. According to Cars Online (Capgemini, 2009a, 2008, 2007), the top four factors that consumers continue to claim they value when making vehicle purchasing decisions are: reliability, safety, price, and fuel economy. | •.www.fueleconomy.gov/<br>•.www.fueleconomy.gov/feg/hybrid_news.shtml;<br>•.www.epa.gov/fueleconomy/420f04053.htm;<br>•.www.eagle-research.com/resources/FS/FuelEff.pdf;<br>•.www.auto-facts.org/;<br>•.www.afdc.energy.gov/afdc/laws/eisa; and drivesmarterchallenge.org/.../fuel-efficient-resources.aspx | 2012 | $1,500 (consultant) | $0 | The web page would be designed and hosted on the City's existing www.pleasantongreenscene.org for approximately $1,500. The cost for uploading files and maintaining the site would be paid for participating service station and automotive repair shops and/or complementary advertisers. |
| **VE1** | **TOTALS** | **0.00** | | | | | **$9,150** | **$1,800** | |
| **VE2** | **City Fleet Replacement Program** | | | | | | | | |
| | Total annual reduction potential by 2020 | **312** | **MT CO2e** | | | | | | |
| | Average annual cost through 2020 | **$4,320** | **(assume first costs amortized over 15 years: 2005 -2020)** | | | | | | |
| | Average cost per MT reduced | **13.85** | | | | | | | |
| | **Action** | **CO2e impact (MT/year)** | **Comments; Description** | **Assumptions, Methodology, and Calculations** | **Background and Data Sources** | **Start Year** | **First Cost to City** | **Avg. Annual Ongoing Cost to City** | **Supporting Comments, Assumptions & Methodology; Data & Funding Source(s);** |
| VE2-1 | City gasoline-fueled fleet replacement program: Planned initiative to upgrade the City fleet to include more hybrid-electric and alternative fuel vehicles to reduce emissions associated with City operations. | 63 | Alternative fuels and technologies include natural gas, propane, biodiesel, ethanol, electricity and hybrid-electric vehicles. City fleet managers will evaluate the feasibility and cost of adding alternative-fuel vehicles (AFVs) and fueling facilities to their operations, ands assess AFV availability, cost benefits and barriers to implementation, and other emissions and fuel-saving opportunities, such as enhanced maintenance or an early-retirement program for the existing fleet. | Assume:<br>• City gasoline-fueled fleet vehicles consumed 114,059 gal. in 2005;<br>• Increase by 25%, fleet gasoline-fuel consumed by 2020, or 142,574 gal./year;<br>• 50% of fleet vehicle replaced with hybrids with 50% less fuel consumption, or 142,574 x .5 = 71,287 x .5 = 35,643 gal. saved;<br>• 142,574 - 35,643 = 106,931; 114,059 - 106,931 = 7,128 gal./year 2020;<br>• 7,128 x 8.87 CO2e/kg. x .001 = 63 CO2e MT. | •.http://www.governmentfleet.com/Channel/Fuel-Management.aspx;<br>•.National League of Cities. Alternative Fuel Programs for Municipal Fleets. http://www.nlc.org/ASSETS/4D4B15DC22EC4B0387E4F503AD9D39E3/CPB%20-%20Alternative%20Fuels%200808.pdf;<br>•.http://www.c40cities.org/bestpractices/transport/sanfran_vehicles.jsp;<br>• http://www.cga.ct.gov/2007/rpt/2007-R-0482.htm | 2010 | $0 | $2,160 | City plans to replace 200 vehicles over next 10 years;<br>Expect no annual budget increase, but goal is to reduce fuel use 5% per year through 2014;<br>Assume 25% fuel use reduction by 2020;<br>Assume staff time to manage = 24 hours/yr<br>Staff count is down about 10% from 2005;<br><br>AB 118 (Chapter 750, Statues of 2007) can offset purchase costs. Carl Moyer Memorial Air Quality Standards Attainment Program. http://www.baaqmd.gov |

| | Action | CO2e impact (MT/year) | Comments; Description | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|---|
| VE2-2 | City diesel-fueled fleet and equipment replacement program: Convert the municipal diesel vehicles, generators, and other diesel powered equipment to fleet to run on biodiesel and/or diesel/biodiesel blend where feasible; promote biodiesel in the City fleet replacement program: | 249 | Planned initiative to upgrade the City fleet to include more electric, hybrid-electric, and alternative fuel vehicles to reduce emissions associated with City operations. "Green Ride" section of the Green Guide Website. To create cost effective program, consider biodiesel conversions of conventional diesels, including multiple axle and vehicles above 18,000 GVW. Cost projections should consist of increasing percentage of annual new and replacement purchase budget such as 10% increase per year [10%, 20% 30%, 40% to 100% by 2020 or sooner. Total average GHG emission per fleet vehicle = 4.96 CO2eMT. Total annual municipal fleet emissions: _____ CO2e MT x 50% emission reduction = ____ x 2 years [implementation 2014] = ____ total CO2eMT and total reduction. Calculation should be adjusted for biodiesel percentage. | AB 118 (Chapter 750, Statues of 2007) can offset purchase costs. We assume that all of the existing diesel fleet will converted to such vehicles by 2020, and that each vehicle will require replacement within 10 years with an emission reduction of 50% of 2005 levels. Assume diesel engine vehicles in the fleet are ready to run on biodiesel, but there are no retailers in the area; assume that biodiesel B99-B100 blend will be available and that prices will correspond roughly to average West Coast biodiesel fuel prices. Cost estimate does not include potential cost offsets for purchases of hybrids under the Enhanced Fleet Modernization Program of AB 118. To calculate potential CO2e MT reduction, calculate total average annual miles and equipment hours. | •.http://howto.wired.com/wiki/Convert_a_Car_to_Biodiesel; •.http://www.ford-trucks.com/forums/521027-converting-to-biodiesel.html; •.http://www.treehugger.com/files/2005/01/how_to_convert.php; •.http://www.noendpress.com/caleb/biodiesel/index.php; •.http://biodieseltech.blogspot.com/2006/06/bio-diesel-renewable-energy-source.html | 2014 | $0 | $2,160 | Assume staff time to manage = 24 hours/yr Biodiesel can be used as a pure fuel or blended with petroleum in any percentage. B20 (a blend of 20 percent by volume biodiesel with 80 percent by volume petroleum diesel) has demonstrated significant environmental benefits with a minimum increase in cost for fleet operations and other consumers. Costs of converting to biodiesel/diesel blends can cost nothing, while converting to 100% biodiesel requires fuel system modifications that can cost about $2,000 for parts and labor per vehicle or equipment. http://www.palmettocleanfuels.org/; http://www.treehugger.com/files/2006/07/converting_dies.php |
| **VE2** | **TOTALS** | **312.00** | | | | | **$0** | **$4,320** | |

## Energy

| | |
|---|---|
| 2020 BAU Projection | **367,724 MT CO2e** |
| Reduction Potential by 2020 | **54,116 MT CO2e/year** |

### EC1 Use City Codes, Ordinances & Permitting to Enhance Green Building, Energy Efficiency, and Energy Conservation

| | | |
|---|---|---|
| Total annual reduction potential by 2020 | **3,807** | MT CO2e |
| Average annual cost thorugh 2020 | **$10,983** | (assume first costs amortized over 15 years: 2005 -2020) |
| Average cost per MT reduced | **$2.88** | |

| | Action | CO2e impact (MT/year) | Comments; Supporting Assumptions & Methodology | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|
| EC1-1 | Continue to implement and improve the City's existing Green Building Ordinance for commercial buildings, according to the California Green Building Standards Code. Include new requirements for shade trees, cool roofs and landscape lighting. | 1,385 | Assume 25% above Title 24 code | City of Pleasanton data on annual new construction | 2011 | $25,000 | $3,750 | EECS includes assumption of $50,000 for updating the green building ordinance. Split between commercial and residential; Estimate ~2% of full time position for program oversight - See EC2-1;<br><br>Pleasanton EECS (March 5, 2010), ARRA funding |
| EC1-2 | Implement the 2006 residential Green Building Ordinance requiring new and significantly remodeled residential buildings to incorporate measures from Build It Green (BIG) green building guidelines. Continue to implement and update according to the California Green Building Standards Code, and include requirements for shade trees and cool roofs. | 512 | Assume 25% above Title 24 code | City of Pleasanton data on annual new construction | 2006 | $25,000 | $3,750 | EECS inlcudes assumption of $50,000 for updating the green building ordinance. Split between commercial and residential; Estimate ~2% of full time position for program oversight - See EC2-1;<br><br>Pleasanton EECS (March 5, 2010), ARRA funding |
| EC1-3 | Modify municipal code to reduce heat island effects in the City by requiring light-colored paving material for roads and parking areas, as well as parking lot shade trees. | 1,910 | Assume 3-6% of peak load savings from reducing heat island effects | Lawrence Berkeley National Lab data on peak load factors | 2012 | $2,250 | $0 | Estimate 25 hrs initial staff time for this measures, apportioned from total staff time needed to revise municipal code for approximately 20 measures (500 hrs); Fully burdened City staff rate = $90 per hour; 1 FTE = $180,000 per year Based on correspondance with Janice Stern of City of Pleasanton; |
| **EC1** | **TOTALS** | **3807.3** | | | | **$52,250** | **$7,500** | |

