City of Vallejo

Climate Action Plan

Final

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Acknowledgements

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Executive Summary

The City of Vallejo Climate Action Plan (CAP) is Vallejo's road map to becoming a more sustainable community. The CAP will enable Vallejo to reduce greenhouse gas (GHG) emissions, adapt to climate change, and improve the economic, environmental, and physical health of the community. The CAP calls for many changes between now and 2035, including practices related to:

- Green Building Practices;
- Energy Efficiency;
- Transit-Oriented Development;
- Mixed-Use, Higher Density Development;
- Recycling and Composting;
- Water Conservation; and,
- Renewable Energy.

The CAP goals and policies will help shape the future of Vallejo. The City encourages every resident, employee, and neighbor of Vallejo to become involved in the planning process and to contribute their vision for a sustainable future.

This Climate Action Plan is funded by a generous grant from the U.S. Department of Energy as part of the American Recovery and Reinvestment Act of 2009.

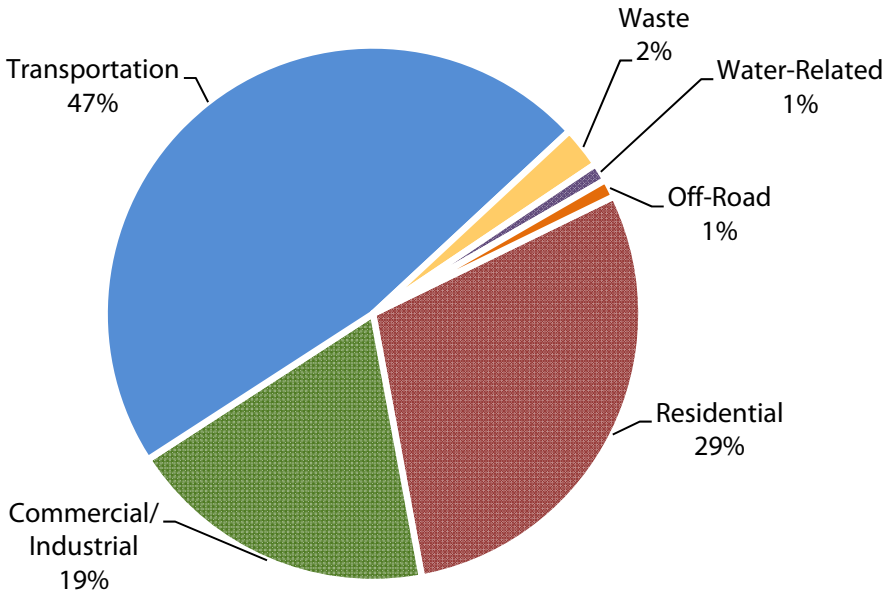
The Vallejo CAP is both a policy document and a quantitative analysis of the City's greenhouse gas emissions. Specifically, this Plan identifies policies that will achieve the state-recommended GHG reduction target of 15% below 2008 levels by the year 2020. The CAP provides goals and associated measures, also referred to as reduction measures, in the sectors of energy use, transportation, land use, water, solid waste, and off-road equipment. The CAP also outlines ways in which the City can prepare for possible impacts of climate change including sea level rise, water shortages, and extreme heat events.

EXECUTIVE SUMMARY

I. 2008 GREENHOUSE GAS EMISSIONS INVENTORY

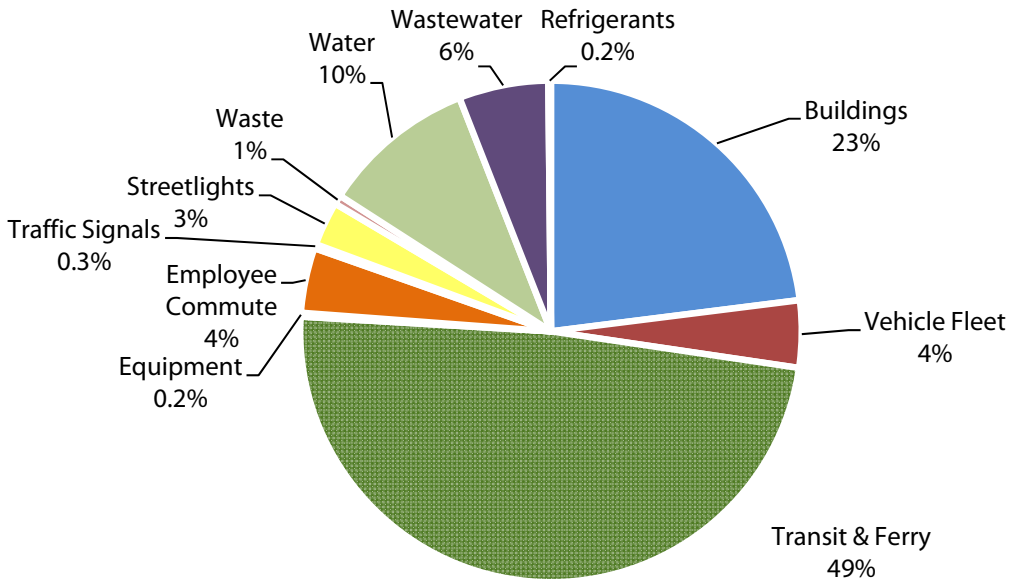
The foundation of a Climate Action Plan is a quantitative analysis of the community's existing GHG emissions. The 2008 baseline GHG Inventory (Inventory) identifies the major sources of emissions from the community of Vallejo and City government operations. The Inventory will act as a basis of comparison for future progress. Figure ES-1below identifies the sources of emissions from community-wide activities. In 2008, the community emitted 588,040 metric tons of carbon dioxide equivalents ($MTCO_2e$), most of which was the result of on-road vehicle travel (47%) and commercial/industrial and residential energy use (19% and 29%, respectively).

Figure ES-1. Community GHG Emissions by Sector



The City also analyzed GHG emissions from City government operations and facilities. Figure ES-2 identifies the GHG emissions caused by the City and Vallejo Sanitation and Flood Control District (VSFCD) such as facility energy use, vehicle fleet, refrigerant use, streetlight and traffic signal electricity use, and refrigerants. In 2008, City operations generated 40, 570 $MTCO_2e$, the majority of which was the result of transit and ferry fuel consumption (49%) and building energy (23%).

Figure ES-2. City Government GHG Emissions by Sector

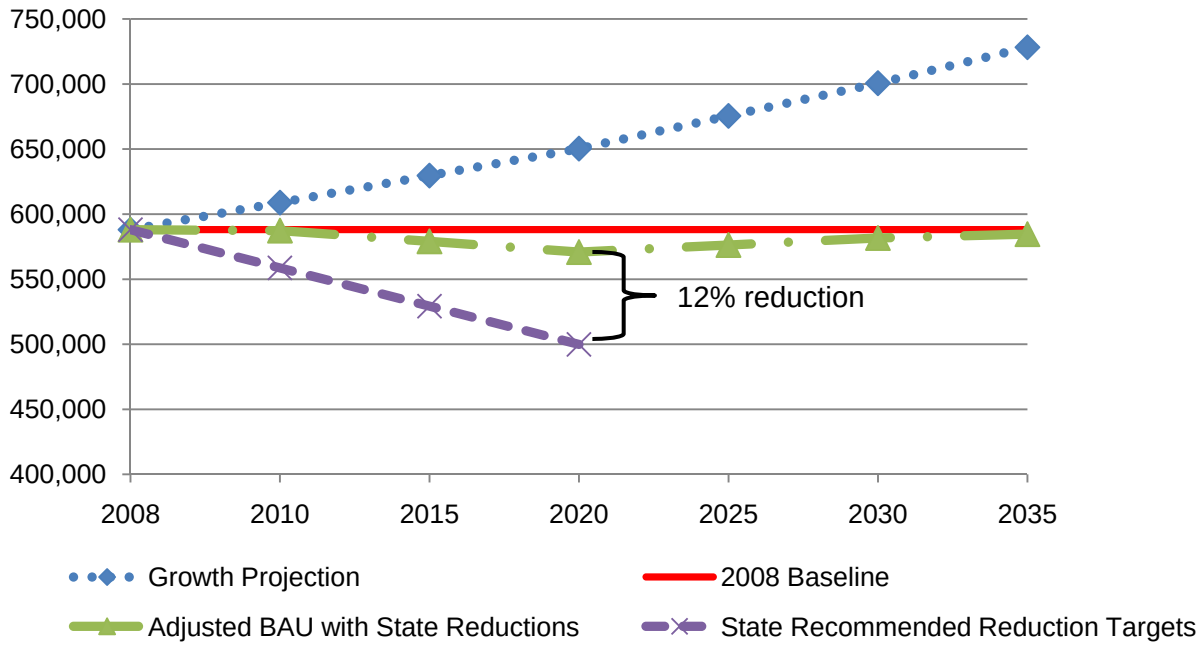


II. GHG EMISSIONS FORECAST

A GHG emissions forecast is a prediction of how GHG emissions will change in the future with anticipated modifications to Vallejo's population, commercial activity, and driving patterns. A GHG forecast allows the City to quantify the possible impact of sustainability goals and measures, and to track the City's progress towards GHG reduction targets.

Under the business-as-usual scenario or "status quo", Vallejo's GHG emissions will reach 650,330 $MTCO_2e$ and 728,170 $MTCO_2e$, by 2020 and 2035, respectively (See Figure ES-3). After incorporating state-mandated reduction efforts such as the California Green Building Standards Code, the renewable portfolio standard (RPS), and new vehicle standards, Vallejo's emissions are anticipated to be 571,360 MTCO2e and 584,630 MTCO2e by 2020 and 2035, respectively. As shown in Figure ES-4, an additional 14% reduction will be needed to reach the state-recommended 2020 target of 15% below baseline levels by 2020.

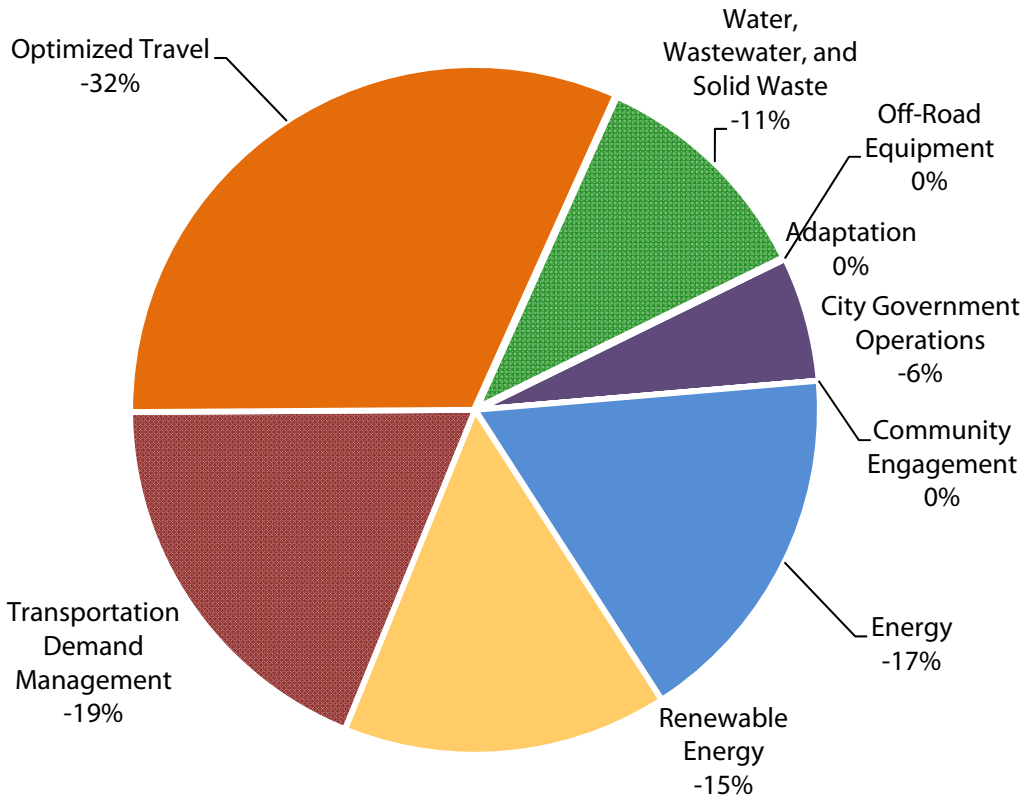
Figure ES-3. Business-As-Usual Forecast in Relation to State-Recommended Reduction Targets



III. GHG REDUCTION SUMMARY

This Plan outlines ways in which the City will be able to reduce GHG emissions 15% below baseline levels by 2020 through changes in land use and travel behaviors, more efficient and cleaner energy use, and additional conservation of natural resources. Optimized travel and transportation demand management make up approximately 50% of all local GHG reductions, while energy and renewable energy make up an additional 32% of local GHG reductions. Water, wastewater, and solid waste comprise an additional 12% of the GHG reductions, while improvements in City government operations and off-road equipment use make up the remaining GHG reductions (see **Figure ES-4**).

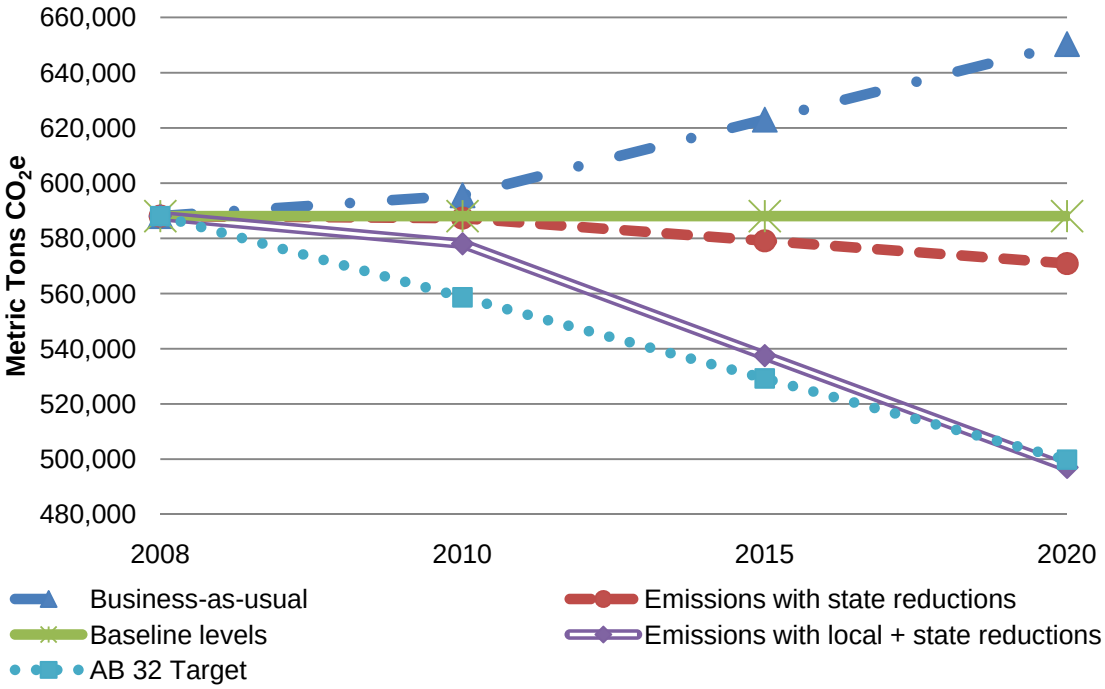
Figure ES-4. 2020 GHG Emissions Reduction Summary by Goal



The goals, measures and actions in this Plan outline how the City can reduce GHG emissions 15% by 2020 (see **Figure ES-5**). This reduction level aligns with state GHG reduction goals and allows this CAP to meet the requirements for a qualified GHG reduction strategy, as defined by the Bay Area Air Quality Management District. A qualified GHG reduction strategy will benefit the City by allowing for streamlined California Environmental Quality Act (CEQA) review.

EXECUTIVE SUMMARY

Figure ES-5. GHG Reduction Summary



IV. IMPLEMENTATION

The Implementation Program of this CAP is a strategy for action with specific measures and steps to achieve the GHG reduction target. The Program identifies responsible department, potential costs to the City time frames for action, and the indicators that will be used to measure progress. As the plan is implemented, the City will be able to compare the actual emissions reductions towards progress to the target and revise the plan as necessary to ensure the City reaches the reduction target for 2020. The Implementation Program is detailed further in Chapter 5.

Introduction

CHAPTER 1

The City of Vallejo is committed to improving the economic, environmental, and physical health of the community by reducing greenhouse gas (GHG) emissions. This Climate Action Plan (CAP; Plan) is a road map to improving efficiency in City operations and facilitating the efficient use of energy, economic, and natural resources in the community. This Plan contains specific goals, measures, and actions to achieve the City's vision from today through 2020 and 2035 while supporting state and federal greenhouse gas reduction targets. The efforts described herein will provide fuel, energy, water, and monetary savings while improving the quality of life in Vallejo.

I. Purpose and Scope

This Plan is the beginning of an ongoing planning process that enables the City to reduce community-wide energy and fuel use, reduce waste, and demonstrate compliance with the Bay Area Air Quality Management District (BAAQMD) CEQA Air Quality Guidelines through the development of a qualified GHG reduction strategy. The purpose of this Plan is to identify how the City will achieve the state-recommended GHG emission reduction target of 15% below 2008 levels by the year 2020. The CAP provides goals and associated measures, also referred to as reduction measures, in the sectors of energy use, transportation, land use, water, solid waste, and off-road equipment. In addition, this CAP provides goals and measures for longer-term adaptation to the potential risks of climate change.

Specifically, this Plan:

- Identifies sources of energy use and greenhouse gas emissions from sources within the City of Vallejo's jurisdictional/political boundary and forecasts how these emissions may change over time. (**Chapter 3**)
- Provides energy use, transportation, land use, water use, and solid waste strategies to save money and reduce Vallejo's GHG emissions levels to 15% below 2008 levels by 2020. (**Chapter 4**)
- Presents an implementation program to assist with monitoring and prioritization of the reduction strategies through 2020. (**Chapter 5**)
- Provides substantial evidence that the emissions reductions estimated in the Climate Action Plan are feasible. (**Appendix B**)
- Provides methods for reducing Vallejo's GHG emissions consistent with the direction of the State of California through the Global Warming Solutions Act (AB 32), Executive Order S-03-05, Public Resources Code Section 21083.3, and BAAQMD's CEQA Air Quality Guidelines for a qualified GHG reduction strategy. (**Appendix C**)

INTRODUCTION

II. PUBLIC PARTICIPATION

The City has involved numerous stakeholders throughout the development of the CAP. During the development of the CAP, the City has engaged stakeholders and interested community members at three public workshops. At the first workshop, the community worked with staff to identify possible goals and reduction measures. The second workshop allowed the community to provide feedback to staff on the preliminary goals, reduction measures, and actions to be included in the CAP. The third and final public workshop was held to receive public comment on the draft CAP. Finally, public comment was considered during the public hearings on the CAP and Negative Declaration at Planning Commission and City Council meetings.

III. HOW TO USE THIS PLAN

This Climate Action Plan covers a broad range of complex issues and strategies related to energy efficiency and conservation, GHG emissions, and the City's economic objectives. The Plan has two primary components: chapters and supporting appendices. Chapters provide the bulk of the Plan's substance. Appendices provide additional technical detail to support the City's overall reduction target and strategies to achieve the target. Chapters 1 through 3 establish the background and process to develop this Plan. Chapter 4 builds on this foundation and creates strategies to achieve GHG targets. The Plan concludes with Chapter 5, which summarizes GHG emissions reductions and establishes an implementation program to achieve the overall reduction targets. Appendix A includes the detailed findings of the City's baseline community-wide and City government GHG emissions inventory. Highlights from the inventory are provided in Chapter 3 of this Plan. Appendix B includes a summary of methodologies, assumptions, and sources that form the basis of reduction measures in Chapter 5. Finally, Appendix C provides details on how this CAP will fufill the requirements of a qualified GHG reduction strategy per BAAQMD's CEQA Air Quality Guidelines.

Chapter 5 depicts the City's actions to achieve energy independence and reduction targets. These actions consist of the basic building blocks of actions, measures, and goals:

- **Goal:** A set of desired outcomes, an ideal future result or condition, based on the City's priorities and vision.
- **Measure:** A specific action derived from a goal that represents the City's strategy to achieve a goal. Measures are assessed and quantified and count toward the City's reduction target.
- **Supportive Measure:** Strategies derived from a goal that are important or essential to goal implementation but not quantified or measured based on available information.

- **Action:** Action items that highlight the implementation steps necessary to achieve measures and ultimately the City's reduction target.

- **Reductions:** Each measure includes details on the specific, numeric reductions achieved in energy, transportation, or waste that contribute to the goal and the resulting reduction in GHG emissions. Reductions are presented in the following categories:

    - **GHG Reductions:** Reductions in GHG emissions are represented as metric tons of carbon dioxide equivalent ($MTCO_2e$), the standard way to present reductions in all GHG emissions.

    - **Co-Benefits:** In addition to reducing GHG emissions, many measures will provide community benefits like saving money or improving mobility, while furthering the sustainability goals of the City. These co-benefits are depicted in this document with the following graphic symbols:

IV. VALLEJO'S PATH FOR SUCCESS

The intent of this Plan is to stimulate and support energy efficiency and greenhouse gas reductions while benefiting residents, employees, and businesses in Vallejo. **Figure 1-2** illustrates that individual lifestyles, economic investment, and governmental actions all work together to improve economic performance and reduce GHG emissions. The strategies contained in this Plan recognize that energy reductions and greenhouse gas (GHG) emissions are linked to the patterns of daily life.

Figure 1-1. Economic Performance and Greenhouse Gas Emissions

Source: Next 10. 2010. 2010 California Green Innovation Index. San Francisco, CA.

The City is already implementing strategies to achieve the reduction targets of this Plan through commitments to reduce energy use and emissions while supporting economic growth and healthier opportunities for daily life. This Plan builds on the City's past leadership to chart a path for sustained success. The remaining chapters of this Plan outline in further detail the step-by-step actions the City will take to implement the Plan.

Plan Integration

This Plan will function as an easy-to-use tool to implement the City's overarching policies, achieve the City's sustainbility goals, and attain GHG emissions reductions. The Plan establishes goals for GHG emissions reductions and creates steps to achieve these targets. Unlike other components of City policies, this Plan translates goals and actions into numeric targets for GHG emissions. The Plan builds on the goals and vision of the General Plan and the City's specific plans, but translates these goals into quantifiable impacts on GHG emissions.

This Plan also has a relationship to the California Environmental Quality Act (CEQA). CEQA is a state law requiring public agencies like Vallejo to assess the environmental impacts of projects they undertake or permit and to adequately inform and solicit feedback from the community before taking action. An Initial Study under CEQA has been prepared to study the environmental impacts of the goals, measures, and actions set forth in this Plan. The Initial Study will allow the City to use the Climate Action Plan to streamline the environmental review of most developments and improvements in Vallejo. In essence, the CAP is an umbrella for all future actions that ensures Vallejo's consistency with state GHG reduction priorities. As long as future development is consistent with the goals and measures of this Plan, it is consistent with state GHG reduction targets. This consistency will allow future improvements in Vallejo to move faster and be more cost effective, saving the City and community time and money.

Background

CHAPTER 2

This chapter outlines how science, economic realities, and regulatory requirements drive the rationale of this Plan within the local context of Vallejo.

I. Vallejo: An Introduction

The City of Vallejo is the largest city in Solano County, and is on the shore of San Pablo Bay in the San Francisco Bay Area. The City of Vallejo has an area of 48.8 square miles, 18.6 square miles of which is water. Vallejo enjoys a mild Mediterranean climate that is influenced by its proximity to the San Francisco Bay.

In 2010, the City of Vallejo was home to approximately 118,000 people. Solano County is generally considered to have the most affordable median sales prices for single-family homes in the Bay Area region. The average household size in Vallejo is approximately 2.9 people per household, higher than the California average of 2.7 people per household.

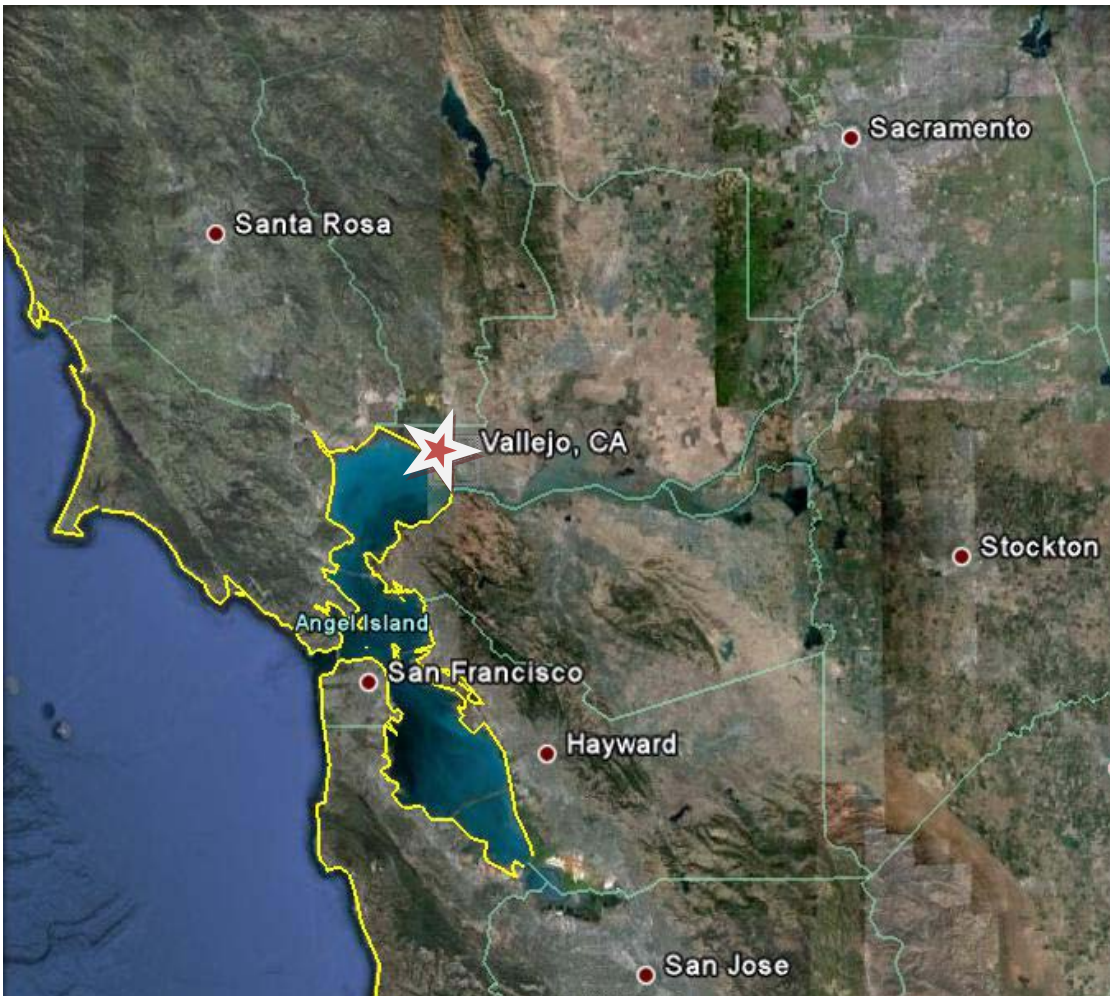
The city's economic base is diverse with strong employment numbers in the medical, government, and educational sectors. The city is home to several recreational and educational facilities including the former Mare Island Naval Shipyard, the California Maritime Academy, Six Flags Discovery Kingdom, Solano Community College, and Touro University. In the 1850s, Mare Island was developed as the West Coast's first naval shipyard, and it continued to serve as a primary economic driver of Vallejo until 1995, when Mare Island was decommissioned. Since its closure, the City has worked with local, regional, state, and federal agencies to transform Mare Island into a revitalized community for living, working, and recreation.

Other attractions in Vallejo include four golf courses, the Solano County Fairgrounds, Empress Theater, sailing and boating facilities like the Vallejo Yacht Club, Vallejo Municipal and Glen Cove marinas, and the weekly farmers market.

Vallejo is connected to several regional employment centers within the Bay Area like Oakland, San Francisco, Walnut Creek, and the North Bay Area as well as to the state capitol in Sacramento through state highways, the Baylink Ferry, Solano Transit, and Vallejo Transit connections to regional BART and Amtrak stations.

BACKGROUND

Figure 2-1. Vallejo Context



Source: Google, Inc. 2011

II. CLIMATE CHANGE SCIENCE OVERVIEW

Since the early 1990s, scientific consensus holds that the world's population is releasing greenhouse gases faster than the earth's natural systems can absorb them. These gases are released as by-products of fossil fuel combustion, waste disposal, energy use, land-use changes, and other human activities. This release of gases, such as carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O), creates a blanket around the earth that allows light to pass through but traps heat at the surface preventing its escape into space (**Figure 2-2**). While this is a naturally occurring process known as the greenhouse effect, human activities have accelerated the generation of greenhouse gases beyond natural levels. The overabundance of greenhouse gases in the atmosphere has led to an unexpected warming of the earth and has the potential to severely impact the earth's climate system.

While often 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 of time that can be caused by both natural factors and human activities.[1] Global warming, on the other hand, is an average increase in the temperature of the atmosphere caused by increased greenhouse gas emissions. The use of the term climate change is becoming more prevalent because it encompasses all changes to the climate, not just temperature.

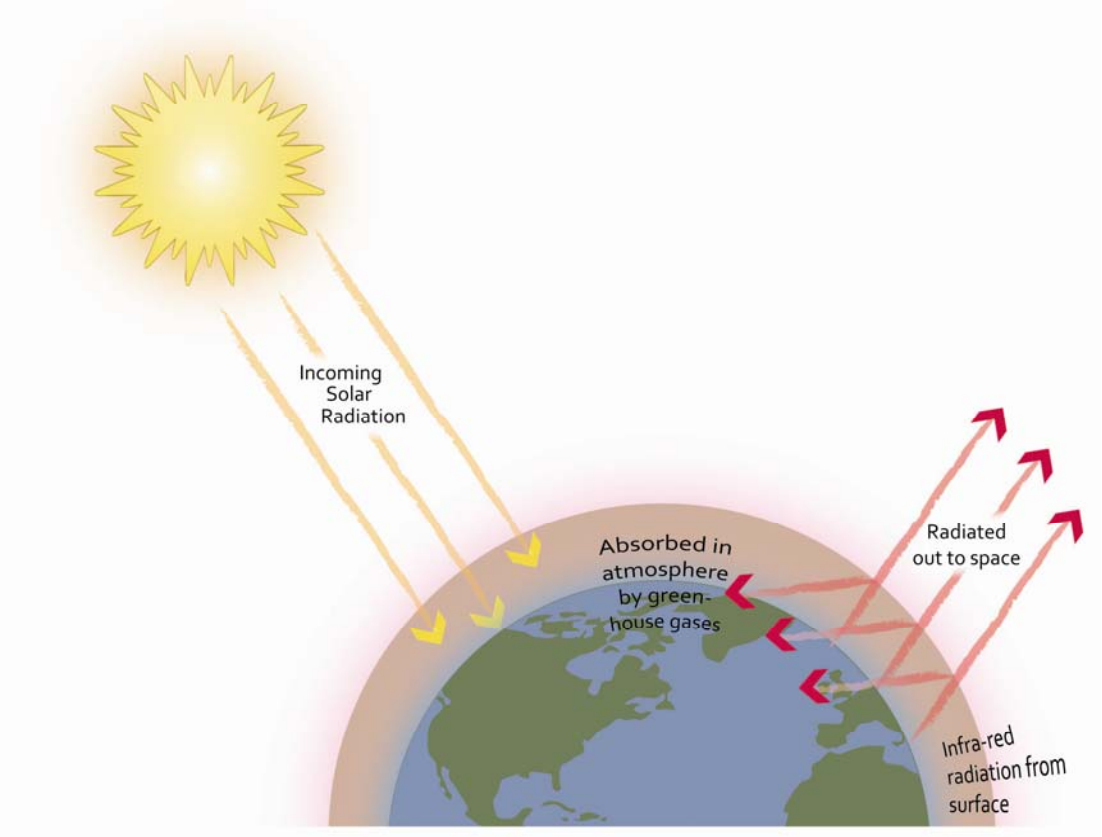
The Greenhouse Effect

Our planet depends on the greenhouse effect, which results when the atmosphere captures the heat that radiates away from the earth toward space. 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 similarly to glass on a greenhouse; the glass panes of a greenhouse allow sunlight to pass into the building but trap heat within it, preventing the heat from escaping.[2]

[1] National Academy of Sciences 2008.

[2] National Oceanic and Atmospheric Administration, National Climatic Data Center 2008.

Figure 2-2. The Greenhouse Effect



Source: National Oceanic and Atmospheric Administration, National Climatic Data Center. 2008. NOAA Satellite and Information Service.

III. RATIONALE FOR CLIMATE ACTION

While the severity of climate change impacts may remain uncertain, the economic, social, and health benefits of addressing the City's air quality, energy consumption, and travel patterns are undeniable. The City has prepared this CAP to both address the most severe climate change scenario and identify opportunities to enhance Vallejo as an attractive place to live, work, and play.

The Local Economy

The economic climate that has developed since 2008 requires an innovative and forward-thinking strategy to both find and direct scarce economic resources that in turn catalyze economic growth. A primary task of this Plan is to demonstrate opportunities for residents and businesses to reduce unnecessary costs in order to redirect money back into the local economy. The Plan aims to put more money back into the pockets of the people who live and work in Vallejo.

Since the 1970s, California has enacted the nation's leading energy efficiency standards and continually leads the nation in terms of energy efficiency. As a result of lower energy consumption compared to other states, money that households and businesses would have otherwise paid for energy has been reinvested into the state's economy.[3] A study prepared for the California Air Resources Board found that the state's energy efficiency measures from 1972 to 2006 have allowed households to redirect approximately $56 billion in expenditures to a more diverse array of goods and services, creating approximately 1.5 million full-time equivalent jobs.[4]

Potential Climate Change Impacts to California and Vallejo

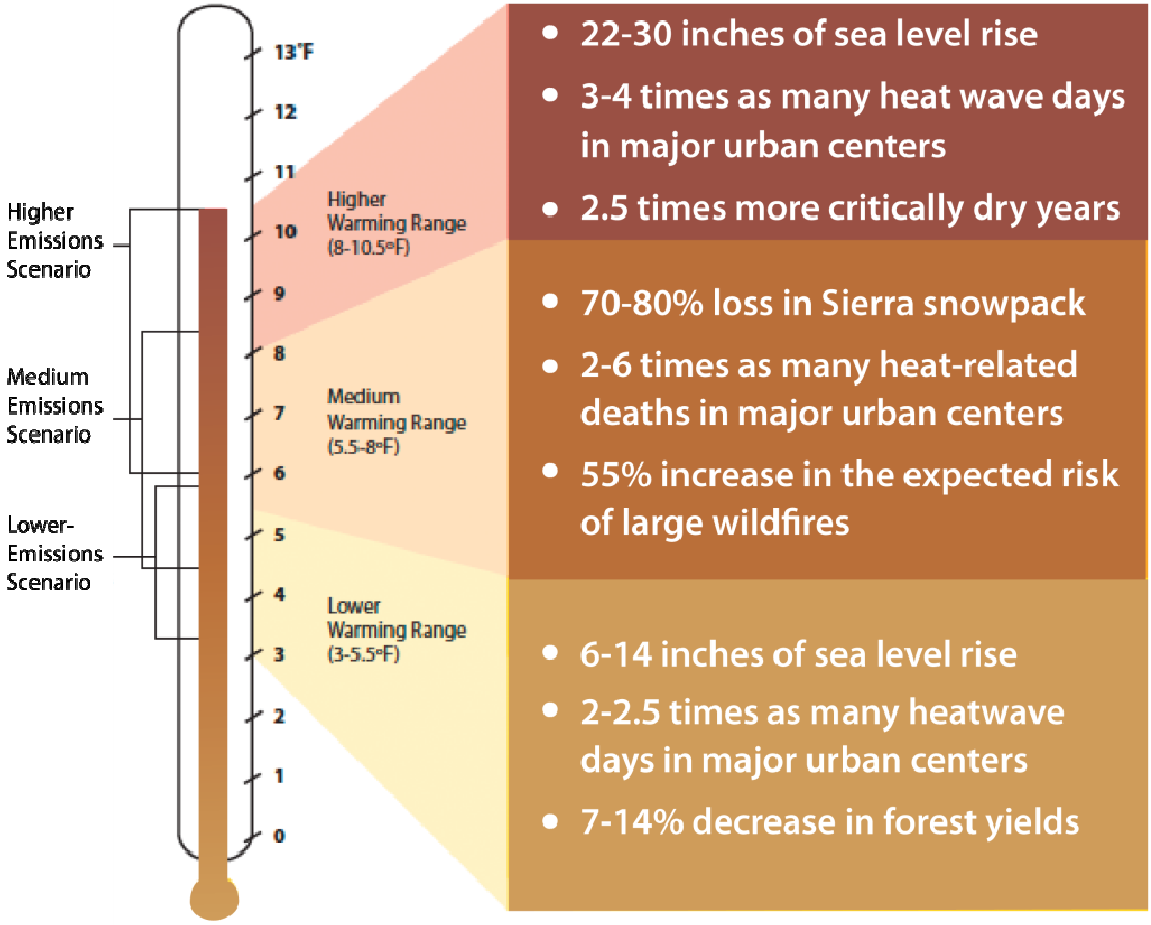
Research suggests that California may experience hotter and drier conditions, reductions in winter snow and increases in winter rains, sea level rise, and an increased occurrence of extreme weather events. Such compounded impacts will affect economic systems throughout the state. To refrain from action is costly and risky; the California Climate Adaptation Strategy estimates that no action to address the potential impacts of climate change will lead to sector-wide losses of "tens of billions of dollars per year in direct costs" and "expose trillions of dollars of assets to collateral risk."[5] Potential impacts in California due to climate change are summarized in **Figure 2-3.**

[3] Next Ten 2010.

[4] Roland-Host 2008.

[5] California Natural Resources Agency 2009.

Figure 2-3. California Climate Change Impacts



Source: California Energy Commission. 2006. Our Changing Climate: Assessing the Risks to California. Web Document. Sacramento, CA: California Energy Commission.

Vallejo is located in Solano County, in the San Francisco Bay Area, along the shoreline of San Pablo Bay. The potential consequences of climate change for the State of California and the City of Vallejo include:

Increased Rate of Wildfires

Wildfire risk is based on a combination of factors including precipitation, winds, temperature, and vegetation. Wildfires are likely to grow in number and size throughout the state as a result of increased temperatures induced by climate change. Even under the

"medium" warming scenario predicted by the Intergovernmental Panel on Climate Change, wildfire risk will likely increase by 55% in California.[6] Further, as wildfires increase in frequency and size, they will also increase in intensity.[7]

Negative Impacts on Wildlife

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. 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. Several potential hydrological changes associated with global climate change could also specifically influence the ecology of aquatic life in California and have several negative effects on cold-water fish. For example, if a rise in air temperature by just a few degrees Celsius occurs, this change could be enough to raise the water temperatures above the tolerance of salmon and trout in many streams, favoring instead non-native fishes such as sunfish and carp. Many of the potential effects on wildlife are still being studied, but due to an inability to quickly adapt to new climates, the potential for severe species loss is present.

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. Further, climate change is expected to alter the spread and prevalence of disease vectors and lead to a possible decrease in food quality and security.[8] Vector control districts throughout the state are already evaluating how they will address the expected changes to California's climate.

According to a new report from the Air Resources Board, the warming climate will increase ozone levels in California's major air basins, leading to upwards of 6 to 30 more days per year with ozone concentrations that exceed federal clean-air standards. The elderly, young, and vulnerable populations most likely to be impacted by climate change are also those that often lack sufficient resources to adapt. Such vulnerable demographics are likely to need assistance to respond to climate change, which leads to social equity issues related to the unequal distribution of resources and increased costs to address community-wide health risks.

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[6] California Natural Resources Agency 2009.

[7] California Natural Resources Agency 2009.

[8] California Natural Resources Agency 2009.

