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INTRODUCTION

Introduction

This Climate Action Plan demonstrates the City of Walnut Creek’s commitment to addressing the challenges of climate change. The City acknowledges the significant changes that may occur in Walnut Creek, throughout California and the world as a result of global climate change. In response, the City of Walnut Creek will show leadership in reducing greenhouse gas emissions from municipal operations and facilitate the reduction of greenhouse gas emissions from sources in the community. This document outlines the City's approach to mitigating the impacts of climate change through a number of goals, measures, and actions that provide a road map to achieving the City's greenhouse gas reduction target of 15 percent by 2020.

PURPOSE AND SCOPE OF THE PLAN

Local governments play a primary role in reducing greenhouse gas emissions and mitigating the potential impacts of climate change. Through increasing energy efficiency in buildings and vehicle fleets, bolstering the use of clean, renewable energy sources, establishing land use and transportation plans that reduce vehicle use, and encouraging waste reduction, communities can respond to the challenges of climate change and adapt for the future. In addition, benefits such as lower energy bills, improved air quality, economic development, reduced emissions, and an enhanced quality of life throughout the community can result from the actions outlined in this Climate Action Plan (CAP).

In September 2009, the City was awarded an Energy Efficiency and Conservation Block Grant (EECBG) from the United States Department of Energy for the development of an Energy Efficiency and Conservation Strategy and the implementation of projects or activities that had demonstrated reductions in energy use and greenhouse gas emissions. The City set aside a portion of its EECBG funds to prepare this Climate Action Plan.

The Walnut Creek Climate Action Plan is the beginning of an ongoing planning process that assesses, prepares, mitigates, and adapts to climate change. The purpose of this Plan is to identify how the City will achieve (or exceed) its greenhouse gas emissions reduction target. The Plan provides goals and associated measures, also referred to as climate change mitigation measures, in the sectors of energy use, transportation, land use, and solid waste. In addition, this Plan provides goals and measures for longer-term climate change adaptation and plan implementation, acknowledging that adaptation to climate change is necessary because reductions in greenhouse gases will not immediately reverse the impacts of climate change.

Local governments play a primary role in reducing greenhouse gas emissions.
City and community together achieve greenhouse gas reduction targets!

Climate Action Plan measures are implemented by a variety of government and citizen actions.

The Climate Action Plan includes greenhouse gas reduction measures for four sectors.

Development of a Climate Action Plan supports implementation of the sustainability goals and policies in General Plan 2025.
Specifically, this Plan:

- Identifies sources of greenhouse gas emissions from sources within the City of Walnut Creek’s jurisdictional/political boundary and estimates how these emissions may change over time.
- Outlines ways in which the City can prepare for and adapt to the consequences of climate change.
- Discusses the various outcomes of reduction efforts and how these reduction efforts can be implemented and advertised.
- Provides energy use, transportation, land use, and solid waste strategies to reduce Walnut Creek’s greenhouse gas emissions levels to 15 percent below 2005 levels by 2020.
- Mitigates Walnut Creek’s impacts on climate change by reducing greenhouse gas emissions consistent with the direction of the State of California through the Global Warming Solutions Act (AB 32), Governor’s Order S-03-05, and Public Resources Code Section 21083.3. [The California Environmental Quality Act (CEQA) Guidelines encourage the adoption of policies or programs as a means of addressing comprehensively the cumulative impacts of projects. See CEQA Guidelines, § 15064 subd. (h)(3), § 15130 subd. (c).]
- Provides substantial evidence that the emission reductions estimated in the Climate Change Action Plan are feasible.
- Meets the requirements of the Bay Area Air Quality Management District’s (BAAQMD) criteria for a qualified greenhouse gas reduction strategy as defined in the district’s updated CEQA Air Quality Guidelines.

**GREENING WALNUT CREEK**

Walnut Creek has taken considerable steps toward more efficient and sustainable municipal operations and programs. This Plan comprehensively identifies the existing “green” activities under way in Walnut Creek and is only one portion of many concurrent sustainability efforts initiated by the City.

Walnut Creek has acted as a leader in taking early actions to reduce the impacts of municipal activities on climate change. In 2007, the City joined ICLEI – Local Governments for Sustainability (ICLEI). Membership in ICLEI requires local governments to initiate and implement reductions in greenhouse gas emissions. Specifically, members are asked to determine current greenhouse gas emissions, set reduction targets, develop and implement local action plans to achieve targets, and monitor progress and report results. Each jurisdiction has the responsibility both to provide local leadership for achievement of local targets and to contribute to regional success.

Walnut Creek initiated an internal green team in 2008 to identify emissions reduction targets, policies, and actions to reduce emissions and develop a framework for advancing the greenhouse gas reduction process in Walnut Creek. The City completed a GHG emissions inventory in 2008 as an important first step in Walnut Creek’s efforts to address climate change.
The results of the inventory are provided in Chapter 3. Based on the results of the inventory, the City selected a reduction target of 15 percent below the baseline 2005 greenhouse gas emissions levels by 2020. The City chose this reduction target to affirm the commitment to developing greenhouse gas reduction measures and to maintaining consistency with state reduction targets.

This Climate Action Plan is the culmination of numerous city and regional initiatives. A brief overview of these initiatives is provided below.

- The City has worked to address traffic concerns since the 1950s through new roadways and major road improvements and, in subsequent years, through growth management measures and a transportation demand management (TDM) program.

- Efforts to preserve open space in the 1970s demonstrate Walnut Creek’s early commitment to sustainability. Walnut Creek has one of the largest aggregations of city-owned open space per capita in California—2,704 acres of oak woodland, savannah, and chaparral.

- Walnut Creek has offered a free BART shuttle to its Downtown since 1986. The shuttle quickly became the most heavily used bus route in the county’s system.

- Walnut Creek has been a regional leader in pedestrian-friendly development, with the emergence of Downtown Walnut Creek’s dense mix of land uses and “park once” strategy. The strategy—in which shoppers, visitors, and employees park once and then enjoy walking or using the free shuttle to get around Downtown—reduces the number of vehicle trips and thus reduces greenhouse gas emissions.

- Walnut Creek’s network of multi-use pathways ensures that residents can travel safely by bicycle and on foot. Grade-separated crossings, such as the Iron Horse Trail overcrossing of Ygnacio Valley Road, help to reduce congestion and ensure safe crossings for cyclists and pedestrians.

- The City has offered curbside recycling for nearly 20 years, which allows households to recycle newspapers, glass, and aluminum cans. Recycling is also offered at City facilities.

- The City fleet includes clean air vehicles, electric vehicles, and vehicles that run on natural gas and electricity. These vehicles greatly reduce carbon emissions.

- City traffic lights have been converted to light-emitting diodes (LEDs), which use less power than conventional traffic lights and last longer. The City has completed numerous other lighting retrofits for increased energy efficiency.

Several City departments are recognized by the County of Contra Costa Green Business Program for their green business practices.
• The City has been planning for sustainability for many years, with General Plan 2025 featuring 23 policies and 58 action items focused on environmental integrity.

• Walnut Creek worked with Association of Bay Area Governments (ABAG) Energy Watch to complete a citywide Energy Assessment Report, Energy Action Plan, and City Hall Retro-Commissioning.

• The City has built a “green” library that was completed in 2010. The facility includes numerous green features such as sun screens, Energy Star heating and cooling systems, energy-efficient lighting, infrastructure for future photovoltaic installation, and recycling of construction waste. The City is pursuing a Gold Leadership in Energy and Environmental Design (LEED) certification for the library.

Benefits from these existing initiatives and activities have been numerous and include the increase of green building in the community, reductions in waste, and increased community participation in reductions in greenhouse gas emissions in addition to those benefits that do not directly result in emissions reductions—such as increased public health from walking and biking.

COMMUNITY ENGAGEMENT IN THE PLANNING PROCESS

Development of a Climate Action Plan relies heavily on community involvement. Engaging community members early in identifying ways the City and community can reduce greenhouse gas emissions will lead to more successful implementation of these programs and projects in the future.

As part of this project, community input was gathered throughout development of the Climate Action Plan, including informal event-based outreach exercises at the Walnut Creek Farmers’ Market, a public workshop, and an online survey. The survey was open to the public during the first three weeks of November 2009. The survey was distributed via the City’s website and various contact lists of business owners and residents who had previously expressed interest in sustainability issues.

In addition, development of the Climate Action Plan relied on information gathered during community engagement efforts that focused on sustainability issues, such as “Going Green Together.”

Key results and themes identified during each outreach process are summarized below.

Farmers’ Market Outreach Events

On November 1, 2009 and September 11, 2011, the Climate Action Plan team gathered input on plan content through informal brainstorming exercises conducted during the Walnut Creek Farmers’ Market, from 8 a.m. to 1 p.m. Educational presentation boards were provided, featuring explanations of the role of a climate action plan, the development of a plan’s reduction measures, and highlights of Walnut Creek’s GHG emissions inventory and sustainability efforts to date.
Information was gathered from more than 100 participants by asking “What else can we do to ‘green’ Walnut Creek?” and “What else can Walnut Creek do to reduce greenhouse gas emissions?” Participant responses were written on sticky notes and collected on a “green screen” under the title “Our Climate Action Plan Vision.”

The following key needs were identified during these exercises:

- More bike lanes
- Increased walkability and more sidewalks and pedestrian zones
- More solar panels for commercial, residential, and civic buildings
- Increased composting options
- More education and marketing on “green” topics like recycling and composting
- More frequent shuttles to BART
- Plastic bag/bottle/container bans
- More recycling opportunities
- Reducing energy consumption Downtown, particularly Broadway Plaza

### Town Hall Public Outreach Event

On Wednesday, August 31, 2011 the City of Walnut Creek hosted a community workshop in order to provide information about climate action planning and the City’s sustainability initiatives, to share the proposed Climate Action Plan reduction measures. Through the workshop, the City collected feedback on the community’s priority for implementing Climate Action Plan measures. The workshop was held at the Walnut Creek Library in the Oak View Conference Room.

The intent of the workshop was to increase community understanding of the role and purpose of the Climate Action Plan and the implications of Plan implementation. The workshop was designed to also provide the City with an understanding of the community’s desired priorities for Climate Action Plan implementation.

The workshop included a presentation and open-house style group breakout activity where participants visited large posters hanging around the room containing the policies and actions in the CAP. Participants were asked to provide feedback on their priority level for the policy: short-term, mid-term, long-term or not a priority. The activity was designed to gather feedback on proposed policies and action items in order to help prioritize the actions. The activity also encouraged attendees to comment on items and provide suggestions for modification. Staff was located around the room to assist meeting participants and answer any questions.

Overwhelmingly, the majority of participants rated the actions as short-term priorities. Participants chose some action items, like purchasing alternative fuel/fuel efficient vehicles and low emission vehicle facilities as mid-term priorities. Only a few people identified long-term priorities including reducing idling and employee education. And finally, affordable housing, smart growth, municipal bicycle program and urban agriculture were the only policies which some participants identified as not a priority at all.

Participants provided hand written comments as well, some with suggestions on policies and action items to include. One participant indicated that the City should adopt a local gas tax
and another thought that requiring energy audits at the point of sale would be beneficial.

2009 Online Survey

The online survey queried a total of 103 participants, the majority of whom were Walnut Creek residents, with other responses coming from residents of unincorporated Walnut Creek or from Walnut Creek business owners or workers who reside elsewhere. Questions gauged existing trends in transportation and energy and water conservation as well as willingness to make changes from current practices to activities that help to reduce greenhouse gas emissions. Key results include:

- Nearly 60 percent of respondents still commute by private vehicle.
- Only 6 percent of respondents ride public transit daily, while nearly 30 percent would consider riding BART more often if there were more parking at the Walnut Creek BART Station. Nearly 20 percent would ride BART more often if there were more buses to and from BART.
- 31 percent of respondents would consider using buses more often if they stopped more frequently and in more convenient locations.
- 44 percent of respondents would bicycle for transportation more often if there were more bicycle lanes, and 32 percent would bicycle more often if there were more bicycle trails and more bicycle parking.
- Nearly 30 percent of respondents would bicycle more often if there were better bicycle accommodation at signalized intersections.
- Nearly 89 percent of respondents have already changed older light bulbs to more energy-efficient models. Seventy-one (71) percent have already replaced appliances with more energy-efficient models.
- 80 percent of respondents believe that the City should require buildings to be retrofitted to a higher level of energy efficiency at the time of major additions or remodels.
- Sixty-six (66) percent of respondents have changed older faucets and showerheads to reduce water usage.
- Over 75 percent of respondents support diverting all compostable organics from landfills or incinerators and support encouragement of on-site composting.
- Eighty-seven (87) percent of respondents support the restriction of plastic bag and Styrofoam container use.

2009 Community Conversations on Balancing the Future

During the fall of 2009, the City conducted a series of Community Conversations Workshops. These events brought Walnut Creek residents together to discuss the future of their city, in a time of significant budget shortfalls. Results of the conversations were used to help allocate resources to address issues the community values most. The conversations focused on six goal areas identified and approved by the City Council. Key needs identified during the conversations, relevant to the Climate Action Plan, include:

Transportation

- Facilitate environmentally sound transportation systems.
- Plan, build, and maintain a transportation system that eases congestion and optimizes mobility.
- Provide and encourage safe and convenient travel for pedestrians and cyclists.
- Provide and promote convenient access to diverse and efficient modes of transportation.
INTRODUCTION

Stewardship of the Natural and Built Environment

- Preserve, protect, and maintain natural resources, parks, creeks, trails, and open space.
- Promote responsible development and maintenance.

2007 Going Green Together

More than 350 citizens and business owners participated in the 2007 Going Green Together conference. This outreach event queried participants on “How can the City of Walnut Creek support my efforts to ‘go green’?” Eighty attendees participated in small group discussions in response to this question. Key discussion results include:

- Provide more frequent free shuttles and buses to more locations.
- Create a bike-share program Downtown.
- Provide parking for hybrid vehicles.
- Provide a user map for Walnut Creek’s bicycle network.
- Provide recycling bins Downtown.
- Encourage composting and use of cooking oil for biofuel, including curbside composting.
- Promote recycling.
- Ban plastic bags.
- Require Downtown merchants to close doors when air conditioning is in use.
- Encourage use of solar energy, including pre-plumbing for solar and installation of solar panels on new library.
- Raise awareness of “green” activities through community engagement efforts such as websites, newsletters, block parties, and outreach to schools.

Additional electronic polling activities during Going Green Together revealed that participants were already actively greening their lifestyles by using public transportation, purchasing alternative fuel vehicles, switching to energy-efficient lighting at home, and considering the impact on the environment prior to purchasing goods or services.

The feedback gathered during these community outreach exercises has been integrated into the goals and measures of...
this Climate Action Plan. Continued public involvement in the Plan’s implementation will be necessary to achieve the target greenhouse gas reductions.

NEED FOR TIMELY IMPLEMENTATION

Timely implementation of this Plan, along with individual initiative on the part of each resident, employee, and visitor to the City of Walnut Creek, will help the global community to reduce our impact on the environment. Achieving the goals set forth in this Plan will help to ensure that Walnut Creek residents can continue to enjoy a high quality of life. And the continuing commitment of the City of Walnut Creek to addressing climate change, as demonstrated by this Plan, will help to ensure that the community adapts to the challenges that lie ahead.
BACKGROUND AND EXISTING REGULATORY FRAMEWORK

CLIMATE ACTION PLAN

CHAPTER 2
Background and Existing Regulatory Framework

In the past decade, California’s regulatory landscape has changed dramatically with regard to climate change. The passage of Assembly Bill 32, “The Global Warming Solutions Act,” in 2006, immediately directed California’s municipalities to address climate change in their local planning efforts. This chapter provides an overview of climate change and explains the current policy and regulatory framework for this Climate Action Plan.

AN OVERVIEW OF CLIMATE CHANGE

Awareness of climate change and global warming has increased significantly in recent years. Although used interchangeably, there is a difference between the terms “climate change” and “global warming.” According to the National Academy of Sciences, climate change refers to any significant, measurable change of climate lasting for an extended period. It can be caused by natural factors and human activities alike. Global warming, on the other hand, is an average increase in the temperature of the atmosphere caused by increased greenhouse gas (GHG) emissions from human activities. The use of the term climate change is becoming more prevalent because it encompasses all changes to the climate, not just temperature. Throughout this Climate Action Plan, the term “climate change” is used.

Climate change is now a widely accepted fact among scientists, with the only remaining uncertainty how climate change will affect the earth’s systems over time. Although much of the attention to the topic is global in scale, it is important to realize that climate change affects every community at the local level.

Climate change refers to any significant, measurable change of climate lasting for an extended period.

To fully understand climate change, it is important to recognize the naturally occurring “greenhouse effect” and to define the greenhouse gases that contribute to this phenomenon. Our planet relies on the natural greenhouse effect. This effect results when the atmosphere captures heat that radiates away from the earth toward space. By retaining heat and warming the planet’s surface, this process makes life possible on earth. Several gases in the atmosphere function as barriers and trap heat within the planet’s atmosphere, including water vapor, carbon dioxide, methane, nitrous oxides, and chlorofluorocarbons. These gases function similar to glass on a greenhouse; the glass panes of a greenhouse allow sunlight to pass into the building but trap heat within it, preventing heat from escaping. ¹

¹ (NASA, 2011)
Greenhouse gases are transparent to certain wavelengths of the sun’s radiant energy, allowing them to penetrate deep into the atmosphere or all the way to the earth’s surface. Clouds, ice caps, and particles in the air reflect about 30% of this radiation, but oceans and land masses absorb the rest (70% of the radiation received from the sun) before releasing it back toward space as infrared radiation. Greenhouse gases and clouds effectively prevent some of the infrared radiation from escaping; they trap the heat near the earth’s surface where it warms the lower atmosphere. If this natural barrier of atmospheric gases were not present, the heat would escape into space, and the earth’s average global temperatures could be as much as 59 degrees Fahrenheit cooler.²

While the greenhouse effect is a natural process, humans have accelerated the generation of greenhouse gas emissions beyond natural levels. This overabundance of greenhouse gases has led to a dangerous acceleration of the warming of the earth. There is an international consensus that humans have caused the emission of dangerous levels of greenhouse gases. These greenhouse gases are impacting the planet’s climate system and posing dangerous large-scale threats to the planet and humanity at large. Climate change will impact all facets of life. Many of its effects are irreversible and are already impacting communities around the world. If current trends remain unchanged, likely effects of climate change include the following:³

An increase in global average temperatures by as much as 7 degrees Fahrenheit by 2100.

Average sea levels will rise; estimates range from 8 to about 20 inches under the most optimistic scenario (if immediate and drastic action is taken) a worst case scenario of 16 to 20 feet if emission trends remain unchecked.

Wildfires will increase in frequency and severity.

Scarce water resources will dwindle. If current trends continue, the Sierra Snow Pack, which provides 65% of California’s fresh water, will decrease by at least 25% by 2050.⁴

Public health impacts will result from increased air pollution and heat.

Numerous studies have documented the human impact on emissions of greenhouse gases and warn against the severity of its consequences if no immediate action is taken.

³ (The National Academies, 2008)
⁴ (California Department of Water Resources, 2010)
IMPACTS TO CALIFORNIA AND WALNUT CREEK FROM CLIMATE CHANGE

Walnut Creek is located in Contra Costa County, to the east of the San Francisco Bay. Walnut Creek is an economic center for the county and is bisected by two freeways, Interstate 680 and State Highway 24. The landscape of Walnut Creek features rolling hills of oak woodlands, chaparral, and numerous sub-watersheds draining into north-flowing Walnut Creek. The city is adjacent to significant open space resources.

Potential consequences of climate change for the State of California and the City of Walnut Creek include:

**Increased rate of wildfires:** Wildfire risk is based on a combination of factors including precipitation, winds, temperature, and vegetation, all of which are susceptible to increased warming. Wildfires are likely to grow in number and size throughout the state as a result of increased temperatures induced by climate change. The City has undertaken efforts to remove non-native, high-risk trees from open space areas to reduce the risk of wildfires and meet Contra Costa Fire Protection District requirements. However, even under the “medium” warming scenario predicted by the Intergovernmental Panel on Climate Change (IPCC), wildfire risk will likely increase by 55% in California. Areas of Walnut Creek that are adjacent to open space may be particularly susceptible to increased risk of wildfire.

**Negative impacts on wildlife:** Increased global temperatures and resource depletion exacerbated by climate change are causing disruptions in animal migration and plant pollination. As temperatures rise, species are moving north in California or to higher elevations. This change in migration disrupts the food chain and prevents some plant species from being pollinated. Water and food supplies are expected to be more variable and to shift as the seasons change on different time frames. With vegetation, reduction in soil moisture will result in early dieback of many plants, potentially leading to conflicts with animal breeding seasons and other natural processes. Many of the potential effects on wildlife are still being studied, but due to inability to adapt to new climates, the potential for severe species loss is prescient.

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5 (California Climate Change Center, 2006)
Deteriorating public health: Heat waves are expected to have a major impact on public health as well as decreasing air quality and increasing mosquito breeding and mosquito-borne diseases. Vector control districts throughout the state are already evaluating how they will address the expected changes to California’s climate. The elderly and young and those vulnerable populations that do not have the resources to deal with the costs and adapt to the changes that are expected to impact the community will need assistance. Social equity issues related to the unequal distribution of resources and increased costs to address community-wide health risks will need to be addressed proactively to reduce the potential for financial strain on the City.

A decreasing supply of fresh water: Warmer average global temperatures cause more rainfall than snowfall, making the winter snowfall season shorter and accelerating the rate at which the snowpacks melt in the spring. With rain and snow events becoming less predictable and more variable, the rate of flooding could increase and California’s ability to store and transport fresh water for consumption could decrease.

Increased severity and frequency of flood events: Climate change is forecast to result in more intense rainfall events that will generate more frequent or more extensive runoff and flooding. Localized flood events may increase in periods of heavy rain. Additionally, erosion may increase and water quality may decrease as a result of increased rainfall amounts. Walnut Creek is particularly at risk in areas surrounding the City’s many creeks.

Rising sea levels: Sea level rise is attributed to the increase of average ocean temperatures and the resulting thermal expansion and the melting of snow and ice contributing to the volume of water held in the oceans. While many effects of climate change will impact Walnut Creek, sea level rise is one specific impact that has been extensively studied and quantified, and its effects mapped. The San Francisco Bay Conservation and Development Commission (BCDC) issued a report on sea level rise in April 2009, which states that sea levels in the Bay Area will rise 16 inches by mid-century and 55 inches by the end of the century. By mid-century, approximately 180,000 acres of the Bay Area could be inundated, and 213,000 acres could be flooded by the end of the century, including 93% of both the Oakland and San Francisco airports.

Though the City of Walnut Creek will not be subject to inundation as a result of sea level rise, the anticipated economic impacts related to movement of goods and people in and around the Bay Area that would be disrupted by flooding of ports, airports, highways, and rail lines will be significant for Walnut Creek.6

The speed and amount of sea level rise will be determined by the increase in average temperatures and rate of melting of glacial ice. While there is a degree of uncertainty in projections, many original projections have been in reality more conservative than the actual impacts of climate change once they occurred. If current trends continue, some have predicted as much as a 10-foot sea level rise by 2025 and a 30-foot sea level rise by 2095.7

6 (San Francisco Bay Conservation and Development Commission, 2009)
7 (Hansen)
Unpredictable weather: The years of 1995–2005 had the warmest global temperature ever recorded in instrumental history (since 1850). Higher temperatures will cause more rainfall than snowfall, which will impact water supplies not only for Walnut Creek but for every other user of water in the state. Combined with longer summer seasons, the increased temperature will reduce soil moisture levels, which necessitate increased irrigation, increase the need for air conditioning use, increase the rate and spread of wildfires, and stress the electrical infrastructure that serves the city.

STATE AND FEDERAL REGULATORY FRAMEWORK

The State of California’s elected officials have taken an aggressive stance on combating climate change. The State has developed a framework of legislation that provides a method for local and state governments to address climate change. The framework is described below.

California’s Legislative Direction

California has a long history of proven leadership in addressing climate change that spans the last 20 years. In 1988, before the world had even arrived at a consensus on the causes of climate change, Assembly Bill (AB) 4420 (Sher, Chapter 1506, Statutes of 1988) designated the California Energy Commission (CEC) as the lead agency for all climate change issues in California. Since that time, there has been a flurry of initiatives in California to address climate change. These initiatives have strengthened the ability of entities in California to engage in accurate data collection and have created ambitious targets and regulations that will directly lead to reductions in greenhouse gas (GHG) emissions. Not only have California’s initiatives earned it a role as the leader in the United States for climate planning strategies, but the state has received world attention and accolades for its tireless efforts.

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8 (Rosenzweig et al., 2007)

9 (Moser, Franco, Pittiglio, Chou & Cayan, 2009)
Currently, the State of California is the 15th largest emitter in the world of all GHG emissions, ultimately accounting for 2% of all global emissions. In June of 2005, Governor Schwarzenegger issued a landmark Executive Order establishing progressive GHG emissions targets for the entire state. Executive Order S-3-05 outlines the following goals:

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

To support these reduction targets, the California legislature adopted the California Global Warming Solutions Act of 2006, also known as AB 32. The law requires the California Air Resources Board (CARB) to identify baseline emissions, develop regulatory and market mechanisms that will reduce GHG emissions to 1990 levels by 2020, and continue to calculate and monitor future emissions. In December 2008, CARB approved the AB 32 Scoping Plan outlining regulatory and market mechanisms to achieve the goal of AB 32. The plan cites local government action as an integral partner to achieving the State’s goals.

In 2008, California continued its efforts to reduce emissions and support AB 32 through adoption of Senate Bill (SB) 375. SB 375 is a comprehensive land use planning law that directly links transportation and land use planning to reduce GHG emissions. There are three goals to SB 375:

- Use the regional transportation planning process to help meet AB 32 emission reduction targets;
- Provide California Environmental Quality Act (CEQA) streamlining to encourage infill development adjacent to existing transportation infrastructure; and
- Coordinate regional housing needs with the regional transportation planning process to encourage sustainable development.

In addition to AB 32 and SB 375, the State has taken numerous other actions taken to reduce GHG emissions in the state. The California Climate Action Registry (CCAR) was created by the State in 2000 through SB 1771 (Sher, Chapter 1018, Statutes of 2000) as a nonprofit entity to assist entities in California working to create GHG emissions baseline inventories. In 2001, SB 527 directed the CEC to provide specific guidance to the CCAR on issues including the development of GHG emissions protocols and the qualifications of third parties providing technical assistance and certification of inventories. Subsequently, in 2002, AB 1493 (Pavley, Chapter 200, Statutes of 2002) directed CARB to create regulations that would lead to reductions in GHG emissions from passenger vehicles, light-duty trucks, and noncommercial vehicles sold in California. In 2006, SB 1368 (Perata, Chapter 598, Statutes of 2006) established GHG emission performance standards for longer-term financial investments in base-load electricity generation to catalyze the transition to cleaner energy use by utility companies. Additional bills targeting climate change include SB 97 (Dutton, Chapter 185, Statutes of 2008), which required the Governor’s Office of Planning and Research (OPR) to develop guidelines for the CEQA pertaining to the mitigation of GHG emissions or the effects of GHG emissions. The State Natural Resources Agency adopted these guidelines in December of 2009, and the guidelines went into effect in March of 2010.

10 (California Air Resources Board; California Climate Action Registry; ICLEI - Local Governments for Sustainability, 2008)

11 (Moser, Franco, Pittiglio, Chou & Cayan, 2009)

12 (California Air Resources Board; California Climate Action Registry; ICLEI - Local Governments for Sustainability, 2008)

13 (Moser, Franco, Pittiglio, Chou & Cayan, 2009)
Bay Area Air Quality Management District

The Bay Area Air Quality Management District (BAAQMD) regulates stationary air pollution sources throughout the nine counties that surround San Francisco Bay, including the County of Contra Costa. In response to the State CEQA guidelines that went into effect in March 2010, BAAQMD updated its CEQA Air Quality Guidelines for the San Francisco Bay Area Basin. The purpose of the BAAQMD CEQA Air Quality Guidelines is to assist lead agencies in evaluating the air quality impacts of proposed projects and plans within the San Francisco Bay Area Basin.

BAAQMD’s updated CEQA Air Quality Guidelines establish thresholds of significance for impacts related to GHG emissions for consistency with the requirements of the State CEQA. These thresholds can be used to assess plan-level and project-level impacts and allow a lead agency to determine that a project’s impact on GHG emissions is less than significant if it is in compliance with a qualified GHG reduction strategy.

This Climate Action Plan (CAP) follows both State CEQA Guidelines and BAAQMD’s guidelines by incorporating the standard elements of a qualified GHG reduction strategy. The standard elements of a GHG reduction strategy include the following steps:

- Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic range.
- Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable.
- Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area.
- Specify measures or a group of measures, including performance standards that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level.
- Monitor the plan’s progress.
- Adopt the GHG reduction strategy in a public process following environmental review.

Appendix 4 describes in detail how the City’s Climate Action Plan provides a foundation to prepare the City for compliance with BAAQMD’s guidelines for standard elements of a qualified GHG reduction strategy. The City will also use this Climate Action Plan to streamline environmental review of development projects for impacts on GHG emissions. Additional information is also provided later in this chapter.

Federal Direction

The federal government has yet to enact legislation for GHG emission reductions. However, even without mandates, new activity has been ushered in with the election of President Obama that is conducive to the reduction of GHG emissions and climate planning. Through the Energy Efficiency and Conservation Block Grant (EECBG) program, the U.S. Department of Energy (DOE) is providing a total of $3.2 billion to cities and counties to reduce fossil fuel emissions; reduce total energy use; improve energy efficiency in the transportation, building, and other appropriate sectors; and create and retain jobs.¹⁴ Using this money, jurisdictions across the United States are allocating funds to initiate climate change planning and achieve reductions in GHG emissions. The EECBG program is an initial indicator of increased federal involvement in the realm of climate planning.

¹⁴ (U.S. Department of Energy, 2010)
RELATIONSHIP TO THE GENERAL PLAN

The City of Walnut Creek is taking a proactive approach to climate action and GHG emissions reduction through the development of a Climate Action Plan that will be used to inform the City’s General Plan Update process. This CAP is also being structured to serve as a programmatic tiering document for the purpose of the California Environmental Quality Act. Through the completion of a General Plan Environmental Impact Report (GPEIR) addendum, the link between this CAP and the General Plan is further established. This CAP is intended to be an adaptively managed document with the flexibility to change and be modified as the science and regulatory framework around climate change is further refined in coming years. It is recommended that the CAP be reviewed every five years to ensure the most appropriate information and emission reduction measures are included in the CAP.

This CAP encompasses the current and future efforts to reduce GHG emissions and reduce the effects of global climate change within the city. By incorporating the goals and measures of this CAP into the General Plan EIR through a GPEIR addendum, Walnut Creek is ensuring that future development and planning activities in the city conform to the objectives of the CAP and state climate change legislation.

This CAP will be an integral part of planning and development in Walnut Creek in the coming years. As illustrated in Figure 2-2, the CAP serves as an analytical link for the City between local development, state requirements, and regional efforts. It will also be a way for the City to determine consistency with state legislation, such as AB 32 and SB 97, which mandate that local governments address GHG emissions in local planning and environmental documents.

IMPLEMENTATION

The City’s Commitment to Implementation and Ongoing Updates to the Climate Action Plan

The City of Walnut Creek’s Climate Action Plan will serve as a guide to the actions City officials, project developers, and the community at large can take to reduce Walnut Creek’s GHG emissions and work toward a more sustainable community. This strategy is a living document that will be updated on a regular basis to incorporate new programs and emissions reduction strategies as they are developed and as technological advancements are made.

As the City moves forward with updates to the General Plan, Zoning Ordinance, implementation of the regional Sustainable Communities Strategy, staff will ensure these efforts support and are consistent with the CAP.

CAP implementation will also require City leadership to execute strategies and report on the progress of implementation. The City will designate a staff member to serve as a coordinator for CAP implementation. The coordinator will be responsible for coordinating GHG reduction efforts between departments and will designate staff to monitor and report on the progress of the CAP. Each department assigned with implementation responsibilities will support this ongoing process.

Bay Area Air Quality Management District guidelines recommend that the City clearly specify the measures within
the Climate Action Plan that new construction projects must implement to demonstrate compliance with the City’s Climate Action Plan and determine that the project’s operational GHG emissions are less than significant by complying with a qualified GHG emissions reduction strategy. To ensure that each new construction project complies with the City’s Climate Action Plan, the City will develop a checklist to be submitted by the project applicant in addition to the already required forms.

To implement the CAP, the City will use funding from a variety of sources. Money from the City’s General Fund will be used to pay for staff time for implementation of actions the City commits to in this CAP. Additional funding is provided through a variety of other sources, including regional, state, and national grants. This CAP was prepared using funds from the City’s Energy Efficiency and Conservation Block Grant. As identified for the measures in Chapter 4 and Chapter 5 of this CAP, the City will seek out additional funding sources during implementation of this CAP. BAAQMD, the California Strategic Growth Council, the CEC, CalRecycle, and other regional and state agencies provide a variety of funding opportunities. In addition, this CAP identifies funding and resources available to residents and the business community in Walnut Creek. To implement many of the community-wide measures in Chapter 5, the City will leverage resources and partnerships to support private investments and achieve community-wide targets, including promotion of rebates available to homeowners through Energy Upgrade California, incentives available through other PG&E programs, and other opportunities.

Lastly, successful implementation requires regular monitoring and reporting. The City is committed to monitor the CAP’s implementation progress on an annual basis and report to the City Council on the CAP’s progress each year. If the City determines during annual review that the City is falling short of reduction targets, the City will create additional voluntary and mandatory measures to attain the City’s overall reduction goals. For instance, if the City fails to achieve the preliminary retrofit targets for 2015, the CAP commits the City to revisit the voluntary energy efficiency programs identified in Measure EU 1.1 and Measure EU 1.2 of Chapter 5. The City is also committed to updating the inventory, forecast, and reduction measures a minimum of once every five years.

Scope of Updates

Updates to the inventory and CAP will respond to findings of the annual CAP review and integrate new tools and methodologies as they become available. The City is committed to respond to BAAQMD guidance and evolving best practices that emerge after the time of preparation of this CAP throughout the life the CAP. During updates to the CAP, staff will revisit methodologies for the inventory, forecasts, adjusted forecasts, and reduction measures. BAAQMD guidance is important in these ongoing updates to the CAP. The City will use the monitoring tool to track, monitor, and update the Climate Action Plan. As the City reports on progress in implementing the CAP, staff will evaluate the effectiveness of each measure to ensure that the anticipated GHG reductions are occurring. In the event that GHG reductions do not occur as expected, the City will be able to modify and add further policies to the CAP to ensure the City meets the 2020 reduction target.

The CAP has made a best-faith effort to account for all emissions sources, reduction measures, and state actions in a conservative and accurate manner that responded to guidance available during the preparation of the CAP. Based on new guidance available as of 2011, potential aspects of the CAP to revisit during subsequent updates include:

- **The adjusted business-as-usual forecast.** This CAP excludes the impact of the Low Carbon Fuel Standard (LCFS), which would reduce the carbon intensity of California’s transportation fuels by at least 10 percent by 2020 and 20 percent by 2035 as called for by Governor Schwarzenegger in Executive Order S 01 07. The LCFS will also incorporate compliance mechanisms that provide flexibility to fuel providers in how they meet the requirements to reduce greenhouse gas emissions. In late 2011, a Federal District Court Judge ruled that California’s Low Carbon Fuel Standard violates the dormant commerce clause by discriminating against out of state ethanol products and that CARB failed to identify alternative methods for achieving greenhouse gas reductions. Though the ruling has been appealed by CARB, the current injunction will limit CARB from implementing the regulation which is why at this time, the City’s CAP does not rely on
LCFS related GHG reductions to achieve the City’s GHG reduction targets. Inclusion of the LCFS in the adjusted business-as-usual forecast would result in additional emissions reductions credits towards the City’s reduction target. This CAP also assumes full implementation of the Renewable Portfolio Standard by 2020. This is an assumption that may be adjusted during the first CAP update, based on PG&E progress.

- **The inventory.** This CAP, including the inventory, will be revisited to ensure consistency with BAAQMD guidance for all inventory and reduction measure sectors. For instance, methane emissions from wastewater treatment were excluded from this inventory. The City of Walnut Creek does not operate wastewater treatment facilities. Since updates to this CAP were completed in August of 2011, BAAQMD released guidance in November 2011, advising jurisdictions to account for methane emissions from wastewater treatment. For jurisdictions that do not treat wastewater, BAAQMD recommends accounting for the proportion of methane emissions at the wastewater treatment facility that can be attributed to wastewater originating from the jurisdiction. This new guidance will be revisited in future updates to the CAP.

- **CAP Reduction measures.** During annual monitoring and reporting, the City will track implementation of CAP reduction measures and identify opportunities for updates. These updates will be critical opportunities to integrate evolving best practices, capitalize on new program opportunities, and address the effectiveness of measures as they change over time. As the City works to achieve 2020 and 2035 targets, the City recognizes and anticipates opportunities to respond to the changing regulatory framework and strengthen the actions in this CAP.

### Implementation Measures

The City is committed to the following implementation measures as the path to achieve the target 15% reduction below 2005 levels by 2020.

#### IMPLEMENTATION MEASURE 1: MONITORING

Annually monitor and report the City’s progress toward achieving the reduction target.

**Action Items:**

- **Action 1.1** Provide support to City staff to facilitate implementation of measures and actions.
- **Action 1.2** Prepare an annual progress report for review and consideration by the City Council, Planning Commission, or other applicable advisory bodies.
- **Action 1.3** Develop and utilize a monitoring and reporting tool to assist with annual reports.
- **Action 1.4** Identify key staff responsible for annual reporting and monitoring.
- **Action 1.5** Integrate the results of the annual monitoring and reporting into the General Plan annual report or other annual monitoring exercises.

#### IMPLEMENTATION MEASURE 2: UPDATE GHG INVENTORY AND CAP

Update the baseline greenhouse gas emissions inventory and Climate Action Plan at a minimum of every five years.