### EC2 Leverage State and Local Programs to Increase Energy Efficiency and Conservation

| | | |
|---|---|---|
| Total annual reduction potential by 2020 | **19,449** | MT CO2e |
| Average annual cost thorugh 2020 | **$16,900** | (assume first costs amortized over 15 years: 2005 -2020) |
| Average cost per MT reduced | **$0.87** | |

| | Action | CO2e impact (MT/year) | Comments; Supporting Assumptions & Methodology | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|
| EC2-1 | Recruit a Manager of Energy and Sustainability to oversee implementation of a community-wide Climate Action Plan, ensure compliance with reporting requirements, and coordinate outreach activities with the public and other key stakeholders. | | | | 2010 | $0 | allocated across EC measures | Full time Manager of Energy and Sustainability (hired in July 2010) manages all Energy measures, with volunteer assistance; Assume 50% of time spent on Energy measures, as follows ($90,000); $45,000 (25%) on EC Measures (12); $18,000 (10%) on EG Measures (5); $27,000 (15%) on ER Measures (8);<br><br>Fully burdened City staff rate = $90 per hour; 1 FTE = $180,000 per year |

| | Action | CO2e impact (MT/year) | Comments; Supporting Assumptions & Methodology | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|
| EC2-2 | PG&E Partnership Program - Implement a multi-year integrated resource strategy that incorporates PG&E's Core, Third Party, Local Government Partnership, Demand Response, Clean Air Transportation, and Distributed Generation, and other pertinent programs. | 12,328 | Based on PG&E energy efficiency program goals for 2010-2012, pro-rated to City of Pleasanton based on population; consistent with PG&E's annual program savings goals; accounts for 10% annual degradation of efficiency savings over time; supported by City's and education outreach efforts. | CPUC proceedings. http://docs.cpuc.ca.gov/PUBLISHED/AGENDA_DECISION/107378.htm#P443_56761 | 2009 | $0 | $3,750 | Estimate ~2% of full time position for program oversight - See EC2-1;<br><br>Pleasanton EECS (March 5, 2010), ARRA funding |
| EC2-3 | Provide funding for StopWaste's Green Packages Program - a set of verifiable standards and specifications for retrofit projects. Local participation may include an analysis of local housing stock to target high-impact areas, production of outreach materials to help property owners understand retrofit options, and bundling of incentives and benefits from existing programs (rebates, tax credits, etc). The program also provides training, verification, and progress tracking. | 5,095 | Assume 12 percent of homes participate and reduce electricity use by 25% and natural gas use by 40%; supported by City's and education outreach efforts. | BKi analysis for Stopwaste.org | 2010 | $22,500 | $3,750 | Estimate ~2% of full time position for program oversight - See EC2-1;<br><br>Pleasanton EECS (March 5, 2010), ARRA funding |
| EC2-4 | Energy Upgrade Pleasanton: Support the Energy Upgrade California Program, through City's concerted public engagement and education program, to manage a large-scale residential retrofit program. This program would target 15 to 30 year-old residential subdivisions with large numbers of similar houses that are good candidates for energy efficiency retrofits. | 2,025 | Assume 1200 homes participate in this program (cumulative) by 2020; supported by City's and education outreach efforts. | City of Pleasanton data on homes built more than 15 years ago. | 2011 | $0 | $3,750 | Estimate ~2% of full time position for program oversight - See EC2-1;<br>Pleasanton EECS (March 5, 2010), ARRA funding<br>Green Home Solutions: $99 assessment ($395 value), 10% off labor and materials<br>State (incl. PG&E): Up to $4,000<br>Alameda County (ABAG): $2,000 plus up to $300 toward assessment costs<br>City of Pleasanton: $1,000 for projects $10,000 or more<br>Federal tax credit: Up to 30% of installed cost ($500 cap) |
| EC2-5 | Participate in Energy Upgrade California. This program, funded in part by grants from the CEC and by California utility customers and administered by utility companies under the auspices of the California PUC, currently offers energy efficiency audits and rebates for home energy upgrades. In the future, the program will also cover commercial buildings. | combined with EC2-3 | | | 2011 | $0 | $3,750 | Estimate ~2% of full time position for program oversight - See EC2-1; |
| EC2-6 | Outreach & education: inlcuding annual update of Pleasanton Green Guide - a one stop green resource for reducing personal carbon footprints and living more sustainably. Distribute at outreach events, online, and in public offices; incorporate or promote the actions listed below where possible. Also - outreach for demand response: work with PG&E to develop targeted outreach to commercial/industrial customers. | NA | | | | $6,000 | $0 | First cost for for consultant for develop and organize the site. The new website would be designed and hosted at pleasantongreenscene.org. Manager of Energy and Sustainability responsible for uploading files and maintaining the site. |
| **EC2** | **TOTALS** | **19,448.8** | | | | **$28,500** | **$15,000** | |

| EC3 | Establish & Promote Financing & Financial Incentive Programs to Support Energy Efficiency and Conservation | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total annual reduction potential by 2020 | **7,416** MT CO2e | | | | | | |
| | Average annual cost thorugh 2020 | **$7,500** (assume first costs amortized over 15 years: 2005 -2020) | | | | | | |
| | Average cost per MT reduced | **$1.01** | | | | | | |
| | **Action** | **CO2e impact (MT/year)** | **Comments; Supporting Assumptions & Methodology** | **Background and Data Sources** | **Start Year** | **First Cost to City** | **Avg. Annual Ongoing Cost to City** | **Supporting Comments, Assumptions & Methodology; Data & Funding Source(s);** |
| EC3-1 | Assess feasibility of establishing a revolving loan fund for home performance audits and system upgrades. | | | | 2013 | $0 | $3,750 | Estimate ~2% of full time position for program oversight - See EC2-1; |
| EC3-2 | Through City's concerted public engagement and education programs, promote and increase awareness of available federal rebates and tax credits for energy efficiency upgrades. | 7,416 | Assume 20% of homes and 12% of businesses decide to act by year 2020, and each home or business achieves 10% energy savings (electricity and natural gas); supported by City's and education outreach efforts. | Based on scaling down Bki estimate for StopWaste.org | 2011 | N/A | $3,750 | Estimate ~2% of full time position for program oversight - See EC2-1; |
| **EC3** | **TOTALS** | **7,416.1** | | | | **$0** | **$7,500** | |

| EC4 | Develop Programs to Increase Energy Efficiency and Conservation | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total annual reduction potential by 2020 | **9,342** MT CO2e | | | | | | |
| | Average annual cost thorugh 2020 | **$128,583** (assume first costs amortized over 15 years: 2005 -2020) | | | | | | |
| | Average cost per MT reduced | **$13.76** | | | | | | |
| | **Action** | **CO2e impact (MT/year)** | **Comments; Supporting Assumptions & Methodology** | **Background and Data Sources** | **Start Year** | **First Cost to City** | **Avg. Annual Ongoing Cost to City** | **Supporting Comments, Assumptions & Methodology; Data & Funding Source(s);** |
| EC4-1 | Establish a Committee on Energy and the Environment to track and evaluate trends in energy demand, energy efficiency, and sustainability, and to make appropriate recommendations to City staff and City Council. | NA | | | 2009 | NA | NA | |
| EC4-2 | Implement a voluntary program that promotes energy and water-efficiency upgrades of existing buildings (residential and commercial). Include a municipal incentive program for residential and commercial energy demand reduction, energy efficiency retrofits, and/or renewable energy projects. This is a funded incentive program that goes beyond the City's green building code.<br>The City's Solar Alliance program, initiated in 2011, offers free evaluations, rebates, and financing options for residential and commercial solar installations using local installers. | 9,312 | Assume initial funding of $250,000 will be allocated $150K for residential and $100K for commercial; Assume $1000 for each home to achieve 15% savings; Assume $500 to $1000 for each business to achieve 10% to 15% savings; supported by City's and education outreach efforts.<br>Assume commercial program will be funded @ $100,000 per year for 8 additional years through 2020. | City of Pleasanton discussions | 2011 | $250,000 | $103,750 | Assume program will be funded through 2020 at $100,000 per year; Estimate 1% of annual staff time for program oversight - See EC2-1;<br>The City's Solar Alliance program offers rebates and financing. |
| EC4-3 | Implement a city-wide tree planting program, with a focus on shade trees. | 30 | Assume 200 trees planted per year; 1000 total by 2020 | | 2015 | $10,000 | $3,750 | Assume $50 spent per tree, in materials;<br><br>Estimate 1% of annual staff time for program oversight - See EC2-1; |
| EC4-4 | Promote use of solar tubes, skylights and other daylighting systems | NA | | | 2011 | $0 | $3,750 | Estimate 1% of annual staff time for program oversight - See EC2-1; |
| EC4-5 | Consider Home Energy Ratings System scores and fostering recognition of buildings that complete a prescriptive package of actions. | NA | | | 2012 | $0 | $3,750 | Estimate 1% of annual staff time for program oversight - See EC2-1; |
| **EC4** | **TOTALS** | **9,341.9** | | | | **$260,000** | **$111,250** | |

| EG1 | Promote Green Building & Energy Efficient Development for Government Operations and City Infrastructure | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total annual reduction potential by 2020 | **1,194** | MT CO2e | | | | | |
| | Average annual cost thorugh 2020 | **NA** | Net negative (Approximate 6 yr payback) | | | | | |
| | Average cost per MT reduced | **NA** | Net negative | | | | | |
| | **Action** | **CO2e impact (MT/year)** | **Comments; Supporting Assumptions & Methodology** | **Background and Data Sources** | **Start Year** | **First Cost to City** | **Avg. Annual Ongoing Cost to City** | **Supporting Comments, Assumptions & Methodology; Data & Funding Source(s);** |
| EG1-1 | Eliminate energy demand, where feasible. Perform energy efficiency upgrades for municipal buildings, including lighting and HVAC retrofits. Assess opportunities for weatherization and insulation. Install more efficient heating, cooling, computer, and lighting systems in City infrastructure whenever practical and/or replacement systems are needed. | 391 | Based on upgrading the lighting at the library and HVAC at the senior center. | Email from City of Pleasanton | 2011 | $1,000,000 | -$190,000 | Assume 5 hours additional weekly staff time; included in EC2-1 costs<br><br>Email from City of Pleasanton |
| EG1-2 | Eliminate illuminated street signs, where feasible. Replace all fluorescent bulbs in illuminated street name signs with more energy efficient systems [e.g. LEDs]. | 18 | Use number of illuminated street signs and wattage from Pleasanton EECS. | Pleasanton EECS (March 5, 2010), ARRA funding | 2011 | $400,000 | -$9,621 | Use first cost estimate from Pleasanton EECS (March 5, 2010), ARRA funding; assume 40 hours total staff time - inlcuded in EC2-1 costs |
| EG1-3 | Eliminate street lights, where feasible. For new streetlights, and for replacing existing sodium vapor street lights, use more energy efficient systems [e.g. LEDs]. | 229 | Focus on retrofiting the HPS street lights: 184 @50 watts; 4586 @70; 558 @100; 1209 @150; and 148 @200; 38 @250; and 10 @400. | City of Pleasanton | 2011 | $1,680,000 | -$145,600 | Cost estimates from Omega Pacific Electric Supply; assume 120 hours total staff time - inlcuded in EC2-1 costs<br><br>Pleasanton EECS (March 5, 2010), ARRA funding |
| EG1-4 | Assess opportunities to eliminate energy demand and improve energy efficiency of municipal water/sewer system equipment (e.g. variable frequency drives (VFD) on well motors). The City has an ongoing motor and pump replacement program to properly maintain this infrastructure. | NA | | | 2011 | $0 | $18,000 | See EC2-1 - this measure includes staff cost for all EG measures (10% of annual staff salary) |
| EG1-5 | Assist area schools with energy audits and green building checklists to evaluate and improve the energy efficiency of school facilities. | 555 | Assume 15% electric savings and 25% natural gas savings | Square footage based on California Commercial End Use Survey | 2011 | $0 | -$241,874 | Costs savings based on energy savings; assume 200 hours total staff time |
| **EG1** | **TOTALS** | **1193.8** | | | | **$3,080,000** | **-$569,095** | |