Decreased Supply of Fresh Water

The state's water supply is already under stress and is anticipated to shrink under even the most conservative climate change scenario. Warmer average global temperatures cause more rainfall than snowfall, making the winter snowfall season shorter and accelerating the rate at which the snowpack melts in the spring. The Sierra snowpack is estimated to experience a 25–40% reduction from its average by 2050.[9] 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. Further, warmer weather will lead to longer growing seasons and increased agricultural demand for water.[10]

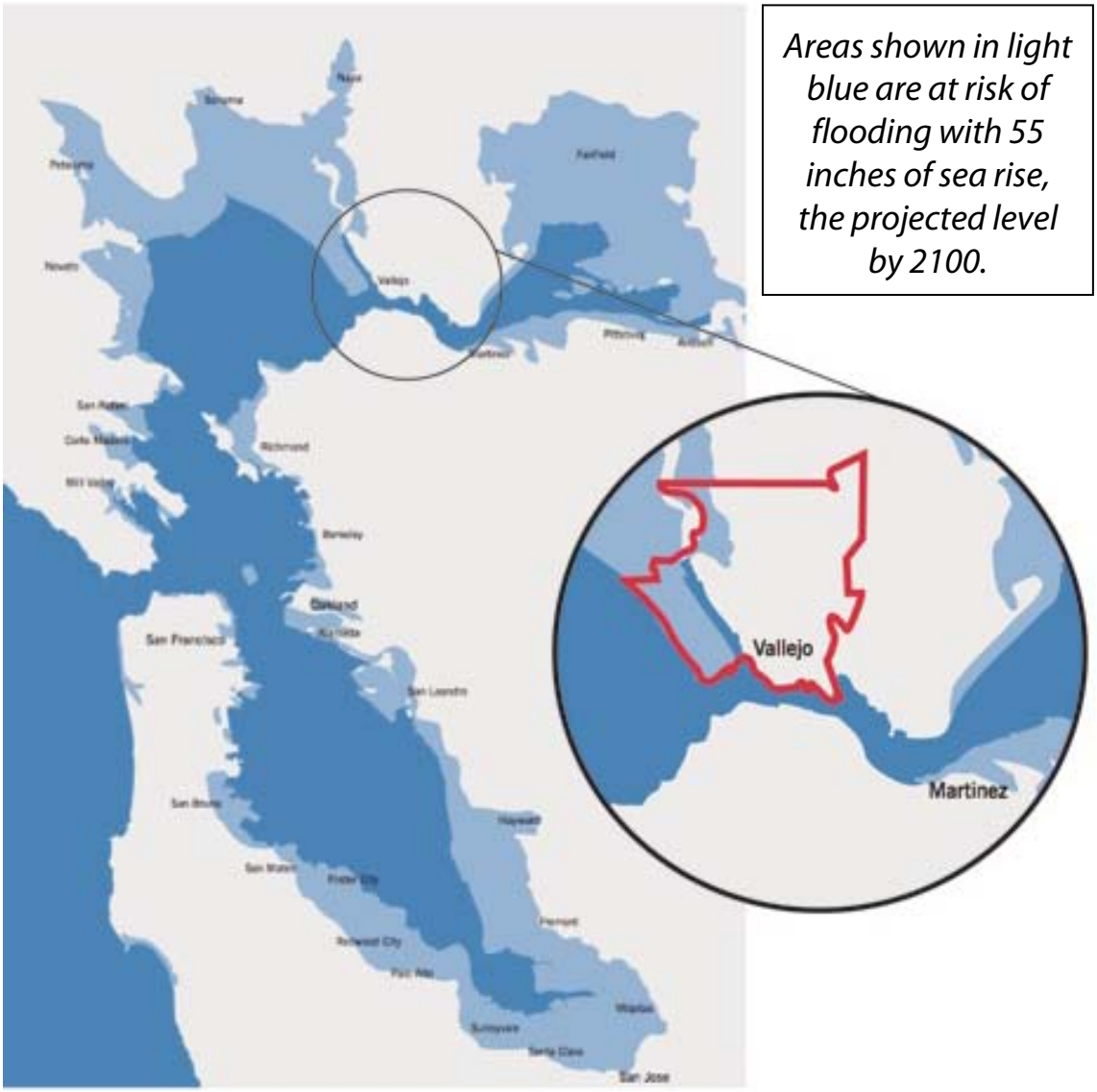
Sea Level Rise

The Bay Area coastline could face inundation as a result of sea level rise and global warming. **Figure 2-4** shows the potential inundation level around Vallejo and Mare Island in 2100, as modeled by the San Francisco Bay Area Conservation and Development Commission (BCDC). As temperatures rise, the ocean waters rise as well due to thermal expansion and the melting of glaciers and snowpack. The State's 2009 Climate Change Impacts Assessment (the 2009 Scenarios Project) estimates that sea levels will rise by 12 to 18 inches by 2050 and 21 to 55 inches by 2100.

[9] California Natural Resources Agency 2009.

[10] California Natural Resources Agency 2009.

Figure 2-4. Areas Vulnerable to Sea Level Rise



Source: San Francisco Bay Conservation and Development Commission 2008.

IV. FEDERAL, STATE, AND REGIONAL EFFORTS TO ADDRESS CLIMATE CHANGE

Vallejo's climate action efforts will be implemented within a robust federal, state, and regional framework. Although the federal government has yet to enact legislative targets for reducing greenhouse gas emissions, California was the first state in the nation to adopt GHG emissions reduction targets in 2006 under Assembly Bill 32 (AB 32). This section highlights the federal, state, and local legislative framework guiding the preparation and implementation of this Plan.

Federal Framework

While current federal government regulations lack strict emissions reduction targets, there are a variety of ways that the federal government is supporting emissions reduction efforts of state and local governments. Numerous proposals are currently under way at the federal level to limit emissions from power plants, impose pricing on carbon emissions, and provide federal energy legislation.

Federal agencies have undertaken a concerted effort to assist state and local governments, businesses, and residents with efforts related to energy, climate action planning, and smart growth. The Environmental Protection Agency (EPA) also provides educational resources and analytical tools in support of GHG analysis and climate action planning.

Clean Air Act

Under the Clean Air Act (CAA), the EPA is required to regulate and set emissions standards for "any air pollutant" from motor vehicles which have the potential to endanger public health or welfare. In 2003, the EPA made the determination that it lacked the authority to regulate carbon dioxide and other greenhouse gas emissions for the purpose of climate change.[11] Following this determination, a group of 12 states (including California), three cities, and one American Territory, along with more than a dozen individual organizations petitioned the EPA's decision to the U.S. Court of Appeals in the case of *Massachusetts v. Environmental Protection Agency*. The decision was upheld by the lower courts and appealed

[11] United States Environmental Protection Agency 2003.

to the Supreme Court, where the 5–4 decision was made to force the EPA to treat and regulate carbon dioxide and other greenhouse gases as pollutants under the Clean Air Act.[12]

Beginning in 2011, the EPA will regulate GHG emissions from new power plants and refineries through a set of New Source Performance Standards (NSPS). These regulations will be finalized and applied to all new stationary sources by 2012.

American Recovery and Reinvestment Act – Energy Efficiency and Conservation Block Grants

In addition to the EPA's regulatory authority to manage greenhouse gas emissions, the 2009 American Reinvestment and Recovery Act (ARRA) package has supported state and local government investment in greenhouse gas reduction activities through Energy Efficiency and Conservation Block Grant (EECBG) funding. The EECBG program, managed under the U.S. Department of Energy, has provided a total of $3.2 billion to cities and counties across the United States to invest in energy efficiency and reduce fossil fuel emissions from the building and transportation sectors, thereby reducing greenhouse gas emissions.

California Framework

The State of California is the 15th largest emitter of greenhouse gases in the world, ultimately accounting for 2% of global greenhouse gas emissions.[13] However, the State has been proactive in working to reduce emissions and has a long history of proven leadership in addressing energy and climate issues spanning the last 40 years. In 1988, Assembly Bill (AB) 4420 (Sher, Chapter 1506, Statutes of 1988) designated the California Energy Commission (CEC) as the lead agency for climate change issues in California.[14] Since that time, there have been numerous initiatives in California to address climate change and energy efficiency, the majority of legislation passed between 2000 and now. 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 efforts 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 efforts.

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[12] Massachusetts et al. v. Environmental Protection Agency et al. 2007.

[13] California Air Resources Board,California Climate Action Registry, ICLEI-Local Governments for Sustainability 2010.

[14] California Energy Commission 2009.

BACKGROUND

California legislation related to climate change includes Executive Order S-3-05, Assembly Bill 32, and Senate Bill (SB) 375, which direct the State and other local agencies to reduce GHG emissions. These orders and laws are summarized below.

Executive Order S-3-05 establishes the California Environmental Protection Agency (CalEPA) as the agency responsible for coordinating the State's effort to achieve the (non-binding) progressive greenhouse gas emissions reduction targets outlined in the executive order for the state:

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

Assembly Bill 32, known as the California Global Warming Solutions Act, was approved by the legislature and signed by Governor Schwarzenegger in 2006. The landmark legislation requires the California Air Resources Board (CARB) to develop regulatory and market mechanisms that will reduce greenhouse gas emissions to 1990 levels by 2020.[15] Mandatory actions under the legislation to be completed by CARB include:

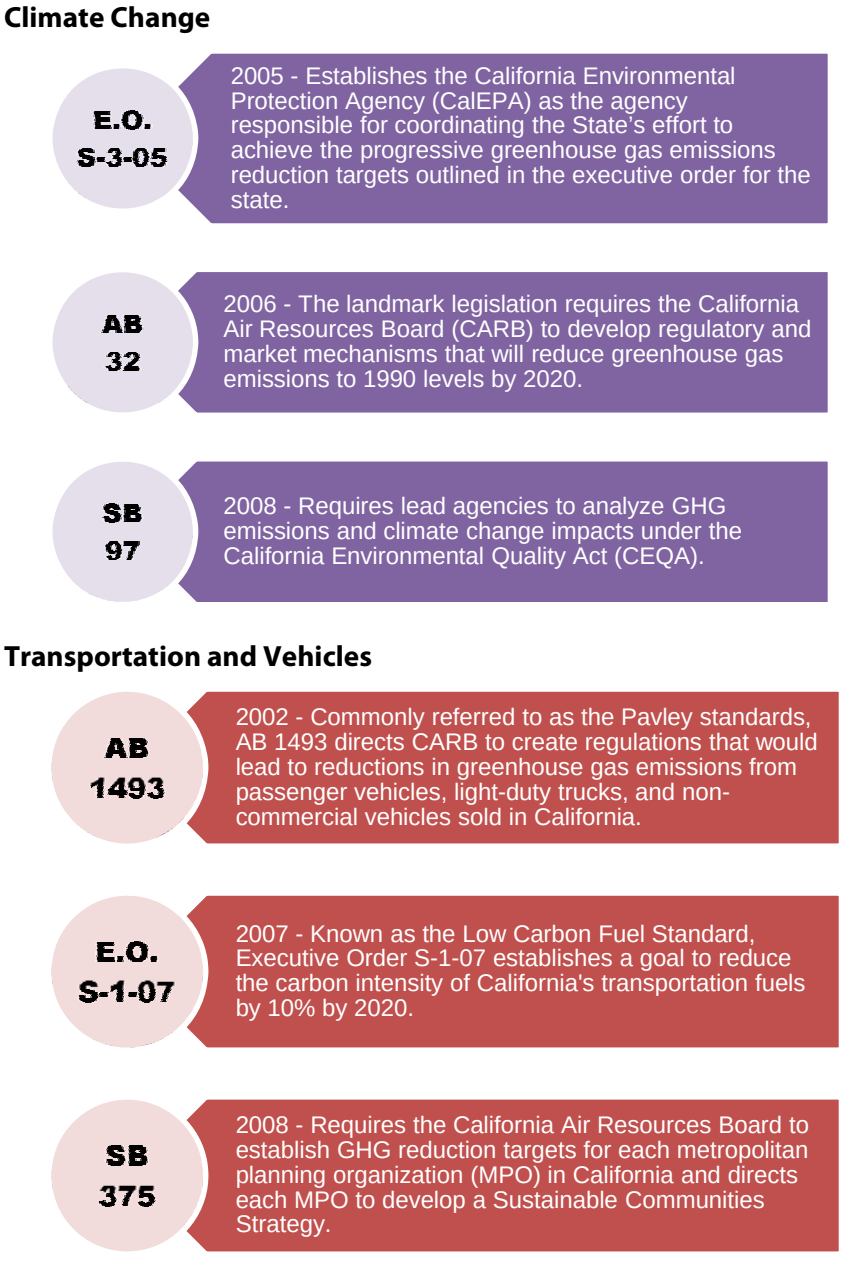
- Identifying early action items that can be quickly implemented to achieve greenhouse gas reductions. These early action items were adopted by the California Air Resources Board in 2007 and include regulations affecting landfill operations, motor vehicle fuels, car refrigerants, and port operations, among other regulations.
- Development of a scoping plan to identify the most technologically feasible and cost-effective measures to achieve the necessary emissions reductions to reach 1990 levels by 2020. The scoping plan employs a variety of GHG reduction measures that include direct regulations, alternative compliance mechanisms, incentives, voluntary actions, and market-based approaches like a cap-and-trade program.
- Creation and adoption of regulations to require the state's largest industrial emitters of greenhouse gases to report and verify their greenhouse gas emissions on an annual basis.

Senate Bill 375 builds off of AB 32 and aims to reduce GHG emissions by linking transportation funding to land use planning. It requires metropolitan planning organizations (MPOs) to create Sustainable Communities Strategies (SCSs) in their regional transportation plans (RTPs) for the purpose of reducing urban sprawl. The SCS will demonstrate how the region will achieve the greenhouse gas emissions reduction target set by CARB for 2020 and 2035.

[15] California Air Resources Board 2010.

In addition to Executive Order S-3-05, AB 32, and SB 375, the State has enacted legislation and policy initiatives related to climate change, transportation and vehicle efficiencies, energy, water, and solid waste. A summary of recent state efforts by topic is provided below in **Figure 2-5.**

Figure 2-5. California Regulatory Framework Summary



BACKGROUND

Energy

Title 24 — Title 24 Standards were first adopted in 1978 and established minimum energy efficiency performance standards for residential and nonresidential buildings. Since then, the standards have been continually updated to reduce California's energy consumption.

SB 1078 — 2002 - Established Renewable Portfolio Standards for each of the state's investor-owned utilities (IOUs) to acquire 20% of their electricity from renewable resources by 2010 and 33% by 2020.

SB 1368 — 2006 - Establishes emissions performance standards for new and existing power plants that produce energy that is sold to publicly owned and investor-owned utilities.

AB 811 — 2008 - Authorized all cities and counties in California to designate areas within which willing property owners could finance the installation of distributed renewable generation, as well as energy efficiency improvements through low-interest loans.

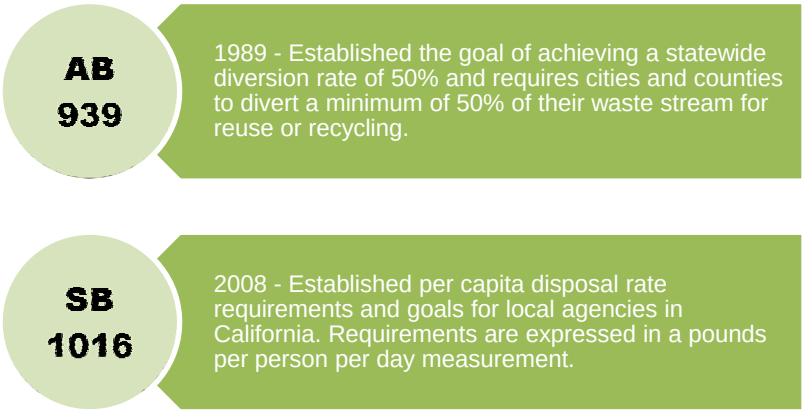
Water

SB 1881 — 2006 - Requires cities and counties to adopt a water-efficient landscape ordinance, limiting the amount of water used for landscaping purposes.

SB 7 — 2009 - Requires the State to achieve a 20% reduction in per capita water use by 2020. Noncompliance by local water providers will make them ineligible for state grant or loan funding from the State.

SB 407 — 2010 - Requires inefficient plumbing fixtures be replaced with more efficient models at the time of property sale or improvement.

Solid Waste



State Guidance and Reports on Climate Change

AB 32 Scoping Plan – In 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.

California Climate Adaptation Strategy – In 2009, the California Natural Resources Agency released the California Climate Adaptation Strategy as a guide to both state and local agencies on appropriate strategies to adapt to climate change impacts. The guide includes adaptation strategies for public health, biodiversity, ocean and coastal resources, water management, agriculture, forestry, transportation, and energy infrastructure sectors.

SB 97-CEQA Guideline Amendments – The State Resources Agency adopted guidelines developed by the Governor's Office of Planning and Research (OPR) to address climate change in CEQA documents, per SB 97. Guidelines Section 15183.5(b) outlines the approach to structuring plans for reduction GHG emissions to serve as tiering documents.

Bay Area Framework

Bay Area Air Quality Management District

CEQA Air Quality Guidelines – The Bay Area Air Quality Management District CEQA Air Quality Guidelines (Guidelines) were developed to assist lead agencies in evaluating air quality impacts for projects and plans in the San Francisco Bay Area Air Basin. The Guidelines were updated in 2010 to include guidance on assessing greenhouse gas and climate change impacts as required under CEQA Section 15183.5(b) and to establish thresholds of significance for impacts related to greenhouse gas emissions. 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 greenhouse gas reduction strategy. This CAP will meet the programmatic threshold of the BAAQMD guidelines.

This CAP will follow both State CEQA Guidelines and BAAQMD's Guidelines by incorporating the standard elements of a qualified GHG reduction strategy into the CAP. The standard elements of a GHG reduction strategy include the following steps:

- 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.

Appendix C describes in detail how the City's Climate Action Plan satisfies BAAQMD's requirements for a qualified GHG reduction strategy and will allow future development projects to determine that a project has a less than significant impact on GHG emissions so long as it complies with the City's Climate Action Plan.

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I. Greenhouse Gas Emissions Inventory, Forecast, and Target

Vallejo has taken the first step in addressing greenhouse gas emissions with the development of a Community-Wide and City Government Operations Baseline Greenhouse Gas (GHG) Emissions Inventory (Inventory). The Inventory identifies the major sources of greenhouse gas emissions within the city and provides a baseline against which future progress can be measured.

Specifically, this Inventory does the following:

- Calculates GHGs from community-wide activities, including City government operations, within the City's jurisdictional boundary in calendar year 2008;
- Details the impact of City government operations on overall community-wide emissions in order to identify inefficiencies and create an example for other organizations to study their operational emissions;
- Provides City decision-makers and the community with adequate information to inform policy decisions; and
- Forecasts how emissions will grow in the community if no behavioral changes are made.

The 2008 Inventory represents a key step in the City of Vallejo's efforts to improve air quality, enhance sustainability, and ensure the safety and comfort of its residents for generations to come. In addition, this Inventory allows the City to quantitatively track and take credit for its numerous efforts related to energy efficiency and the mitigation of greenhouse gas emissions.

How is an inventory different from a carbon footprint?

It is important to note the difference between a GHG inventory and a carbon footprint. An emissions inventory incorporates GHG emissions that occur within the boundaries of a city based on standard protocol and industry standards. The consistency allows GHG inventories to be compared and used in policy decisions. On the other hand, a carbon footprint includes GHG emissions from the region, and it is difficult to accurately estimate the community's contribution to the carbon footprint. Accordingly, s Carbon Footprint has limited value as a basis for policy decisions.

GHG Inventory Methodology

The Inventory measures three primary GHG emissions—carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O)—as defined in Chapter 2 of this Climate Action Plan. These greenhouse gases are then converted to carbon dioxide equivalents (CO_2e), enabling the City to consider different greenhouse gases in comparable terms. The conversion of

greenhouse gases is done by comparing the global warming potential (GWP) of each gas to CO_2. For example, methane (CH_4) is 21 times more powerful than CO_2 on a per weight basis in its capacity to trap heat, and therefore one metric ton of CH_4 would be calculated as 21 metric tons of CO_2e, while nitrous oxide (N_2O) is 310 times more powerful than CO_2.

Inventory Structure

The Inventory is split into a community-wide baseline inventory, detailing the sources of emissions from community activities, and a municipal operations iInventory, determining the sources and quantities of GHG emissions from activities on City-owned or -operated property or by City employees.

The community-wide baseline GHG Inventory has been divided into six sectors, or sources of GHG emissions. Sources of GHG emissions for the community-wide inventory include residential energy use, commercial and industrial energy use, on-road transportation, solid waste, water-related energy use, and off-road equipment. Calculating GHG emissions by sector allows the City to align GHG emissions reduction programs with the largest sources of emissions, making the Inventory an integral component of the City's sustainability efforts.

The government operations Inventory provides a more detailed analysis of the City's streetlights, building energy use, fleet vehicles, waste disposal, and more. Conducting a more in-depth analysis of City operations by individual facility or vehicle allows the City to incorporate potential emissions reductions into budget and capital improvement decisions when upgrading City facilities or purchasing new vehicles.

Data Collection and Methodology

Creating the community-wide and government operations emissions inventories required the collection of data from a variety of sources. Data sources for both inventories include:

For community activities and government operations, emissions sources are categorized by scope. Scopes help to identify where emissions originate and what entity retains regulatory control and the ability to implement efficiency measures. The scopes are illustrated in **Figure 3-1** and are defined as follows:

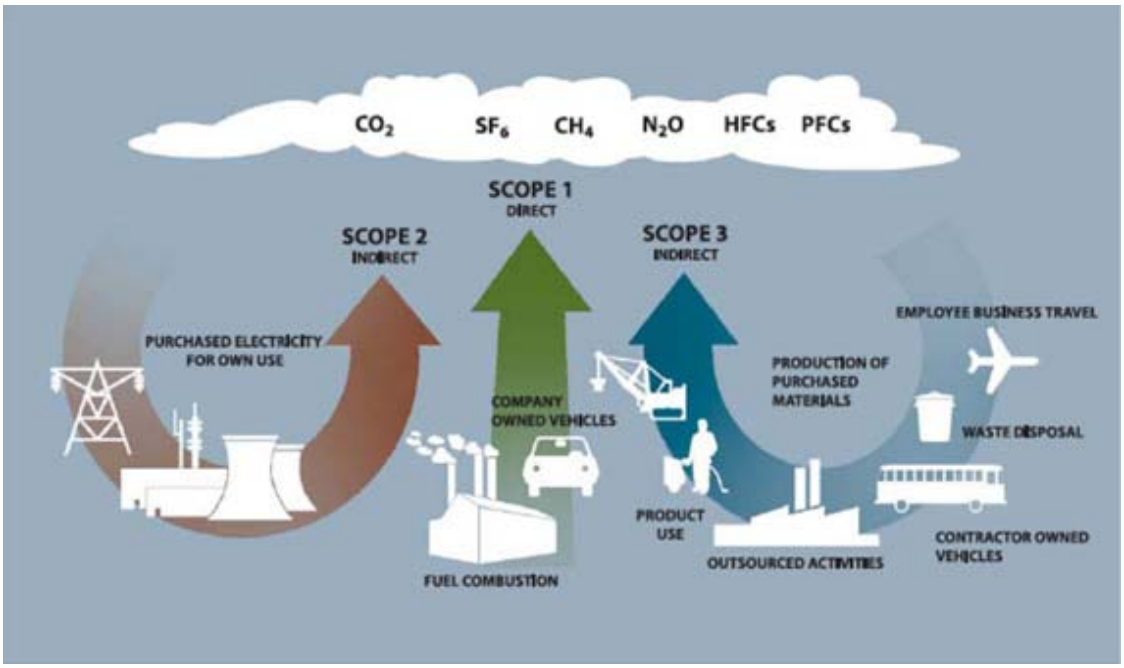
- **Scope 1** – Direct emissions sources located within the unincorporated areas of the county, primarily from combustion of fuels. Examples of Scope 1 sources include the use of fuels such as gasoline or natural gas.

- **Scope 2** – Indirect emissions that result because of activities in the city are limited to electricity, district heating, steam and cooling consumption. Scope 2 emissions sources include purchased electricity used in the city and associated with the

generation of greenhouse gas emissions at the power plant. These emissions should be included in community-wide analysis, as they are the result of the community's electricity consumption.

- **Scope 3** – All other indirect emissions that occur as a result of activity in the city. Examples of Scope 3 emissions include methane emissions from solid waste generated within the community, which decomposes at landfills either inside or outside the city limits.

Figure 3-1. GHG Emissions by Scope



Source: New Zealand Business Council for Sustainable Development. 2002. The Challenge of GHG Emissions: The "why" and "how" of accounting and reporting for GHG emissions: An Industry Guide.

Data Limitations

The Inventory was developed with the best-available tools, data, and methodology; however, as with any GHG inventory, there are limitations to representing all sources of emissions in a local jurisdiction. The main factors that limit GHG inventories include (1) data availability, (2) privacy laws, and (3) a lack of a reasonable methodology. The following sections highlight emissions that cannot be included in a GHG inventory due to the factors listed above.

Data Availability

Lack of available data prevented the calculation of emissions from the following sources as described below:

- Rail and port emissions – For rail and port emissions, the California Air Resources Board OFFROAD 2007 software provides emissions from rail and port activities; however, these numbers are aggregated for the entire Solano County area, which includes incorporated, unincorporated, and state or federally owned land. Without data specific to the City of Vallejo and without a reasonable methodology for attributing these activities to the city, these emissions cannot be accurately included in the community-wide GHG inventory.

- Propane use – Propane is essentially an unregulated fuel in California (except for storage and safety issues, which are regulated). Because it is an unregulated commodity, no data is collected by the State on propane sales or usage. Collecting propane usage data at the local level would be difficult and, since it is not a required part of an inventory, it is not included.

- Refrigerants – Similar to propane, above, the amount of fugitive refrigerant emissions cannot be calculated for community-wide activities because sales are not tracked.

Review of similar inventories, including the California Greenhouse Gas Inventory prepared by the California Air Resources Board (CARB), indicates that those sources not included in the Inventory for the reasons stated above comprise less than 5.0% of total emissions in the county. Once CARB adopts a community-wide protocol, it is likely that methodology and accessibility to data will improve. The emissions identified in this report are primarily GHGs that the community has directly caused and has the ability to reduce through implementation of conservation actions, a climate action plan, or corresponding efforts.

Privacy Laws

Privacy laws require commercial and industrial electricity and natural gas to be aggregated when released to the County for analysis. The California 15/15 rule was adopted by the California Public Utilities Commission in the Direct Access Proceeding (CPUC Decision 97-10-031) to protect customer confidentiality. The 15/15 Rule requires that any aggregated information provided by the utilities must include at least 15 customers and that a single customer's load must be less than 15% of an assigned category. If the number of customers in the compiled data is below 15, or if a single customer's load is more than 15% of the total data, categories must be combined before the information is released. The rule further requires that if the 15/15 Rule is triggered for a second time after the data has been screened already using the 15/15 Rule, the customer must be dropped from the information provided.

Life-Cycle Emissions

A lack of a reasonable methodology prevents estimation of life-cycle emissions for the community. Life-cycle emissions are emissions associated with the production and disposal of items consumed by a community (i.e., cradle to grave). For instance, a life-cycle assessment of vehicle emissions would include emissions from vehicle design, extracting raw materials, producing, delivering, and disposing of each car in the city. In contrast, this analysis only captures how much emissions are attributable to a car that is driven in the city consistent with standard protocol.

II. COMMUNITY-WIDE GHG INVENTORY RESULTS

The City of Vallejo emitted approximately 588,040 metric tons of carbon dioxide equivalent ($MTCO_2e$) in the baseline year 2008. As shown in **Figure 3-2** and **Table 3-1**, the transportation sector was the largest contributor to emissions (47%), producing approximately 277,720 $MTCO_2e$ in 2008. Emissions from the residential sector were the next largest contributor (29%), producing approximately 172,310 $MTCO_2e$. The commercial and industrial sectors accounted for a combined 19% of the total, approximately 110,390 $MTCO_2e$. Emissions from solid waste comprised 2% of the total. Emissions from electricity used to pump and treat water and emissions from off-road fuel use each accounted for 1%.

Figure 3-2. Community GHG Emissions by Sector

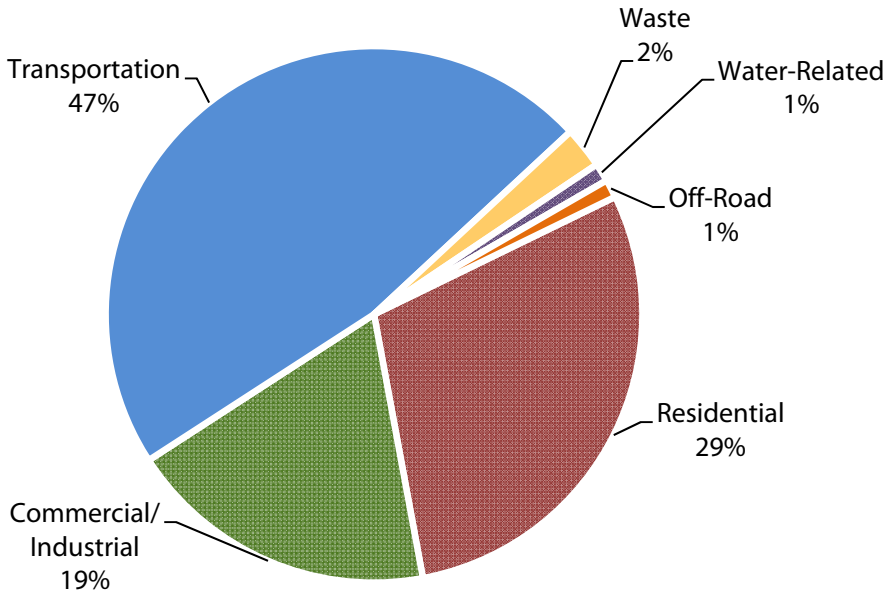


Table 3-1. Community GHG Emissions by Sector

Sector	2008 Metric Tons CO2e/yr	Percentage of Total
Residential	172,310	29%
Commercial/ Industrial	110,390	19%
Transportation	277,720	47%
Waste	14,640	2%
Water-Related	6,570	1%
Off-Road	6,410	1%
Total	**588,040**	**100%**

1. Due to rounding, the sum of all numbers may not add up to 100.0%.

III. City Government Operations GHG Inventory Results

City government operations and facilities produced approximately 40,570 $MTCO_2e$ of greenhouse gas emissions in 2008. As displayed in **Figure 3-3**, this quantity represents approximately 5% of total community-wide emissions in the city. City government emissions result from waste, energy consumption from water and wastewater facilities, buildings, streetlights and other facilities, and fuel consumption by the vehicle fleet and from employee commutes. Fuel consumption from the City's vehicle, ferry, and transit fleet was the largest contributor to the City's emissions (53%), producing 21,620 $MTCO_2e$. The second largest contributors (23% and 16%, respectively) were energy consumption in City buildings and facilities and energy consumption from the City's reservoirs, water treatment plants, pumps, wastewater treatment facility, direct process emissions from the wastewater treatment plant, and irrigation controllers.

Figure 3-3. City Government GHG Emissions by Sector

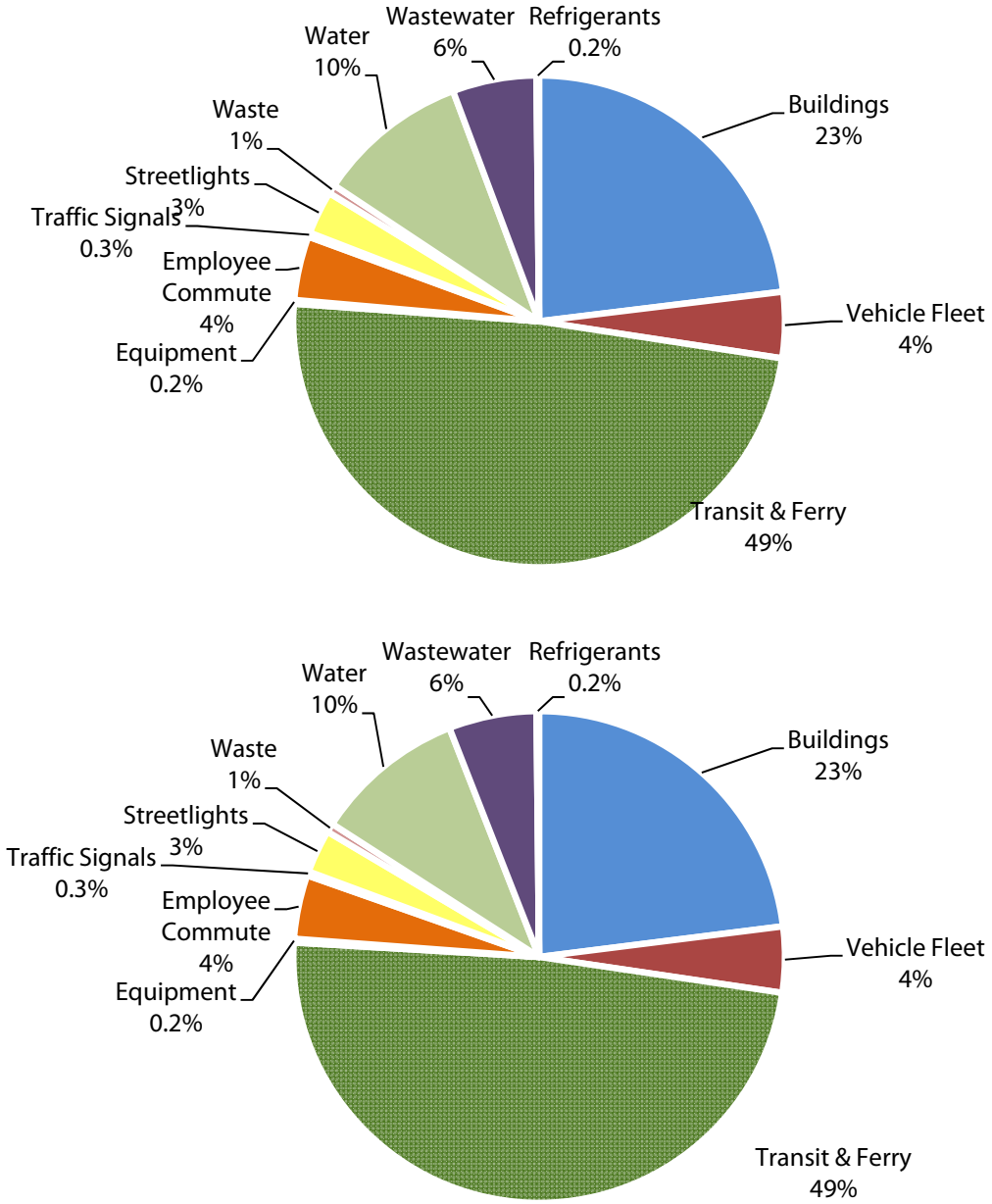


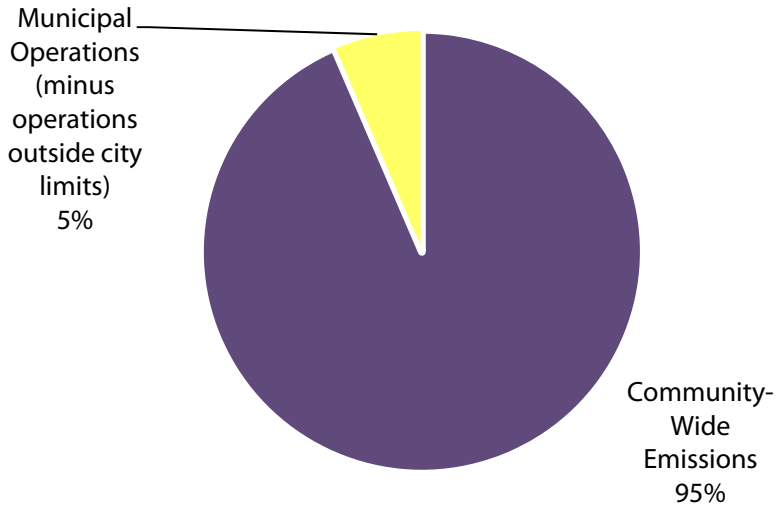
Table 3-2. City Government Operations GHG Emissions by Sector

Sector	2008 Metric Tons CO_2e/yr	Percentage of Total
Buildings	9,360	23%
Vehicle Fleet	1,760	4%
Transit & Ferry	19,770	49%
Equipment	100	0.2%
Employee Commute	1,710	4%
Traffic Signals	110	0.3%
Streetlights	1,160	3%
Waste	240	1%
Water	4,050	10%
Wastewater	2,240	6%
Refrigerants	70	0.2%
Total	**40,570**	**100%**

IV. RELATIONSHIP BETWEEN THE COMMUNITY-WIDE AND CITY GOVERNMENT OPERATIONS INVENTORIES

The majority of government operations occur within the City of Vallejo;[16] therefore, government operations emissions occurring within the city are included in the total community-wide emissions inventory as a subset of the transportation, energy, and waste sectors. Government operations make up approximately 5% of total community-wide GHG emissions (**Figure 3-4**). However, similar to the way in which businesses and factories perform their own facility-scale GHG inventories, this Inventory analyzes City emissions in more detail in order to identify cost-saving and emissions-reducing strategies in the future. The methodology for estimating emissions from local government operations is guided specifically by the Local Government Greenhouse Gas Inventory Protocol developed by the California Air Resources Board and the California Climate Registry.

Figure 3-4. City Government Portion of Community-Wide GHG Emissions



[16] Government operations serving the City of Vallejo, but occurring outside of City boundaries, include the Fleming Hill, Green Valley, and Travis Air Force Base water treatment plants and ferry services.

V. GHG Emissions Forecast

Following the completion of a baseline GHG emissions inventory, emissions must be forecasted. A GHG emissions forecast is a prediction of how GHG emissions will change in the future with anticipated changes in population, commercial activity, and driving patterns. A GHG forecast allows the City to quantify the possible impact of sustainability goals and measures, and to track the City's progress toward GHG reduction targets.

Community-Wide Forecast

This chapter presents a community-wide GHG emissions forecast for the years 2020 and 2035. The City chose to model the year 2020 for consistency with state legislation (AB 32) and 2035 for consistency with regional planning efforts. The basis for all growth scenarios is a "business-as-usual" (BAU) projection. A BAU projection is an estimate how emissions would grow if consumption trends and efficiencies remain at their 2008 levels yet the number of people, households, and jobs continue to grow in Vallejo. In other words, it is the status quo scenario before state, regional, and local reduction efforts are taken into consideration. The BAU projection is used as a starting point for the City to determine the degree of reduction efforts needed to reach the reduction target.

Indicators Used to Determine Future Emissions

GHG forecasts are modeled based on projected growth trends in employment, population, vehicle miles traveled (VMT), and households, among other indicators. The forecast relies on the Association of Bay Area Governments (ABAG) Projections 2009 for 2020 and 2035 population and employment growth, and the Metropolitan Transportation Commission's (MTC) VMT forecasts for Solano County. **Table 3-3** shows the growth indicators used to determine community-wide emissions growth for each sector by 2020 and 2035.

Table 3-3. Vallejo Community-Wide Growth Indicators

Growth Indicator	2008	2020	2035	Applied to…
Population	120,466	130,900	143,900	Waste Water
Households	41,640	44,480	47,940	Residential Energy
Annual VMT	652,399,900	706,665,400	766,375,500	Transportation
Employment	33,082	37,790	45,920	Commercial & Industrial Energy

These indicators were applied to the 2008 GHG emissions inventory to determine a business-as-usual growth scenario. Under the business-as-usual scenario, community-wide emissions will grow by approximately 11% by the year 2020 to 650,340 $MTCO_2e$ and by 24% by 2035 to 728,170 $MTCO_2e$ (refer to **Figure 3-5** and **Table 3-4**).