**Action Items:**

- **Action 2.1** Inventory 2010 GHG emissions no later than 2015 and update the forecasts to integrate new methodologies, best practices, and BAAQMD guidance.
- **Action 2.2** Update the CAP no later than 2015 to incorporate new technology, programs, and policies to reduce GHG emissions.
- **Action 2.3** Consider updating and amending the CAP, as necessary, should the City find that specific reduction measures are not meeting intended GHG reductions.

#### IMPLEMENTATION MEASURE 3: COLLABORATIVE PARTNERSHIPS

Continue to develop partnerships that support implementation of the Climate Action Plan.
Action Items:

**Action 3.1** Continue formal memberships and participation in local and regional organizations that provide tools and support for energy efficiency, energy conservation, GHG emissions reductions, adaptation, education, and implementation of this CAP.

**IMPLEMENTATION MEASURE 4: FUNDING SOURCES**

Secure necessary funding to implement the Climate Action Plan.

**Action Items:**

**Action 4.1** Identify potential funding sources for reduction measures as part of annual reporting.

**Action 4.2** Ensure implementation through the inclusion of emissions reduction measures in department budgets, the capital improvement program, and other plans as appropriate.

**Action 4.3** Pursue local, regional, state, and federal grants to assist with potential costs to the City and the community and support successful implementation of the CAP.
EXISTING GREENHOUSE GAS EMISSIONS INVENTORY

CLIMATE ACTION PLAN
Existing Greenhouse Gas Emissions Inventory

2005 GREENHOUSE GAS EMISSIONS INVENTORY

The City of Walnut Creek completed a greenhouse gas emissions inventory for all municipal and community-wide activities for the baseline year of 2005. The year 2005 was selected as the baseline year for the inventory because of the availability of reliable data and consistency with other cities in the Bay Area. The State of California uses 1990 as a reference year to remain consistent with the Kyoto Protocol and because it has well-kept records of transportation trends and energy consumption in that year. However, cities and counties throughout California typically elect to use 2005 or 2006 as a baseline year because of the more reliable recordkeeping from those years and because of the large amount of growth that has occurred since 1990.

The inventory is an important first step for the City in its climate change efforts to create a baseline against which to measure future progress and to understand the most significant sources of emissions in order to find best opportunities for reductions.

For the baseline year of 2005, municipal operations emitted approximately 4,396 metric tons of carbon dioxide equivalent (CO2e).\(^1\) As shown in Figure 3-1 and Table 3-1, City buildings and facilities were the largest emitter, producing 53% of all municipal emissions. As shown in Figure 3-2 and Table 3-2, community-wide activities (including municipal operations) emitted approximately 643,596 metric tons of CO2e. The transportation sector generated the most emissions, creating approximately 377,305 metric tons of CO2e, or 59% of total emissions. Transportation sector emissions are the result of diesel and gasoline combustion in vehicles traveling on local roads (Ygnacio Valley Road and Treat Boulevard) and state highways (Interstate 680 and State Highway 24) that pass through the jurisdictional boundaries of Walnut Creek.

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\(^1\) This number includes all Scope 1 emissions from the on-site combustion of fuels in facilities and vehicles, Scope 2 emissions from the purchase of electricity, and Scope 3 emissions from waste generated by local government operations and emissions associated with employee commute patterns.
The building sector was the largest contributor to emissions from City operations, creating approximately 53% of total emissions.

Table 3-1. 2005 Greenhouse Gas Emissions from City Operations

<table>
<thead>
<tr>
<th>Sector</th>
<th>Greenhouse Gas Emissions (metric tons CO2e)</th>
<th>Greenhouse Gas Emissions (% CO2e)</th>
<th>Cost ($)</th>
<th>Percentage of Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings</td>
<td>2,311</td>
<td>53%</td>
<td>$1,023,965</td>
<td>53.9%</td>
</tr>
<tr>
<td>Vehicle Fleet</td>
<td>1,178</td>
<td>27%</td>
<td>$267,533</td>
<td>14.1%</td>
</tr>
<tr>
<td>Lighting</td>
<td>669</td>
<td>15%</td>
<td>$608,408</td>
<td>32.0%</td>
</tr>
<tr>
<td>Waste</td>
<td>238</td>
<td>5%</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4,396</td>
<td>100.0%</td>
<td>$1,899,906</td>
<td>100.0%</td>
</tr>
</tbody>
</table>
Figure 3-2. 2005 Greenhouse Gas Emissions (CO2e) from Community-Wide Sources

Table 3-2. 2005 Community-Wide Greenhouse Gas Emissions by Sector

<table>
<thead>
<tr>
<th>Sector</th>
<th>Greenhouse Gas Emissions (metric tons CO2e)</th>
<th>Greenhouse Gas Emissions (% CO2e)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>117,868</td>
<td>18%</td>
</tr>
<tr>
<td>Commercial/Industrial</td>
<td>117,312</td>
<td>18%</td>
</tr>
<tr>
<td>Transportation – Highway</td>
<td>174,369</td>
<td>27%</td>
</tr>
<tr>
<td>Transportation – Local Road</td>
<td>202,936</td>
<td>32%</td>
</tr>
<tr>
<td>Waste</td>
<td>9,892</td>
<td>2%</td>
</tr>
<tr>
<td>Water</td>
<td>6,736</td>
<td>1%</td>
</tr>
<tr>
<td>Off-Road</td>
<td>12,293</td>
<td>2%</td>
</tr>
<tr>
<td>BART</td>
<td>2,191</td>
<td>&lt;1%</td>
</tr>
<tr>
<td>TOTAL</td>
<td>643,596</td>
<td>100.00%</td>
</tr>
</tbody>
</table>
2020 AND 2030 FORECAST FOR GREENHOUSE GAS EMISSIONS

To illustrate the potential emissions growth based on projected trends in energy use, driving habits, job growth, and population growth from the baseline year going forward, the inventory provides an emissions forecast for the years 2020 and 2030. Forecasts also allow for the assessment of the effectiveness of various reduction strategies. Forecast years provide a snapshot of where annual emissions levels could be under various scenarios. Forecasting is completed by adjusting baseline levels of emissions consistent with household, population, commercial square footage, and transportation growth.

The basis for all growth scenarios is a “business-as-usual” projection. A business-as-usual projection predicts how greenhouse gas emissions will increase if behaviors and efficiencies do not change from baseline levels, yet population, households, and vehicle miles traveled continue to increase. Under a business-as-usual scenario, the City of Walnut Creek’s emissions will grow by approximately 21% by the year 2020, from 643,596 to 779,117 metric tons CO2e. Table 3-3 and Figure 3-3 show the results of the forecast. Forecasts are based on 2009 projections from the Association of Bay Area Governments (ABAG).

WHY 2020 AND 2030 FORECAST YEARS?

The year 2020 was chosen to create consistency with AB 32, the Global Warming Solutions Act of 2006, which recommends a local goal of 15 percent below current levels by 2020. The 2030 year was chosen to create consistency with the General Plan Update and ABAG projections for population, jobs, and housing growth.
### Table 3-3. Business-as-Usual (BAU) Emission Forecast by Sector – 2020 and 2030

<table>
<thead>
<tr>
<th>GHG BAU Forecast</th>
<th>Metric Tons CO₂e</th>
<th>2005</th>
<th>2020</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td></td>
<td>117,868</td>
<td>130,626</td>
<td>142,037</td>
</tr>
<tr>
<td>Commercial/Industrial</td>
<td></td>
<td>117,312</td>
<td>131,716</td>
<td>141,474</td>
</tr>
<tr>
<td>Transportation – Highway</td>
<td></td>
<td>174,369</td>
<td>234,722</td>
<td>249,978</td>
</tr>
<tr>
<td>Transportation – Local Road</td>
<td></td>
<td>202,936</td>
<td>229,468</td>
<td>244,418</td>
</tr>
<tr>
<td>Waste</td>
<td></td>
<td>9,892</td>
<td>10,759</td>
<td>11,610</td>
</tr>
<tr>
<td>Water</td>
<td></td>
<td>6,736</td>
<td>7,780</td>
<td>8,396</td>
</tr>
<tr>
<td>Off-Road</td>
<td></td>
<td>12,293</td>
<td>31,626</td>
<td>29,016</td>
</tr>
<tr>
<td>BART</td>
<td></td>
<td>2,191</td>
<td>2,420</td>
<td>2,606</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>643,596</td>
<td>779,117</td>
<td>829,535</td>
</tr>
</tbody>
</table>

**Figure 3-3.** Business-as-Usual (BAU) Greenhouse Gas Emissions Forecast – 2020 and 2030
GREENHOUSE GAS EMISSIONS REDUCTION TARGET

The City of Walnut Creek has set an emissions reduction target of 15% below 2005 levels by 2020, which is consistent with the State’s direction to local governments in the AB 32 Scoping Plan. Figure 3-4 provides a comparison of the business-as-usual forecasts for 2020 and 2030 to the 2005 baseline year and the 15% reduction target. Figure 3-4 is also a depiction of the challenge that Walnut Creek will face in attempting to meet its reduction target. Emissions will continue to increase along the business-as-usual scenario while reduction efforts are initiated. Achieving the target is therefore more than a 15% decrease—rather, it is a 29.7% reduction from 2020 emissions levels, or business as usual, in Walnut Creek. In 2030, the gap between future growth and target reduction levels increases to 54.8%. In Figure 3-4, this gap is depicted by the difference between the red line and the purple line, both of which show projected increases or desired decreases relative to the green-colored baseline.

Figure 3-4. Comparison of Business-as-Usual Forecast to Baseline and Reduction Target
Municipal Reduction Goals and Measures

This chapter summarizes the Climate Action Plan’s goals and measures to reduce municipal greenhouse gas emissions from sources within the city boundaries.

SUMMARY OF GOALS AND MEASURES
The following goals and measures are organized by buildings, street lights, vehicle fleet, waste reduction, and education and outreach consistent with the baseline greenhouse gas (GHG) emissions inventory. Each goal is tied to a specific reduction of GHG emissions as well as energy (electricity and therms), fuel, and waste reductions. GHG reductions are provided in supporting tables for each measure. Detailed GHG reduction calculations are presented in Appendix 2. The Climate Action Plan goals and measures are presented below in summary form. Detailed descriptions follow starting on page 4-6.

Each goal is tied to a specific reduction of greenhouse gas emissions.
Along with a narrative description of each measure, the following implementation information is presented with each goal when available:

### SUMMARY OF POTENTIAL GREENHOUSE GAS REDUCTIONS

The goals and measures presented here have the potential to reduce the City of Walnut Creek’s municipal GHG emissions by 1,963 metric tons (MT) of CO2e by 2020 and 3,516 MT by 2030. These reductions are equivalent to a change of approximately -39% and -71% from the municipal baseline, respectively; from 2005 baseline levels (Also refer to Figures 4-1, 4-2, and 4-3).

It is important to note that achievement of the City’s reduction targets is dependent on successful implementation of both municipal and community-wide measures. Municipal emissions account for a small subset of overall community-wide emissions, and therefore municipal measures alone are not sufficient to achieve the comprehensive bulk of the City’s targets. More information on community-wide targets and measures is provided in Chapter 5 (Community Reduction Goals and Measures).

Tables 4-2 and 4-3 and Figures 4-4 and 4-5 present the potential GHG emissions reductions (MT CO2e) to municipal emissions for 2020 and 2030 by goal and then by sector. They also identify Walnut Creek’s progress in achieving these goals since the baseline year of 2005. The goals and measures are presented in detail later in this chapter.

### Chapter 4 Terms & Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>2010 “Existing and In-Progress” Reductions</strong></td>
<td>The annual reductions in energy/vehicle miles traveled (VMT)/waste/water and GHGs resulting from implementation of the goal prior to or concurrent with this Plan (2005–2010).</td>
</tr>
<tr>
<td><strong>2020 and 2030 Reductions</strong></td>
<td>The annual reductions in energy/VMT/waste/water and GHGs in calendar years 2020 and 2030 as a result of staggered goal implementation and ramp-up.</td>
</tr>
<tr>
<td><strong>Responsible City Department(s)</strong></td>
<td>City department or outside agency responsible for implementation.</td>
</tr>
<tr>
<td><strong>Supporting Department(s) or Agencies</strong></td>
<td>City department or outside agency that can support the responsible City department with the implementation of the specific measure.</td>
</tr>
<tr>
<td><strong>Cost to City</strong></td>
<td>Overall cost to the City for implementation of the goal. Cost estimates represent additional City costs for measure implementation through 2030. Due to the nature of variation in costs between municipal programs and community-wide programs, for purposes of simplicity, City costs for municipal programs are presented on a scale.</td>
</tr>
<tr>
<td><strong>Cost Savings</strong></td>
<td>Annual cost savings from decreased energy or fuel consumption.</td>
</tr>
<tr>
<td><strong>Timeframe</strong></td>
<td>The period of time estimated for staff to initiate measure implementation and achieve measure reductions.</td>
</tr>
</tbody>
</table>

- **Low** = under $25,000 (uses existing staff)
- **Low-Mid** = $25,000 to $100,000 (existing staff can implement but will require reprioritization of workload)
- **Medium** = $100,000 to $200,000 (requires new staff or contracts to implement)
- **Medium-High** = $200,000 to $500,000 (requires new staff or contract(s) to implement)
- **High** = over $500,000 (requires new staff or contract(s) to implement)
### Table 4-1. Municipal GHG Reductions by Goal

<table>
<thead>
<tr>
<th>Goal</th>
<th>To Date</th>
<th>2020</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>B 1</td>
<td>Integrate energy efficiency and other green building practices into new City facilities.</td>
<td>-26</td>
<td>-93</td>
</tr>
<tr>
<td>B 2</td>
<td>Conduct efficiency audits and implement energy/water efficiency retrofits to existing City facilities.</td>
<td>-129</td>
<td>-152</td>
</tr>
<tr>
<td>B 3</td>
<td>Establish energy and water management and operations policies and practices for City facilities.</td>
<td>-37</td>
<td>-961</td>
</tr>
<tr>
<td>B 4</td>
<td>Consider clean energy alternatives for City facilities and operations.</td>
<td>-0</td>
<td>-246</td>
</tr>
<tr>
<td>S 1</td>
<td>Implement energy management and operations practices for City-owned street lights.</td>
<td>0</td>
<td>-134</td>
</tr>
<tr>
<td>MWR 1</td>
<td>Implement waste reduction practices in all City facilities.</td>
<td>0</td>
<td>-6</td>
</tr>
<tr>
<td>MWR 2</td>
<td>Encourage recycling of used materials whenever feasible at City facilities.</td>
<td>0</td>
<td>-1</td>
</tr>
<tr>
<td>MT 1</td>
<td>Increase the number of fuel-efficient vehicles in the City's fleet.</td>
<td>-112</td>
<td>-158</td>
</tr>
<tr>
<td>MT 2</td>
<td>Establish energy-efficient fleet management and operation practices.</td>
<td>0</td>
<td>-172</td>
</tr>
<tr>
<td>MT 3</td>
<td>Provide alternative transportation options for all City employees.</td>
<td>0</td>
<td>-3</td>
</tr>
<tr>
<td>MEO 1</td>
<td>Inform City employees of sustainability initiatives/upgrades to City facilities and engage employees in behavior-based programming to complement these efforts.</td>
<td>-9</td>
<td>-36</td>
</tr>
<tr>
<td><strong>Total Reductions</strong></td>
<td></td>
<td>-313</td>
<td>-1,963</td>
</tr>
<tr>
<td><strong>Business-as-Usual Emissions (Municipal Emissions Only)</strong></td>
<td>4,506</td>
<td>4,640</td>
<td>4,781</td>
</tr>
<tr>
<td><strong>Net Emissions</strong></td>
<td>4,192</td>
<td>2,677</td>
<td>1,265</td>
</tr>
<tr>
<td><strong>Percentage Change to Municipal Emissions from 2005 Baseline Year Levels</strong></td>
<td>-5%</td>
<td>-39%</td>
<td>-71%</td>
</tr>
</tbody>
</table>
Figure 4-1. 2020 Municipal Reductions by Goal

- Establish energy efficient fleet management and operation practices. 9%
- Increase the number of fuel efficient vehicles for the City's fleet. 8%
- Implement waste reduction practices in all City facilities. 6%
- Implement energy management and operation practices for City owned streetlights. 7%
- Consider clean energy alternatives for City facilities and operations. 12%
- Require recycling of used materials whenever feasible at City facilities. 6%
- Integrate energy efficiency and other green building practices into new City facilities. 5%
- Inform City employees of sustainability initiatives/upgrades to City facilities and engage employees in behavior-based programming to complement these efforts. 2%
- Conduct energy water efficiency retrofits to existing City facilities. 6%

Figure 4-2. 2030 Municipal Reductions by Goal

- Establish energy efficient fleet management and operation practices. 5%
- Increase the number of fuel efficient vehicles for the City's fleet. 4%
- Implement waste reduction practices in all City facilities. 0%
- Implement energy management and operation practices for City owned streetlights. 8%
- Consider clean energy alternatives for City facilities and operations. 7%
- Require recycling of used materials whenever feasible at City facilities. 0%
- Integrate energy efficiency and other green building practices into new City facilities. 4%
- Inform City employees of sustainability initiatives/upgrades to City facilities and engage employees in behavior-based programming to complement these efforts. 3%
- Conduct energy water efficiency retrofits to existing City facilities. 5%

Establish energy and water management and operation policies and practices for City facilities. 64%
### Table 4-2. 2020 Municipal Reductions by Sector and Source

<table>
<thead>
<tr>
<th>Reductions by Sector, 2020</th>
<th>BAU</th>
<th>With CAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings</td>
<td>2,548</td>
<td>1,096</td>
</tr>
<tr>
<td>Street Lights</td>
<td>669</td>
<td>535</td>
</tr>
<tr>
<td>Waste</td>
<td>245</td>
<td>238</td>
</tr>
<tr>
<td>Vehicle Fleet</td>
<td>1,178</td>
<td>844</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4,640</td>
<td>2,677</td>
</tr>
<tr>
<td><strong>Percentage Change</strong></td>
<td>6%</td>
<td>-39%</td>
</tr>
</tbody>
</table>

### Table 4-3. 2030 Municipal Reductions by Sector and Source

<table>
<thead>
<tr>
<th>Reductions by Sector, 2030</th>
<th>BAU</th>
<th>With CAP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings</td>
<td>2,675</td>
<td>-143</td>
</tr>
<tr>
<td>Street Lights</td>
<td>669</td>
<td>401</td>
</tr>
<tr>
<td>Waste</td>
<td>259</td>
<td>244</td>
</tr>
<tr>
<td>Vehicle Fleet</td>
<td>1,178</td>
<td>855</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>4,781</td>
<td>1,261</td>
</tr>
<tr>
<td><strong>Percentage Change</strong></td>
<td>9%</td>
<td>-71%</td>
</tr>
</tbody>
</table>

### Figure 4-3. 2020 Municipal Reductions by Sector

- Buildings, 40%
- Vehicle Fleet, 31%
- Streetlights, 20%
- Waste, 9%

### Figure 4-4. 2030 Municipal Reductions by Sector

- Buildings, 9%
- Vehicle Fleet, 52%
- Streetlights, 24%
- Waste, 15%
BUILDING EFFICIENCY (B)

Building energy use accounted for 52% of the City’s municipal GHG emissions inventory in 2005. As a result, implementation of energy conservation strategies in building design and construction provides an opportunity for substantial reduction in energy consumption and associated GHG emissions.

As the majority of the City’s existing building stock was constructed before California Title 24 established minimum standards for energy efficiency, there are considerable opportunities to improve the efficiency of existing buildings through measures that improve lighting, water, and HVAC efficiency and utilize renewable energy sources.

Walnut Creek has taken early actions to improve the efficiency of its existing buildings, with the recent retro commissioning of City Hall’s energy management system and the installation of energy efficient lighting in the City’s community centers, parking garages, and Corporation Yard. In addition, the U.S. Green building Council recently awarded the new downtown library a Leadership in Energy and Environmental Design (LEED) Gold certification; the second highest rating given by the U.S. Green Building Council for new construction.

The measures and actions contained in this section continue the City’s leadership in the areas of green building and energy efficiency. In addition, this section includes actions that increase the City’s use and generation of renewable energy through the installation of photovoltaic solar arrays on select municipal buildings.

GHG Reduction Potential

1,452 MT CO₂e
74% of total Municipal GHG Reductions
INTEGRATE ENERGY EFFICIENCY AND OTHER GREEN BUILDING PRACTICES

B 1.1: Municipal Green Building Policy

**Measure Description:** Adopt a green building policy for new construction and major renovations of municipal facilities that exceeds current Title 24 energy standards to facilitate the continued implementation of municipal green building and establish the City as a leader in the community.

California Title 24 establishes minimum standards for energy efficiency in new and renovated buildings; however, further emissions reduction can be achieved through higher levels of energy reductions outlined in the voluntary CALGreen standards. Exceeding Title 24 is an opportunity for City leadership, demonstrating the feasibility and benefits of green building.

While not yet adopting a green building policy, the City of Walnut Creek has taken the initiative to begin “greening” some of its facilities. Most notably, the City constructed a new Leadership in Energy and Environmental Design (LEED)-certified downtown library. The City is also investigating the feasibility of having City Hall certified as a LEED building. This measure gives the City credit for projects completed, including City Hall and the library.

Green buildings conserve water, contribute to improved air quality, and lead to improved occupant health and comfort.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>Develop a Municipal Green Building Policy for new construction and major renovations that exceeds Title 24 energy standards</td>
<td>Short Term (1–2 years)</td>
</tr>
<tr>
<td>B</td>
<td>Incorporate the Municipal Green Building Policy standards into the City’s Maintenance Master Plan (MMP)</td>
<td>Medium Term (2–5 years)</td>
</tr>
<tr>
<td>C</td>
<td>Develop a Municipal Green Building Policy page on the City’s sustainability website to highlight municipal green building efforts</td>
<td>Short Term (1–2 years)</td>
</tr>
</tbody>
</table>

GHG Reduction Potential: -93 MT CO2e/yr

Municipal Percentage Reduction: 5%

Cost to City: $210,000

Medium-High

Annual Cost Savings: $45,000
### AUDIT AND IMPLEMENT ENERGY/WATER EFFICIENCY

#### B 2.1: Municipal Energy Audits and Upgrades

**Measure Description:** Conduct energy audits of all City facilities, identify opportunities for energy savings, and implement recommended, cost-effective energy efficiency retrofit upgrades, including solar and tankless water heaters, and energy-efficient ventilation and air conditioning.

Energy efficiency upgrades present the greatest opportunity for energy conservation in the building sector. A variety of measures can be applied to increase building energy efficiency through basic lighting, appliance, insulation, and HVAC upgrades. Implementation of efficiency measures in City facilities provides an opportunity to demonstrate benefits and set a model for community programs.

The City of Walnut Creek has been proactive in conducting energy audits and retrofit upgrades in its facilities. Retrofit projects have already been conducted at Tice Valley Gym, Ceramics Studio, and City Hall/Police Department. The energy savings and costs associated with these proactive actions are included in the measure.

Many efficiency measures result in improved health and productivity of occupants; productivity gains have been shown to have significant fiscal payoff. Additionally, efficiency projects provide an opportunity for public education.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Conduct an energy audit of all City facilities and develop benchmarking program utilizing Energy Star’s Portfolio Manager software tool</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
<tr>
<td>A Replace aging water heaters with tankless water heaters</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
<tr>
<td>B Continue to install energy-efficient lighting in City facilities</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
<tr>
<td>C Identify opportunities to improve the efficiency of existing HVAC and energy management systems</td>
<td>Medium Term (2–5 years)</td>
<td>PS</td>
</tr>
</tbody>
</table>
AUDIT AND IMPLEMENT ENERGY/WATER EFFICIENCY

B 2.2: Water-Conserving Equipment in Municipal Facilities

**Measure Description:** Install water-conserving equipment (e.g., faucets, high-efficiency toilets, and, if applicable, showerheads) in all City facilities.

Water treatment and distribution account for a significant portion of municipal energy consumption. In Northern California, the average energy required to deliver 10,000 gallons of water is 54 kWh for indoor use and 35 kWh for outdoor use. Minimizing water consumption therefore has significant energy savings potential.

Toilets, in particular, account for one-third of commercial water use. High-efficiency toilets can use 60% to 80% less water than conventional toilets, while water use in urinals can be eliminated completely. Associated energy reduction can be significant because of reduced demand as well as reduced wastewater treatment requirements. Additionally, because water heating is an energy-intensive activity, efficient use of water for faucets and showers in public facilities can have a significant impact on energy use and emissions.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Replace traditional toilets with waterless urinals and high-efficiency toilets</td>
<td>Medium Term (2–5 years)</td>
</tr>
<tr>
<td>B</td>
<td>Bring existing plumbing fixtures up to current standards</td>
<td>Medium Term (2–5 years)</td>
</tr>
<tr>
<td>C</td>
<td>Continue water audits of all municipal buildings and operations</td>
<td>Ongoing</td>
</tr>
<tr>
<td>D</td>
<td>Install water-efficient fixtures in all municipal facilities</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>

**GHG Reduction Potential:**
-9 MT CO2e/yr

**Municipal Percentage Reduction:**
Less than 1%

**Cost to City:**
$0

**Annual Cost Savings:**
$0

---

1. (California Energy Commission, 2005)
2. (US Environmental Protection Agency and Department of Energy, 2009)
3. Amount based on the City of Walnut Creek’s existing replacement intervals.
AUDIT AND IMPLEMENT ENERGY/WATER EFFICIENCY

B 2.3: Reflective Roofing on City Facilities

*Measure Description:* Install reflective roofing on select City facilities to reduce building energy (heating/cooling) consumption.

Cooling accounts for a substantial portion of commercial building energy consumption, second only to lighting. A reflective roof significantly reduces building energy use by minimizing the heat entering the building through the roof. Energy Star-certified reflective roof products reflect the sunlight striking the roof, lowering roof temperature by up to 100 °F. 

This measure quantifies the impacts of the planned installation of 42,000 square feet of reflective roofing at the City’s library. While this measure does not explicitly call for the additional installation of reflective roofing on other municipal facilities, such an expansion will yield additional benefits with financial payback for City investment.

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<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>Long Term (5–10 years)</td>
<td>PS</td>
</tr>
<tr>
<td>B</td>
<td>Long Term (5–10 years)</td>
<td>PS</td>
</tr>
</tbody>
</table>

4 Assumes existing scheduled roof replacement intervals in the City’s MMP.

5 Ibid.
ENERGY AND WATER MANAGEMENT

B 3.1: Loans for Energy Efficiency and Renewable Energy

Measure Description: Establish a reinvestment loan fund to cover first costs for energy efficiency/renewable energy projects at City facilities.

A municipal reinvestment fund is a pool of money that is “loaned” out internally and “repaid” through energy cost savings. It is similar to a revolving loan fund, except that for internal projects there is no need to loan money. In addition, since money for this kind of fund comes from general fund allocations on an annual basis, there is no actual repayment. Rather, the municipality tracks savings and reports annually to demonstrate value for annual budget allocations. The most basic elements of the fund are its initial seed amount and the repayment mechanism. The repayment mechanism defines how savings are credited to the fund and what, if any, cap is put on the fund.

A municipal reinvestment fund is designed to support ongoing environmental improvements that are outside of specific project and departmental structures. It is also designed to pay for itself overtime. The program will become self-sustaining as energy and water savings from projects implemented through the fund reduce costs to the City.

In addition to energy cost savings, a municipal reinvestment fund provides benefits through:

- Elevated awareness of energy management that increases staff skills and improves the chances that additional opportunities for resource savings will be identified.
- Review and identification of projects can contribute significant value to other city projects.
- The continual stream of funding for energy efficiency measures provides an incentive to internally embrace environmental performance.
- Having funds focused on resource conservation reduces internal competition for other essential municipal priorities such as community center upgrades, sidewalk repair, or tree planting.
- Demonstrated leadership and commitment to energy conservation.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Short Term (1–2 years)</td>
<td>ASD, PS</td>
</tr>
<tr>
<td>B</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
</tbody>
</table>

GHG Reduction Potential: -753 MT CO2e/yr

Municipal Percentage Reduction: 38%

Cost to City: $450,000

Medium-High

Annual Cost Savings: $350,000
GHG Reduction Potential: -48 MT CO2e/yr

Municipal Percentage Reduction: 2%

Cost to City: $15,000 Low

Annual Cost Savings: $9,000

ENERGY AND WATER MANAGEMENT

B 3.2: Energy-Efficient Electronics

Measure Description: Replace in City facilities existing outdated electronic appliances and office equipment in favor of those that are more energy efficient.

To date, the City has already worked to implement this measure. By 2010, 30 computer monitors had been replaced and upgraded to the EPEAT Silver standard for monitor purchases. While there are incremental costs for this more energy-efficient model, the payback period that results from energy savings is less than a year.

Energy used for appliances and office equipment represents a large portion of commercial energy consumption. Energy Star, in partnership with the U.S. Environmental Protection Agency (EPA), certifies appliances and office equipment including computers, printers, copiers, water heaters, water coolers, and monitors that meet specified energy efficiency standards. Incrementally upgrading appliances and office equipment in City facilities to Energy Star models can significantly reduce municipal facility energy use.

In addition to energy savings, energy-efficient electronics can result in energy cost savings for minimal to no upfront cost.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Continue to replace all aging monitors with energy-efficient monitors that meet EPEAT Silver requirements</td>
<td>Medium Term (2–5 years)</td>
<td>ASD</td>
</tr>
<tr>
<td>B Continue server and desktop virtualization work</td>
<td>Short Term (1–2 years)</td>
<td>ASD</td>
</tr>
<tr>
<td>C Replace aging and inefficient copiers and scanners with new energy-efficient models</td>
<td>Medium Term (2–5 years)</td>
<td>ALL</td>
</tr>
</tbody>
</table>
ENERGY AND WATER MANAGEMENT

B 3.3: Demand Response Programs

Measure Description: Participate in demand response programs.

Demand response (DR) programs are incentive-based mechanisms used by utilities to encourage consumers to reduce demand during peak hours.

Participation by cities in DR programs sets a strong precedence for community members and decreases risks and costs of power outages, while providing the city with the associated incentives.

The City of Walnut Creek currently participates in a Pacific Gas and Electric (PG&E) DR program called the Smart AC Program, implementing such measures as the installation of 50 Smart AC thermostats in City facilities. Other potential DR programs in which the City can participate are PG&E’s Automated Demand Response Program and Scheduled Demand Response Program.

In addition to energy costs savings, DR programs offer reliability benefits because demand response lowers the likelihood and consequences of forced outages that impose financial costs and inconvenience on customers.

<table>
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<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Ongoing</td>
<td>PS</td>
</tr>
<tr>
<td>B</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
<tr>
<td>C</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
</tbody>
</table>

GHG Reduction Potential: -12 MT CO2e/yr

Municipal Percentage Reduction: 1%

Cost to City: $4,000 Low

Annual Cost Savings: $48,000
ENERGY AND WATER MANAGEMENT

B 3.4: Reduced Lighting Usage: Lights-Out Policy at City Facilities

**Measure Description:** Reduce lighting use by instituting a lights-out-at-night policy at City facilities where feasible.

Lighting accounts for one of the largest portions of electricity consumption in commercial buildings, a significant portion of which is wasted by lights left on when not in use. A combination of timers and motion sensors with good workspace policies and employee education can eliminate much of this wasted energy.

In addition to energy savings, instituting a lights-out-at-night policy will result in significant energy cost savings with minimal to no upfront cost.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
<tr>
<td>B</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
<tr>
<td>C</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
</tbody>
</table>

**GHG Reduction Potential:**

-140 MT CO2e/yr

**Municipal Percentage Reduction:**

7%

**Cost to City:**

$0

**Low**

**Annual Cost Savings:**

$30,000
ENERGY AND WATER MANAGEMENT

B 3.5: Drought-Tolerant Landscaping at Municipal Facilities

**Measure Description:** Expand current energy-efficient and drought-tolerant landscaping practices at City facilities to exceed current levels.

Native plant species require less water and maintenance than non-native plant species. Therefore, use of local native plants reduces energy use in landscaping by minimizing water requirements for irrigation.

In addition to reducing water and energy use in landscaping, use of native plants minimizes adverse impacts to natural habitat, prevents pollution through reduced use of landscape chemicals, allows for integrated pest management, minimizes stormwater runoff, and improves air quality.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Ongoing</td>
<td>PS</td>
</tr>
<tr>
<td>B</td>
<td>Ongoing</td>
<td>PS</td>
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<tr>
<td></td>
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</tbody>
</table>

**GHG Reduction Potential:**

-3 MT CO2e/yr

**Municipal Percentage Reduction:**

Less than 1%

**Cost to City:**

$0

Low

**Annual Cost Savings:**

$0
**GHG Reduction Potential:**
-6 MT CO2e/yr

**Municipal Percentage Reduction:**
Less than 1%

**Cost to City:**
$6,000
Low

**Annual Cost Savings:**
$1,000

---

**ENERGY AND WATER MANAGEMENT**

**B 3.6: Expand Tree Cover at Municipal Facilities**

*Measure Description:* Reduce energy use by planting trees to shade City facilities where feasible.

Trees strategically planted around buildings can provide shade and wind blockage, thereby reducing buildings’ cooling and heating requirements. In addition, evapotranspiration contributes to reduced ambient air temperature; trees planted near paved surfaces reduce the heat island effect.

In addition to decreasing the cooling and heating needs of buildings, trees improve air quality and provide aesthetic value.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Medium Term (2–5 years)</td>
<td>PS</td>
</tr>
</tbody>
</table>
CLEAN ENERGY ALTERNATIVES

B 4.1: Solar Electric Arrays

**Measure Description:** Conduct a solar feasibility study and install solar electric (PV) arrays at/on appropriate City facilities, and identify additional opportunities for increasing renewable energy systems, including wind energy generation.

Use of on-site PV systems on municipal buildings generates clean energy for building use while increasing the visibility of solar energy in the community. Installation of PV should be combined with lower-cost efficiency measures to improve payoff. Local governments can borrow money at low interest rates through bond issues, making solar more cost effective than it is for individuals or businesses.

This measure takes credit for the City’s Energy Efficiency and Conservation Block Grant (EECBG) project, which includes installation of 1,068 kW of solar panels on City facilities, including on buildings, parking garages, and carports. All potential projects could generate up to 1,374,412 kWh of annual electricity and provide 25-year electricity savings of over $6 million. The solar feasibility study also outlines possible financing mechanisms. The City will finalize solar projects for installation in 2011, including an installation on City Hall. The solar feasibility identifies several additional priority projects, including installations at the following facilities:

- City Hall and Police Department
- Heather Farm Community Center
- Boundary Oak Golf Course
- Corporation Yard
- North Locust Parking Garage
- Tice Valley Gymnasium

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Install solar electric arrays on select City-owned facilities identified as “Priority A” in the Solar Feasibility Study</td>
<td>ongoing</td>
<td>PS</td>
</tr>
<tr>
<td>B Explore opportunities to partner with energy service companies to install solar on additional City facilities outlined as “Priority B” in the Solar Feasibility Study</td>
<td>ongoing</td>
<td>PS</td>
</tr>
</tbody>
</table>

**GHG Reduction Potential:**
-244 MT CO2e/yr

**Municipal Percentage Reduction:**
12%

**Cost to City:**
$6,000,000
High

**Annual Cost Savings:**
$200,000
### GHG Reduction Potential:
-2 MT CO2e/yr

### Municipal Percentage Reduction:
Less than 1%

### Cost to City:
$12,000
Low

### Annual Cost Savings:
$500

### CLEAN ENERGY ALTERNATIVES

#### B 4.2: Solar Water Heating

**Measure Description:** Install solar water heating at/on appropriate City facilities.

Water heating can account for a significant portion of a building’s energy use. Solar water heating systems can provide significant energy savings at a relatively low cost. Solar water heating is one of the most cost-effective forms of renewable energy and is a proven and reliable technology with a long lifetime and low maintenance costs.

<table>
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<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>Long Term (5–10 years)</td>
<td>PS</td>
</tr>
<tr>
<td>B</td>
<td>Long Term (5-10 year)</td>
<td>PS</td>
</tr>
</tbody>
</table>
MUNICIPAL STREET LIGHTS (S)

Street lighting can account for a substantial portion of the energy budget for local governments. Based on the GHG emissions inventory conducted for the year 2005, electricity use from street lights represented 15% of the City’s total emissions.

Walnut Creek was one of the first cities in the Bay Area to utilize Pacific Gas and Electric Company’s (PG&E) LED Street Light Turnkey Replacement Program. As part of the program, the City was able to replace all existing city-owned street lights along Ygnacio Valley Road with PG&E-approved LED street lights, resulting in improved quality of light and significant energy and cost savings.

The actions included in this section continue the City’s efforts to leverage existing grants and PG&E sponsored financing programs to retrofit the City’s remaining street lights. In addition, the actions call for partnering with PG&E to retrofit PG&E-owned street lights within Walnut Creek.

GHG Reduction Potential

152 MT CO₂e
7% of total Municipal GHG Reductions
GHG Reduction Potential: 
-134 MT CO2e/yr

Municipal Percentage Reduction: 
7%

Cost to City: 
$350,000
Medium-High

Annual Cost Savings: 
$80,000

STREET LIGHT ENERGY MANAGEMENT

S 1.1: High-Efficiency Street lights

Measure Description: Replace low-efficiency street lights with high-efficiency light-emitting diode (LED) fixtures as funding becomes available.

Street lighting can account for a substantial portion of the energy budget for local governments. Based on the GHG emissions inventory conducted for the year 2005, electricity use from street lights made up 15% of the City’s total emissions.

LED technologies achieve between 40% and 60% energy savings over conventional high-pressure sodium street lights. The corresponding emissions reduction potential is significant.

The City is currently taking advantage of Pacific Gas and Electric’s On-Bill Financing Program, which provides 0% interest loans to the City for energy efficiency projects. The City also replaced 162 street lights with LED fixtures in 2010 using funding from the Energy Efficiency and Conservation Block Grant Program.