| ER1 | Implement Local Ordinances and Permitting Processes to Support Renewable Energy | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total annual reduction potential by 2020 | **2,389** | MT CO2e | | | | | |
| | Average annual cost thorugh 2020 | **$10,125** | (assume first costs amortized over 15 years: 2005 -2020) | | | | | |
| | Average cost per MT reduced | **$4.24** | | | | | | |
| | **Action** | **CO2e impact (MT/year)** | **Comments; Supporting Assumptions & Methodology** | **Background and Data Sources** | **Start Year** | **First Cost to City** | **Avg. Annual Ongoing Cost to City** | **Supporting Comments, Assumptions & Methodology; Data & Funding Source(s);** |
| ER1-1 | Adopt local zoning ordinances that encourage residential renewable energy installations (e.g., wind turbines). | 490 | Assume 200 new renewable energy systems (including wind, geothermal, etc.) total by 2020; Assume homeowner sizes system to household energy load (8,500 Kwh/year); supported by City's and education outreach efforts | | 2013 | Staff time | $3,375 | Estimate ~2% of full time position for program oversight - See EC2-1; |
| ER1-2 | Expedite green permits and include outreach materials in all permit applications. "Green" permits include solar and renewable energy permits, and new construction/renovations according to "green building" guidelines. | 1,898 | Assume 100 new residential participants (about 1% of households) and 100 new commercial participants (about 3% of businesses) | | 2011 | Staff time | $3,375 | Estimate ~2% of full time position for program oversight - See EC2-1; |
| ER1-3 | Consider Community Choice Aggregation to increase the proportion of clean, renewable resources in the electric mix used by City of Pleasanton. | NA | | | 2013 | $0 | $3,375 | Estimate ~2% of full time position for program oversight - See EC2-1; |
| **ER1** | **TOTALS** | **2388.7** | | | | **$0** | **$10,125** | |

| ER2 | Develop Programs to Promote On-Site Renewable Energy in the Community | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total annual reduction potential by 2020 | **10,518** MT CO2e | | | | | | |
| | Average annual cost thorugh 2020 | **$36,125** (assume first costs amortized over 15 years: 2005 -2020) | | | | | | |
| | Average cost per MT reduced | **$3.43** | | | | | | |
| | **Action** | **CO2e impact (MT/year)** | **Comments; Supporting Assumptions & Methodology** | **Background and Data Sources** | **Start Year** | **First Cost to City** | **Avg. Annual Ongoing Cost to City** | **Supporting Comments, Assumptions & Methodology; Data & Funding Source(s);** |
| ER2-1 | Evaluate existing installed renewable energy capacity in community and set future community goal. | NA | | | 2012 | $0 | $3,375 | Estimate ~2% of full time position for program oversight - See EC2-1; |
| ER2-2 | Solar Cities Program (Solar City Program)- Since 2008, Pleasanton has participated in a customer assistance program designed to facilitate the purchase and installation of photovoltaic and other energy efficient technologies for residential, commercial, and municipal facilities. Outreach activities are currently being planned to enhance the existing program. | 9,636 | Initial assumption of 100 new residential and 50 commercial participants by 2020 was very conservative. By 2011, 436 residential installations with total nameplate capacity = 4,075 MW<br><br>Case studies, articles, guests on local radio, participate in community events and work with PG&E on bill inserts; | | 2007 | $35,000 | $3,375 | Estimate ~2% of full time position for program oversight - See EC2-1;<br><br>Pleasanton EECS (March 5, 2010), ARRA funding |
| ER2-3 | Increase promotion (rebates, education and outreach, demonstration projects and or other means) of distributed generation, especially PV, solar thermal, solar hot water, and solar cooling. Also consider including bloom box or other fuel cell technologies. | | | | 2013 | $0 | $3,375 | Estimate ~2% of full time position for program oversight - See EC2-1; |
| ER2-4 | Form a Pleasanton solar cooperative to purchase solar panels in bulk and leverage economies of scale in installation costs. | 882 | Assume 100 residential participants and 50 commercial participants | | 2013 | N/A | $3,375 | Estimate ~2% of full time position for program oversight - See EC2-1; |
| ER2-5 | Consider installing neighborhood solar grids (use parking lots) for solar EV charging stations. | NA | | | 2013 | | $3,375 | Estimate ~2% of full time position for program oversight - See EC2-1; |
| **ER2** | **TOTALS** | **10518.1** | | | | **$35,000** | **$16,875** | |

| ER3 | Promote Use of Renewable Energy for Municipal Operations | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total annual reduction potential by 2020 | **0** MT CO2e | | | | | | |
| | Average annual cost thorugh 2020 | **$0** (assume first costs amortized over 15 years: 2005 -2020) | | | | | | |
| | Average cost per MT reduced | **NA** | | | | | | |
| | **Action** | **CO2e impact (MT/year)** | **Comments; Supporting Assumptions & Methodology** | **Background and Data Sources** | **Start Year** | **First Cost to City** | **Avg. Annual Ongoing Cost to City** | **Supporting Comments, Assumptions & Methodology; Data & Funding Source(s);** |
| ER3-1 | Evaluate existing installed renewable energy capacity for municipal operations and set future installed goal. | NA | | | 2012 | $0 | $0 | |
| ER3-2 | Evaluate the feasibility of installing solar (PV) panels or vertical wind turbines at City-owned facilities. | NA | | | 2009 | $0 | $0 | Estimate negligible staff time for program oversight - See EC2-1; |
| ER3-3 | Investigate feasibility of purchasing Green Power for municipal operations. | NA | | | 2012 | $0 | $0 | Estimate negligible staff time for program oversight - See EC2-1; |
| **ER3** | **TOTALS** | **0.0** | | | | **$0** | **$0** | |

## Establish Pleasanton as a Zero Waste Community

2020 BAU Projection **43,521 MT CO2e**

Reduction Potential by 2020 **29,605 MT CO2e/year**

**SW1 Increase recycling, organics diversion, and waste reduction associated with municipal operations.**

**Total annual reduction potential by 2020** **0** (included in SW2)
**Average annual cost through 2020** **$0** (included in SW2)
**Average cost per MT reduced** **$1.79**

| | Action | CO2e impact (MT/year) | Comments; Supporting Assumptions & Methodology | Background and Data Sources | Start Year | First Cost to City ($) | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|
| SW1-1 | Adopt a City goal of Zero Waste (defined as 90% diversion) for government operations by 2020. | 0 | Utilize model language to draft and pass Zero Waste resolution and goal for City Of Pleasanton. | 1. Zero Waste International Alliance standards for Zero Waste Communities. http://zwia.org/joomla/index.php?option=com_content&view=article&id=10&Itemid=8<br>2. SF Environment Zero Waste Resolution http://www.sfbos.org/ftp/uploadedfiles/bdsupvrs/resolutions02/r0679-02.pdf | 2011 | $0 | $0 | See SW2-1; Because the majority of emissions reductions will be for private sector businesses and residents, costs are attributed in SW2-1 below.<br><br>City responsibility, utilizing existing staff |
| SW1-2 | Develop strategy and implementation plan to achieve Zero Waste by 2020 | 0 | Hire consultants to write Zero Waste implementation and strategy plan. Asses progress and update plan at 5 year intervals. | 1. Based on average of fees for Zero Waste Plans for the Cities for Alameda, Mountain View, and Oceanside, CA. | 2011 | $0 | $0 | See SW2-2; Because the majority of emissions reductions will be for private sector businesses and residents, costs are attributed in Sw2-2 below.<br><br>City responsibility, staff to project the cost per taxpayer to draft and implement the plan. |
| SW1-3 | Adopt an Environmentally Preferable Purchasing Policy. | 0.0 | An Environmentally Preferrable Purchasing policy has been drafted for the City of Pleasanton, using existing staff resources and is expected to be completed and implementation begun in 2011. The draft plan was created based on resources from StopWaste.org | 1. Draft Pleasanton EPP ordinance, conversation and data from Laura Ryan, March 2011.<br>2. StopWaste.org EPP resources http://stopwaste.org/home/index.asp?page=439 | 2011 | $0 | $0 | Implementation of the EPP plan can be incorporated in to job duties for existing staff members. |
| SW1-4 | Launch municipal compost and/or recycling collection sites for City-owned facilities: one at the Operations Service Center, two at City Hall, and one at the Senior Center. | 0.0 | This action is currently in progress with the city. In order to calculate actual costs, more information is needed and will depend upon several factors, such as the amount of material that will be processed, the equipment needed, any infrastructure or construction improvements needed. | | 2011 | $0 | $0 | |
| **SW1** | **TOTALS** | **0.0** | | | | **$0** | **$0** | |

| SW2 | Increase recycling, organics diversion, and waste reduction associated with the entire community. | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total annual reduction potential by 2020 | **29,605** MT CO2e | | | | | | |
| | Average annual cost thorugh 2020 | **$53,000** (assume first costs amortized over 15 years: 2005 -2020) | | | | | | |
| | Average cost per MT reduced | **$1.79** | | | | | | |
| | **Action** | **CO2e impact (MT/year)** | **Assumptions, Methodology, and Calculations** | **Background and Data Sources** | **Start Year** | **First Cost to City ($)** | **Avg. Annual Ongoing Cost to City** | **Supporting Comments, Assumptions & Methodology; Data & Funding Source(s);** |
| SW2-1 | Adopt a City resolution to achieve zero waste (defined as 90% diversion) citywide by 2025. | 0 | The upfront costs for drafting the Zero Waste goal are included in SW1-1. The Zero Waste goal will address all sectors including municipal operations and the private sector so no additional costs will be incurred to implement SW2-1. | 1. Zero Waste International Alliance standards for Zero Waste Communities. http://zwia.org/joomla/index.php?option=com_content&view=article&id=10&Itemid=8<br>2. SF Environment Zero Waste Resolution http://www.sfbos.org/ftp/uploadedfiles/bdsupvrs/resolutions02/r0679-02.pdf | 2010 | $0 | $0 | Requires existing staff time to write ordinance. Ongoing cost = Staff time; see SW2-2<br>One Resolution to be written which will include both Municipal and Community goals. |
| SW2-2 | Develop community zero waste plan - 75% diversion by 2015; 85% diversion by 2020; 90% by 2025; that includes strategies and implementation timeline for improving diversion and reducing waste generation. | 0 | The upfront costs for drafting the Zero Waste Plan and implementation strategy are included in SW1-2. The Zero Waste Plan will address all sectors including municipal operations and the private sector so no additional costs will be incurred to implement SW2-2. The plan should be revisited at 5 year increments to ensure that goals are being met and to reevaluate measures. | | 2012 | $90,000 | $45,000 | Fisrt cost based on an average of fees charged for Zero Waste plans for various California jurisdictions, including Alameda, Mountain View, and Oceanside, CA. Actual costs will vary based upon the amount of detail, analysis, and modeling needed or required by the City. The 2008 StopWaste.org Waste Characterization study provides information that should keep costs low for Pleasanton. One Zero Waste Plan to be written which will include both Municipal and Community goals.<br><br>Implementation (all measures under this strategy) by 1/4 FTE employee = $45,000/yr (Zero Waste Coordinator = Manager of Energy and Sustainability - see PE1-3). May need additional staff time as proigram develops. |
| SW2-3 | Residential Curbside Recycling Program – In 2009, new residential curbside recycling program replaced the blue bag program with a separate collection cart for recyclable materials. Expand residential recycling program to include the collection and processing of more materials including single use plastics. | | Ongoing since 2009 | | 2009 | $0 | $0 | Staff time; see SW2-2 |
| SW2-4 | Partner with the PGS to expand commercial recycling program to include the collection and processing of more materials; launch commercial organics program. | 0 | Infrastructure investments needed for improving PGS processing and collection programs will be incurred by the hauler. Costs for improving the program can be incorporated into the rate review and setting process, and can them be spread overtime and account holder base. | Note: Commercial recycling will be mandatory by 2012. | 2011 | $0 | $0 | PGS, hauling contract & rates |
| SW2-5 | Expand residential yard and food waste collection program to multifamily residences, a service provided to single family residents since 2006. | 0 | Infrastructure investments needed for improving PGS processing and collection programs will be incurred by the hauler. Costs for improving the program can be incorporated into the rate review and setting process, and can them be spread overtime and account holder base. | | 2014 | $0 | $0 | PGS, hauling contract & rates |