Figure 3-5. 2020 and 2035 City of Vallejo Business-As-Usual GHG Emissions Forecast

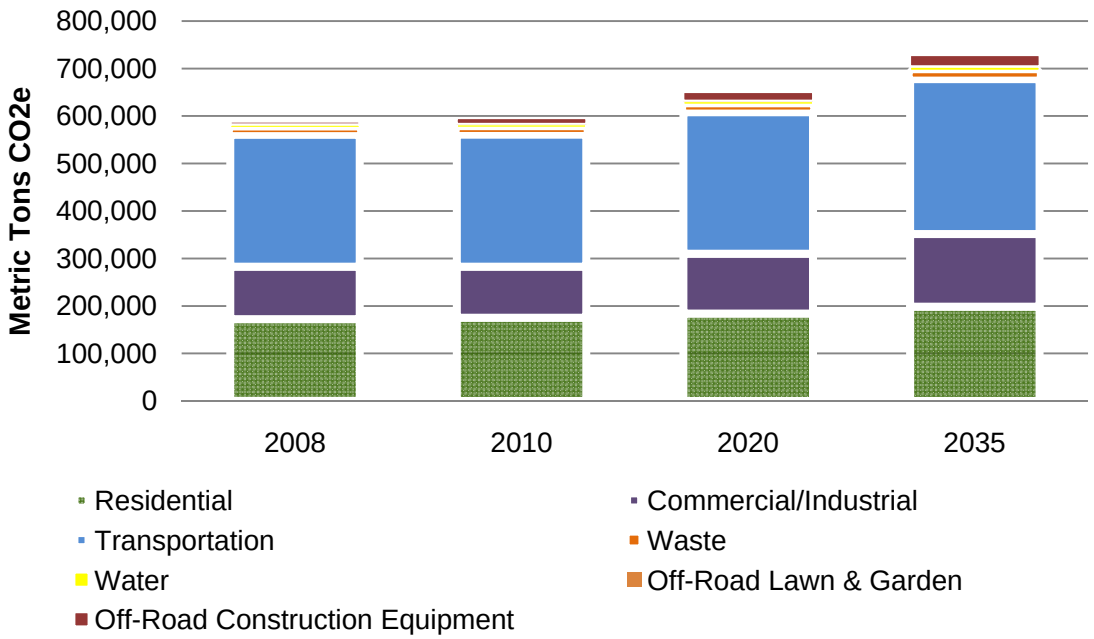


Table 3-4. 2020 and 2035 City of Vallejo Business-As-Usual GHG Emissions Forecast ($MTCO_2e$)

Sector	2008	2010	2020	2035
Residential	172,310	175,370	184,060	198,380
Commercial/Industrial	110,390	107,410	126,100	153,230
Transportation	277,720	277,990	297,790	325,910
Waste	14,640	14,860	16,080	18,100
Water	6,570	6,670	7,220	8,120
Off-Road	6,410	13,300	19,080	24,430
Total	**588,040**	**595,600**	**650,330**	**728,170**
Percentage Above 2008	**0%**	**1%**	**11%**	**24%**

With this information, the City established a reduction target of 15% below present emission levels by 2020 in conformance with the State of California's recommended reduction target. To attain this reduction target, the City will need to reduce emissions by 23% below the city's business-as-usual emissions. Conformance with the state goal of 80% below 1990 levels by 2050 will require a 64% reduction below present levels by 2035.[17]

VI. INCORPORATION OF STATE REDUCTIONS INTO FORECASTS

State-led or state-induced reduction strategies included in the AB 32 Scoping Plan are factored into the adjusted 2020 and 2035 emissions forecast. Strategies include all state actions that are approved, programmed, and/or adopted. These programs require no additional local action. Incorporating them into the forecast and reduction assessment to create an adjusted business-as-usual forecast provides a more accurate picture of future emissions growth and the responsibility of local governments once state measures to

[17] The AB 32 Scoping Plan, page 27, states that CARB encourages local governments to "move toward establishing similar goals for community emissions that parallel the State commitment to reduce greenhouse gas emissions by approximately 15 percent from current levels by 2020." http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm

reduce GHG emissions have been implemented. A brief description of each of these items is provided below and summarized in **Table 3-5**.

The estimated business-as-usual GHG emissions forecast was adjusted to incorporate state and federal vehicle technology, energy efficiency, and renewable electricity mandates.

Clean Car Standards, 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 when the U.S. Environmental Protection Agency (EPA) issued a waiver confirming California's 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, while simultaneously improving fuel efficiency and reducing motorists' costs.[18]

Low Carbon Fuel Standard

Established in 2007 under an executive order from Governor Schwarzenegger, the Low Carbon Fuel Standard (LCFS) directs the California Environmental Protection Agency, the California Energy Commission, and the California Air Resources Board to develop protocols for measuring the life-cycle carbon intensity of transportation fuels to be included as part of the State's early action item for implementing AB 32. LCFS will reduce the carbon intensity of transportation fuels by 10%.[19]

Renewable Portfolio Standard

California's Renewable Portfolio Standard (RPS) is one of the most ambitious renewable energy standards in the country, mandating that 33% of electricity delivered in California is generated by renewable sources like solar, wind and geothermal by 2020. The California RPS was first codified in 2002 by Senate Bill 1078 (requiring 20% renewable electricity mix by 2010) and further strengthened in April 2011 with the adoption of Senate Bill X 1-2 (requiring 33% renewable electricity mix by 2020).[20] The RPS intends to boost the economy and establish California as a center for the development and use of renewable energy. Only

[18] California Air Resources Board 2010.

[19] California Air Resources Board 2011.

[20] California Public Utilites Commision 2011.

Hawaii's electricity standard of 40% renewable by 2030 trumps California renewable energy standards.

Despite the 2020 goal of California's RPS, technological and political challenges may prevent some investor-owned utilities from meeting the 33% target by 2020. In 2010, the California Public Utilities Commission reported that 18% of California's electricity came from renewable sources in 2010, missing the 20% goal by 2%. California utilities have more than enough renewable electricity under consideration to meet the 33% target by 2020. However, due to contract and transmission limitations, not all of this new electricity will be available in time.[21] Taking these issues into account, this document assumes a more conservative forecast of a 28% renewable mix by 2020.

California Building Code, 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. This Plan focuses 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

[21] California Public Utilites Commision 2011.

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. Local governments can adopt a Tier 1 or Tier 2 standard in order to achieve greater energy, water, and health benefits.

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.

The GHG forecast in this Plan incorporates the net energy and water 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.

California Solar Initiative

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: Pacific Gas & Electric (PG&E), San Diego Gas & Electric, or Southern California Edison. The CSI program has a budget of $2.167 billion to be expended by 2016 with a goal to reach 1,940 megawatts of installed power throughout the state by that time.[22] 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.

[22] California Energy Commission and California Public Utilities Commission 2011.

Table 3-5. Summary of State Reductions($MTCO_2e$)

State Reductions Summary	2008	2010	2020	2035
Growth Projection	588,040	595,600	650,340	728,170
RPS Reductions	0	-7,770	-23,510	-38,370
Title 24 Reductions	0	0	-8,250	-26,310
Pavley Reductions	0	0	-47,200	-78,340
CSI Reductions	0	-520	-520	-520
Total State Reductions	**0**	**-8,290**	**-79,480**	**-143,540**
Adjusted Growth Projection	**588,040**	**587,310**	**570,860**	**584,630**

VII. City Operations Forecast

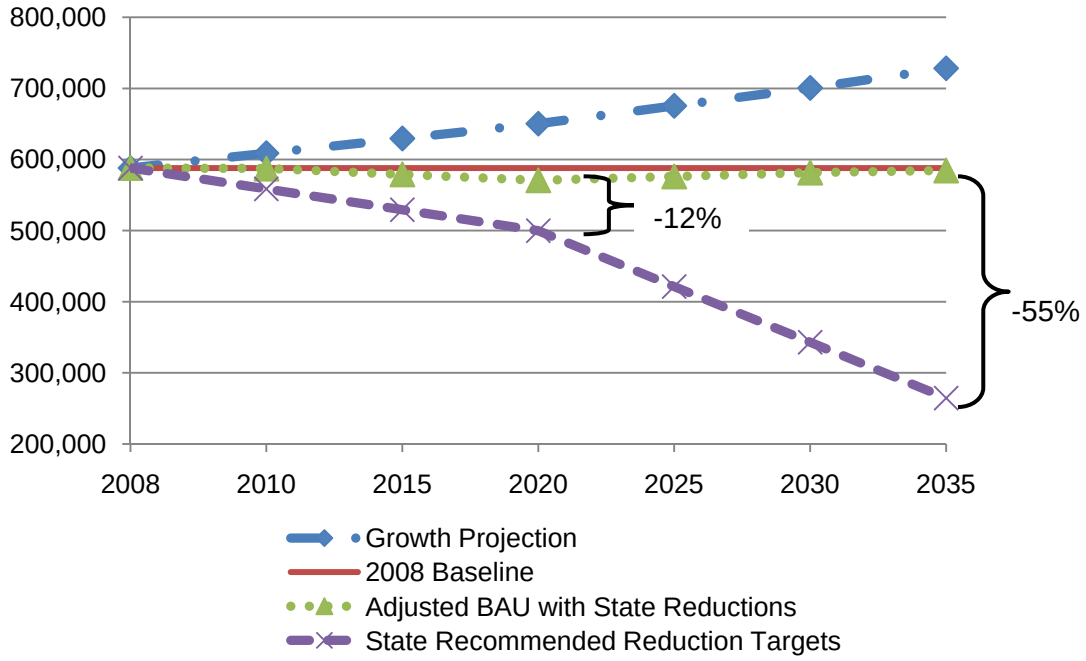
Government operations are more difficult to forecast due to a lack of reasonable growth indicators like those of the community. Any change in emissions from government operations would likely occur from new buildings, retired or sold buildings, or changes in services. The City of Vallejo does not forsee many changes in services or facilities; therefore, the business-as-usual projection reflects baseline year activity through 2020 and 2035, yet with updated emissions coefficients.

It is important to note that 2008 emissions are simply a benchmark for measuring progress and not necessarily a reflection of current municipal conditions. Between 2008 and 2010, Vallejo experienced significant staffing reductions, resulting in a temporary closure of some facilities, and a reduction in the size of the vehicle fleet. It is likely that these operational reductions translate into an equivalent decrease in current emissions from City operations.

VIII. GHG Emissions Reduction Targets

For consistency with the State's GHG reduction target as outlined in AB 32, the City has set an emissions reduction target of 15% below 2008 levels by 2020. The State's long-term goal to reduce emissions by 80% below 1990 emissions by 2050 is included in forecasts. **Figure 3-6** provides a comparison of the BAU forecast, the adjusted BAU forecast, and the emissions reduction targets for 2020 and 2035 to the 2006 baseline emissions to demonstrate the additional emissions reductions that will need to be achieved through implementation of local actions and programs.

Figure 3-6. Business-As-Usual Forecast in Relation to State-Recommended Reduction Targets



I. INTRODUCTION TO VALLEJO GHG REDUCTION GOALS, MEASURES, AND ACTIONS

In order to achieve the state-recommended reduction target of 15% below 2008 emissions levels by 2020, the City of Vallejo will need to implement the goals, policies, and actions set forth in this chapter. The City's strategy is organized by the following topic areas:

- City Government Operations (CG)
- Community Engagement (CE)
- Energy (E)
- Renewable Energy (RE)
- Transportation Demand Management (TDM)
- Optimized Travel (OT)
- Water, Wastewater, and Solid Waste (W)
- Off-Road Equipment (OR)
- Adaptation (A)

Each topic area has a corresponding goal and multiple supporting measures necessary for implementation. Following an introduction to a topic area and goal, the chapter presents each policy with the following information:

- Description: A description of the measure, including background, desired outcomes, and case studies.
- Existing Efforts: A list of completed, planned, or in progress efforts to implement the measure.
- Implementation Actions: A list of actions needed to achieve the GHG reductions and outcomes of the measure.
- Potential Implementation Resource and Partners: A list of organizations, government agencies, nonprofits, community groups, and educational organizations that could aid in the implementation of the measure either through technical assistance, financial

assistance, or as a partner for implementation. Additional implementation information is also provided in the Implementation Program (Chapter 5).

In addition to this information, the cost, GHG, and co-benefit impact of each measure is summarized in a breakout box for each measure.

2020 and 2035 Greenhouse Gas Reductions

Greenhouse gas reductions are displayed in $MTCO_2e$ per year in 2020 and 2035. Not all measures have a GHG equivalent; some are supportive measures necessary for the implementation of this CAP, but without a direct GHG benefit. The GHG reduction of each quantified measure is detailed further in **Appendix C**.

City Cost and Savings

Cost to the City and savings to the City are shown in a low to high range according to **Table 4-1** below. Costs include implementation costs such as equipment, supplies, and staff time (if additional staff is necessary) and maintenance costs. Costs are displayed as a range due the large amount of uncertainty in future costs such as that of gasoline, natural gas, and solar panels. Costs are in 2011 dollars and are not adjusted for inflation. Savings include those from utility bills, re-fueling, and waste hauling. Costs do not include the privates costs to the community that may be required for some measures.

Table 4-1. Range of Cost and Savings to the City

Range	Cost Equivalent
None	$0
Low	$1–$25,000
Low-Mid	$25–$100,000
Medium	$100,000–$200,000
Medium-High	$200,000–$500,000
High	Over $500,000

Co-Benefits

Many measures will result in other benefits aside from GHG reductions. These co-benefits are represented by icons to the side of each measure and are shown in **Figure 4-1** below.

Figure 4-1. Co-Benefit Legend

The assumptions, sources, and details of each measure are further detailed in **Appendix B** of this Climate Action Plan. Further implementation information such as implementation phase, responsible agency, and performance indicators are presented in **Chapter 5 – Implementation.**

II. CITY GOVERNMENT OPERATIONS (CG)

Establish the City of Vallejo as a leader in greenhouse gas management through efficiency improvements to City buildings, vehicles, operations, and water and waste facilities.

As presented in **Chapter 3**, City government operations include any buildings, facilities, or operations under the influence of the City of Vallejo. This includes City buildings such as City Hall, facilities such as streetlights, fleet and transit vehicles, and water treatment plants. City government operations, for the purposes of this CAP, also include the Vallejo Sanitation and Flood Control District (VSFCD), which handles wastewater treatment for the Vallejo community.

The City installed solar panels on City Hall and the John F. Kennedy Library in 2002 and 2003.

Excluded from this chapter are services and facilities that the City does not have influence or control over. For instance, the City of Vallejo does not operate a landfill. As such, landfill emissions cannot be addressed aside from reducing the amount of waste that is sent to a landfill operated by an outside entity. Similarly, this CAP does not address emissions from the BayLink Ferry. The federal government is anticipated to take over control of the Vallejo Ferry, so the City does not have influence over the future efficiency of fuels or operations. Lastly, the CAP does not address efficiency in Vallejo's public parks. Parks are operated by the Greater Vallejo Recreation District (GVRD), an entity over which the City of Vallejo has limited influence.

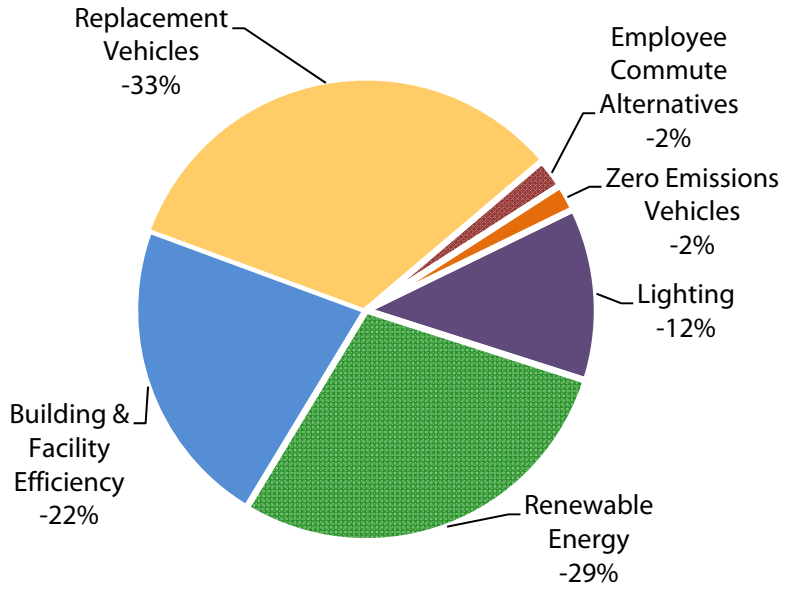
City government operations accounted for 40,680 $MTCO_2e$ in the baseline year of 2008. The majority of emissions resulted from fleet vehicles and ferry operations. Other notable emissions sources include buildings and water treatment facilities.

The reduction measures presented in this chapter are estimated to reduce emissions from City government operations by 4,200 $MTCO_2e$ by 2020 and 8,090 $MTCO_2e$ in 2035, a 10% and 20% reduction, respectively. The GHG reductions of each measure are stated in **Table 4-2** and depicted in **Figure 4-2**.GHG Reductions from City Government Operations will also be counted toward achievement of the reduction target for community-wide GHG emissions reductions.

Table 4-2. City Government Operations (CG) GHG Reductions by Measure

		2010 Emissions Reductions ($MTCO_2e$)	2020 Emissions Reductions ($MTCO_2e$)	2035 Emissions Reductions ($MTCO_2e$)
CG	City Government Operations	-40	-4,200	-8,090
CG-1	Green Team	Supporting Measure	Supporting Measure	Supporting Measure
CG-2	CAP Implementation	Supporting Measure	Supporting Measure	Supporting Measure
CG-3	Lighting	-40	-520	-1,000
CG-4	Renewable Energy	0	-1,230	-2,310
CG-5	Building & Facility Efficiency	0	-940	-1,870
CG-6	New Building & Facility Efficiency	Unknown	Unknown	Unknown
CG-7	Replacement Vehicles	0	-1,420	-2,820
CG-8	Employee Commute Alternatives	0	-90	-90

Figure 4-2. City Government Operations (CG) GHG Reductions by Measure, 2020



CG-1. Green Team

Create a City Green Team, or other similar working group, to identify, prioritize, and implement greenhouse gas (GHG) reduction projects, including education.

2020 Greenhouse Gas Reduction:

Supportive

2035 Greenhouse Gas Reduction:

Supportive

City Cost:

None

City Savings:

N/A

Co-Benefits:

Green Teams are established to help local governments design, implement, and monitor a variety of energy and resource conservation programs applicable to municipal operations. Although governmental operations typically account for only a small percentage of a jurisdiction's total GHG emissions, a city that leads by example encourages widespread efforts by other institutions, businesses, and individuals. Accordingly, the City of Vallejo Green Team will assist in the coordination, goal setting, and tracking of Climate Action Plan goals and measures according to the implementation plan set forth in **Chapter 5**.

The City's Green Team will also serve to educate and raise staff and public awareness of green initiatives undertaken by various City departments. The Green Team will use outlets such as the City's website and newsletter and the media to ensure that the City's sustainability accomplishments and priorities are known to the community. Finally, the Green Team will coordinate with neighboring jurisdictions and agencies on regional sustainability efforts and outreach campaigns.

Existing Efforts in Support of CG-1:

- None at this time.

Implementation Actions:

- CG-1.1. Form a multidepartmental Green Team to identify, prioritize, and implement GHG reduction projects for City operations such as commute programs, recycling efforts, and procurement policies consistent with the CAP.

- CG-1.2. Provide energy and GHG reduction training to existing staff.

Potential Implementation Resources and Partners:

Neighboring jurisdictions, Association of Bay Area Governments (ABAG), 511.org, Metropolitan Transportation Commission

CG-2. CAP Implementation

See to the timely implementation of CAP strategies by establishing an implementation and reporting infrastructure.

Successful implementation requires a clear description of responsibilities, priorities, and funding. In addition, monitoring GHG emission levels and tracking the effectiveness of GHG reduction measures are needed to understand if the CAP is being successfully implemented.

The California Environmental Quality Act (CEQA) requires that all GHG emissions be evaluated and encourages lead agencies to streamline the environmental review process for GHG emissions. Implementation of the CAP will assist new development projects —and thereby assist economic development. Conversely, failure to adopt and implement GHG reduction measures in a CAP or general plan may result in increased delays for individual projects subject to CEQA and increase the potential for costly litigation.

The City will implement the CAP according to the implementation plan set forth in **Chapter 5**. As part of implementation, the City will monitor funding and grant opportunities. The City will also report regularly to the City Council on CAP implementation accomplishments and next steps.

2020 Greenhouse Gas Reduction:

Supportive

2035 Greenhouse Gas Reduction:

Supportive

City Cost:

Low-Mid

City Savings:

None

Co-Benefits

N/A

Existing Efforts in Support of CG-2:

- None at this time.

Implementation Actions:

- CG-2.1. Designate a City staff member of the Green Team to have lead responsibilities for implementing the Climate Action Plan. Duties of this position include coordination of the Green Team, preparation of annual CAP implementation priorities, and tracking City government and community-wide greenhouse gas emissions.
- CG-2.2. On an annual basis, report to the City Council on the City's progress toward CAP implementation and GHG reduction targets.
- CG-2.3. Identify and pursue grants to fund CAP implementation strategies.

Potential Implementation Resources and Partners:

Department of Energy (DOE), California Energy Commission (CEC), California Infrastructure and Economic Development Bank, Pacific Gas and Electric (PG&E), ABAG, neighboring jurisdictions

CG-3. Lighting

Retrofit City-owned or -operated lighting and related mechanical systems.

Vallejo's streetlights and traffic signals alone consume 35% of City government electricity. This energy consumption costs the City an average $680,000 per year. Under this measure, the City will identify cost-effective opportunities to retrofit streetlights, traffic signals, outdoor lighting, and indoor lighting in City facilities.

2020 Greenhouse Gas Reduction:

-520 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-1,000 $MTCO_2e/yr$

City Cost:

Medium-High

City Savings:

Medium-High

Co-Benefits:

Existing Efforts in Support of CG-3:

- In 1993, Vallejo retrofitted lighting systems in City-owned buildings. Retrofits that took place in the early 1990s primarily consisted of replacing T12 fluorescent lamps with T8 fluorescent lamps.
- In 2008, the City retrofitted the lights at the Corporation Yard, City of Vallejo Transit, and Vallejo Fire Station #28. These retrofits were installed through ABAG's Energy Watch program. These three retrofit projects reduced electricity use by an estimated 135.5 megawatt-hours (MWh) per year, reducing annual energy costs by over $22,000.[23]

Implementation Actions:

- CG-3.1. Retrofit City streetlights, outdoor lighting, and traffic signals with high-efficiency lights such as light-emitting diode (LED) or induction lighting.
- CG-3.2. Rewire lighting circuits to allow for user control of task lighting, sensors, Building Management System (BMS) control, and day lighting modulated control.
- CG-3.3. Adjust the lighting schedule of street lighting and other exterior lighting to minimize the use of lighting at unnecessary or underutilized times.

Potential Implementation Resources and Partners:

DOE, CEC, ABAG, PG&E, Local Government Programs, neighboring jurisdictions

[23] City of Vallejo 2009.

CG-4. Renewable Energy

Continue to install renewable energy systems on City properties.

2020 Greenhouse Gas Reduction:

-1,230 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-2,310 $MTCO_2e/yr$

City Cost:

High

City Savings:

High

Co-Benefits:

Renewable energy installations not only reduce electricity and greenhouse gas emissions, but they also act as an adaptation measure by decreasing the City's reliance on fossil fuels. Potential sources of renewable energy include solar, wind, biomass, moving water, geothermal, and hydrogen. Although most forms of renewable energy currently cost more than fossil fuels, wind conversion systems are already cost-competitive and other systems such as solar photovoltaic installations are also widespread and eligible for various types of subsidy. Over time, renewable energy sources are projected to become increasingly cost-competitive and provide shorter payback periods.

Existing Efforts in Support of CG-4:

- The City of Vallejo currently owns and operates four photovoltaic systems: at City Hall, at the John F. Kennedy Library, at the City's water pumping station, and near Fire Station 7 on Columbus Parkway.

- Additional photovoltaic systems are being discussed, planned or in progress at the Sears Point Pump Station, the Vallejo Yacht Club, as shade structures at existing municipal parking lots, and at Mare Island.

- The Vallejo Energy Efficiency and Conservation Strategy Report contains a prioritized list of potential City government energy projects, including renewable energy systems.

Implementation Actions:

- CG-4.1. Identify cost-effective renewable energy opportunities for additional City properties and apply for federal, state, and utility grant and funding opportunities when they become available.

Potential Implementation Resources and Partners:

DOE, CEC, PG&E

CG-5. Building & Facility Efficiency

Reduce energy consumption from City facilities by 20% by 2035 through energy efficiency improvements.

2020 Greenhouse Gas Reduction:

-940 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-1,870 $MTCO_2e/yr$

City Cost:

Unknown

City Savings:

Medium-High

Co-Benefits:

Energy efficiency improvements and conservation are typically the most cost-effective way to reduce energy consumption. If existing facilities are upgraded to achieve optimal energy performance, the installation of on-site renewable energy generating technologies can be appropriately sized to also reduce costs, energy usage, and greenhouse gas emissions.

Building and facility efficiency can be enhanced by a wide variety of building envelope, mechanical, plumbing, and electrical improvements that reduce energy consumption. Examples include increased insulation, equipment upgrades, improved controls, and technologies that reduce water consumption. In addition, conservation measures and training are often critical components to reducing energy consumption.

Existing Efforts in Support of CG-5:

- The City completed an Energy Efficiency and Conservation Strategy in 2009, which outlined several possible energy efficiency improvements: replace 1970s-era boilers, replace inefficient motors and pumps, and install variable-speed drives (VSDs).

- VSFCD is continuing existing efforts to reduce energy consumption at the wastewater treatment plant and identify potential reuses of wastewater.

Implementation Actions:

- CG-5.1. Create a City Government Energy Fund to reinvest annual cost savings from energy efficiency improvements for additional energy efficiency programs.

- CG-5.2. Complete energy and water audits of City facilities to identify building inefficiencies—and prioritize the implementation of cost-effective energy and water efficiency retrofits—with a payback of less than 10 years.

- CG-5.3. Emphasize water management and reclamation for schools, parks, golf courses, and manufacturing processes to reduce City energy use related to the pumping and treatment of water.

- CG-5.4. Schedule regular operating hours and restrict facility use in a manner that reduces inefficient use of buildings or rooms.

- CG-5.5. Explore the City's use of technical equipment and identify opportunities for low-power alternatives, such as tablet computers or networked copiers.

- CG-5.6. Optimize the City Data Center by identifying and implementing energy efficiency measures to computer systems and related equipment.

Potential Implementation Resources and Partners:

DOE, CEC, PG&E, ABAG

CG-6. New Building & Facility Efficiency

Apply CALGreen Tier 1 energy efficiency standards to all new City facilities.

CALGreen is the California residential and commercial green building code. 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 CALGreen Code includes a mandatory minimum code for green building and two tiers of voluntary measures to achieve greater energy efficiencies and other benefits. Tier 1 is a 15% improvement and Tier 2 is a 30% improvement over minimum requirements.

2020 Greenhouse Gas Reduction:

Unknown

2035 Greenhouse Gas Reduction:

Unknown

City Cost:

Low

City Savings:

Low-Mid

Co-Benefits:

Under this measure, the City would ensure that new City and VSFCD facilities and major remodels (greater than 50% of floor area) conform to Tier 1 CALGreen. PG&E completed a cost-effectiveness study of CALGreen Tier 1 in 2010 and concluded that, regardless of the building design, occupancy, and number of stories, the incremental improvement in overall annual energy performance in Tier 1 buildings is cost effective. The additional cost of conforming with Tier 1 standards was determined to be paid back through energy savings in anywhere from 3 to 15 years, depending on the building type.[24]

Existing Efforts in Support of CG-6:

- None at this time.

Implementation Actions:

- CG-6.1. Require new municipal facilities to meet CALGREEN Tier 1 standards. Tier 1 prerequisites include requirements to install cool roofs, provide preferential parking for low-emitting vehicles, exceed Title 24 requirements, reduce indoor potable water use and outdoor landscaping water use, and include recycled materials within new facilities.

[24] Pacific Gas and Electric Company 2010.

- CG-6.2. Encourage Leadership in Energy and Environmental Design (LEED), CALGreen, or similar best practices for new buildings and facilities as well as remodels.

Potential Implementation Resources and Partners:

CEC, California Association of Local Building Officials, US Green Building Council, American Institute of Architects (AIA)

CG-7. Replacement Vehicles

Purchase fuel-efficient and alternatively fueled vehicles.

2020 Greenhouse Gas Reduction:

-1,420 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-2,820 $MTCO_2e/yr$

City Cost:

Medium

City Savings:

Medium

Co-Benefits:

The City operates over 250 vehicles, including those for maintenance, fire services, police services, and administration. The vehicle fleet contributes over half of GHG emissions from City government operations. As appropriate, the City will incrementally upgrade City vehicles to alternatively fueled or fuel-efficient vehicles according to existing replacement schedules. For example, cars with over 100,000 miles would be replaced with a hybrid compressed natural gas (CNG) vehicle. The City will also work to ensure that vehicle types and sizes are appropriate for the work at hand. For example, a building inspector can drive a smaller passenger car to a meeting and a pickup truck to a work site.

Existing Efforts in Support of CG-7:

- Low-Carbon Municipal Vehicle Fleet – Vallejo took advantage of California's efficient vehicle rebate programs and purchased eight new Toyota Priuses.
- Low-Carbon Public Transportation Fleet – Vallejo currently has 60 buses that are fueled with clean diesel fuel and equipped with Diesel Emission Control Systems (DECs), which are certified by the California Air Resources Board (CARB) to reduce particulate emissions. All of Vallejo's buses meet CARB standards.
- Twenty additional buses are slated to be replaced. At least two will be hybrid vehicles, and all of the new buses will operate on clean diesel fuel.

Implementation Actions:

- CG-7.1. Adopt a City policy to incrementally replace appropriate fleet vehicles and buses with more fuel-efficient and lower-carbon-emitting models per the standard schedule. Alternative fuels and vehicles include liquefied petroleum gas (LPG), compressed natural gas (CNG), biodiesel, hybrid vehicles, and plug-in electric vehicles.
- CG-7.2. Use Global Positioning System (GPS) tools to map routes and path of travel to control fuel and wear and tear on vehicles.
- CG-7.3. Extend the replacement time on maintained vehicle pools.
- CG-7.4. Ensure that vehicle sizes are appropriate for the job performed.

Potential Implementation Resources and Partners:

DOE, Metropolitan Transportation Commission (MTC), CARB, CEC

CG-8. Employee Commute Alternatives

Provide information and incentives for City staff to carpool, use public transportation, walk, or bike to work.

Emissions from City employees commuting to and from work account for 4% of Vallejo City government's GHG emissions. One key to reducing this impact is to support alternatives to employees commuting to work alone in their car. Toward this end, a variety of public outreach methods, incentives, and other techniques may be provided to make it more convenient for employees to commute by alternate means such as bus, carpool, on foot, or on bicycle. The Solano Transportation Authority has played a lead role in local commute alternative programs. Subsidized transit passes are considered a compelling and relatively inexpensive way to reduce GHG emissions from employee commuting. Other measures such as preferential reserved parking and providing lockers and showers support carpooling and bicycling to work.

2020 Greenhouse Gas Reduction:

-90 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-90 $MTCO_2e/yr$

City Cost:

Low

City Savings:

None

Co-Benefits:

Existing Efforts in Support of CG-8:

- None at this time.

Implementation Actions:

- CG-8.1. Designate an Employee Commute Alternatives Coordinator to implement and support trip reduction programs.
- CG-8.2. Promote carpooling by providing a website or message board for coordinating shared rides and designating a percentage of conveniently located parking spaces for carpooling vehicles.
- CG-8.3. Enact a guaranteed ride home program for employees who carpool, take public transit, or use other alternative modes of transportation.
- CG-8.4. Provide recognition awards to City departments and employees with high carpooling, transit, biking, and walking to work participation rates.
- CG-8.5. For external meetings, select a centrally located site to meet.
- CG-8.6. Make provisions for secure and safe bike storage at City facilities.

Potential Implementation Resources and Partners:

Solano Transportation Authority, 511.org.

III. COMMUNITY ENGAGEMENT (CE)

Educate residents, businesses, and students about greenhouse gas emissions, the City's sustainability efforts, and ways in which they can be more sustainable.

Community involvement is essential to achieving all goals, measures, and actions in this Climate Action Plan. Everyday decisions like changing a lightbulb, commuting to work, and taking out the trash can be altered to support the quantified goals, policies, and actions of this Plan. This goal calls for the City to involve, engage, and educate the community on ways in which they can foster sustainable behavior. As shown in **Table 4-3**, the measures under this goal do not have a direct GHG equivalent; rather, they are incorporated into each and every aspect of this Plan.

Table 4-3. Community Engagement (CE) GHG Reductions by Measure

		2010 Emissions Reductions ($MTCO_2e$)	2020 Emissions Reductions ($MTCO_2e$)	2035 Emissions Reductions ($MTCO_2e$)
CE	**Community Engagement**	**0**	**0**	**0**
CE-1	Student Outreach	Supporting Measure	Supporting Measure	Supporting Measure
CE-2	Community Outreach	Supporting Measure	Supporting Measure	Supporting Measure

CE-1. Student Outreach

Engage students in the City's GHG reduction efforts through outreach to K–12 schools and colleges.

2020 Greenhouse Gas Reduction:

Supportive

2035 Greenhouse Gas Reduction:

Supportive

City Cost:

Low

City Savings:

None

Co-Benefits:

Historically, many noteworthy reforms and improvements to our environment have gained traction as a result of not only general public outreach but also classroom instruction and discussion in schools and universities. A relatively recent example of this occurrence is our awareness of the need to reduce, reuse, and recycle.

In keeping with this practice, the California Environmental Protection Agency (CalEPA) and the Bay Area Air Quality Management District (BAAQMD) both have developed curriculums centered around environmental sustainability and climate change. Under this measure, the City would work with the Vallejo Unified School District to educate schoolchildren about environmental sustainability and ways in which their household can reduce greenhouse gas emissions. The City would also reach out to local institutions of higher education such as the California Maritime Academy, Solano Community College, and Touro University.

Existing Efforts in Support of CE-1:

None at this time.

Implementation Actions:

- CE-1.1. Create a collaboration between the City Green Team and Vallejo schools to:
  - Inform students about climate change, water conservation, and recycling and ways to reduce GHG emissions.
  - Sponsor competitions and contests with prizes for promoting climate protection and reducing GHG emissions.
  - Partner with professional associations to develop strategies to reduce GHG emissions at the local level.

Potential Implementation Resources and Partners:

State of California Department of Education, CalEPA, Vallejo Unified School District, Solano Community College, Sonoma State University, California Maritime Academy, Touro University, and local professional organizations

CE-2. Community Outreach

Engage the general community in the City's GHG reduction efforts through print, online, and in-person outreach mechanisms.

2020 Greenhouse Gas Reduction:

Supportive

2035 Greenhouse Gas Reduction:

Supportive

City Cost:

Low

City Savings:

None

Co-Benefits:

Adoption and implementation of new plans and policies are more successful when the public clearly understands the desired outcomes, why they are important, and how to achieve and measure results. Community encouragement and education takes time and tends to work best both ahead and after the public hearing approval process. Rather than relying solely on enforcing regulations, the City will enhance voluntary compliance by responding to questions and suggestions and informing the community of ways in which they may participate in Vallejo's commitment to sustainability.

The City of Vallejo has already begun informing the community of the City's GHG reduction plans and efforts through community workshops. The City will continue to inform and update the community via the City's website, newsletter, television station, and public hearings.

Existing Efforts in Support of CE-2:

- Vallejo has a portion of its website dedicated to the Climate Action Plan.
- The City held three public workshops as part of the CAP development process.

Implementation Actions:

- CE-2.1. Educate and inform residents and businesses about CAP implementation strategies and ways in which they can support the City's GHG reduction goals through changes to their behavior or environment.
- CE-2.2. Identify a primary location in Vallejo for deposit and distribution of information regarding GHG management.
- CE-2.3. Cooperate with the schools, business community, and community groups to develop an online one-stop shop for GHG information and resources.
- CE-2.4. Use the City newsletter to communicate and raise awareness of sustainable practices, with an emphasis on illustrating cost savings and benefits to all consumers.

Potential Implementation Resources and Partners:

League of California Cities, Local Government Commission, Association of Bay Area Governments (ABAG), 511.org, MTC

IV. ENERGY (E)

Reduce energy demand through energy efficiency improvements and conservation.

Energy consumption accounts for approximately 48% of Vallejo's emissions and therefore poses an enormous opportunity for reduction. This goal focuses on energy efficiency and conservation; renewable energy is addressed in a separate goal. Multiple studies prove that energy efficiency is by far the most cost-effective way to reduce energy consumption, lower GHG emissions, and save money.

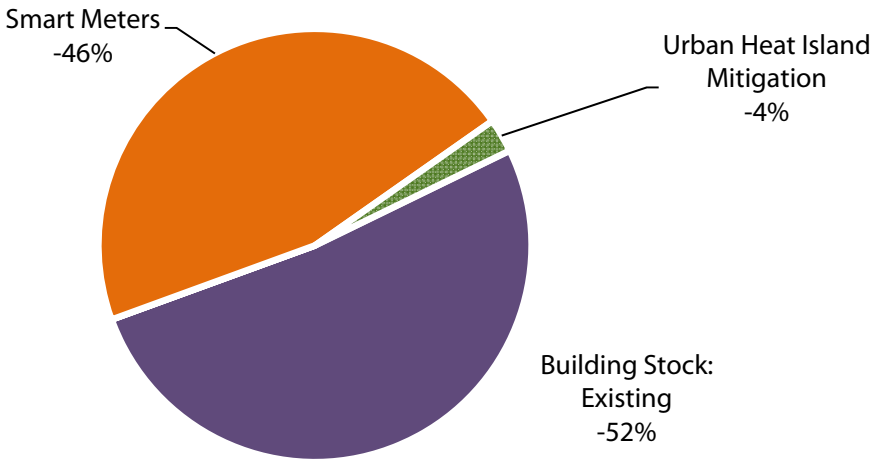
Energy in Vallejo is provided by Pacific Gas and Electric (PG&E) and Island Energy. Island Energy is operated by the Pittsburg Power Company and serves the energy needs of Mare Island.

Table 4-4 and **Figure 4-3** show the GHG reduction impact of the measures under this goal. Existing buildings, especially those built before California's energy-efficient building standards, pose the greatest opportunity for reduction.

Table 4-4. Energy (E) GHG Reductions by Measure

		2010 Emissions Reductions ($MTCO_2e$)	2020 Emissions Reductions ($MTCO_2e$)	2035 Emissions Reductions ($MTCO_2e$)
E	**Energy**	**-270**	**-26,020**	**-42,280**
E-1	Building Stock: Existing	-270	-22,840	-36,670
E-2	Building Standards	-	-	-
E-3	Smart Meters	-	-2,960	-5,220
E-4	Urban Heat Island Mitigation	-	-220	-390

Figure 4-3. Energy (E) GHG Reductions by Measure, 2020



E-1. Building Stock: Existing

Facilitate energy efficiency upgrades and retrofits in existing commercial, residential, and industrial buildings by connecting residents and businesses with technical and financial assistance.

2020 Greenhouse Gas Reduction:

-22,840 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-36,670 $MTCO_2e/yr$

City Cost:

Medium

City Savings:

Low

Co-Benefits:

Increasing the energy efficiency of buildings is the most cost-effective approach for reducing greenhouse gas emissions. Energy efficiency upgrades such as lighting retrofits, insulation, and heating and air conditioning replacements have demonstrated substantial energy savings and as little as a one- to five-year return on investment. The American Recovery and Reinvestment Act (ARRA) of 2009 allowed California to make great strides to the amount of financing, rebates, and incentives for energy efficiency upgrades. The new Energy Upgrade California program, debuted in early 2011, provides a "one-stop shop" for home and business owners to receive financial and technical assistance to upgrade properties.

Under this measure, the City will work with PG&E, Island Energy, and neighboring jurisdictions to connect residents and businesses with assistance for energy efficiency improvements. The City will also work to establish a Property Assessed Clean Energy (PACE) program. The PACE model is a financing mechanism that enables local governments to raise funds for energy efficiency and renewable energy projects in homes and businesses. Property owners apply for an energy upgrade or renewable energy installation. The cost of the upgrade is secured by a property lien and repaid as an addition to the property tax bill. The mechanism allows for energy efficiency upgrades at a low interest rate with no money down.

Existing Efforts in Support of E-1:

- Island Energy and PG&E currently offer rebates and incentives including those for Energy Star appliances like dishwashers, clothes washers, and air conditioners.

- Island Energy automatically enrolls Mare Island residential customers in the residential retail lighting program in which customers receive up to five compact fluorescent light (CFL) and two light-emitting diode (LED) light bulbs per household per year.