In addition to energy savings, converting to LED street lights will result in significant energy cost savings.

<table>
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<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
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</thead>
<tbody>
<tr>
<td>A Convert all City-owned street lights to LED</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
<tr>
<td>B Partner with PG&amp;E to convert all utility-owned street lights within the city</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
</tbody>
</table>

6 (Los Angeles Profile, 2009)
MUNICIPAL WASTE REDUCTION (MWR)

Municipal waste accounts for 5% of the total municipal GHG emissions. Measures to decrease waste production and increase waste diversion include regulating waste production, providing recycling programs, and developing education and outreach campaigns to change consumption and disposal behaviors.

The City has already taken action to reduce municipal waste through efforts to promote recycling in City facilities, parks, and downtown streets. Limiting use of disposable items, such as water bottles and plastic bags, plates and utensils, has also reduced the amount of waste the City sends to the landfill. The measures included in this section expand upon the City’s existing efforts, including actions that reduce paper use through the utilization of a paperless records management program and setting printer defaults to two-sided printing.

GHG Reduction Potential

7 MT CO₂e
<1% of total Municipal GHG Reductions
Municipal Percentage Reduction:
Less than 1%

Cost to City:
$0
Low

Annual Cost Savings:
$3,000

GHG Reduction Potential:
-6 MT CO2e/yr

WASTE REDUCTION

MWR 1.1: Waste Prevention

*Measure Description:* Require waste prevention in day-to-day operations (e.g., two-sided copying, reduced paper requirements) in all City facilities.

GHG emissions from municipal waste represent about 5% of the total emissions from City facilities (based on the 2005 GHG emissions inventory). Although it represents a small portion of the overall municipal GHG emissions portfolio for Walnut Creek, there is still opportunity to reduce emissions within this municipal sector.

In-house paper-saving policies and practices, including conservative default office equipment settings and switching to electronic from paper filing, is an effective and low-cost way to cut down on office paper waste.

The City has already begun instituting waste prevention practices. For example, the Police Department has implemented a paperless records management system. Expansion of similar practices across all City facilities can result in greater waste prevention and GHG emissions reductions.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Medium Term (2–5 years)</td>
<td>ALL</td>
</tr>
<tr>
<td>B</td>
<td>Short Term (1–2 years)</td>
<td>ASD</td>
</tr>
<tr>
<td>C</td>
<td>Short Term (1–2 years)</td>
<td>ARCS, PS</td>
</tr>
</tbody>
</table>

Action Timetable Responsibility
A Develop a paperless records management program, including an electronic timecard management system Medium Term (2–5 years) ALL
B Set default printer and copier settings to duplex Short Term (1–2 years) ASD
C Ban the distribution of plastic bags from all City programs and facilities Short Term (1–2 years) ARCS, PS
RECYCLING OF USED MATERIALS

MWR 2.1: Expand Recycling Programs

**Measure Description:** Expand City Hall, Police Station, and City parks recycling programs into all City facilities.

Recycling utilizes less energy than manufacturing with raw materials. Organic matter such as wood, paper, food, and yard waste decomposes anaerobically in landfills, producing large quantities of methane, a greenhouse gas that is 21 times more powerful than carbon dioxide. Therefore, recycling organic matter reduces landfill emissions.

The City already has a recycling program in place in its facilities. An expansion of the current program can help to further reduce GHG emissions.

In addition to reducing emissions, recycling is valuable to natural resource conservation. Recycling facilities can also provide a significant number of local jobs.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Require recycling at all events, regardless of expected attendance</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
<tr>
<td>B Provide recycling receptacles at all City-owned facilities</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
</tbody>
</table>

GHG Reduction Potential: -1 MT CO2e/yr

Municipal Percentage Reduction: Less than 1%

Cost to City: $0 Low

Annual Cost Savings: $0
MUNICIPAL TRANSPORATION (MT)

The vehicle fleet accounts for a significant portion of the City’s GHG emissions—27% based on 2005 emissions levels. The City’s municipal fleet operations have taken early steps to reduce the City’s transportation related emissions through fleet size reductions, use of alternative fueled vehicles, and utilization of green maintenance practices. The measures included in this section will result in a 17% reduction in municipal GHG emissions.

The measures range from increasing the City’s use of electric, hybrid, and compressed natural gas (CNG) vehicles to improving scheduling and routing efficiencies. In addition, this section includes measures that encourage City employees to participate in commuting and ride-share programs and promotes the use of bicycles and walking.

GHG Reduction Potential

112 MT CO₂e
17% of total Municipal GHG Reductions
INCREASE NUMBER OF FUEL-EFFICIENT VEHICLES

MT 1.1: Purchase of Alternative Fuel/Fuel-Efficient Vehicles

Measure Description: Require the purchase of alternative fuel and/or fuel-efficient vehicles.

The vehicle fleet accounts for a significant portion of the City’s GHG emissions—27% based on 2005 emissions levels. It is recommended that the City continue to purchase new vehicles for the City fleet to ensure that alternative fuel/fuel-efficient models are selected.

The City has replaced five traditional-fuel vehicles with alternative fuel vehicles. As of 2011, the City has a number of electric and hybrid vehicles as well as vehicles that run on compressed natural gas (CNG) and biodiesel. When appropriate hybrid vehicle models are available to purchase, the City plans to continue purchasing hybrid and fuel-efficient vehicles instead of standard vehicles to upgrade the City’s aging fleet.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Improve fuel efficiency of the City vehicle fleet by purchasing low- or zero-emission vehicles to replace vehicles that are retired from the fleet</td>
<td>Ongoing</td>
<td>PS</td>
</tr>
<tr>
<td>B Continue to reduce baseline emissions for City fleet vehicles</td>
<td>Ongoing</td>
<td>PS</td>
</tr>
<tr>
<td>C Continue to purchase high-mileage vehicles when vehicles are retired</td>
<td>Ongoing</td>
<td>PS</td>
</tr>
</tbody>
</table>

GHG Reduction Potential: 
-158 MT CO2e/yr

Municipal Percentage Reduction: 
8%

Cost to City: 
$100,000
Low-Mid

Annual Cost Savings: 
$18,000
ENERGY-EFFICIENT FLEET MANAGEMENT

MT 2.1: Reduce Fleet Size

**Measure Description:** Reduce fleet size (i.e., total number of vehicles) by retiring older and underused vehicles.

This measure quantifies the reductions that will result from the City’s plans to retire vehicles and downsize its fleet. While downsizing has yet to be implemented, this measure formalizes downsizing plans and estimates the impacts of implementation. The City will also investigate strategies to limit the use of City vehicles and facilitate the use of non-vehicular travel when feasible. For instance, the City will investigate creating caps on vehicle use that deter unnecessary vehicular travel.

Many vehicles in the City’s fleet are old and extremely fuel-inefficient and/or underutilized. Implementing a policy of retiring older vehicles can significantly reduce the amount of gas required for City transportation. Additionally, it can potentially reduce time spent by City staff for maintaining vehicles. As of 2011, the City has removed a total of thirteen vehicles from the City’s fleet.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Ongoing</td>
<td>PS</td>
</tr>
<tr>
<td>B</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
<tr>
<td>C</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
<tr>
<td>D</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
</tbody>
</table>

7 The forecast of vehicles to be retired was provided by Joe Jorgensen, Supervisor – Vehicle & Equipment Maintenance Division, City of Walnut Creek.
ENERGY-EFFICIENT FLEET MANAGEMENT

MT 2.2: Reduce Idling

*Measure Description:* Institute a policy to limit idling of City fleet vehicles.

Idling vehicles unnecessarily burn fuel. Implementing a policy to limit idling can reduce fuel use and associated emissions at no cost.

Vehicle idling is linked to increased cases of asthma, allergies, heart and lung disease, and cancer; reduction in idling can therefore help reduce health risks.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Create a policy to reduce unnecessary idling of City fleet vehicles</td>
<td>Short Term (1–2 years)</td>
</tr>
<tr>
<td>B</td>
<td>Require as part of purchasing specifications that all diesel-powered vehicles have automatic idle shut-down features</td>
<td>Short Term (1–2 years)</td>
</tr>
<tr>
<td>C</td>
<td>Create a policy that instructs vehicle operators on the appropriate vehicle warm-up time based on seasonal climate conditions</td>
<td>Short Term (1–2 years)</td>
</tr>
</tbody>
</table>

**GHG Reduction Potential:**
-43 MT CO2e/yr

**Municipal Percentage Reduction:**
2%

**Cost to City:**
$0
Low

**Annual Cost Savings:**
$12,000
ENERGY-EFFICIENT FLEET MANAGEMENT

MT 2.3: Fleet Maintenance

Measure Description: Implement a maintenance regime for increased efficiency for City vehicles (e.g., regularly check tire pressure).

Underinflated tires equate to less than optimal fuel economy. Therefore, regular maintenance of the municipal fleet, including checking vehicles’ tire pressure, can be a low-cost way to increase fuel efficiency and decrease fuel use.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Create and implement a daily vehicle inspection policy that includes checking tire pressure</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
<tr>
<td>B Establish minimum vehicle utilization requirements for use of City vehicles</td>
<td>Medium Term (2–5 years)</td>
<td>PS</td>
</tr>
<tr>
<td>C Establish standards in purchase specifications to require fuel efficiency and sustainable material use in manufacturing</td>
<td>Medium Term (2–5 years)</td>
<td>PS</td>
</tr>
</tbody>
</table>
ESTABLISH ENERGY-EFFICIENT FLEET MANAGEMENT AND OPERATION PRACTICES

MT 2.4: Scheduling & Routing Efficiency

*Measure Description:* Improve scheduling and route efficiency for using City vehicles.

The City will undertake this supportive measure to identify opportunities for improved scheduling and routes for City vehicles in order to reduce vehicular use and fuel combustion. Staff supervisors and fleet maintenance will work together to review routes and schedules and determine strategies for reduced fleet use. There may be opportunities to link trips for regular maintenance or other activities.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Review City fleet schedules and identify opportunities for routing and schedule efficiencies</td>
<td>Short Term (1–2 years)</td>
</tr>
<tr>
<td>B</td>
<td>Create a tracking system to monitor fleet efficiencies</td>
<td>Medium Term (2-5 years)</td>
</tr>
</tbody>
</table>

**SUPPORTIVE MEASURE**

Cost to City: $0

Annual Cost Savings: $10,000
**GHG Reduction Potential:**

-3 MT CO₂e/yr

**Municipal Percentage Reduction:**

Less than 1%

**Cost to City:**

$0

Low

**Annual Cost Savings:**

$0

---

## ALTERNATIVE TRANSPORTATION OPTIONS

### MT 3.1: Municipal Commuter Programs

**Measure Description:** Implement incentive programs to reduce municipal employee commute (e.g., parking cash-out, telecommute, bike checkout).

Employee commute can account for a significant portion of a municipal GHG emissions inventory. A number of potential measures can be implemented to reduce emissions from employee commute.

In the United States, it is largely standard that employers provide easily accessible parking options to employees. Such accessible parking facilitates the use of single-occupancy vehicles. Hence, parking accessibility represents a hidden incentive for employees to drive to work. Because the cost of parking is passed on to clients, most commuters do not recognize the true cost of parking. With the directive of reducing single-occupancy automobile commuting, many employers are now introducing parking cash-out programs. These programs offer a payment option to employees who volunteer to give up their parking spaces. Reducing the number of single-occupancy vehicle commuters offers a significant opportunity for emissions reduction.

Offering telecommuting options to select City employees is another potential option to help reduce GHG emissions from employee commute. Additionally, implementing a bicycle checkout program for City employee commute use is another potential measure.

Taking cars off the road has a number of benefits, including improved air quality, alleviation of the effects of stormwater runoff, and reduced congestion.

The City already has in place a carpool program for City employees. Expanding this program to include the above recommended employee commute options can increase fuel and GHG emissions savings.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Continue to provide commute alternative leave for City employees that walk, run, bicycle, or carpool to work at least 3 days per week</td>
<td>Ongoing</td>
</tr>
<tr>
<td>B</td>
<td>Continue to offer BART/County Connection tickets at a discounted rate</td>
<td>Ongoing</td>
</tr>
<tr>
<td>C</td>
<td>Conduct study to determine feasibility of telecommuting options</td>
<td>Short Term (1–2 years)</td>
</tr>
<tr>
<td>D</td>
<td>Continue to offer and expand flexible working schedules, such as the 9/80 work schedule currently offered in several departments, which helps to reduce VMT</td>
<td>Ongoing</td>
</tr>
</tbody>
</table>
ALTERNATIVE TRANSPORTATION OPTIONS

MT 3.2: Municipal Bicycle Program

**Measure Description:** Provide bicycles for daily trips for City employees.

Automobile use for City operations accounts for a significant portion of GHG emissions. Providing employees with bicycles as an alternative to automobiles for daily City operations, when feasible, is a cost-savings approach to reduce fuel use and associated GHG emissions from vehicle trips.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Ongoing</td>
<td>CDD, PS</td>
</tr>
</tbody>
</table>

**GHG Reduction Potential:**
Less than 1 MT CO2e/yr

**Municipal Percentage Reduction:**
Less than 1%

**Cost to City:**
$3,000
Low

**Annual Cost Savings:**
Less than $100
MUNICIPAL EDUCATION (MEO)

A substantial portion of energy, water, and resource consumption is a result of wasteful behavior patterns. Basic education about conservation practices can help develop positive changes in behavior and yield significant energy and water savings and waste reduction.

The measures included in this section focus on developing workplace sustainability education programs for City employees with an emphasis on energy/water conservation, waste reduction/diversion practices, and transportation/commute alternatives.

The measures included in this section help support other municipal actions. As a result, the emission reductions resulting from these measures are already accounted for in other municipal reduction measures related to energy efficiency, transportation, and waste reduction.
EDUCATE CITY EMPLOYEES ON SUSTAINABILITY INITIATIVES/UPGRADES

MEO 1.1: Employee Education

**Measure Description:** Conduct workplace sustainability education programs with City employees focused on energy/water conservation, waste reduction/diversion practices, and transportation/commute alternatives.

A substantial portion of energy, water, and resource consumption is a result of wasteful behavior patterns. Basic education about conservation practices can impact behavior and yield significant energy and water savings and waste reduction. Education and outreach programs for City employees can be developed with limited cost and should be included in any emissions reduction effort.

Behavioral changes by City employees reach beyond the workplace and into their homes and everyday activities.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
<tr>
<td>B</td>
<td>Short term (1–2 years)</td>
<td>PS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Municipal Percentage Reduction:</th>
<th>0%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cost to City:</td>
<td>$0</td>
</tr>
<tr>
<td>Annual Cost Savings:</td>
<td>$36,000</td>
</tr>
</tbody>
</table>
MUNICIPAL ENVIRONMENTALLY PREFERABLE PURCHASING (MEPP)

Several City departments have already adopted environmentally preferable purchasing practices (EPP) into many daily operations, including the use of recycled-content printer paper, green cleaning supplies, and low-volatile organic compound (VOC) paints. This section includes actions to expand the City’s existing EPP practices and formally adopt a citywide environmental purchasing policy, currently in draft form.

GHG Reduction Potential

36 MT CO$_2$e
2% of total Municipal GHG Reductions
MUNICIPAL ENVIRONMENTALLY PREFERABLE PURCHASING (MEPP) MEPP 1.1: Expand Environmentally Preferable Purchasing

Measure Description: Create and implement environmentally preferable purchasing (EPP) categories and practices in City facilities.

Environmentally preferable refers to products or services that have a lesser or reduced effect on human health and the environment when compared with competing products or services. EPP policies help guide City operations to achieve sustainability goals. EPP policies also utilize the city’s buying power to stimulate market demand for green products and services.

EPP leads to improved worker safety and health, reduced liability, reduced health and disposal costs, and increased availability of environmentally preferable products in the local marketplace.

The City of Walnut Creek has been making progress in the environmentally preferable purchasing area. For example, a draft EPP policy is in the process of being reviewed and approved by the City. The draft EPP includes following required solid waste measures:

- Purchasing paper towels and copier/printer paper with at least 30% post consumer waste
- Eliminate the use of bottled water at city hosted events
- Eliminate the use of polystyrene in beverage and food service ware

Additionally, in terms of green cleaning products in the custodial division, soy- and citrus-based cleaners, which are non-petroleum-based products, have been used throughout City facilities since 2008.

This measure will allow the City to set an example for other local governments in this area by continuing to push for environmentally preferable purchasing policies and actions within both City facilities and the broader regional community. Such efforts will facilitate the achievement of emissions reductions elsewhere and solidify Walnut Creek’s status as a regional leader in environmental stewardship. While the EPP may create higher initial purchase cost for some types of equipment and supplies, these products may require less maintenance and yield long-term cost savings over the life of the product.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Short Term (1–2 years)</td>
<td>CMO, PS</td>
</tr>
<tr>
<td>B</td>
<td>Short Term (1–2 years)</td>
<td>ALL</td>
</tr>
</tbody>
</table>

GHG Reduction Potential: -36 MT CO2e/yr

Municipal Percentage Reduction:

2%

Cost to City: $0

Annual Cost Savings: $0
COMMUNITY REDUCTION
GOALS AND MEASURES

CHAPTER 5
Community Reduction Goals and Measures

This chapter summarizes the Climate Action Plan’s goals and measures to reduce greenhouse gas emissions from sources within the city boundaries.

SUMMARY OF GOALS AND MEASURES

The following goals and measures are organized by energy, transportation, and waste reduction, consistent with the baseline greenhouse gas (GHG) emissions inventory. Each goal is tied to a specific reduction of GHG emissions as well as energy, transportation, and waste reductions. GHG reductions are provided in supporting tables for each measure. Detailed greenhouse gas reduction calculations are presented in Appendix 3. The Climate Action Plan goals and measures are presented below in summary form. Detailed descriptions follow starting on page 5-7.

Each goal is tied to a specific reduction in greenhouse gas emissions and achieved through a package of reduction measures.
Chapter 5 Terms & Definitions

2010 “Existing and In-Progress” Reductions: The annual reductions in energy/vehicle miles traveled (VMT)/waste/water and GHGs resulting from implementation of the goal prior to or concurrent with this Plan (2005–2010).

2020 and 2030 Reductions: The annual reductions in energy/VMT/waste/water and GHGs in calendar years 2020 and 2030 as a result of staggered goal implementation and ramp-up.

Responsible City Department(s): City department or outside agency responsible for implementation.

Cost to City: Overall cost to the City for implementation of the goal. Costs represent full City costs for measure implementation through 2030 and in current (2010) dollars (e.g., 2030 costs are in addition to 2010 and 2020 costs, not inclusive of 2010 and 2020 costs). Due to the nature of variation in costs between municipal programs and community-wide programs, for purposes of simplicity, City costs for community-wide programs are presented on a scale. These costs are less certain than municipal program costs provided in Chapter 4, and are presented in aggregated form to give a more general sense of proportional cost scales.

- Low = under $25,000 (uses existing staff)
- Low-Mid = $25,000 to $100,000 (existing staff can implement but will require reprioritization of workload)
- Medium = $100,000 to $200,000 (requires new staff or contracts to implement)
- Medium-High = $200,000 to $500,000 (requires new staff or contract(s) to implement)
- High = over $500,000 (requires new staff or contract(s) to implement)

Private Investment: The level of private investment needed for the goal assumptions to come to fruition (Ex: The overall cost of solar panel installations). Costs represent full anticipated costs for full measure implementation through 2030 and in current (2010) dollars Minimal = less than $25,000

- Low = $25,000 to $500,000
- Low-Mid = $500,000 to $1,000,000
- Medium = $1,000,000 to $10,000,000
- Medium-High = $10,000,000 to $30,000,000
- High = over $30,000,000

Time Frame: The period of time estimated for staff to initiate measure implementation and achieve measure reductions.

SUMMARY OF POTENTIAL REDUCTIONS

The goals and measures presented here have the potential to reduce greenhouse gas emissions by 104,747 metric tons (MT) of CO₂e by 2020. (Refer to Table 5-1 and Figures 5-1 and 5-2.) With the incorporation of State-mandated initiatives, emissions in Walnut Creek would be reduced by 234,648 metric tons CO₂e, for a total reduction of 15% from the 2005 baseline by 2020.

Local implementation of all proposed measures and State-mandated efforts would allow the City to achieve its reduction target of 15% below baseline levels by 2020. The City’s 2020 target is consistent with Assembly Bill (AB) 32; therefore, implementation of the goals and measures in this Plan will be consistent with the State’s recommended goal for local governments. By 2035, these reduction measures have the potential to reduce emissions 35% below baseline levels, demonstrating progress toward long-term targets that will be established by Senate Bill (SB) 375.

Tables 5-2 and 5-3 and Figures 5-4 and 5-5 present the potential GHG emissions reductions (MT CO₂e) for 2020 and 2030 by goal and then by sector. They also identify Walnut Creek’s progress in achieving these goals since the baseline year of 2005. The goals and measures are presented in detail later in this chapter.
### Table 5-1. Community-Wide GHG Reductions

<table>
<thead>
<tr>
<th>Goal</th>
<th>To Date</th>
<th>2020</th>
<th>2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>EU 1 Increase energy efficiency and conservation efforts.</td>
<td>-121</td>
<td>-16,506</td>
<td>-6,682</td>
</tr>
<tr>
<td>EU 2 Promote and support renewable energy generation and use.</td>
<td>-</td>
<td>-10,572</td>
<td>-21,496</td>
</tr>
<tr>
<td>EU 3 Facilitate green building and design.</td>
<td>-</td>
<td>-1,001</td>
<td>-3,447</td>
</tr>
<tr>
<td>EU 4 Reduce energy use through increased water conservation.</td>
<td>-631</td>
<td>-2,179</td>
<td>-2,351</td>
</tr>
<tr>
<td>TLU 1 Reduce GHG emissions through use of alternative vehicles, trip reduction and consolidation, and efficient traffic flow.</td>
<td>-692</td>
<td>-14,555</td>
<td>-32,666</td>
</tr>
<tr>
<td>TLU 2 Reduce vehicle miles traveled through smart land use and design.</td>
<td>-373</td>
<td>-38,276</td>
<td>-41,576</td>
</tr>
<tr>
<td>TLU 3 Convert vehicular trips to non-vehicular or transit trips.</td>
<td>-300</td>
<td>-13,544</td>
<td>-19,178</td>
</tr>
<tr>
<td>WR 1 Implement a zero waste policy to reduce waste sent to the landfill.</td>
<td>-97</td>
<td>-6,152</td>
<td>-9,724</td>
</tr>
<tr>
<td>EPP 1 Investigate promoting the purchase of local goods and services.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>EPP 2 Encourage residents in green lifestyles.</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Municipal Reductions (see Chapter 4)</td>
<td>-313</td>
<td>-1,963</td>
<td>-3,516</td>
</tr>
<tr>
<td><strong>Subtotal – Local Reductions</strong></td>
<td>-2,528</td>
<td>-104,747</td>
<td>-140,635</td>
</tr>
<tr>
<td><strong>State Actions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Renewable Portfolio Standard</td>
<td>-3,321</td>
<td>-47,890</td>
<td>-124,767</td>
</tr>
<tr>
<td>California Solar Initiative</td>
<td>-416</td>
<td>-1,110</td>
<td>-832</td>
</tr>
<tr>
<td>Title 24 Reductions</td>
<td>-</td>
<td>-2,670</td>
<td>-7,728</td>
</tr>
<tr>
<td>Pavley (AB 1493)</td>
<td>-</td>
<td>-78,231</td>
<td>-135,470</td>
</tr>
<tr>
<td><strong>Subtotal – State Reductions</strong></td>
<td>-3,738</td>
<td>-129,901</td>
<td>-268,798</td>
</tr>
<tr>
<td><strong>Total Reductions (Local + State)</strong></td>
<td>-6,266</td>
<td>-234,648</td>
<td>-409,433</td>
</tr>
<tr>
<td><strong>Business-as-Usual Emissions</strong></td>
<td>680,113</td>
<td>779,117</td>
<td>829,535</td>
</tr>
<tr>
<td><strong>Net Emissions</strong></td>
<td>673,847</td>
<td>544,469</td>
<td>420,103</td>
</tr>
<tr>
<td><strong>Percentage Change from 2005 Levels</strong></td>
<td>+4.70</td>
<td>-15.40%</td>
<td>-34.73%</td>
</tr>
</tbody>
</table>
Figure 5-1. 2020 Reductions by Goal

- Increase Energy Efficiency and Conservation Efforts, 15%
- Promote and Support Renewable Energy Generation and Use, 4%
- Facilitate Green Building and Design, 1%
- Reduce Energy Use Through Increased Water Conservation, 1%
- Reduce VMT through Smart Land Use and Design, 16%
- Convert Vehicular Trips to Non-Vehicular Trips, 6%
- Implement a Zero Waste Policy to Reduce Waste, 2%
- Municipal Measures, 1%
- Alternative Vehicles, Trip Reduction and Consolidation, and Efficient Flow, 5%
- Renewable Portfolio Standard, 19%
- Pavley (AB 1493), 33%

Figure 5-2. 2030 Reductions by Goal

- Increase Energy Efficiency and Conservation Efforts, 15%
- Promote and Support Renewable Energy Generation and Use, 5%
- Facilitate Green Building and Design, 4%
- Reduce Energy Use Through Increased Water Conservation, 1%
- Alternative Vehicles, Trip Reduction and Consolidation, and Efficient Flow, 6%
- Reduce VMT through Smart Land Use and Design, 10%
- Convert Vehicular Trips to Non-Vehicular Trips, 6%
- Implement a Zero Waste Policy to Reduce Waste, 2%
- Municipal Measures, 1%
- Renewable Portfolio Standard, 21%
- Pavley (AB 1493), 32%
Table 5-2. 2020 Community-Wide Reductions by Sector and Source

<table>
<thead>
<tr>
<th>Reductions by Sector, 2020</th>
<th>BAU</th>
<th>With CAP</th>
<th>With CAP &amp; State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>130,626</td>
<td>116,553</td>
<td>89,686</td>
</tr>
<tr>
<td>Commercial</td>
<td>131,716</td>
<td>115,747</td>
<td>90,943</td>
</tr>
<tr>
<td>Transportation</td>
<td>464,190</td>
<td>397,816</td>
<td>319,585</td>
</tr>
<tr>
<td>Waste</td>
<td>7,780</td>
<td>5,602</td>
<td>5,602</td>
</tr>
<tr>
<td>Water</td>
<td>31,626</td>
<td>31,626</td>
<td>31,626</td>
</tr>
<tr>
<td>Off-Road</td>
<td>10,759</td>
<td>4,607</td>
<td>4,607</td>
</tr>
<tr>
<td>BART</td>
<td>2,420</td>
<td>2,420</td>
<td>2,420</td>
</tr>
<tr>
<td>Total</td>
<td>779,117</td>
<td>674,370</td>
<td>544,469</td>
</tr>
<tr>
<td>Percentage Change from Baseline</td>
<td>21.06%</td>
<td>4.78%</td>
<td>-15.40%</td>
</tr>
</tbody>
</table>

Table 5-3. 2030 Community-Wide Reductions by Sector and Source

<table>
<thead>
<tr>
<th>Reductions by Sector, 2030</th>
<th>BAU</th>
<th>With CAP</th>
<th>With CAP &amp; State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential</td>
<td>142,037</td>
<td>126,187</td>
<td>57,612</td>
</tr>
<tr>
<td>Commercial</td>
<td>141,474</td>
<td>122,183</td>
<td>57,430</td>
</tr>
<tr>
<td>Transportation</td>
<td>494,396</td>
<td>400,977</td>
<td>265,507</td>
</tr>
<tr>
<td>Waste</td>
<td>8,396</td>
<td>6,045</td>
<td>6,045</td>
</tr>
<tr>
<td>Water</td>
<td>29,016</td>
<td>29,016</td>
<td>29,016</td>
</tr>
<tr>
<td>Off-Road</td>
<td>11,610</td>
<td>1,886</td>
<td>1,886</td>
</tr>
<tr>
<td>BART</td>
<td>2,606</td>
<td>2,606</td>
<td>2,606</td>
</tr>
<tr>
<td>Total</td>
<td>829,535</td>
<td>686,294</td>
<td>420,103</td>
</tr>
<tr>
<td>Percentage Change from Baseline</td>
<td>28.89%</td>
<td>7.04%</td>
<td>-34.73%</td>
</tr>
</tbody>
</table>

Figure 5-3. 2020 Community-wide Reductions by Sector

Figure 5-4. 2030 Community-wide Reductions by Sector
GREENHOUSE GAS REDUCTIONS PER SERVICE POPULATION

Greenhouse gas emissions can also be viewed as GHGs per service population instead of as whole numbers for comparison with the transportation reduction targets established by SB 375. Table 5-4 displays GHGs per service population in 2005 and 2030. GHG emissions per service population increase 8% without the Climate Action Plan and state reductions. With the Climate Action Plan and state reductions, they are reduced 45%. Similarly, transportation-related GHG emissions per service population would have increased 10% without a CAP and state reductions. With a CAP and state reductions, transportation-related GHG emissions per service population and per capita (population only) are reduced by 41% and 40% below baseline, respectively. Transportation emissions are shown separately for context with SB 375, which sets transportation-related GHG emissions targets per capita. The California Air Resources Board adopted per capita targets for the Metropolitan Transportation Commission (MTC) region of 7% below 2005 per capita levels by 2020 and 15% below per capita levels by 2035.

It is important to note that the SB 375 reduction targets are specific to passenger cars and light trucks, while the figures below include emissions from all vehicle classes including commercial vehicles and buses. Regardless, the reduction measures of the Climate Action Plan demonstrate local progress relative to SB 375 targets and metrics. Further, while the City has individually achieved a 40% reduction in local per capita transportation emissions, SB 375 holds the City responsible for contributing to the overall regional target assigned to the MTC. The MTC is currently in the process of identifying each jurisdiction’s responsibility to the overall regional target. The Climate Action Plan prepares the City for SB 375 implementation and positions the City of Walnut Creek as an early adopter and regional leader for achieving reductions in transportation emissions.

Table 5-4. 2030 Per Capita Reductions

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Total GHGs per Service Population</td>
<td>5.32</td>
<td>5.83</td>
<td>4.07</td>
<td>5.76</td>
<td>2.92</td>
</tr>
<tr>
<td>Percentage Change from 2005</td>
<td>0%</td>
<td>10%</td>
<td>-23%</td>
<td>8%</td>
<td>-45%</td>
</tr>
<tr>
<td>Transportation-Related GHG per Service Population</td>
<td>3.12</td>
<td>3.47</td>
<td>2.39</td>
<td>3.43</td>
<td>1.84</td>
</tr>
<tr>
<td>Percentage Change from 2005</td>
<td>0%</td>
<td>11%</td>
<td>-23%</td>
<td>10%</td>
<td>-41%</td>
</tr>
<tr>
<td>Transportation-Related GHG per Capita</td>
<td>5.70</td>
<td>6.45</td>
<td>4.44</td>
<td>6.36</td>
<td>3.42</td>
</tr>
<tr>
<td>Percentage Change from 2005</td>
<td>0%</td>
<td>13%</td>
<td>-22%</td>
<td>12%</td>
<td>-40%</td>
</tr>
</tbody>
</table>
ENERGY USE AND EFFICIENCY (EU)

The majority of Walnut Creek’s existing residential and commercial building stock was built before California’s Title 24 energy efficiency standards were established. Retrofitting existing residential properties and aging commercial buildings to meet current energy efficiency standards offers a great opportunity to achieve significant emission reductions.

GHG emissions related to energy use are largely attributed to indoor heating, ventilation and air conditioning (HVAC) as well as the efficiency of appliances and other mechanical systems. This includes hot water heaters, dishwashers, washers and dryers, and plumbing fixtures. Consequently, a large portion of the total emissions for both the community and City can be attributed to the built environment. The Residential and Commercial/Industrial sectors both contribute 18% of the total GHG emissions in Walnut Creek. Together, residential and commercial energy use accounts for 36% of total GHG emissions.

This section includes goals and measures aimed at helping residents and businesses owners complete energy efficiency improvements in their homes and businesses. The measures will also help in marketing the benefits of reduced energy costs, increased property values, and available financial incentives to offset or eliminate upfront investment costs for energy efficiency retrofits. In addition to reducing energy use related to buildings, this section includes goals that expand the City’s Tree Preservation Ordinance to increase shade from tree cover, encourage the use of renewable energy through streamlined permitting processes, and expand water conservation efforts.

GHG Reduction Potential

30,258 MT CO$_2$e
19% of total GHG Reductions
**INCREASE ENERGY EFFICIENCY AND CONSERVATION**

**EU 1.1: Residential Energy Conservation Program**

*Measure Description:* Create a Residential Energy Conservation Program in partnership with business and real estate stakeholders that leverages financial incentives, local partnerships, and education for voluntary home energy efficiency improvements, with a target of achieving an average 20% in energy savings for 6% of the existing housing stock by 2015, 13% of the existing housing stock by 2020, and 27% by 2030.

The City will develop a Residential Energy Conservation Program to retrofit 6% of the City’s housing stock by 2015 (approximately 2,000 housing units), 13% of the housing stock by 2020 (approximately 4,000 housing units), and 27% of the housing stock by 2030 (approximately 8,500 housing units), to achieve an average of 20% savings in energy consumption. To ensure it achieves these targets, the City will track progress and if the City is falling short of the 2015 target, will consider implementing a mandatory energy conservation ordinance to apply at point of sale, with a cost ceiling of 2–3% of the sales price, not to exceed $25,000 per home. While this measure is a voluntary program, the City will promote retrofits upon point of sale as key opportunities for enhancements. On average, each home changes hands every 5–7 years. Through this measure, the City will collaborate with business, real estate, and other community stakeholders to implement a voluntary, highly participatory program. The program will help residents realize the benefits of reduced costs for energy bills, increased property values, and available financial incentives to offset or eliminate upfront investment costs for energy efficiency retrofits.

Financial incentives are available to homeowners through the Energy Upgrade California Whole House Program, which offers incentives for single-family homeowners. The City is also funding energy efficiency loans through the Home Loan Rehabilitation Program, providing up to $22,000 in loans per home with money from the Energy Efficiency and Conservation Block Grant (EECBG) Program. The measure also captures the energy efficiencies that will result through PG&E’s deployment of smart meters in existing residential development. Smart meters will equip households to monitor energy use and participate in energy-conserving participation programs.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Develop a Residential Energy Conservation Program with the Contra Costa Realtors Association</td>
<td>Short Term (1–2 years)</td>
<td>CDD, EDD, PS</td>
</tr>
<tr>
<td>B Facilitate retrofits to achieve an average of 20% energy savings per home in 6% of the housing stock by 2015, 13% of the housing stock by 2020, and 27% of the housing stock by 2030</td>
<td>Ongoing</td>
<td>CDD</td>
</tr>
<tr>
<td>C By 2015, if 6% retrofit target is not achieved, develop a mandatory energy conservation program to apply at point of sale</td>
<td>Medium Term (2–5 years)</td>
<td>CDD, EDD, PS</td>
</tr>
<tr>
<td>D Continue to partner with Contra Costa County to implement the Home Loan Rehabilitation Loan Program</td>
<td>Short Term (1–2 years)</td>
<td>CDD</td>
</tr>
<tr>
<td>E Support regional efforts to implement the Energy Upgrade California Program</td>
<td>Short Term (1–2 years)</td>
<td>CDD, PS</td>
</tr>
</tbody>
</table>
INCREASE ENERGY EFFICIENCY AND CONSERVATION

EU 1.2 Commercial Energy Conservation Program

**Measure Description:** Work with the stakeholders, and PG&E to develop a voluntary Commercial Energy Conservation Program for highly collaborative, incentive-based energy efficiency efforts, with a target of achieving an average of 25% energy savings for 360 businesses by 2015, 600 by 2020, and 800 by 2030.

The City will develop a voluntary program to help building owners improve the energy and water efficiency of the commercial building stock. This measure’s phased approach aims to facilitate an average of 25% in energy savings per business for 7% of businesses by 2015 (approximately 360 businesses), 10% of businesses by 2020 (approximately 600 businesses), and 15% of businesses by 2030 (approximately 800 businesses). If the City finds through ongoing monitoring that the total retrofits are falling short of the 2015 target, the City will consider additional voluntary and mandatory programs to achieve the commercial building retrofits outlined in this measure. The measure also captures the energy efficiencies that will result through PG&E’s deployment of smart meters in existing commercial development. Smart meters will equip building users to monitor energy consumption in real time and better understand the relationship between energy and costs.

The City will develop a marketing and outreach plan in partnership with a variety of business and real estate stakeholders. Potential partners include the Downtown Business Association and the Chamber of Commerce. The City will also identify additional partners to promote green building techniques and opportunities, and showcase exemplary local projects. Towards this end, the City will reach out to entities such as the U.S. Green Building Council – Northern California Chapter, which promotes transformation of sustainable communities through such mechanisms as the Leadership in Energy and Environmental Design (LEED) Green Building Rating System.

The City will also collaborate with PG&E and partners such as the Bay Area Climate Collaborative to identify and promote free energy audit programs and finance opportunities. The City will promote participants and investigate the appropriate form of reward for leading energy efficiency businesses. Possible rewards may take the form of including businesses at local events, promoting businesses on the City’s website, or offering some additional form of promotion or other incentive. The City anticipates that this promotion will also educate other businesses in the community about energy efficiency opportunities. The Walnut Creek Chamber of Commerce is an important partner to the City in developing and implementing an attractive incentive program for local businesses.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1–2 years (Short Term)</td>
<td>CDD, EDD, PS</td>
</tr>
<tr>
<td>B</td>
<td>Ongoing</td>
<td>CDD</td>
</tr>
<tr>
<td>C</td>
<td>Medium Term (2–5 years)</td>
<td>CDD, EDD, PS</td>
</tr>
<tr>
<td>D</td>
<td>Ongoing</td>
<td>CDD, EDD, PS</td>
</tr>
<tr>
<td>E</td>
<td>1–2 years (Short Term)</td>
<td>CDD, EDD</td>
</tr>
<tr>
<td>F</td>
<td>Ongoing</td>
<td>CDD, EDD</td>
</tr>
</tbody>
</table>

**GHG Reduction Potential:**
-5,807 MT CO2e/yr

**Community Percentage Reduction:**
6%

**Cost to City:**
$10,000
Low

**Private Cost:**
$1,000,000
Low-Mid

**Annual Cost Savings:**
$2,900,000
INCREASE ENERGY EFFICIENCY AND CONSERVATION

EU 1.3: Public Outreach

**Measure Description:** Work with partners to educate and inform the community about ways to improve energy efficiency, including behavioral changes, appliance purchases and rebates, maintenance practices, and more.