| | Action | CO2e impact (MT/year) | Assumptions, Methodology, and Calculations | Background and Data Sources | Start Year | First Cost to City ($) | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|
| SW2-6 | Implement and enforce Construction and Demolition debris recycling ordinance. | | The ordinance has been in effect since 2009. | | 2009 | $0 | $0 | Existing staff resources can be utilized to implement and enforce the C&D ordinance and no additional cost need to be incurred. |
| SW2-7 | Launch outreach campaign to increase participation in residential recycling and composting programs and to promote waste reduction. | 0 | | | 2012 | $0 | $2,000 | Marketing materials; Staff time; see SW2-2 |
| SW2-8 | Utilize resources available through StopWaste.org to promote backyard composting, grasscycling, and low maintenance landscaping. | 0 | Existing resources from StopWaste.org can be utilized to help existing City staff and promote these programs without incurring additional costs. | 1. StopWaste.org backyard composting and landscaping resources for residents http://stopwaste.org/home/index.asp?page=441 | on-going | $0 | $0 | Staff time; see SW2-2 |
| SW2-9 | Expand commercial recycling program to include the collection and processing of more materials. Launch commercial organics program. | 0 | Infrastructure investments needed for improving PGS processing and collection programs will be incurred by the hauler. Costs for improving the program can be incorporated into the rate review and setting process, and can them be spread overtime and account holder base. | | 2011 | $0 | $0 | Staff time; see SW2-2<br><br>Potential funding: PGS, hauling contracts and rates |
| SW2-10 | Utilize resources avaialbe through Stopwaste.org to promote outreach and education to businesses to use less packaging, and more durable, local, and low-impact goods, and resusable shipping containers. | 0 | Existing resources from StopWaste.org can be utilized to help existing City staff and promote these programs without incurring additional costs. | 1. StopWaste.org business partnership resources http://stopwaste.org/home/index.asp?page=9 | 2012 | $0 | $0 | Staff time; see SW2-2 |
| SW2-11 | Establish municipal ordinance requiring large and special events producers to plan and divert waste from landfill. | 0 | Utilize existing resources to draft and pass an ordinance that will require special event producers to submit a Waste Management Plan and divert material from landfill in order to issue an event permit. Existing staff resources in permitting can be utilized as well as 1-FTE employee that will implement CAP. | 1. San Francisco special event recycling ordinance http://www.sfenvironment.org/our_programs/interests.html?ssi=3&ti=5&ii=191 | 2011 | $0 | $0 | Staff time; see SW2-2 |
| SW2-12 | For new and remodeled commercial and multifamily buildings, require adequate space and logistics for handling of recyclable and compostable materials. | 0 | Utilize resources from StopWaste.org to draft a Green Building Ordinance. | 1. Model Green Building Ordinance from StopWaste.org http://www.stopwaste.org/docs/final_model_civic_gbo.doc | 2011 | $0 | $0 | Staff time; see SW2-2 |
| SW2-13 | Establish a battery recycling program with various collection centers. | | | | Done | $0 | $0 | |
| SW2-14 | Consider a Landfill Ban or Mandatory Recycling and Composting if zero waste goals are not on track. | 0 | Utilize model language to draft Landfill Ban or Mandatory Recycling and Composting Ordinance. The ordinance will include both City Government and Private sectors so no further costs will be incurred. Additionally, the 1-FTE estimated in SW1-5 will be spread across all SW actions and additional costs incurred. | 1. Based on the experience of other jurisdiction, it takes 1FTE employee to implement and enforce. Mandatory recycling ordinance (source Alameda Zero Waste Plan Appendix B, September 2010) 2. Enforcement would be part of duties for 1 FTE staff member charged with implementing CAP. | 2015 | $0 | $0 | Staff time; see SW2-2 |
| SW2-15 | Support state policies and implement local policy for extended producer responsibility. | 0 | Utilize existing staff resources, or portion of 1FTE employee hired for implementing CAP to track and support EPR legislation at regional and statewide. | | on-going | $0 | $0 | Staff time; see SW2-2 |
| SW2-16 | Outreach and education: included in Public Engagement | 0 | | | | $0 | $0 | Staff time; see SW2-2 |
| **SW2** | **TOTALS** | **29,605** | | | | **$90,000** | **$47,000** | |

## Water and Wastewater

| | | |
|---|---|---|
| 2020 BAU Projection | **38,489** | **MT CO2e** |
| Reduction Potential by 2020 | **371** | **MT CO2e/year** |

**WA1 Conserve Community Water through Building and Landscape Design & Improvements**

| | | |
|---|---|---|
| **Total annual reduction potential by 2020** | **272** | MT CO2e |
| **Average annual cost thorugh 2020** | **$180,600** | (assume first costs amortized over 15 years: 2005 -2020) |
| **Average cost per MT reduced** | **$486** | |

| | Action | CO2e impact (MT/year) | Comments; Supporting Assumptions & Methodology | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|
| WA1-1 | Hire a Water Conservation Coordinator to administer current and new conservation activities, develop water use policy, set water savings targets concurrent with CA Senate Bill x7-7, and manage outreach activities. | 0 | | | 2009 | $0 | $180,000 | Requires staff time to write ordinance. Operational staff time = 1 FTE<br><br>City: Annual Ongoing cost $180,000 for one fulltime equivalent Allocated across all water measures |
| WA1-2 | Expand Commercial Irrigation Rebate Program. Enhance rebate incentive structure to increase and further provide informational materials on water-conserving gardening practices.<br>Provide large landscape audit support services program for top tier water customers. | 0 | | | 2013 | $0 | See WA1-1 | Zone 7 would run this, with assistance from the water conservation coordinator. See WA1-1. |
| WA1-3 | Continue to provide City water customers with free indoor water conservation devices. | 110 | Assume a 20% reduction of indoor residential water use emissions.<br>Assume a 50% participation rate. | 1. Pleasanton General Plan, Section 8-11, Table 8-1.<br>2. CAPCOA (2010), pg. 347 to 353. | 2013 | $5,000 | See WA1-1 | Requires up-front cost to purchase equipment. Requires staff time to write ordinance (from existing resources). See WA1-1. |
| WA1-4 | Implement a landscape ordinance requiring new commercial and residential projects to meet prescribed landscape water budgets and ensure that new construction uses the latest irrigation technology, and meet AB 1881 requirements. | 34 | Assume a 6.1% reduction of commercial/industrial irrigation water use emissions. | 1. CAPCOA (2010), pg. 372.<br>2. Pleasanton General Plan, Section 8-11, Table 8-1. | 2012 | $0 | See WA1-1 | Requires staff time to write ordinance (from existing resources). See WA1-1. |
| WA1-5 | Install/expand installation of smart water meters | 11 | Assume additional smart meter installation in 20% of Pleasanton households.<br>Assume a 5% decrease in water use emissions from smart meter installation. | 1. Pleasanton General Plan, Section 8-11, Table 8-1. | 2011 | $4,000 | See WA1-1 | Requires 80 hrs staff time ($50/hr) to get program started = $4,000 first cost; Operational staff time = 0.1 FTE (covered by water conservation coordinator). |
| WA1-6 | Restrict the use of utility-provided water for cleaning vehicles and outdoor surfaces. | 16 | | | 2013 | $0 | See WA1-1 | See WA1-1 |
| WA1-7 | Restrict landscape watering; encourage xeriscaping and drought-resistant planting in lieu of lawns. | 56 | Assume 10% reduction in landscape watering. | 1. Pleasanton General Plan, Section 8-11, Table 8-1. | 2013 | $0 | See WA1-1 | Will apply for grant funding from Zone 7 for support. See WA1-1 |
| WA1-8 | Provide incentives for replacing lawn areas at business parks; promote more trees and xeriscaping. | 46 | Assume 20,000 sq. ft.reduced. | 1. CAPCOA (2010), pg. 376-378<br>2. CDWR Model Water Efficient Landscape Ordinance (2009): Appendix A, pg. 20. | 2013 | $0 | See WA1-1 | Education and training provided from existing funds and staff time.<br>See WA1-1. |
| **WA1** | **TOTALS** | **272.30** | | | | **$9,000** | **$180,000** | |

| WA2 | Conserve Water Used by Municipal Operations through Building and Landscape Design & Improvements | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total annual reduction potential by 2020 | **1** | MT CO2e | | | | | |
| | Average annual cost thorugh 2020 | **NA** | (included in WA1 cost)) | | | | | |
| | Average cost per MT reduced | **$486** | | | | | | |
| | **Action** | **CO2e impact (MT/year)** | **Comments; Supporting Assumptions & Methodology** | **Background and Data Sources** | **Start Year** | **First Cost to City** | **Avg. Annual Ongoing Cost to City** | **Supporting Comments, Assumptions & Methodology; Data & Funding Source(s);** |
| WA2-1 | City to install "smart" water-efficient irrigation systems and devices for City parks and landscaping, such as soil moisture-based irrigation controls and use water-efficient irrigation methods. | 0 | Assume 200 sq. ft. reduced.<br><br>Laura Ryan: "In 1998 the City began installing weather-based irrigation controls. They were installed in all City parks by 2005 (385 turf acres) with the exception of Bernal Community park, which was done after 2005 and covers 3 turf acres. So as of today, all 42 City parks have these controls. | | 2012 | $0 | See WA1-1 | Regarding City-owned landscaped areas… 80% of medians have weather-based irrigation controls (75 acres), and 50% of municipal building landscape has them (from the hip estimate is 5 acres)". See WA1-1.<br><br>Laura Ryan, City of Pleasanton; CAPCOA |
| WA2-2 | Require the installation of water conservation devices in new construction and additions (public facilities) | 0 | Assume a 25% increase in public facility square footage. | 1. CAPCOA (2010), pg. 347.<br>2. Pleasanton General Plan, Section 8-11, Table 8-1. | 2012 | 0 | See WA1-1 | Assuming 5 new buildings to be constructed, and assuming $100 per conservation device + $100 labor intallation charge per device = $500 See WA1-1.<br><br>Cost of conservation device from http://www.consumerreports.org/cro/appliances/heating-cooling-and-air/water-heaters/tankless-water-heaters/overview/tankless-water-heaters-ov.htm |
| **WA2** | **TOTALS** | **1** | | | | **$0** | **$0** | |