Implementation Actions:

- E-1.1. Connect businesses and residents with voluntary programs that provide free or low-cost energy efficiency audits and retrofit installations.

- E-1.2. Develop an outreach program to encourage participation in low-income weatherization programs.

- E-1.3. Work collaboratively with Solano County, other municipalities in the region, and the Association of Bay Area Governments (ABAG), and participate in regional energy efficiency financing programs such as low-interest revolving loan funds, the California Comprehensive Residential Building Retrofit Program, or a Property Assessed Clean Energy (PACE) program that enables Vallejo property owners to obtain low-interest financing for energy improvements.

- E-1.4. Consider creating a Residential Energy Conservation Ordinance (RECO) and Commercial Energy Conservation Ordinance (CECO) to require point-of-sale energy audits and retrofits for all buildings that do not meet minimum energy efficiency requirements.

Potential Implementation Resources and Partners:

California Energy Commission, California Air Resources Board, California Public Utilities Commission, PG&E, ABAG

E-2. Building Standards

Require all new development to meet the minimum California Title 24 and California Green Building Standards Code requirements, as amended, and encourage new development to exceed the minimum requirements.

As described in CG-6, CALGreen is the California residential and commercial green building code. 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 CALGreen Code includes a mandatory minimum code for green building and two tiers of voluntary measures to achieve greater energy efficiencies and other benefits. Tier 1 is a 15% improvement and Tier 2 is a 30% improvement over minimum energy efficiency requirements.

Under this measure, the City would require that new construction and specified remodels meet the minimum requirements of CALGreen and would encourage new development to meet the Tier 1 standards of CALGreen. PG&E completed a cost effectiveness study of CALGreen Tier 1 in 2010 and concluded that, regardless of the building design, occupancy, and number of stories, the incremental improvement in overall annual energy performance in Tier 1 buildings is cost effective. The additional cost of conforming with Tier 1 standards was determined to be paid back through energy savings in anywhere from 3 to 15 years, depending on the building type.[25]

2020 Greenhouse Gas Reduction:

Supportive

2035 Greenhouse Gas Reduction:

Supportive

City Cost:

Low

City Savings:

N/A

Co-Benefits:

Existing Efforts in Support of E-2:

- None at this time.

Implementation Actions:

- E-2.1. Adopt the California Title 24 minimum requirements and encourage new construction and major remodels to adhere to a Tier 1 or Tier 2 standard of the CALGreen Code.

[25] Pacific Gas and Electric Company 2010.

- E-2.2. Require newly constructed buildings and recommend that remodels over 50% and tenant improvements demonstrate compliance with the mandatory CALGreen Code requirements by completing a green building checklist when submitting a request for building permits.

- E-2.3. Consider requiring new development to comply with the Tier 1 requirements of CALGreen, part 11 of the California Building Standards Code. This optional measure may be necessary to address any shortfall in attaining reduction objectives.

Potential Implementation Resources and Partners:

California Energy Commission, California Association of Local Building Officials, US Green Building Council

E-3. Smart Meters

Increase the community's awareness and utilization of real-time energy consumption data available through PG&E's SmartMeter program.

Smart meters allow energy customers to discern their real-time energy consumption and use that information to save energy and money. The SmartMeter system relies on two-way communication between energy meters and the utility provider. The Smart Meter records hourly energy consumption and transmits it to PG&E. PG&E, in turn, can upgrade and read the SmartMeter remotely, which cuts down on administrative costs. PG&E's SmartMeter program is part of a statewide effort to upgrade California energy infrastructure and automate the process of energy metering. SmartMeters have already been installed in Vallejo homes and businesses.[26]

2020 Greenhouse Gas Reduction:

-2,960 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-5,220 $MTCO_2e/yr$

City Cost:

None

City Savings:

N/A

Co-Benefits:

Smart grid integration will reduce energy demand through continuous feedback of real-time energy use. Research has shown that when building users are reminded of their energy use more frequently, higher energy savings will be achieved. Additional energy savings will be achieved through the installation of smart grid appliances that can be pre-programmed to run at off-peak energy times.

Existing Efforts in Support of E-3:

- PG&E completed their installation of SmartMeters in Vallejo in early 2011.

Implementation Actions:

- E-3.1. Support PG&E's installation of SmartMeters on commercial and residential properties by informing the community of the GHG and energy cost-saving potential of the devices.
- E-3.2. Require newly constructed buildings and recommend that major remodels, over 50% install indoor real-time energy monitors.
- E-3.3. Inform the community of metering options, such as online applications and in-home monitors.

[26] PG&E 2011.

- E-3.4. Connect businesses and residents with rebate programs that give priority to appliances with smart grid technology.

Potential Implementation Resources and Partners:

PG&E, Island Energy, California Air Pollution Control Officers Association (CAPCOA), CPUC, CEC

E-4. Cool Roofs and Pavements

Increase tree planting and the use of cool roofs and cool pavement materials to reduce the urban heat island effect and corresponding energy consumption. Implement tree replacement policy for projects where tree removal is necessary.

Dark materials like asphalt absorb and retain more heat from the sun than white or reflective materials. In urban areas like Vallejo with a large amount of pavement, this can cause temperatures to increase dramatically during hot summer and fall days, which causes increased energy consumption for air conditioning. "Albedo" is a measurement of the solar reflectivity of a material. High albedo pavements, or "cool pavements," have high solar reflectivity and result in cooler urban temperatures.[27]

This measure requires the use of high albedo paving materials whenever possible in parking lots, street medians, sidewalks, and roadway improvements. According to a report by the U.S. Environmental Protection Agency (EPA), high albedo materials can be comparable in cost and durability to traditional asphalt, depending upon the technology used.[28] California has required white-colored material for flat roofs since 2005. Surfaces eligible for replacement with high albedo materials can include parking lots, sidewalks, driveways, and roads.

2020 Greenhouse Gas Reduction:

-220 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-390 $MTCO_2e/yr$

City Cost:

Low

City Savings:

None

Co-Benefits:

Existing Efforts in Support of E-4:

- The City implements the California Green Building Standards Code, which requires white roofs for most new development.

Implementation Actions:

- E-4.1. Actively inspect and enforce state requirements for cool roofs on residential and nonresidential roofing projects. Require new buildings to meet Title 24 and recommend that new buildings meet CALGreen Tier 1 requirements for cool roofs, which require a minimum solar reflectance index (SRI) of 10 for steep slope roofs and 64 for low slope roofs.

[27] Akbari 2009.

[28] EPA 2005.

- E-4.2. Establish standards for new development and major remodels (to be defined) to reduce exterior heat gain for 50% of non-roof impervious site surfaces (roads, sidewalks, courtyards, parking lots, driveways) through one or more of the following mechanisms:
  - Achieve 50% paved surface shading within five to ten years by planting trees and other vegetation and/or installing solar panels or shading structures above parking.
  - Use paving materials with an SRI of at least 29 for all surfaces.
- E-4.3. Maintain and expand Vallejo's urban forest, including street trees and trees on private property.
- E-4.4. For public improvements and public projects, require the use of high albedo paving material for sidewalks, roads, crosswalks, parking lots, and driveways.

Potential Implementation Resources and Partners:

University of California Pavement Research Group, California Department of Transportation (Caltrans), CEC

V. RENEWABLE ENERGY (RE)

Facilitate the installation and use of small-scale renewable energy systems.

Renewable energy not only reduces greenhouse gas emissions, but also reduces California's reliance on nonrenewable fossil fuels. Renewable energy includes solar photovoltaic (PV), wind, biomass, and geothermal. This goal focuses on small-scale renewable energy that can be incorporated into the urban fabric of Vallejo, such as wind or solar PV, but it also leaves room for emerging renewable technologies such as tidal and geothermal.

The most widely used renewable power source at this time is solar PV. The community of Vallejo is already deeply committed to solar PV. The California Solar Initiative, which disperses rebates and incentives for solar installations, shows that Vallejo already has over 70 solar installations totaling over 1 MW of capacity within city limits.

The City of Vallejo leads by example! The City has four solar PV installations, including the 255 kW system shown above located at the City's Ascot Court water pumping station.

The GHG reduction impact of each reduction measure is shown in **Table 4-5** below. The two measures work together to reduce emissions by over 10,000 metric tons of CO_2e by 2020.

Table 4-5. Renewable Energy (RE) GHG Reductions by Measure

		2010 Emissions Reductions ($MTCO_2e$)	2020 Emissions Reductions ($MTCO_2e$)	2035 Emissions Reductions ($MTCO_2e$)
RE	**Renewable Energy**	**0**	**-32,380**	**-60,030**
RE-1	Renewable Energy Installations	Supporting Measure	Supporting Measure	Supporting Measure
RE-2	Renewable Energy Financing	0	-32,380	-60,030

RE-1. Renewable Energy Installations

Support the installation of small-scale renewable energy systems including solar photovoltaic, solar thermal, and wind, river current, and tidal energy conversion systems.

2020 Greenhouse Gas Reduction:

Supportive

2035 Greenhouse Gas Reduction:

Supportive

City Cost:

Unknown

City Savings:

Unknown

Co-Benefits:

The City will support the installation of small-scale renewable energy systems throughout the city by identifying and eliminating procedural barriers and by training staff to facilitate the permitting process in as smooth a manner as possible. Common renewable energy options available to city residents include solar PV, solar thermal (i.e., solar water heaters), and wind.

The solar industry continues to emerge and mature, and it is becoming more cost competitive to procure this type of energy at the individual home and business level. Research is seeking to reduce costs, and the promise of an inexpensive thin film photovoltaic design could revolutionize this technology in the future. Currently most solar photovoltaic installations are either small (1–10 kW) rooftop applications or large solar farm projects. Consequently, there may be an opening for developing small to medium-sized solar projects, provided they are approved and constructed in a timely manner.

Existing Efforts in Support of RE-1:

- The California Solar Initiative (CSI) records over 70 solar installations in Vallejo totaling over 1 MW in capacity. This amount saves over 1.8 million kWh per year.

Implementation Actions:

- RE-1.1. Update the Zoning Code to define a renewable energy strategy that removes barriers to small-scale solar energy systems.

- RE-1.2. Revise the permit processes and fees as appropriate to remove barriers to and incentivize the installation of renewable energy systems in accordance with applicable safety and environmental standards.

- RE-1.3. Provide training to at least one designated Planning and one Building staff member to enable knowledgeable and expeditious processing of renewable energy applications.

- RE-1.4. Encourage new homes and businesses to be pre-wired and pre-plumbed for solar and solar thermal installations.

- RE-1.5. Evaluate site-specific opportunities and constraints related to Vallejo's proximity to the San Francisco Bay and to rivers, channels, and lakes, both man-made and natural.

Potential Implementation Resources and Partners:

California Solar Initiative (CSI), CPUC, PG&E, Island Energy

RE-2. Renewable Energy Financing

Connect residents and businesses with renewable energy incentives and low-interest financing mechanisms.

Many local governments, including the County of Solano, elected to participate along with the Association of Bay Area Governments (ABAG) in the California FIRST program, which allows qualified residential and commercial property owners to repay the cost of solar energy systems through a voluntary increase on their property tax bill. Equipment and installation costs of a renewable energy system are provided for approved applicants. In turn, the property owner's property tax bill is increased to repay the cost of the energy project plus interest. If the property is sold, both the renewable energy system and the remaining debt stay with the property.

However, major mortgage lenders closely associated with the federal government are currently preventing the use of PACE programs on federally backed mortgages. Nonetheless, the State of California is pursuing legal action in support of PACE programs, and some local jurisdictions including nearby Sonoma County continue to successfully operate this type of program for commercial properties. It is assumed that the federal barriers to PACE financing will be overcome in the next few years, or that an alternative financing mechanism with be made available.

2020 Greenhouse Gas Reduction:

-32,080 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-60,030 $MTCO_2e/yr$

City Cost:

Low

City Savings:

Mid-Term

Co-Benefits:

Existing Efforts in Support of RE-2:

- Vallejo has attempted to participate in current retrofit financing programs, but has been delayed.
- Support for the PACE program remains high at state, regional, and local levels.

Proposed Efforts in Support of RE-2:

- Connect property owners with low-interest financing opportunities for renewable energy installations.
- Establish a comprehensive renewable energy program that would allow the community of Vallejo to increase the community's use of locally produced renewable energy through community choice aggregation or other measures.

Implementation Actions:

- RE-2.1. Participate in a regional financing program such as the Property Assessed Clean Energy (PACE) program or equivalent that achieves similar results to provide low-interest financing for renewable energy installations.
- RE-2.2. Designate a City staff person to coordinate local inquiries regarding the regional financing program.
- RE-2.3. Train Planning and Building staff members on available state, regional, and utility-led financing mechanisms and incentives/rebates.
- RE-2.4. Collaborate with neighboring jurisdictions and Solano County to explore the feasibility and cost of a community choice aggregation program.
- RE-2.5. Set a renewable power generation goal for the City to increase community-wide energy generation.
- RE-2.6. Work with Solano County to identify the benefits and costs of a community choice aggregation program and establish a stakeholder advisory group.

Potential Implementation Resources and Partners:

Solano County, California Solar Initiative rebate program, CEC, CARB, Yolo-Solano Air Quality Management District

VI. TRANSPORTATION DEMAND MANAGEMENT (TDM)

Reduce and consolidate the number of single-occupancy vehicle trips to and from Vallejo by providing attractive alternatives and by requiring co-beneficial land use decisions.

Transportation demand management (TDM) is a general term for measures that result in more efficient use of transportation resources.[29] TDM strategies can include anything from carpooling to higher-density housing to bicycle paths. This measure seeks to reduce the need for travel and, when travel is necessary, to make it more convenient to travel by an alternative mode such as public transit or bicycle. Decreased vehicular travel will have a direct impact on air quality and public health as well as on GHG emissions.

The City of Vallejo currently owns the Baylink Ferry service. This service connects Vallejo residents to the heart of San Francisco in about 55 minutes and will soon be administered by the federal government.

The City of Vallejo can influence transportation demand management through outreach, land use decisions, and public transportation options. The City runs Vallejo Transit, which consists of nine regular transit routes in Vallejo and three regular connection routes to BART stations. Vallejo Transit runs regular service Monday through Saturday, with limited service on Sunday. From a land use perspective, the City has a Downtown Specific Plan and Waterfront Master Plan to direct denser, more transit-oriented development in these areas. This goal will encompass and develop existing efforts into one unified strategy through 2020 and 2035.

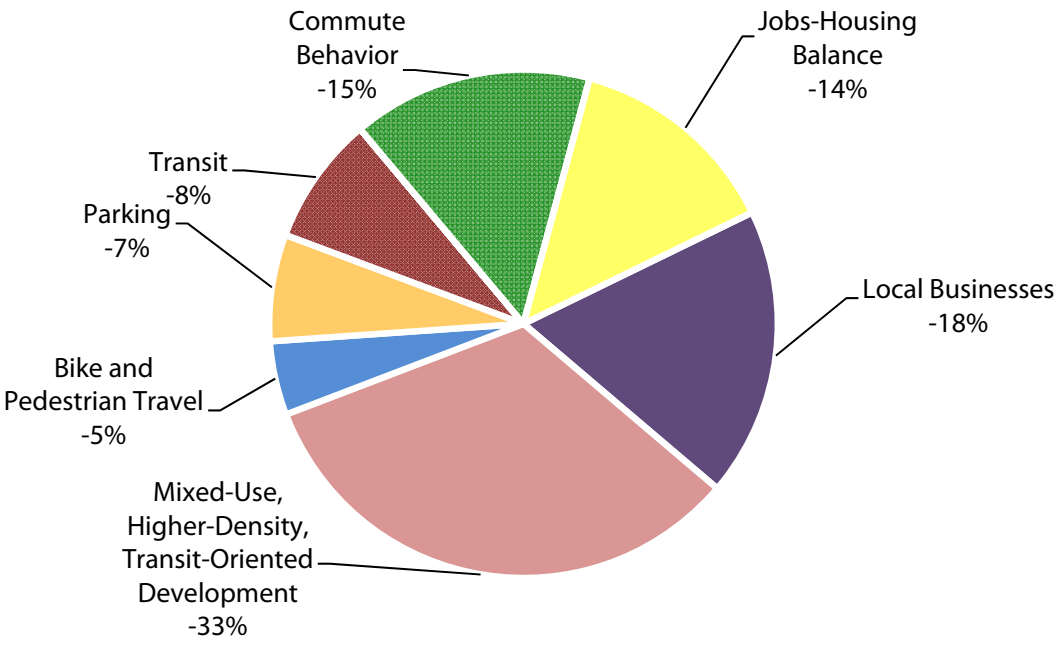
The GHG reduction potential of each measure under this goal is shown in **Table 4-5** and **Figure 4-4**. The largest reduction of this goal (30%) is the result of mixed-use, higher-density, transit-oriented development. The second largest reduction is from shopping and producing locally (17%), followed by a better distribution of jobs and housing (13%).

[29] Victoria Transport Policy Institute 2011.

Table 4-6. Transportation Demand Management (TDM) GHG Reductions by Measure

		2010 Emissions Reductions ($MTCO_2e$)	2020 Emissions Reductions ($MTCO_2e$)	2035 Emissions Reductions ($MTCO_2e$)
TDM	**Transportation Demand Management**	**-4,550**	**-13,250**	**-18,860**
TDM-1	Local Businesses	0	-2,470	-3,070
TDM-2	Mixed-Use, Higher-Density, Transit-Oriented Development	-3,360	-4,270	-5,590
TDM-3	Bike and Pedestrian Travel	0	-630	-800
TDM-4	Parking	0	-910	-1,830
TDM-5	Transit	-1,190	-1,100	-1,230
TDM-6	Food Systems	Supporting Measure	Supporting Measure	Supporting Measure
TDM-7	Commute Behavior	-140	-2,050	-2,390
TDM-8	Jobs/Housing Balance	-80	-1,820	-3,950

Figure 4-4. Transportation Demand Management (TDM) GHG Reductions by Measure, 2020



The Downtown Vallejo Specific Plan and Downtown Vallejo Design Guidelines were adopted by the City Council in 2005. The Downtown Vallejo Specific Plan identifies the areas that are appropriate for new and higher density and mixed use growth within Vallejo. Creating environments that are pedestrian friendly, reduce travel distances, and spur economic growth are essential to reducing vehicle miles traveled and inherently tied to the goals of this Climate Action Plan. The Design Guidelines help to support the vision of the Specific Plan by providing detailed design direction for public and private improvements. Both documents are available at http://www.ci.vallejo.ca.us/GovSite/default.asp?serviceID1=842&Frame=L1.

TDM-1. Local Businesses

Promote buy local and related initiatives that support local commerce and reduce the need for extensive transport.

2020 Greenhouse Gas Reduction:

-2,470 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-3,070 $MTCO_2e/yr$

City Cost:

Low

City Savings:

Unknown

Co-Benefits:

Supporting local businesses results in benefits to the triple bottom line: the economy, the environment, and social equity. The purchase of locally produced goods and services recycles dollars within the community, increases opportunities for local employment, and reduces GHG emissions associated with transportation.

Working through the local Chamber of Commerce and other community benefit organizations, "buy local" campaigns can simultaneously help the local economy and the planet. In order to continue attracting people Downtown, ongoing economic revitalization efforts will be needed along with award and recognition programs that celebrate local accomplishments and encourage local commerce. Similarly, chain stores should also be encouraged to increase their purchases from local suppliers.

Existing Efforts in Support of TDM-1:

- The Downtown Specific Plan and Mare Island Specific Plan support public improvements that attract increased public access to local goods and services.
- The Vallejo General Plan contains a number of goals and policies that support public access to local commercial areas as well as economic revitalization.

Implementation Actions:

- TDM-1.1. Support efforts that encourage people who live, work, or have businesses in Vallejo to buy local goods, food supplies, and services.
- TDM-1.2. Implement the elements of the Downtown Specific Plan that encourage the promotion of economic revitalization of the Downtown Commercial Area to create local options for commerce.
- TDM-1.3. Enact new or participate in existing award programs that recognize local employers who provide outstanding contributions to the quality of life in the community, including "green businesses."

- TDM-1.4. Promote cooperative benefits organizations to enable individual merchants to achieve benefits of scale and innovation to reduce energy consumption, establish recycling programs, and reduce water use.

- TDM-1.5. Support strategies to increase local business-to-business commerce.

Potential Implementation Resources and Partners:

Chamber of Commerce, local business associations, farmers market, buy local advocate

TDM-2. Mixed-Use, Higher-Density, Transit-Oriented Development

Promote mixed-use, higher-density development near transit nodes.

Well-designed higher-density, mixed-use development near public transportation encourages local business activity while reducing the need to own a car and drive long distances. Bay Area households spend nearly $13,400 annually on transportation. [30]

2020 Greenhouse Gas Reduction:

-4,270 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-5,590 $MTCO_2e/yr$

City Cost:

Unknown

City Savings:

None

Co-Benefits:

Many cities have successfully focused economically vital development along bus routes and multimodal centers such as ferry stops. For transit to be successful, there needs to be a critical density of passengers for residential, office, academic, and retail uses. Market research shows an increasing number of young and older adults want to live in walkable communities with multimodal transportation choices. This measure analyzes the GHG impact of the proposed densities of the Downtown Specific Plan and the Waterfront Master Plan.

Existing Efforts in Support of TDM-2:

- The City's Specific Plans, including those for Downtown, Mare Island, and the Waterfront Planned Development Master Plan, and the Vallejo General Plan all contain a number of provisions that support transit-oriented development (TOD) and public access to local commercial areas.

Implementation Actions:

- TDM-2.1. Maintain the Downtown Commercial Area as a strong focal point to attract higher-density housing, business, and office use.
- TDM-2.2. Provide a high-quality and relatively high-density Downtown multi-family residential environment connected by selected transit-oriented priority areas and other transit corridors.
- TDM-2.3. Adopt incentives such as priority processing and revised codes to increase densities in the Downtown or within one-half mile of a regularly scheduled transit stop.
- TDM-2.4. Implement elements in the Downtown Specific Plan that encourage pedestrian-oriented plazas, walkways, bike trails, bike lanes, and street furniture and

[30] Urban Land Institute 2010.

connections to other community areas. Promote pedestrian convenience and recreational opportunities through development conditions requiring sidewalks, walking paths, or hiking trails connecting various land uses with safety amenities such as lighting and signage.

- TDM-2.5. Implement elements in the Downtown Specific Plan that promote mixed-use development support services such as day care, restaurants, banks, and stores near employment centers, where feasible.

- TDM-2.6. Support "complete streets" by incorporating applicable public transit, bicycle and pedestrian rights-of-way, and facilities for Vallejo residents when evaluating future expansion and new development of streets and highways.

Potential Implementation Resources and Partners:

ABAG, downtown developers, housing organizations

TDM-3. Bicycle and Pedestrian Travel

Expand and link the network of pedestrian and bicycle paths and facilities through preparation of a Bicycle and Pedestrian Master Plan, with the goal of increasing the bicycle and pedestrian mode share 20% by 2035.

A large percentage of trips less than a mile are currently made by car. Most of these trips could easily be accomplished by walking or biking, provided the trip occurred on a well-designed pedestrian and bicycle network. The advantages of walking or biking are manifold and include improved health, cost savings, and reduced GHG emissions. Research has shown that many people are willing to walk up to one-half mile and that such a walk can be completed in around 15 minutes or less.

Similarly, Vallejo's climate and topography are very well suited for increased bicycle transportation. This measure calls for Vallejo to work with the Solano Transportation Authority to install the bike lanes and facilities outlined in the Solano Countywide Bicycle Plan. It also calls for the City to build upon the countywide plan with its own Bicycle and Pedestrian Master Plan.

2020 Greenhouse Gas Reduction:

-630 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-800 $MTCO_2e/yr$

City Cost:

Medium-High

City Savings:

None

Co-Benefits:

Existing Efforts in Support of TDM-3:

- The Downtown Specific Plan and the Vallejo General Plan all contain a number of provisions that support pedestrian and bicycle facilities.
- The Mare Island Specific Plan includes plans to develop bike lanes throughout the island, including a path that spans from the promenade to the regional park system.
- The Solano Transportation Authority completed the Solano Countywide Bicycle Plan in 2004. A current list of projects and updates can be found at http://www.sta-snci.com/plans2.html#bikeplan.

Implementation Actions:

- TDM-3.1. Create a City-wide Bicycle and Pedestrian Master Plan to analyze existing and future pedestrian and bicycle infrastructure and facilities and to qualify for state and federal funding for bicycle- and pedestrian-related infrastructure.
- TDM-3.2. Pursue public and private funding to expand and link the network of pedestrian and bicycle paths and facilities beginning in selected, transit-oriented priority areas.

- TDM-3.3. Revise zoning standards to require the provision of bicycle support facilities (lockers, shower rooms, etc.) for appropriate development at a rate of 1 changing room and shower per 200 occupants.

Potential Implementation Resources and Partners:

Solano Transportation Authority, Caltrans Bicycle Division, ABAG, MTC, Bay Area Air Quality Management District (BAAQMD), East Bay Bicycle Coalition, Solano Cycling Club

TDM-4. Parking

Revise parking requirements for new commercial and multi-family projects and implement the Downtown Parking Meter Installation Plan.

2020 Greenhouse Gas Reduction:

-910 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-1,830 $MTCO_2e/yr$

City Cost:

Low

City Savings:

Medium-High

Co-Benefits:

Reductions to parking requirements can increase the supply of housing and reduce unnecessary vehicle trips, traffic congestion, air pollution, energy use, and greenhouse gas emissions. Moreover, the effects can occur quickly. This measure calls for Vallejo to allow a reduction in parking requirements by 15%. It also assumes that the paid parking system outlined in the Downtown Parking Management Plan will be implemented before 2020.

Existing Efforts in Support of TDM-4:

- Jurisdictions are evaluating parking policies with federal, state, and regional agencies.

Implementation Actions:

- TDM-4.1. Revise parking requirements for new commercial and multi-family residential projects to provide bike racks for 5% of the building's projected visitors within 200 feet of the building's entrance for commercial project and one long-term bicycle storage space per two multi-family units.
- TDM-4.2. Allow up to a 15% reduction in required private vehicle parking spaces in new commercial and multi-family residential projects if justified in an approved trip reduction plan.
- TDM-4.3. Encourage shared parking programs in mixed-use and transit-oriented development areas.
- TDM-4.4. Design parking lots, where feasible, to include clearly marked and shaded pedestrian pathways between transit facilities and building entrances.

Potential Implementation Resources and Partners:

Downtown developers, housing organizations

TDM-5. Transit

Support a convenient, attractive, and comprehensive transit system.

2020 Greenhouse Gas Reduction:

-1,100 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-1,230 $MTCO_2e/yr$

City Cost:

Low-Mid

City Savings:

Low

Co-Benefits:

The availability of good public transportation increases personal choice and reduces automobile use. Furthermore, Americans living in public transit-intensive urban areas benefit from substantial savings in transportation costs. Every year, public transportation in the United States saves millions of barrels of oil and correspondingly reduces GHG emissions.

Consequently, integrating public transportation into the core of community planning and economic development efforts is a wise investment and provides the foundation for successful sustainable development. Vallejo has the benefit of controlling both sides of the issue: land use and transit. There were over 1.5 million transit trips taken through Vallejo Transit in 2008, a number which the City hopes to increase through this measure.

Existing Efforts in Support of TDM-5:

- The City currently operates Vallejo Transit, which includes bus, ferry, taxi, and paratransit (www.vallejotransit.com).
- Vallejo Transit runs direct shuttles to and from Six Flags Marine World, BART, and the ferry.

Implementation Actions:

- TDM-5.1. Prioritize and pursue transit improvements that serve local businesses and job sites.
- TDM-5.2. Encourage major employers to provide free or discounted transit passes or other incentives to employees for using transit.
- TDM-5.3. On Mare Island, create a network of bicycle and pedestrian paths that connect with transit services, combined with a street framework that is transit-friendly but sensitive to Mare Island's historic character.

Potential Implementation Resources and Partners:

Solano Transit Authority, City, and regional agencies engaged in and funding public transit riders , BART, Amtrak, Baylink Ferry

TDM-6. Food Systems

Support convenient access to neighborhood-serving grocery stores and community gardens.

2020 Greenhouse Gas Reduction:

Supportive

2035 Greenhouse Gas Reduction:

Supportive

City Cost:

None

City Savings:

None

Co-Benefits:

The average piece of produce in California travels well over 1,000 miles to reach the customer. However, at some local markets and most farmers markets, food products are generally grown within 500 miles and many within 100 miles. This not only reduces the consumption of petroleum and GHG emissions, but local food is usually fresher and may even taste better.

Food merchants are increasingly letting their customers know where the food came from—and some even post the food miles traveled along with the price. Ensuring that local neighborhoods have access to markets selling fresh produce and encouraging urban gardening and increased food production is intended to provide greater access to food products from within a regional "food shed."

This measure does not have a direct GHG benefit at this time, but is thought to contribute to TDM-1, Local Businesses.

Existing Efforts in Support of TDM-6:

- Farmers markets are held regularly in Vallejo, including one on Saturday mornings on Georgia street.

Implementation Actions:

- TDM-6.1. Encourage the distribution of grocery stores that provide fresh and local foods with convenient access from all residential neighborhoods.
- TDM-6.2. Improve the distribution, frequency, and attendance of farmers markets in Vallejo.
- TDM-6.3. Collaborate with community-based organizations in support of community gardens on applicable sites throughout the city.
- TDM-6.4.Revise zoning standards as necessary to allow small neighborhood markets in appropriate areas.
- TDM-6.5. Add an additional week-day Farmer's Market in Vallejo.

Potential Implementation Resources and Partners:

Local markets and restaurants that provide local or organic produce, markets that sell ethnic foods, local nonprofit organizations.

TDM-7. Commute Behavior

Reduce emissions from commute travel to and from schools and workplaces.

2020 Greenhouse Gas Reduction:

-2,050 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-2,390 $MTCO_2e/yr$

City Cost:

Low

City Savings:

None

Co-Benefits:

Commute trips can be as much as 30% of a city's total vehicle miles traveled. This measure calls for the City to address regular travel to and from Vallejo and major employers and/or schools. Opportunities for reduction include telecommuting, alternative work schedules, and carpooling.

Existing Efforts in Support of TDM-7:

- Solano/Napa Commuter Information (SNCI) is a program that helps commuters find commute alternatives such as carpooling, vanpooling, and public transit. SNCI also works with employers to develop transportation solutions for employees including survey assistance, on-site presentations, commuter guides, commuter incentives, and vanpool program assistance. (See http://www.commuterinfo.net/Content/10012/about.html)

Implementation Actions:

- TDM-7.1. Encourage a variety of transportation system demand management techniques for new development, including variable work hours and telecommuting.
- TDM-7.2. Support the establishment and participation in Safe Routes to Schools and similar infrastructure and educational programs that enable safe passage of children and reduce vehicle trips to local schools.
- TDM-7.3. Collaborate with the Solano Transportation Authority (STA) and Solano County to update the rideshare matching system to include the use of social networking and smart phone platforms and encourage greater use of existing park-and-ride lots.
- TDM-7.4. Collaborate with STA and local employers to support guaranteed ride home programs including preferential parking spaces, employer-assisted ride-matching databases, recognition programs, and other incentives.
- TDM-7.5. Participate in and contribute to regional programs to address Bay Area commute alternatives and commute efficiency.

Potential Implementation Resources and Partners:

Yolo-Solano Air Quality Management District, Bay Area Air Quality Management District (BAAQMD), Solano County, 511.org

TDM-8. Jobs/Housing Balance

Plan for an improved jobs/housing balance in order to reduce the need for long-distance travel from residences to places of work.

2020 Greenhouse Gas Reduction:

-1,820 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-3,950 $MTCO_2e/yr$

City Cost:

Unknown

City Savings:

Unknown

Co-Benefits:

Creating an effective jobs/housing balance means that Vallejo salaries are matched with Vallejo housing costs so that people may live and work in the same area. This measure analyzes how emissions will reduce as Vallejo's jobs/housing balance improves and the need to travel long distances to job centers diminishes. This measure is closely tied with other TDM measures. A jobs/housing balance can be improved through a variety of mechanisms such as affordable housing, economic development, increased live/work units or home occupations, and more.

Existing Efforts in Support of TDM-8:

- None at this time.

Implementation Actions:

- TDM-8.1. Update the City General Plan and corresponding regulations to support additional jobs and economic revitalization that improves Vallejo's jobs/housing balance.
- TDM-8.2. Support the retention and expansion of local anchor and growth industries including Kaiser and Sutter hospitals, as well as Touro University on Mare Island and the California Maritime Academy.
- TDM-8.3. Review land-use plans and regulations and revise as needed to support additional live/work opportunities and home occupations, provided they are compatible with the existing neighborhood.

Potential Implementation Resources and Partners:

California Department of Housing and Community Development, California Planning Roundtable, ABAG, MTC

VII. OPTIMIZED TRAVEL (OT)

Optimize necessary vehicular travel to the greatest extent possible through alternative vehicles and fuels and efficient vehicle maintenance and use.

Realizing that some vehicle travel is unavoidable, this measure calls for necessary trips to be made in an efficient manner or with fuels other than diesel and gasoline. Alternative vehicles and fuels include hybrids, plug-in electric vehicles, biodiesel, and fuel cells. There are also design and maintenance issues that lead to lower GHG emissions from vehicular travel, including proper tire inflation and decreased speeds.

The City can encourage the use of efficient and alternative fuel vehicles through incentives and by guaranteeing that Vallejo's infrastructure will be prepared for these types of vehicles and fuels.

As shown in **Table 4-7** and **Figure 4-5**, the majority of GHG reductions result from the efficient and alternative fuels measure.

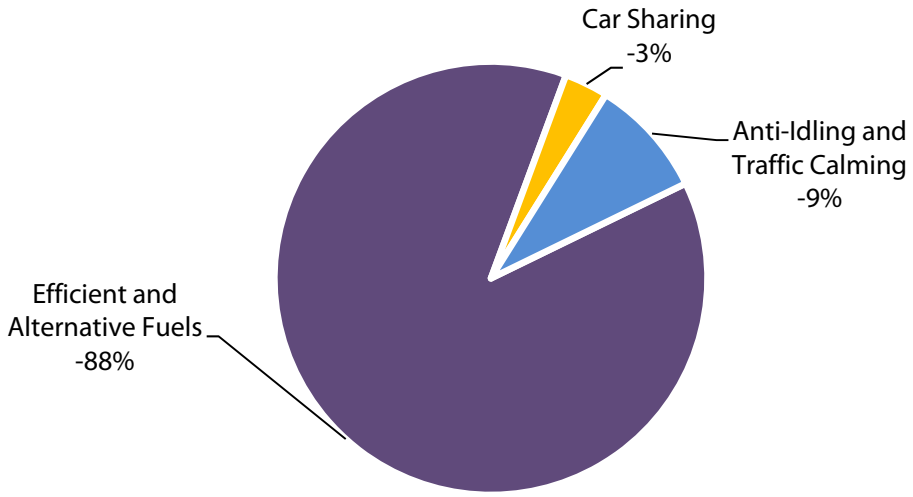
Plug-in electric vehicles are powered by charging stations like the one seen here in a Walnut Creek parking garage.

Photo Credit: 511 Contra Costa

Table 4-7. Optimized Travel (OT) GHG Reductions by Measure

		2010 Emissions Reductions ($MTCO_2e$)	2020 Emissions Reductions ($MTCO_2e$)	2035 Emissions Reductions ($MTCO_2e$)
OT	**Optimized Travel**	**0**	**-19,920**	**-22,540**
OT-1	Efficient and Alternative Fuel Vehicles	0	-17,090	-18,380
OT-2	Car Sharing	0	-740	-2,130
OT-3	Anti-Idling and Traffic Calming	0	-2,010	-1,870
OT-4	Zero Emission Vehicle Stations	0	-80	-160

Figure 4-5. Optimized Travel (OT) GHG Reductions by Measure, 2020



OT-1. Efficient and Alternative Fuel Vehicles

Support the expanded use of efficient and alternative fuel vehicles.

2020 Greenhouse Gas Reduction:

-17,090 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-18,380 $MTCO_2e/yr$

City Cost:

Low-Mid

City Savings:

None

Co-Benefits:

N/A

Alternative fuels include hybrid electric, plug-in hybrids, compressed natural gas, biodiesel, hydrogen fuel cell, and all electric. Depending on their fuel source and design features, the cleanest burning of these vehicles are classified as zero emission vehicles (ZEV) or partial zero emission vehicles (PVEZ).

Existing Efforts in Support of OT-1:

- The City of Vallejo has purchased hybrids for the City fleet and efficient diesel buses.

Additional Efforts in Support of OT-1:

- Support the State's implementation of the Low Carbon Fuel Standard and facilitate the use of alternative fuels in Vallejo.

Implementation Actions:

- OT-1.1. Support use of high-occupancy vehicle (HOV) lanes by fuel-efficient and alternative fuel vehicles designated as zero or partial zero emission vehicles by CARB through adoption of Climate Action Plan policies and participation on the Metropolitan Transportation Commission and other regional agency committees.

- OT-1.2. Revise parking requirements for public and newly constructed commercial developments to include designated stalls for low-emitting, fuel-efficient vehicles and carpool/vanpool vehicles for a minimum of 8% of total parking capacity and develop pre-wire stalls for future electric vehicle charging for 2% of total parking capacity.

- OT-1.3. Encourage new gas stations and automotive uses to include biodiesel facilities and/or offer biodiesel retrofits to diesel vehicles.

- OT-1.4. Consider creating refueling stations to provide biodiesel fuel, compressed natural gas, or liquefied natural gas.

Potential Implementation Resources and Partners:

CEC, CARB, Yolo-Solano Air Quality Management District, ABAG

OT-2. Car Sharing

Facilitate a car-sharing network in Vallejo.

Car sharing has the benefit of occasional car use without issues of parking, maintenance, and paying for downtime. This system is popular in cities with good transportation systems that support the incidental need for a car. Car-sharing systems allow members to rent a car by the hour for a relatively inexpensive cost per mile plus a membership fee. Participants in similar car sharing programs have been documented to reduce automobile use and increase the use of other modes as a result of program participation.

2020 Greenhouse Gas Reduction:

-740 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-2,130 $MTCO_2e/yr$

City Cost:

Low

City Savings:

None

Co-Benefits:

Existing Efforts in Support of OT-2:

- None at this time.

Implementation Actions:

- OT-2.1. Facilitate and encourage at least one car-sharing company, such as Zip Car and City Car Share, to include Vallejo in its service area by 2020.

- OT-2.2. Investigate the possibility of reducing the City's vehicle fleet by using car-sharing vehicles for appropriate City uses by 2020.

Potential Implementation Resources and Partners:

Commercial enterprises that wish to expand their markets. College and university students are frequent customers for car sharing.

OT-3. Anti-Idling and Traffic Calming

Support anti-idling and traffic calming infrastructure and enforcement.

Anti-idling and traffic calming methods reduce GHG generation from vehicle operation. In some situations, vehicles are required to idle at long traffic lights not tied to traffic flow. In other situations, vehicles idle voluntarily, such as parents waiting for children to be dismissed from school or a commercial truck loading/unloading. Locations with long idling periods have been known to create carbon monoxide (CO) hot spots, a direct health risk. CO can become CO_2 following interaction with other molecules. Public works and transportation engineering can help resolve long periods of idling through design and flow improvements. Situations of idling preference can be resolved in meetings with parents and temporary parking with the engine off rather than in a queue.

2020 Greenhouse Gas Reduction:

-2,010 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-1,870 $MTCO_2e/yr$

City Cost:

Medium

City Savings:

None

Co-Benefits:

Existing Efforts in Support of OT-3:

- None at this time.

Implementation Actions:

- OT-3.1. Synchronize, improve, and construct traffic signal/road improvements that reduce vehicle idling.
- OT-3.2. Work with the Vallejo Police Department to increase enforcement of state idling restrictions for heavy-duty vehicles.
- OT-3.3. Encourage local schools to implement an anti-idling campaign at pick-up and drop-off areas.

Potential Implementation Resources and Partners:

Caltrans, CHP, BAAQMD

OT-4. Zero Emission Vehicle Stations

Provide electric vehicle charging stations.

2020 Greenhouse Gas Reduction:

-80 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-160 $MTCO_2e/yr$

City Cost:

Low

City Savings:

None

Co-Benefits:

The San Francisco Bay Area is becoming a center for the production, distribution, and use of electric vehicles, and Bay Area jurisdictions are increasingly requesting funding to install electric vehicle charging stations to support this emerging trend. Fortunately, funding opportunities for this purpose currently exist from federal, state, and regional agencies responsible for energy and air quality issues.