This measure directs the continued implementation of a community-wide public education campaign to inform residents, businesses, and consumers about the way that individuals can reduce their energy costs and GHG emissions. The public is informed about the benefits of installing energy-efficient indoor and outdoor lighting at commercial and residential uses and alerted to the availability of free energy audit programs, as well as financial and other incentives that are available to assist residential and commercial energy retrofits.

The City shall continue and expand existing partnerships with the East Bay Municipal Utility District (EBMUD), PG&E, and the Contra Costa Water District (CCWD). This existing forum for outreach can be used as a platform to educate residents and business owners about resources and opportunities for increased energy efficiencies. Existing efforts provide a foundation for the heightened efforts necessary to achieve this measure.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Further develop the City’s sustainability website to help inform and educate the community about energy efficient behavioral changes, maintenance practices, and more</td>
<td>Short Term (1–2 years)</td>
<td>CMO, PS</td>
</tr>
<tr>
<td>B Continue to partner with PG&amp;E and the City’s water utilities to develop educational materials and education programs</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
<tr>
<td>C Develop public service announcements through Walnut Creek Television, promoting energy efficiency practices in action</td>
<td>Short Term (1–2 years)</td>
<td>CMO, PS</td>
</tr>
</tbody>
</table>
RENEWABLE ENERGY GENERATION AND USE

EU 2.1: Renewable Energy Strategy

**Measure Description:** Develop a renewable energy strategy that facilitates installation of residential solar energy systems through streamlined permit procedures, adoption of local incentives, fee waivers, and potential for a municipal finance district program that provides a low-risk option for property owners to invest in on-site renewable energy installations.

This measure calls for a renewable energy strategy for the City in order to assess current barriers to renewable energy installations and to target key opportunities to incentivize renewable energy installations in the community. Barriers could include building codes, zoning ordinances, and the availability of financing. The municipal code can often present barriers to renewable energy installations by prohibiting small-scale wind turbines, not protecting solar access, having roofing or setback requirements that prohibit efficient solar operations, and similar restrictions. Through this measure, the City will identify how to exceed the levels of forecasted participation in the California Solar Initiative program. This program provides financial incentives for commercial and residential solar installations. The impact of this program is accounted for in state-led reductions, including the installation of solar that has taken place since 2010 (for more information, refer to Appendix 5).

This measure identifies local strategies to achieve higher rates of installation of local renewable energy systems than has been achieved through the California Solar Initiative program. This reduction measure will be achieved through new local actions to reduce barriers to the installation of solar.

This measure assumes that the renewable energy strategy will be implemented, which may include a municipal financing program available to Walnut Creek property owners to provide additional support beyond the statewide rebates available through the California Solar Initiative and New Solar Homes Partnership. Additional actions the City will take to increase rates of solar installations beyond business-as-usual trends are detailed in the actions below.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Short Term (1–2 years)</td>
<td>CDD, PS</td>
</tr>
<tr>
<td>B</td>
<td>Short Term (1–2 years)</td>
<td>CDD, PS</td>
</tr>
<tr>
<td>C</td>
<td>Short Term (1–2 years)</td>
<td>CDD, PS</td>
</tr>
<tr>
<td>D</td>
<td>Short Term (1–2 years)</td>
<td>CDD, PS</td>
</tr>
<tr>
<td>E</td>
<td>Medium Term (2–5 years)</td>
<td>CDD, PS</td>
</tr>
<tr>
<td>F</td>
<td>Medium Term (2–5 years)</td>
<td>CDD, PS</td>
</tr>
</tbody>
</table>

**GHG Reduction Potential:**
-10,572 MT CO2e/yr

**Community Percentage Reduction:**
10%

**Cost to City:**
- $10,000 (Low)

**Private Cost:**
- $68,500,000 (High)

**Annual Cost Savings:**
- $6,000,000
COMMUNITY

GREEN BUILDING AND DESIGN

EU 3.1: Green Building Ordinance

**Measure Description:** Adopt CALGreen Tier 1 by 2014 to exceed Title 24 energy efficiency standards by 15%, and adopt CALGreen Tier 2 by 2017 to exceed Title 24 energy efficiency standards by 30%.

Walnut Creek has been proactive in supporting voluntary green building practices throughout the community. In April of 2007, the City started distributing Build It Green brochures on green development practices, at both community events and the City’s Permit Center. Walnut Creek has also been actively pursuing and encouraging green development in the City. In 2009, the City hosted a U.S. Green Building Council roundtable at the Lesher Center, and several staff members have completed the LEED Accredited Professionals Credential Program.

This measure builds on the City’s green building promotional efforts. The City will adopt Walnut Creek’s first mandatory green building requirements to exceed the California Green Building Standards Code, consistent with the energy reductions established by CALGreen Tier 1 and 2. The City will phase in adoption of the CALGreen tiers, with adoption of Tier 1 by 2014 and Tier 2 by 2017. Adoption of the voluntary CALGreen tiers will take place after the inventory baseline year of 2005, and will exceed business-as-usual trends.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Create a user-friendly green building checklist</td>
<td>Short Term (1–2 years)</td>
<td>CDD</td>
</tr>
<tr>
<td>B Adopt CALGreen Tier I requirements as part of the next code adoption cycle in 2014, and Tier 2 requirements in 2017</td>
<td>Ongoing</td>
<td>CDD</td>
</tr>
<tr>
<td>C Create plan review and inspection checklist to streamline the review and approval process</td>
<td>Short Term (1–2 years)</td>
<td>CDD</td>
</tr>
<tr>
<td>D Explore and implement incentives that would support a volunteer-based program</td>
<td>Short Term (1–2 years)</td>
<td>CDD</td>
</tr>
</tbody>
</table>
GREEN BUILDING AND DESIGN

EU 3.2: Urban Forestry

**Measure Description:** Increase tree cover throughout the city, with special emphasis on shading east and west walls of structures and parking lots.

This measure requires the City to update City landscaping requirements to increase tree plantings where they will effectively shade improvements and reduce energy demands. This update could occur through revised building and zoning ordinances that require additional street tree plantings and trees on properties.

The energy and greenhouse gas benefits of this measure result from increased shading on buildings and pavements. Increased shading causes lower urban temperatures, thus reducing the urban heat island effect. This measure does not include the carbon sequestration benefit of trees or open space. Additional co-benefits for this measure that are not captured in GHG emissions reductions include, extended life of paved surfaces, improves water quality from trapping runoff, increase in traffic safety, aesthetic improvements, increased real estate values, increased sociological benefits.

This measure would expand upon the City’s existing Tree Preservation Ordinance and General Plan 2025 policies, which protect tree resources on public and private property and expand the City’s existing tree canopy.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Continue to implement the City’s Tree Preservation Ordinance</td>
<td>Ongoing</td>
</tr>
<tr>
<td>B</td>
<td>Adopt an ordinance that requires tree plantings specifically to reduce energy demand through building shading and parking lot shading</td>
<td>Medium Term (2-5 years)</td>
</tr>
</tbody>
</table>

GHG Reduction Potential: -28 MT CO2e/yr

Community Percentage Reduction: Less than 1%

Cost to City: $0 Low

Private Cost: $300,000 Low

Annual Cost Savings: $16,000
GHG Reduction Potential: 
-2,179 MT CO2e/yr

Community Percentage Reduction: 
2%

Cost to City: 
$0
Low

Private Cost: 
$0
Low

Annual Cost Savings: 
$850,000

INCREASE WATER CONSERVATION

EU 4.1: Water Conservation

**Measure Description:** Work with EBMUD and CCWD to ensure that the Walnut Creek community achieves regional and statewide water reduction targets, including a 20% reduction as established by the State’s 20X2020 plan.

This measure is a multi-pronged approach to achieve energy reductions through water conservation and efficiency. To complete this measure, the City of Walnut Creek will rely on local actions and water rationing by its water utility districts. The City receives water service from both the Contra Costa Water District (CCWD) and the East Bay Municipal Utility District (EBMUD), both of which are enacting drought rationing policies that will require water users to cut water use by a certain percentage, based on past water use trends. The City will partner with each water provider to further publicize these conservation efforts and educate residents to ensure achievement of the reduction goals. This measure assumes the City will exceed the reduction in water use established by the State of California’s 20x2020 Water Conservation Plan, which directed state agencies to develop a plan to reduce statewide per capita urban water use by 20% by the year 2020.

The City will implement this measure through CALGreen mandatory standards that went into effect January 1, 2011. These standards establish requirements for new development to reduce on-site potable water use, install water-efficient irrigation systems and devices such as soil moisture-based irrigation controls, and achieve 20% reductions in water consumption.

With increased water efficiencies, not only will total kWh for transport of water be decreased, but the community’s water supply will be better protected and preserved for future needs. Results from this measure are assumed from increased community-wide water efficiency and decreased overall water use, and do not include upgrades to infrastructure.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Medium Term (2–5 years)</td>
<td>CDD, PS</td>
</tr>
<tr>
<td>B</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
<tr>
<td>C</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
<tr>
<td>D</td>
<td>Ongoing</td>
<td>CDD, PS</td>
</tr>
</tbody>
</table>
TRANSPORTATION AND LAND USE (TLU)

Transportation comprises nearly one-third of total U.S. emissions and close to 40 percent of California emissions (U.S. EPA, 2008). In Walnut Creek, it is the largest contributor of greenhouse gas emissions, with local roads contributing 32% and highways contributing 27%, representing a total of 59% of the City’s total GHG emissions. Transportation related emissions are linked to the mode of transportation (passenger vehicle, heavy-equipment, bicycle, etc.), trip length, number of trips, efficiency of vehicles, and from land use and development patterns.

Land use is closely related to transportation related greenhouse gas emissions. Sprawling development patterns foster dependence on motor vehicles and increases GHG emissions. In contrast, an integrated and connected street network of alternative modes of transit, such as walking, biking, access to public transit; lowers automobile dependency; and reduces trip lengths, results in lower GHG emissions. Where people live determines how far they travel to work, to shopping, and other destinations, and influences whether they choose to walk, bike, and use public transit, or drive. If residents live near bus stops, neighborhood-serving commercial centers, or their work places, they are more likely to use alternative lower-emission travel modes than to drive. Walnut Creek has opportunities for infill and mixed-use development, which are key to achieving reductions in vehicle miles traveled.

Tracking transportation related emissions at a local level is particularly challenging for Walnut Creek, as 32% of the City’s total GHG emissions are contributed by state-controlled highways. In addition, many transportation policies, such as fuel efficiency and vehicle emissions standards, are enacted at the federal, state, and regional levels. However, the City can lower transportation related emissions by implementing strategies that decrease vehicle miles traveled (VMT), retrofit the municipal fleet and local infrastructure, and implementing policies that reduce travel demand.

The reduction goals included in this section provide a combination of measures that leverage regional partnerships and resources to encourage the use of low-emission vehicles, improved transportation demand management, and expanding the City’s existing network of bicycle and pedestrian-friendly trails and pathways. In addition, this section includes land use specific strategies that focus on reducing travel demand through encouraging higher density, mixed use infill development and expanding job availability to include job types and levels suitable to all residents of Walnut Creek.

**GHG Reduction Potential**

66,375 MT CO₂e

27% of total GHG Reductions
REduce GHG Emissions

TLU 1.1: Low-Emission Vehicle Facilities

Measure Description: Facilitate the use of low-emission vehicles by coordinating with regional and state agencies for region-wide low-emission vehicle infrastructure improvements and networks.

This measure achieves reductions in vehicle miles traveled (VMT) by facilitating the use of clean fuel and electric vehicles by providing charging stations and clean fuel vehicle parking in new development. In order to achieve these reductions, the City will need to ensure the provision of 300 charging stations by 2020 and 600 charging stations by 2030 (an additional 300 spaces from 2020), at a rate of approximately 20 charging stations per year, plus the provision of clean fuel or carpool vehicle parking spaces.

The City will accomplish this measure by amending Section 10.203 of the Zoning Ordinance as follows:

- Require the provision of charging stations in parking facilities at the rate of 10% of the required automobile parking spaces for all commercial and community facilities exceeding 50,000 square feet. Each parking space with a charging station shall count toward the total number of required parking spaces and shall not be in addition to total required parking spaces.

- Provide a 5% reduction in the total number of parking spaces required for every one charging station provided, beyond that required, up to a 20% reduction, encouraging developers to go above the Zoning Ordinance requirements.

- Require designated stalls for low-emitting, fuel-efficient vehicles and carpool/vanpool vehicles for a minimum of 8% of total parking capacity.

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<th>Action</th>
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<tbody>
<tr>
<td>A</td>
<td>Amend the Zoning Ordinance to require and encourage the provision of charging stations and designated parking spaces for clean fuel, low-emitting, and carpool/vanpool vehicles</td>
<td>Medium Term (2–5 years)</td>
</tr>
<tr>
<td>B</td>
<td>Conduct a feasibility study to investigate the provision of on-street charging stations spaces in the public right-of-way</td>
<td>Medium Term (2–5 years)</td>
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</table>
REDUCE GHG EMISSIONS

TLU 1.2: Transportation Demand Management (TDM)

**Measure Description:** Promote ridesharing and TDM programs with the CMA and 511.org to reduce use of traditional motor vehicles. Create a citywide car-sharing program to achieve further reductions in vehicle miles traveled.

This measure achieves reductions in vehicle miles traveled (VMT) by getting more workers community-wide to participate in ride-sharing programs, achieving participation of 12% of the workforce in 2020 and 15% of the workforce in 2030. It quantifies reductions achieved to date through existing rideshare programs and anticipates the reasonable expected growth of such programs. While the City can accomplish this using a variety of methods, it will require strong action to achieve significant reductions. Specifically, the City will expand its promotion efforts to publicize and promote ridesharing and other TDM options.

The City will also work to partner with non-profit car-sharing programs like City Car Share, to develop a citywide car share program. The program will provide parking spaces for car-share vehicles at convenient locations and promote the program to encourage private sector involvement. Start-up costs for car-sharing programs vary, but numerous federal and local grants are available to fund initiation of a program, including the U.S. Department of Transportation, the Federal Congestion Mitigation and Air Quality fund, the U.S. EPA, and the California Department of Transportation.

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<tbody>
<tr>
<td>A</td>
<td>Partner with 511.org and non-profit car share providers to develop a citywide car share program</td>
<td>Short Term (1–2 years)</td>
</tr>
<tr>
<td>B</td>
<td>Develop policy to allow use of public parking garages and public parking lots for car share use</td>
<td>Short Term (1–2 years)</td>
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</table>

**GHG Reduction Potential:** -1,759 MT CO2e/yr

**Community Percentage Reduction:** 2%

**Cost to City:**
- $0
- Low

**Private Cost:**
- $0
- Low

**Annual Cost Savings:**
- $900,000
REDUCE GHG EMISSIONS

TLU 1.3: Traffic Calming

**Measure Description:** Install street design features such as landscaped medians and roundabouts in order to reduce vehicle speeds, volumes, and idling.

Studies have shown that traffic calming directly impacts the elasticity of vehicle travel; a 20% reduction in average vehicle speeds will reduce total vehicle travel by 10% during the first few years and up to 20% over a longer time period. Traffic calming measures that serve to impede and slow vehicle travel include curb extensions and “pinch points,” speed tables, raised crosswalks, roundabouts, median islands, tighter corner radii, speed humps, pavement treatments, and lane narrowing.  

To achieve these reductions in vehicle travel and their related reduction in greenhouse gas emissions, the City will investigate appropriate revisions to development standards to achieve the reductions estimated for this measure. Additional actions that the City can investigate include the following:

- Establish a municipal “Complete Streets” approach as a foundation, incorporating traffic calming design features when a street is built or reconstructed (whether for maintenance, utility work or otherwise).

- Revise Improvement Standards and Zoning Ordinance regulations to both require and encourage traffic calming devices, including but not limited to the following:
  - Limit the use of new STOP signs as traffic calming devices
  - Create an incentive structure to reward developers for the provision of pedestrian and bicycle friendly facilities
  - Continue to design for pedestrians through necking down intersections

- Strengthen pedestrian connectivity within Pedestrian Retail District (PRD) and build infrastructure to connect PRD with surrounding residential neighborhoods.

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<td>A</td>
<td>Short Term (1–2 years)</td>
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<tr>
<td>B</td>
<td>Medium Term (2–5 years)</td>
<td>PS</td>
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<td>C</td>
<td>Medium Term (2–5 years)</td>
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<tr>
<td>D</td>
<td>Medium Term (2–5 years)</td>
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1 (Victoria Town Planning Institute (VTPI), 2008)
REDUCE GHG EMISSIONS

TLU 1.4: Anti-Idling Efficient Traffic Signal Timing

**Measure Description:** Reduce vehicle emissions through an effective traffic signal synchronization program.

As a gateway to Central Contra Costa County—located at the interchange of State Route 24 and Interstate 680—Walnut Creek sees over a hundred thousand vehicles pass through its City limits each day. Many of these vehicles are traveling along City streets, resulting in unique traffic flow and congestion challenges. The effective synchronization of traffic signals along these main arterials can result in a significant reduction in GHG emissions.

Walnut Creek has demonstrated its leadership in developing forward thinking traffic management strategies through the development of a regional traffic signal system and the utilization of state-of-the-art traffic synchronization technology. Over the past four years, the City has been working in partnership with the Metropolitan Transportation Commission on the implementation of a new adaptive traffic signal control system along the City’s Ygnacio Valley Road corridor. The new system will result in an estimated 5% reduction in fuel consumption and vehicle emissions for transportation activity in the project corridor. To date, this project has achieved an annual reduction of approximately 600,000 gallons of fuel.

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<tr>
<td>A</td>
<td>Complete the installation and programming of Adaptive Signal Control along Ygnacio Valley Road</td>
<td>Short Term (1–2 years)</td>
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<tr>
<td>B</td>
<td>Work with the Metropolitan Transportation Commission to identify other opportunities for improved traffic signal timing along major traffic arterials</td>
<td>Medium Term (2–5 years)</td>
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<tr>
<td>C</td>
<td>Implement additional traffic programs, including signal synchronization, evaluating transit and emergency signal priority, and additional traffic flow management techniques</td>
<td>Medium Term (2–5 years)</td>
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<tr>
<td>D</td>
<td>Implement vehicle idling limitations for commercial and construction vehicles and buses beyond those required by state law</td>
<td>Medium Term (2–5 years)</td>
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</table>

**GHG Reduction Potential:** -2,953 MT CO2e/yr

**Community Percentage Reduction:** 3%

**Cost to City:** $550,000  
High

**Private Cost:**  
$0  
Low

**Annual Cost Savings:**  
$150,000
### REDUCE VEHICLE MILES TRAVELED

**TLU 2.1: Smart Growth**

**Measure Description:** Achieve higher-density, mixed-use, infill development and through updated regulations and new incentives.

To date, the City has already achieved reductions since the baseline inventory year of 2005 through such mixed-use infill projects as The Mercer (1655 California Boulevard) and high-density residential infill projects such as 555 YVR (555 Ygnacio Valley Road). The City will also implement this measure through Planned Development Agreements, and the BART Specific Plan. Other high-density infill development projects such as these are included in the GHG reduction potential. Further reductions in VMT per capita will result from additional high-density infill development projects within the City’s Core Area and participation in the regional Sustainability Communities Strategy.

In addition to GHG reductions, mixed-use redevelopment promotes a variety of densities and housing types, improves the livability of the community by providing amenities in close proximity to residences, and improves air quality by reducing the number of trips necessary to provide for basic household needs.

By utilizing available tools and expertise, the City can implement this measure with minimal investment. For instance, available programs include the EPA’s Smart Growth Implementation Assistance Program, which is a competitive program the City can apply for. If selected, the EPA provides a national team of experts to analyze existing policies and provide a final report that recommends implementation tools.

This measure builds on the vision for increased density based on the City’s General Plan. The City will achieve the GHG reductions in this measure through additional implementation actions that exceed business-as-usual trends. Specifically, the City will work to identify and remove barriers to mixed-use, smart growth projects through creation of new incentives, identification of high-priority infill sites, and partnerships with developers. This measure assumes implementation of the regional Sustainable Community Strategy, which will include rezoning land for transit-oriented-development and other priority smart growth projects that will improve the accessibility between transit, housing, and jobs, reducing local VMT.

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<tr>
<td>A</td>
<td>Continue to support the creation and implementation of a regional Sustainable Communities Strategy</td>
<td>Ongoing</td>
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<td>B</td>
<td>Adopt Zoning Code updates as directed by the Sustainable Communities Strategy to facilitate increased accessibility between homes, jobs, and transit</td>
<td>Medium Term (2–5 years)</td>
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<tr>
<td>B</td>
<td>Continue to implement the City’s General Plan</td>
<td>Ongoing</td>
</tr>
<tr>
<td>C</td>
<td>Remove barriers to mixed-use, smart growth projects through incentives, identification of new high-priority infill sites, and partnerships with developers</td>
<td>Medium Term (2–5 years)</td>
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</table>
REDUCE VEHICLE MILES TRAVELED

TLU 2.2: Jobs/Housing Balance

Measure Description: Attract new job-generating uses that will provide a variety of employment opportunities and improve the jobs/housing balance within Walnut Creek.

The City of Walnut Creek is already a jobs-rich community, with a jobs/housing ratio of 1.63, according to ABAG 2007 projections. With this jobs/housing ratio, the City draws employees into the community who reside outside of the City’s jurisdictional boundaries. While economically advantageous, bringing residents of other communities into Walnut Creek significantly increases GHG emissions in the transportation sector. Expanding job availability to include job types and levels suitable to all residents of Walnut Creek will increase the number of people who live and work within the community, thus resulting in lower GHG emissions.

Through implementation of the regional Sustainable Communities Strategy, the City will identify new strategies to provide meaningful employment opportunities for local residents, reducing work commutes and business-as-usual transportation trends. In addition, with the recent hire of an Economic Development Manager, the City is in the process of implementing new business attraction strategies to increase local employment through economic development efforts that are partnered with effective transportation planning. In addition, the City is proactively identifying underutilized properties, such as the Shadelands Business Park, and developing creative public-private partnership incentives and transportation demand management strategies to attract new job-generating uses and businesses enterprises.

Updates to the Zoning Ordinance will be directed by the Sustainable Communities Strategy, but are anticipated to include updates to facilitate live-work housing and encourage other land uses that reduce work commutes, such as proximity of housing and employment opportunities.

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<td>E</td>
<td>Short Term (1–2 years)</td>
<td>EDD</td>
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GHG Reduction Potential: 36,305 MT CO2e/yr

Community Percentage Reduction:
35%

Cost to City: $0 Low

Private Cost: $0 Low

Annual Cost Savings: $18,500,000
REDUCE VEHICLE MILES TRAVELED

TLU 2.3: Affordable Housing

*Measure Description:* Support and expand affordable housing development through implementation of the City’s Housing Element and new programs.

A significant amount of evidence points to the fact that lower-income households and senior citizens own fewer vehicles and drive less. Furthermore, affordable housing encourages support for an equitable and just community in which people of all income levels can live in Walnut Creek.

The City has multiple affordable housing programs. Achievement of this measure requires implementation of these programs as called for in the adopted 2007-2014 Housing Element, in addition to implementation of the anticipated Housing Element update that the City will undergo for implementation of the regional Sustainable Communities Strategy. Affordable housing programs include the Below Market Rate Homeownership Program for low- and moderate-income households, the Rehabilitation Loan & Emergency Grant Program for low- and moderate-income homeowners, and subsidization of affordable rental units. The City will seek to expand these programs by planning for affordable housing options that are served by local and regional transit connections.

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<td>Medium Term (2-5 Years)</td>
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CONVERT VEHICULAR TRIPS TO ALTERNATE MODES

**TLU 3.1: Bicycle Planning**

*Measure Description:* Implement the City’s Bicycle Master Plan and incorporate bicycle lanes and routes into street systems, new subdivisions, and large developments.

Walnut Creek currently has 31 miles of paved Class I, II, and III designated bikeways. In addition to these bikeways, bicycles are also allowed to use the sidewalk along major arterials including Treat Boulevard and Ygnacio Valley Road. The city also enjoys a robust network of multi-use, whole-access trails, including the popular Iron Horse and Contra Costa Canal trails, which help connect residential and commercial areas, businesses, schools, and public transportation (BART, County Connection). The reductions in this measure will result from implementation of the new facilities identified in the Bicycle Master Plan.

In addition to GHG reductions, the measure also promotes a healthful lifestyle and reduced commuting costs for individuals, alleviates traffic congestion, and improves local air quality.

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<tr>
<td>A Prioritize recommendations within the Bicycle Master Plan and begin an implementation strategy</td>
<td>Short Term (1–2 years)</td>
<td>CDD</td>
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<tr>
<td>B When preparing the 10-year Capital Improvement Projects list, incorporate new or improved bicycle facilities that enhance connectivity and improve public safety</td>
<td>Ongoing</td>
<td>CDD, PS</td>
</tr>
<tr>
<td>C Continue to partner with 511 Contra Costa, MTC, and CCTA to promote the usage of bicycle facilities and support bicycle related programs like “Bike to Work Day”</td>
<td>Ongoing</td>
<td>CDD, PS</td>
</tr>
<tr>
<td>D Identify gaps and improve connectivity of the City’s existing bikeway network</td>
<td>Medium Term (2–5 years)</td>
<td>CDD, PS</td>
</tr>
<tr>
<td>E Develop a Complete Streets policy that includes vehicle, pedestrian and bicycle-related improvements for upgraded roadways in Walnut Creek</td>
<td>Short Term (1–2 years)</td>
<td>CDD, PS</td>
</tr>
</tbody>
</table>

**GHG Reduction Potential:**
-5,835 MT CO2e/yr

**Community Percentage Reduction:**
6%

**Cost to City:**
$30,000,000
High

**Private Cost:**
$700,000
Low-Mid

**Annual Cost Savings:**
$3,000,000
COMMUNITY

CONVERT VEHICULAR TRIPS TO ALTERNATE MODES

TLU 3.2: Multi-Modal Wayfinding

Measure Description: Develop and implement a comprehensive wayfinding system for the city’s bicycle and pedestrian transportation networks.

Wayfinding systems can be created through signs, maps, guides, and electronic devices that provide information on travel options to destinations throughout a community. Such information may include schedules, routes, fares, connections, estimated real time arrival, availability of bicycle facilities, and other related information.² The intent of such a system is to facilitate non-vehicular transit. Wayfinding should help users to easily plan and execute a travel route.

This measure takes partial credit for two informational kiosks the City installed in Downtown. The City has already allocated $60,000 for the two-year costs of these kiosks. These kiosks can be the catalysts for the wayfinding program established in this measure.³ The City will also implement this measure by identifying additional opportunities for non-traditional wayfinding programs. Mobile applications for smart phones provide one such opportunity for a locally-customized program to encourage wayfinding and alternative transit.

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<td>C</td>
<td>Short Term (1–2 years)</td>
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² (Victoria Town Planning Institute (VTPI), 2008)
³ (City of Walnut Creek, 2009)
COMMUNITY

CONVERT VEHICULAR TRIPS TO ALTERNATE MODES

TLU 3.3: Bicycle Parking

Measure Description: Increase the number and locations of bicycle parking by requiring new development or redevelopment to provide adequate short- and long-term bicycle parking facilities.

Currently, the Zoning Ordinance requires a range of minimum required bicycle spaces for all commercial and community facilities uses at the time of new construction or any major alteration that increases the overall parking requirement by 10%. Bicycle parking is not required for any other use. Required parking spaces range from a low of 1 bicycle parking space per 1–14 vehicle parking spaces to a high of 10 bicycle parking spaces per 95–104 vehicle parking spaces. For projects with 105 or more parking spaces, 10% of the total required number of vehicle parking spaces must be provided as bicycle parking spaces. The City will also work to provide bicycle parking, showers, and other bicycle facilities at all new public facilities.

Implementation of this measure also supports implementation of Policy 11 in the Bicycle Master Plan (August 2011). To achieve the emissions reductions possible in this measure, the City will revise Section 10-2.3.202 of its Zoning Ordinance to ensure the provision of additional bicycle support facilities, as identified in the actions below.

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<tr>
<td>A</td>
<td>Implement the Bicycle Plan</td>
<td>Ongoing</td>
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<tr>
<td>A</td>
<td>Revise the bicycle parking standards in the zoning ordinance to include bicycle parking for multi-family residential uses</td>
<td>Short Term (1–2 years)</td>
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<tr>
<td>B</td>
<td>Expand the number of bicycle racks and lockers in parking garages, employment centers, shopping centers, transit stations, and the Core Area to meet future demand</td>
<td>Ongoing</td>
</tr>
<tr>
<td>C</td>
<td>Adopt standards for the installation and placement of bicycle racks and lockers</td>
<td>Short Term (1–2 years)</td>
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GHG Reduction Potential: -224 MT CO2e/yr

Community Percentage Reduction: Less than 1%

Cost to City: $0

Low

Private Cost: $6,200,000

Medium

Annual Cost Savings: $115,000
COMMUNITY

CONVERT VEHICULAR TRIPS TO ALTERNATE MODES

TLU 3.4: Transit Incentives

**Measure Description:** Provide public transit incentives such as free or low-cost monthly transit passes to achieve higher use of transportation alternatives, including provision of parking “cash-out” options.

Providing transit incentives to the community for carpooling or using alternative forms of transportation will reduce the number of residents making single-occupant vehicle trips to and from work. Such actions do not necessarily require a large investment from the City. Through this measure, the City will leverage existing commuting programs and provide new incentives as appropriate while undertaking cost-effective incentives to encourage higher levels of public transit ridership.

This measure assumes that by 2020 the City will take action to divert approximately 2,000 new vehicle trips by 2020, or 354,000 vehicle miles traveled from single-occupant vehicle use to public transportation or another alternative transit option. The City can achieve this by offering a $2 dollar per workday transit subsidy for participants. Through ongoing monitoring of implementation of the Climate Action Plan, the City will determine the most effective approach to achieve these VMT reductions and revise strategies as appropriate.

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<tr>
<td>B</td>
<td>Short Term (1–2 years)</td>
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<tr>
<td>C</td>
<td>Medium Term (2-5 years)</td>
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</table>

GHG Reduction Potential:
-1,674 MT CO2e/yr

Community Percentage Reduction:
2%

Cost to City:
$5,000
Low

Private Cost:
$0
Low

Annual Cost Savings:
$4,000
CONVERT VEHICULAR TRIPS TO ALTERNATE MODES

TLU 3.5: BART Shuttles

**Measure Description:** Increase the frequency and range of BART shuttles.

The City will investigate the frequency of BART shuttles in order to support the projected ridership of BART for the target years. Residents of Walnut Creek already utilize the Pleasant Hill BART and Walnut Creek BART stations; however, this utilization alone does not lead to reductions in VMT. Many residents must drive and park at the BART station in order to benefit from its transit service. This measure quantifies the benefit of facilitating the use of BART without a car.

This measure captures increased BART ridership projected in the 2008 BART Station Profile Study, which will result from BART expansions and other initiatives outside of City control and responsibility. To further achieve this measure, the City will investigate expanding existing transit ridership programs to support expected increases in BART ridership. Existing programs to build on include the Free Ride shuttles program operated by the City. Beginning in 1990, Walnut Creek gave free rides to the “shappy shuttle.” Starting in 2005, the City utilized distinctive trolleys to offer free rides for passengers from the BART station to the Broadway Shopping Center.

Reductions achieved in this measure include such transit use, as it was reported by BART in its 2008 Station Profile Study.

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<tr>
<td>A</td>
<td>Monitor and support ridership levels of the Free Ride trolley and consider expanding the existing Free Ride Trolley route</td>
<td>Medium Term (2–5 years)</td>
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<td>B</td>
<td>Expand marketing campaign to inform and encourage downtown employees, residents, and visitors to utilize the BART shuttles</td>
<td>Short Term (1–2 years)</td>
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<td>C</td>
<td>Conduct a needs assessment to identify public transportation gaps throughout the community</td>
<td>Short Term (1–2 years)</td>
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**GHG Reduction Potential:**
-632 MT CO2e/yr

**Community Percentage Reduction:**
1%

**Cost to City:**
$6,000,000
High

**Private Cost:**
$515,000
Low-Mid

**Annual Cost Savings:**
$320,000
CONVERT VEHICULAR TRIPS TO OTHER TRANSIT

TLU 3.6: Safe Routes to School

Measure Description: Work with local schools to expand Safe Routes to Schools (SR2S) programs.

To actively promote walking as a safe mode of local travel, particularly for children attending local schools, the City will employ traffic calming methods such as median landscaping and provide bike or transit lanes to slow traffic, improve roadway capacity, and address safety issues.

According to 2000 census data, approximately 11,211 school-age children live in Walnut Creek (ages 6–18). Until a few decades ago, most grade-school students walked or bicycled to school. Now, only a small portion (typically about 20%) walk or bicycle to school in North American communities. Travel to school represents 10–15% of peak period motor vehicle trips in many urban areas. Chauffeuring children to school often results in two vehicle trips, one to the school and one returning home, or four additional trips per day. There are currently few detailed studies of the effectiveness of school transport management programs, but anecdotal evidence indicates that total reductions in automobile trips of 10–20% or more are possible at a particular school, and much greater reductions are possible when schools are sited and designed for good accessibility.

School transport management can provide financial savings to schools and parents, help reduce parking and traffic problems, reduce pollution, and provide safety and health benefits.

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CONVERT VEHICULAR TRIPS TO OTHER TRANSIT

TLU 3.7: Parking Management

**Measure Description:** Implement and maintain a comprehensive Parking Management Plan to divert vehicle trips to alternative modes.

Parking management seeks to reduce unnecessary vehicle trips through strategies such as parking pricing. By reducing vehicle trips, effective parking management strategies can reduce vehicle trips and local vehicle miles traveled. The City of Walnut Creek has studied and identified strategies to achieve optimal parking levels throughout the community. Parking pricing not only reduces VMT but is an effective strategy to support local in-demand businesses by ensuring the availability of parking. Through the work of the Downtown Parking Task Force and the Council approved Parking Management Plan, the City identified a desired occupancy rate of 85% for the City’s three paid parking zones (1,500 spaces).

The City of Walnut Creek identified several strategies to achieve desired parking space occupancy rates. This measure assumes that by 2020 parking pricing will be raised for each zone to achieve the 85% occupancy. The City will implement this measure as follows:

- Improve the effective utilization of the City-owned parking garages and identify opportunities to enhance the garage user experience.
- Develop policies and programs to encourage employees working in the Core Area to park in underutilized parking areas.
- Identify and utilize opportunities to use technology, pricing, and occupancy management tools to effectively manage the City’s downtown parking inventory.
- Communicate and strategize parking policies with all stakeholders.

In addition to GHG reductions, the measure also promotes a healthful lifestyle and reduced commuting costs for individuals and alleviates traffic congestion and improves local air quality.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>Medium Term (2–5 years)</td>
<td>CMO</td>
</tr>
<tr>
<td>Increase parking costs for City parking spots to reduce vehicle trips: $2.50/hour in Zone 1, $1.25/hour in Zone 2, and $1.00/hour in Zone 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Ongoing</td>
<td>CMO</td>
</tr>
<tr>
<td>Monitor and modify parking costs as appropriate to achieve 85% parking spot occupancy</td>
<td></td>
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</tbody>
</table>

**GHG Reduction Potential:**
-4,845 MT CO2e/yr

**Community Percentage Reduction:**
5%

**Cost to City:**
$0
Low

**Private Cost:**
$45,000
Low

**Annual Cost Savings:**
$2,500,000
WASTE REDUCTION (WR)

Waste-related GHG emissions result from product consumption and disposal, and from pre-consumer commercial and industrial processes. As solid waste decomposes in landfills, methane is released into the atmosphere. Methane has a climate warming potential 21 times that of carbon dioxide. Additionally, extracting and processing raw materials for consumer products, distributing them to consumers and disposing of them, represents a large portion of global GHG emissions.

Presently, most waste reduction practices focus on diverting waste products from landfills through recycling strategies. However, it is also important to consider programs that reduce overall waste generation, and to first consider reuse options.

Personal choices regarding products, packaging, and consumption determine personal contributions to community waste streams. Lowering overall consumption and buying more environmentally-friendly, durable products with minimal packaging can reduce waste generation and GHG reductions.

This section includes strategies to decrease waste production and increase waste diversion, including regulating waste production, providing composting and recycling programs, and creating education and outreach campaigns. Specific actions include partnering with the Contra Costa County Solid Waste Authority to ban the use of plastic bags and polystyrene foam containers, developing a commercial construction debris diversion program, and promoting the expansion of the City’s food scrap composting program.

GHG Reduction Potential

6,152 MT CO₂e
2% of total GHG Reductions
ZERO WASTE POLICY

WR 1.1: Zero Waste

Measure Description: Reduce landfilled waste and increase promotion of recycling and composting through an expanded public education campaign, community-wide incentives, and continued partnership with the Bay Area’s Green Business Program.

Walnut Creek’s last solid waste contract was adopted in 2005 and will remain in effect until 2015. To implement this measure, the City will work with the Central Contra Costa Solid Waste Authority (CCCSWA) to negotiate new franchise agreements. These agreements will include terms that will require haulers to initiate a publicity program to advertise recycling and composting programs. The City is also working with the Contra Costa Solid Waste Authority to implement a new composting program that is available to commercial and residential customers, diverting approximately 900 tons of food waste from the landfill in 2010.