| WA3 | Increase or Establish use of Reclaimed/Grey Water Systems | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total annual reduction potential by 2020 | **98** | MT CO2e | | | | | |
| | Average annual cost thorugh 2020 | **NA** | (included in WA1 cost)) | | | | | |
| | Average cost per MT reduced | **$486** | | | | | | |
| | **Action** | **CO2e impact (MT/year)** | **Comments; Supporting Assumptions & Methodology** | **Background and Data Sources** | **Start Year** | **First Cost to City** | **Avg. Annual Ongoing Cost to City** | **Supporting Comments, Assumptions & Methodology; Data & Funding Source(s);** |
| WA3-1 | Investigate the feasibility of using stormwater runoff, if all water quality measures are in place, for irrigation and groundwater recharge. | | | | 2013 | $0 | See WA1-1 | Responsibility of water Conservation Coordinator. See WA1-1 |
| WA3-2 | Utilize reclaimed wastewater for productive use (need to design program) | 98 | Assume a 10% participation rate. A 40% reduction in emissions (for Northern California), would mean **878*.4*.1 = 35 MT** | 1. CAPCOA (2010), pg. 334. | 2014 | $0 | See WA1-1 | Responsibility of water Conservation Coordinator. See WA1-1 |
| WA3-3 | Incentives for water recycling - e.g. tax credits | | | | 2013 | $0 | See WA1-1 | Responsibility of water Conservation Coordinator. See WA1-1 |
| WA3-4 | Increase rain harvesting - city program that provides equipment and education | | | | 2013 | $0 | See WA1-1 | Responsibility of water Conservation Coordinator. See WA1-1 |
| **WA3** | **TOTALS** | **98** | | | | **$0** | **$0** | |

## Community Engagement

Reduction Potential by 2020: **Quantified elsewhere; Increases effectives of other measures**

### PE1 Provide Information and Resources to the Community

| | |
|---|---|
| Total annual reduction potential by 2020 | **NA** ; impacts other measures |
| Average annual cost through 2020 | **NA** ; allocated across Transportation, Energy and Solid Waste programs |
| Average cost per MT reduced | **NA** |

| | Action | CO2e impact (MT/year) | Comments; Supporting Assumptions & Methodology | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|
| PE1-1 | Develop a comprehensive public/private education and empowerment program that helps residents, businesses, and visitors take action to reduce their personal carbon footprint. | Impact on behavior change; Affects energy, transportation, water and solid waste measures | The Environmental Education and Empowerment Program includes all of the measures listed below.<br><br>See report on achievable carbon emissions reductions from voluntary household actions: Household Actions Can Provide a Behavioral Wedge to Rapidly Reduce US Carbon Emissions; Proceedings of the National Academy of Sciences of the United States of America, Nov 3, 2009, by Thomas Dietza, Gerald T. Gardnerb, Jonathan Gilliganc, Paul C. Sternd,1, and Michael P. Vandenberghe;<br><br>Study develops behaviorally realistic estimates of how well-designed policies can reduce US household greenhouse gas emissions by more than 20%, equivalent to more than 7% of total US emissions. Results of 17 different behavior change predictions were adjusted for Pleasanton (11% reduction in household emissions) using the following conservative assumptions:<br>• Public engagement & education affects only residents of Pleasanton<br>• Assume no impact on commercial vehicle trips, or on non-home-based (NHB) trips<br>• Adjustment made to account for higher CA residential energy use efficiency (44% less energy use per capita than US average) | Additional sources:<br>• http://www.pnas.org/<br>• Redwood City Community Climate Action Plan Goal Matrix,www.redwoodcity.org/.../Community%20Climate%20Action%20Plan%20Goal%20Matrix.pdf;<br>• Sec 8 -Transportation-final 082207, www.deq.utah.gov/.../BRAC_Report_Sec_8-Transportation-Land-Use.pdf;<br>• Appendix B: Greenhouse Gas Emissions Reductions Analysis Calculations, www.cityofsancarlos.org/civica/filebank/blobdload.asp;<br>• York Green Neighbourhood Challenge, www.sei-international.org/.../SEI-Green-NeighbourhoodChallenge-Project_report.pdf | 2011 | $0 | See PE1-3 | See PE1-3 |
| PE1-2 | Update the Pleasanton Green Guide annually - a one stop green resource for reducing personal carbon footprints and living more sustainably. Distribute at outreach events, online, and in public offices; incorporate or promote the actions listed below where possible. | Impact on behavior change; Affects energy, transportation, water and solid waste measures | Convert the "Greenscene" website after the CAP's adoption into a stand-alone resource center or portal that would serve as the City and community's hub for all things green. The site would contain the following sections:<br>1) on-going implementation of the Climate Action Plan;<br>2) information about local and regional green jobs, training, and trends;<br>3) "Green Energy" about alternative energy;<br>4) a "Green Ride" section as described in VE1-7 and TR1-8;<br>5) a "Green Building" section with resources for new and existing buildings; 6) a "Greenscapes" section that addresses public and private landscapes; and 7) "Blue-Green" about water; and 8) "Greens" about food. | •.www.coolcalifornia.org;<br>•.www.beclimatesmart.com/;<br>•.www.greenmartinez.org;<br>•.www.fes.uwaterloo.ca/research/climateconference/;<br>• Berkeley Institute of the Environment, University of California, Berkeley bie.berkeley.edu;<br>• California Energy Commission www.energy.ca.gov;<br>• California Climate Action Registry, www.climateregistry.org;<br>• California Climate Change Portal, www.climatechange.ca.gov;<br>• Talk of the City: engaging urbanites on climate change, www.iop.org/EJ/article/1748-9326/1/1/014006/erl6_1_014006.html;<br>• ICLEI Outreach and Communications Guidebook: http://www.icleiusa.org/actioncenter/engaging-your-community/outreach and-communications-guide | 2011 | See EC2-6 | See PE1-3 | The new website would be designed and hosted on the City's existing www.pleasantongreenscene.org. Manager of Energy and Sustainability responsible for uploading files and maintaining the site. |

| | Action | CO2e impact (MT/year) | Comments; Supporting Assumptions & Methodology | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|
| PE1-3 | In conjunction with the www.PleasantonGreenScene.org website, develop a citywide outreach program that engages, educates, and exchanges information on implementing the measures in the Climate Action Plan and related General Plan policies. See PE3-1 | Impact on behavior change; Affects energy, transportation, water and solid waste measures | The City will lead the development of a formal, ongoing GreenGuide program in partnership with the Pleasanton Unified School District, representatives of the Chamber of Commerce, and others to engage, educate, and exchange information to reduce energy consumption and generate renewable energy, reduce motor vehicle miles traveled, solid waste, and other goals of the CAP. Specific activities would include the development of a marketing strategy, the design and publication of collateral materials, and the development of the Green Guide website. A separate organization might assume responsibility for the program.<br><br>Feedback from Workshop II strongly supported a single resource portal hosted by the City for all things green. The program might be directed and managed by a small non-profit entity rather than the City to streamline the organization and operations. | • ClimatePlan <chanell@climateplanca.org>; •.www.nrc-cnrc.gc.ca/obj/irc/doc/pubs/nrcc48341/nrcc48341.pdf; •.www.flagstaff.az.gov/DocumentView.aspx?DID=9615; •.www.cityofsacramento.org/generalservices/sustainability/; •.www.olds.ca/communty/sustain2.pdf; •.www.nhlgc.org/affiliate/nhpa/nhpa_strategicplan.htm; •.www.raleighnc.gov/content/FinPurchasing/../AD-ClimateEnergyActionPlan.pdf; •.www.cob.org/services/environment/climate/index.aspx; •.www.managementhelp.org/plan_dec/str_plan/str_plan.htm | 2011 | $0 | Annual staff cost allocated across Energy, Land Use & Transprtation, and Solid Waste measures | Full time Manager of Energy and Sustainability (hired in July 2010) manages and promotes implementation of climate and sustainability measures, with volunteer assistance; Assume 50% of time spent on Energy measures (see EC2, EC3, and EC4); 25% on Land Use & Transportation Measures; 25% on Solid Waste Minimization measures (see SW2). The Manager seeks funding to offset costs from grants and local, participating businesses.<br><br>Fully burdened City staff rate = $90 per hour; 1 FTE = $180,000 per year |
| PE1-4 | Develop user-friendly fact sheets for ways that residents, landlords and/or businesses can reduce GHG emissions by improving energy and water efficiency, reducing waste, and improve home performance using green building techniques; organize information by cost efficiency and type of home or building (apartment, slab foundation, pier foundation, etc.). If available, include funding and implementation resources. Distribute at events and post on web site. | Impact on behavior change; Affects energy, transportation, water and solid waste measures | | | | $0 | See PE1-3 | See PE1-3 |
| PE1-5 | Provide community workshops on water and energy conservation, renewable energy systems and rebates, and backyard composting/home management of organics. | Support measure; impacts behavior change | | | | $0 | See PE1-3 | See PE1-3 |
| PE1-6 | Identify and empower neighborhood leaders and community champions on climate change and sustainability. | Support measure; impacts behavior change | | | | $0 | See PE1-3 | See PE1-3 |
| PE1-7 | Implement a "Buy Local" campaign. | Support measure; impacts behavior change | | | | $0 | See PE1-3 | See PE1-3 |
| PE1-8 | Work with PG&E and area organizations to recognize exemplary green buildings and businesses and individuals that save energy. | Support measure; impacts behavior change | | | | $0 | See PE1-3 | See PE1-3 |
| **PE3** | **TOTALS** | **0.00** | | | | **$0** | **$0** | |