Because electricity generated in California does not rely upon coal as a fuel stock, conversion to electric vehicles will clearly result in reduced GHG emissions. Additional clean air and energy security benefits will continue to accrue as investor-owned utilities achieve compliance with Renewable Portfolio Standard (RPS) requirements for utilizing an increased share of renewable energy. Similarly, local jurisdictions may seek funding to install electric vehicle charging stations in corporation yards for their municipal fleets as well as in designated public parking stalls. The greatest energy and GHG reduction benefits occur when combined with funding to install a renewable power source such as photovoltaic panels or wind turbines.

Existing Efforts in Support of OT-4:

- The Bay Area Air Quality Management District (BAAQMD) recently launched the Bay Area Electric Vehicle (EV) Ready program to give assistance to local governments in purchasing or facilitating EV use and charging stations.

Implementation Actions:

- OT-4.1. Install additional electric vehicle charging stations at City Hall and other appropriate municipal parking lots for public use.
- OT-4.2. Coordinate with regional agencies to install charging stations in high traffic areas through grant-funded programs encouraging electric vehicle use.
- OT-4.3 Use small- and large-scale solar panels to power or supplement charging stations.

Potential Implementation Resources and Partners:

DOE, CEC (Alternative and Renewable Fuel and Vehicle Technology Program), BAAQMD, MTC, ABAG, STA, Solano County, surrounding cities

VIII. WATER, WASTEWATER, AND SOLID WASTE (W)

Conserve water, reduce water-related energy use, and reduce the amount of solid waste sent to landfills from Vallejo.

Reducing water consumption and waste production will allow California to maintain its natural resources. Water is supplied to Vallejo residents and businesses directly from the City. The Vallejo Sanitation and Flood Control District (VSFCD) controls the wastewater facilities and their efficiency. Finally, waste collection and disposal is managed by Recology Vallejo while recycling services are provided by VALCORE.

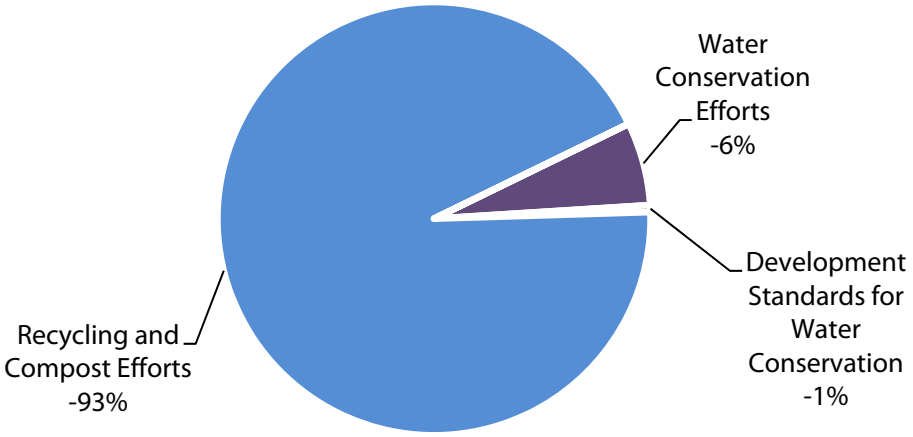
This measure calls for the City to work with these agencies to reduce water-related GHG emissions through their operations. The measures under this goal also focus on reducing the amount of water that needs to be treated and waste that needs to be thrown away.

As shown in **Table 4-8** and **Figure 4-6**, the majority of GHG reductions are the result of recycling and composting efforts.

Table 4-8. Water, Wastewater, and Solid Waste (W) GHG Reductions by Measure

		2010 Emissions Reductions ($MTCO_2e$)	2020 Emissions Reductions ($MTCO_2e$)	2035 Emissions Reductions ($MTCO_2e$)
W	**Water, Wastewater, and Solid Waste**	**-3,070**	**-8,920**	**-15,140**
W-1	Water Conservation Efforts	0	-490	-890
W-2	Development Standards for Water Conservation	0	-40	-90
W-3	Recycling and Compost Efforts	-3,070	-8,390	-14,160
W-4	Development Standards for Recycling and Composting	Supportive	Supportive	Supportive

Figure 4-6. Water, Wastewater, and Solid Waste (W) GHG Reductions by Measure, 2020



W-1. Water Conservation Efforts

Promote and require water conservation through outreach and pricing.

2020 Greenhouse Gas Reduction:

-490 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-890 $MTCO_2e/yr$

City Cost:

Medium

City Savings:

Medium

Co-Benefits:

By the year 2020, California's population growth will result in unmet water demand of 2.4 million acre-feet of water in average rainfall years and up to 6.2 million acre-feet in drought years.[31] California's CALGreen Code will require stringent indoor and outdoor measures to reduce wasted water through fixtures and timers. Most water districts have instituted conservation programs in previous droughts, which are becoming standard behavior. Water conservation is a good topic for schools since it is tangible and objectives are easily understood.

Saving water also saves energy. Over 6% of the energy used in the state of California is for pumping and treating water—in fact, pumping water south (and uphill) in the State Water Project accounts for 2–3% of all the electricity used in the state. And for personal energy bills, using less hot water saves on water heating.[32]

Existing Efforts in Support of W-1:

- Irrigation Scheduling – The City's Maintenance Division is partnering with the Greater Vallejo Recreation District (GVRD) to begin hydrology-based irrigation control systems on City property.
- Community-wide Water Conservation Program – This community-based program began around 1994 and coordinates with the Solano County Water Agency to provide free residential water use surveys, water audits, and efficiency education to teachers and elementary grades (http://www.vallejowater.org).
- Wasteful Water Use Prohibition Ordinance – The ordinance provides requirements for the use of water efficient landscapes in new developments and prohibits the wasteful use of water that may result in excessive runoff.
- Untreated Water for Irrigation – The City irrigates the City-owned Blue Rocks Springs Golf Club with untreated surface water. Although technically not a water conservation measure, this practice reduces the embodied energy in the irrigation

[31] Environmental Protection Agency 2011.

[32] EPA 2010.

water at the golf course by avoiding the additional pumping and water treatment energy required to irrigate the grounds with treated water from the Fleming Hill Water Treatment Plant.

- Collaborate with VSFCD – The City of Vallejo collaborates with VSFCD on energy-saving projects.

Implementation Actions:

- W-1.1. Continue to provide water customers with information on conservation techniques, services, devices, and rebates by posting information at vallejowater.org or through other outreach methods.

- W-1.2. Continue to enforce the City's Wasteful Water Use Prohibition Ordinance.

Potential Implementation Resources and Partners:

Vallejo Sanitation and Flood Control District, GVRD

W-2. Development Standards for Water Conservation

Require water conservation in all new buildings and landscapes.

CALGreen has established conservation standards through the Building Code. This measure calls for the City to adopt the minimum requirements of CALGreen for water conservation, which will achieve 20% water savings.

2020 Greenhouse Gas Reduction:

-40 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-90 $MTCO_2e/yr$

City Cost:

Low

City Savings:

Medium

Co-Benefits:

Existing Efforts in Support of W-2:

- Water districts have recommended action be taken in the face of drought. The City of Vallejo has been engaged in water conservation practices in the city.

Implementation Actions:

- W-2.1. Per the minimum requirements of the 2010 CALGreen Code, ensure that all new non-residential buildings larger than 50,000 square feet install individual water meters for each tenant space projected to consume more than 100 gallons per day.
- W-2.2. Per the minimum requirements of the 2010 CALGreen Code, ensure that new non-residential facilities with 1,000 to 5,000 square feet of irrigated landscaped space provide an additional water meter or submeter for landscaping uses.
- W-2.3. Revise development standards to support the use of greywater, recycled water, and rainwater catchment systems in all zones.
- W-2.4. Per the voluntary requirements of the 2010 CALGreen Code, encourage newly constructed development to treat at least 40% of the average annual rainfall on-site through low impact development strategies.
- W-2.5. Per the minimum requirements of the 2010 CALGreen Code, require a minimum of 20% of the total parking, walkway, and porch area surfaces serving single-family and multi-family residential buildings under 4 units to be permeable to facilitate on-site retention of water and reduce water runoff.

Potential Implementation Resources and Partners:

Department of Water Resources, CALGreen, VSFCD

W-3. Recycling and Composting Efforts

Support waste diversion through composting and recycling programs.

2020 Greenhouse Gas Reduction:

-8,390 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-14,160 $MTCO_2e/yr$

City Cost:

Low-Mid

City Savings:

Low

Co-Benefits:

The City of Vallejo does not operate a landfill, but is a voting member on the board of the Napa-Vallejo Waste Management Authority, a Joint Powers Authority that oversees operations at the Devlin Road Transfer Station. The City has no influence over what is disposed at landfills; however, the City can implement recycling programs, and provide reuse opportunities to reduce the amount of materials that are likely to be disposed at landfills. This measure will reduce the amount or rate of landfill gas emitted into the atmosphere through increasing recycling and composting efforts. The goal of this measure is to lower the pounds of waste per person per day generated by Vallejo residents and businesses.

Existing Efforts in Support of W-3:

- Composting Program – VALCORE Recycling contracts with the City to provide composting classes and the City purchases composting bins to sell to residents at a substantially reduced price to encourage attendance at the composting classes. In addition, composting classes are often held at the solano County Fair and other special events held within the City. The City's, Solano County's and VALCORE Recycling websites also contain composting information and resources.

- The City also currently offers weekly greenwaste services to all residents, which is taken to Recology Hayroad in Vacaville, where it is turned into compost.

Implementation Actions:

- W-3.1. Collaborate with CalRecycle and VALCORE Community Recycling to continue to host recycling and composting workshops and to disseminate information.

- W-3.2. Provide links to information on composting and VALCORE composting services and classes on the City's website and at other appropriate venues.

- W-3.3. Prepare a list of GHG-reducing best practices for material management to be considered during the solid waste franchise selection process and applicable City permit processes for major development projects.

Potential Implementation Resources and Partners:

Recology Vallejo, VALCORE Community Recycling, CalRecycle

W-4. Development Standards for Recycling and Composting

Require waste diversion and use of recycled materials in new development.

Much of Vallejo's waste stream is the result of construction and demolition of buildings. The City requires all projects that meet or exceed the Construction and Demolition Recycling Ordinance's threshold of $50,000 or 5,000 square feet to recycle or reuse 50% of all construction or demolition debris and 75% of all concrete and asphalt generated from their project. This percentage is the minimum amount required by CalRecycle. This measure calls for increasing the amount of construction and demolition material that is recycled or reused and requires that new developments use recycled materials so as to create a market for more diversion.

2020 Greenhouse Gas Reduction:

Supportive

2035 Greenhouse Gas Reduction:

Supportive

City Cost:

Low

City Savings:

None

Co-Benefits:

N/A

Existing Efforts in Support of W-4:

- The City currently requires 50% of construction and demolition waste and 75% of concrete and asphalt to be diverted from landfills.

Implementation Actions:

- W-4.1. Continue to update the City's Construction/Demolition Waste Reuse and Recycling Ordinance as higher diversion rates become feasible, necessary, or required.

- W-4.2. Support the development of additional markets for recycled content products by requiring new developments to include recycled content materials at a minimum of 10% of total materials.

Potential Implementation Resources and Partners:

CalReycle, VALCORE Community Recycling, Recology Vallejo

IX. OFF-ROAD EQUIPMENT (OR)

Reduce GHG emissions from off-road equipment use in Vallejo.

Off-road emissions include those from lawn and garden equipment and construction activity. While these emissions constitute a relatively small portion of the GHG inventory, it is important that the City make an attempt to reduce emissions from each emissions source. The BAAQMD Air Quality Guidelines require best management practices for addressing construction emissions and the intent of this policy is to identify best practices that are locally relevant to the City of Vallejo. This measure calls for more efficient fuels, equipment, and vehicles in construction and lawn and gardening activities. These improvements will reduce GHG emissions and improve public health.

Construction activities, including tractors and rollers like those shown above, are estimated to emit less than 1% of Vallejo's emissions.

The emissions reductions under this goal are the result of more efficient lawn and garden equipment. **Table 4-9** shows the reductions by measure.

Table 4-9. Off-Road (OR) GHG Reductions by Measure

		2010 Emissions Reductions ($MTCO_2e$)	2020 Emissions Reductions ($MTCO_2e$)	2035 Emissions Reductions ($MTCO_2e$)
OR	**Off-Road Equipment**	**0**	**-30**	**-50**
OR-1	Lawn & Garden Equipment	0	-30	-50
OR-2	Construction Equipment	Supporting Measure	Supporting Measure	Supporting Measure

OR-1. Lawn & Garden Equipment

Encourage the use of electrified and higher efficiency lawn and garden equipment.

Lawn and garden equipment was previously exempt from regulations seeking to reduce GHG from small internal combustion engines. Battery packs for small machinery have become more advanced and effective, but the industry standard is gas-powered machinery. For landscape crews that have routine service sites, some arrangement can be made for appropriate on-site outlets.

2020 Greenhouse Gas Reduction:

-30 $MTCO_2e/yr$

2035 Greenhouse Gas Reduction:

-50 $MTCO_2e/yr$

City Cost:

None

City Savings:

None

Co-Benefits:

Existing Efforts in Support of OR-1:

- None at this time.

Implementation Actions:

- OR-1.1. Support BAAQMD's efforts to re-establish a voluntary exchange program for residential lawn mowers and backpack-style leaf blowers.
- OR-1.2. Require new buildings to provide electrical outlets on the exterior in an accessible location to charge electric-powered lawn and garden equipment.
- OR-1.3. Encourage the replacement of high maintenance landscapes (like grass turf) with native vegetation to reduce the need for gas-powered lawn and garden equipment.

Potential Implementation Resources and Partners:

BAAQMD, CAPCOA

OR-2. Construction Equipment

Reduce emissions from heavy-duty construction equipment by limiting idling and utilizing cleaner fuels, equipment, and vehicles.

This measure calls for the City to enforce state idling restrictions for construction vehicles and equipment. It also requires that a percentage of vehicles and equipment are powered by alternative means such as a hybrid unit, biodiesel, or compressed natural gas.

2020 Greenhouse Gas Reduction:

Supportive

2035 Greenhouse Gas Reduction:

Supportive

City Cost:

Low-Mid

City Savings:

None

Co-Benefits:

Existing Efforts in Support of OR-2:

- None at this time.

Implementation Actions:

- OR-2.1. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxics Control Measure Title 13, Section 2485 of California Code of Regulations [CCR]), or less. Clear signage shall be provided at all access points to remind construction workers of idling restrictions.
- OR-2.2. Construction equipment shall be maintained per manufacturer's specifications.
- OR-2.3. Planning and Building staff will work with project applicants to limit GHG emissions from construction equipment by selecting one of the following measures, at a minimum, as appropriate to the construction project:
  - Substitute electrified equipment for diesel- and gasoline-powered equipment where practical.
  - Use alternatively fueled construction equipment on-site, where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel.
  - Avoid the use on on-site generators by connecting to grid electricity or utilizing solar-powered equipment.
  - Limit heavy-duty equipment idling time to a period of 3 minutes or less, exceeding CARB regulation minimum requirements of 5 minutes.

Potential Implementation Resources and Partners:

BAAQMD, CAPCOA

X. ADAPTATION (A)

Improve Vallejo's resiliency to possible climate change effects through adaptation and preparation.

Many state and regional entities are well under way in their effort to address climate change impacts. Existing efforts include detailed vulnerability assessments, risk assessments, adaptation policies, and adaptation policy guides for local governments. Current efforts include the following:

The Bay Area Conservation and Development Commission (BCDC) predicts that the Vallejo shoreline could face inundation if sea levels rise 16 inches.

- **Executive Order S-13-08** – Signed in 2008, the executive order requires the preparation of a California Sea Level Rise Assessment Report and requires that state agencies planning construction projects in areas vulnerable to sea level rise consider and address a range of scenarios for 2050 and 2100 inundation. Lastly, the order requires development of the Climate Adaptation Strategy (CAS).
- **California Climate Adaptation Strategy** – The CAS summarizes the best-known science on climate change impacts and provides recommendations on how to manage the risks.
- **Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water** – A report by the Natural Resources Agency on climate change impacts to California's water system.
- **Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on the Shoreline** – The San Francisco Bay Conservation and Development Commission (BCDC) report identifies vulnerabilities in the Bay Area's economic and environmental systems, as well as the potential impacts of climate change on public health and safety.

This goal calls for Vallejo to be aware of climate change risks and to address them proactively. It also calls for the City to participate in regional efforts to adapt to climate change. As a coastal city, this goal may not have a GHG reduction potential, but it is essential for Vallejo's continued prosperity.

A-1. Regional Coordination

Participate in regional efforts to analyze and prepare for the impacts of climate change in the Bay Area.

The Vallejo City Council and staff members participate in various regional committees, which helps them keep up with strategies for adapting to climate change in the Bay Area.

2020 Greenhouse Gas Reduction:

Supportive

2035 Greenhouse Gas Reduction:

Supportive

City Cost:

Low

City Savings:

None

Co-Benefits:

N/A

Existing Efforts in Support of A-1:

- Individual Council members take initiative to participate on committees.

Implementation Actions:

- A-1.1. Join regional adaptation and resiliency task forces such as that of the San Francisco Bay Area Conservation and Development Commission (BCDC) and the Joint Policy Committee (JPC).
- A-1.2. Appoint a staff liaison to attend and participate in regional meetings focusing on adaptation and resilience and to report to staff on a regular basis.

Potential Implementation Resources and Partners:

Members of ABAG, Solano Elected Officials Association, League of California Cities, Local Government Commission

A-2. Preparedness

Ensure that Vallejo is prepared for potential environmental risks and hazards related to climate change, with a special emphasis on vulnerable populations.

As outlined in Chapter 2, potential climate change impacts include public health, wildfires, flood events, and habitat and species lost. The City of Vallejo will coordinate with neighboring jurisdictions and Solano County to prepare for potential environmental risks.

2020 Greenhouse Gas Reduction:

Supportive

2035 Greenhouse Gas Reduction:

Supportive

City Cost:

Medium-High

City Savings:

Unkown

Co-Benefits:

N/A

Existing Efforts in Support of A-2:

- None at this time.

Implementation Actions:

- A-2.1. Regularly train, inform, and solicit feedback from the City's Fire and Police departments on potential climate change risks and hazards.
- A-2.2. Revise City Hazard Mitigation Plans and other applicable documents such as long-range capital improvement plans to address climate change issues and best practices during required updates and as funding permits.
- A-2.3. Monitor climate change science and policy, and regularly inform stakeholders of new information.

Potential Implementation Resources and Partners:

Bay Conservation and Development Commission, ABAG, State Office of Emergency Services, Solano County

A-3. Adaptation Mainstreaming

Integrate potential climate change impacts into local planning documents and processes.

2020 Greenhouse Gas Reduction:

Supportive

2035 Greenhouse Gas Reduction:

Supportive

City Cost:

Low

City Savings:

None

Co-Benefits:

N/A

Similar to other potential hazards, climate change impacts can be incorporated into planning projects to identify at-risk areas, notify development of potential risks, or require a higher level of protection. The City of Vallejo is at the point where the plans and projects beginning in the next decade will be affected by BCDC's sea level rise prediction in 2050. This threat, in particular, should be addressed in waterfront developments.

Existing Efforts in Support of A-3:

- None at this time.

Implementation Actions:

- A-3.1. In development review, analyze and disclose possible impacts of climate change on the project or plan area, with an emphasis on sea level rise.
- A-3.2. Integrate climate change adaptation into future updates of the Zoning Code, Building Code, General Plan, and other related documents.

Potential Implementation Resources and Partners:

Bay Conservation and Development Commission, ABAG, State Office of Emergency Services, Solano County

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I. SUMMARY AND NEXT STEPS

Reducing GHG emissions 15% below baseline 2008 levels by 2020 will be a significant task. This chapter outlines a path for the City to monitor progress and summarizes the GHG reductions that will occur through the implementation of this Plan.

GHG Reduction Summary

This Plan outlines ways in which the City will be able to reduce GHG emissions 15% below baseline levels through changes in land use and travel behaviors, more efficient and cleaner energy use, and additional conservation of natural resources. Optimized travel and transportation demand management make up approximately 50% of all local GHG reductions, while energy and renewable energy make up an additional 32% of local GHG reductions. Water, wastewater, and solidwaste comprise an additional 12% of the GHG reductions, while improvements in City government operations and off-road equipment use make up the remaining GHG reductions (see **Figure 5-1** and **Table 5-1**).

The Vallejo Climate Action Plan (CAP) is a vision document that provides a menu of actions for the City to implement over the next several years in order to reduce greenhouse gas (GHG) emissions. These measures may be implemented In order to meet state reduction targets that will allow the CAP to be considered "qualified" for the purposes of streamlining environmental review.

The CAP creates a policy framework for future City actions that will result in a reduction of GHG emissions. Future actions may include adoption of ordinances and resolutions to change City Codes or development standards, approval of Capital Improvement Programs (CIPs) that include "green" construction or facilities, or budgeting actions that allocate resources to support implementation of reduction measures. In cases where future action is required by City Council, such actions will go through the standard local process for adoption.

As a vision document, the CAP is designed to afford the Council the greatest degree of possible latitude while still accomplishing City objectives. This latitude is necessary for Climate Action Plans, to allow for future integration of new technologies, State regulations, and regional programs that have not yet been developed. As a vision document, a number of the policies and actions identified in this document are not enforceable until that policy is brought back to council for implementation approval. Even where the CAP identifies "required" reduction measures, at the time the Council takes action to implement the measure, they have the flexibility to replace the measure with alternative reduction measures of equal benefit. Should the City elect not to implement any measure in the CAP,

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Staff would seek to identify additional measures or more aggressively implement other reduction measures in order to meet City and State reduction targets.

Because there is flexibility in implementation of reduction measures, monitoring is a critical component of CAP Implementation. As the City implements reduction measures, they may find that they are ahead of or trailing their reduction objectives. In instances where the City has fallen behind in their efforts to reduce GHG emissions, additional measures can be identified for implementation in order to preserve a "Qualified" CAP status and enjoy the benefits of streamlined environmental review.

Figure 5-1. 2020 GHG Emissions Reduction Summary by Goal

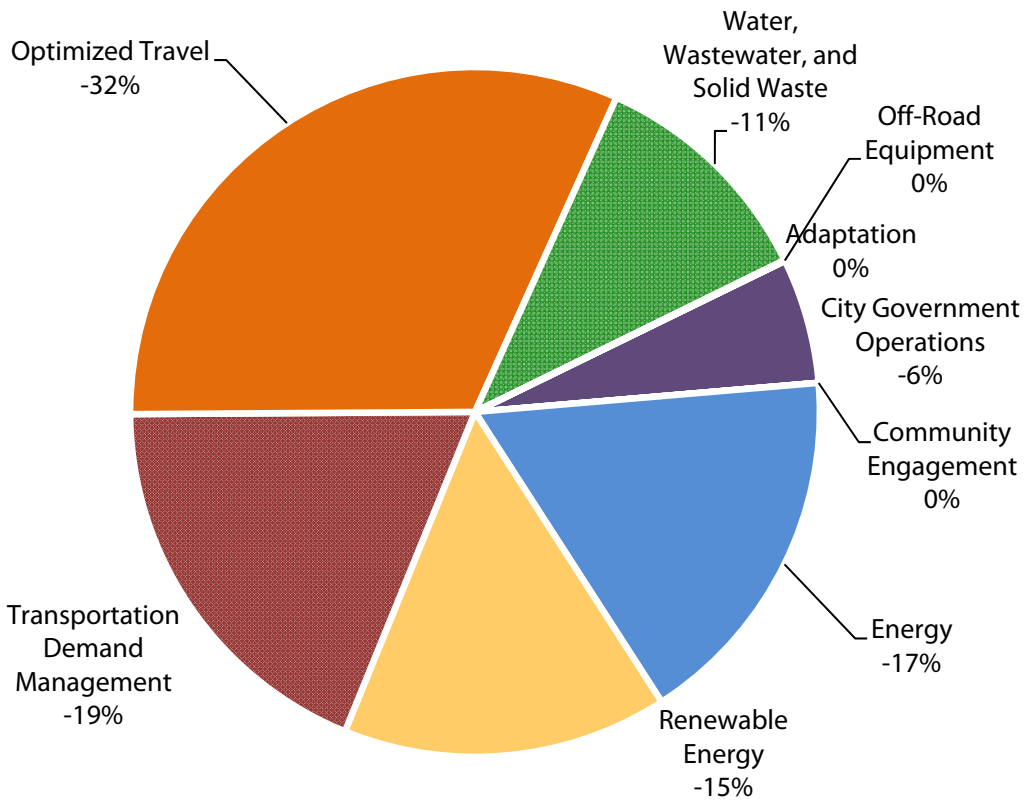
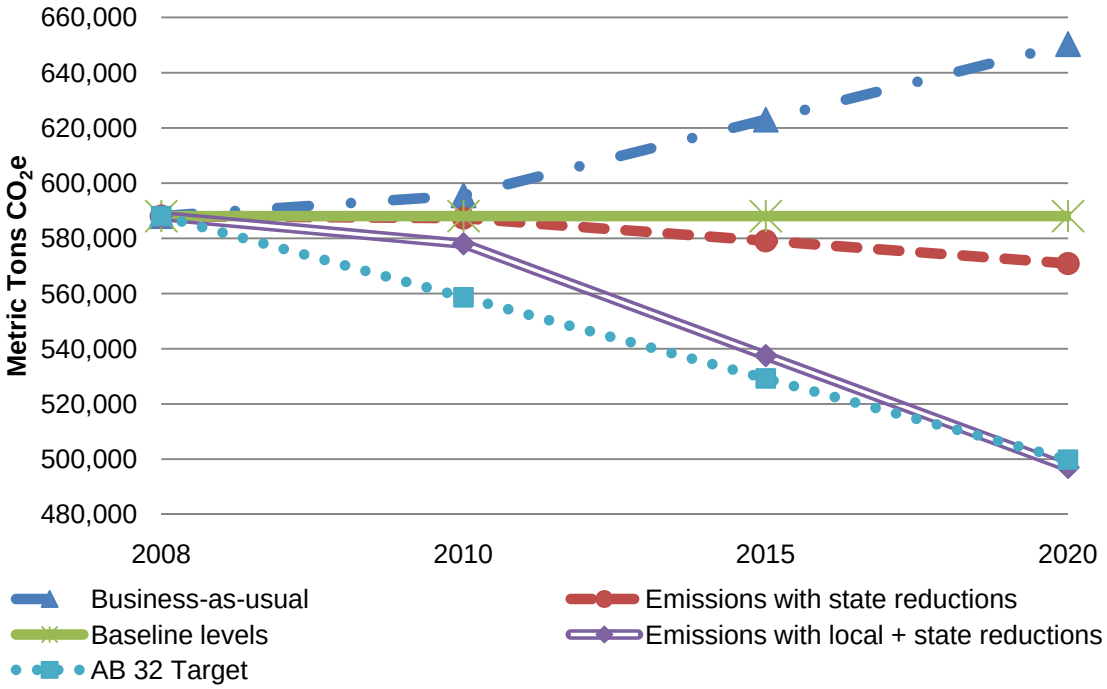


Table 5-1. 2020 and 2035 GHG Emission Reduction Summary by Goal

Sector	2010 GHG Reductions ($MTCO_2e/yr$)	2020 GHG Reductions ($MTCO_2e/yr$)	2025 GHG Reductions ($MTCO_2e/yr$)
City Government Operations (CG)	-40	-4,200	-8,090
Community Engagement (CE)	--	--	--
Energy (E)	-270	-26,020	-42,280
Renewable Energy (RE)	--	-32,380	-60,030
Transportation Demand Management (TDM)	-4,770	-13,400	-19,220
Optimized Travel (OT)	--	-19,920	-21,150
Water, Wastewater, and Solid Waste (W)	-3,070	-8,920	-15,140
Off-Road Equipment (OR)	--	-30	-50
Adaptation	--	--	--
Total Reductions	**-8,150**	**-104,870**	**-167,350**
Emissions Forecast	595,600	650,340	728,170
State Reductions	-8,290	-79,480	-143,540
Local Reductions	-8,150	-104,870	-167,350
Net Emissions	579,160	465,990	417,280
Percentage Change from 2008 Levels	-2%	-21%	-29%

A 15% reduction in GHG emissions by 2020 will align the City's GHG reductions with state GHG reduction goals and meet the requirements for a qualified GHG reduction strategy, as defined by the Bay Area Air Quality Management District (see **Figure 5-2**).

Figure 5-2. GHG Reduction Summary



Plan Implementation and Integration

To ensure the success of this Climate Action Plan, the City will integrate the goals and strategies of this Plan into other local and regional plans, programs, and activities. As the City moves forward with Zoning Code updates, specific plans, Housing Element updates, and other planning documents, staff will make sure that these documents support and are consistent with the CAP.

CAP implementation will also require City leadership to execute strategies and report on the progress of implementation. City staff will create a Green Team to coordinate GHG reduction efforts between departments and will designate staff to monitor and report on the progress of the CAP, as called for by measure CG-1. This Plan identifies the responsilbe department for each measure and offers time frames and cost estimates for implementing each strategy. Lastly, successful implementation requires regular reporting. Staff will monitor the CAP's implementation progress on a quarterly and annual basis, and report to the City Council on the CAP's progress each year.

Crucial to the implementation of this Plan will be **Table 5-1**, the City's implementation matrix. This matrix contains the GHG reduction, cost, savings, and co-benefit information

presented in Chapter 4 for the year 2020, as well as more detail for City staff to efffectively integrate these actions into their work plans. Additional information includes:

- **Implementation Time Frame:** The phase in which this measure should begin implementation. Time frames include:
  - Immediate – This Year
  - Near Term – Before 2015
  - Mid-Term – Before 2020
  - Long-Term – After 2020
- **Responsible Agency:** City department or division that will take the lead on implementing and reporting process on the selected measure. Other departments and divisions will likely play a major supporting role; however, this department/division is the leader.
- **Applicability:** Designates the type of development that the measure applies to. There are four options:
  - Municipal – Applies to municipal operations
  - New Development – Applies to new development applications only
  - Existing Development – Applies to existing development
  - New & Existing Development – Applies to new and existing development.
- **Performance Target:** Performance indicators and targets are readily available statistics that signify a reduction in GHG. For instance, the performance of the car-share measure is measured by the number of people registered for a car-share program in Vallejo. Performance targets allow the City to measure its progress without having to re-inventory GHG emissions.

The City will use the implementation matrix and a corresponding implementation tool to track, monitor, and update the Plan's implementation. 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 occuring. In the event that GHG reductions do not occur as expected, the City will be able to modify and add additional policies to the CAP to ensure the City meets the 2020 reduction target.

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Implementation Summary

	Policy Topic	Recommended Reduction Measure	Actions	2020 GHG Reductions ($MTCO_2e/yr$)	City Costs	City Savings	Implementation Time Frame	Responsible Agencies	Applicability	2020 Performance Indicator	CALGreen Standard
City Government Operations (CG) Establish the City of Vallejo as a leader in greenhouse gas management through efficiency improvements to City buildings, vehicles, operations, and water and waste facilities.											
CG-1	Green Team	Create a City Green Team, or other similar working group, to identify, prioritize, and implement greenhouse gas (GHG) reduction projects, including education.	• Form a multi-departmental Green Team to identify, prioritize, and implement GHG reduction projects for City operations such as commute programs, recycling efforts, and procurement policies consistent with the CAP. • Provide energy and GHG reduction training to existing staff.	Supporting Measure	None	N/A	Immediate	All City Departments	Municipal	N/A	N/A
CG-2	CAP Implementation	See to the timely implementation of CAP strategies by establishing an implementation and reporting infrastructure.	• Designate a City staff member of the Green Team to have lead responsibilities for implementing the Climate Action Plan. Duties of this position include coordination of the Green Team, preparation of annual CAP implementation priorities, and tracking City government and community-wide greenhouse gas emissions. • On an annual basis, report to the City Council on the City's progress toward CAP implementation and GHG reduction targets. • Identify and pursue grants to fund CAP implementation strategies.	Supporting Measure	Low-Mid	None	Near-Term	Community Development	Municipal	N/A	N/A
CG-3	Lighting	Retrofit City-owned or -operated lighting and related mechanical systems.	• Retrofit City streetlights, outdoor lighting, and traffic signals with high-efficiency lights such as light-emitting diode (LED) or induction lighting. • Rewire lighting circuits to allow for user control of task lighting, sensors, Building Management System (BMS) control, and day lighting modulated control. • Adjust the lighting schedule of street lighting and other exterior lighting to minimize the use of lighting at unnecessary or underutilized times.	-520	Medium-High	Medium-High	Near-Term	Public Works	Municipal	50% of streetlight fixtures replaced	N/A
CG-4	Renewable Energy	Continue to install renewable energy systems on City properties.	• Identify cost-effective renewable energy opportunities for additional City properties and apply for federal, state, and utility grant and funding opportunities when they become available.	-1,230	High	High	Mid-Term	Public Works	Municipal	Install an additional 2.75 MW of renewable energy	N/A

	Policy Topic	Recommended Reduction Measure	Actions	2020 GHG Reductions ($MTCO_2e/yr$)	City Costs	City Savings	Implementation Time Frame	Responsible Agencies	Applicability	2020 Performance Indicator	CALGreen Standard
CG-5	Building & Facility Efficiency	Reduce energy consumption from City facilities by at least 20% by 2035 through energy efficiency improvements.	• Create a City Government Energy Fund to reinvest annual cost savings from energy efficiency improvements for additional energy efficiency programs. • Complete energy and water audits of City facilities to identify building inefficiencies—and prioritize the implementation of cost-effective energy and water efficiency retrofits—with a payback of less than 10 years. • Emphasize water management and reclamation for schools, parks, golf courses, and manufacturing processes to reduce City energy use related to the pumping and treatment of water. • Schedule regular operating hours and restrict facility use in a manner that reduces inefficient use of buildings or rooms. • Explore the City's use of technical equipment and identify opportunities for low-power alternatives, such as tablet computers or networked copiers. • Optimize the City Data Center by identifying and implementing energy efficiency measures to City data centers, computer systems, and related equipment.	-940	Unknown	Medium-High	Mid-Term	Administration /VSFCD	Municipal	Reduce energy consumption in City and VSFCD facilities by 10% by 2020 and 20% by 2035.	N/A
CG-6	New Building & Facility Efficiency	Apply CALGreen Tier 1 energy efficiency standards to all new City facilities.	• Adopt a policy or ordinance to require new municipal facilities to meet CALGREEN Tier 1 standards. Tier 1 prerequisites include requirements to install cool roofs, provide preferential parking for low-emitting vehicles, exceed Title 24 requirements, reduce indoor potable water use and outdoor landscaping water use, and include recycled materials within new facilities. • Encourage Leadership in Energy and Environmental Design (LEED), CALGreen, or similar best practices for new buildings and facilities as well as remodels.	Unknown	Low	Low-Mid	Mid-Term/	Public Works Building Division	Municipal	All new buildings meet CALGreen Tier 1, as amended	Non-Residential Voluntary Measure, A5.203.1

	Policy Topic	Recommended Reduction Measure	Actions	2020 GHG Reductions ($MTCO_2e/yr$)	City Costs	City Savings	Implementation Time Frame	Responsible Agencies	Applicability	2020 Performance Indicator	CALGreen Standard
CG-7	Replacement Vehicles	Purchase fuel-efficient and alternatively fueled vehicles.	• Adopt a City policy to incrementally replace appropriate fleet vehicles and buses with more fuel-efficient and lower-carbon-emitting models per the standard turnover schedule. Alternative fuels and vehicles include liquefied petroleum gas (LPG), compressed natural gas (CNG), biodiesel, hybrid vehicles, and plug-in electric vehicles. • Use Global Positioning System (GPS) tools to map routes and path of travel to control fuel and wear and tear on vehicles. • Extend the replacement time on maintained vehicle pools. • Ensure that vehicle sizes are appropriate for the job performed.	-1,420	Medium	Medium	Mid-Term	Finance	Municipal	Increase the number of hybrid vehicles to 18; improve transit fleet MPG average to 6	N/A
CG-8	Employee Commute Alternatives	Provide information and incentives for City staff to carpool, use public transportation, walk, or bike to work.	• Designate an Employee Commute Alternatives Coordinator to implement and support trip reduction programs. • Promote carpooling by providing a website or message board for coordinating shared rides and designating a percentage of conveniently located parking spaces for carpooling vehicles. • Enact a guaranteed ride home program for employees who carpool, take public transit, or use other alternative modes of transportation. • Provide recognition awards to City departments and employees with high carpooling, transit, biking, and walking to work participation rates. • For external meetings, select a centrally located site to meet. • Make provisions for secure and safe bike storage at City facilities.	-90	Low	None	Near-Term	Human Resources	Municipal	Reduce employee commute VMT by 5.2%	N/A

	Policy Topic	Recommended Reduction Measure	Actions	2020 GHG Reductions ($MTCO_2e/yr$)	City Costs	City Savings	Implementation Time Frame	Responsible Agencies	Applicability	2020 Performance Indicator	CALGreen Standard
Community Engagement (CE) Educate residents, businesses, and students about greenhouse gas emissions, the City's sustainability efforts, and ways in which they can be more sustainable.											
CE-1	Student Outreach	Engage students in the City's GHG reduction efforts through outreach to K–12 schools and colleges.	• Create a collaboration between the City Green Team and Vallejo schools to: a. Inform students about climate change, water conservation, and recycling and ways to reduce GHG emissions. b. Sponsor competitions and contests with prizes for promoting climate protection and reducing GHG emissions. c. Partner with professional associations to develop strategies to reduce GHG emissions at the local level.	Supporting Measure	Low	None	Near-Term	Green Team	Other	Number of climate-related school events or visits	N/A
CE-2	Community Outreach	Engage the general community in the City's GHG reduction efforts through print, online, and in-person outreach mechanisms.	• Educate and inform residents and businesses about CAP implementation strategies and ways in which they can support the City's GHG reduction goals through changes to their behavior or environment. • Identify a primary location in Vallejo for deposit and distribution of information regarding GHG management. • Cooperate with the schools, business community, and community groups to develop an online one-stop shop for GHG information and resources. • Educate stakeholders on effectiveness of "value added banking strategies" to assure the ability to sustain efficient activities. • Use the City newsletter to communicate and raise awareness of sustainable practices, with an emphasis on illustrating cost savings and benefits to all consumers.	Supporting Measure	Low	None	Near-Term	Green Team	Other	Number of community outreach events	N/A

	Policy Topic	Recommended Reduction Measure	Actions	2020 GHG Reductions ($MTCO_2e/yr$)	City Costs	City Savings	Implementation Time Frame	Responsible Agencies	Applicability	2020 Performance Indicator	CALGreen Standard
Energy (E) Reduce energy demand through energy efficiency improvements and conservation.											
E-1	Building Stock: Existing	Facilitate energy efficiency upgrades and retrofits in existing commercial, residential, and industrial buildings by connecting residents and businesses with technical and financial assistance.	• Connect businesses and residents with voluntary programs that provide free or low-cost energy efficiency audits and retrofit installations. • Develop an outreach program to encourage participation in low-income weatherization programs. • Work collaboratively with Solano County, other municipalities in the region, and the Association of Bay Area Governments (ABAG), and participate in regional energy efficiency financing programs such as low-interest revolving loan funds, the California Comprehensive Residential Building Retrofit Program, or a Property Assessed Clean Energy (PACE) program that enables Vallejo property owners to obtain low-interest financing for energy improvements. • Consider creating a Residential Energy Conservation Ordinance (RECO) and Commercial Energy Conservation Ordinance (CECO) to require point-of-sale energy audits and retrofits for all buildings that do not meet minimum energy efficiency standards.	-22,840	Medium	Low	Near-Term	Community Development	Existing Development	650 low-income homes weatherized; 3,300 homes participating in a PACE program	N/A
E-2	Building Standards	Require all new development to meet the minimum California Title 24 and California Green Building Standards Code requirements, as amended, and encourage new development ,remodels and improvements to exceed the minimum requirements; .	• Adopt the California Title 24 minimum requirements and encourage new construction and major remodels to adhere to a Tier 1 or Tier 2 standard of the CALGreen Code. • Require newly constructed buildings, and recommend that remodels over 50%, and tenant improvements demonstrate compliance with the mandatory CALGreen Code requirements by completing a green building checklist when submitting a request for building permits. • Consider requiring new development to comply with the Tier 1 requirements of CALGreen, Part 11 of the California Building Standards Code. This optional measure may be necessary to address any shortfall in attaining reduction objectives.	0	Low	N/A	Near-Term	Community Development	New Development	Encourage new buildings meet CALGreen Tier 1 standards, as amended	