The City will work with waste providers to expand composting and recycling services to multi-family and commercial customers throughout the City in effort to increase the City’s waste diversion rate. The City will also promote participation in regional and statewide waste prevention and recovery efforts to minimize costs to the City and maximize the effectiveness of programs. Potential opportunities for collaboration and leveraging of resources include creation a county-wide plastic bag ban, state-level product stewardship legislation, and development of local end-uses for recycled material. Additional waste reduction and recycling promotion that the City will implement includes the following:

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Medium Term (2–5 Years)</td>
<td>PS</td>
</tr>
<tr>
<td>B</td>
<td>Short Term (1–2 years)</td>
<td>CDD, PS</td>
</tr>
<tr>
<td>C</td>
<td>Medium Term (2–5 years)</td>
<td>CDD</td>
</tr>
<tr>
<td>D</td>
<td>Ongoing</td>
<td>CDD, PS</td>
</tr>
<tr>
<td>E</td>
<td>Medium Term (2–5 years)</td>
<td>CDD, PS</td>
</tr>
<tr>
<td>F</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
<tr>
<td>G</td>
<td>Short Term (1–2 years)</td>
<td>PS</td>
</tr>
<tr>
<td>H</td>
<td>Ongoing</td>
<td>PS</td>
</tr>
<tr>
<td>I</td>
<td>Short Term (1-2 Years)</td>
<td>PS</td>
</tr>
</tbody>
</table>

GHG Reduction Potential: -6,152 MT CO2e/yr

Community Percentage Reduction: 6%

Cost to City: $0
Low

Private Cost: $2,000,000
Medium

Annual Cost Savings: $9,100,000
ENVIRONMENTALLY PREFERED PURCHASING (EPP)

Environmentally Preferable Purchasing (EPP) programs encourage businesses and residents to choose environmentally-friendly products and local goods and services. Green purchasing takes into account a life cycle evaluation and includes purchasing of goods and services that minimize environmental impacts, toxins, pollution and hazards to residents, businesses and the community.

By considering environmental impacts in public purchasing, local governments can limit unnecessary depletion of resources and energy through the purchase of local sustainable goods.

The goals and actions included in this section focus on strategies that encourage residents and businesses to adopt more environmentally-friendly practices related to product consumption and in the delivery of goods and services. Specific actions include the development of marketing programs that promote the environmental and financial benefits of green business practices, as well as measures that encourage local food production and distribution to reduce energy use related to transporting goods. As supportive measures, the reductions resulting from the actions outlined in this section are already accounted for in other community measures.
PROMOTE PURCHASING LOCAL GOODS AND SERVICES

EPP 1.1: Green Businesses

**Measure Description:** Investigate local partnerships or creation of a forum to promote and equip local green businesses (for example, through the Chamber of Commerce).

To date, the City has initiated a partnership with the Walnut Creek Chamber of Commerce on the “Green Minded” campaign to encourage and ferment green initiatives of the private sector. Such an approach is important to the overall economic prosperity of the City. Green business products and practices are desirable for numerous reasons. They are more environmentally responsible, yet are also becoming more marketable and in demand. Consumers are searching for green products and businesses, and provide an eager market demographic. Further, green business practices are in the long-term interest of Walnut Creek’s businesses. By implementing energy-efficient technologies, businesses can cut down on operating costs.

Many businesses in Walnut Creek are already working toward this end; businesses as diverse as dentists and day care providers are working to minimize environmental impacts and make a positive contribution to the community through proactive green efforts. The City recognizes that it will not be working to supplant such initiative, but rather to encourage and equip it.

The City will continue to investigate local partnerships and look for additional ways to facilitate private sector initiatives for green business. In so doing, it will provide additional green marketing advantages for the private sector while helping them to reduce operating costs. This approach is integral to the long-term success of private industry in Walnut Creek throughout the 21st century. Possible actions include:

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create a Bay Area Green Business Directory on the City’s website</td>
<td>Short Term (1–2 years)</td>
<td>EDD, PS</td>
</tr>
<tr>
<td>Develop and advertise a list of resources and tools for local businesses interested in implementing EPP practices</td>
<td>Short Term (1–2 years)</td>
<td>EDD, PS</td>
</tr>
<tr>
<td>Establish quarterly meeting in collaboration with the Chamber of Commerce and DBA to share EPP tips and ideas</td>
<td>Short Term (1–2 years)</td>
<td>EDD, PS</td>
</tr>
<tr>
<td>Partner with the Chamber of Commerce and Downtown Business Association to create a Green Business tour and marketing program</td>
<td>Short Term (1–2 years)</td>
<td>EDD, PS</td>
</tr>
</tbody>
</table>

**SUPPORTIVE MEASURE**

Cost to City: 
*Low*

Private Cost: 
*Low*
SUPPORTIVE MEASURE

Cost to City: Low

Private Cost: Low

GREEN LIFESTYLE FOR RESIDENTS

EPP 2.1: Going Green

Measure Description: Continue and expand the efforts of the City’s Going Green Initiatives.

The City Manager’s office hosted a one-time “Going Green Together” event in October 2007. This was a proactive outreach effort to engage the community in visioning how to achieve a sustainable community that supports the lifestyles of all of Walnut Creek’s diverse residents. At this event, participants addressed residential, commercial energy use, transportation, and waste.

In addition, the City has provided ongoing supportive information for residents, both in articles in its regular newsletter, The Nutshell, and though Web resources. “Going Green” web pages are provided on the City website to support residents and businesses in sustainability. These pages provide information on green buildings, alternative transportation, water conservation, waste, climate change, energy efficiency, and greenhouse gas emissions. The website supplements these resources with biographies of Walnut Creek residents who are doing their part in reducing energy use and demonstrating exemplary environmental stewardship. By linking resources with model stories of what sustainability means in day-to-day life, the City has taken an important step in making the ambiguous concept of sustainability more real, immediate, and achievable for residents.

The City recognizes that it plays an important role in equipping residents and business owners in making sense of individual roles, responsibilities, and opportunities for sustainability. Hence, this measure embodies such awareness and calls for the City to continue its ongoing support of locals trying to “go green.” While there is no specific reduction attached to this measure, it is intrinsically linked to other measures of this Climate Action Plan because it emphasizes the role of the individual.

<table>
<thead>
<tr>
<th>Action</th>
<th>Timetable</th>
<th>Responsibility</th>
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<tbody>
<tr>
<td>A Update and expand City’s existing sustainability website with up-to-date green initiatives</td>
<td>Short Term (1–2 years)</td>
<td>CMO, PS</td>
</tr>
<tr>
<td>B Continue to utilize City’s online social networking outlets and citywide newsletter for marketing green ideas, programs, and community events</td>
<td>Short Term (1–2 years)</td>
<td>CMO, PS</td>
</tr>
<tr>
<td>C Partner with regional sustainability groups to develop educational programs on green topics ranging from energy efficiency to urban farming</td>
<td>Short Term (1–2 years)</td>
<td>CMO, PS</td>
</tr>
</tbody>
</table>
GREEN LIFESTYLE FOR RESIDENTS

EPP 2.2: Urban Agriculture

*Measure Description:* Increase and encourage urban agriculture through incentives and streamlined application procedures.

Food choices have significant impacts on greenhouse gas emissions. Over 10% of total U.S. emissions are caused by the food system. By working to increase the productivity of local agriculture, the City will be facilitating the production of less carbon-intensive food and equipping residents to enjoy the benefits of local, fresh produce. This measure will not only lead to reductions in greenhouse gas emissions but will also encourage complete neighborhoods and a healthier community.

To implement this measure, the City will take the following steps:

- Establish partnerships with local healthcare, schools, and other organizations to promote healthy, low-carbon diets through such initiatives as the “Going Green” efforts. This will entail partnering to provide educational opportunities to give residents skills in gardening, animal husbandry, food preservation and cooking, and affordable, healthful eating.

- Conduct outreach and facilitate a local agricultural program, such as a community-garden, targeting a 10% participation rate of all households.

- Identify and implement strategies to encourage local food production and distribution through incentives and regulations established in the Zoning Ordinance. This will entail, at a minimum, removing barriers to residential agriculture and community-supported agriculture, allowing for the use of public and private land and rooftops for growing food, allow the option to plan edible landscaping in multi-family developments, and promoting the use of fruit and nut trees as options for planned tree plantings.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td>A</td>
<td>Ongoing</td>
<td>PS</td>
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<tr>
<td>B</td>
<td>Short Term (1–2 years)</td>
<td>CMO</td>
</tr>
<tr>
<td>C</td>
<td>Medium Term (2–5 years)</td>
<td>PS</td>
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</tbody>
</table>

4 (European Commission, 2006)
SUMMARY OF STATE-LED REDUCTIONS

The following are state-led reduction strategies included in the AB 32 Scoping Plan and accounted for in the City's adjustment of the business-as-usual forecast. To clarify, the State of California has approved, programmed, and/or adopted these actions. Furthermore, they are programs or projects that require no local involvement. Incorporating them into the forecast and reduction assessment provides a more accurate picture of future emissions growth and the responsibility and ability of local governments versus the state to reduce greenhouse gas emissions. These reductions are further summarized in Appendix 5.

Assembly Bill (AB 1493 (Pavley). Signed into law in 2002, AB 1493 requires carmakers to reduce GHG emissions from new passenger cars and light trucks beginning in 2011. Regulations were adopted by the California Air Resources Board (CARB) in 2004 and took effect in 2009 with the release of a waiver from the U.S. Environmental Protection Agency (EPA) granting California the right to implement the bill. CARB anticipates that the Pavley standards will reduce GHG emissions from new California passenger vehicles by about 22% in 2012 and about 30% in 2016, all while improving fuel efficiency and reducing motorists' costs. Based on analysis of local VMT and EMFAC 2007, the Pavley standards will result in a 17% decrease in transportation related GHG emissions in Walnut Creek by 2020 and a 27% decrease by 2030.

Renewable Portfolio Standard (RPS). The RPS program requires electricity providers to increase the portion of energy that comes from renewable sources to 20% by 2010 and to 33% by 2020. Assembly Bill 1493 (Pavley), signed into law in 2002, requires carmakers to reduce greenhouse gas emissions from new passenger cars and light trucks beginning in 2011. The California Air Resources Board (CARB) adopted regulations in September 2004 that create two phases of increasingly stringent standards for car manufacturers between 2009 and 2020. It is expected that new vehicles sold in California will create an average of 16% fewer greenhouse gas emissions than current models.

Title 24 Standards. State reductions account for the net energy benefit of new Title 24 requirements that did not exist in the baseline year. These estimates are based on California Energy Commission studies that compare each new update of Title 24 to its former version. The AB 32 Scoping Plan calls for ongoing triennial updates to Title 24 that will yield regular increases in the mandatory energy and water savings for new construction. State reductions account for a conservative estimate of the energy and water reductions due to future updates of Title 24 based on historic growth rates.

California Solar Initiative (CSI). The California Solar Initiative (CSI) was authorized in 2006 under Senate Bill (SB) 1 and allows the California Public Utilities Commission (CPUC) to provide incentives to install solar technology on existing residential, commercial, nonprofit, and governmental buildings. The CPUC provides complete solar installation data for each jurisdiction in California since 2006. GHG reductions related to the California Solar Initiative are incorporated into this Plan by identifying the total megawatts (MW) installed in Walnut Creek since the start of the program and estimating the annual kWh output of the solar installations, based on new installations since the year of 2010. This calculation also estimates the rate at which residents and businesses will continue to install solar equipment through 2016, the anticipated end year of the program.

Other state initiatives such as funding mechanisms and loan programs are not included in these state reductions. Rather, they are included within the local reductions because of the need for or requirement for local government implementation or contribution to the effort.
CITY OF
WALNUT CREEK
CLIMATE ACTION PLAN
Works Cited


City Car Share. Bringing Car-Sharing to your Community.


Appendix 1
General Plan Goals and Policies Related to the Climate Action Plan

Below is a list of relevant General Plan 2025 goals and policies that explicitly relate to this Climate Action Plan’s emission reduction measures. These policies and actions both influenced and supported the Climate Action Plan emission reduction measure development process.

The policies and actions below are listed by General Plan policy or action number. For full text related to these policies and actions, please refer to the City of Walnut Creek General Plan 2025, available on the City’s website at: http://www.walnut-creek.org/citygov/depts/cd/planninggp_2025.asp.

2.2 Cooperate with East Bay Regional Parks and other jurisdictions to improve connections to regional trails.

2.2.1 Improve signage and displays along regional trails to provide better way finding and to direct users to convenient rest areas and other facilities.

2.3 Promote the safety of bicyclists, pedestrians, and equestrians.

3.1 Create opportunities for mixed-use developments.

3.1.1 Encourage mixed-use development at and near the Walnut Creek and Pleasant Hill BART Stations.

4.1 Plan for a full complement of interconnected trails and paths for walkers, joggers, bicyclists, and equestrians, from the regional trails to downtown trails and paths.

4.1.1 Work with the County, the East Bay Regional Park District, and other agencies to develop trail links between residential areas and parks, creeks, transportation, schools, open space, shopping, and various public facilities.

4.1.3 Complete bicycle and pedestrian trail linkages, including the following:

- In the Pleasant Hill and Walnut Creek BART areas
- From Heather Farm Park to John Muir Medical Center
- Along the Iron Horse Regional Trail near the Sugarloaf Open Space, downtown, Las Lomas High School and Walden Park.

4.1.4 Use existing easements and creeks for trail links to neighborhoods.

5.1 Promote bicycle use as an alternative way to get to work, school, shopping, recreational facilities, and transit stops.

5.1.4 Periodically update and distribute a map identifying bikeways in the city and environs.

5.1.5 Pursue grants for construction and development of new and improved bicycle facilities.

5.2 Provide facilities that encourage and support bicycle travel.
5.2.1 Require appropriate bicycle-related improvements as a condition of site development, design review, subdivision, or building permit approval and for all City street-widening projects.

5.2.3 Improve signalized intersections for bicyclist use along highly traveled bicycle corridors.

5.2.4 Provide bicycle racks and other bike storage facilities at key high-use public locations.

5.2.5 Working with local school districts, plan safe, pleasant, and attractive bicycle routes to school and organize programs that promote bicycling.

5.2.7 Revise design guidelines to require, where appropriate, new projects to provide weather-protected, safe bike parking and/or storage facilities and other bicycle-friendly amenities.

5.2.8 Revise design guidelines to encourage the installation of shower facilities in large, new office developments.

5.3 Oppose the use of motorized transportation (trains, buses, autos, motorcycles) on the Iron Horse Corridor between the Pleasant Hill BART station and Newell Avenue.

6.1 Provide safe and attractive pedestrian routes along arterials and collectors leading to schools, along arterials or collectors that carry high traffic volumes, on all downtown streets, along major streets leading to the downtown, and on all streets leading to transit facilities.

6.1.2 Working with local school districts, plan safe and attractive pedestrian routes to schools, and organize programs that promote walking.

6.1.4 Eliminate “gaps” in sidewalks/walkways and support the additional connections to regional trails and trailheads.

6.1.5 Provide improved pedestrian facilities via grants and assistance to residents in forming assessment districts.

6.2.1 In the Pedestrian Retail District, require pedestrian-oriented uses at street level.

6.2.2 Promote building layouts and designs that create pedestrian interest and encourage people to “park once and walk”.

6.4.1 Encourage diverse housing options, including mixed-use, higher-density developments.

7.2 Encourage improvements to transit systems that connect Walnut Creek residents to regional locations.

7.3 Link high-density residential developments, schools, employment centers, and shopping areas via transit.

7.3.1 Work with the Central Contra Costa Transit Authority (CCCTA) to ensure frequent, peak-hour transit services, including express bus, to Walnut Creek schools, employment and activity centers, and park-and-ride lots.

7.5.4 Require, where appropriate, that new developments provide transit amenities as a condition of project approval.

8.1 Provide, monitor, and continuously improve a coordinated set of convenient, efficient transportation alternatives for those who would otherwise drive alone, including employees and school children of driving age.

8.5 Link high-density residential developments, employment centers, and shopping areas via transit, bikeways, and walkways.

9.2.1 Convert selected streets to temporary pedestrian-only use on a regularly scheduled basis.

9.2.2 Establish a trail connection that links BART to Mt. Diablo Boulevard and the Pedestrian Retail District (similar to the one identified in the 2002 Shaping Our Future workshop).

10.1 Link existing and planned bikeways in and through downtown.

10.1.1 Apply land use designations that encourage transit-oriented development around the BART stations and in the Core Area.

12.1.1 Review the use of park-and-ride lots to maximize use.

12.1.2 Update the transportation systems management (TSM) ordinance or resolution, as needed.
12.1.3 Encourage transportation demand management (TDM) programs in new development.

12.2.1 Adopt a voter approved Urban Limit Line, either as mutually voted on countywide or relating solely to Walnut Creek.

15.1 Encourage new development that optimizes both interconnecting street layouts within a neighborhood or residential subdivision and street and walkway/bikeway connections to surrounding neighborhoods and nearby commercial areas.

15.1.1 In new development where street connections are possible, encourage both street and walkway/bikeway connections and discourage use of cul-de-sacs.

21.1.1 Revise City Design Review Guidelines to encourage developers to include the following features in the development of new and the redevelopment of existing shopping centers:

- Pedestrian walkways and bikeway connections that create safe paths of travel through the shopping center and parking, and to transit and nearby sidewalks
- Attractive and convenient bicycle parking
- Orientation of buildings to transit facilities, where applicable

23.3.1 Work with the County toward ensuring that development of the Pleasant Hill BART station area is compatible with and accessible to adjacent areas within the incorporated city.

26.2 Incorporate natural features such as trees, hillsides, and rock outcroppings into new development.

26.3 Preserve and add to the city’s tree canopy.

26.4 Protect tree resources on public and private property.

26.5.1 Assess the effectiveness and efficiency of, and if necessary modify, the City’s Tree Preservation Ordinance.

26.5.2 Plan for the replacement of trees that have been removed.

26.5.3 Set standards for — and require new developments to have — adequate tree canopy

26.7.1 Consider adopting a “dark sky ordinance” aimed at reducing light spillage both upward and onto adjoining properties.

27.1.1 Develop incentives to use green building techniques.

27.1.1 Consider adding an energy audit requirement to the City’s review processes.

27.1.2 Consider adding an energy-audit requirement to the City’s review process.

27.1.2 Explore incentives to use green building techniques.

28.1 Implement energy conservation measures in City facilities and operations.

28.1.1 Conduct an energy audit of all City activities and functions.

28.2 Promote energy conservation throughout the city.

28.2.1 Adopt residential and commercial energy-conservation ordinances.

28.2.2 Adopt a solar-access ordinance.

28.2.3 Develop incentives to help small businesses become more energy efficient.

28.2.4 Develop incentives for new development or substantial redevelopment to incorporate energy conservation.

29.2.1 Explore possibilities for safe and effective use of reclaimed or recycled water consistent with State law (e.g., for landscape irrigation and toilet flushing in commercial buildings).

29.2.4 Follow existing standards and guidelines for water-conserving landscaping, and encourage the planting of native and drought-tolerant plants.

30.1.1 Implement source-reduction and waste-diversion programs within City government.

30.1.2 Give preference to recycled content and environmentally friendly products in City procurement.

30.2.1 Locally implement the State’s 1993 Source Reduction and Recycling Element.

30.2.2 Consider adopting a comprehensive source-reduction and recycling plan specific to Walnut Creek.
30.2.3 Promote and participate in residential and commercial waste prevention and diversion programs.

30.2.4 Make recycling convenient for small businesses.

30.2.5 Develop size, location, and design standards for commercial and multifamily trash and recycling facilities and enclosures.

30.2.6 Consider an ordinance requiring businesses and multifamily dwellings to participate in recycling and waste-reduction programs.

30.2.7 Require the recycling of construction waste for all City and private projects.

30.2.8 Encourage shared recycling facilities among businesses, especially those with limited space, for example, within the Core Area.

30.2.9 Provide accessible disposal containers, including recycling containers, at appropriate locations downtown and at City public facilities and parks.

30.3.1 Work with waste management companies to institute curbside residential organic waste-collection programs.

30.3.2 Encourage restaurants to recycle organic waste.

31.1.1 Support local transportation control measures (TCMs) and other ideas in the latest Bay Area Clean Air Plan.

31.1.2 Develop a local, voluntary Clean Air Plan.

31.1.3 Participate in the BAAQMD Spare the Air program.

31.2.1 Review parking lot landscaping requirements to ensure adequate width and depth to allow for appropriate tree canopy.

31.2.2 Investigate policies that promote cleaner air, such as commercial reflective roofing ordinances.

31.2.3 Promote residential development and redevelopment opportunities near transit and commercial centers, and encourage walking, bicycling, and transit use.

31.3.2 Adopt a wood smoke ordinance.
# Appendix 2

## Quantification of Costs and Reductions of Municipal Measures

**Table A2-1. Detailed Reductions by Measure**

### Buildings Energy Use Reduction Measures

### Municipal Green Building Policy

<table>
<thead>
<tr>
<th>Sector</th>
<th>Area</th>
<th>Measure</th>
<th>Title</th>
<th>Description</th>
<th>Metric Tons CO2e</th>
<th>% of Goal Reduction</th>
<th>% of Total Reduction</th>
<th>$ City Cost</th>
<th>City Cost</th>
<th>$ Private Cost</th>
<th>Private Cost</th>
<th>Annual Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal</td>
<td>Building</td>
<td>B 1.1</td>
<td>Municipal Green Building Policy</td>
<td>Adopt a green building policy for new construction and major renovations of municipal facilities that exceeds current Title 24 energy standards to facilitate the continued implementation of municipal green building and establish the City as a leader in the community.</td>
<td>-93</td>
<td>6%</td>
<td>5%</td>
<td>$210,000</td>
<td>Medium</td>
<td>NA</td>
<td>NA</td>
<td>$45,000</td>
</tr>
</tbody>
</table>
### Appendix 2: Detailed Municipal Reductions by Measure

<table>
<thead>
<tr>
<th>Sector</th>
<th>Area</th>
<th>Measure</th>
<th>Title</th>
<th>Description</th>
<th>Metric Tons CO2e</th>
<th>% of Goal Reduction</th>
<th>% of Total Reduction</th>
<th>$ City Cost</th>
<th>City Cost</th>
<th>$ Private Cost</th>
<th>Private Cost</th>
<th>Annual Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal</td>
<td>Building</td>
<td>B 2.1</td>
<td>Municipal Energy Audits and Upgrades</td>
<td>Conduct energy audits of all City facilities, identify opportunities for energy savings, and implement recommended, cost-effective energy efficiency retrofit upgrades, including solar and tankless water heaters, and energy-efficient ventilation and air conditioning.</td>
<td>-143</td>
<td>10%</td>
<td>7%</td>
<td>$80,000</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$6,500</td>
</tr>
<tr>
<td>B 2: Conduct efficiency audits and implement energy/water efficiency retrofits to existing City facilities.</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Municipal</td>
<td>Building</td>
<td>B 2.2</td>
<td>Water-Conserving Equipment in Municipal Facilities</td>
<td>Install water-conserving equipment (e.g., faucets, high-efficiency toilets, and, if applicable, showerheads) in all City facilities.</td>
<td>-9</td>
<td>1%</td>
<td>0%</td>
<td>$0</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$0</td>
</tr>
<tr>
<td>Municipal</td>
<td>Building</td>
<td>B 2.3</td>
<td>Reflective Roofing on City Facilities</td>
<td>Install reflective roofing on select City facilities to reduce building energy (heating/cooling) consumption.</td>
<td>0</td>
<td>0%</td>
<td>0%</td>
<td>$500</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$500</td>
</tr>
<tr>
<td>B 3: Establish energy and water management and operations policies and practices for City facilities.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Municipal</td>
<td>Building</td>
<td>B 3.1</td>
<td>Loans for Energy Efficiency and Renewable Energy</td>
<td>Establish a reinvestment loan fund to cover first costs for energy efficiency/renewable energy projects at City facilities.</td>
<td>-753</td>
<td>52%</td>
<td>38%</td>
<td>$450,000</td>
<td>Medium</td>
<td>NA</td>
<td>NA</td>
<td>$350,000</td>
</tr>
<tr>
<td>Municipal</td>
<td>Building</td>
<td>B 3.2</td>
<td>Energy-Efficient Electronics</td>
<td>Replace in City facilities existing outdated electronic appliances and office equipment in favor of those that are more energy efficient.</td>
<td>-48</td>
<td>3%</td>
<td>2%</td>
<td>$15,000</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$9,000</td>
</tr>
<tr>
<td>Municipal</td>
<td>Building</td>
<td>B 3.3</td>
<td>Demand Response Programs</td>
<td>Participate in demand response programs.</td>
<td>-12</td>
<td>1%</td>
<td>1%</td>
<td>$4,000</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$48,000</td>
</tr>
</tbody>
</table>
## Appendix 2: Detailed Municipal Reductions by Measure

<table>
<thead>
<tr>
<th>Sector</th>
<th>Area</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Municipal</td>
<td>Building</td>
<td>B 3.4</td>
<td>Reduced Lighting Usage: Lights-Out Policy at City Facilities</td>
<td>Reduce lighting use by instituting a lights-out-at-night policy at City facilities where feasible.</td>
<td>-140</td>
<td>10%</td>
<td>7%</td>
<td>$0</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$30,000</td>
</tr>
<tr>
<td>Municipal</td>
<td>Building</td>
<td>B 3.5</td>
<td>Drought-Tolerant Landscaping at Municipal Facilities</td>
<td>Expand current energy-efficient and drought-tolerant landscaping practices at City facilities to exceed current levels.</td>
<td>-3</td>
<td>0%</td>
<td>0%</td>
<td>$0</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$0</td>
</tr>
<tr>
<td>Municipal</td>
<td>Building</td>
<td>B 3.6</td>
<td>Expand Tree Cover at Municipal Facilities</td>
<td>Reduce energy use by planting trees to shade City facilities where feasible.</td>
<td>-6</td>
<td>0%</td>
<td>0%</td>
<td>$6,000</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$1,000</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>B 4: Consider clean energy alternatives for City facilities and operations.</strong></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Municipal</td>
<td>Building</td>
<td>B 4.1</td>
<td>Solar Electric Arrays</td>
<td>Conduct a solar feasibility study and install solar electric (PV) arrays at/on appropriate City facilities, and identify additional opportunities for increasing renewable energy systems, including wind energy generation.</td>
<td>-244</td>
<td>17%</td>
<td>12%</td>
<td>$6,000,000</td>
<td>Medium</td>
<td>NA</td>
<td>NA</td>
<td>$200,000</td>
</tr>
<tr>
<td>Municipal</td>
<td>Building</td>
<td>B 4.2</td>
<td>Solar Water Heating</td>
<td>Install solar water heating at/on appropriate City facilities.</td>
<td>-2</td>
<td>0%</td>
<td>0%</td>
<td>$12,000</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>S 1: Implement energy management and operations practices for City-owned streetlights.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Municipal</td>
<td>Streetlights</td>
<td>S 1.1</td>
<td>High-Efficiency Streetlights</td>
<td>Replace low-efficiency streetlights with high-efficiency light-emitting diode (LED) fixtures as funding becomes available.</td>
<td>-134</td>
<td>100%</td>
<td>7%</td>
<td>$350,000</td>
<td>Medium</td>
<td>NA</td>
<td>NA</td>
<td>$80,000</td>
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## Appendix 2: Detailed Municipal Reductions by Measure

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</thead>
<tbody>
<tr>
<td>Municipal</td>
<td>Waste Reduction</td>
<td>MWR 1.1</td>
<td>Waste Prevention</td>
<td>Require waste prevention in day-to-day operations (e.g., two-sided copying, reduced paper requirements) in all City facilities.</td>
<td>-6</td>
<td>79%</td>
<td>0%</td>
<td>$0</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$3,000</td>
</tr>
<tr>
<td>Municipal</td>
<td>Waste Reduction</td>
<td>MWR 2.1</td>
<td>Expand Recycling Programs</td>
<td>Expand City Hall, Police Station, and City parks recycling programs into all City facilities.</td>
<td>-1</td>
<td>21%</td>
<td>0%</td>
<td>$0</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$0</td>
</tr>
<tr>
<td>Municipal</td>
<td>Transportation</td>
<td>MT 1.1</td>
<td>Purchase of Alternative Fuel/Fuel-Efficient Vehicles</td>
<td>Require the purchase of alternative fuel and/or fuel-efficient vehicles.</td>
<td>-158</td>
<td>47%</td>
<td>8%</td>
<td>$100,000</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$18,000</td>
</tr>
<tr>
<td>Municipal</td>
<td>Transportation</td>
<td>MT 2.1</td>
<td>Reduce Fleet Size</td>
<td>Reduce fleet size (i.e., total number of vehicles) by retiring older and underused vehicles.</td>
<td>-91</td>
<td>27%</td>
<td>5%</td>
<td>$0</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$25,000</td>
</tr>
<tr>
<td>Municipal</td>
<td>Transportation</td>
<td>MT 2.2</td>
<td>Reduce Idling</td>
<td>Institute a policy to limit idling of City fleet vehicles.</td>
<td>-43</td>
<td>13%</td>
<td>2%</td>
<td>$0</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$12,000</td>
</tr>
<tr>
<td>Municipal</td>
<td>Transportation</td>
<td>MT 2.3</td>
<td>Fleet Maintenance</td>
<td>Implement a maintenance regime for increased efficiency for City vehicles (e.g., regularly check tire pressure).</td>
<td>-39</td>
<td>12%</td>
<td>2%</td>
<td>$0</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$11,000</td>
</tr>
<tr>
<td>Municipal</td>
<td>Transportation</td>
<td>MT 2.4</td>
<td>Scheduling &amp; Routing Efficiency</td>
<td>Improve scheduling and route efficiency for using City vehicles.</td>
<td>0</td>
<td>0%</td>
<td>0%</td>
<td>$0</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$10,000</td>
</tr>
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## Appendix 2: Detailed Municipal Reductions by Measure

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</thead>
<tbody>
<tr>
<td>Municipal</td>
<td>Transportation</td>
<td>MT 3.1</td>
<td>Municipal Commuter Programs</td>
<td>Implement incentive programs to reduce municipal employee commute (e.g., parking cash-out, telecommute, bike checkout).</td>
<td>-3</td>
<td>1%</td>
<td>0%</td>
<td>$0</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$0</td>
</tr>
<tr>
<td>Municipal</td>
<td>Transportation</td>
<td>MT 3.2</td>
<td>Municipal Bicycle Program</td>
<td>Provide bicycles for daily trips for City employees.</td>
<td>0</td>
<td>0%</td>
<td>0%</td>
<td>$2,500</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>Less than $100</td>
</tr>
<tr>
<td>Municipal</td>
<td>Education</td>
<td>MEO 1.1</td>
<td>Employee Education</td>
<td>Conduct workplace sustainability education programs with City employees focused on energy/water conservation, waste reduction/diversion practices, and transportation/commute alternatives.</td>
<td>-36</td>
<td>100%</td>
<td>2%</td>
<td>$0</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$36,000</td>
</tr>
</tbody>
</table>

**MEPP 1: Expand City environmentally preferred purchasing (EPP) efforts.**

<table>
<thead>
<tr>
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<th>Annual Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Municipal</td>
<td>Purchasing</td>
<td>MEPP 1.1</td>
<td>Expand Environmentally Preferable Purchasing</td>
<td>Create and implement environmentally preferable purchasing (EPP) categories and practices in City facilities.</td>
<td></td>
<td></td>
<td></td>
<td>$0</td>
<td>Low</td>
<td>NA</td>
<td>NA</td>
<td>$0</td>
</tr>
</tbody>
</table>

*Installation of water-efficient equipment measure and energy-efficient/drought-tolerant landscaping measure provided here are information items only. Emissions reductions from these measures are not included in the “Subtotal” or “Total Change” table above.*
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**TECHNICAL SUMMARY OF QUANTIFICATION OF REDUCTION MEASURES**¹

**B 1: INTEGRATE ENERGY EFFICIENCY AND OTHER GREEN BUILDING PRACTICES INTO NEW CITY FACILITIES**

**Measure B 1.1: Municipal Green Building Policy**

**Implementation Cost:**


For 2010, increased green building cost is based on Walnut Creek’s City Hall and a new LEED-certified downtown library. The City is currently looking into the feasibility of having the City Hall certified as LEED. New library size: 42,000 square feet (Source: http://www.walnut-creek.org/about/qualitylife/libraries/dlp/default.asp).


**Energy Reductions:**

For 2010, energy savings and GHG emissions reduction are based on the City’s City Hall and a new LEED-certified downtown library. The City is currently looking into the feasibility of having the City Hall certified as LEED.

Assumes Tier 2 (30% above) for City facilities development 2020–2030.

Assumes all growth in natural gas and electricity sectors is from new construction.

**B 2: CONDUCT EFFICIENCY AUDITS AND IMPLEMENT ENERGY/WATER EFFICIENCY RETROSETS TO EXISTING CITY FACILITIES**

**Measure B2.1: Municipal Energy Audits and Upgrades**

**Implementation Cost:**


Typical new construction building’s annual energy use per square foot is 17.3 kWh for electricity and 0.33 therms for natural gas. (Source: ICLEI’s CAPPA Beta Version2. Calculated from Tables3.1.4 and3.1.8, 2008 Building Energy Databook. DOE. March 2009. http://buildingsdatabook.eren.doe.gov/docs%5CDataBooks%5C2008_BEDB_Updated.pdf)


¹ Excludes supportive measures that do not result in GHG reductions for the City (e.g., MEO 1.1).
2010 energy/GHG savings based on City data on seven projects: Tice Valley Gym lighting retrofit, Ceramics Studio EE upgrades, Network-Based Power Management, City Hall server virtualization, Panologic Thin Clients, retro-commissioning of City Hall/Police Department, City Hall CFL switchout. (See calculations below.)

- **Tice Valley Gym**: Retrofit costs $16,000–8,000 rebates.

- **Network-Based Power Management**: Implementation costs for 325 workstations (per City) at a cost of $25/license (Cost source: http://www.peoplesgasdelivery.com/business/DisplayESource.aspx?type=PA&page=PA_52)

- **Server Virtualization**: Costs assumed to be $2,500 x 3 servers. (Source: http://www.cites.illinois.edu/vmware/benefits.html)

- **Panologic Thin Clients**: Costs assumed to be $2,500 x 1 servers. (Source: http://www.cites.illinois.edu/vmware/benefits.html)

- **City Hall retro-commissioning**: $38,890. (Source: City-provided ABAG project agreement)

- **CFL switchout**: (Source: Amazon.com, CFL/conventional bulb pricing)

**Energy Reductions:**

- **Tice Gym**: From City retrofit work order (energy retrofit company). Four-lamp T5 fluorescent with wire guards. 108,326.4 kwh to 54,512.64.

- **Ceramics studio**: Electricity savings based on 20 4-foot T-12 to T-8 replacements (82w to 57w per bulb, 2 bulbs per lamp, x 8 hrs/day 5 days a week, 52 weeks a year). Wattages taken from ICLEI CAPPA - lighting retrofit measure.

- **Network-Based Power Management**: 325 desktops outfitted with NBPM software, estimated 200 kWh per workstation per year (Source: http://www.peoplesgasdelivery.com/business/DisplayESource.aspx?type=PA&page=PA_52)

- **Server Virtualization**: Old servers use 50 watts each (per City) each running 24/7. Replaced 30 servers with 3; savings = 50w x 30 units x 365 days x 24 hours - 50w x 3 units x 365 days x 24 hours.

- **Panologic Thin Clients**: Another server virtualization application - data from City 50 watts/unit, 18 units replaced with 1. Savings = 50w x 18 units x 365 days x 24 hours - 50w x 1 units x 365 days x 24 hours.

- **City Hall retro-commissioning**: 233,888 kwh, 7,010 therms. (Source: City-provided ABAG project agreement)

- **CFL switchout**: Per City 110 75-watt incandescent floods replaced with Par-30 CFL; 134 can lights (75-watt incandescent) replaced with Par-38 CFL, 28 75-watt incandescent replaced with PAR-38 dimmables.

**Measure B 2.2: Water-Conserving Equipment in Municipal Facilities**

**Implementation Cost:**

Total cost is based on $8/faucet, $539/toilet, and $29/showerhead.

- **Faucet**: Middle of $5–$10 range. (Source: http://www.eartheasy.com/live_lowflow_aerators.htm)


Water cost savings are based on $0.001/gallon.

Energy cost savings are based on $0.13/kWh for electricity and $1.069/therm for natural gas.

Cost savings for water are from water savings only. Cost of electricity is included in cost of water, so is not calculated separately.
**Energy Reductions:**

**Faucets and Showerheads:**


- Energy use to heat gallon of water: 0.19 kWh. (Source: ICLEI's CAPPA Beta Version 2)
  Calculated from 8.3 lbs/gallon x 1 Btu/lb*F x (120 F hot water - 55 F cold water) x 1 therm/100,000 Btu/0.55 gas water heater energy factor.

- U.S. average temperature for 2006. Water supply typically travels through underground pipes where temperature is approximately local annual average temperature. (Energy factor source: http://www.eere.energy.gov/buildings/info/components/waterheating/conventional.html)
  Middle of 0.5–0.6 range. Energy factor is a measure of the overall efficiency of water heaters, including energy losses from the tank.

- Energy use to heat gallon of water: 0.0098 therms. (Source: ICLEI's CAPPA Beta Version 2) See details of assumptions above to heat a gallon of water.

- Water is heating 100% by natural gas and 0% by electricity.

**Toilets:**

- Energy use per gallon of water: 0.0054 kWh. Energy use for pumping, treatment, and wastewater treatment. Value is for indoor water use in Northern California (indoor water use requires energy to both supply water and to treat wastewater). (Source: ICLEI's CAPPA Beta Version 2; California Energy Commission. 2006. Refining Estimates of Water Related Energy Use in California. Table ES-1)

**Water Reductions:**

**Faucets:**


**Toilets:**


- Gallons per flush saved per toilet: 3.05 gallons. Based on the fact that many older toilets use 3.5–5 gallons of water per flush, and newer high efficiency toilets from Kohler or Caroma use far less (0.8–1.6 gallons). (Source: http://www.getwithgreen.com/2009/06/28/save-over-1-gallon-per-flush-high-efficiency-toilets-hetswork)

- Flushes per toilet per day: 21. Based on 30 flushes per toilet per day x 260 days per year = averages to 21 flushes per day. (Source: http://www.fypower.org/com/tools/products_results.html?id=10013-9)
Showerheads:


Measure B2.3: Reflective Roofing on City Facilities

Implementation Cost:

Incremental Cost of Energy Star Roofing ($ per square foot): $0.25. Based on traditional roof cost of $1.25 per square foot and reflective membrane cost of $1.50 per square foot. (Source: http://www.eoearth.org/article/Green_roofs)

Assumes 5% and 10% of City facilities’ rooftop space will be available for reflective roofs in 2020 and 2030, respectively. (Source: City of Walnut Creek)

Energy Reductions:

- Annual electricity savings per roof square foot (kWh): 0.790
- Annual natural gas use increase per square foot (therms): -0.0046.