| PE2 | Partner with schools to promote sustainability efforts | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Total annual reduction potential by 2020 | **NA** ; impacts other measures | | | | | | |
| | Average annual cost through 2020 | **NA** ; allocated across Transportation, Energy and Solid Waste programs | | | | | | |
| | Average cost per MT reduced | **NA** | | | | | | |
| | **Action** | **CO2e impact (MT/year)** | **Comments; Description** | **Background and Data Sources** | **Start Year** | **First Cost to City** | **Avg. Annual Ongoing Cost to City** | **Supporting Comments, Assumptions & Methodology; Data & Funding Source(s);** |
| PE2-1 | Promote community climate action planning through schools; send information home through schools. | Support measure; impacts behavior change | | | | $0 | See PE1-3 | See PE1-3 |
| PE2-2 | Leverage StopWaste program to assist schools with on-site waste audits to evaluate and improve current recycling practices, and outreach to promote recycling to schoolchildren. | Support measure; impacts behavior change | | | | $0 | See PE1-3 | See PE1-3 |
| PE2-3 | Participate in E-coaches activities to identify opportunities to leverage resources to help the schools. | Support measure; impacts behavior change | | | | $0 | See PE1-3 | See PE1-3 |
| PE2-4 | Develop and offer to present sustainability modules to schools and special interest youth groups. | Support measure; impacts behavior change | | | | $0 | See PE1-3 | See PE1-3 |
| **PE2** | **TOTALS** | **0.00** | | | | **$0** | **$0** | |
| **PE3** | **Implement Outreach Programs for Local Businesses and Residents** | | | | | | | |
| | Total annual reduction potential by 2020 | **NA** ; impacts other measures | | | | | | |
| | Average annual cost through 2020 | **NA** ; allocated across Transportation, Energy and Solid Waste programs | | | | | | |
| | Average cost per MT reduced | **NA** | | | | | | |
| | **Action** | **CO2e impact (MT/year)** | **Comments; Description** | **Background and Data Sources** | **Start Year** | **First Cost to City** | **Avg. Annual Ongoing Cost to City** | **Supporting Comments, Assumptions & Methodology; Data & Funding Source(s);** |
| PE2-3 | Foster public-private partnerships, including Sustainability Circles. | Support measure; impacts behavior change | | | | $0 | See PE1-3 | See PE1-3 |
| PE3-2 | Support Pleasanton's participation in Alameda County Green Business Program. | Support measure; impacts behavior change | | | | $0 | See PE1-3 | See PE1-3 |
| PE3-3 | Provide outreach and education to businesses and residents to use less packaging, and more durable, local, and low-impact goods, including re-usable shopping bags and compostable foodware. | Support measure; impacts behavior change | | | | $0 | See PE1-3 | See PE1-3 |

| Action | | CO2e impact (MT/year) | Comments; Description | Background and Data Sources | Start Year | First Cost to City | Avg. Annual Ongoing Cost to City | Supporting Comments, Assumptions & Methodology; Data & Funding Source(s); |
|---|---|---|---|---|---|---|---|---|
| PE3-4 | Engage the Committee on Energy and the Environment - an advisory committee to track and evaluate trends in energy efficiency and sustainability, and to make appropriate recommendations to City staff and City Council. | Support measure; impacts behavior change | | | | $0 | See PE1-3 | See PE1-3 |
| PE3-5 | Develop and implement financial aid programs for residential and commercial energy efficiency upgrades/retrofits (incentives or financing options). | Supports EC4-2 | | | | $0 | See PE1-3 | See PE1-3 |
| PE3-6 | Raise awareness about the City's large scale residential program to retrofit homes with energy efficiency measures (see EC4-2). | Supports EC4-2 | | | | $0 | See PE1-3 | See PE1-3 |
| PE3-7 | Sponsor California Youth Energy Services to perform free “green house calls” to Pleasanton residents. | Support measure; impacts behavior change | | | | $0 | See PE1-3 | See PE1-3 |
| PE3-8 | Continue to host free community events, such as the annual green fair, e-waste/Rx drop off events, sustainability lectures and various workshops. | Support measure; impacts behavior change | | | | $0 | See PE1-3 | See PE1-3 |
| **PE3** | **TOTALS** | **0.00** | | | | **$0** | **$0** | |

# Appendix E

## Letters of Support

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PLEASANTON CHAMBER of COMMERCE

July 27, 2011

To: Nelson Fialho, Pleasanton City Manager

FR: Tom Powers, Chairman, Pleasanton Chamber of Commerce

RE: Climate Action Plan

On behalf of the Pleasanton Chamber of Commerce and our roughly 800 member firms that employ more than 15,000 area residents I wish to extend our appreciation to the City of Pleasanton for their thoughtful engagement of community stakeholders in the development of a meaningful Climate Action Plan for our community.

Specifically, I want to commend City staff for their responsiveness and timely follow-through over a period of several months to work with the Chamber's Economic Development & Government Relations (EDGR) Committee to refine standards, goals and objectives that are both meaningful and attainable.

We look forward to partnering with the City and other stakeholders in the coming months and years to achieve the highest levels of community awareness and engagement in a variety of strategies that will help reduce greenhouse gas emissions and meet California's AB32 requirements. In fact, we are already making plans for city-wide business energy audits in partnership with PGE.

BAYEAST
ASSOCIATION OF REALTORS®
7901 Stoneridge Drive, Suite 150
Pleasanton, CA 94588
(925) 730-4060 Fax (925) 730-0237
1-800-773-3103
http://www.bayeast.org

August 11, 2011

Nelson Fialho
City Manager
City of Pleasanton
123 Main Street
Pleasanton, CA 94566

Dear Mr. Fialho:

The Bay East Association of REALTORS® commends the City of Pleasanton for taking a leadership role in addressing climate change. We, too, are supportive of policies that create and maintain a suitable living environment.

The members of the Bay East Association of REALTORS® want to help the City of Pleasanton address the impact residential buildings have on the environment and we are supportive of the proposed Climate Action Plan (CAP). In fact, the CAP presents many opportunities for our members to partner with the City of Pleasanton in achieving your energy efficiency goals.

The relationship between a REALTOR® and their client often continues long after the close of a transaction. Many homeowners turn to their REALTOR® for advice and referrals for home improvement projects. Furthermore, REALTORS® proactively share information with their clients about real estate issues. This relationship is a perfect opportunity to provide information about making homes more energy efficient. We hope the City of Pleasanton continues working with the REALTOR® community to promote the various energy efficiency programs offered by the City and other organizations.

We look forward to being a partner with the City of Pleasanton, Pleasanton homeowners, home buyers and the community at-large in promoting energy efficiency.

Sincerely,

Otto Catrina, 2011 President
Bay East Association of REALTORS®

HACIENDA
Owners Association

August 8, 2011

Mr. Daniel Smith
Director of Operations Services
City of Pleasanton
3333 Busch Road
PO Box 520
Pleasanton, California 94566

Re: Sustainability Initiatives

Dear Daniel:

After several recent meetings with city staff in your department on a number of topics, I wanted to take a moment to let you know how much I appreciate the assistance that has been afforded Hacienda on a number of important sustainability initiatives. In particular, our partnership on the Pleasanton Green Scene Fair and the work being done to retrofit Hacienda's street lights.

As you know, Hacienda has partnered for years with Pleasanton to conduct our Commuter Choice Transportation Fair. Your willingness to allow the scope of this event to be broadened so that it could provide more interest for more people last year led to a very successful launch of the new Pleasanton Green Scene Fair. We were very encouraged by the interest created due in no small part to the fact that, through our partnership, we took a single subject area event and turned it into a fair that provided content on six inter-related subject areas all focused around the common theme of sustainability. In addressing this broader range of interest, I have no doubt that we were able to provide more information to more people in that participants were exposed to resources that they might not have otherwise encountered through an event with a narrower focus.

Likewise, I wish to express my appreciation for all of the lead work your department has done in furtherance of developing a viable street light replacement project. Hacienda has had a number of successful collaborations with the city on traffic signal upgrades that have led to enormous savings on energy costs. We are similarly hopeful about the prospects for good outcomes on a street light retrofit project using LED lamps. This has only been possible with the dedication to this project provided by city staff who have done all of the background research and have assembled the project parameters. While there is still some work left to do, we look forward to partnering with the city to make this project a reality.

Aside from the ongoing support that we have enjoyed from you personally in these and a number of other efforts I could name, I would be remiss if I did not call out the specific contributions of two staff people in your department: Laura Ryan and Craig Higgins. Ms. Ryan has been invaluable on both of the aforementioned projects and Mr. Higgins has likewise been instrumental in moving the LED street light project forward.

Again, I want to thank you for your assistance in helping us advance our mutual objectives. I look forward to the opportunity for future collaborations.

Sincerely

James Paxson
General Manager, Hacienda

4473 Willow Road, Suite 105, Pleasanton, California 94588-8570 Phone 925.734.6500 Fax 925.734.6501 e-mail info@hacienda.org www www.hacienda.org

Pacific Gas and Electric Company®

August 1, 2011

Laura Ryan
City of Pleasanton Sustainability Manager
3333 Busch Road
Pleasanton, CA 94566

Dear Laura,

As the PG&E Account Manager for the City of Pleasanton, I am writing to commend you and your staff for taking a leadership role in attaining your city-wide goal of reducing energy by 1.2 MW in 2010.

We at PG&E have appreciated the collaborative effort Pleasanton has made in working with our team and our Local Government Partnership to attain our mutual goal of reducing energy city-wide. We worked together to achieve these goals through the implementation of an Outreach program which consisted of PG&E reps and Pleasanton staff canvassing all the small and medium sized businesses plus the members of the Hacienda Business Park. This Outreach enabled us to inform businesses of the low and no cost programs available to them and to assist them with implementation and receipt of any rebates for work completed. Due to the city's active role in this process, there were a very high percentage of businesses that took advantage of the programs and reduced energy at their sites. Pleasanton further focused on implementing efficiency measures at several of their municipal buildings plus incorporated solar power into their energy mix. These initiatives helped Pleasanton to reach their goal of being one of the greenest cities in California!

Due to the success of this partnership, Pleasanton has emerged as a leader in sustainability by promoting awareness and community action to save energy. PG&E uses Pleasanton as an example of success for other local governments as they begin the process of forming their Climate Action Plan and developing their strategies for greenhouse gas reduction. Congratulations once again on your remarkable efforts!

Best Regards,

Andrea Schumer
Account Executive
Pacific Gas & Electric Company
(925) 459-8033

January 31, 2012

City of Pleasanton
City Council Members
200 Old Bernal Avenue
Pleasanton, CA 94566

**RE: Pleasanton Garbage Service's Commitment to Climate Action Planning**

Dear Honorable Members of the Council,

Pleasanton Garbage Service (PGS) has demonstrated its commitment to being an industry leader in environmental responsibility in Pleasanton since they began servicing the local community in 1969. The City of Pleasanton has published a Climate Action Plan to outline how the City may achieve its 15% by 2020 climate reduction goal. PGS' commitment and achievements have assisted the City in getting a step closer to their carbon reduction vision. Through PGS' transition from diesel to compressed natural gas (CNG) alone, they have been able to reduce their mobile fleet emissions by 21% from 2008 to 2011, getting the City one step closer to realizing their GHG reduction goals. PGS has been integral in reducing waste and improving recycling within the City and looks forward to assisting them in their vision of reducing greenhouse gas emissions.