	Policy Topic	Recommended Reduction Measure	Actions	2020 GHG Reductions ($MTCO_2e/yr$)	City Costs	City Savings	Implementation Time Frame	Responsible Agencies	Applicability	2020 Performance Indicator	CALGreen Standard
E-3	Smart Meters	Increase the community's awareness and utilization of real-time energy consumption data available through PG&E's SmartMeter program.	• Support PG&E's installation of SmartMeters on commercial and residential properties by informing the community of the GHG and energy cost-saving potential of the devices. • Encourage newly constructed buildings and recommend that major remodels, over 50%, s install indoor real-time energy monitors. • Inform the community of metering options, such as online applications and in-home monitors. • Connect businesses and residents with rebate programs that give priority to appliances with smart grid technology.	-2,960	None	N/A	Near-Term	Development Services	New & Existing Development	60% of homes and 50% of businesses with energy monitors	N/A
E-4	Cool Roofs and Pavements	Increase tree planting and the use of cool roofs and cool pavement materials to reduce the urban heat island effect and corresponding energy consumption. Implement tree replacement policy for projects where tree removal is necessary.	• Actively inspect and enforce state requirements for cool roofs on residential and nonresidential roofing projects. Require new buildings to meet Title 24 and recommend that new buildings meet CALGreen Tier 1 requirements for cool roofs, which require a minimum solar reflectance index (SRI) of 10 for steep slope roofs and 64 for low slope roofs. • Establish standards for new development and major remodels (to be defined) to reduce exterior heat gain for 50% of non-roof impervious site surfaces (roads, sidewalks, courtyards, parking lots, driveways) through one or more of the following mechanisms: ▪ Achieve 50% paved surface shading within five to ten years by planting trees and other vegetation and/or installing solar panels or shading structures above parking. ▪ Use paving materials with an SRI of at least 29 for all surfaces. • Maintain and expand Vallejo's urban forest, including street trees and trees on private property. • For public improvements and public projects, require the use of high albedo paving material for sidewalks, roads, crosswalks, parking lots, and driveways	-220	Low	None	Long-Term	Community Development	New & Existing Development	All new paved surfaces meeting an SRI of 29 or higher	Residential Mandatory Measure, 4.201.1 and Non-residential Mandatory Measure, 5.201.1

	Policy Topic	Recommended Reduction Measure	Actions	2020 GHG Reductions ($MTCO_2e/yr$)	City Costs	City Savings	Implementation Time Frame	Responsible Agencies	Applicability	2020 Performance Indicator	CALGreen Standard
Renewable Energy (RE) Facilitate the installation and use of small-scale renewable energy systems.											
RE-1	Renewable Energy Installations	Support the installation of small-scale renewable energy systems including solar photovoltaic, solar thermal, and wind, river current, and tidal energy conversion systems.	• Update the Zoning Code to define a renewable energy strategy that removes barriers to small-scale solar energy systems. • Revise the permit processes and fees as appropriate to remove barriers to and incentivize the installation of renewable energy systems in accordance with applicable safety and environmental standards. • Provide training to at least one designated Planning and one Building staff member to enable knowledgeable and expeditious processing of renewable energy applications. • Encourage new homes and businesses to be pre-wired and pre-plumbed for solar and solar thermal installations. • Evaluate site-specific opportunities and constraints related to Vallejo's proximity to the San Francisco Bay and to rivers, channels, and lakes, both man-made and natural.	Supporting Measure	Unknown	Unknown	Near-Term	Community Development	New & Existing Development	Percent of new buildings pre-wired for solar installations	N/A
RE-2	Renewable Energy Financing	Connect residents and businesses with renewable energy incentives and low-interest financing mechanisms.	• Participate in a regional financing program such as the Property Assessed Clean Energy (PACE) program or equivalent that achieves similar results to provide low-interest financing for renewable energy installations. • Designate a City staff person to coordinate local inquiries regarding the regional financing program. • Train Planning and Building staff members on available state, regional, and utility-led financing mechanisms and incentives/rebates. • Collaborate with neighboring jurisdictions and Solano County to explore the feasibility and cost of a community choice aggregation program. • Set a renewable power generation goal for the City to increase community-wide energy generation. • Work with Solano County to identify the benefits and costs of a community choice aggregation	-32,380	Low-Mid	Low	Mid-Term	Community Development	New & Existing Development	25 MW of renewable energy installed	N/A

	Policy Topic	Recommended Reduction Measure	Actions	2020 GHG Reductions ($MTCO_2e/yr$)	City Costs	City Savings	Implementation Time Frame	Responsible Agencies	Applicability	2020 Performance Indicator	CALGreen Standard
			program and establish a stakeholder advisory group.								
Transportation Demand Management (TDM) Reduce and consolidate the number of single-occupancy vehicle trips to and from Vallejo by providing attractive alternatives and by requiring co-beneficial land use decisions.											
TDM-1	Local Businesses	Promote buy local and related initiatives that support local commerce and reduce the need for extensive transport.	• Support efforts that encourage people who live, work, or have businesses in Vallejo to buy local goods, food supplies, and services. • Implement the elements of the Downtown Specific Plan that encourage the promotion of economic revitalization of the Downtown Commercial Area to create local options for commerce. • Enact new or participate in existing award programs that recognize local employers who provide outstanding contributions to the quality of life in the community, including "green businesses.". • Promote cooperative benefits organizations to enable individual merchants to achieve benefits of scale and innovation to reduce energy consumption, establish recycling programs, and reduce water use. • Support strategies to increase local business-to-business commerce.	-2,470	Low	Unknown	Ongoing	Economic Development	Other	5.6% reduction in shopping-related VMT	N/A
TDM-2	Mixed-Use, Higher-Density, Transit-Oriented Development	Promote mixed-use, higher-density development near transit nodes.	• Continue to maintain the Downtown Commercial Area as a strong focal point to attract higher-density housing, business, and office use. • Provide a high-quality and relatively high-density Downtown multi-family residential environment connected by selected transit-oriented priority areas and other transit corridors. • Adopt incentives such as priority processing and revise codes to increase densities in the Downtown or within one-half mile of a regularly scheduled transit stop. • Implement elements in the Downtown Specific Plan that encourage pedestrian-oriented plazas, walkways, bike trails, bike lanes, and street furniture and connections to other community areas. Promote pedestrian convenience and recreational opportunities through development	-4,270	Unknown	None	Long-Term	Community Development	New Development	50% of specific plans implemented	N/A

	Policy Topic	Recommended Reduction Measure	Actions	2020 GHG Reductions ($MTCO_2e/yr$)	City Costs	City Savings	Implementation Time Frame	Responsible Agencies	Applicability	2020 Performance Indicator	CALGreen Standard
			conditions requiring sidewalks, walking paths, or hiking trails connecting various land uses and including safety amenities such as lighting and signage. • Implement elements in the Downtown Specific Plan that promote mixed-use development and provide commercial services such as day care, restaurants, banks, and stores near to employment centers, where feasible. • Support "complete streets" by incorporating applicable public transit, bicycle and pedestrian rights-of-way, and facilities for Vallejo community members when evaluating future expansion and new development of streets and highways.								
TDM-3	Bicycle and Pedestrian Travel	Expand and link the network of pedestrian and bicycle paths and facilities through preparation of a Bicycle and Pedestrian Master Plan, with the goal of increasing the bicycle and pedestrian mode share 20% by 2035.	• Create a city-wide Bicycle and Pedestrian Master Plan to analyze existing and future pedestrian and bicycle infrastructure and facilities and to qualify for state and federal funding for bicycle- and pedestrian-related infrastructure. • Pursue public and private funding to expand and link the network of pedestrian and bicycle paths and facilities beginning in selected, transit-oriented priority areas. • Revise zoning standards to require the provision of bicycle support facilities (lockers, shower rooms, etc.) for appropriate development at a rate of 1 changing room and shower per 200 occupants.	-630	Medium-High	None	Long-Term	Community Development/ Public Works	Other	19 miles of new bike lanes installed	
TDM-4	Parking	Revise parking requirements for new commercial and multi-family residential projects and implement the Downtown Parking Meter Installation Plan.	• Revise parking requirements for new commercial and multi-family residential projects to provide bike racks for 5% of the building's projected visitors within 200 feet of the building's entrance for commercial projects and one long-term bicycle storage space per two multi-family units. • Allow up to a 15% reduction in required private vehicle parking spaces in new commercial and multi-family residential projects if justified in an approved trip reduction plan. • Encourage shared parking programs in mixed-use and transit-oriented development areas. • Design parking lots, where feasible, to include	-910	Low	Medium-High	Long-Term	Community Development	New & Existing Development	15% average reduction in parking provisions	Non-Residential Mandatory Measure, 5.106.4

	Policy Topic	Recommended Reduction Measure	Actions	2020 GHG Reductions ($MTCO_2e/yr$)	City Costs	City Savings	Implementation Time Frame	Responsible Agencies	Applicability	2020 Performance Indicator	CALGreen Standard
			clearly marked and shaded pedestrian pathways between transit facilities and building entrances.								
TDM-5	Transit	Support a convenient, attractive, and comprehensive transit system.	• Prioritize and pursue transit improvements that serve local businesses and job sites. • Encourage major employers to provide free or discounted transit passes or other incentives to employees for using transit. • On Mare Island, create a network of bicycle and pedestrian paths that connect with transit services, combined with a street framework that is transit-friendly and sensitive to Mare Island's historic character.	-1,100	Low-Mid	Low	Long-Term	Vallejo Transit	Municipal	Annual ridership counts	N/A
TDM-6	Food Systems	Support convenient access to neighborhood-serving grocery stores and community gardens.	• Encourage the distribution of grocery stores that provide fresh and local foods with convenient access from all residential neighborhoods. • Improve the distribution, frequency, and attendance of farmers markets in Vallejo. • Collaborate with community-based organizations in support of community gardens on applicable sites throughout the city. • Revise zoning standards as necessary to allow small neighborhood markets in appropriate areas.	Supporting Measure	None	None	Long-Term	Community Development	Other	Percentage of residents within 1/2 mile of grocery store	N/A
TDM-7	Commute Behavior	Reduce emissions from commute travel to and from schools and workplaces.	• Encourage a variety of transportation system demand management techniques for new development, including variable work hours and telecommuting. • Support the establishment and participation in Safe Routes to Schools and similar infrastructure and educational programs that enable safe passage of children and reduce vehicle trips to local schools. • Collaborate with the Solano Transportation Authority (STA) and Solano County to update the rideshare matching system to include the use of social networking and smart phone platforms and encourage greater use of existing park-and-ride lots. • Collaborate with STA and local employers to support guaranteed ride home programs including preferential parking spaces, employer-assisted ride-matching databases, recognition programs, and other incentives. • Participate in and contribute to regional	-2,050	Low	None	Ongoing	Community Development/ Public Works	Other	Participation rates in SRTS and rideshare programs	N/A

	Policy Topic	Recommended Reduction Measure	Actions	2020 GHG Reductions ($MTCO_2e/yr$)	City Costs	City Savings	Implementation Time Frame	Responsible Agencies	Applicability	2020 Performance Indicator	CALGreen Standard
			programs to address Bay Area commute alternatives and commute efficiency.								
TDM-8	Jobs/Housing Balance	Plan for an improved jobs/housing balance in order to reduce the need for long-distance travel from residences to places of work.	• Update the City General Plan and corresponding regulations to support additional jobs and economic revitalization that improves Vallejo's jobs/housing balance. • Support the retention and expansion of local anchor and growth industries including Kaiser and Sutter hospitals, as well as Touro University on Mare Island and the California Maritime Academy. • Review land-use plans and regulations and revise as needed to support additional live/work opportunities and home occupations, provided they are compatible with the existing neighborhood.	-1,820	None	None	Long-Term	Community Development	New Development	Jobs to housing ratio; number of affordable housing units	N/A
Optimized Travel (OT) Optimize necessary vehicular travel to the greatest extent possible through alternative vehicles and fuels and efficient vehicle maintenance and use.											
OT-1	Efficient and Alternative Fuel Vehicles	Support the expanded use of efficient and alternative fuel vehicles.	• Support continued use of high-occupancy vehicle (HOV) lanes by fuel-efficient and alternative fuel vehicles designated as zero or partial zero emission vehicles (ZEV or PZEV) by the California Air Resources Board through adoption of Climate Action Plan policies and participation on Metropolitan Transportation Commission and other regional agency committees. • Revise parking requirements for public and newly constructed commercial developments to include designated stalls for low-emitting, fuel-efficient vehicles and carpool/vanpool vehicles for a minimum of 8% of total parking capacity and to pre-wire stalls for future electric vehicle charging stations for 2% of total parking capacity. • Encourage new gas stations and automotive uses to include biodiesel facilities and/or offer biodiesel retrofits to diesel vehicles. • Consider creating refueling stations to provide biodiesel fuel, compressed natural gas, or	-17,090	Low-Mid	None	Mid-Term	Community Development	New & Existing Development	Number of clean vehicle parking stalls; hybrid vehicle sales; annual bridge crossings	Non-Residential Mandatory Measure, 5.106.5.2

	Policy Topic	Recommended Reduction Measure	Actions	2020 GHG Reductions ($MTCO_2e/yr$)	City Costs	City Savings	Implementation Time Frame	Responsible Agencies	Applicability	2020 Performance Indicator	CALGreen Standard
			liquefied natural gas.								
OT-2	Car Sharing	Facilitate a car-sharing network in Vallejo.	• Facilitate and encourage at least one car-sharing company, such as Zip Car and City Car Share, to include Vallejo in its service area by 2020. • Investigate the possibility of reducing the City's vehicle fleet by using car-sharing vehicles for appropriate City uses by 2020.	-740	Low	None	Near-Term	Development Services	New & Existing Development	1% of population participating in car-sharing program	N/A
OT-3	Anti-Idling and Traffic Calming	Support anti-idling and traffic calming infrastructure and enforcement.	• Synchronize, improve, and construct traffic signal/road improvements that reduce vehicle idling. • Work with the Vallejo Police Department to increase enforcement of state idling restrictions for heavy-duty vehicles. • Encourage local schools to implement an anti-idling campaign at pick-up and drop-off areas.	-2,010	Medium	None	Long-Term	Public Works/Police	New & Existing Development	10% decrease in trip time due to synchronization	N/A
OT-4	Zero Emission Vehicle Stations	Provide electric vehicle charging stations.	• Install additional electric vehicle charging stations at City Hall and other appropriate municipal parking lots for public use. • Coordinate with regional agencies to install charging stations in high traffic areas through grant-funded programs encouraging electric vehicle use. • Use small- and large-scale solar panels to power or supplement charging stations.	-80	Low	None	Mid-Term	Public Works	Municipal	100 charging stations installed	N/A
Water, Wastewater, and Solid Waste (W) Conserve water, reduce water-related energy use, and reduce the amount of solid waste sent to landfills from Vallejo.											
W-1	Water Conservation Efforts	Promote and require water conservation through outreach and pricing.	• Continue to provide water customers with information on conservation techniques, services, devices, and rebates by posting information at vallejowater.org or through other outreach methods. • Continue to enforce the City's Wasteful Water Use Prohibition Ordinance.	-490	Medium	Medium	Mid-Term	Finance	New & Existing Development	8% reduction in water use	N/A

	Policy Topic	Recommended Reduction Measure	Actions	2020 GHG Reductions ($MTCO_2e/yr$)	City Costs	City Savings	Implementation Time Frame	Responsible Agencies	Applicability	2020 Performance Indicator	CALGreen Standard
W-2	Development Standards for Water Conservation	Require water conservation in all new buildings and landscapes.	• Per the minimum requirements of the 2010 CALGreen Code, ensure that all new non-residential buildings larger than 50,000 square feet install individual water meters for each tenant space projected to consume more than 100 gallons per day. • Per the minimum requirements of the 2010 CALGreen Code, ensure that all new non-residential facilities with 1,000 to 5,000 square feet of irrigated landscaped space provide an additional water meter or sub-meter for landscaping uses. • Revise development standards to support the use of greywater, recycled water, and rainwater catchment systems in all zones. • Per the voluntary requirements of the 2010 CALGreen Code, encourage newly constructed development to treat at least 40% of the average annual rainfall on-site through low impact development strategies. • Per the minimum requirements of the 2010 CALGreen Code, require a minimum of 20% of the total parking, walkway, and porch area surfaces serving single-family and multi-family residential buildings under 4 units to be permeable to facilitate on-site retention of water and reduce water run-off.	-40	Low	Medium	Near-Term	Community Development	New Development	20% reduction in indoor water use	Non-Residential Mandatory Measures, 5.304.1, 5.304.2
W-3	Recycling and Compost Efforts	Support waste diversion through composting and recycling programs.	• Collaborate with CalRecycle and VALCORE Community Recycling to continue to host recycling and composting workshops and to disseminate information. • Provide links to information on composting and VALCORE composting services and classes on the City's website and at other appropriate venues. • Prepare a list of GHG-reducing best practices for material management to be considered during the solid waste franchise selection process and applicable City permit processes for major development projects.	-8,390	Low-Mid	Low	Mid-Term	Public Works	New & Existing Development	75% diversion rate	N/A

	Policy Topic	Recommended Reduction Measure	Actions	2020 GHG Reductions ($MTCO_2e/yr$)	City Costs	City Savings	Implementation Time Frame	Responsible Agencies	Applicability	2020 Performance Indicator	CALGreen Standard
W-4	Development Standards for Recycling and Composting	Require waste diversion and the use of recycled materials in new development.	• Continue to update the City's Construction/Demolition Waste Reuse and Recycling Ordinance as higher diversion rates become feasible, necessary, or required. • Support the development of additional markets for recycled content products by requiring new developments to include recycled content materials at a minimum of 10% of total materials.	Supporting Measure	Low	None	Near-Term	Community Development	New Development	50% construction and demolition diversion rate	
Off-Road Equipment (OR) Reduce GHG emissions from off-road equipment use in Vallejo.											
OR-1	Lawn & Garden Equipment	Encourage the use of electrified and higher-efficiency lawn and garden equipment.	• Support BAAQMD's efforts to re-establish a voluntary exchange program for residential lawnmowers and backpack-style leaf blowers. • Require new buildings to provide electrical outlets on the exterior in an accessible location to charge electric-powered lawn and garden equipment. • Encourage the replacement of high-maintenance landscapes (like grass turf) with native vegetation to reduce the need for gas-powered lawn and garden equipment.	-30	None	None	Near-Term	Community Development	New & Existing Development	Replace 25% of gas leaf blowers; replace 15% of gas lawnmowers	N/A

	Policy Topic	Recommended Reduction Measure	Actions	2020 GHG Reductions ($MTCO_2e/yr$)	City Costs	City Savings	Implementation Time Frame	Responsible Agencies	Applicability	2020 Performance Indicator	CALGreen Standard
OR-2	Construction Equipment	Reduce emissions from heavy-duty construction equipment by limiting idling and utilizing cleaner fuels, equipment, and vehicles.	• Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]), or less. Clear signage will be provided at all access points to remind construction workers of idling restrictions. • Construction equipment must be maintained per manufacturer's specifications. • Planning and Building staff will work with project applicants to limit GHG emissions from construction equipment by selecting one of the following measures, at a minimum, as appropriate to the construction project: a. Substitute electrified equipment for diesel- and gasoline-powered equipment where practical. b. Use alternatively fueled construction equipment on-site, where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel. c. Avoid the use on on-site generators by connecting to grid electricity or utilizing solar-powered equipment. d. Limit heavy-duty equipment idling time to a period of 3 minutes or less, exceeding CARB regulation minimum requirements of 5 minutes.	Supporting Measure	Low-Mid	None	Near-Term	Community Development	New Development	Percentage of construction projects using alternative fuel equipment	N/A
Adaptation (A) Improve Vallejo's resiliency to possible climate change effects through adaptation and preparation.											
A-1	Regional Coordination	Participate in regional efforts to analyze and prepare for the impacts of climate change in the Bay Area.	• Join regional adaptation and resiliency task forces such as that of the San Francisco Bay Area Conservation and Development Commission (BCDC) and the Joint Policy Committee (JPC). • Appoint a staff liaison to attend and participate in regional meetings focusing on adaptation and resilience and to report to staff on a regular basis.	Supporting Measure	Low	None	Near-Term	Community Development	Other	N/A	N/A

	Policy Topic	Recommended Reduction Measure	Actions	2020 GHG Reductions ($MTCO_2e/yr$)	City Costs	City Savings	Implementation Time Frame	Responsible Agencies	Applicability	2020 Performance Indicator	CALGreen Standard
A-2	Preparedness	Ensure that Vallejo is prepared for potential environmental risks and hazards related to climate change, with a special emphasis on vulnerable populations.	• Regularly train, inform, and solicit feedback from the City's Fire and Police departments on potential climate change risks and hazards. • Revise City Hazard Mitigation Plans and other applicable documents such as long-range capital improvement plans to address climate change issues and best practices during required updates and as funding permits. • Monitor climate change science and policy and regularly inform stakeholders of new information.	Supporting Measure	Medium-High	Unknown	Long-Term	All Departments	Municipal	N/A	N/A
A-3	Adaptation Mainstreaming	Integrate potential climate change impacts into local planning documents and processes.	• In development review, analyze and disclose possible impacts of climate change on the project or plan area, with an emphasis on sea level rise. • Integrate climate change adaptation into future updates of the Zoning Code, Building Code, General Plan, and other related documents.	Supporting Measure	Low	None	Mid-Term	Development Services	Municipal	N/A	N/A

Appendix A

City of Vallejo Climate Action Plan

Baseline Greenhouse Gas Emissions Inventory

The detailed methodology for government operations is much less complex than the community-wide methodology explanation. The government operations GHG emissions inventory is a facility-scale study so data records are more reliable and consistent than community-wide information. The Local Government Operations Protocol (LGOP) also provides us a verified guide for calculating emissions in each sector.

FACILITIES

The building sector includes all emissions from natural gas and electricity consumed in City-owned and -operated facilities, as well as facilities associated with the Vallejo Sanitation and Flood Control District (VSFCD). PG&E electricity and natural gas usage for City of Vallejo facilities was provided by John Joseph, PG&E (ghgdatarequests@pge.com). Island Energy electricity and natural gas usage for City facilities on Mare Island was provided by Linda Anderson, Administrative Assistant, Pittsburg Power (landerson@ci.pittsburg.ca.us; 707-562-5000). Electricity, natural gas, and stationary diesel use for facilities associated with VSFCD were provided by Rolf Ohlemutz, VSFCD (rohlemutz@vsfcd.com; 707-644-8949). Facility activity data is summarized in **Table 1.**

Table 1: 2008 Facility Activity Data

Agency	Energy Supplier	Activity Type	Activity Data
City of Vallejo	PG&E	Electricity (kWh)	5,328,000
	PG&E	Natural Gas (Therms)	73,256
	Island Energy	Electricity (kWh)	4,285,230
	Island Energy	Natural Gas (Therms)	62,139
VSFCD	PG&E	Electricity (kWh)	8,299,410
	PG&E	Natural Gas (Therms)	670,085
	---	Stationary Diesel (Gal)	3,200

The kilowatt-hours (kWh) of electricity, therms of natural gas, and gallons of stationary diesel were then multiplied by their respective emissions factors (see **Table 2**) and converted to CO_2e.

Table 2: Energy Coefficients

Source	Activity Type	Emissions Coefficient ($MTCO_2e$ per unit of activity)
PG&E	Electricity	0.00022356
	Natural Gas	0.00530709
Island Energy	Electricity	0.00043700
	Natural Gas	0.00530709
LGOP V1.1	Stationary Diesel	0.01024850

VEHICLE AND EQUIPMENT FLEET

The vehicle fleet sector includes gasoline and diesel use from vehicles and equipment for all City departments, including the transit and ferry fleets. Gasoline and diesel consumption, as well as vehicle miles traveled (VMT) for each vehicle in 2008, was obtained from fuel usage reports provided by Mark Fowler, Equipment Supervisor (mfowler@ci.vallejo.ca.us; 707-646-4334). Vehicle fleet consumption information is summarized in **Table 3**.

Table 3: Vehicle Fleet Summary

Fuel Type	Vehicle Type	Number of Vehicles	Fuel Consumed	VMT
Diesel	Light-Duty Truck	17	7,096	37,501
	Heavy-Duty Vehicle	24	19,082	44,830
	Transit Fleet	60	481,386	2,046,678
	Ferry Fleet	4	1,415,040	216,126
	Equipment	21	4,099	n/a
Gasoline	Passenger Vehicle	92	76,917	828,517
	Light-Duty Truck	139	62,258	724,754
	Heavy-Duty Vehicle	1	27	–
	Para-Transit Vans	12	22,979	146,694
	Equipment	8	509	n/a

Emission factors for each vehicle were determined using VMT, fuel consumption data, and vehicle model year data. Emissions coefficients for each vehicle and equipment type are found in the Local Government Operations Protocol Version 1.1 and summarized in **Table 4.**

Table 4: Vehicle Fleet Coefficients

Fuel Type	Vehicle Type	Model Year	CO_2 (MT/gal)	N_20 ($MTCO_2e$/mile)[1]	CH_4 ($MTCO_2e$/mile)[2]
Diesel	Light-Duty Truck	All Model Years	0.01021	0.000000310	0.000000032
	Heavy-Duty Vehicle	All Model Years	0.01021	0.000001488	0.000000107
	Transit Fleet	All Model Years	0.01021	0.000001488	0.000000021
	Ferry Fleet	All Model Years	0.01021	0.000080600	0.00001554
	Equipment	All Model Years	0.01021	0.000080600	0.00001218
Gasoline	Passenger Vehicle	1996	0.00878	0.000013206	0.00000057
		1999	0.00878	0.000010447	0.00000045
		2000	0.00878	0.000008463	0.00000037
		2001	0.00878	0.000004898	0.00000023
		2002	0.00878	0.000004743	0.00000022
		2003	0.00878	0.000004185	0.00000024
		2004	0.00878	0.000002573	0.00000030
		2005	0.00878	0.000002449	0.00000031
		2006	0.00878	0.000001767	0.00000034
		2007	0.00878	0.000001271	0.00000036
		2008	0.00878	0.000001178	0.00000036
	Light-Duty Truck	1988–1993	0.00878	0.000032085	0.00000171
		1994	0.00878	0.000030442	0.00000136
		1995	0.00878	0.000028148	0.00000109
		1996–1997	0.00878	0.000027001	0.00000095
		1998	0.00878	0.000022568	0.00000082
		1999	0.00878	0.000017484	0.00000067

[1] N_2O emissions for equipment is in $MTCO_2e$/gallon

[2] CH_4 emissions for equipment is in $MTCO_2e$/gallon

Fuel Type	Vehicle Type	Model Year	CO_2 (MT/gal)	N_20 ($MTCO_2e$/mile)[1]	CH_4 ($MTCO_2e$/mile)[2]
		2000	0.00878	0.000019251	0.00000073
		2001	0.00878	0.000005084	0.00000032
		2002	0.00878	0.000007068	0.00000037
		2003	0.00878	0.000004464	0.00000033
		2004	0.00878	0.000004092	0.00000032
		2006	0.00878	0.000002759	0.00000033
		2007	0.00878	0.000002449	0.00000034
		2008	0.00878	0.000002046	0.00000034
	Heavy-Duty Vehicle	1990	0.00878	0.000035402	0.00000682
	Para-Transit Vans	All Model Years	0.00878	0.00003844	3.255E-07
	Equipment	All Model Years	0.00878	0.0000682	0.0000105

EMPLOYEE COMMUTE

Employees were surveyed in October 2010 using an online survey instrument. The questions, attached as **Appendix C**, asked employees about their current commuting patterns. Of those questions, we used the following for our analysis:

- What is your approximate one-way distance to work (in miles)? Please indicate the most direct distance to work, discounting midway destinations that would be taken whether or not you drove to work each day (i.e., dropping off children at school).

- Please indicate the type of transportation you take to work each day in your average two-week work period. Respondents were asked to provide daily commute behavior for a period of two weeks to account for alternative work schedules (9/80, 4/10) and police/fire non-traditional work weeks.

  - Drive alone
  - Carpool with fellow City employees
  - Carpool with drivers not employed by the City
  - Vanpool
  - Public transit

  - Motorcycle
  - Bicycle
  - Walk
  - Telecommute
  - Other

- What type of vehicle do you drive?
- What type of fuel does your vehicle use?
- If you carpool with fellow City employees, how many City employees ride with you? If you carpool with a different number each day, please indicate the average.

Approximately 153 employees responded to the survey with usable information, meaning that all essential questions were answered. Answers with mileage left blank or with highly inconsistent data were omitted. In addition, if a respondent did not describe their "other" category of transportation, the entry was omitted.

To perform this analysis, entries were separated by what type of vehicle they own and operate (compact, mid-size car, full-size car, small truck, medium-small truck, large truck, motorcycle, or "don't drive"). Within each new group, entries were separated by diesel or gasoline fuel. For each group of entries with the same vehicle type and technology, round-trip mileage per year was calculated. To convert vehicle miles traveled into emissions, the average fuel economy for each vehicle class and fuel class, as provided by LGOP v 1.1 (see **Table 6**), was used to convert CO_2 emissions from kilograms per gallon to grams per mile. Hybrid vehicles were separated from gasoline-fueled vehicles to account for their higher average fuel efficiency.

In 2008, there were a total of 555 employees. For each employee, workday mileage for two weeks was multiplied by an average of 26.09 for a total of 52.18 work weeks/year. The 2008 sample results, adjusted for the 2008 employee population, are shown in **Table 5**.

Table 5: 2010 Employee Commute Survey

Vehicle Group	Fuel Type	2010 Sample Annual VMT	Adjusted 2008 Annual VMT for Employee Population	2008 Employee Commute Emissions ($MTCO_2e$)	Adjusted 2008 Annual VMT for VSFCD Employee Commute	2008 VSFCD Employee Commute Emissions
Passenger Vehicle	Gasoline	577,239	2,093,906	800	335,780	128
	Diesel	11,700	42,441	10	6,806	2
	Hybrid	13,104	47,534	11	7,623	2
Small Truck/SUV/Pickup	Gasoline	135,699	492,241	230	78,936	37
Medium-Small Truck/SUV/Pickup	Gasoline	91,733	332,758	156	53,361	25
Large Truck/SUV/Pickup	Gasoline	86,102	312,329	199	50,085	32
	Diesel	22,360	81,110	28	13,007	4
	Hybrid	13,000	47,157	22	7,562	4
Motorcycle	Gasoline	19,760	71,678	16	11,494	3
TOTAL		970,697	3,521,154	1,470	564,650	240

Table 6: Vehicle Emissions Coefficients

Vehicle Class	Fuel Type	Avg Fuel Efficiency (mpg)	CO_2 (g/mi)	CH_4 (g/mi)	N_2O (g/mi)
Passenger Car	Gas	23.6	372	0.0254	0.0300
	Diesel	27.4	210	0.0550	0.0670
	Hybrid[3]	39.1	224	0.0254	0.0300
Light-Duty Vehicle - 1	Gas	19.5	450	0.0349	0.0529
Light-Duty Vehicle - 2	Gas	19.5	450	0.0349	0.0529
Medium-Duty Vehicle	Gas	14.6	602	0.1401	0.1029
	Diesel	30.0	340	0.0051	0.0048
	Hybrid[4]	20.0	439	0.1401	0.1029
Motorcycle	Gas	40.7	216	0.0254	0.0300

STREETLIGHTS

PG&E provided billing information for the electricity used to operate City streetlights and traffic signals. Electricity use data for streetlights on Mare Island was provided by Island Energy.[5] The total kWh used for streetlights in 2008 (see **Table 7**) was multiplied by the emissions coefficients for PG&E and Island Energy as provided in **Table 2**.

[3] Fuel economy for hybrid vehicles was determined by taking the average fuel economy of all hybrid passenger vehicles available in 2008 as reported by www.fueleconomy.gov.

[4] Fuel economy for hybrid vehicles was determined by taking the average fuel economy of all hybrid medium duty vehicles available in 2008 as reported by www.fueleconomy.gov.

[5] For PG&E and Island Energy data source, see "Facilities" section.

Table 7: Streetlights and Traffic Signal Electricity Use

Activity	Electricity Provider	Activity Data (kWh)
Traffic Signals	PG&E	496,572
	Island Energy	-
Streetlights	PG&E	4,795,772
	Island Energy	198,216

WATER

This sector calculates emissions from energy consumption at City-owned and -operated reservoirs, water storage tanks, water pumps, and lifts, as well as City-owned irrigation controllers. It does not calculate the total emissions from all water used or treated for the community. Doing so would be including emissions that are accounted for in another jurisdiction, which would cause double-counting.

PG&E and Island Energy provided the electricity consumption for each water facility or equipment as shown in **Table 8**.[6] The total kWh used in 2008 was multiplied by the emissions coefficients for PG&E and Island Energy as provided in **Table 2**.

Table 8: Water Equipment ELectricity Use

Activity	Electricity Provider	Activity Data (kWh)
Irrigation	PG&E	70,232
Pump Stations	PG&E	6,818,179
Reservoirs	PG&E	10,728,909
Water Storage Tanks	PG&E	23,951
	Island Energy	239,226
Total		17,641,271

[6] For PG&E and Island Energy data source, see "Facilities" section.

WASTEWATER

The Vallejo Sanitation and Flood Control District is responsible for the collection, treatment, and discharge of Vallejo's water. Nitrous oxide emissions from wastewater treatment processes are calculated using a publically-available tool provided by ICLEI – Local Governments for Sustainability to calculate wastewater treatment process and fugitive emissions. The tool is based on the type of system utilized and the population served by VSFCD. VSFCD operates an trickling filter solids contact system to treat water effluent, which releases nitrous oxide emissions similar to the process of an anaerobic digester. In 2008, VSFCD served approximately 116,000 people. Information regarding wastewater treatment operations and the population served by VSFCD was provided by Rolf Ohelmutz and Huberto Molina with VSFCD (rohlemutz@vsfcd.com).

WASTE

Recology Vallejo provides waste services to the City of Vallejo and VSFCD. The City produced 10,692 cubic yards of waste in 2008 that was sent to managed landfills, while VSFCD produced 782 cubic yards. The total cubic yards of waste was converted to tons by using a standard volume to weight conversion rate of 225 pounds/cubic yard provided by CalRecycle's Diversion Study Guide, Appendix I.[7] Activity data and its conversion to tons are shown in **Table 9**.

Like many jurisdictions, the City does not know the composition of its waste stream; therefore, the California averages provided by the 2004 California Integrated Waste Management Board Waste Characterization Report were used. Calculating emissions from municipal waste sent to landfills follows the same process of using EPA's WARM Model to determine the methane emissions from municipal waste over a 100- year life-cycle as summarized in **Appendix A**.

Table 9: Waste Activity Data

	Bin Type	Cubic Yards Per year	Weight (Tons)
City of Vallejo	Cans	2,892	325
	Yard Bins	7,800	878
VSFCD	Yard Bins	782	88

[7] CalRecycle, Diversion Study Guide Appendix I - Conversion Factor Sources, September 2009, http://www.calrecycle.ca.gov/LGCentral/Library/dsg/ApndxI.htm.

REFRIGERANTS

Refrigerants are used in air conditioning equipment for both buildings and vehicles. Converting refrigerant emissions to carbon dioxide equivalents requires multiplying the metric tons of refrigerant used by the chemical's global warming potential. In 2008, the City of Vallejo used 40 pounds of HFC-134a refrigerant for the City's vehicle fleet, which has a global warming potential of 1,300. VSFCD used 48 pounds of R-22 for building HVAC systems, which has a global warming potential of 1,700. The global warming potential of common refrigerants and refrigerant blends are provided in Appendix G of LGOP v1.1.

Appendix B

City of Vallejo Climate Action Plan

Compliance with BAAQMD CEQA Guidelines

Bay Area Air Quality Management District CEQA Guidelines

The City of Vallejo developed this Climate Action Plan 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 BAAQMD's California Environmental Quality Act (CEQA) Air Quality Guidelines. The CEQA Air Quality Guidelines were updated in 2010 in response to the State of California's amendment to the State CEQA Guidelines through Senate Bill 97 (SB 97). SB 97 requires all projects subject to CEQA to analyze and mitigate the greenhouse gas emissions that will occur.

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 Air Basin. The guidelines were updated to establish thresholds of significance for impacts related to greenhouse gas (GHG) emissions to be consistent with the requirements of the California Environmental Quality Act. 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 greenhouse gas reduction strategy.

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

- 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.

BAAQMD COMPLIANCE

The remainder of this appendix describes in detail how the City's Climate Action Plan has been developed to satisfy the requirements of BAAQMD's guidelines on the standard elements of a qualified GHG reduction strategy and will 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 CAP.

GHG Emissions Inventory

The first component of a qualified GHG reduction strategy is to conduct an inventory of GHG emissions within a specified geographic boundary. The City of Vallejo's GHG inventory utilizes a baseline year of 2008 to inventory carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4) generated from activities by the Vallejo community.

The emissions sources calculated in the baseline GHG inventory include commercial, residential, and industrial electricity and natural gas use, on-road transportation, solid waste disposal, energy use related to water and wastewater, and off-road equipment use for construction and lawn and garden activities. GHG emissions from these activities were calculated from activity data such as kilowatt hours of electricity, therms of natural gas, tons of waste disposed, and vehicle miles traveled (VMT) from trips with an origin or destination in Vallejo. In 2008, the City of Vallejo emitted approximately 588,040 metric tons of carbon dioxide equivalents ($MTCO_2e$).

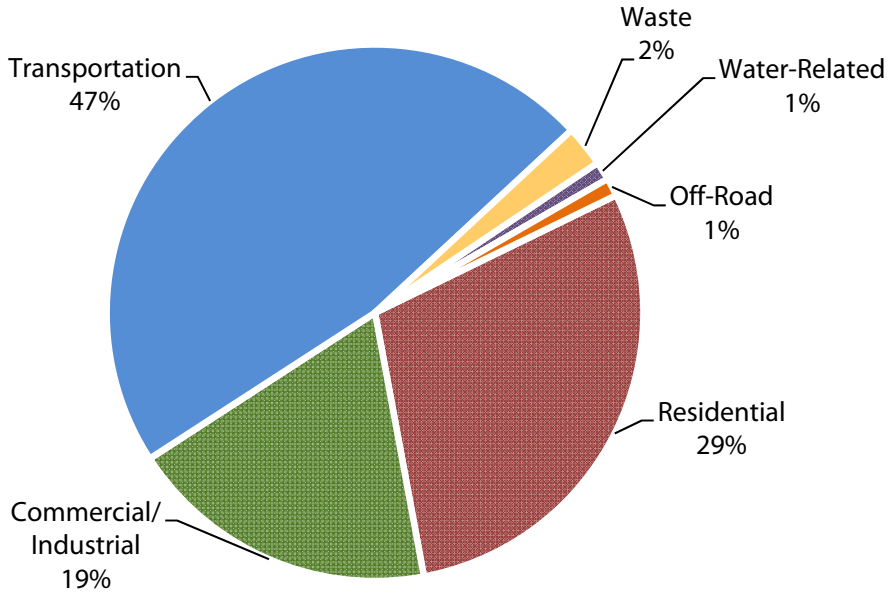
Stationary source emissions have also been examined in this emissions inventory. Stationary sources are defined as any fixed emitter of air pollutants, such as power plants, petroleum refineries, petrochemical plants, food processing plants, and other heavy industrial sources. BAAQMD provided a list of stationary source emissions within the City of Vallejo totaling 9,630 $MTCO_2$ in 2008.

Stationary source emissions are included in the GHG emissions reduction strategy for informational purposes only, as stationary source emissions are most effectively addressed and regulated by BAAQMD or through federal and state programs. The baseline inventory is intended to guide future local policy decisions that relate to emissions within the City's control; therefore, stationary source emissions are excluded from all further discussions of the inventory for the purpose of setting accurate emissions reduction targets.