(Based on default inputs from Energy Star Roofing calculator. Calculated using coefficients from Energy Star Roofing Calculator. Based on default inputs from Energy Star roofing calculator, which calculates savings based on local weather according to zip code: http://www.roofcalc.com/RoofCalcBuildingInput.aspx)

B 3: ESTABLISH ENERGY AND WATER MANAGEMENT AND OPERATIONS POLICIES AND PRACTICES FOR CITY FACILITIES

Measure B 3.1: Loans for Energy Efficiency and Renewable Energy

Implementation Cost:

This measure assumes the implementation year to be 2011 with an assumed $20,000 as initial seed funding. Based on $1.00 per square foot for retrofit cost, $20,000 initial seed funding equates to 200,000 projected square foot retrofit. (Source for $1.00 per square foot cost in retrofit: Murry, Barbra. Private CRE to Spur Energy Retrofit Market Over Next Few Years. http://login.vnuemedia.com/cpn/business-specialties/Private-CRE-to-Spur-Energy-Retrofit-Market-Over-Next-Few-Years-1473.shtml)

Assumes an allocation of 65% of cost savings from implemented energy efficiency retrofit projects is reinvested into revolving funding, and an annual $100,000 cap placed on available funding/retrofit cost for energy efficiency projects.


Energy Reductions:

Typical new construction building’s annual energy use per square foot is 17.3 kWh for electricity and 0.33 therms for natural gas. (Source: ICLEI’s CAPPA Beta Version2. Calculated from Tables 3.1.4 and 3.1.8, 2008 Building Energy Databook. DOE. March 2009. http://buildingsdatabook.eren.doe.gov/docs%5CDataBooks%5C2008_BEDB_Updated.pdf)
Percentage electricity and natural gas savings from retrofit: 25%. Average of 29%, 30%, and 15% based on the following three references:

- City of Chicago has retrofitted three buildings, which are expected to have a 29% reduction on energy costs. (Source: http://www.clintonfoundation.org/what-we-do/clinton-climate-initiative/i/katie-mcclain-is-helping-an-entire-city-become-more-energy-efficient)


**Measure B 3.2: Energy-Efficient Electronics**

**Implementation Cost:**

Incremental cost refers to the difference of the cost of purchasing a non-energy-efficient appliance versus purchasing an energy-efficient appliance.

Computers (including monitors):

- Computers here include monitors. But 2010 figures are for monitors only; the City has switched to EPEAT Silver standard for new monitor purchases. Incremental cost to purchase Energy Star monitors is $78 ($189 vs. $111 for conventional monitors). (Source: http://www.energystar.gov/ia/products/power_mgt/LowCarbonITSavingsCalc.xls)

- 2020 and 2030 computer projections figures are for computers in general, which include monitors. Assumes incremental cost to purchase an Energy Star computer is $42 ($784 vs. $742).

Printers:


Copiers:


Water Heaters:


- Assumes 42% of water heaters are electric water heaters and the remainder natural gas. (Source: ICLEI’s CAPPA Beta Version2. 2001 Residential Energy Consumption Survey. 58.2 million households use NG from Table 1; 41.6 million households use electric from Table3. http://www.eia.doe.gov/emeu/recs/byfuels/2001/byfuels_2001.html#Natural%20Gas%20Consumption)

Water Coolers:

Source of number of appliances/equipment: Laura Peabody, City of Walnut Creek.

**Energy Reductions:**

**Computers (including monitors):**

- Computers here include monitors. 2010 figures are for monitors only; the City has switched to EPEAT Silver standard for new monitor purchases. Annual energy savings of one Energy Star monitor is 390 kWh (462 kWh vs 36kWh). This assumes going from one CRT monitor (non-flat panel) to an Energy Star qualified LCD with power management. City installed computer management power software to reduce energy consumption in 2008. (Source: [http://www.energystar.gov/ia/products/power_mgt/LowCarbonITSavingsCalc.xls](http://www.energystar.gov/ia/products/power_mgt/LowCarbonITSavingsCalc.xls))

- 2020 and 2030 computer projections figures are for computers in general, which include monitors. (Source: Energy Star calculator. [http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/Calc_computers.xls](http://www.energystar.gov/ia/business/bulk_purchasing/bpsavings_calc/Calc_computers.xls))

**Printers:**


**Copiers:**

- Percentage of copiers < 20 cpm: 33%
- Percentage of copiers 20–40 ppm: 34%
- Percentage of copiers >40 ppm: 33%

- Annual energy savings of one Energy Star copier <20 cpm (kWh): 12
- Annual energy savings of one Energy Star copier: 20–40 cpm (kWh): 358
- Annual energy savings of one Energy Star copier: >40 cpm (kWh): 2,084


**Water Heaters:**


  Based on replacing low-efficiency electric ($463/yr @$0.095/kWh = 4870kWh/yr) with electric heat pump ($190/yr @$0.095/kWh = 2000 kWh/yr)


  Based on replacing conventional gas storage ($350/yr @$1.40/therm = 250 therms/yr) with condensing gas storage ($244/yr @$1.40/therm = 174 therms/yr).

- Assumes 42% of water heaters are electric water heaters and the remainder natural gas water heaters. (Source: ICLEI’s CAPPA Beta Version2. 2001 Residential Energy Consumption Survey. 58.2 million households use NG from Table 1; 41.6 million households use electric from Table3. [http://www.eia.doe.gov/emeu/recs/byfuels/2001/byfuels_2001.html#Natural%20Gas%20Consumption](http://www.eia.doe.gov/emeu/recs/byfuels/2001/byfuels_2001.html#Natural%20Gas%20Consumption))

**Water Coolers:**

- Percentage of coolers producing hot/cold water: 50%
- Percentage of coolers producing cold water only: 50%
- Annual energy savings of one Energy Star hot/cold cooler (kWh): 361
- Annual energy savings of one Energy Star cold-only cooler (kWh): 47

Measure B 3.3: Demand Response Programs

Implementation Cost:

Automated Demand Response Program (ADRP):

- 91.6 kw, per Matt Huffaker, City of Walnut Creek. (only on 1 day in the year)

Scheduled Demand Response Program (SDRP):

- Growth in SLRP participation based on 0 in 2010, some amount in 2020, and 2030.
- SDRP incentive from PG&E ($/kwh): $0.10. The committed load reduction must be at least 15% of one’s average monthly demand or 100 kW, whichever is greater - $0.10/ kwh saved (Source: http://pge.com/mybusiness/energysavingsrebates/demandresponse/slrp/index.shtml)

Smart AC:

- Cost of installation is associated with cost for each programmable thermostat ($50/thermostat). (Source: Matt Huffaker, City of Walnut Creek)
- Number of thermostats installed: 50. (Source: Matt Huffaker, City of Walnut Creek)

Combined two programs – ADPR and SDRP:

- Multiplied participation amounts for each program x incentives and added to energy cost savings from kwh reductions (based on assumptions). 


Energy Reductions:

Smart AC:

- Average percentage savings per thermostat installed: 5%. Based on setting back the programmable thermostat by 5 degrees, which equates to about 5% savings. According to the U.S. Department of Energy’s energy-saving tips, one can save approximately 5% to 15% in heating bills by turning the thermostat back by about 10° to 15°, a savings of 1% for each degree, if the setback period is 8 hours long. (Source: http://www.energysavers.gov/your_home/space_heating Cooling/index.cfm/mytopic=12720)

Measure B 3.4: Reduced Lighting Use: Lights-Out Policy at City Facilities

Implementation Cost:

Assumes all applicable City facilities adopt the lights-out-at-night policy immediately.

Square feet w/lights-out-at-night policy source: City of Walnut Creek

Cost of implementation ($ per square foot): $0.06. Watt stopper 120/277 VAC, 60 Hz automatic wall switch w/plate $39.99, covers 900 square feet. Assumes 1/2 hour labor to install @ $25/hour. Total cost $52.50/900 square feet. (Source: ICLEI’s CAPPA Beta Version2. http://www.westsidewholesale.com/index.cgi?HN_SessionID=@@@@1203383159.5556@@@@&sort_order=sales&pid=10013&CATEGORY=511)

Energy Reductions:

Annual lighting energy use per square foot (kWh): 6.85. kWh/sq ft*yr calculated from data from U.S. Department of Energy Advanced Sensors and Controls for Building Applications: Market Assessment and Potential R&D Pathways, Table2.6. 2005.
APPENDIX 2


55 billion square feet of lit commercial building space in U.S. uses 3.9 quadrillion BTU/year primary energy for lighting, which equals 6.85 kWh/sq ft*yr. (Source: ICLEI’s CAPPA Beta Version 2)


Measure B 3.5: Drought-Tolerant Landscaping at Municipal Facilities

Implementation Cost:

Installation cost per acre of native seeded turf, average between low and high: $5,348. (Source: www.appliedeco.com/Projects/CostofNative.pdf)

Energy Reductions:


Measure B 3.6: Expand Tree Cover at Municipal Facilities

Implementation Cost:


In this calculation, it is assumed that the City will plant 25 shade trees near City facilities by 2020 and 50 trees by 2030.

Energy Reductions:

Annual energy savings of one mature tree (kWh): 204 kWh. (Source: SMUD’s Tree Benefit Estimator. http://www.appanet.org/treeben/calculate.asp)

Energy and CO2 (carbon sequestration) savings per tree from SMUD’s Tree Benefit Estimator. Inputs were 50% cooling load, Norway maple, 0–15 feet from house, 10-year-old tree. Savings for mature tree on west of house are 265 kWh/yr, on east 143 kWh/yr, or 204 kWh/yr average (trees on west and east sides give greatest energy savings). CO2 sequestration: 0.28 tons/yr/tree for east and west orientation.

B 4: CONSIDER CLEAN ENERGY ALTERNATIVES FOR CITY FACILITIES AND OPERATIONS

Measure B 4.1: Solar Electric Arrays

Implementation Cost:

1,068 kW projected solar PV system is based on City’s EECBG project and contractor agreements. The Solar Feasibility Study of municipal facilities produced through the award determined that installation of these panels could generate up to 1,374,412 kWh annually. Cost of the system is also based on 5–100kW system for $7,600/kW. (Cost of system source: Lawrence Berkeley National Laboratory. 2009. Tracking the Sun: The installed costs of photovoltaics in the U.S. from 1998–2007. http://eetd.lbl.gov/ea/emp/reports/lbnl-1516e.pdf)

Energy cost savings per year is based on amount of electricity that the City will be generating and using, and thus not buying from the utility power grid.

Energy Reductions:

Measure B 4.2: Solar Water Heating

Implementation Cost:

Cost of solar heater per daily gallon hot water use: $60. (Source: ICLEI’s CAPPA Beta Version 2)

Based on cost of home solar water heater, providing 50 gallons per day at $3,000 installed cost. (Source: Toolbase Services. http://www.toolbase.org/Technology-Inventory/Plumbing/solar-water-heaters; source for gallons of hot water per day: City of Walnut Creek)

Middle of $2,500–$3,500 range for active plate collectors. Collector technologies for colder climates are more complex and more expensive.

Energy Reductions:

Energy use per gallon (kWh): 0.19 kWh. (Source: ICLEI’s CAPPA Beta Version 2)

For electricity, calculated from 8.3 lbs/gallon x 1 Btu/lb*°F x (120 F hot water - 55 F cold water) x 1 kWh/3414 Btu/ 0.82 electric water heater energy factor.

For natural gas, calculated from 8.3 lbs/gallon x 1 Btu/lb*°F x (120 F hot water - 55 F cold water) x 1 therm/100,000 Btu/0.55 gas water heater energy factor.


(Cold water temp source: http://www.noaanews.noaa.gov/stories2007/s2772.htm

U.S. average temperature for 2006. Water supply typically travels through underground pipes where temperature is approximately local annual average temperature.)

Energy use per gallon of water: (source: http://www.eere.energy.gov/buildings/info/components/waterheating/conventional.html)

Middle of 0.7–0.95 range for electricity. Middle of 0.5–0.6 range for natural gas.

Energy factor is a measure of the overall efficiency of water heaters, including energy losses from the tank.


Midpoint of 50–85% range.

Assumes that no water is heated with electricity.

S 1: IMPLEMENT ENERGY MANAGEMENT AND OPERATIONS PRACTICES FOR CITY-OWNED STREETLIGHTS

Measure S 1.1: High-Efficiency Streetlights

Implementation Cost:

Cost of LED streetlight is $602. Based on City of Ann Arbor’s upgrade of 1,046 120 W incandescent streetlights to LED at a project cost of $630,000. (Source: http://blog.mlive.com/annarbornews/2007/10/ann_arbor_to_install_led_stree.html)

Assumes that by 2020 and 2030, 50% and 100%, respectively, of the City’s streetlights will be converted to LED.

Energy use from streetlights was derived from the 2005 GHG emissions inventory and forecast conducted into 2010, 2020, and 2030.

Energy Reductions:

Percentage annual energy savings from LED streetlight replacement: 40%.

Energy savings from LED streetlights is typically 40–60% compared to high pressure sodium systems. A more conservative energy savings figure of 40% is utilized in this methodology. (Source: Los Angeles LED Street Light Program Estimated to Save $10M Annually. http://www.solidstatelightingdesign.com/documents/articles/gsedoc/118076.html)
MWR 1: IMPLEMENT WASTE REDUCTION PRACTICES IN ALL CITY FACILITIES

Measure MWR 1.1: Waste Prevention

Implementation Cost:

Pounds of paper used/employee/year: 135. Assumes that the average office worker generates between 120 and 150 pounds of recoverable white office paper a year. (Source: www.ofm.wa.gov/sustainability/resources/source_impacts.pdf)

Cost savings per year based on cost of paper: $0.50/pound of paper. Paper prices vary, but a typical bulk cost is $1,000/ton, which is $2.50 per ream of 500 sheets, half a cent per sheet, 50 cents per pound, or 3 cents per ounce. (Source: http://eetd.lbl.gov/paper/ideas/html/copyfactsA.htm)

Assumes percentage reduction in paper use with the implementation of this measure results in 10% reduction in paper use by 2020 and 20% by 2030.

Total City staff numbers source: Beverly Christie, City of Walnut Creek.

Energy Reductions:

GHG emissions avoided here represent the methane that has been prevented from being released from a managed landfill.

MWR 2: ENCOURAGE RECYCLING OF USED MATERIALS WHENEVER FEASIBLE AT CITY FACILITIES

Measure MWR 2.1: Expand Recycling Programs

Implementation Cost:

Total cost for this project includes tipping and hauling fee for recyclables.

Assumes no cost for implementing the measure and cost savings per year.

Assumes that through this measure, an average City employee will increase their recycling generation by 5 pounds/year by 2020 and 10 pounds/year by 2030.

Total City staff numbers source: Beverly Christie, City of Walnut Creek.

MT 1: INCREASE THE NUMBER OF FUEL-EFFICIENT VEHICLES IN THE CITY’S FLEET

Measure MT 1.1: Purchase of Alternative Fuel/Fuel-Efficient Vehicles

Implementation Cost:

The City currently has 2 electric vehicles, 7 hybrid (gasoline/electric) vehicles, and 2 natural gas pickup trucks. Additionally, when available, hybrid vehicles are purchased to replace the City’s aging fleet. Additionally, the City’s entire diesel fleet, consisting of 16 vehicles, uses B-5 soybean-based biodiesel fuel.

This measure pertains only to on-road/highway vehicles and not regular equipment (e.g., chainsaws).

Number of vehicles available was estimated from information provided by Joe Jorgensen, Supervisor - Vehicle & Equipment Maintenance Division, City of Walnut Creek.

Electric:


  Price of RAV4 electric vehicle: $29,000 (this includes tax credits; original price is $42,000). (Source: http://www.plentymag.com/magazine/by_the_numbers.php)
• Annual cost savings from gasoline savings: cost of gasoline saved minus cost of electricity used.

Hybrid:

• Incremental cost is based on cost difference of conventional vehicles vs. hybrid: $2,530. Based on 2008 Toyota Prius base MSRP ($21,100) and 2008 Toyota Camry base MSRP ($18,570). (Source: ICLEI’s CAPPA Beta Version 2; www.toyota.com)

CNG:

• Incremental cost of CNG vehicle: $3,000. Incremental cost is based on Honda Civic GX. At $25,225, the GX costs about $7,000 more than the gasoline-powered LX model but presently qualifies for a $4,000 federal tax credit and other incentives. The $3,000 figure quoted here takes into account the $4,000 federal tax credit.


• Source for $4,000 tax credit: http://www.cngnow.com/EN-US/AmericaOnCNG/Incentives/Pages/FederalallIncentives.aspx.

Biodiesel:

• Biodiesel does not require the purchase of specific biodiesel-using vehicles.

Energy Reductions:

Average annual miles per vehicle for all vehicle categories are based on City’s 2005 GHG emissions inventory. Total gallons of gasoline and diesel consumed in 2005 were divided by average MPG of passenger/light-duty vehicles and heavy-duty vehicles, respectively.

MPG for passenger/light duty vehicles was based on 21 MPG. (Source: http://www.bts.gov/publications/national_transportation_statistics/html/table_04_23.html)


Assumes average annual miles per vehicle for all vehicle categories remains relatively constant from 2005 to 2030.

Total GHG emissions (metric tons) takes into account emissions from CNG and biodiesel use.

Forecast of number of alternative vehicle fleet. (Source: Joe Jorgensen, Supervisor - Vehicle & Equipment Maintenance Division, City of Walnut Creek)

Electric:


• Annual electricity use (kWh): 12,730. (Source: ICLEI’s CAPPA Beta Version 2)

• kWh used = 11.1 x gallons of gasoline saved. Based on comparison of miles per gallon and kWh per mile of 1999 Ford Ranger, 1998 Chevy S-10, and 1998 Toyota RAV4.


• Electric kWh/mi from Idaho National Laboratory. 2006. Full Size Electric Vehicles Advanced Vehicle Testing Activity reports at avt.inel.gov.
Hybrid:


CNG:


CNG Conversions:

- One equivalent gallon is equal to 121.5 cubic feet of CNG. (Source: http://fueleconomy.gov/feg/FEG2000.htm)

- 100 cubic feet of CNG equates to 100,000 Btu, or 1 Therm

- GHG emissions (metric tons) takes into account emissions from CNG use.

- Emissions calculation for CNG represents the emissions that are offset by using less carbon-intense fuel replacements. The conventional more carbon-intense fuel that CNG is compared to here is gasoline.

Biodiesel:


- GHG emissions (metric tons) takes into account emissions from biodiesel use.

- Emissions calculations for biodiesel represent the emissions that are offset by using less carbon-intense fuel replacements. The conventional more carbon-intense fuel that biodiesel is compared to here is biodiesel.

MT 2: ESTABLISH ENERGY-EFFICIENT FLEET MANAGEMENT AND OPERATION PRACTICES

Measure MT 2.1: Reduce Fleet Size

Implementation Cost:

This measure assumes miles of eliminated vehicles are taken up by remainder of fleet or by new vehicles, both of which are more fuel efficient.

Percentage of old vehicles that can be replaced with more efficient vehicles: 50%. Assumes 50% of old vehicles can be replaced with more efficient vehicles.

Smaller/more fuel-efficient vehicle fuel economy for 2010: 29. (Source: ICLEI’s CAPPA Beta Version 2)

Fuel economy for smaller/more fuel-efficient vehicle for 2020 is based on the recent federal vehicle policy that will require fleets to scale up to an average fuel economy of 35.5 miles/gallon by 2016. This breaks down to 39 mpg for passenger vehicles and 30 mpg for light trucks. This is roughly equivalent to Pavley's 2016 greenhouse gas emission standard. The average fuel economy of 35.5 was utilized here to take into account both passenger and light-duty vehicles. (Source: California Office of the Attorney General http://ag.ca.gov/globalwarming/motorvehicle.php; http://www.greenbiz.com/news/2009/05/19/get-ready-new-auto-mileage-and-emissions-rules)

Fuel economy for smaller/more fuel-efficient vehicle for 2030 is assumed to remain the same as 2020.


Assumes 2020 and 2030 fuel efficiency of vehicles being replaced equates to 25 and 30, respectively.

Average annual miles per vehicle: 8,529 miles. This figure was based on the average annual miles traveled by the City's heavy-duty and light-duty/passenger vehicles. Assumes that the miles traveled stay relatively constant in 2020 and 2030.

Source of forecast of vehicles to be retired: Joe Jorgensen, Supervisor - Vehicle & Equipment Maintenance Division, City of Walnut Creek.

Energy Reductions:

Annual gasoline savings were determined by calculating the gallons saved per year for one average vehicle from switching to the use of a smaller/more fuel-efficient vehicle over the specified number of average annual miles traveled. The gallons saved per year per vehicle were then multiplied by the total number of larger/less fuel-efficient vehicles the City plans to replace.

Measure MT 2.2: Reduce Idling

Implementation Cost:

 Assumes all City vehicles are affected by the no idling policy.

Forecast of number of heavy-duty vehicles/trucks and light/passenger vehicles. Assumes fleet size will stay relatively constant into the future as the City will continue to replace old vehicles with vehicles and equipment that will be even better utilized then before. (Source: Joe Jorgensen, Supervisor - Vehicle & Equipment Maintenance Division, City of Walnut Creek)

Total cost is assumed to be minimal to none, as this measure only requires City staff’s behavioral changes.

Heavy-Duty Vehicles/Trucks:


• Assumes daily hours vehicles idle: 1 hour.

• Assumes vehicles are operating 20% of the time throughout the year.

Light/Passenger Vehicles:

• Daily minutes vehicles idle: 7.5 minutes. The average person idles their car 5–10 minutes a day. Take middle of road number 7.5 minutes. (Source: California Energy Commission’s Consumer Energy Center. http://www.consumerenergycenter.org/myths/idling.html)

• Gasoline use/minute of idling: 0.125 gallons. One hour (60 minutes) of idling burns nearly 1 gallon of gasoline. (Source: California Energy Commission’s Consumer Energy Center. http://www.consumerenergycenter.org/myths/idling.html)

• Based on that information, 7.5 min of idling would yield 0.125 gallons of gasoline wasted.
• Assumes vehicles are operating 20% of the time throughout the year.

• Days of operation/year: Assumes 5 days/week, 48 weeks per year (four weeks vacation, holidays).

**Energy Reductions:**

Assumes instituting a no idling policy reduces idling time by at least 50%.

Estimated fuel savings (gallons) was derived by multiplying number of vehicles affected by time of vehicles idling times amount of fuel used/time of idling times days of operation/year.

**Measure MT 2.3: Fleet Maintenance**

**Implementation Cost:**

Gallons of fuel used by vehicle fleet were derived from the 2005 GHG emissions inventory. The projected use of gallons of fuel is assumed to remain constant, as there will be significant changes in the vehicle fleet in 2020 and 2030.

Percentage savings of fuel from maintenance: 3.3%. The U.S. Department of Energy released a statement that proper inflation of vehicles tires can save up to 3.3% of fuel usage. (Source: http://collegian.lorainccc.edu/News/Pump+it+up.htm)

Cost savings for measure in 2010 is $0 because it is not an existing measure.

Little to minimal upfront cost is associated with the implementation of this measure.

**Energy Reductions:**

Gallons of gasoline/diesel saved per year were estimated by calculating 3.3% fuel saved from fleet maintenance (specifically maintaining tire pressure) of the total amount of gasoline/diesel City vehicle use on average each year.

Gallons of fuel and GHG emissions avoided for measure in 2010 is 0 because it is not an existing measure.

**Measure MT 2.4: Scheduling & Routing Efficiency**

Supportive measure.

**MT 3: PROVIDE ALTERNATIVE TRANSPORTATION OPTIONS FOR ALL CITY EMPLOYEES.**

**Measure MT 3.1: Municipal Commuter Programs**

**Implementation Cost:**

Employee commute program is a combination of three measures: parking cash-out incentive (carpool 1 day/week), telecommute incentive (1 day/week), and employee bike use program (4 miles/day). See below for details on each.

Total City staff numbers source: Beverly Christie, City of Walnut Creek.

Cost savings per year for employee is based on the assumption that all fuel displaced by alternative transportation options is gasoline and the price of gasoline of $2.52/gallon (average miles x reduction x employees).

Payback period does not pertain to this measure as the cost savings that result from this measure (paid by the City) is passed onto the City employees and not directly to the City.

Percentage reduction in commute vehicle trips from telecommute and parking cash-out programs: 10%. (Source: ICLEI’s CAPPA Beta Version 2; Victoria Transportation Policy Institute. http://www.vtpi.org/tdm/tdm26.htm)

Within the 10–30% range, the more conservative 10% reduction is used in this methodology. Also, assumes the same for the bicycle program. Assumes the 10% reduction is realized in 2020 and 2030.

Parking Cash-Out Program:

- Cost for parking cash-out measure implementation per employee: $100. Examples of monthly cash incentives provided to employees range from $36 to $165 per month. Midrange incentive of $100 was assumed in this methodology. (Source: Hill, Elizabeth. A Commuter's Dilemma: Extra Cash or Free Parking? www.lao.ca.gov/2002/parking/031802_cash_or_parking.pdf)

- Percentage participating in parking cash-out program: 8%. Based on a University of California Los Angeles report that assesses the results of eight case studies of employers who participated in the cash-out program. Cash-out program reduced 8 cars driven to work per 100 employees (or 8%). (Source: http://www.arb.ca.gov/research/abstracts/93-308.htm. Table 11.)

- Assumes 8% participation rate stays constant in 2020 and 2030.

Telecommuting Program:

- Cost for telecommute measure implementation per employee: $0. Assumes that there is minimal to no upfront cost for this measure for the City.


- Assumes 25% participation rate stays constant in 2020 and 2030.

Bicycle Program:

- Cost for bike use measure implementation per employee: $250. $250 upfront cost for purchase of one bicycle.


Energy Reductions:

Annual vehicle mile reduction is based on baseline assumption that employees commute to/from work five times a week for 48 weeks a year.


Average one-way commute length (miles) for bicycling program: 2 miles. (Source: ICLEI’s CAPP A Beta Version 2)

Measure MT 3.2: Municipal Bicycle Program

Implementation Cost:

Assumes City will be able to provide 20 bicycles for daily operations to its City staff by 2020 and 40 bicycles by 2030.

Percentage of employees switching to bicycles for daily operations: 2%. Percentage of employees switching to bicycles for daily operations at work is not available. Therefore, percentage of employees switching to bicycle for commuting was utilized. (Source: Mahoney, Sarah. Bike Industry Poised for a Breakthrough. http://www.mediapost.com/publications/?fa=Articles.showArticle&art_aid=111301)
Average one-way bicycle trip length for daily operations: 2 miles. Average one-way bicycle trip length for daily operations not available. Therefore, the figure was based on commuting from work/home. 
(Source: ICLEI’s CAPP Beta Version 2)

Cost for measure implementation is based on $250/bicycle.

Cost savings is based on the assumption that all of the fuel used for commute is gasoline.

**Energy Reductions:**

Annual vehicle mile reduction is based on trip to/from location five times a week for 48 weeks a year.


**MEO 1: INFORM CITY EMPLOYEES OF SUSTAINABILITY INITIATIVES/UPGRADES TO CITY FACILITIES AND ENGAGE EMPLOYEES IN BEHAVIOR-BASED PROGRAMMING TO COMPLEMENT THESE EFFORTS**

**Measure MEO 1.1: Employee Education**

This is a supportive measure. Costs are based on estimated costs for outreach and educational materials.
## Appendix 3
Quantification of Costs and Reductions of Community-Wide Reduction Measures

### Table A3-1. Detailed Reductions by Measure

*Energy Use Reduction Measures*

<table>
<thead>
<tr>
<th>Sector</th>
<th>Area</th>
<th>Measure</th>
<th>Title</th>
<th>Description</th>
<th>Metric Tons CO2e</th>
<th>% of Goal Reduction</th>
<th>% of Total Reduction</th>
<th>$ City Cost</th>
<th>City Cost</th>
<th>$ Private Cost</th>
<th>Private Cost</th>
<th>Annual Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Community</strong></td>
<td>Energy Use</td>
<td>EU 1.1</td>
<td>Voluntary Residential Energy Conservation</td>
<td>Create a Residential Energy Conservation Program in partnership with business and real estate stakeholders that leverages financial incentives, local partnerships, and education for voluntary home energy efficiency improvements, with a target of achieving an average 20% in energy savings for 6% of the existing housing stock by 2015, 13% of the existing housing stock by 2020, and 27% by 2030.</td>
<td>-10,568</td>
<td>64%</td>
<td>10%</td>
<td>$20,000</td>
<td>Low</td>
<td>$13,400,000</td>
<td>Medium-High</td>
<td>$2,300,000</td>
</tr>
<tr>
<td><strong>Community</strong></td>
<td>Energy Use</td>
<td>EU 1.2</td>
<td>Commercial Energy Conservation Program</td>
<td>Work with stakeholders and PG&amp;E to develop a voluntary Commercial Energy Conservation Program for highly collaborative, incentive-based energy efficiency efforts, with a target of achieving an average of 25% energy savings for 360 businesses by 2015, 600 businesses by 2020, and 800 businesses by 2030.</td>
<td>-5,807</td>
<td>35%</td>
<td>6%</td>
<td>$0</td>
<td>Low</td>
<td>$1,000,000</td>
<td>Medium</td>
<td>$2,900,000</td>
</tr>
<tr>
<td>Sector</td>
<td>Area</td>
<td>Measure</td>
<td>Title</td>
<td>Description</td>
<td>Metric Tons CO2e</td>
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</tr>
<tr>
<td>Community</td>
<td>Energy Use</td>
<td>EU 1.3</td>
<td>Public Outreach</td>
<td>Work with partners to educate and inform the community about ways to improve energy efficiency, including behavioral changes, appliance purchases and rebates, maintenance practices, and more.</td>
<td>-131</td>
<td>1%</td>
<td>0%</td>
<td>$0</td>
<td>Low</td>
<td>$4,000</td>
<td>Low</td>
<td>$46,000</td>
</tr>
<tr>
<td>EU 2: Promote and support renewable energy generation and use.</td>
<td>Community Energy Use</td>
<td>EU 2.1</td>
<td>Renewable Energy Strategy</td>
<td>Develop a renewable energy strategy that facilitates installation of residential solar energy systems through streamlined permit procedures, adoption of local incentives, fee waivers, and potential for a municipal finance district program that provides a low-risk option for property owners to invest in on-site renewable energy installations.</td>
<td>-10,572</td>
<td>100%</td>
<td>10%</td>
<td>$10,000</td>
<td>Low</td>
<td>$68,500,000</td>
<td>High</td>
<td>$6,000,000</td>
</tr>
<tr>
<td>EU 3: Facilitate green building and design.</td>
<td>Community Energy Use</td>
<td>EU 3.1</td>
<td>Green Building Ordinance</td>
<td>Adopt CALGreen Tier 1 by 2014 to exceed Title 24 energy efficiency standards by 15%, and adopt CALGreen Tier 2 by 2017 to exceed Title 24 energy efficiency standards by 30%.</td>
<td>-973</td>
<td>97%</td>
<td>1%</td>
<td>$15,000</td>
<td>Low</td>
<td>$2,000,000</td>
<td>Medium</td>
<td>$300,000</td>
</tr>
<tr>
<td>Community</td>
<td>Energy Use</td>
<td>EU 3.2</td>
<td>Urban Forestry</td>
<td>Increase tree cover throughout the city, with special emphasis on shading east and west walls of structures and parking lots.</td>
<td>-28</td>
<td>3%</td>
<td>0%</td>
<td>$0</td>
<td>Low</td>
<td>$300,000</td>
<td>Low-Mid</td>
<td>$16,000</td>
</tr>
<tr>
<td>EU 4: Reduce energy use through increased water conservation.</td>
<td>Community Energy Use</td>
<td>EU 4.1</td>
<td>Water Conservation</td>
<td>Work with EBMUD and CCWD to ensure that the Walnut Creek community achieves regional and statewide water reduction targets, including a 20% reduction as established by the State’s 20X2020 plan.</td>
<td>-2,179</td>
<td>100%</td>
<td>2%</td>
<td>$0</td>
<td>Low</td>
<td>$0</td>
<td>Low</td>
<td>$850,000</td>
</tr>
</tbody>
</table>
## Appendix 3: Detailed Community Reductions by Measure

<table>
<thead>
<tr>
<th>Sector</th>
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<th>Annual Cost Savings</th>
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</thead>
<tbody>
<tr>
<td>Community</td>
<td>Transportation &amp; Land Use</td>
<td>TLU 1.1</td>
<td>Low-Emission Vehicle Facilities</td>
<td>Facilitate the use of low-emission vehicles by coordinating with regional and state agencies for region-wide low-emission vehicle infrastructure improvements and networks.</td>
<td>-3,234</td>
<td>22%</td>
<td>3%</td>
<td>$10,000</td>
<td>Low</td>
<td>$3,000,000</td>
<td>Medium</td>
<td>$200,000</td>
</tr>
<tr>
<td>Community</td>
<td>Transportation &amp; Land Use</td>
<td>TLU 1.2</td>
<td>Transportation Demand Management (TDM)</td>
<td>Promote ridesharing and TDM programs with the CMA and 511.org to reduce use of traditional motor vehicles. Create a citywide car-sharing program to achieve further reductions in vehicle miles traveled.</td>
<td>-1,759</td>
<td>12%</td>
<td>2%</td>
<td>$0</td>
<td>Low</td>
<td>$0</td>
<td>Low</td>
<td>$900,000</td>
</tr>
<tr>
<td>Community</td>
<td>Transportation &amp; Land Use</td>
<td>TLU 1.3</td>
<td>Traffic Calming</td>
<td>Install street design features such as landscaped medians and roundabouts in order to reduce vehicle speeds, volumes, and idling.</td>
<td>-6,609</td>
<td>45%</td>
<td>6%</td>
<td>$115,013</td>
<td>Medium</td>
<td>$115,000</td>
<td>Low</td>
<td>$3,400,000</td>
</tr>
<tr>
<td>Community</td>
<td>Transportation &amp; Land Use</td>
<td>TLU 1.4</td>
<td>Anti-Idling Efficient Traffic Signal Timing</td>
<td>Reduce vehicle emissions through an effective traffic signal synchronization program.</td>
<td>-2,953</td>
<td>20%</td>
<td>3%</td>
<td>$550,000</td>
<td>High</td>
<td>$0</td>
<td>Low</td>
<td>$150,000</td>
</tr>
<tr>
<td>Community</td>
<td>Transportation &amp; Land Use</td>
<td>TLU 2.1</td>
<td>Smart Growth</td>
<td>Achieve higher-density, mixed-use, infill development and through updated regulations and new incentives.</td>
<td>-1,789</td>
<td>5%</td>
<td>2%</td>
<td>$50,000</td>
<td>Low-Medium</td>
<td>$0</td>
<td>Low</td>
<td>$900,000</td>
</tr>
<tr>
<td>Community</td>
<td>Transportation &amp; Land Use</td>
<td>TLU 2.2</td>
<td>Jobs/Housing Balance</td>
<td>Attract new job-generating uses that will provide a variety of employment opportunities and improve the jobs/housing balance within Walnut Creek.</td>
<td>-36,305</td>
<td>95%</td>
<td>35%</td>
<td>$0</td>
<td>Low</td>
<td>$0</td>
<td>Low</td>
<td>$18,500,000</td>
</tr>
<tr>
<td>Sector</td>
<td>Area</td>
<td>Measure</td>
<td>Title</td>
<td>Description</td>
<td>Metric Tons CO2e</td>
<td>% of Goal</td>
<td>% of Total Reduction</td>
<td>$ City Cost</td>
<td>City Cost</td>
<td>$ Private Cost</td>
<td>Private Cost</td>
<td>Annual Cost Savings</td>
</tr>
<tr>
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</tr>
<tr>
<td>Community</td>
<td>Transportation &amp; Land Use</td>
<td>TLU 2.3</td>
<td>Affordable Housing</td>
<td>Support and expand affordable housing development through implementation of the City’s Housing Element and new programs.</td>
<td>-182</td>
<td>0%</td>
<td>0%</td>
<td>$0</td>
<td>Low</td>
<td>$0</td>
<td>Low</td>
<td>$93,000</td>
</tr>
<tr>
<td>Community</td>
<td>Transportation &amp; Land Use</td>
<td>TLU 3.1</td>
<td>Bicycle Planning</td>
<td>Implement the City’s Bicycle Master Plan and incorporate bicycle lanes and routes into street systems, new subdivisions, and large developments.</td>
<td>-5,835</td>
<td>43%</td>
<td>6%</td>
<td>$30,000,000</td>
<td>Medium-High</td>
<td>$700,000</td>
<td>Low-Mid</td>
<td>$3,000,000</td>
</tr>
<tr>
<td>Community</td>
<td>Transportation &amp; Land Use</td>
<td>TLU 3.2</td>
<td>Multi-Modal Wayfinding</td>
<td>Develop and implement a comprehensive wayfinding system for the city’s bicycle and pedestrian transportation networks.</td>
<td>-330</td>
<td>2%</td>
<td>0%</td>
<td>$1,000</td>
<td>Low</td>
<td>$0</td>
<td>Low</td>
<td>$170,000</td>
</tr>
<tr>
<td>Community</td>
<td>Transportation &amp; Land Use</td>
<td>TLU 3.3</td>
<td>Bicycle Parking</td>
<td>Increase the number and locations of bicycle parking by requiring new development or redevelopment to provide adequate short- and long-term bicycle parking facilities.</td>
<td>-224</td>
<td>2%</td>
<td>0%</td>
<td>$0</td>
<td>Low</td>
<td>$6,200,000</td>
<td>Medium</td>
<td>$115,000</td>
</tr>
<tr>
<td>Community</td>
<td>Transportation &amp; Land Use</td>
<td>TLU 3.4</td>
<td>Transit Incentives</td>
<td>Provide public transit incentives such as free or low-cost monthly transit passes to achieve higher use of transportation alternatives, including provision of parking “cash-out” options.</td>
<td>-1,674</td>
<td>12%</td>
<td>2%</td>
<td>$5,000</td>
<td>Low</td>
<td>$0</td>
<td>Low</td>
<td>$4,000</td>
</tr>
<tr>
<td>Community</td>
<td>Transportation &amp; Land Use</td>
<td>TLU 3.5</td>
<td>BART Shuttles</td>
<td>Increase the frequency and range of BART shuttles.</td>
<td>-632</td>
<td>5%</td>
<td>1%</td>
<td>$6,000,000</td>
<td>High</td>
<td>$515,000</td>
<td>Low-Mid</td>
<td>$320,000</td>
</tr>
<tr>
<td>Community</td>
<td>Transportation &amp; Land Use</td>
<td>TLU 3.6</td>
<td>Safe Routes to School</td>
<td>Work with local schools to expand Safe Routes to Schools (SR2S) programs.</td>
<td>-2</td>
<td>0%</td>
<td>0%</td>
<td>Funded through TLU 1.3 &amp; TLU 1.1</td>
<td>Low</td>
<td>$0</td>
<td>Low</td>
<td>$1,000</td>
</tr>
<tr>
<td>Community</td>
<td>Transportation &amp; Land Use</td>
<td>TLU 3.7</td>
<td>Parking Management</td>
<td>Implement and maintain a comprehensive Parking Management to divert vehicle trips to alternative modes.</td>
<td>-4,845</td>
<td>36%</td>
<td>5%</td>
<td>$0</td>
<td>Low</td>
<td>$45,000</td>
<td>Low</td>
<td>$2,500,000</td>
</tr>
</tbody>
</table>

Community Transportation & Land Use
### Appendix 3: Detailed Community Reductions by Measure

<table>
<thead>
<tr>
<th>Sector</th>
<th>Area</th>
<th>Measure</th>
<th>Title</th>
<th>Description</th>
<th>Metric Tons CO2e</th>
<th>% of Goal</th>
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<th>$ Private Cost</th>
<th>Private Cost</th>
<th>Annual Cost Savings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community</td>
<td>Waste Reduction</td>
<td>WR 1.1</td>
<td>Zero Waste</td>
<td>Reduce landfilled waste and increase promotion of recycling and composting through an expanded public education campaign, community-wide incentives, and continued partnership with the Bay Area’s Green Business Program.</td>
<td>-6,152</td>
<td>100%</td>
<td>6%</td>
<td>$0</td>
<td>Low</td>
<td>$2,000,000</td>
<td>Medium</td>
<td>$9,100,000</td>
</tr>
<tr>
<td>Community</td>
<td>Environmentally Preferable Purchasing</td>
<td>EPP 1.1</td>
<td>Green Businesses</td>
<td>Investigate local partnerships or creation of a forum to promote and equip local green businesses (for example, through the Chamber of Commerce).</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$0</td>
<td>Low</td>
<td>0</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td>Community</td>
<td>Environmentally Preferable Purchasing</td>
<td>EPP 2.1</td>
<td>Going Green</td>
<td>Continue and expand the efforts of the City’s Going Green Initiatives.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$0</td>
<td>Low</td>
<td>0</td>
<td>Low</td>
<td>0</td>
</tr>
<tr>
<td>Community</td>
<td>Environmentally Preferable Purchasing</td>
<td>EPP 2.2</td>
<td>Urban Agriculture</td>
<td>Increase and encourage urban agriculture through incentives and streamlined application procedures.</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>$0</td>
<td>Low</td>
<td>0</td>
<td>Low</td>
<td>0</td>
</tr>
</tbody>
</table>
EU 1: INCREASE ENERGY EFFICIENCY AND CONSERVATION EFFORTS.