On behalf of PGS, Edgar & Associates attended the October 26, 2011 meeting of the Planning Commissions which discussed the Draft Climate Action Plan (CAP). We profiled PGS's early actions and supported many proposed measures. We plan to attend the February 7, 2012 City Council Meeting to continue to support the measures to reduce and avoid GHG emissions.

The City is planning to reduce emissions under the following categories:

> **Land Use and Transportation:** This is the largest segment of the City's emissions. Reduction programs include policy which seek to reduce vehicle miles traveled (VMT) through energy-efficient land use patterns and transportation systems. This includes developing a supportive community infrastructure for alternative fuel vehicles.

1822 21st Street, Sacramento California 95811 | tel 916.739.1200 fax 916.739.1216 email edgarinc@edgarinc.org

**Energy:** This is the second largest segment of the City's emissions. The CAP includes policies which seek to reduce energy demand, increase the generation of renewable energy and energy efficiency programs.

**Solid Waste Minimization:** Emissions from solid waste represent 5% of the City's emissions inventory and primary measures include reducing total amount of waste to landfills by expanding current recycling programs.

**Water and Wastewater:** Emissions associated with water use and wastewater treatment represent 4.4% of emissions associated with the City. Goals include reducing direct water usage and energy efficiency surrounding water conveyance and treatment.

PGS is particularly excited to assist the City to expand the current recycling programs. This will help the City in achieving its goals to reduce the total tons of materials sent to landfills. As a City contractor that collects and processes recyclables and wasted resources, PGS' GHG reduction achievements and early action programs will assist the City in achieving their reduction goals outlined below.

**Data Table 1: Proposed CAP Reduction Strategies**

| Code | Goal/Supporting Strategy | Percent of Category | Total MT $CO_2e$ |
|---|---|---|---|
| **Land Use and Transportation Strategies** | | | **33,345** |
| LU | Reduce VMT through mixed-use, infill, and higher density development | 45% | |
| NM | Increased non-motorized mobility | 11% | |
| TDM | Improved transportation demand management | 43% | |
| VE | Increased motor vehicle efficiency *(including alternative fuels)* | 1% | |
| **Energy** | | | **54,116** |
| EC | Reduce Community Energy Use | 74% | |
| EG | Reduce Energy Used by Municipal Operations | 2% | |
| ER | Increased Renewable Energy Generation | 24% | |
| **Solid Waste Minimization** | | | **29,605** |
| SW | Establish Pleasanton as a Zero Waste Community by 2025 | 100% | |
| **Water and Waste Water** | | | **371** |
| WA | Reduce Water Usage | 100% | |

The sub-sections below discuss PGS' achievements in reducing GHG emissions in the focus areas.

**Land Use and Transportation**

PGS supports many of the proposed Land Use and Transportation measures that the City of Pleasanton has outlined in their CAP, primarily around increasing motor vehicle efficiency and reducing carbon intensity through alternative fuels. Although estimated to bring only a 1% reduction in the communities' emissions for this category, PGS has experienced substantial reductions in their GHG emissions inventory due to internal goals in this area.

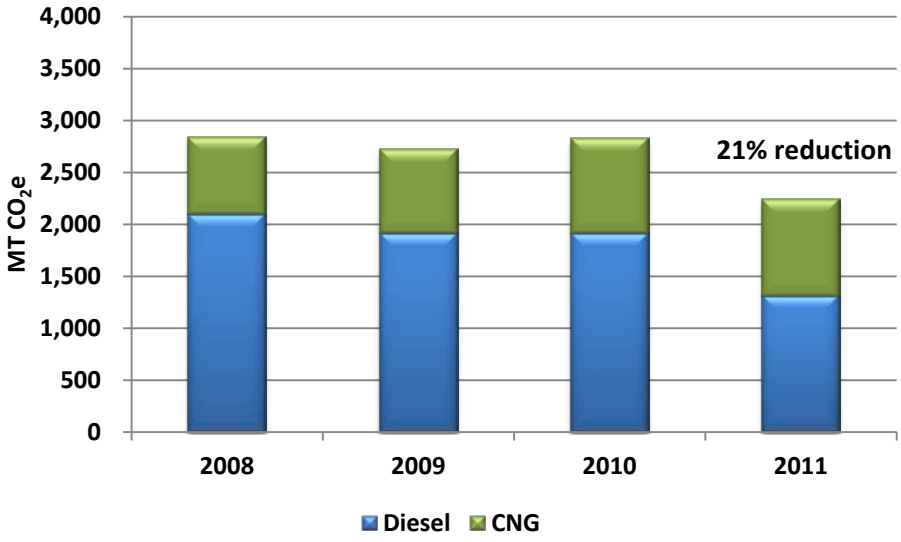
PGS, in conjunction with their sister company Amador Valley Industries (AVI) which services neighboring Dublin, have pioneered the use of Compressed Natural Gas (CNG) for their on-road collection fleets. Not only has this assisted in reducing local air quality pollutants, this has also resulted in a direct reduction in the GHG emissions inventories for both companies. One of the greatest reasons for the success in pioneering this alternative fuel comes from the on-site CNG fueling station for the vehicles located at our Busch Road Facility. Creating this infrastructure allows PGS to plan for a complete transition of all of on-road vehicles to CNG in Pleasanton[1].

**Data Table 2** and **Figure 1** below provide summaries of how emissions from the mobile collection fleet have changed from 2008 to 2011. Notably, an estimated 21% reduction in mobile emissions has been realized since 2008 primarily due to the CNG conversion. On average, mobile emissions account for approximately 90% of the total emissions inventory.

**Data Table 2: Mobile Fleet Emissions (metric tons $CO_2$)**

| | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|
| CNG | 741 | 799 | 913 | 923 |
| Diesel | 2,096 | 1,919 | 1,915 | 1,315 |
| Total | 2,837 | 2,718 | 2,827 | 2,237 |

**Figure 1: Mobile Fleet Emissions**

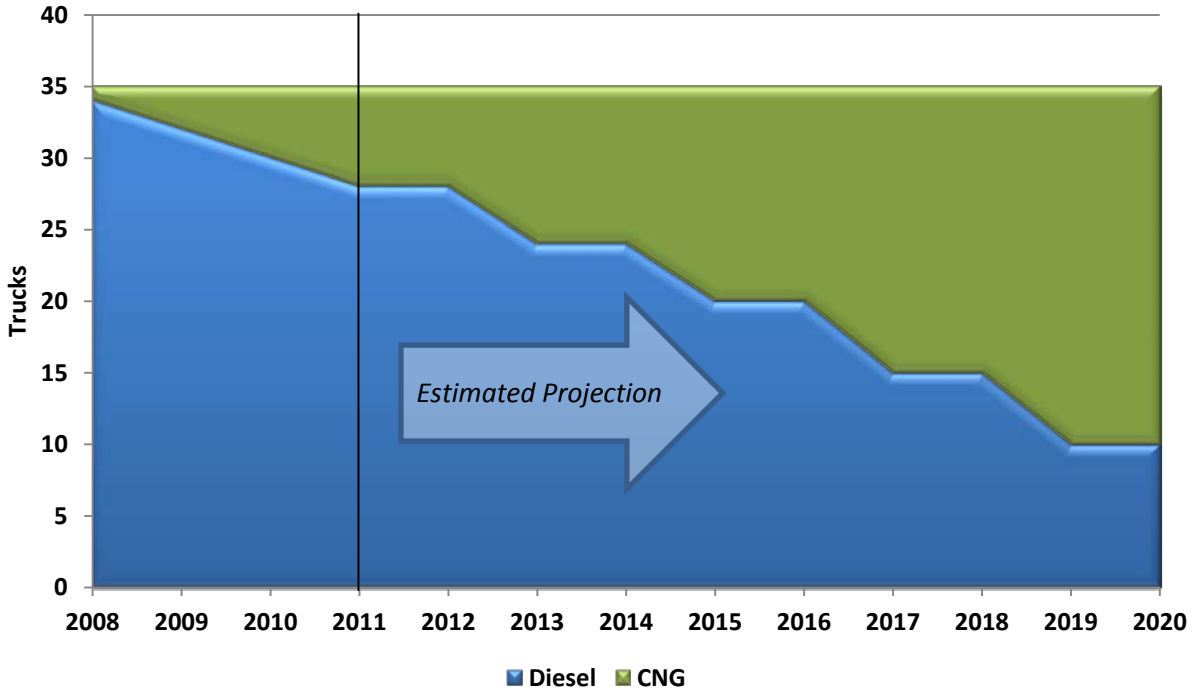



[1] AVI already operates 100% CNG collection vehicles.

Currently PGS has 7 CNG vehicles, which all fuel on-site at the station. PGS is pleased to continue to invest in technologies to assist the communities they service become national leaders in environmental protection.

**Figure 2** provides a summary of how the fleet has transitioned from diesel to CNG from 2008 to 2011, and the approximate projection of how the fleet will continue transitioning to CNG by 2020. As diesel vehicles are replaced with CNG PGS expects to continue to have substantial decreases in mobile GHG emissions.