2008 GHG Emissions by Sector

Sector	2008 Metric Tons CO2e	% of Total
Residential	172,310	29%
Commercial/ Industrial	110,390	19%
Transportation	277,720	47%
Waste	14,640	2%
Water-Related	6,570	1%
Off-Road	6,410	1%
Total	588,040	100%

2008 GHG Emissions by Sector



GHG Emissions Projections

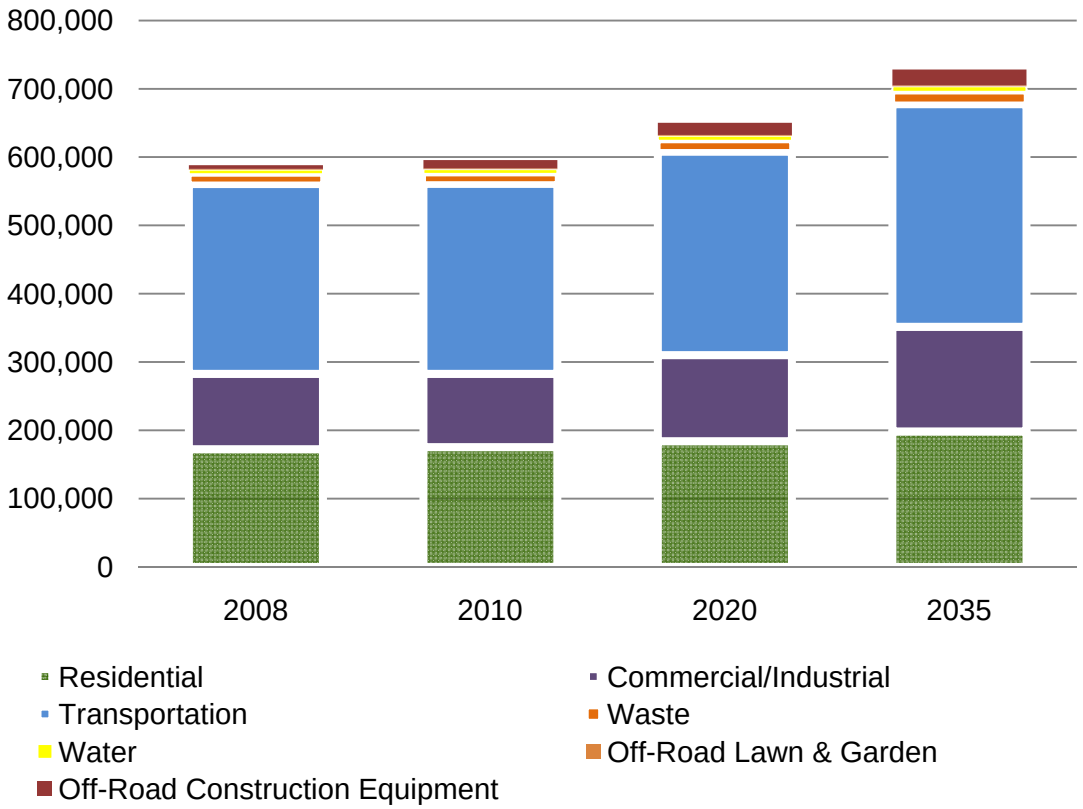
The basis for all growth scenarios is a business-as-usual (BAU) projection. The BAU projection forecasts emissions to reflect the City's desired growth projections without regulatory or technical intervention to reduce GHG emissions. The BAU projection is based on population, housing, employment, and vehicles miles traveled projections for 2020 and 2035. The population, housing, and employment forecasts come from the Association of Bay Area Government's 2009 Projections, while VMT projections are from the Metropolitan Transportation Commission's County-Specific Growth Estimates from the Transportation 2035 Plan.

Vallejo Community Growth Indicators

Growth Indicator	2008	2020	2035	Applied to…
Service Population	153,548	168,690	189,820	Waste Water
Households	41,640	44,480	47,940	Residential Energy
Annual VMT	652,399,900	706,665,400	766,375,500	Transportation
Employment	33,082	37,790	45,920	Commercial & Industrial Energy

These indicators are then applied to the 2008 GHG emissions inventory to determine a business-as-usual growth scenario. Under the business-as-usual scenario, community-wide emissions will grow by approximately 11% by the year 2020 to 650,340 $MTCO_2e$ and by 24% by 2035 to 728,170 $MTCO_2e$

GHG Emissions Forecast, 2008–2035



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 the Clean Car Fuel Standard, commonly referred to as the Pavley Standard. The impact of these state programs will play a critical role in helping Vallejo to achieve the emissions reduction target.

State Reductions Summary	2008	2010	2020	2035
Growth Projection	588,040	595,600	650,340	728,170
Pavley I Reductions	0	-7,770	-23,510	-38,370
RPS Reductions	0	0	-8,250	-26,310
CSI Reductions	0	0	-47,200	-78,340
Title 24 Reductions	0	-520	-520	-520
Total State Reductions	**0**	**-8,290**	**-79,480**	**-143,540**
Adjusted Growth Projection	**588,040**	**587,310**	**570,860**	**584,630**

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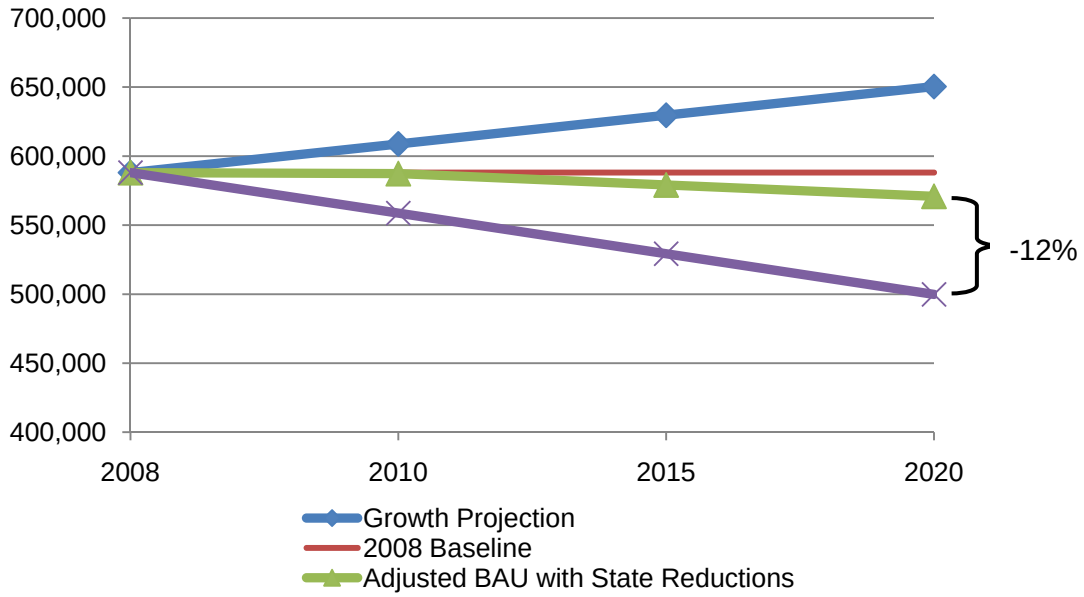
GHG Emissions Reduction Target

The City of Vallejo has set a GHG emissions reduction target of 15% below 2008 baseline levels by 2020. This target is consistent with the State's direction to local governments in the AB 32 Scoping Plan and is equivalent to reducing local GHG emissions to 1990 levels.

City reduction target



GHG Reduction Measures

The GHG reduction measures included in this Climate Action Plan demonstrate the City's ability to reach the GHG reduction target of 15% below baseline levels by 2020. Emissions reductions were quantified for three different years: 2010, 2020, and 2035. Emissions reductions for 2010 have been quantified to demonstrate the actual emissions reduction progress that the City has already made in implementing measures within the CAP, while the 2020 and 2035 emissions reductions are the potential reductions that will be achieved through the implementation of these measures over the next several years. The GHG reduction strategies are separated by goal or topic area to correspond with the sectors or and sources of GHG emissions as follows:

- City Government Operations
- Community Engagement
- Energy
- Renewable Energy
- Transportation Demand Management
- Optimized Travel
- Water, Wastewater, and Solid Waste
- Off-Road Equipment

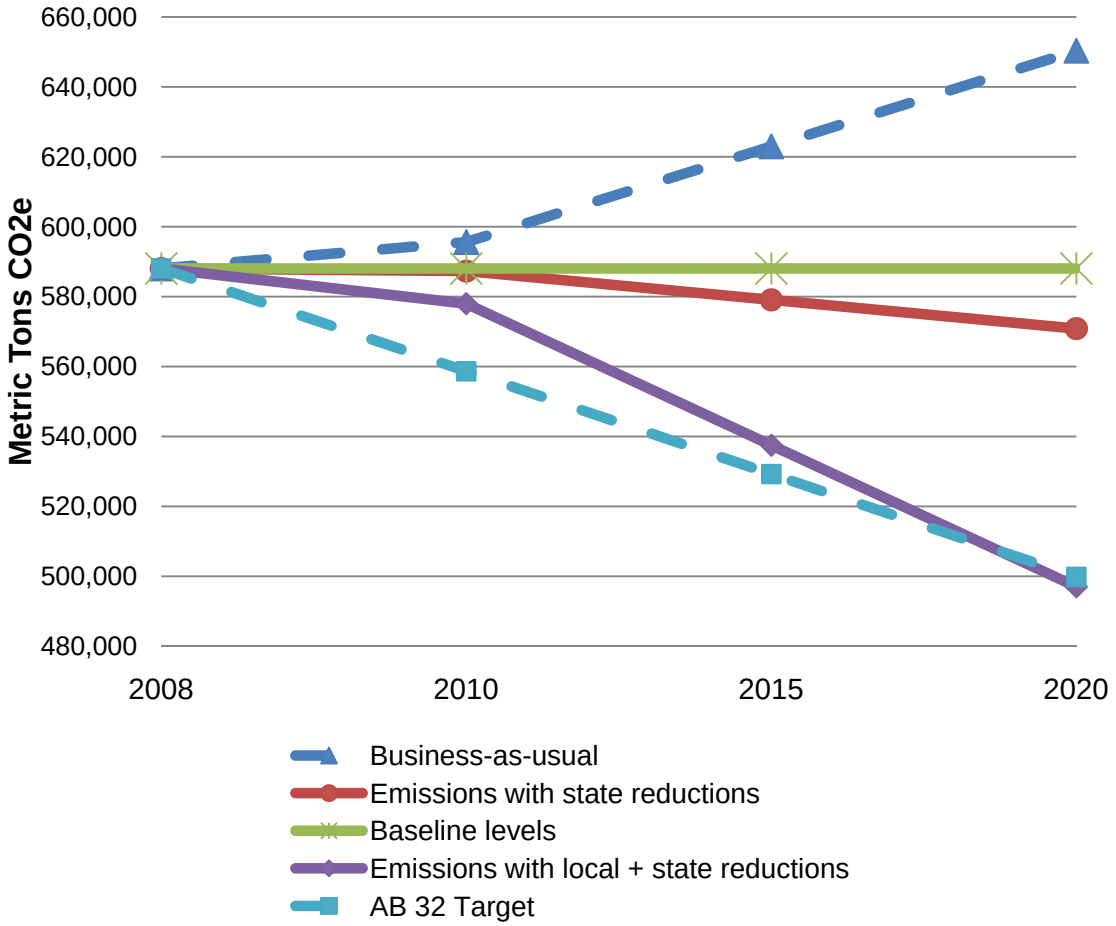
GHG Reduction Summary by Topic

Sector	2010 GHG Reductions ($MTCO_2e/yr$)	2020 GHG Reductions ($MTCO_2e/yr$)	2025 GHG Reductions ($MTCO_2e/yr$)
City Government Operations (CG)	-40	-4,200	-8,090
Community Engagement (CE)	--	--	--
Energy (E)	-270	-26,020	-42,280
Renewable Energy (RE)	--	-32,380	-60,030
Transportation Demand Management (TDM)	-4,770	-13,400	-19,220
Optimized Travel (OT)	--	-19,920	-21,150
Water, Wastewater, and Solid Waste (W)	-3,070	-8,920	-15,140
Off-Road Equipment (OR)	--	-30	-50
Adaptation	--	--	--
Total Reductions	**-8,150**	**-104,870**	**-167,350**
Emissions Forecast	595,600	650,340	728,170
State Reductions	-8,290	-79,480	-143,540
Local Reductions	-8,150	-104,870	-167,350
Net Emissions	579,160	465,990	417,280
Percentage Change from 2008 Levels	-2%	-21%	-29%

Implementation of the GHG reduction strategies included in this CAP will at a minimum 15% reduction below 2008 baseline levels by 2020.

In addition to quantifying the emissions reductions associated with each strategy in the CAP, BAAQMD guidelines recommended that the City clearly specify the measures within the CAP applicable to new construction projects to demonstrate compliance with the City's GHG emissions reduction strategy and determine that the project's GHG emissions are less than significant. To ensure that each new construction project complies with the City's CAP, a checklist has been developed to be submitted by the project applicant.

Attainment of 2020 Reduction Target



Implementation and Monitoring

To ensure the timely implementation of the City's CAP, the City will identify staff to coordinate City Green Team meetings, track implementation of GHG reduction strategies and progress toward GHG reduction targets, and prepare annual reports to the City Council on CAP implementation and progress. To assist staff, the City has developed an implementation and monitoring tracking tool that identifies the major implementation milestones and the necessary actions to be taken for each measure. The tool enables the City to quickly update the GHG emissions inventory and streamline the reporting of CAP implementation on an annual basis. The monitoring tool also outlines the necessary procedures to update the inventory and reduction measures every 3–5 years. This tool that will serve as the primary instrument in measuring the City's progress toward achieving emissions reduction targets and to ensure timely implementation occurs.

Public Process and Environmental Review

The final requirement of a qualified GHG emissions reduction strategy is to adopt the plan through a public hearing process following environmental review. The City has involved numerous stakeholders throughout the development of the CAP. The Plan will undergo environmental review as part of the public hearing and adoption process.

During the development of the CAP, the City has engaged stakeholders and interested community members during three public workshops. The public has also had opportunities to participate in the development of this CAP through the public hearing and review process at Planning Commission and City Council meetings.

In order to operate effectively as a programmatic tiering document, the California State Attorney General's Office and BAAQMD both recommend integration of components of the GHG emissions reduction strategy into the General Plan. This integration will identify how the GHG emissions reduction strategy operates as a stand-alone policy and implementation document that is updated on a regular basis to respond to updates to science, technology, and policy. The GHG emissions reduction strategy will contribute to the General Plan's policies and will serve as mitigation for the City's GHG emissions.

The City has initiated the environmental review process to comply with the requirements of the California Environmental Quality Act. The City has prepared an initial environmental study and negative declaration finding that the CAP will have a less than significant environmental impact.

Appendix C

City of Vallejo Climate Action Plan

Technical Appendix

CG-1 Green Team

Create a City Green Team, or other similar working group, to identify, prioritize, and implement greenhouse gas (GHG) reduction projects, including education.

Action Items:

- Form a multidepartmental Green Team to identify, prioritize, and implement GHG reduction projects for City operations such as commute programs, recycling efforts, and procurement policies consistent with the CAP.
- Provide energy and GHG reduction training to existing staff.

Target Year	GHG Reduction (MTCO2e/yr)	Performance Indicator
2010 Reductions ($MTCO_2e$):	Supporting Measure	N/A
2020 Reductions ($MTCO_2e$):	Supporting Measure	N/A
2035 Reductions ($MTCO_2e$):	Supporting Measure	N/A

CG-2 CAP Implementation

See to the timely implementation of CAP strategies by establishing an implementation and reporting infrastructure.

Action Items:

- Designate a City staff member of the Green Team to have lead responsibilities for implementing the Climate Action Plan. Duties of this position include coordination of the Green Team, preparation of annual CAP implementation priorities, and tracking City government and community-wide greenhouse gas emissions.
- On an annual basis, report to the City Council on the City's progress toward CAP implementation and GHG reduction targets.
- Identify and pursue grants to fund CAP implementation strategies.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions ($MTCO_2e$):	Supporting Measure	N/A
2020 Reductions ($MTCO_2e$):	Supporting Measure	N/A
2035 Reductions ($MTCO_2e$):	Supporting Measure	N/A

CG-3 LIGHTING

Retrofit City-owned or -operated lighting and related mechanical systems.

Action Items:

- Retrofit City streetlights, outdoor lighting, and traffic signals with high-efficiency lights such as light-emitting diode (LED) or induction lighting.
- Rewire lighting circuits to allow for user control of task lighting, sensors, Building Management System (BMS) control, and day lighting modulated control.
- Adjust the lighting schedule of street lighting and other exterior lighting to minimize the use of lighting at unnecessary or underutilized times.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions ($MTCO_2e$):	-40	N/A
2020 Reductions ($MTCO_2e$):	-520	50% of streetlight fixtures replaced
2035 Reductions ($MTCO_2e$):	-1,000	100% of streetlight fixtures replaced

Methodology:

The City has already completed several indoor and outdoor lighting retrofits through the Association of Bay Area Governments Energy Watch Partnership, totaling an annual reduction of 135,500 kWh of electricity. The City will replace 50% of all existing streetlights with LED light bulbs by 2020 and 100% by 2035. LED lighting will reduce energy use from streetlights by approximately 60% from incandescent street lighting.

Sources:

City of Little Rock. 2003. "Conventional vs. LED Traffic Signals; Operational Characteristics and Economic

Feasibility." Little Rock, AR.

Energy Solutions. 2009. City of Vallejo Energy Efficiency Conservation Strategy Preliminary Results.

U.S. Department of Energy and Pacific Gas & Electric. 2008. LED Street Lighting: U.S. DOE Solid-State Lighting Technology Demonstration Gateway Program and PG&E Emerging Technologies Program. http://apps1.eere.energy.gov/buildings/publications/pdfs/ssl/gateway_sf-streetlighting.pdf.

CG-4 Renewable Energy

Continue to install renewable energy systems on City properties.

Action Items:

Identify cost-effective renewable energy opportunities for additional City properties and apply for federal, state, and utility grant and funding opportunities when they become available.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions ($MTCO_2e$):	0	N/A
2020 Reductions ($MTCO_2e$):	-1,230	Install an additional 2.75 MW of renewable energy
2035 Reductions ($MTCO_2e$):	-2,310	Install an additional 5.5 MW of new renewable energy

Methodology:

The preliminary results of Vallejo's Energy Efficiency Conservation Strategy identified potential City facilities to install additional renewable energy equipment, up to 5.5 additional megawatts of energy. By 2020, the City will install 2.75 MW of renewable energy to offset energy use at City facilities.

Sources:

Energy Solutions. 2009. City of Vallejo Energy Efficiency Conservation Strategy Preliminary Results.

CG-5 BUILDING & FACILITY EFFICIENCY

Reduce energy consumption from City facilities by 20% by 2035 through energy efficiency improvements.

Action Items:

- Create a City Government Energy Fund to reinvest annual cost savings from energy efficiency improvements for additional energy efficiency programs.
- Complete energy and water audits of City facilities to identify building inefficiencies—and prioritize the implementation of cost-effective energy and water efficiency retrofits—with a payback of less than 10 years.
- Emphasize water management and reclamation for schools, parks, golf courses, and manufacturing processes to reduce City energy use related to the pumping and treatment of water.
- Schedule regular operating hours and restrict facility use in a manner that reduces inefficient use of buildings or rooms.
- Explore the City's use of technical equipment and identify opportunities for low-power alternatives, such as tablet computers or networked copiers.
- Optimize the City Data Center by identifying and implementing energy efficiency measures to City data centers, computer systems, and related equipment.

Target Year	GHG Reduction ($MTCO_2e/yr$)	Performance Indicator
2010 Reductions ($MTCO_2e$):	0	N/A
2020 Reductions ($MTCO_2e$):	-940	Reduce energy consumption in City and VSFCD facilities by 10%
2035 Reductions ($MTCO_2e$):	-1,870	Reduce energy consumption in City and VSFCD facilities by 20%

Methodology:

This policy directs the City and the Vallejo Sanitation and Flood Control District to reduce energy use at all City facilities by 20% by 2035. This measure quantifies the energy reductions associated with a 10% reduction in electricity and natural gas use at City facilities by 2020 and a 20% reduction by 2035.

Sources:

Energy Solutions. 2009. City of Vallejo Energy Efficiency Conservation Strategy Preliminary Results.

CG-6 New Building & Facility Efficiency

Apply CALGreen Tier 1 energy efficiency standards to all new City facilities.

Action Items:

- Require new municipal facilities to meet CALGreen Tier 1 standards. Tier 1 prerequisites include requirements to install cool roofs, provide preferential parking for low-emitting vehicles, exceed Title 24 requirements, reduce indoor potable water use and outdoor landscaping water use, and include recycled materials within new facilities.
- Encourage Leadership in Energy and Environmental Design (LEED) , CALGreen, or or similar best practices for new buildings and facilities as well as remodels.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions ($MTCO_2e$):	Unknown	All new buildings meet CALGreen Tier 1, as amended
2020 Reductions ($MTCO_2e$):	Unknown	All new buildings meet CALGreen Tier 1, as amended
2035 Reductions ($MTCO_2e$):	Unknown	All new buildings meet CALGreen Tier 1, as amended

Methodology:

With uncertainty as to how Vallejo's government facilities will grow over the next 25 years, the City has not quantified the GHG impact that will occur when building new facilities to comply with the Tier 1 requirements of CALGreen. The energy efficiency component of Tier 1 requires buildings to exceed Title 24 energy efficiency requirements by a minimum of 15%.

Sources:

California Building Standards Commission. 2010. California Code of Regulations Title 24: Part 11 - California Green Building Standards Code.

CG-7 REPLACEMENT VEHICLES

Purchase fuel-efficient and alternatively fueled vehicles.

Action Items:

- Adopt a City policy to incrementally replace appropriate fleet vehicles and buses with more fuel-efficient and lower-carbon-emitting models per the standard turnover schedule. Alternative fuels and vehicles include liquefied petroleum gas (LPG), compressed natural gas (CNG), biodiesel, hybrid vehicles, and plug-in electric vehicles.
- Use Global Positioning System (GPS) tools to map routes and path of travel to control fuel and wear and tear on vehicles.
- Extend the replacement time on maintained vehicle pools.
- Ensure that vehicle sizes are appropriate for the job performed.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions ($MTCO_2e$):	0	N/A
2020 Reductions ($MTCO_2e$):	-1,420	Increase the number of hybrid vehicles to 18; improve transit fleet MPG average to 6
2035 Reductions ($MTCO_2e$):	-2,820	Increase the number of hybrid vehicles to 23; improve transit fleet average MPG to 7.5

Methodology:

The City will continue to improve the fuel efficiency of transit and police vehicles as they are replaced and purchase additional hybrid vehicles for general fleet use. By 2020, the City will increase transit fleet fuel efficiency by 20% and increase the fuel efficiency of police vehicles by 70%. For general fleet vehicles, the City already utilizes 12 hybrid vehicles and will continue to purchase and replace existing vehicles with hybrid and alternative fuel vehicles as financially feasible. .

Sources:

City of Vallejo. 2010. City of Vallejo Greenhouse Gas Emissions Inventory.

U.S. Department of Energy. 2011. FuelEconomy.gov. http://fueleconomy.gov/.

CG-8 Employee Commute Alternatives

Provide information and incentives for City staff to carpool, use public transportation, walk, or bike to work.

Action Items:

- Designate an Employee Commute Alternatives Coordinator to implement and support trip reduction programs.
- Promote carpooling by providing a website or message board for coordinating shared rides and designating a percentage of conveniently located parking spaces for carpooling vehicles. Enact a guaranteed ride home program for employees who carpool, take public transit, or use other alternative modes of transportation.
- Provide recognition awards to City departments and employees with high carpooling, transit, biking, and walking to work participation rates.
- For external meetings, select a centrally located site to meet. Make provisions for secure and safe bike storage at City facilities.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions ($MTCO_2e$):	0	N/A
2020 Reductions ($MTCO_2e$):	-90	Reduce employee commute VMT by 5.2%
2035 Reductions ($MTCO_2e$):	-90	Reduce employee commute VMT by 5.2%

Methodology:

Increased participation in rideshare programs will reduce the City's employee commute VMT by 5.2%.

Sources:

California Air Pollution Control Officers Association. 2010. Quantifying and Mitigating Greenhouse Gas Emissions.

CE-1 STUDENT OUTREACH

Engage students in the City's GHG reduction efforts through outreach to K–12 schools and colleges.

Action Items:

- Create a collaboration between the City Green Team and Vallejo schools to:
- Inform students about climate change, water conservation, and recycling and ways to reduce GHG emissions.
- Sponsor competitions and contests with prizes for promoting climate protection and reducing GHG emissions.
- Partner with professional associations to develop strategies to reduce GHG emissions at the local level.

Target Year	GHG Reduction ($MTCO_2e/yr$)	Performance Indicator
2010 Reductions (MTCO2e):	Supporting Measure	Number of climate-related school events or visits
2020 Reductions (MTCO2e):	Supporting Measure	Number of climate-related school events or visits
2035 Reductions (MTCO2e):	Supporting Measure	Number of climate-related school events or visits

CE-2 COMMUNITY OUTREACH

Engage the general community in the City's GHG reduction efforts through print, online, and in-person outreach mechanisms.

Action Items:

- Educate and inform residents and businesses about CAP implementation strategies and ways in which they can support the City's GHG reduction goals through changes to their behavior or environment.
- Identify a primary location in Vallejo for deposit and distribution of information regarding GHG management.
- Cooperate with the schools, business community, and community groups to develop an online one-stop shop for GHG information and resources.
- Use the City newsletter to communicate and raise awareness of sustainable practices, with an emphasis on illustrating cost savings and benefits to all consumers.

Target Year	GHG Reduction ($MTCO_2e/yr$)	Performance Indicator
2010 Reductions (MTCO2e):	Supporting Measure	Number of community outreach events
2020 Reductions (MTCO2e):	Supporting Measure	Number of community outreach events
2035 Reductions (MTCO2e):	Supporting Measure	Number of community outreach events

E-1 Building Stock: Existing

Facilitate energy efficiency upgrades and retrofits in existing commercial, residential, and industrial buildings by connecting residents and businesses with technical and financial assistance.

Action Items:

- Connect businesses and residents with voluntary programs that provide free or low-cost energy efficiency audits and retrofit installations.
- Develop an outreach program to encourage participation in low-income weatherization programs.
- Work collaboratively with Solano County, other municipalities in the region, and the Association of Bay Area Governments (ABAG), and participate in regional energy efficiency financing programs such as low-interest revolving loan funds, the California Comprehensive Residential Building Retrofit Program, or a Property Assessed Clean Energy (PACE) program that enables Vallejo property owners to obtain low-interest financing for energy improvements.

- Consider creating a Residential Energy Conservation Ordinance (RECO) and Commercial Energy Conservation Ordinance (CECO) to require point-of-sale energy audits and retrofits for all buildings that do not meet minimum energy efficiency requirements.

Target Year	GHG Reduction ($MTCO_2e/yr$)	Performance Indicator
2010 Reductions (MTCO2e):	-270	N/A
2020 Reductions (MTCO2e):	-22,840	650 low-income homes weatherized; 3,300 homes participating in a PACE program
2035 Reductions (MTCO2e):	-36,670	1,600 low-income homes weatherized; 6,500 homes participating in a PACE program

Methodology:

The GHG and energy reduction benefits from this measure will occur through the implementation of energy efficiency programs in Vallejo. These programs include a low-income weatherization program, an energy efficiency financing program, and the impact of energy conservation outreach. Participation in energy efficiency programs and the average energy savings per participant is based on program evaluations and research of existing programs in other jurisdictions.

Sources:

City of Berkeley. 2010. Berkeley FIRST Initial Evaluation. Berkeley, CA.

National Resources Defense Council; PACE Now; Renewable Funding LLC; The Vote Solar Initiative. 2010. Property Assessed Clean Energy Programs White Paper.

Sacramento Metropolitan Air Quality Management District. 2009. Spare the Air Control Measure Program; Revision to State Implementation Plan Staff Report. http://www.airquality.org/notices/ CAPUpdate/STA-revisiontoSIP-StaffRpt23April2009.pdf.

State of California, Community Services and Development. 2009. CSD Helps Low-Income Families Manage and Reduce Energy Costs. http://www.csd.ca.gov/Contractors/documents/ Energy%20tab/LIHEAP-DOE%20Fact%20Sheet%20(2008).pdf.

State of California, Department of Finance. 2008. California Statewide Population.

E-2 Building Standards

Require all new development to meet the minimum California Title 24 and California Green Building Standards Code requirements, as amended, and encourage new development to exceed the minimum requirements.

Action Items:

- Adopt the California Title 24 minimum requirements and encourage new construction and major remodels, , to adhere to a Tier 1 or Tier 2 standard of the CALGreen Code.
- Require newly constructed buildings and recommend that remodels over 50% and tenant improvements demonstrate compliance with the mandatory CALGreen Code requirements by completing a green building checklist when submitting a request for building permits.
- Consider requiring new development to comply with the Tier 1 requirements of CALGreen, Part 11 of the California Building Standards Code. This optional measure may be necessary to address any shortfall in attaining reduction objectives.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions (MTCO2e):	Supporting Measure	N/A
2020 Reductions (MTCO2e):	Supporting Measure	All buildings meet Title 24 Part 6, as amended
2035 Reductions (MTCO2e):	Supporting Measure	All buildings meet Title 24 Part 6, as amended

Methodology:

Reduction in electricity and natural gas use from new buildings is based on average energy reductions by building type and climate zone as provided in the California Air Pollution Control Officers Association's (CAPCOA) Quantifying Greenhouse Gas Mitigation Measures.

Sources:

California Air Pollution Control Officers Association. 2010. "Quantifying Greenhouse Gas Mitigation Measures."

California Building Standards Commission. 2010. 2010 California Green Building Standards Code. Sacramento,

CA: California Building Standards Commission.

California Energy Commission. 2007. Impact Analysis: 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings. Sacramento, CA: California Energy Commission.

E-3 SMART METERS

Increase the community's awareness and utilization of real-time energy consumption data available through PG&E's SmartMeter program.

Action Items:

- Support PG&E's installation of SmartMeters on commercial and residential properties by informing the community of the GHG and energy cost-saving potential of the devices.
- Require newly constructed buildings and recommend that major remodels, over 50%, install indoor real-time energy monitors.
- Inform the community of metering options, such as online applications and in-home monitors.
- Connect businesses and residents with rebate programs that give priority to appliances with smart grid technology.

Target Year	GHG Reduction ($MTCO_2e/yr$)	Performance Indicator
2010 Reductions (MTCO2e):	0	N/A
2020 Reductions (MTCO2e):	-2,960	60% of homes and 50% of businesses with energy monitors
2035 Reductions (MTCO2e):	-5,220	80% of homes and 75% of businesses with energy monitors

Methodology:

Smart grid integration will reduce energy demand through continuous feedback of real-time energy use. Research has shown that when building users are reminded of their energy use more frequently, higher energy savings will be achieved. Additional energy savings will be achieved through the installation of smart grid appliances that can be pre-programmed to run at off-peak energy times.

Sources:

Ehrhardt-Martinez, K., K. Donnely, and J. Laitner. 2010. Advanced Metering Initiatives and Residential Feedback Programs: A Meta-Review for Household Electricity-Savings Opportunities. Washington, D.C.: American Council for an Energy-Efficient Economy.

Pike Research. 2010. Smart appliance sales to start off slow, but 118 million units will be sold worldwide by 2019. http://www.smartgridnews.com/artman/publish/Smart-Grid-Press-Releases/ Smart-appliance-sales-to-start-off-slow-but-118-million-units-will-be-sold-worldwide-by-2019-forecasts-Pike-Research-3290.html.

U.S. Department of Energy. 2008. Energy Star. Clothes Washer Product Snapshot. http://www.energystar.gov/ia/partners/reps/pt_reps_res_retail/files/CW_ProductSnapshot_May08.pdf.

———. n.d. Energy Star. Residential New Construction: An Overview of Energy Use and Energy Efficiency Opportunities. http://www.energystar.gov/ia/business/challenge/learn_more/ ResidentialNewConstruction.pdf.

E-4 Cool Roofs and Pavements

Increase tree planting and the use of cool roofs and cool pavement materials to reduce the urban heat island effect and corresponding energy consumption. Implement tree replacement policy for projects where tree removal is necessary.

Action Items:

- Actively inspect and enforce state requirements for cool roofs on residential and nonresidential roofing projects. Require new buildings to meet Title 24 and recommend that new buildings meet CALGreen Tier 1 requirements for cool roofs, which require a minimum solar reflectance index (SRI) of 10 for steep slope roofs and 64 for low slope roofs.

- Establish standards for new development and major remodels (to be defined) to reduce exterior heat gain for 50% of non-roof impervious site surfaces (roads, sidewalks, courtyards, parking lots, driveways) through one or more of the following mechanisms:

- Achieve 50% paved surface shading within five to ten years by planting trees and other vegetation and/or installing solar panels or shading structures above parking.

- Use paving materials with an SRI of at least 29 for all surfaces.

- Maintain and expand Vallejo's urban forest, including street trees and trees on private property.
- For public improvements and public projects, require the use of high albedo paving material for sidewalks, roads, crosswalks, parking lots, and driveways.

Target Year	GHG Reduction ($MTCO_2e/yr$)	Performance Indicator
2010 Reductions (MTCO2e):	0	N/A
2020 Reductions (MTCO2e):	-220	All paved surfaces meeting an SRI of 29 or higher
2035 Reductions (MTCO2e):	-390	All paved surfaces meeting an SRI of 29 or higher

Methodology:

This measure includes the GHG benefit of cool pavements. Cool pavements retain less heat than traditional pavement materials like black asphalt, causing urban surface temperatures to decrease and creating less demand for air conditioning in buildings. Please note that this measure does not include the GHG impact of cool roofs, which is included in the quantification of the 2008 CALGreen Code (State mandated).

Sources:

Akbari, Hashem. Energy Savings Potentials and Air Quality Benefits of Urban Heat Island Mitigation. http://heatisland.lbl.gov/.

California Building Standards Commission. 2010. California Code of Regulations, Title 24: Part 11: California Green Building Standards Code. http://www.documents.dgs.ca.gov/bsc/CALGreen/ 2010_CA_Green_Bldg.pdf.
U.S. Environmental Protection Agency. 2005. Reducing Urban Heat Island Compendium of Strategies: Cool Pavements. http://www.epa.gov/heatisld/resources/pdf/CoolPavesCompendium.pdf.

RE-1 RENEWABLE ENERGY INSTALLATIONS

Support the installation of small-scale renewable energy systems including solar photovoltaic, solar thermal, and wind, river current, and tidal energy conversion systems.

Action Items:

- Update the Zoning Code to define a renewable energy strategy that removes barriers to small-scale solar

energy systems.

- Revise the permit processes and fees as appropriate to remove barriers to and incentivize the installation of renewable energy systems in accordance with applicable safety and environmental standards.
- Provide training to at least one designated Planning and one Building staff member to enable knowledgeable and expeditious processing of renewable energy applications.
- Encourage new homes and businesses to be pre-wired and pre-plumbed for solar and solar thermal installations.
- Evaluate site-specific opportunities and constraints related to Vallejo's proximity to the San Francisco Bay and to rivers, channels, and lakes, both man-made and natural.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions ($MTCO_2e$):	Supporting Measure	Percentage of new buildings pre-wired for solar installations
2020 Reductions ($MTCO_2e$):	Supporting Measure	Percentage of new buildings pre-wired for solar installations
2035 Reductions ($MTCO_2e$):	Supporting Measure	Percentage of new buildings pre-wired for solar installations

RE-2 Renewable Energy Financing

Connect residents and businesses with renewable energy incentives and low-interest financing mechanisms.

Action Items:

- Participate in a regional financing program such as the Property Assessed Clean Energy (PACE) program or equivalent that achieves similar results to provide low-interest financing for renewable energy installations.
- Designate a City staff person to coordinate local inquiries regarding the regional financing program.
- Train Planning and Building staff members on available state, regional, and utility-led financing mechanisms and incentives/rebates.
- Collaborate with neighboring jurisdictions and Solano County to explore the feasibility and cost of a community choice aggregation program.

- Set a renewable power generation goal for the City to increase community-wide energy generation.
- Work with Solano County to identify the benefits and costs of a community choice aggregation program and establish a stakeholder advisory group.

Target Year	GHG Reduction ($MTCO_2e/yr$)	Performance Indicator
2010 Reductions (MTCO2e):	0	N/A
2020 Reductions (MTCO2e):	-32,380	25 MW of renewable energy installed
2035 Reductions (MTCO2e):	-60,030	47 MW of renewable energy installed

Methodology:

Participation in renewable energy financing programs and the average energy savings per participant are based on program evaluations and research of existing programs in other jurisdictions.

Sources:

California Energy Commission. 2010. New Solar Homes Partnership, Third Edition. Sacramento, CA: California Energy Commission.

California Energy Commission; California Public Utilities Commission. 2010. California Solar Initiative Program Data: Geographical Statistics. http://www.californiasolarstatistics.ca.gov/reports/locale_stats/.

City of Berkeley. 2010. Berkeley FIRST Initial Evaluation. Berkeley, CA.

National Resources Defense Council; PACE Now; Renewable Funding LLC; The Vote Solar Initiative. 2010. Property Assessed Clean Energy Programs White Paper.

TDM-1 LOCAL BUSINESSES

Promote buy local and related initiatives that support local commerce and reduce the need for extensive transport.

Action Items:

- Support efforts that encourage people who live, work, or have businesses in Vallejo to buy local goods, food supplies, and services.

- Implement the elements of the Downtown Specific Plan that encourage the promotion of economic revitalization of the Downtown Commercial Area to create local options for commerce.
- Enact new or participate in existing award programs that recognize local employers who provide outstanding contributions to the quality of life in the community, including "green businesses.".
- Promote cooperative benefits organizations to enable individual merchants to achieve benefits of scale and innovation to reduce energy consumption, establish recycling programs, and reduce water use.
- Support strategies to increase local business-to-business commerce.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions (MTCO2e):	0	N/A
2020 Reductions (MTCO2e):	-2,470	5.6% reduction in shopping-related VMT
2035 Reductions ($MTCO_2e$):	-3,070	8% reduction in shopping-related VMT

Methodology:

The 2011 Independent Business Survey found that independent business owners located in a community with a buy local campaign increased revenues by an average of 5.6% compared to 2010. A buy local campaign encourages the Vallejo community to make shopping trips within the community instead of going outside of the community for shopping and necessities. Local trips help to reduce the distance traveled for shopping purposes while supporting the local tax base.

Sources:

Institute for Local Self-Reliance. 2011. Buy Local First Survey. http://www.ilsr.org/.

U.S. Department of Transportation; Oak Ridge National Laboratory. 2004. Summary of Travel Trends: 2001 National Household Travel Survey. http://nhts.ornl.gov/2001/pub/STT.pdf.

TDM-2 Mixed-Use, Higher-Density, Transit-Oriented Development

Promote mixed-use, higher-density development near transit nodes.

Action Items:

- Continue to maintain the Downtown Commercial Area as a strong focal point to attract higher-density housing, business, and office use.
- Provide a high-quality and relatively high-density Downtown multi-family residential environment connected by selected transit-oriented priority areas and other transit corridors.
- Adopt incentives such as priority processing and revise codes to increase densities in the Downtown or within one-half mile of a regularly scheduled transit stop.
- Implement elements in the Downtown Specific Plan that encourage pedestrian-oriented plazas, walkways, bike trails, bike lanes, and street furniture and connections to other community areas. Promote pedestrian convenience and recreational opportunities through development conditions requiring sidewalks, walking paths, or hiking trails connecting various land uses and including safety amenities such as lighting and signage.
- Implement elements in the Downtown Specific Plan that promote mixed-use development and provide commercial services such as day care, restaurants, banks, and stores near to employment centers, where feasible.
- Support "complete streets" by incorporating applicable public transit, bicycle and pedestrian rights-of-way, and facilities for Vallejo community members when evaluating future expansion and new development of streets and highways.

Target Year	GHG Reduction ($MTCO_2e/yr$)	Performance Indicator
2010 Reductions (MTCO2e):	-3,360	N/A
2020 Reductions (MTCO2e):	-4,270	50% of specific plans implemented
2035 Reductions (MTCO2e):	-5,590	100% of specific plans implemented

Methodology:

This measure includes the GHG benefit of increased densities and diversity of land uses through the implementation of the Mare Island and Downtown Vallejo specific plans. Mixed-use development results in VMT reductions by shortening trip distances and improving accessibility to alternative modes of transportation.