Measure EU 1.1: Voluntary Residential Energy Conservation

Methodology:
Measure looks at overall reductions that will result from two types of energy efficiency improvements to approximately 4,000 homes by 2020 and 8,500 homes by 2030.

- Electricity reductions: Assumes average of 20% decrease in electricity per household.
- Natural gas reductions: Assumes average of 20% reduction for approximately 1,500 homes by 2020 and 3,700 homes by 2030; assumes reductions specific to water heater replacement for approximately 2,500 homes by 2020 and 4,500 homes by 2030.

For natural gas reductions that result from replaced water heaters, looks at greater efficiencies that would be generated by more efficient water heaters. (44% of therms for water heating x 19.5% therm savings in newer models x therm use in target year = therm savings in residential uses for water heater retrofits). Assumes that 44% of residential natural gas is used for water heating (CPUC) and that this rate will remain constant. Assumes that there is 19.5% in natural gas savings for improved efficiency water heaters (based on Energy Star findings) and that this percentage will remain constant.

Assumes that conversion to more efficient water heaters is merely an issue of turnover and easy for property owners to finance because of minimal price differences and existing subsidies (Fuller et al. 2009). Assumes half (50%) of water heaters in existing development will turn over before 2020 and 100% by 2030. The reductions for more efficient water heaters are assumed to be achieved in all new development in the target years, and so the reductions are applied to all therms that exceed levels of the baseline years. The use of therms for new development in the target years is assumed to be all new therms generated since the target year or baseline year.

Please note that these estimates do not include energy reductions from new homes; these are included in the green building measure. Hence, the reductions to homes are only applied to the existing building stock, as established by the 2005 number of households.

Measure also looks at total energy reductions in the new and existing housing stock due to smart meters. At an individual scale, users will be able to rely on smart meters to monitor electricity consumption in real time and better understand the relationship between electricity usage and costs. Studies document that this new technology will result in behavioral changes that decrease electricity and natural gas consumption. Measure identifies a 95% in-home monitoring participation rate to achieve average of 7% in electricity savings per household and 1% in natural gas savings per household.

Fiscal Impact:

Cost to the City: Cost to the City would include staff time for preparation of the Energy Conservation Ordinance and public outreach. Additional building inspection staff would also be needed on an ongoing basis for program implementation.

Costs to households: On average, including rebates, costs for household retrofits range from $2,000 to $6,000 per home. Assumes an average cost of $350 per home for an energy audit and average retrofit cost of $3,000 per home.

Cost savings to the community: Represents energy bill savings.

Sources:
Measure EU 1.2: Commercial Energy Conservation Program

Methodology & Assumptions:

For voluntary commercial retrofits, assumes average energy reductions of 20% for electricity and 5% for natural gas. The target participation rate for this measure is 10% of businesses by 2020 and 15% by 2030.

Measure also captures total anticipated reductions to be realized through smart meter installation. PG&E is in the process of installing smart meters, assuming 95% in-building monitoring participation to achieve an average of 5% of electricity savings and 1% in overall natural gas savings due to PG&E’s enhanced ability to track and repair leaks.

Total commercial businesses calculated using the actual number of licensed businesses with commercial locations in the city in November 2009 and job growth rates projected by Contra Costa County. Job growth rates were assumed to equal business growth rates. It was assumed that one-third of all licensed businesses are home occupations, so one-third of all licensed businesses were excluded as a conservative estimate to avoid double-counting for home conversions (two-thirds of 8,007 total licensed businesses = 5,338 licensed businesses counted for this measure in 2005). In 2000, 28.5% of all residents worked from home (City of Walnut Creek 2004). It was assumed that this percentage increased to one-third (33%) by 2005.

Assumes that as a result of promotion efforts, 7% of businesses will initiate energy efficiency actions by 2020 through energy efficiency financing programs, and 15% by 2020.

Fiscal Impact:

Assumes energy cost savings and minimal public cost investment based on the City’s existing outreach and partnerships. Cost average of $2,000 per commercial building retrofit was assumed.

Sources:


Measure EU 1.3: Public Outreach

Methodology & Assumptions:

This measure is based on empirical data from a public education campaign designed to reduce emissions of criteria air pollutants in the Sacramento region (i.e., the Spare the Air program). This is one of the few public outreach campaigns that conducted an analysis of the effectiveness of the program as it relates to emission reductions. We use its findings for market penetration. The analysis confirmed that approximately 1% of people changed their behavior (e.g., took fewer vehicle trips on Spare the Air days) as a result of the Spare the Air campaign. For the City’s public education campaign, it was assumed that approximately 1% of people would reduce their consumption of kWh of energy and therms by 10%. Hence, a 10% reduction was applied to projected residential energy consumption of kWh and therms for 1% of all residents.

For this measure, it was assumed that existing City activities have already achieved this 10% reduction for residential energy use in 2010. Existing activities include the City’s “Going Green Together” bimonthly publications, “Going Green Together” web pages sponsored by the City, and workshops held in 2007 by the City Manager’s Office. This is a conservative estimate for 2010 reductions. The City has estimated that its Going Green Together initiatives have led to over 862,000 kWh in reductions per year, but this includes reductions resulting from green building practices. This measure quantifies only reductions resulting from changed residential behavior and its effect on kWh and therms.

Fiscal Impact:

Cost to the City: Cost of outreach would be covered by existing programs through PG&E, the City, and the County including the City’s continuation of the Going Green program.

Private cost: Average private cost of $100/household was assumed to account for purchase of small-scale products to facilitate optimal energy efficiency behaviors (e.g., purchase of LED light bulbs).

Annual cost savings to the community: Represents energy bill savings.

Sources:


EU 2: PROMOTE AND SUPPORT RENEWABLE ENERGY GENERATION AND USE

Measure EU 2.1: Renewable Energy Strategy

Methodology:

Reductions in kWh from renewable energy facilities:
Calculation takes 15% of kWh energy use for new and existing residential and commercial development, as depicted in the kWh used in 2020, phased in with only 8% applied in 2020. The projected amount of energy use excludes the percentage of energy use attributed to municipal facilities, which is accounted for in municipal actions (percentage phased in for target year x [total kWh in baseline year - total kWh for municipal uses in baseline year]). The estimate of PV installed is restricted to installations on existing homes and commercial properties. It excludes renewable installations to power new developments that come as a result of green building efforts and the State’s Zero Net Energy Homes effort in Measure EU 3.2 (represented by the difference of projected kWh between 2020 and 2030).

Therms for residential uses: Reductions for greater efficiencies in hot water heaters is applied only to new residential development in 2020 (excluding therms for hot water heating in existing development accounted for in Measure EU 1.3, and reductions resulting from the State’s Zero Net Energy Homes effort that will result by 2030).
accounts for all possible savings that would be generated by more efficient water heaters (44% of therms for water heating X 19.5% therm savings in newer models X new therm use in target year = therm savings in residential uses for water heater retrofits).

**Assumptions:**

Assumes a 15% market penetration of renewable energy facilities and water heaters in the target years phased in with only 8% penetration achieved by 2020 and that this penetration rate will apply to new and existing development in 2020 [excluding reductions that will be attributed to green building efforts and the State’s Zero Net Energy Homes effort (represented by new kWhs in 2030)].

Excludes renewable energy facilities for new development projected to occur between 2020 and 2030, which will be captured under Measure EU 3.2. This avoids double-counting.

Assumes 44% of residential natural gas is used for water heating (CPUC 2008) and that this rate will remain constant.

Assumes that 19.5% in natural gas savings for improved efficiency water heaters (the average of tankless and efficient gas storage models according to the Energystar.gov savings and benefits web pages) and that this will remain constant.

Assumes that conversion to more efficient water heaters is merely an issue of turnover and easy for property owners to finance because of minimal price differences and existing subsidies (Fuller et al. 2009). The reductions for more efficient water heaters is assumed to be achieved in all new development in 2020, and so the reductions are applied to all therms that exceed levels of the baseline years. The use of therms for new development in the target years is assumed to be all new therms generated since the target year or baseline year before, cumulatively (i.e., 2020 therm use from new residential development is assumed to exclude all therms generated by residential development existing in 2005). This measure excludes all therm use attributed to new residential development between 2020 and 2030, which is captured under Measure EU 3.2, the State’s Zero Net Energy Homes effort.

**Fiscal Impact:**

**Cost to the City:**

Looks at an assumed cost of $10,000 for zoning code updates and revisions to permit procedures.

Private costs: Assumes an average cost of $5,200 per solar installation (accounting for $2,800 in average rebates per residential or commercial installation).

Through Cost savings to the community: Represents energy bill savings.

**Sources:**

County of San Luis Obispo. 2009. County of San Luis Obispo Board of Supervisors Agenda Item Transmittal.  
http://www.environmentmagazine.org/Archives/Back%20Issues/January-February%202009/FullerPortisKammen-full.html.  
EU 3: FACILITATE GREEN BUILDING AND DESIGN

Measure EU 3.1: Green Building Ordinance

Methodology:
Assumes adoption of Tier by 2014 to impact 30% of total new development between 2010 and 2020, and adoptions of Tier 2 by 2017 affects 30% of new development between 2010 and 2020. Assumes all growth in natural gas and electricity sectors is from new construction. Captures the reduction from complying with Tier 1 and 2, as amended, assuming historical average increases in efficiency requirements. Assumes energy reductions representative of Walnut Creek’s Climate Zone (12).

Fiscal Impact:
Cost to the City: Assumes costs for training staff to implement the new Tier 1 and Tier 2 requirements.

Private cost: Assumes an average cost of $1/square foot for nonresidential compliance, and average cost of $1,500 per home.

Annual cost savings to the community: Results from reduced electricity and natural gas utility bills.

Sources:


Measure EU 3.2: Urban Forestry

Methodology:
Urban Heat Island Reduction: According to the United States Department of Agriculture, planting shade trees within 40 feet of the south side or within 60 feet of the west side of properties can reduce summertime energy consumption associated with air conditioning by approximately 30%.

If trees are planted strategically to shade east and west walls of residential buildings, they would reduce air conditioning energy use by 6,408 GWh, equivalent to an average annual CO2 equivalent emission reduction of 1.8 MT.

If 50,000,000 trees would reduce energy use by 6,408 GWh (6,408,000,000 kWh), then 1 tree reduces energy use by 128.16 kWh per year.
Assumed that approximately 3.5% of properties in Walnut Creek would receive an additional tree that would reach maturity (5–10 years) by 2020 and 10% by 2030.

Assumptions:

Distance from and orientation to buildings, building vintage, and type of air conditioning/heating: A relatively conservative assumption of 30,000 tree cover within the city and in proper relationship to buildings was made. A conservative estimate of 500 trees planted annually was also utilized.

Fiscal Impact:

Cost to the City: Minimal. Updates to zoning regulations can be accomplished in conjunction with other required updates and will create only a marginal incremental cost.

Private cost: Private costs will be incurred through planting new trees, as required through the entitlement process established by the Zoning Code (once amended). Based on a survey of tree plantings throughout the United States, McPherson et al. (2003) estimated that the cost of tree plantings can vary from $100 to $1,000, based on the size of the tree, with a $300 to $1,000 range for a large tree (2- to 5-inch caliper). It is assumed that trees will cost $300 for a medium to large tree. Cost is assumed to remain constant. By partnering with a local nonprofit or tree-planting advocate, the City could work to offset this private cost and provide trees at a subsidized rate.

Annual cost savings to the community: Represents savings in reduced energy bills.

Sources:


EU 4: REDUCE ENERGY USE THROUGH INCREASED WATER CONSERVATION

Measure EU 4.1: Water Conservation

Methodology:

Assumes the baseline water-energy intensity, and quantifies the impact of achieving a 20% reduction in new development per the requirements of CALGreen and an overall 20% reduction in water consumption for existing development.

Fiscal Impact:

Cost to the City: None. Drought rationing is mandated by utility companies. The City will conduct minimal additional outreach and publication and be available to answer questions of the public.

Private cost: None.

Annual cost savings to the community: Results from reductions in energy bills and water bills, based on lower water use projected in this measure.

Sources:


Marin Clean Energy Partnership tool.

**TLU 1: REDUCE GHG EMISSIONS THROUGH USE OF ALTERNATIVE VEHICLES, TRIP REDUCTION AND CONSOLIDATION, AND EFFICIENT TRAFFIC FLOW**

**Measure TLU 1.1: Low-Emission Vehicle Facilities**

**Methodology:**

Electric vehicles (EV) are much more efficient than standard internal combustion engine vehicles. The performance of this measure is related to the replacement of standard vehicles with EVs once the necessary infrastructure is available. The literature supports the fuel use reduction equivalent to one 10-mile trip for every charging station available. The energy use needed to service the charging stations was then calculated to discount the emissions reductions.

**Assumptions:**

Assumes that stations will be installed through civic and private development at the rate of 20 per year.

**Fiscal Impact:**

Costs to the City: The cost of updates to the Zoning Code, including staff time. Assumed to be approximately $10,000 for a one-time update. Costs for review will be offset through entitlement fees as part of the normal review process.

Private costs: To determine the cost of Level 3 commercial charging spaces, the cost of Level 2 commercial charging spaces was manipulated based on the price difference of Level 1 Residential and Level 2 Residential charging spaces (the only category for which cost comparisons were available). The cost of Level 2 Residential spaces are $1,268 more than the cost of Level 1 Residential spaces (the difference between $2,146 and $878, which includes costs for the charge cord, circuit installation, and administration costs); a conservative estimate, which is higher than the price difference between Level 1 and 2 Apartment charging spaces.

This difference was applied to the cost of Level 2 Commercial spaces. The total charger cost per charging space is $1,852, when installed in groups of 10 (including ten wall boxes; ten charge cords; and ten 40A branch circuits, 240VAC/1-Phase with separate meter and breaker panel; and administration costs). Adding this per space cost to the assumed price difference between each level of charging station, the assumed cost of Level 3 Commercial spaces is $3,120 ($1,628 + $1,852). Additional costs may be incurred for batteries, based on type used (Morrow, Karner, and Frankfort 2008).

Annual cost savings to the community: Results from reduced VMT (accounting for the increased use of electricity for vehicle charging). Conversion from VMT to equivalent gallons completed using Contra Costa County miles per gallon (mpg) from EMFAC2007 (11.06 mpg for gasoline). Used for the purposes of consistency with other measures. Assumes that all fuel use offset by this measure will be gasoline (rather than diesel).

**Sources:**

Calculated assuming parking spaces were used for commuting: 5 days per week, 48 weeks/year, 9.8 miles each way. Source for trip length: National Household Travel Survey, 2001. 2,298 billion miles/235 billion trips = 9.8 miles/trip.


Measure TLU 1.2: Transportation Demand Management (TDM)

Methodology:

Rideshare incentive programs: Rideshare/Carpooling assumed to currently be at 20% consistent with other cities as ranked in the Bay Area 2000 census (http://www.mtc.ca.gov/maps_and_data/datamart/census/dp234/PlaceCarpoolRank.htm)

Participation in car sharing programs in a typical region is 10–20% of residents living in neighborhoods suitable for car sharing, and perhaps 3–5% of those residents would car share rather than own a private vehicle if the service were available (VTPI 2009). Car share is found to typically be used by residents that drive 6,000 miles a year or less. Reduction is approximately 50%, or 3,000 miles a year. We assume that half of these miles are within Walnut Creek.

Estimated number of vehicles in Walnut Creek calculated by assuming that the number of cars per household is constant with the countywide car per household figure. Car population derived from EMFAC2007, which uses historical DMV registration data. (754,277 cars/344,129 = 2.19 cars per household, which is in line with the national average).

Fiscal Impact:

Cost to the City: Start-up costs for car-sharing programs vary, but numerous federal and local grants are available to fund initiation of a program, including the U.S. Department of Transportation, the Federal Congestion Mitigation and Air Quality fund, the U.S. EPA, and the California Department of Transportation. Alternatively, other cities have provided incentives to the private community to initiate a private car-share program (e.g., in Canada, many localities provide loans or start-up grants to private car share programs, usually under $20,000). The U.S. EPA awarded the City of Vancouver $64,000 to implement a car-share/bike-share program. Hence, costs vary, but it is assumed that the City will seek and obtain grant funding to initiate and manage this program (Shaheen and Meyn 2002).

Private cost: Rideshare costs are excluded. Ridesharing is the most cost effective form of transit and is minimal; therefore, costs for rideshare are excluded from this measure (VTPI 2008). All costs based on car-share programs. Participants in car-share programs must pay a fee, which varies based on time of use and other factors (City Car Share n.d.). Cost assumes a rate structure utilized by Chicago’s car share program.

Assumes the average length of per person number of trips per year and trip miles established in the methodology of Measure TLU 1.4 (total VMT on local roads/population of target year X average distance of local trips, or 11,254 miles). Using the 1,500-mile reduction in per person VMT assumed under this measure results in a 13% reduction in annual per person VMT. It is therefore assumed that each car-share participant will travel 9,754 miles through car share, and (as assumed in Measure TLU 1.4, that each of these trips is on average 5 miles in length and 10 minutes in time), totaling 19,580 trips and 195,800 minutes of travel for each participant per year.

This time and mileage per participant was utilized to determine costs. The City Car Share program (2009) provides a Share Local Rate that is conducive to local trips and a higher number of road trips, costing $5.50 per hour + 35 cents per mile, plus a $20 per month participation fee. This rate structure was utilized to determine car share costs for participants.

It is important to note that this cost is much lower than the cost of owning a personal vehicle. According to City Car Share (n.d.), once a car-share participant has traveled over 5,000 miles a year, they have passed the break-even point for participation and will be saving money by participating in a car-share program rather than owning a personal automobile. Since the average per person mileage in Walnut Creek is assumed to be 9,754 for participants in car share, participants will see a significant cost savings. All costs shown in this
measure will replace the costs of maintaining a personal automobile and actually save participants money.

Reduced VMT for 2010 result from existing rideshare programs not requiring additional investment. As a car-share program is not yet in existence, the costs for participation in car share are not included for this target year.

Annual cost savings: Based on reduced VMT. Conversion from VMT to equivalent gallons completed using Contra Costa County mpg from EMFAC2007 (11.06 mpg for gasoline). Used for the purposes of consistency with other measures. Assumes that all fuel use offset by this measure will be gasoline (rather than diesel).

Sources:


Measure TLU 1.3: Traffic Calming

Methodology:

The percentage of total VMT penetrated by this measure was multiplied by projected VMT and the percentage of VMT reductions possible through traffic calming measures.

Assumptions:

Assumes that a comprehensive menu of traffic calming measures will be installed to utilize the full elasticity of vehicle travel.

The penetration of traffic calming measures is phased in, assuming that installation of such devices will impact 15% of VMT in 2020 and 20% of VMT in 2030.

Assumes that total VMT reductions from this action will be 10% by 2020 and 20% by 2030, based on realistic reductions from other case studies (VTPI 2008).

Fiscal Impact:

Cost to the City and private cost: It is assumed that the City will pay for half of the cost of traffic calming, and the other half will be paid through private funds through new development or infill. Therefore, the methodology below was used to derive total cost, with half applied to the City and half applied to private costs.

To determine affected mileage of roadways:

- Assumes all traffic calming measures will take place on local roads and that all VMT penetrated by measure is on local roads. VMT affected assumed to be the portion of total VMT that is penetrated by this measure and that takes place on local roads. Percentage of VMT attributed to local roads (49.3%) calculated using data from the 2005 GHG inventory, by dividing baseline local road travel by total travel. Assumed to be constant in 2020 and 2030.
• Resulting VMT is translated to mileage of road using assumptions for Measure TLU 1.4. Assumes each local trip is on average 5 miles in length. Hence, it is assumed that each 5-mile trip is a round trip (2.5 miles going each way on a given piece of roadway). Therefore, half of VMT is taken to deduce the mileage that reflects the mileage of roadway affected by this measure.

To determine cost of improvements for affected mileage, looks at the cost to calm traffic, assuming a 15% penetration for 184.76 miles of roadway, with an average cost of $83,000 per 10 miles of roadway. Splits costs equally between private and City costs, assuming measure will be achieved through both new development and enhancements to existing roads.

Annual cost savings: Based on reduced VMT. Conversion from VMT to equivalent gallons completed using Contra Costa County mpg from EMFAC2007 (11.06 mpg for gasoline). Used for the purposes of consistency with other measures. Assumes that all fuel use offset by this measure will be gasoline (rather than diesel).

Sources:

Measure TLU 1.4: Anti-Idling Efficient Traffic Signal Timing

Methodology & Assumptions:
Average local trip length in miles and minutes derived from various local driving scenarios modeled through Google Maps and Yahoo driving directions. Credit to date based on MTC findings for fuel savings achieved as of 2011.

Percentage of VMT attributed to local roads calculated using data from the 2005 GHG inventory, by dividing baseline local road travel by total travel. Assumed to be constant in 2020 and 2030.

Average number of local trips calculated by dividing the local road VMT by the average trip length.

Decrease in trip length from traffic signal synchronization based on a range of 8–25% as reported by John S. Niles in the Seattle Times article, “T-Ops: Use Technology to Combat Congestion.” The 16% reduction is a median and supported by the traffic light synchronization project in Los Angeles (bloomekatz 2009).

Truck population: According to EMFAC2007, the 2005 population of heavy-duty trucks (over 10,000 pounds) was 3,111 in Contra Costa County. Assuming that truck activity in Walnut Creek is proportionate with heavy-duty truck activity per the percentage of VMT for heavy-duty trucks reported in the 2005 Baseline Inventory (for 12% of VMT), Walnut Creek would be responsible for 12% of traffic and vehicles or approximately 374 heavy-duty trucks. Assumes that this anti-idling enforcement successfully targets half, or 137 heavy-duty trucks by 2020 and all trucks by 2030.

Assumes heavy-duty trucks idle for one hour per day for 240 days per year (5-day workweek minus holidays).


Conversion to equivalent VMT completed using Contra Costa County mpg from EMFAC2007 - 11.06 for gasoline and 7.03 for diesel. Used for the purposes of consistency with other measures.

Fiscal Impact:

Cost to the City: Assumes the cost from a Portland case study. According to the Climate Leadership Group (2009), the City of Portland spent $533,000 to synchronize 135 intersections and 16 streets. This was the amount the City received in a grant, and the City was not able to synchronize all signals. Costs to re-time a single intersection range from $1,000 to $3,000 per intersection. For this measure, it was assumed the City would spend $533,000 to synchronize an equivalent amount of signals and streets. The City can pursue grant funding to
finance this effort and may be able to allocate more funds than anticipated here, depending on amounts awarded.

Private cost: None.

Annual cost savings: Reduced gasoline and diesel usage from improved flow of vehicle traffic achieved by this measure. Conversion from VMT to equivalent gallons completed using Contra Costa County mpg from EMFAC2007 (11.06 mpg for gasoline). Used for the purposes of consistency with other measures. Assumes that all fuel use offset by this measure will be gasoline (rather than diesel).

Sources:


TLU 2: REDUCE VEHICLE MILES TRAVELED THROUGH SMART LAND USE AND DESIGN

Measure TLU 2.1: Smart Growth

Methodology & Assumptions:

The performance of this measure is related to the elasticity of increased density and reduced travel associated with the increased mixture of uses. The literature supports a 5% reduction in vehicle miles traveled for every 100% increase in density and increase in convenience. To calculate the net increase in density in the city between 2005 and the target years, the following variables were needed:

Population density from residents and employees citywide in 2005, 2020, and 2035.

Based on a study by Ewing, Reid, et al. (2001), it was assumed that a 5% reduction in VMT would result from each 100% increase in density. Accordingly, 0.05 was taken of each target year’s percentage increase in density. The resulting number was the percentage reduction in VMT for the target year. The percentage of reduction in VMT for the target year that resulted from the measure was multiplied by the annual VMT projected for that year. This resulted in a total projected decrease in VMT citywide attributed to increased density.

Similarly, the literature supports a 5% reduction for increasing job/housing balance and convenience of shopping and services. Relying on the percentage of travel attributed to shopping and commuting from national averages (14% shopping and 18% commuting), it was assumed that shopping and commuting related trips would be reduced by 5%.

Fiscal Impact:

Cost to the City: Assumes $30,000 to update the Zoning Code and General Plan.

This measure captures increases in density based on development projections; therefore, attaining this measure does not require significant investment from the City. However, by taking additional steps for implementation, the City can ensure achievement and possibly achieve even greater reductions.

Private cost: This measure is based on anticipated development scenarios and requires the City to direct development in certain land use patterns. It is premised on development the City can reasonably expect based on regional forecasts and does not pose additional costs on the development community.

Annual cost savings: Based on reduced fuel use resulting from reduced VMT. Conversion from VMT to equivalent gallons completed using Contra Costa County mpg from EMFAC2007 (11.06 mpg for gasoline). Used for the purposes of consistency with other measures. Assumes that all fuel use offset by this measure will be gasoline (rather than diesel).
Measure TLU 2.2: Jobs/Housing Balance

Methodology:

Trip Reduction = \(1-\frac{(\text{ABS}(1.5*h-e)/(1.5*h+e))-0.25\times0.03)}{0.25}\) where \(h\) = study area housing units, \(e\) = study area employment. Household and employment growth rates were obtained from ABAG Projections 2009.

Fiscal Impact:

Cost to the City: Costs for implementation of this measure will be achieved through the Draft Housing Element. Any required code modifications or other work on part of the City to implement the Draft Housing Element will be outlined in the Draft Housing Element, and hence, no additional costs are incurred here.

Private cost: This measure is based on anticipated development scenarios and projected modifications to the jobs/housing balance; therefore, it creates no additional private costs. (It is premised on private investment the City can reasonably expect based on regional projections.)

Annual cost savings: Based on reduced fuel use resulting from reduced VMT. Conversion from VMT to equivalent gallons completed using Contra Costa County mpg from EMFAC2007 (11.06 mpg for gasoline). Used for the purposes of consistency with other measures. Assumes that all fuel use offset by this measure will be gasoline (rather than diesel).

Sources:


Measure TLU 2.3: Affordable Housing

Methodology:

URBEMIS provides a 4% reduction in vehicle trips for each deed-restricted below-market-rate (BMR) unit. Thus, the total reduction is as follows: Trip reduction = % of units that are BMR * 0.04. The units assumed to be BMR are based on assumptions from the Draft 2009 Housing Element, as clarified below.

Assumptions:

Assumes that all new traffic is caused by new business growth and new housing growth equally.

Assumes that all housing units dedicated to extremely low-, very low-, and low-income levels receive the reductions in VMT attributed to BMR units (extremely low income = 0–30% of area median income (AMI), very low income = 31–50% of AMI, and low income = 51–80% of AMI) (City of Walnut Creek 2009). This likely underestimates the City’s provision of affordable housing, since the City’s BMR program also supports moderate-income households (those earning up to 120% of AMI). All projected housing units for extremely low-, very low-, and low-income levels are taken from the Draft 2009 Housing Element (City of Walnut Creek 2009).

For 2010, takes credit for 70 very low-income units constructed from 2007 to 2008, 13 low-income units under construction in 2009, and 33 very low-income units under construction in 2009 (City of Walnut Creek 2009).

For 2020, assumes that all affordable housing projects currently under review by the City, as outlined in the Draft Housing Element, will be constructed.

For 2030, assumes that 10% of all high potential residential housing units identified by the Draft Housing Element will be constructed as low-, very low-, or extremely low-income units.

Please note that 2010, 2020, and 2030 numbers are cumulative.
Fiscal Impact:

Cost to the City: Implementation of this measure generates no additional costs to the City, beyond funds and programs it already has committed. Costs and resources here would be the same outlined in the Draft Housing Element (not in addition to) (City of Walnut Creek 2009).

Approximately 8–10% of the City’s affordable housing programs are paid out of the General Fund, but most funds come from other sources. According to the Draft Housing Element, the City has several main sources for these funds: federal Community Development Block Grant (CDBG) funds (~$30,000/year, a minimum of 50% going directly to affordable housing programs), City Redevelopment Agency Housing Set-Aside funds (RDA) (~$190,000 each year between 2010 and 2014), and City Revolving Bond funds (a total of $194,000) (City of Walnut Creek 2009). In addition to these sources, the City utilizes money from private sources as outlined below.

Private costs: New development is required to contribute to affordable housing, but such investment is determined on a case-by-case basis according to project characteristics and City ordinances. The reductions established in this measure are based on projects planned or that the City reasonably expects to partner with private developers to implement; therefore, this measure does not create any costs but is premised on investment the City has already assumed will take place.

Two ordinances ensure that private development contributes to the City’s affordable housing (City of Walnut Creek 2009):

1. The City’s Inclusionary Housing Ordinance requires all residential developments to either provide affordable units or pay an affordable housing in-lieu fee. Developments providing more than 10 units must provide affordable units at varying percentages. Developers providing less than 10 units may either provide at least one affordable unit or pay an in-lieu fee. All in-lieu fees are used by the City to provide 100% affordable housing or subsidies for low and very-low income residents.

2. The City’s Commercial Linkage Fee ordinance requires all commercial developments to pay into a housing linkage fee based on the number of square feet of the net new commercial development. These funds exclusively fund the City’s affordable acquisition or new/construction program.

Annual cost savings: Based on reduced fuel use resulting from reduced VMT. Conversion from VMT to equivalent gallons completed using Contra Costa County mpg from EMFAC2007 (11.06 mpg for gasoline). Used for the purposes of consistency with other measures. Assumes that all fuel use offset by this measure will be gasoline (rather than diesel).

Sources:


**TLU 3: CONVERT VEHICULAR TRIPS TO NON-VEHICULAR OR TRANSIT TRIPS**

**Measure TLU 3.1: Bicycle Planning**

Methodology & Assumptions:

Each mile of bikeway per 100,000 residents increases bicycle commuting 0.075%, all else being equal. Calculates the increase in bicycle commuting through the cumulative amount of bike lanes, both new lanes planned for construction and those already existing.

Assumes that 1% of trips are performed by bikes per national average (Comsis Corporation 1993).

Assumes that Class I lanes are paved right-of-way completely separated from any street or highway; Class II lanes are located on the outside edge of roadways; and Class III lanes provide for shared use with pedestrian traffic.

Assumes that development of bike lanes will be phased in, with 75% of improvements in the Bicycle Plan completed by 2020 and 100% completed by 2030.

2010 reductions take credit for existing bike lanes, as stated by the Draft Bicycle Plan. Also takes credit for improvements planned to Ygnacio Valley Road, assuming that it will lead to the installation of approximately .7 mile of Class III bike lanes, based on approximations from Google Maps. According to the City of Walnut Creek (2009a), the 2008–2010 CIP allocates $890,000 for the Ygnacio Valley Road Pedestrian and Bicycle Facility Improvement project, which would include plans, bids, and construction of a widened sidewalk on Ygnacio Valley Road from Ygnacio Court to Marchbanks. Money is allocated for this project from CIP Outside Grant funds, and construction was completed in 2009.

Fiscal Impact:

Costs to the City: All costs to the City for implementation of the projected bike lanes come from the Draft Bicycle Plan. Costs reflect building costs, but do not include maintenance, design, inflation, or specific engineering-related costs for construction. Total cost for implementation is $38,218,500. Consistent with the phasing of this measure, it is assumed that 75% of project costs will be expended by 2020 and the remaining 25% of project costs expended by 2030, with the total 100% of the project cost spent cumulatively and distributed over the target years.

Private costs: Assumes private developers will share costs of design and engineering, assuming cost of $29,000 per mile of bicycle lane.

Annual cost savings: Achieved through reduced fuel use that results from reduced VMT. Conversion from VMT to equivalent gallons completed using Contra Costa County mpg from EMFAC 2007 (11.06 mpg for gasoline). Used for the purposes of consistency with other measures. Assumes that all fuel use offset by this measure will be gasoline (rather than diesel).

Sources:


Comsis Corporation. 1993. Implementing Effective Travel Demand Management Measures: Inventory of Measures and Synthesis of Experience, USDOT and Institute of Transportation Engineers.


Measure TLU 3.2: Multi-Modal Wayfinding

Methodology & Assumptions:

The Victoria Transportation Planning Institute cites up to a 17% reduction of auto VMT as users opt for walking, cycling, or transit as a result of a multi-modal navigation tool system that is integrated as part of a comprehensive TDM program. This is a high estimate based on a facility-level wayfinding system. In order to adjust for a citywide program and to account for overlap with Measure TLU 1.3, this measure is assumed to lead to an additional 5% decrease in VMT by 2030. This reduction is phased in, with 3% attainment in 2020. Installation of the informational kiosks in Downtown is assumed to achieve a .05% reduction in VMT by 2010. These reductions are only applied to a portion of local VMT serving major arterials.

Fiscal Impact:

Cost to the City: Based on a case study of Portland. Portland initiated a SmartTrips program to increase biking, walking, and use of public transit (leading to reduced VMT). This project incorporated a highly effective “individualized marketing” method through an advanced wayfinding campaign that targets key areas. It cost $550,000 in initial investment per 20,000 households, or approximately $27.50 for each targeted household (Climate Leadership Group 2009).

To determine a number of households affected by this measure, total projected VMT for each target year was divided by total projected households (VMT/household) to obtain occurrence of VMT by household. This ratio was applied to the projected reduction in VMT for this measure in order to determine the number of households affected by the measure (25.76). Lastly, the ratio of initial investment per household targeted ($550,000/20,000 households) was utilized to determine total costs for the City. Costs for project implementation in 2010 are based on the cost of kiosk installation expected by 2010, as established by the City CIP.

It was assumed that these costs reflect initiation only and not ongoing project maintenance.

Cost savings: Achieved through reduced fuel use that results from reduced VMT. Conversion from VMT to equivalent gallons completed using Contra Costa County mpg from EMFAC2007 (11.06 mpg for gasoline). Used for the purposes of consistency with other measures. Assumes that all fuel use offset by this measure will be gasoline (rather than diesel).

Sources:


Measure TLU 3.3: Bicycle Parking

Methodology:

The calculation for expected transportation emissions reductions was provided by the San Joaquin Valley Air Pollution Control District (SJVAPCD) Climate Change Action Plan and manipulated to correspond to the bicycle parking requirements proposed for the City of Walnut Creek.