**Figure 2: Fleet Replacement**

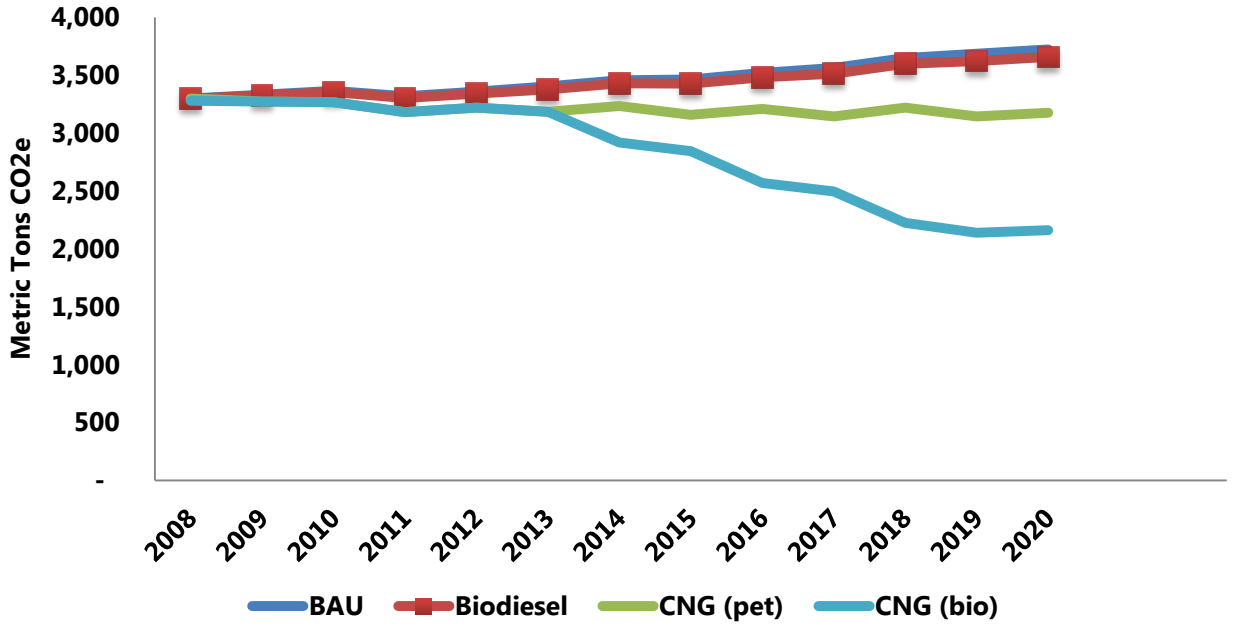



Additionally, PGS is investigating alternative forms of producing CNG, such as anaerobic digestion. Anaerobic Digestion is a natural process in which bacteria breaks down organic matter in an oxygen-free environment. Decomposition occurs in several stages and converts organic matter into a soil amendment and a combustible biogas which can be used directly for heat and power generation. Biogas may even be processed into renewable natural gas to be used as a vehicle fuel. The biogas can be cleaned and compressed into biogenic CNG.

In an effort to assist our understanding of our operations and what they would have been without the recent downturn in the economy, and the GHG reductions we have seen from alternative fuel use, we have projected our 2008 baseline emissions (fleet only) to 2020, using population growth in Figure 3. The blue line in the chart below provides what our emissions would have been if all of our trucks had been kept diesel and our emissions had grown in-line with the population projections for the area (business as usual). All scenarios are subject to the same growth estimate, but with different choices for fuel type.

Using the life cycle impacts of 20% biodiesel, the red line projects the 2% GHG reduction in 2020 that would have been realized if our fleet was converted completely to 20% biodiesel. The green line demonstrates the 20% reduction expected if the fleet were converted to CNG from petroleum sources, taking the life cycle emissions of the fuels into account. The blue line for CNG (bio) represents the conversion of the petroleum based CNG vehicles to biogenic CNG, which under these projections would result in a 42% reduction by 2020 if we convert 15 of our trucks to biogenic fuel by 2020. Biogenic CNG is derived from biogas from organic waste decomposition, which is currently conceptual for us since there are very few locations with the ability to provide this type of fuel. PGS envisions a future where stand alone facilities process organic waste and provide vehicle fuel. These types of facilities can use organic food waste as a feedstock, producing CNG for transportation fuels, avoiding placement of the organic waste in landfills.

**Figure 3: GHG Projections under Alternative Fuels Scenario**




**Energy**

There are several proposed incentives and regulatory measures outlined by the City that will provide beneficial emission reductions for local businesses.

PGS has invested in a lighting retrofit at its facility. By installing LED lights in the mechanic shop, administrative offices and material recovery facility energy usage will be reduced by 16.2% annually, resulting in a savings of 125,168 kWh or 45.38 metric tons of carbon dioxide per year. Not only will this reduce the total emissions inventory it will also provide long term cost savings to PGS, which assists in keeping collection rates competitive to the City.

Additionally, PGS has begun looking into renewable energy technologies such as anaerobic digestion which utilizes organic materials to produce energy before it is made into high quality

compost. Anaerobic Digestion is a natural process in which bacteria breaks down organic matter in an oxygen-free environment. Decomposition occurs in several stages and converts organic matter into a soil amendment and a combustible biogas which can be used directly for heat and power generation. Biogas may even be processed into renewable natural gas to be used as a vehicle fuel. Currently PGS is in the early stages of investigating how this technology may play a role in the future of services to Pleasanton and looks forward to partnerships with the community as this progress.

**Solid Waste Minimization**

PGS diverts valuable materials from landfills, which not only helps reducing GHG emissions from no longer requiring those materials to be made from virgin sources, but also to help reduce other environmental impacts of both landfills and the processing of virgin materials. Effective material management provides an excellent way for communities to reduce GHG emissions and other negative environmental impacts.

PGS specializes in achieving high recycling and diversion rates. Using the EPA WARM Model recycled and composted tonnages can be converted into avoided GHG emissions. **Data Table 3** breaks down the tonnages and the avoided emissions by category for the waste diverted in calendar year 2011.

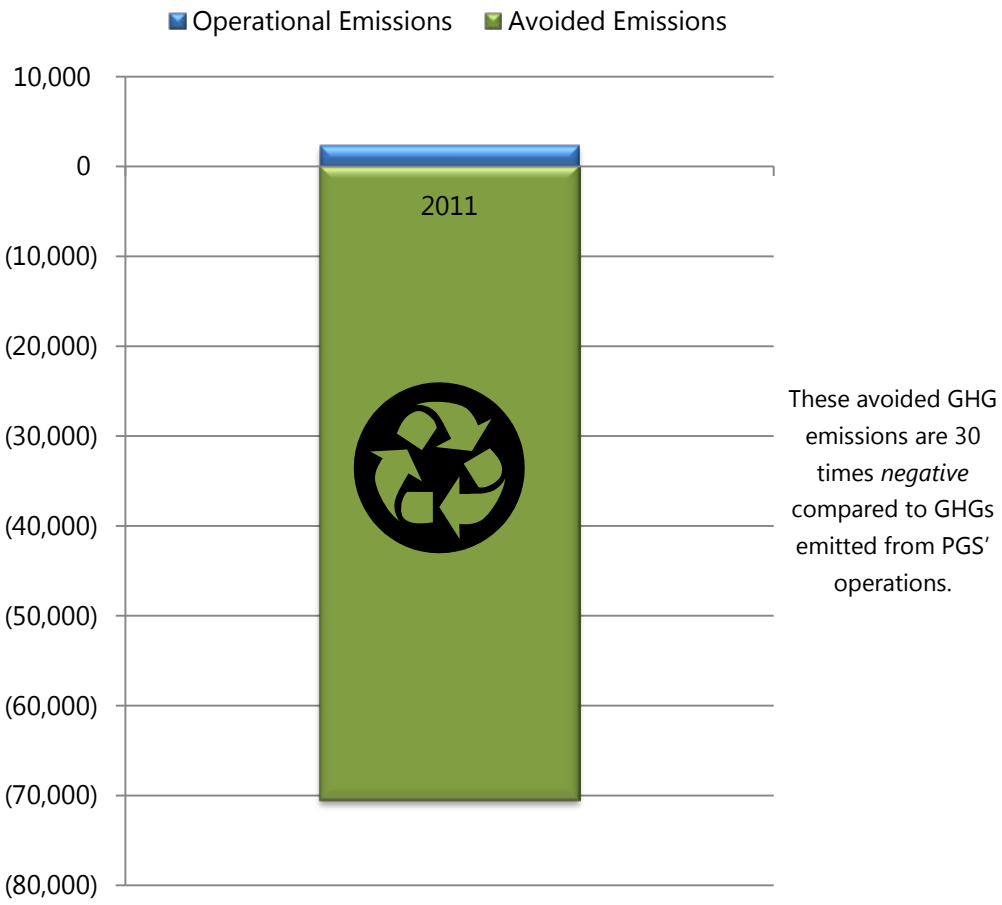
**Data Table 3: Breakdown of Recycled Materials and Avoided Emissions**

| Commodity | Tons of Materials | | Avoided Emissions (MT $CO_2e$) | |
|---|---|---|---|---|
| | Recycled | Composted/ Biomass to Energy | Recycled | Composted/ Biomass to Energy |
| Aluminum Cans | 108 | | -1,473 | |
| Steel Cans | 3,045 | | -5,591 | |
| Copper Wire | 20 | | -100 | |
| Glass | 1,446 | | -459 | |
| HDPE | 163 | | -230 | |
| PET | 116 | | -180 | |
| Corrugated Containers | 4,248 | | -16,993 | |
| Newspaper | 7 | | -21 | |
| Office Paper | 228 | | -1,001 | |
| Food Scraps | | 139 | | -143 |
| Yard Trimmings | | 25,687 | | -18,444 |
| Branches | | 4,764 | | -3,168 |
| Mixed Paper (general) | 3,949 | | -17,242 | |
| Mixed Metals | 909 | | -4,948 | |

| Commodity | Tons of Materials | | Avoided Emissions (MT $CO_2e$) | |
|---|---|---|---|---|
| | Recycled | Composted/ Biomass to Energy | Recycled | Composted/ Biomass to Energy |
| Mixed Plastics | 230 | | -353 | |
| Concrete | 1,602 | | -75 | |
| Tires | 151 | | -65 | |
| Drywall | 600 | | -57 | |
| **Totals** | **47,411** | | **-70,545** | |

Through this model, PGS has avoided approximately 30 times the emissions that have been generated by their operations, as shown in **Figure 4.**

**Figure 4: Avoided Emissions from Recycling Activities**




PGS plans to increase the total amount of waste diverted from landfills and to continue operating in a sustainable, environmentally friendly manner, while investing time and resources to push their operations beyond what is required by City contracts and State regulations. PGS is

considered a leader amongst California waste management companies, and will continue to maintain this reputation.

Zero Waste goals have been set by the Pleasanton CAP. PGS has assisted in Pleasanton in achieving their diversion rate of 71% in 2009 and remains committed to assisting in the success of a zero waste program outlined by the City. Specifically, PGS plays an integral role in expanding current recycling and organics diversion programs for residential and commercial customers with the expectation that this will assist Pleasanton in reaching an interim goal of 80% diversion by 2015. Already, PGS has begun the roll-out of the Mandatory Commercial Regulation requirement (AB 341) which will greatly assist the City in meeting their interim goal. PGS looks forward to expanding the partnership with the City in pursuing Zero Waste.

PGS expects that advancement in waste-to-energy technology, such as anaerobic digestion discussed above, will play a major part in California's future ability to achieve high diversion from landfills and a low carbon future. PGS is excited to be a part of the investigation and feasibility studies of these technologies with the City.

AS California paves the way to reducing statewide GHG emissions, increasing energy efficiency and reducing waste to landfills, we are excited about these developments and how they can inspire us to stay ahead of that curve. These are momentous times for PGS and the City of Pleasanton, and we hope that together we can achieve and demonstrate a partnership in environmental leadership.

Very truly yours,

Evan W.R. Edgar, Principal Civil Engineer