Sources:

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

City of Vallejo. 2005. Downtown Vallejo Specific Plan.

TDM-3 Bicycle and Pedestrian Travel

Expand and link the network of pedestrian and bicycle paths and facilities through preparation of a Bicycle and Pedestrian Master Plan, with the goal of increasing the bicycle and pedestrian mode share 20% by 2035.

Action Items:

- Create a city-wide Bicycle and Pedestrian Master Plan to analyze existing and future pedestrian and bicycle infrastructure and facilities and to qualify for state and federal funding for bicycle- and pedestrian-related infrastructure.
- Pursue public and private funding to expand and link the network of pedestrian and bicycle paths and facilities beginning in selected, transit-oriented priority areas.
- Revise zoning standards to require the provision of bicycle support facilities (lockers, shower rooms, etc.) for appropriate development at a rate of 1 changing room and shower per 200 occupants.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions (MTCO2e):	0	N/A
2020 Reductions (MTCO2e):	-630	19 miles of new bike lanes installed
2035 Reductions (MTCO2e):	-800	25 miles of new bike lanes installed

Methodology:

Providing pedestrian access and a bicycle network to link areas within the city encourages people to walk instead of drive. This mode shift results in people driving less and thus a reduction in VMT.

Sources:

Dierkers, G., E. Silsbe, S. Stott, S. Winkelman, and M. Wubben. 2007. CCAP Transportation Emissions Guidebook. Center for Clean Air Policy. Washington, D.C. http://www.ccap.org/safe/guidebook.php. as cited in California Air Pollution Control Officers Association (CAPCOA) 2008. CEQA and Climate Change.

Nelson, Arthur C. and David Allen. 1997. If You Build Them, Commuters Will Use Them: Cross-Sectional Analysis of Commuters and Bicycle Facilities.

Solano County Transit Authority. 2010. Bicycle Plan Projects List.

http://www.sta.dst.ca.us/pdfs/Plans/FINAL%20Bike%20Projects%2003-15-10.pdf (accessed January 21, 2011).

U.S. Census Bureau. 2010. American Communities Survey: City of Vallejo. http://factfinder.census.gov/servlet/ADPTable?_bm=y&-geo_id=16000US0681666&-qr_name=ACS_2008_3YR_G00_DP3YR3&-context=adp&-ds_name=&-tree_id=3308&-_lang=en&-redoLog=false&-format=.

U.S. Department of Transportation, Federal Highway Administration. 2009. National Household Travel Survey. http://nhts.ornl.gov.

U.S. Department of Transportation; Oak Ridge National Laboratory. 2004. Summary of Travel Trends: 2001 National Household Travel Survey. http://nhts.ornl.gov/2001/pub/STT.pdf.

TDM-4 PARKING

Revise parking requirements for new commercial and multi-family residential projects and implement the Downtown Parking Meter Installation Plan.

Action Items:

- Revise parking requirements for new commercial and multi-family residential projects to provide bike racks for 5% of the building's projected visitors within 200 feet of the building's entrance for commercial projects and one long-term bicycle storage space per two multi-family units.
- Allow up to a 15% reduction in required private vehicle parking spaces in new commercial and multi-family residential projects if justified in an approved trip reduction plan.
- Encourage shared parking programs in mixed-use and transit-oriented development areas.
- Design parking lots, where feasible, to include clearly marked and shaded pedestrian pathways between transit facilities and building entrances.

Target Year	GHG Reduction ($MTCO_2e/yr$)	Performance Indicator
2010 Reductions (MTCO2e):	-0	N/A
2020 Reductions (MTCO2e):	-910	N/A
2035 Reductions (MTCO2e):	-1,830	N/A

Methodology:

This measure relies on the Institute of Transportation Engineers (ITE) parking generation rates based on proposed land uses in the city and assumes a 15% reduction in parking spaces compared to ITE rates. Additionally, this measure assumes that the City will implement a metered parking program in the downtown areas specified in the Downtown Parking Management Plan by 2020.

Sources:

City of Vallejo. 2005. Downtown Vallejo Specific Plan.

City of Vallejo. 2007. Downtown Parking Management Plan. http://www.ci.vallejo.ca.us/uploads/56/010208%20-%20Downtown%20Parking%20Management%20Plan%20-%20Draft%20Executive%20Summare%2011192007.pdf

City of Vallejo. 2010. Municipal Code. http://library.municode.com/index.aspx?clientId=16106&stateId=5&stateName=California&customBanner=16106.jpg&imageclass=L&cl=16106.txt.

TDM-5 Transit

Support a convenient, attractive, and comprehensive transit system.

Action Items:

- Prioritize and pursue transit improvements that serve local businesses and job sites.
- Encourage major employers to provide free or discounted transit passes or other incentives to employees for using transit.
- On Mare Island, create a network of bicycle and pedestrian paths that connect with transit services, combined with a street framework that is transit-friendly and sensitive to Mare Island's historic character.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions (MTCO2e):	-1,190	Annual ridership counts
2020 Reductions (MTCO2e):	-1,100	Annual ridership counts
2035 Reductions (MTCO2e):	-1,230	Annual ridership counts

Methodology:

Increased access to local and regional transit systems like Vallejo Transit, Baylink Ferry, and shuttles to and from BART stations will reduce VMT by .5%. 2010 GHG reductions are based on increased ridership on local transit routes between 2008 and 2010 based on passenger miles on the Vallejo transit system reported to the National Transit Database.

Sources:

Federal Transportation Adminstration. 2009. National Transit Database: City of Vallejo Transportation Program Profile. http://www.ntdprogram.gov/ntdprogram/pubs/profiles/2008/ agency_profiles/9028.pdf.

Solano Transportation Authority. 2007a. Countywide Ridership Study, Baylink Ferry http://www.sta.dst.ca.us/pdfs/SNCI/Transit%20Ridership%20Study/Baylink%20report%203-26.pdf.

Solano Transportation Authority. 2007b. Countywide Ridership Study, Vallejo Transit Inter-City Lines

http://www.sta-snci.com/pdfs/SNCI/Transit%20Ridership%20Study/ Vallejo%20report%20intercity%203-26.pdf.

Solano Transportation Authority. 2007c. Countywide Ridership Study, Vallejo Transit Local Lines. http://www.sta.dst.ca.us/pdfs/SNCI/Transit%20Ridership%20Study/Vallejo%20report%20local%20only%203-26.pdf.

TDM-6 FOOD SYSTEMS

Support convenient access to neighborhood-serving grocery stores and community gardens.

Action Items:

- Encourage the distribution of grocery stores that provide fresh and local foods with convenient access from all residential neighborhoods.
- Improve the distribution, frequency, and attendance of farmers markets in Vallejo.
- Collaborate with community-based organizations in support of community gardens on applicable sites throughout the city.
- Revise zoning standards as necessary to allow small neighborhood markets in appropriate areas.

- Add an additional week-day Farmer's Market in Vallejo.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions (MTCO2e):	Supporting Measure	Percentage of residents within 1/2 mile of grocery store
2020 Reductions (MTCO2e):	Supporting Measure	Percentage of residents within 1/2 mile of grocery store
2035 Reductions (MTCO2e):	Supporting Measure	Percentage of residents within 1/2 mile of grocery store

TDM-7 Commute Behavior

Reduce emissions from commute travel to and from schools and workplaces.

Action Items:

- Encourage a variety of transportation system demand management techniques for new development, including variable work hours and telecommuting.
- Support the establishment and participation in Safe Routes to Schools and similar infrastructure and educational programs that enable safe passage of children and reduce vehicle trips to local schools.
- Collaborate with the Solano Transportation Authority (STA) and Solano County to update the rideshare matching system to include the use of social networking and smart phone platforms and encourage greater use of existing park-and-ride lots.
- Collaborate with STA and local employers to support guaranteed ride home programs including preferential parking spaces, employer-assisted ride-matching databases, recognition programs, and other incentives.
- Participate in and contribute to regional programs to address Bay Area commute alternatives and commute efficiency.

Target Year	GHG Reduction ($MTCO_2e/yr$)	Performance Indicator
2010 Reductions (MTCO2e):	-140	Participation rates in SRTS and rideshare programs
2020 Reductions (MTCO2e):	-2,050	Participation rates in SRTS and rideshare programs
2035 Reductions (MTCO2e):	-2,390	Participation rates in SRTS and rideshare programs

Methodology:

Additional participation in commute trip reduction programs and expansion of Safe Routes To School programs will result in a 1% reduction in VMT.

Sources:

Solano County Transit Authority. 2008. Solano County Safe Routes to School Plan http://www.sta.dst.ca.us/pdfs/Programs/SR2S/final/STA-SR2S%20Final%20Plan%2002-13-2008%20-%20WEB.pdf.

U.S. Census Bureau. 2008. American Communities Survey: City of Vallejo. http://factfinder.census.gov/servlet/ADPTable?_bm=y&-geo_id=16000US0681666&-qr_name=ACS_2008_3YR_G00_DP3YR3&-context=adp&-ds_name=&-tree_id=3308&-_lang=en&-redoLog=false&-format=

TDM-8 JOBS/HOUSING BALANCE

Plan for an improved jobs/housing balance in order to reduce the need for long-distance travel from residences to places of work.

Action Items:

- Update the City General Plan and corresponding regulations to support additional jobs and economic revitalization that improves Vallejo's jobs/housing balance.
- Support the retention and expansion of local anchor and growth industries including Kaiser and Sutter hospitals, as well as Touro University on Mare Island and the California Maritime Academy.
- Review land-use plans and regulations and revise as needed to support additional live/work opportunities

and home occupations, provided they are compatible with the existing neighborhood.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions ($MTCO_2e$):	-80	Jobs to housing ratio; number of affordable housing units
2020 Reductions ($MTCO_2e$):	-1,820	Jobs to housing ratio; number of affordable housing units
2035 Reductions ($MTCO_2e$):	-3,950	Jobs to housing ratio; number of affordable housing units

Methodology:

An improved jobs/housing balance and increased affordable housing will result in a decrease in VMT as residents of Vallejo can reduce work-related trips by living closer to job opportunities.

Sources:

California Air Pollution Control Officers Association. 2010. Quantifying Greenhouse Gas Mitigation Measures.

Nelson/Nygaard, Creating Low-Traffic Developments: Adjusting Site-Level Vehicle Trip Generation Using URBEMIS, 2005. pg. 12.

Sacramento Metropolitan Air Quality Management District. 2007. Recommended Guidance for Land Use Emission Reductions, Version 2.4.

Urbemis 2007 Version 9.2.4. Rimpo and Associates.

OT-1 Efficient and Alternative Fuel Vehicles

Support the expanded use of efficient and alternative fuel vehicles.

Action Items:

- Support continued use of high-occupancy vehicle (HOV) lanes by fuel-efficient and alternative fuel vehicles designated as zero or partial zero emission vehicles (ZEV or PZEV) by the California Air Resources Board through adoption of Climate Action Plan policies and participation on the Metropolitan Transportation Commission and other regional agency committees

- Revise parking requirements for public and new commercial developments to include designated stalls for

low-emitting, fuel-efficient vehicles and carpool/vanpool vehicles for a minimum of 8% of total parking capacity and to pre-wire stalls for future electric vehicle charging stations for 2% of total parking capacity.

- Encourage new gas stations and automotive uses to include biodiesel facilities and/or offer biodiesel retrofits to diesel vehicles.
- Consider creating refueling stations to provide biodiesel fuel, compressed natural gas, or liquefied natural gas.

Target Year	GHG Reduction ($MTCO_2e/yr$)	Performance Indicator
2010 Reductions (MTCO2e):	0	Number of clean vehicle parking stalls; hybrid vehicle sales; annual bridge crossings
2020 Reductions ($MTCO_2e$):	-17,6090	Number of clean vehicle parking stalls; hybrid vehicle sales; annual bridge crossings
2035 Reductions ($MTCO_2e$):	-18,380	Number of clean vehicle parking stalls; hybrid vehicle sales; annual bridge crossings

Methodology:

This measure incorporates the fuel savings and VMT reductions associated with increases in hybrid and alternative fuel vehicles uses as well as reduced intercity travel through increased toll prices and the installation of HOV (high-occupancy vehicle) lanes on nearby highways.

Sources:

California Air Pollution Control Officers Association. 2010. Quantifying and Mitigating Greenhouse Gas Emissions.

California Building Standards Commission. 2010. 2010 California Green Building Standards Code; California Code of Regulations Title 24, Part 11.

California Department of Transportation. 2009. High Occupancy Vehicle Report. http://www.dot.ca.gov/dist4/highwayops/docs/hov_report_2009.pdf.

Department of Transportation. 2001. National Household Travel Survey. Washington, D.C.

Idaho National Laboratory. 2006. Full Size Electric Vehicles: Advanced Vehicle Testing Reports.

Metropolitan Transportation Commission. 2010. Transportation News, Commission Approve Toll Hike Package for Earthquake Safety. http://www.mtc.ca.gov/news/info/toll_increase.htm.

OT-2 Car Sharing

Facilitate a car-sharing network in Vallejo.

Action Items:

- Facilitate and encourage at least one car-sharing company, such as Zip Car and City Car Share, to include Vallejo in its service area by 2020.
- Investigate the possibility of reducing the City's vehicle fleet by using car-sharing vehicles for appropriate City uses by 2020.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions (MTCO2e):	0	N/A
2020 Reductions (MTCO2e):	-740	1% of population participating in car-sharing program
2035 Reductions (MTCO2e):	-2,130	3% of population participating in car-sharing program

Methodology:

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. VMT reduction per participant is estimated at 50%of previous annual vehicle use, of which approximately 50% is assumed to occur in Vallejo.

Sources:

California Air Resources Board. 2007. Emissions Factor (EMFAC) 2007 Software.

Victoria Transportation Policy Institute. 2011. http://www.vtpi.org/index.php

OT-3 ANTI-IDLING AND TRAFFIC CALMING

Support anti-idling and traffic calming infrastructure and enforcement.

Action Items:

- Synchronize, improve, and construct traffic signal/road improvements that reduce vehicle idling.
- Work with the Vallejo Police Department to increase enforcement of state idling restrictions for heavy-duty vehicles.
- -Encourage local schools to implement an anti-idling campaign at pick-up and drop-off areas.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions ($MTCO_2e$):	0	N/A
2020 Reductions ($MTCO_2e$):	-2,010	10% decrease in trip time due to synchronization
2035 Reductions ($MTCO_2e$):	-1,870	10% decrease in trip time due to synchronization

Methodology:

Vehicles consume .5 gallon of gasoline fuel for every hour of idling. Conversion to equivalent VMT completed using Solano County MPG from EMFAC2007 - 18.1 for gasoline

Sources:

Bloomekatz, Ari B. October 8, 2009. Los Angeles Times, Metro Blog, 82% of L.A.'s signal-controlled intersections are now synchronized, mayor will announce. Retrieved from: http://latimesblogs.latimes.com/lanow/2009/10/82-of-las-streets-now-covered-by-synchronized-traffic-lights.html

OT-4 ZERO EMISSION VEHICLE STATIONS

Provide electric vehicle charging stations.

Action Items:

- Install additional electric vehicle charging stations at municipal facilities and appropriate on-street locations for public use.
- Coordinate with regional agencies to install charging stations in high traffic areas through grant-funded programs encouraging electric vehicle use.
- Use small- and large-scale solar panels to power or supplement charging stations.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions ($MTCO_2e$):	0	N/A
2020 Reductions ($MTCO_2e$):	-80	100 charging stations installed
2035 Reductions ($MTCO_2e$):	-160	250 charging stations installed

Methodology:

The installation of vehicle charging stations throughout the city will encourage the purchase of electric vehicles for use by residents and businesses. GHG reductions from increased electric vehicle use include the fuel emissions reduced and the increased electricity used to charge the vehicles.

Sources:

Idaho National Laboratory. 2006. Full Size Electric Vehicles. http://avt.inel.gov.

National Household Travel Survey. 2001.

U.S. Department of Energy. 2010. http://fueleconomy.gov.

W-1 Water Conservation Efforts

Promote and require water conservation through outreach and pricing.

Action Items:

- Continue to provide water customers with information on conservation techniques, services, devices, and

rebates by posting information at vallejowater.org or through other outreach methods.

- Continue to enforce the City's Wasteful Water Use Prohibition Ordinance.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions ($MTCO_2e$):	0	N/A
2020 Reductions ($MTCO_2e$):	-490	8% reduction in water use
2035 Reductions ($MTCO_2e$):	-890	15% reduction in water use

Methodology:

Additional outreach and enforcement of the City's wasteful water use ordinance will result in an 8% reduction in commercial and residential water use by 2020. Decreased water use will result in lower volumes of water and therefore lower electricity use to deliver, treat, and discharge water. This measure will result in a decrease in use of over 470 million gallons of water annually.

Sources:

City of Vallejo. 2009. Proposed Water Rate Increase FY 2009/10 – FY 2013/14. http://www.ci.vallejo.ca.us/uploads/568/Common%20Public%20Questions%20&%20Answers%202009.pdf.

City of Vallejo. 2010. City of Vallejo Municipal Code: Vallejo Wasteful Water Use Ordinance. http://search.municode.com/html/16106/level3/TIT11WA_IIMIWARE_CH11.54WAWAUSPROR.html.

W-2 DEVELOPMENT STANDARDS FOR WATER CONSERVATION

Require water conservation in all new buildings and landscapes.

Action Items:

- Per the minimum requirements of the 2010 CALGreen Code, ensure that all new non-residential buildings larger than 50,000 square feet install individual water meters for each tenant space projected to consume more than 100 gallons per day..

- Per the minimum requirements of the 2010 CALGreen Code, ensure that new non-residential facilities with

1,000 to 5,000 square feet of irrigated landscaped space provide an additional water meter or submeter for landscaping uses.

- Revise development standards to support the use of greywater, recycled water, and rainwater catchment systems in all zones.
- Per the voluntary requirements of the 2010 CALGreen Code, encourage newly constructed development to treat at least 40% of the average annual rainfall on-site through low impact development strategies.
- Per the minimum requirements of the 2010 CALGreen Code, require a minimum of 20% of the total parking, walkway, and porch area surfaces serving single-family and multi-family residential buildings under 4 units to be permeable to facilitate on-site retention of water and reduce water runoff.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions ($MTCO_2e$):	0	N/A
2020 Reductions ($MTCO_2e$):	-40	20% reduction in indoor water use
2035 Reductions ($MTCO_2e$):	-90	20% reduction in indoor water use

Methodology:

Decreased water use from new buildings will result in lower volumes of water and therefore lower electricity use to deliver, treat, and discharge water.

Sources:

California Building Standards Commission. 2010. California Code of Regulations, Title 24: Part 11: California Green Building Standards Code. http://www.documents.dgs.ca.gov/bsc/CALGreen/2010_CA_Green_Bldg.pdf.

W-3 Recycling and Compost Efforts

Support waste diversion through composting and recycling programs.

Action Items:

- Collaborate with CalRecycle and VALCORE Community Recycling to continue to host recycling and composting workshops and to disseminate information.
- Provide links to information on composting and VALCORE composting services and classes on the City's

website and at other appropriate venues.

- Prepare a list of GHG-reducing best practices for material management to be considered during the solid waste franchise selection process and applicable City permit processes for major development projects.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions ($MTCO_2e$):	-3,070	60% diversion rate
2020 Reductions ($MTCO_2e$):	-8,390	75% diversion rate
2035 Reductions (MTCO2e):	-14,160	85% diversion rate

Methodology:

Increased diversion rates through the expansion of recycling and composting opportunities will result in decreased amounts of waste being sent to landfills and therefore a decrease in waste-related GHG emissions.

Sources:

Cal Recycle. 2011. Jurisdiction Profile for City of Vallejo. http://www.calrecycle.ca.gov/profiles/Juris/JurProfile1.asp?RG=C&JURID=554&JUR=Vallejo.

W-4 DEVELOPMENT STANDARDS FOR RECYCLING AND COMPOSTING

Require waste diversion and the use of recycled materials in new development.

Action Items:

- Propose adoption of a Construction/Demolition Waste Reuse and Recycling Ordinance that requires the diversion of at least 50% of construction and demolition waste from landfills.

- Support the development of additional markets for recycled content products by requiring new developments to include recycled content materials at a minimum of 10% of total materials.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions ($MTCO_2e$):	Supporting Measure	50% diversion rate

2020 Reductions ($MTCO_2e$):	Supporting Measure	50% diversion rate
2035 Reductions ($MTCO_2e$):	Supporting Measure	50% diversion rate

Methodology:

This measure will increase the minimum amount of construction and demolition waste to be diverted by 15%.

Sources:

California Integrated Waste Management Board. 2004. Statewide Waste Characterization Study.

OR-1 Lawn & Garden Equipment

Encourage the use of electrified and higher-efficiency lawn and garden equipment.

Action Items:

- Support BAAQMD's efforts to re-establish a voluntary exchange program for residential lawnmowers and backpack-style leaf blowers.
- Require new buildings to provide electrical outlets on the exterior in an accessible location to charge electric-powered lawn and garden equipment.
- Encourage the replacement of high-maintenance landscapes (like grass turf) with native vegetation to reduce the need for gas-powered lawn and garden equipment.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions ($MTCO_2e$):	0	N/A
2020 Reductions ($MTCO_2e$):	-30	Replace 25% of gas leaf blowers; replace 15% of gas lawnmowers
2035 Reductions ($MTCO_2e$):	-50	Replace 50% of gas leaf blowers; replace 25% of gas lawnmowers

Methodology:

This measure assumes that 25% of gasoline-powered leaf blowers and 15% of gas-powered lawnmowers will be

replaced with all-electric equipment by 2020. CARB Off-Road Software provides total equipment population and fuel consumption by equipment type for Solano County, which was used to determine average emissions per piece of equipment in Vallejo.

Sources:

Bay Area Air Quality Management District. 2010. History of the Air District: 1995-200. http://www.baaqmd.gov/Divisions/Communications-and-Outreach/News-Media-and-Features/History-of-Air-District-2005/1995--2000.aspx

California Air Resources Board. 2007. Off-Road Software.

OR-2 CONSTRUCTION EQUIPMENT

Reduce emissions from heavy-duty construction equipment by limiting idling and utilizing cleaner fuels, equipment, and vehicles.

Action Items:

- Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]), or less. Clear signage will be provided at all access points to remind construction workers of idling restrictions.
- Construction equipment must be maintained per manufacturer's specifications.
- Planning and Building staff will work with project applicants to limit GHG emissions from construction equipment by selecting one of the following measures, at a minimum, as appropriate to the construction project:
  - Substitute electrified equipment for diesel- and gasoline-powered equipment where practical.
  - Use alternatively fueled construction equipment on-site, where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel.
  - Avoid the use on on-site generators by connecting to grid electricity or utilizing solar-powered equipment.
  - d. Limit heavy-duty equipment idling time to a period of 3 minutes or less, exceeding CARB regulation

minimum requirements of 5 minutes.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions ($MTCO_2e$):	Supporting Measure	Percentage of construction projects using alternative fuel equipment
2020 Reductions ($MTCO_2e$):	Supporting Measure	Percentage of construction projects using alternative fuel equipment
2035 Reductions ($MTCO_2e$):	Supporting Measure	Percentage of construction projects using alternative fuel equipment

A-1 Regional Coordination

Participate in regional efforts to analyze and prepare for the impacts of climate change in the Bay Area.

Action Items:

- Join regional adaptation and resiliency task forces such as that of the San Francisco Bay Area Conservation and Development Commission (BCDC) and the Joint Policy Committee (JPC).
- Appoint a staff liaison to attend and participate in regional meetings focusing on adaptation and resilience and to report to staff on a regular basis.

Target Year	GHG Reduction ($MTCO_2e$/yr)	Performance Indicator
2010 Reductions (MTCO2e):	Supporting Measure	N/A
2020 Reductions (MTCO2e):	Supporting Measure	N/A
2035 Reductions (MTCO2e):	Supporting Measure	N/A

A-2 Preparedness

Ensure that Vallejo is prepared for potential environmental risks and hazards related to climate change, with a special emphasis on vulnerable populations.

Action Items:

- Regularly train, inform, and solicit feedback from the City's Fire and Police departments on potential climate change risks and hazards.
- Revise City Hazard Mitigation Plans and other applicable documents such as long-range capital improvement plans to address climate change issues and best practices during required updates and as funding permits.
- Monitor climate change science and policy, and regularly inform stakeholders of new information.

Target Year	GHG Reduction ($MTCO_2e/yr$)	Performance Indicator
2010 Reductions (MTCO2e):	Supporting Measure	N/A
2020 Reductions (MTCO2e):	Supporting Measure	N/A
2035 Reductions (MTCO2e):	Supporting Measure	N/A

A-3 ADAPTATION MAINSTREAMING

Integrate potential climate change impacts into local planning documents and processes.

Action Items:

- In development review, analyze and disclose possible impacts of climate change on the project or plan area, with an emphasis on sea level rise.
- Integrate climate change adaptation into future updates of the Zoning Code, Building Code, General Plan, and other related documents.

Target Year	GHG Reduction ($MTCO_2e/yr$)	Performance Indicator
2010 Reductions (MTCO2e):	Supporting Measure	N/A
2020 Reductions (MTCO2e):	Supporting Measure	N/A
2035 Reductions (MTCO2e):	Supporting Measure	N/A

Appendix D

City of Vallejo Climate Action Plan

Compliance Checklist for New Development

COMPLIANCE CHECKLIST FOR NEW DEVELOPMENT

CITY OF VALLEJO QUALIFIED GREENHOUSE GAS REDUCTION PLAN

The following table will be used to determine compliance with the City's Climate Action Plan (CAP), a Qualified Greenhouse Gas Reduction Plan according to the Bay Area Air Quality Management District (BAAQMD) California Environmental Quality Act (CEQA) guidelines. A new development may use the CAP as a performance based threshold of significance for greenhouse gas emissions by demonstrating compliance with the CAP's goals, measures, and actions. The checklist below will aid in this endeavor.

The checklist will be updated regularly as the CAP's goals, policies and actions are implemented. The CAP policy language will be replaced by actual municipal code sections, where applicable.

Topic	Policy	City Requirements	Project Requirements	Compliance	Discussion
Energy Efficiency					
Building Standards	Require all new development to meet minimum energy efficiency and green building requirements, as amended and encourage new development to exceed Title 24 Energy Efficiency and CALGreen Standards.	Adopt the California Title 24 minimum requirements and encourage new construction and major remodels to adhere to a Tier 1 or Tier 2 standard of the CALGreen Code.	Comply with Title 24 minimum requirements and consider adhering to the Tier 1 or Tier 2 standards of the CALGreen Code for Energy Efficiency.	☐ Complies ☐ Complies with Intent of Project Requirement ☐ Not Applicable ☐ Does Not Comply	
		Require news constructed buildings and recommend that remodels over 50% and tenant improvements demonstrate compliance with the mandatory CALGreen Code requirements by completing a green building checklist when submitting a request for building permits.	Complete CAP checklist.		
		Consider requiring new development to comply with the Tier 1 requirements of CALGreen, Part 11 of the California Building Standards Code. This optional measure may be necessary to address any shortfall in attaining reduction objectives.			
Smart Meters	Increase the community's awareness and utilization of real-time energy consumption data available through PG&E's SmartMeter program.	Require newly constructed buildings and recommend that major remodels install indoor real-time energy monitors.	Install indoor real-time energy monitor in each unit or tenant space.	☐ Complies ☐ Complies with Intent of Project Requirement ☐ Not Applicable ☐ Does Not Comply	
		Connect businesses and residents with rebate programs that give priority to appliances with smart grid technology.	Provide information to prospective buyers or tenants on available rebates for appliances with smart grid enabled technology		
Cool Roofs and Pavements	Increase tree planting and the use of cool roofs and cool pavement materials to reduce the urban heat island effect and corresponding energy consumption. Implement tree replacement policy for	Actively inspect and enforce state requirements for cool roofs on residential and nonresidential roofing projects. Require new buildings to meet Title 24 and recommend that new buildings meet CALGreen Tier 1 requirements for cool roofs, which require a minimum solar reflectance index (SRI) of 10 for steep slope roofs and 64 for low slope roofs.	Comply with minimum Title 24 requirements for cool roofs to have a minimum SRI of 10 for steep slope and 64 for low slope roofs on residential and nonresidential projects.	☐ Complies ☐ Complies with Intent of Project Requirement ☐ Not Applicable	
		Establish standards for new development and major remodels to reduce exterior heat gain for 50% of non-roof impervious site surfaces (roads, sidewalks, courtyards, parking lots, driveways) through one or more of the following mechanisms:	Reduce exterior heat gain by planting vegetation, installing solar panel shade structures, or utilizing paving materials with a		

COMPLIANCE CHECKLIST FOR NEW DEVELOPMENT

Topic	Policy	City Requirements	Project Requirements	Compliance	Discussion
	projects where tree removal is necessary.	▪ Achieve 50% paved surface shading within five to ten years by planting trees and other vegetation and/or installing solar panels or shading structures above parking.	minimum SRI of 29 for at least 50% of non-roof impervious site surfaces.	☐ Does Not Comply	
		▪ Use paving materials with an SRI of at least 29 for all surfaces.			
		Maintain and expand Vallejo's urban forest, including street trees and trees on private property.	Install and maintain street trees in compliance with current development standards		
		For public improvements and public projects, require the use of high albedo paving material for sidewalks, roads, crosswalks, parking lots, and driveways.	Utilize high albedo paving material when required to install or renovate sidewalks, roads, crosswalks, parking lots, and driveways		
Renewable Energy					
Renewable Energy Installations	Support the installation of small-scale renewable energy systems including solar photovoltaic, solar thermal, and wind, river current, and tidal energy conversion systems.	Encourage new homes and businesses to be pre-wired and pre-plumbed for solar and solar thermal installations.	Pre-wire and pre-plumb new residential and commercial buildings for solar and solar thermal installations.	☐ Complies ☐ Complies with Intent of Project Requirement ☐ Not Applicable ☐ Does Not Comply	
Transportation & Land Use					
	Promote mixed-use, higher-density development near transit nodes.	Implement elements in the Downtown Specific Plan that encourage pedestrian-oriented plazas, walkways, bike trails, bike lanes, and street furniture and connections to other community areas. Promote pedestrian convenience and recreational opportunities through development conditions requiring sidewalks, walking paths, or hiking trails connecting various land uses and including safety amenities such as lighting and signage.	Include sidewalks, walking paths, or hiking trails connecting various land uses and including safety amenities such as lighting and signage throughout the project site for projects with the Downtown Specific Plan.	☐ Complies ☐ Complies with Intent of Project Requirement ☐ Not Applicable ☐ Does Not Comply	
		Implement elements in the Downtown Specific Plan that promote mixed-use development and provide commercial services such as day care, restaurants, banks, and stores near to employment centers, where feasible.	Incorporate commercial services such as day care, restaurants, banks, and stores near employment centers where feasible in mixed use projects for projects within the Downtown Specific Plan.		
	Expand and link the network of pedestrian and bicycle paths and facilities through preparation of a Bicycle and Pedestrian Master Plan, with the goal of increasing the bicycle and pedestrian mode share 20% by 2035.	Revise zoning standards to require the provision of bicycle support facilities (lockers, shower rooms, etc.) for appropriate development at a rate of 1 changing room and shower per 200 occupants.	Provide bicycle support facilities at a rate of 1 changing room and shower per 200 occupants within non-residential developments.	☐ Complies ☐ Complies with Intent of Project Requirement ☐ Not Applicable ☐ Does Not Comply	

Topic	Policy	City Requirements	Project Requirements	Compliance	Discussion
	Revise parking requirements for new commercial and multi-family residential projects and implement the Downtown Parking Meter Installation Plan.	Revise parking requirements for new commercial and multi-family residential projects to provide bike racks for 5% of the building's projected visitors within 200 feet of the building's entrance for commercial projects and one long-term bicycle storage space per two multi-family units.	Provide bike racks for 5% of the projected building occupants within 200 feet of the building entrance and one long-term bicycle storage space per two-multi-family units.	☐ Complies ☐ Complies with Intent of Project Requirement ☐ Not Applicable ☐ Does Not Comply	
		Allow up to a 15% reduction in required private vehicle parking spaces in new commercial and multi-family residential projects if justified in an approved trip reduction plan.	Consider reducing the number of required vehicle parking spaces by up to 15% through the development of an approved trip reduction program.		
		Encourage shared parking programs in mixed-use and transit-oriented development areas.	Consider utilizing shared parking in mixed-use and transit-oriented developments.		
		Design parking lots, where feasible, to include clearly marked and shaded pedestrian pathways between transit facilities and building entrances.	Design parking lots, where feasible, to include clearly marked and shaded pedestrian pathways between transit facilities and building entrances.		
	Reduce emissions from commute travel to and from schools and workplaces.	Encourage a variety of transportation system demand management techniques for new development, including variable work hours and telecommuting.	Implement applicable transportation demand management programs and techniques.	☐ Complies ☐ Complies with Intent of Project Requirement ☐ Not Applicable ☐ Does Not Comply	
		Support the establishment and participation in Safe Routes to Schools and similar infrastructure and educational programs that enable safe passage of children and reduce vehicle trips to local schools.	Install infrastructure within and adjacent to the project site to ensure the safe passage of children to and from school.		
		Collaborate with the Solano Transportation Authority (STA) and Solano County to update the rideshare matching system to include the use of social networking and smart phone platforms and encourage greater use of existing park-and-ride lots.	Encourage employers and employees to utilize the Solano transit Authority's rideshare matching system.		
		Collaborate with STA and local employers to support guaranteed ride home programs including preferential parking spaces, employer-assisted ride-matching databases, recognition programs, and other incentives.	Encourage employers and employees to participate in STA's ridesharing and support services.		
	Plan for an improved jobs/housing balance in order to reduce the need for long-distance travel from residences to places of work.	Update the City General Plan and corresponding regulations to support additional jobs and economic revitalization that improves Vallejo's jobs/housing balance.	Provide jobs and economic revitalization that improves Vallejo's jobs/housing balance.	☐ Complies ☐ Complies with Intent of Project Requirement ☐ Not Applicable ☐ Does Not Comply	
		Review land-use plans and regulations and revise as needed to support additional live/work opportunities and home occupations, provided they are compatible with the existing neighborhood.	Provide live/work opportunities when compatible within existing neighborhood.		

COMPLIANCE CHECKLIST FOR NEW DEVELOPMENT

Topic	Policy	City Requirements	Project Requirements	Compliance	Discussion
Efficient and Alternative Fuel Vehicles	Support the expanded use of efficient and alternative fuel vehicles.	Revise parking requirements for public and newly constructed commercial developments to include designated stalls for low-emitting, fuel-efficient vehicles and carpool/vanpool vehicles for a minimum of 8% of total parking capacity and to pre-wire stalls for future electric vehicle charging stations for 2% of total parking capacity.	Include designated stalls for low-emitting, fuel-efficient vehicles and carpool/vanpool vehicles for a minimum of 8% of total non-residential parking capacity and pre-wire stalls for future electric vehicle charging stations for 2% of total parking capacity.	☐ Complies ☐ Complies with Intent of Project Requirement ☐ Not Applicable ☐ Does Not Comply	
		Encourage new gas stations and automotive uses to include biodiesel facilities and/or offer biodiesel retrofits to diesel vehicles.	Consider including alternative fuel stations within the project.		
Water Conservation					
Development Standards for Water Conservation	Require water conservation in all new buildings and landscapes.	Per the minimum requirements of the 2010 CALGreen Code, ensure that all new non-residential buildings larger than 50,000 square feet install individual water meters for each tenant space projected to consume more than 100 gallons per day.	Install individual water meters for each tenant space projected to consume more than 100 gallons per day in all non-residential buildings larger than 50,000 square feet.	☐ Complies ☐ Complies with Intent of Project Requirement ☐ Not Applicable ☐ Does Not Comply	
		Per the minimum requirements of the 2010 CALGreen Code, ensure that all new non-residential facilities with 1,000 to 5,000 square feet of irrigated landscaped space provide an additional water meter or sub-meter for landscaping uses.	Provide an additional water meter or sub-meter for landscaping uses for all new non-residential facilities with 1,000 to 5,000 square feet of irrigated landscaped space.		
		Revise development standards to support the use of greywater, recycled water, and rainwater catchment systems in all zones.	Consider installing greywater, recycled water, and rainwater catchment systems if feasible.		
		Per the voluntary requirements of the 2010 CALGreen Code, encourage newly constructed development to treat at least 40% of the average annual rainfall on-site through low impact development strategies.	Implement low impact development strategies in new non-residential projects to treat a minimum of 40% of the average annual rainfall on-site.		
		Per the minimum requirements of the 2010 CALGreen Code, require a minimum of 20% of the total parking, walkway, and porch area surfaces serving single-family and multi-family residential buildings under 4 units to be permeable to facilitate on-site retention of water and reduce water run-off.	Facilitate on-site retention of water and reduce water run-off by installing permeable surfaces for a minimum of 20% of the total parking, walkway, and porch area surfaces serving single-family and multi-family residential buildings under 4 units.		
Development Standards for Recycling and Composting	Require waste diversion and the use of recycled materials in new development.	Continue to update the City's Construction/Demolition Waste Reuse and Recycling Ordinance as higher diversion rates become feasible, necessary, or required.	Comply with the City's Construction/Demolition Waste Reuse and Recycling Ordinance.	☐ Complies ☐ Complies with Intent of Project Requirement ☐ Not Applicable ☐ Does Not Comply	
		Support the development of additional markets for recycled content products by requiring new developments to include recycled content materials at a minimum of 10% of total materials.	Incorporate recycled content materials for a minimum of 10% of total materials.		

Topic	Policy	City Requirements	Project Requirements	Compliance	Discussion
Equipment					
Lawn & Garden Equipment	Encourage the use of electrified and higher-efficiency lawn and garden equipment.	Require new buildings to provide electrical outlets on the exterior in an accessible location to charge electric-powered lawn and garden equipment.	Install outdoor electrical outlets on the exterior of each building in an accessible location.	☐ Complies ☐ Complies with Intent of Project Requirement ☐ Not Applicable ☐ Does Not Comply	
		Encourage the replacement of high-maintenance landscapes (like grass turf) with native vegetation to reduce the need for gas-powered lawn and garden equipment.	Consider installing low-maintenance, native landscaping to minimize the need for gas-powered lawn and garden equipment.		
Construction Equipment	Reduce emissions from heavy-duty construction equipment by limiting idling and utilizing cleaner fuels, equipment, and vehicles.	Idling times will be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]), or less. Clear signage will be provided at all access points to remind construction workers of idling restrictions.	Shut construction equipment off when not in use or reduce the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]), or less.	☐ Complies ☐ Complies with Intent of Project Requirement ☐ Not Applicable ☐ Does Not Comply	
		Construction equipment must be maintained per manufacturer's specifications.	Maintain construction equipment per manufacturer's specifications.		
		Planning and Building staff will work with project applicants to limit GHG emissions from construction equipment by selecting one of the following measures, at a minimum, as appropriate to the construction project:	Implement one of the following best practices to minimize construction related GHG emissions:		
		a. Substitute electrified equipment for diesel- and gasoline-powered equipment where practical.	Substitute electrified equipment for diesel- and gasoline-powered equipment where practical.		
		b. Use alternatively fueled construction equipment on-site, where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel.	Use alternatively fueled construction equipment on-site, where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel.		
		c. Avoid the use on on-site generators by connecting to grid electricity or utilizing solar-powered equipment.	Avoid the use on on-site generators by connecting to grid electricity or utilizing solar-powered equipment.		
		d. Limit heavy-duty equipment idling time to a period of 3 minutes or less, exceeding CARB regulation minimum requirements of 5 minutes.	Limit heavy-duty equipment idling time to a period of 3 minutes or less, exceeding CARB regulation minimum requirements of 5 minutes.		
Adaptation					
Adaptation Mainstreaming	Integrate potential climate change impacts into local planning documents and processes.	In development review, analyze and disclose possible impacts of climate change on the project or plan area, with an emphasis on sea level rise.	Review, analyze and disclose possible impacts of climate change on the project or plan area, with an emphasis on sea level rise.	☐ Complies ☐ Complies with Intent of Project Requirement ☐ Not Applicable ☐ Does Not Comply	