For nonresidential uses, according to the California Air Pollution Control Officers Association (CAPCOA)/the SJVAPCD Plan, provision of short- and long-term bike parking at the rate of 1:20 vehicle spaces supports a 0.625% reduction in emissions. Assuming reduced emissions are attributed equally to short- and long-term bicycle parking spaces, one-half of the reduction (or 0.3125%) is attributable to each short- and long-term spaces provided at the 1:20 ratio. The City of Walnut Creek is proposing requiring short-term bike parking at twice that rate, or 1:20 vehicle spaces, so the reduction for this half of the measure would result in double...
The proposed long-term bike parking ratio of 1:20 would result in an additional 0.3125% reduction.

According to CAPCOA/the SJVAPCD Plan, provision of long-term bike parking at the rate of 1 per unit supports a 0.625% reduction in emissions.

According to the 2001 National Household Travel Survey, average annual VMT per household is 21,187 and the “to or from work” subcategory is 5,724 (27.0%). Shopping is 3,062 (14.5%). Other Family and Personal Business is 3,956 (18.7%). Social and Recreational driving is 5,186 (24.5%). Therefore, VMT attributed to commercial businesses is 27% + 14.5% = 41.5%, and VMT attributed to residents is 18.7% + 24.5% = 43.5 (trips to commercial destinations are captured within the commercial bike parking measure).

Assumptions:

- It was assumed that emissions reductions for commercial bicycle parking are attributed equally to short- and long-term bicycle parking spaces.

In 2008, 47% of all housing units were multi-family (City of Walnut Creek 2009b), a 2% increase from 1990 (in an 18-year time span, an average increase of just approximately .11% per year). It was assumed that by 2020, the percentage of multi-family units would increase at a rate of .10% per year from 2008 to 48.2% of all units, and that by 2030, the percentage of multi-family units would increase at the same rate to 49.2% of all units.

Fiscal Impact:

- Cost to the City: Minimal. No major costs will be incurred to adopt these code updates in conjunction with other related update processes called for by the General Plan.

Private cost: The VTPI (2009) states the cost of installing high-quality bike racks and lockers typically range from $100 to $500. It is assumed to cost $150 per bike. This rate is multiplied by the projected number of bike spaces.

Multi-family bike spaces:

1. Assumes that the number of multi-family housing units is based on the projected percentage that will be multi-family units, using the calculation above for the reduction. Also assumes the existing average household size for multi-family units is 2.09 persons per household. Therefore, assumes that all multi-family units constructed will be two bedrooms (as a conservative estimate). Two-bedroom multi-family units require 2.25 parking spaces, as established in Section 10-2.3.206 of the Municipal Code.

2. Total number of multi-family parking spaces for the target year = projected multi-family households X 2.25 parking spaces. Of this total, 10% was taken (based on the bike parking ratio provided in this measure) to get a projected number of bike parking spots. This was multiplied by the assumed cost of $350 per bike space in order to project costs incurred by this measure for multi-family parking.

Commercial bike spaces:

1. Number of businesses: Total commercial businesses calculated using the actual number of licensed businesses with commercial locations in the City in November 2009 and job growth rates projected by Contra Costa County. Job growth rates were assumed to equal business growth rates. It was assumed that one-third of all licensed businesses are home occupations, so one-third of all licensed businesses were excluded as a conservative estimate to avoid taking reductions (two-thirds of 8,007 total licensed businesses = 5,338 licensed businesses counted for this measure in 2005, based on the 2003 Economic Development Report (City of Walnut Creek 2004) that states that in 2000, 28.5% of residents worked from home).

2. Square footage: Total commercial square footage includes all office, retail, and industrial space constructed between 1993 and 2003, and permitted development as of April 2003. Assumes that all commercial square footage provided in the 2003 Economic Development Report (City of Walnut Creek 2004) is reflected in the total square footages. The average business square foot was deduced using this figure and number of existing businesses in 2005.
(2,798 square feet per business) and is assumed to remain constant in target years. This average square foot was applied to the projected number of businesses to get a projected total square footage figure. See Measure EU1.1 for additional projection calculations.

3. Vehicle parking ratio (from the Municipal Code) is assumed to be 1 space per every 200 square feet for all commercial and community facilities (Section10-2.3.205). The total projected square footage was divided by 200 to project the number of vehicle parking spaces.

4. Bike spaces: The parking space total is divided by 20 (based on the bike parking ratio provided in this measure) to get a projected number of bike parking spots. This was multiplied by the assumed cost of $350 per bike space in order to project costs incurred by this measure for commercial parking.

Cost savings:

Achieved through reduced fuel use that results from reduced VMT. Conversion from VMT to equivalent gallons completed using Contra Costa County mpg from EMFAC2007 (11.06 mpg for gasoline). Used for the purposes of consistency with other measures. Assumes that all fuel use offset by this measure will be gasoline (rather than diesel).

Sources:


Measure TLU 3.4: Transit Incentives

Methodology & Assumptions:

Assumes one average transit trip replaces a 7.16-mile vehicle trip to and from home. Based on the average median trip length of car trips for riders with home origins at the Walnut Creek BART station, as cited in the 2008 BART Station Profile Report, page 137 (the median distance from home to the Walnut Creek Station X 2, or 3.58 X 2). According to Victoria Transport Policy Institute, with a $2 per day parking subsidy in a low-density, travel-mode-neutral setting, a 7.9% decrease in annual VMT attributed to employee commute is achieved. Cambridge Systematic (2009) finds a 4.5% decrease in VMT from parking cash-out programs. Assumes a 4.5% decrease for a $2 subsidy.

Fiscal Impact:

Cost to the City: Equals the cost of transit incentive offered to each participant ($2 per day). Cost to be offset through partnerships with transit authorities and regional programs.

Private cost: None.
Annual cost savings:

Achieved through reduced fuel use that results from reduced VMT. Conversion from VMT to equivalent gallons completed using Contra Costa County mpg from EMFAC2007 (11.06 mpg for gasoline). Used for the purposes of consistency with other measures. Assumes that all fuel use offset by this measure will be gasoline (rather than diesel).

Sources:


———. 2008. BART 2008 Station Profile Study. (Provided by Matt Huffaker, City of Walnut Creek).


Measure TLU 3.5: BART Shuttles

Methodology & Assumptions:

The Walnut Creek Comprehensive Plan (2004) estimates a conservative increase of Walnut Creek BART Station ridership by 2025 to be 40.4% over 2004 levels of ridership, which equals an approximate average yearly increase in ridership of 1.923%. This yearly increase is applied to each target year over the 2008 observed ridership trends for total projected ridership, discussed below.

For 2010 reductions, the frequency of transit is based on actual transit use of Walnut Creek BART Station riders, cited in the BART 2008 Station Profile, which states that 7% of home origin Walnut Creek station users access BART by bus or transit. It is assumed that all transit use is new since the baseline year of 2005.

Assumes the average of amount of riders entering the Walnut Creek BART Station in 2008 is 6,084 (based on the 2008 BART Station Profile Study, page 107). Multiplying the number of daily entries by 240 days per year (based on a 5-day workweek minus holidays) yields a transit ridership yearly average of 1,460,160. Since these trip trends have already been observed, they are credited to the 2010 year for reductions.

According to the BART Profile Study (page 107), 57% of average weekday trips are made by people with a home original in Walnut Creek; thus, it is assumed that this measure will impact 57% of all Walnut Creek BART users, the portion of BART users in Walnut Creek that will be affected by City implementation of this measure. Assumes that this portion of ridership remains constant.

For every 1.0% increase in transit service (measured by transit vehicle mileage or operating hours), ridership increases 0.5% (Victoria Transportation Policy Institute, vtpi.org/tdm/tdm47.htm). With the projected usage of BART provided through detailed BART analyses and planning documents, we expect this reduction to be highly achievable in Walnut Creek.

Assumes one average transit trip replaces a 7.16-mile vehicle trip to and from home. Based on the average median trip
length of car trips for riders with home origins in the Walnut Creek BART station, as cited in the 2008 BART Station Profile Report, page 137 (the median distance from home to the Walnut Creek Station X 2, or 3.58 X 2).

Fiscal Impact:

Cost to the City: Utilizes national averages to determine estimated operating and expense costs.

In 2007, the national total of expenses for bus transit was as follows (APTA 2009, Table 17): $3,291 million for all capital costs and $17,307.5 million for all operating costs (including all operations, maintenance, general administration, and purchased transportation). Hence, the national ratio of expense for capital expenses to operation was 1:10.06.

In 2005, the City spent $180,000 to appropriate three buses for conversion into use as free trolleys. This cost is assumed to reflect all capital costs. It is also assumed that this cost was supplemented by operational costs at the national ratio established above, for a total of $1,811,460.63 in operational costs ($180,000 X 10.06), a combined total of $1,991,460.63 for all costs.

It is also assumed that these investments supported the 7% increase in ridership travel by 2010. Hence, a ratio of total investment of $1,991,460.63 supported a 7% increase in ridership, at a ratio of $284,494.38 investment for each 1% increase in transit use.

Using these ratios, the total cost of achieving the projected ridership in the target years was deduced. Note that total costs to the City were deduced by the costs projected for the private community below.

Private cost: The national average fare per unlinked bus trip was 85 cents (APTA 2009, Table 22). To offset the financial burden on the City, it was assumed that riders would be charged a $1.00 round-trip ticket, good for a ride to and from BART. Hence, half the fare amount (50 cents) was multiplied by the projected number of riders for each year. Fees were not assumed to initiate until the 2020 target year.

Cost savings: Achieved through reduced fuel use that results from reduced VMT. Conversion from VMT to equivalent gallons completed using Contra Costa County mpg from EMFAC2007 (11.06 mpg for gasoline). Used for the purposes of consistency with other measures. Assumes that all fuel use offset by this measure will be gasoline (rather than diesel).

Sources:


Measure TLU 3.6: Safe Routes to School

Methodology:

Assumes number of school-age children increases evenly with population growth. 2005 number of school-age children includes children ages 5–17 in the city (City of Walnut Creek 2009).

According to VTPI, there are currently few detailed studies of the effectiveness of School Transport Management programs, but anecdotal evidence indicates that total reductions in automobile trips of 10–20% or more are possible at a particular school under programs such as a walking school bus. For the purposes of this study, we will assume a 15% reduction in automobile trips.

Assumes average round-trip drop off distance for parents is 5 miles.
Assumptions:

All students living within 2 miles of a school will participate (GIS buffers to determine percentage of residences within 2 miles of schools).

Fiscal Impact:

Cost to the City: None. To be funded through a combination of grant programs.

Private cost: None.

Annual cost savings: Achieved through reduced fuel use that results from reduced VMT. Conversion from VMT to equivalent gallons completed using Contra Costa County mpg from EMFAC2007 (11.06 mpg for gasoline). Used for the purposes of consistency with other measures. Assumes that all fuel use offset by this measure will be gasoline (rather than diesel).

Sources:


Measure TLU 3.7: Parking Management

Methodology:

Cost-based parking pricing (i.e., prices set to recover the full cost of parking facilities) typically reduces parking demand 10–30% compared with unpriced parking (Shoup 2005). Reduction of 10% applied to local road trips to and from the downtown area, which were assumed to be a quarter of all local transportation.

Assumptions:

Percentage of VMT attributed to local roads calculated using data from the 2005 GHG inventory, by dividing baseline local road travel by total travel. Assumed to be constant in 2020 and 2030.

Fiscal Impact:

Cost to the City: The City will need to conduct a parking analysis and pay the costs of creating a parking plan. Including staff time, retention of a parking consultant, and adoption of the new plan, it is anticipated to cost the City $75,000, plus $10,000 in administration and modification costs in 2030.

Note that all private costs outlined in this measure are added as cumulative revenue to the City; hence, the negative cost and the profit in 2030, which accounts for the costs of implementation and operation of the parking plan, plus revenues earned in 2020 and 2030.

Private cost: Consistent with Parking Task Force findings, assumes following price increases to achieve an 85% occupancy rate:

- Zone 1: Increase rate from $1.00/hour to $2.50 per hour
- Zone 2: Increase rate from $0.50/hour to $0.75/hour
- Zone 3: Increase rate from $0.50/hour to $0.50/hour

The reduction in VMT applies to local road trips only that were not affected by this measure (49.3% of all VMT and 90% of all local VMT, when accounting for 10% reduction of this measure). Therefore, it was assumed that 44.37% of all VMT (VMT not reduced by this measure) was vulnerable to traffic pricing.

Based on the assumptions in Measure TLU 1.4, it was assumed that the average local trip length was 10 miles. Therefore, the remaining local VMT was divided by 10 miles to determine a number of trips on local roads that is unaffected by this measure. It was assumed that this measure would penetrate 25% of these trips by 2020 and 40% by 2030. Hence, the $5.00 daily rate was converted into a yearly
rate ($5 \times 22 \text{ days/month} \times 12 \text{ months/year}) and multiplied by these affected trips.

Annual cost savings: Achieved through reduced fuel use that results from reduced VMT. Conversion from VMT to equivalent gallons completed using Contra Costa County mpg from EMFAC2007 (11.06 mpg for gasoline). Used for the purposes of consistency with other measures. Assumes that all fuel use offset by this measure will be gasoline (rather than diesel).

Sources:

WR 1: IMPLEMENT A ZERO WASTE POLICY TO REDUCE WASTE SENT TO THE LANDFILL

Measure WR 1.1: Zero Waste

Methodology:

Walnut Creek’s 2005 diversion rate is 48% as reported by the California Integrated Waste Management Authority.

Zero waste goal assumed to achieve a 75% diversion rate by 2020 and a 95% rate by 2030.

Current composting methods are understood to produce greenhouse gas emissions; however, commercial composting methods are expected to improve to negate these emissions by 2020 and 2030.

Fiscal Impact:

Cost to the City: None. According to the Central Costa County Solid Waste Authority, Walnut Creek’s last solid waste contract was adopted in 2004 and will remain in effect until 2014 (CCCSWA 2004). To implement this measure, the City will work with CCCSWA to negotiate into the new contract an agreement that Allied Waste (the waste provider) will initiate a publicity program to advertise recycling and composting programs. For example, the San Carlos Climate Action Plan (2009) describes how Recology of San Mateo County has agreed to provide a free 6-month Commercial and Multi-Family Dwelling “Recycling Blitz” educational program (estimated to cost $478,435) and will remit to the SBWMA member Agencies the revenue derived from the recyclable material that is collected during this program (estimated at $210,000). They will also do ongoing outreach and public education as part of their contract with the City of San Carlos. Through a similar agreement, the City of Walnut Creek can ensure that Allied Waste helps the City achieve its goals, while also building a longer-term clientele for Allied Waste that will support its alternative waste programs. For instance, customers currently have to pay $39–$62 for a composting bin. The City can negotiate as part of its contract the limited supply of free composting bins to City residents, which will reduce waste while expanding Allied Waste’s composting program (CCCSWA 2009).

Private cost: It is assumed that three-quarters of all households whose waste is eliminated in the target years (according to the assumptions below) will have to purchase a composting bin. It is assumed that three-quarters of all households in 2020 will have to purchase bins and that in 2030 three-quarters of the new households whose waste is eliminated since 2020 will have to purchase bins. The cost of bins is assumed conservatively to be the more expensive composting model, which costs $62. This cost is assumed to remain constant, although it is anticipated to reduce in price with increased use. Further, it is assumed that the one-quarter of all households not purchasing bins whose waste is eliminated by this measure will receive a bin through the outreach initiatives established in this effort.

Annual cost savings: The amount of waste in 2005 was divided by the population to determine an average tonnage
per person in Walnut Creek, which was converted to annual gallons of waste per person. Ratio was assumed to remain constant. This ratio was used to determine how many households would essentially be eliminated in waste production for this measure in the target years, by dividing projected amount of waste reduced by this ratio.

It is assumed that on average all Walnut Creek households use 64-gallon waste carts, which cost $31.80 a month. By assuming a diversion goal of 75% by 2020, it will eliminate a waste amount that was converted to the number of households whose waste was reduced. For each household whose was eliminated, it was assumed that their bin size was downgraded from 64 gallons to 20 gallons (the smallest waste bin size allowed, costing $13.27 a month), and the resulting amount is the cost savings to the community.

Sources:


PROMOTE PURCHASING LOCAL GOODS AND SERVICES

EPP 1.1: Green Businesses

This is a supportive measure, with no technical quantification.

EPP 2.1: Going Green

This is a supportive measure, with no technical quantification.

EPP 2.2: Urban Agriculture

This is a supportive measure, with no technical quantification.
Appendix 4
Compliance with Bay Area Air Quality Management District Guidelines

The City of Walnut Creek developed this Climate Action Plan (CAP) to meet the requirements of the Bay Area Air Quality Management District’s (BAAQMD) criteria for a qualified greenhouse gas reduction strategy as defined in the district’s updated California Environmental Quality Act (CEQA) Air Quality Guidelines. The City originally prepared this CAP before the release of BAAQMD’s guidelines. Based on evolving standards and BAAQMD’s release of formal and informal guidance, the City has updated this CAP to the greatest extent feasible to provide a foundation for long-term compliance with BAAQMD guidance and to create a long-term trajectory that will guide development in the community. The City recognizes that future updates to the CAP will be required for ongoing compliance with changing guidance. Nonetheless, this Appendix demonstrates the City’s efforts to uphold BAAQMD guidance.

The remainder of this appendix describes in detail how the City’s Climate Action Plan satisfies the requirements of BAAQMD’s guidelines on the standard elements of a qualified GHG reduction strategy. The intent of this CAP is to allow future development projects to determine that a project has a less than significant impact on GHG emissions so long as it is in compliance with the City’s GHG Emissions Reduction Strategy (the City’s CAP). However, the City will continue to work to identify the best paths for use of this CAP ongoing streamlining of development review.

The BAAQMD establishes the following minimum elements in its guidelines for a greenhouse gas reduction plan:

- Quantify greenhouse gas emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic range.
- Establish a level, based on substantial evidence, below which the contribution to greenhouse gas emissions from activities covered by the plan would not be cumulatively considerable.
- Identify and analyze the greenhouse gas emissions resulting from specific actions or categories of actions anticipated within the geographic area.
- Specify measures or a group of measures, including performance standards that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level.
- Monitor the plan’s progress.
- Adopt the greenhouse gas reduction strategy in a public process following environmental review.

GREENHOUSE GAS EMISSION QUANTIFICATION

The first component of a qualified GHG reduction strategy is to complete an inventory of all GHG emissions within a specific geographic boundary. Walnut Creek’s GHG inventory uses a baseline year of 2005 and inventories carbon dioxide (CO2),
nitrous oxide (N2O), and methane (CH4) emissions from activities within the jurisdictional boundary of the City of Walnut Creek. The inventory was prepared by ICLEI, Local Governments for Sustainability (ICLEI), in 2009 following the Local Government Operations Protocol and best management practices for calculating and reporting community-wide and government operations emissions. The emissions sources calculated in the baseline inventory include residential, commercial, and industrial electricity and natural gas use, on-road transportation, energy use associated with water, certain off-road equipment use, and solid waste by compiling activity data like kilowatt hours of electricity, vehicle miles traveled (VMT) on state and local roads, or tons of waste disposed and converting them into metric tons of carbon dioxide equivalents (MTCO2e). Emissions from waste disposal were calculated using a methane recovery factor of 85% for the County of Contra Costa.

This GHG Emissions Reduction Strategy includes revisions to the baseline community-wide GHG inventory to comply with BAAQMD guidance. Revisions included the following:

- The methodology for calculating VMT and associated emissions was updated. Countywide highway vehicle miles traveled were updated and applied to the City using the proportion of county highway miles that fall within the city.

- Emissions associated with water were calculated and added to the inventory to account for the energy for water supply and conveyance, water treatment, water distribution, and wastewater treatment. Energy use for water-related activities was calculated using Northern California averages provided by the California Energy Commission\(^1\) and the average water split for indoor and outdoor water use reported by the Natural Resources Defense Council.\(^2\) The inventory does not include methane emissions from wastewater processing. These operations are outside of the control of the City of Walnut Creek.

- Off-road emissions from construction activities and lawn and garden equipment were added to the inventory. These emissions are provided on a countywide level by the California Air Resources Board Offroad 2007 Software. Construction emissions were appropriated based on Walnut Creek’s proportion of building permits in the baseline year. Lawn and garden equipment emissions for the city were calculated assuming the proportion of total households.

- BART emissions were added to the inventory. The total number of trips and trip lengths with Walnut Creek as an origin or destination were determined using BART monthly ridership report\(f\) for August 2010 and the distance between stations. Data for 2005 is not available, and 2010 data was used as a proxy. Weekday, Saturday, and Sunday trips were summed to determine a weekly and annual number of trips and annual passenger miles traveled to or from Walnut Creek. Total annual passenger miles were multiplied by a passenger mile coefficient provided by BART for 2008. Half of each trip was attributed to Walnut Creek (the other half of the trip would be attributed to the origin or destination outside of the City).\(^3\)

The City did not include stationary point source emissions from industrial activities. These emissions are not prevalent in Walnut Creek. Any such emissions are likely well documented in other inventory programs and outside of the City’s ability to influence.

The inventory includes emissions from energy associated with water.

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\(^{1}\) November 2005.

\(^{2}\) Natural Resources Defense Council 2010.

\(^{3}\) BART 2008, BART 2010.
GROWTH FACTORS & FORECASTS

In addition to completing an inventory of GHG emissions, the City has projected how these emissions will continue to grow if community activities do not change, but the city’s population, housing, employment, and vehicle miles traveled (VMT) continue to grow. These emissions have been projected for each sector out to the years 2020 and 2030 to be consistent with the target years set in Assembly Bill (AB) 32. Projecting these emissions out to 2020 and 2030 relies on the Association of Bay Area Governments (ABAG) projections of housing, population, and employment within the city by 2020 and 2035, and the Metropolitan Transportation Commission’s (MTC) county-specific growth estimates of VMT for Contra Costa County.

The following growth indicators were used to forecast emissions:

- Residential energy: growth in households forecast in the Association of Bay Area Governments (ABAG) 2009 projections
- Commercial and industrial energy: growth in jobs forecast in the ABAG 2009 projections
- Vehicle miles traveled: growth in vehicle miles traveled for Contra Costa County in the Metropolitan Transportation Commission Travel Forecasts Data Summary
- Waste: growth in population forecast in the ABAG 2009 projections
- Construction emissions: the city’s proportion of new countywide household growth forecast in the ABAG 2009 projections
- Lawn and garden equipment emissions: the city’s proportion of total countywide households forecast in the ABAG 2009 projections
- Water: growth in population forecast in the ABAG 2009 projections and forecast water consumption per capita provided by the Contra Costa Water District and the East Bay Municipal Utilities Water District
- BART emissions: the city’s growth in service population (residents and jobs)

These growth projections are then applied to each emissions sector to determine future emissions levels under a business-as-usual scenario. These forecasts are summarized in Chapter 3.

REDUCTION TARGET

The City of Walnut Creek has set an emissions reduction target of 15% below 2005 levels by 2020, which is consistent with the State’s direction to local governments in the AB 32 Scoping Plan and would equal achieving 1990 emissions levels by 2020. The target will be achieved through a combination of local, regional, state, and federal actions and programs, including programs that have not yet been developed. Achieving the reduction target will also rely on community participation and engagement in these programs.

In addition to AB 32, California has adopted and started to implement several state-level programs that will impact local GHG emissions. In order to effectively determine the emissions reductions that will need to be implemented at the local level to meet the City’s emissions reduction target, the impact of state-level programs has been incorporated into an adjusted business-as-usual forecast. The state-level programs included in this adjusted forecast include the Renewable Portfolio Standard (RPS), updates to Title 24 Energy Efficiency Standards, California Solar Initiative Rebates, and the implementation of AB 1493, the motor vehicle fuel efficiency standard, referred to as the Pavley Standard. The impact of these state programs is described in Chapter 5 and Appendix 5.

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5 2009.
6 2009.
REDUCTION MEASURES

This Climate Action Plan demonstrates how the City will achieve its GHG emissions reduction target through the implementation of CAP strategies. All measures are captured in Chapter 4 and Chapter 5.

Emissions reductions were quantified for three different years: 2010, 2020, and 2030. Emissions reductions for 2010 have been quantified to demonstrate the actual emissions reduction progress that the City has already made in implementing measures in the Climate Action Plan, while the 2020 and 2030 emissions reductions are the potential reductions that will be achieved through the implementation of these measures over the next several years.

APPLICABILITY TO NEW DEVELOPMENT PROJECTS

In addition to quantifying the emissions reductions associated with each strategy in the Climate Action Plan, BAAQMD guidelines recommend that the City clearly specify the measures in the Climate Action Plan that new construction projects must implement to demonstrate compliance with the City’s GHG Climate Action Plan and determine that the project’s operational GHG emissions are less than significant by complying with a qualified GHG emissions reduction strategy. To ensure that each new construction project complies with the City’s Climate Action Plan, the City will adopt measures the Climate Action Plan identifies to integrate Climate Action Plan implementation in project development and review.

IMPLEMENTATION AND MONITORING

This Climate Action Plan recommends monitoring and updates of the emissions inventory and reduction measures a minimum of every 3 to 5 years. Each department assigned with implementation responsibilities will support this ongoing process. The City will delegate a department responsible for annual reports to the City Council and to monitor progress in achieving Climate Action Plan targets. Upon finalization of the Administrative Draft Climate Action Plan, the City will develop a Microsoft Excel-based tool to monitor and evaluate CAP implementation progress. Staff will use this tool to report on progress to date both qualitatively and quantitatively on an annual or quarterly basis. Should the City find that the reduction measures are not achieving their intended GHG reductions, the City will add additional voluntary and mandatory strategies, or consider making existing voluntary strategies mandatory, in order to achieve the City’s reduction target.

As Walnut Creek continues to implement additional programs that reduce GHG emissions, the Climate Action Plan will be updated accordingly. Additionally, as new technologies are developed and more thorough research on the effectiveness of certain emissions reduction measures is released, the potential emissions reductions to be achieved for each measure will be revised.

PUBLIC PARTICIPATION

Community participation has been an integral component as the City has developed its sustainability strategy and Climate Action Plan. The City held a Farmers’ Market outreach event in 2009 and a Town Hall workshop in 2011 that involved the community in the Climate Action Plan. Additional details can be found in Chapter 1. The City also has ongoing sustainability outreach programs outlined in Chapter 5 that support Climate Action Plan implementation.

Growth Indicator | Source | 2005 | 2010 | 2020 | 2030
--- | --- | --- | --- | --- | ---
Population | ABAG | 66,200 | 68,300 | 72,900 | 77,400
Households | ABAG | 31,050 | 32,230 | 34,160 | 36,450
Daily VMT (County of Contra Costa) | MTC Travel Forecast Data | 19,764,813 | 20,594,387 | 22,843,127 | 24,671,393
Employment | ABAG | 54,830 | 54,510 | 58,170 | 65,880
ENVIRONMENTAL REVIEW

To be updated as necessary before adoption of the Climate Action Plan.

Prior to adoption of this Climate Action Plan, the City will initiate an environmental review process to comply with the requirements of the California Environmental Quality Act. The City will complete a General Plan Environmental Impact Report (EIR) Addendum to the General Plan Final EIR (General Plan EIR) that the City adopted on December 9, 2005. This EIR assesses the potential environmental consequences of the Walnut Creek General Plan 2025, which was adopted April 4, 2006. The Final EIR identified significant impacts and mitigation measures for the General Plan.

The General Plan EIR Addendum addresses the environmental effects of the Climate Action Plan in light of the previous environmental review in the General Plan EIR. Implementation of the proposed Climate Action Plan will address climate change impacts associated with increases in greenhouse gas emissions that were not previously considered in the General Plan EIR.
Appendix 5

Adjusted Business as Usual Forecast Summary

Actions and legislation implemented by the State of California will have significant impact on reducing the city’s GHG emissions. State programs are included in the adjusted business-as-usual forecast to determine the additional level of local efforts that will be needed to meet the State-recommended and City-adopted GHG reduction targets of 15% below baseline levels by 2020.

Figure 5-1. Summary of State GHG Reduction Impacts to Walnut Creek

<table>
<thead>
<tr>
<th>State Actions</th>
<th>2010</th>
<th>2020</th>
<th>2030</th>
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<tr>
<td>Renewable Portfolio Standard</td>
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<tr>
<td>California Solar Initiative</td>
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<td>-832</td>
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<tr>
<td>Title 24 Updates</td>
<td>0</td>
<td>-2,670</td>
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<tr>
<td>Pavley (AB 1493)</td>
<td>0</td>
<td>-78,231</td>
<td>-135,470</td>
</tr>
</tbody>
</table>

ASSEMBLY BILL (AB) 1493 (PAVLEY)

METHODOLOGY

Signed into law in 2002, AB 1493 requires carmakers to reduce GHG emissions from new passenger cars and light trucks beginning in 2011. Regulations were adopted by the California Air Resources Board (CARB) in 2004 and took effect in 2009 with the release of a waiver from the U.S. Environmental Protection Agency (EPA) granting California the right to implement the bill. CARB anticipates that the Pavley standards will reduce GHG emissions from new California passenger vehicles by about 22% in 2012 and about 30% in 2016, all while improving fuel efficiency and reducing motorists’ costs.

The Pavley rules establish GHG emission standards for two different groups of passenger vehicles: (1) passenger cars (PC) and light duty trucks with test weights under 3,751 pounds loaded vehicle weight (LDT1); and (2) light-duty trucks with test weights between 3,751 pounds loaded vehicle weight and 8,500 pounds gross vehicle weight (GVW) (LDT2). Medium-duty passenger vehicles (LDT3) between 8,500 and 10,000 pounds GVW are included with manufacturers’ LDT2 vehicles when determining compliance with California’s GHG standards. For the purposes of this analysis, only vehicles up through 8,500 pounds were considered, since the majority of LDT3 vehicles are commercial and therefore do not fall under the scope of the Pavley rules.

The GHG emission standards established by the Pavley regulation reflect not only exhaust CO2 emissions resulting directly from operation of the vehicle but also (1) tailpipe emissions of CH4 and N2O; (2) CO2 emissions resulting from operating the air conditioning system (indirect AC emissions); and (3) HFC refrigerant emissions released from the air conditioning system due to
leakage, losses during recharging, sudden releases due to accidents, or release from scrappage of the vehicle at end of life (direct AC emissions). In this analysis, we’re only accounting for CO2 from tailpipe. Air conditioning is not included in EMFAC estimates of CO2e and methane and therefore not accounted for in the reductions.

GHG reductions from the Pavley standard were calculated using EMFAC 2007 data for Contra Costa County. EMFAC 2007 data includes the breakdown of vehicles by vehicle class and emissions factors per mile for each vehicle class. The impact that the Pavley standard will have on passenger vehicles in Walnut Creek follows a methodology based on an analysis of the reductions by vehicle class completed by the California Air Resources Board. Reductions by vehicle class were applied to emissions by vehicle class in Walnut Creek. Emissions reductions per model year and vehicle class based on the Pavley standards were applied to Walnut Creek’s transportation emissions and will result in a 17% decrease in transportation related GHG emissions by 2020 and a 27% decrease by 2030. This calculation excludes the impact of the Low Carbon Fuel Standards.

CITATIONS


Renewable Portfolio Standard

METHODOLOGY

California’s Renewable Portfolio Standard (RPS) mandates that utility providers procure 33% of their energy from renewable sources by 2020. PG&E is the provider of electricity in Walnut Creek, and approximately 11.8% of the utility’s electricity came from qualified renewable sources in 2005. In 2010, PG&E maintained a portfolio with 17.7% of their total electricity sales coming from certified renewable energy sources. While PG&E has made significant strides to reach the 33% goal by 2020, the California Public Utilities Commission (CPUC) has indicated that energy providers are not likely to meet this target due to transmission and permitting issues that have proved to be significant barriers to the development of renewable energy. The implementation of RPS in this Plan estimates PG&E will be providing customers in Walnut Creek with 30% of their electricity from renewable sources by 2020 and 50% by 2030.

CITATIONS


California Solar Initiative

**METHODOLOGY**

The California Solar Initiative (CSI) was authorized in 2006 under Senate Bill (SB) 1 and allows the California Public Utilities Commission (CPUC) to provide incentives to install solar technology on existing residential, commercial, nonprofit, and governmental buildings if they are customers of the state’s investor-owned utilities (IOUs): Pacific Gas & Electric (PG&E), San Diego Gas & Electric (SDG&E), or Southern California Edison (SCE). The CSI program has a budget of $2.167 billion to be expended by 2016, with a goal to reach 1,940 megawatts (MW) of installed power throughout the state by that time. The CSI program has several components including the Research and Development, Single-family Affordable Solar Housing (SASH), Multi-family Affordable Solar Housing (MASH), and Solar Water Heating Pilot Program, each of which provides incentives to further the development and installation of new solar technology on California’s buildings.

The CPUC provides complete solar installation data for each jurisdiction in California since 2006. GHG reductions related to the California Solar Initiative are incorporated into this Plan by identifying the total megawatts installed in Walnut Creek since the start of the program and estimating the annual kWh output of the solar installations. This calculation also estimates the rate at which residents and businesses will continue to install solar equipment through 2016, the anticipated end year of the program. Between 2006 and 2010, residential and commercial customers in Walnut Creek installed approximately 1 MW of solar photovoltaic systems, estimated to generate 1.9 million kWh every year. By 2020, it is estimated that Walnut Creek residents and businesses will have installed 2.7 MW of renewable energy systems that will produce 5 million kWh annually.

Local reductions attributed to the California Solar Initiative program are calculated solely based on the local rate of solar installation caused by the existing California Solar Initiative incentives. Reduction measures in the Climate Action Plan that address renewable energy capture the installation of additional renewables that are exceed the forecasted levels incentivized by the California Solar Initiative. Reduction measures will be achieved through additional local action and promotions that incentivize the local installation of solar and other renewable energy sources.

**CITATIONS**


http://www.californiasolarstatistics.ca.gov/reports/locale_stats/
Title 24: Energy Efficiency Standards

METHODOLOGY

California Building Codes, Title 24
Title 24 of the California Code of Regulations (CCR) mandates how each new home and business is built in California. It includes requirements for the structural, plumbing, electrical and mechanical systems of buildings, and for fire and life safety, energy conservation, green design and accessibility in and about buildings. The 2010 triennial edition Title 24 applies to all occupancies that applied for a building permit on or after January 1, 2011, and remains in effect until the effective date of the 2013 triennial edition. The EECAP will focus on two sections of Title 24: Part 6, the California Energy Code; and Part 11, the California Green Building Standards Code or CALGreen Code. These two sections require direct electricity, natural gas, and water savings for every new home or business built in California. Title 24 is a statewide standard applied at the local level by local agencies through project review.

Part 6, 2008 Building Energy Efficiency Standards
The most recent update to Title 24 Part 6, the California Energy Code, went into effect on January 1, 2010 for both residential and nonresidential new construction. Part 6 also includes requirements for lighting and insulation upgrades to nonresidential buildings undergoing a major retrofit.

Part 11, 2010 California Green Building Code
California is the first state in the nation to adopt a mandatory green building code, the California Green Building Standards Code, or CALGreen. The CALGreen Code was updated in 2010, and became a mandatory code beginning January 1, 2011. The Code takes a holistic approach to green building by including minimum requirements in the areas of planning and design, energy efficiency, water efficiency and conservation, material conservation and resource efficiency, and environmental quality. All local governments must adopt the minimum requirements of the CALGreen code and may elect to adopt one of the two additional tiers. Mandatory CALGreen standards do not require explicit reductions in energy consumption beyond the minimum Title 24 Part 6 standards. However, if a local government elects to adopt either of the tiers of CALGreen, additional prerequisites and electives must be implemented by new development projects subject to CALGreen. For the voluntary energy efficiency prerequisites, Tier 1 is a 15% improvement and Tier 2 is a 30% improvement over minimum Title 24 Part 6 requirements.

Adjustment to the Forecast for Mandatory Title 24 Reductions
The GHG forecast incorporates the net energy benefit of new Title 24 requirements that did not exist in the baseline year. These estimates are based on California Energy Commission studies that compare each new update of Title 24 to its former version. The AB 32 Scoping Plan calls for on-going triennial updates to Title 24 that will yield regular increases in the mandatory energy and water savings for new construction. As such, the GHG forecast also includes a conservative estimate of the energy and water reductions due to future updates of Title 24 based on historic growth rates. The energy reductions quantified in the forecast from Part 6 Energy Code updates are based on the assumption that the triennial updates to the code will yield regular
decreases in the maximum allowable amount of energy used from new construction. The County has adopted the minimum requirements of CALGreen.

The GHG forecast in this Plan incorporates the net energy benefit of new Title 24 requirements that did not exist in the baseline year. These estimates are based on California Energy Commission studies that compare each new update of Title 24 to its former version. The AB 32 Scoping Plan calls for ongoing triennial updates to Title 24 that will yield regular increases in the mandatory energy and water savings for new construction. As such, the GHG forecast also includes a conservative estimate of the energy and water reductions due to future updates of Title 24 based on historic growth rates. The energy reductions quantified in the forecast from Part 6 Energy Code updates are based on the assumption that the triennial updates to the code will yield regular decreases in the maximum allowable amount of energy used from new construction.

The AB 32 Scoping Plan calls for triennial updates to Title 24. To be conservative, we estimate that updated Title 24 standards will become effective every four years in 2010 (current version), 2014, 2018, and 2022. This analysis does not take into consideration any updates past 2022 due to lack of certainty.

Past updates to Title 24 have shown equal if not higher increases in efficiency as a result of the update. To be conservative, we estimate that each update to the Title 24 standards will have 70\% of the effectiveness of the 2008 versus 2005 standards.

The energy impact of 2008 Title 24 standards for nonresidential alterations is modeled. Future updates to Title 24 standards for nonresidential alterations are not taken into consideration for lack of data and certainty.

**CITATIONS**


http://www.energy.ca.gov/2010publications/CEC-200-2010-004/CEC-200-2010-004-ES.PDF