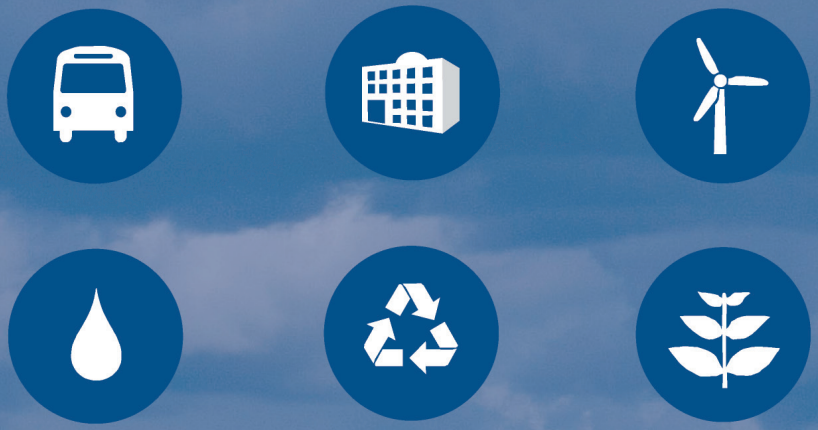
ALAMEDA COUNTY
(UNINCORPORATED AREAS)

Community Climate Action Plan

FINAL



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Preface ACKNOWLEDGEMENTS

The *Community Climate Action Plan* (CAP) is the result of the hard work and persistence of many people (see list below), including staff from various agencies at the Alameda County (Community Development Agency, General Services Agency, Public Works Agency), consultants, and reviewers. They spent many hours researching, writing, crunching numbers, and reviewing the Plan. In particular, Claire Bonham-Carter, Christopher Clement, Culley Thomas, Heather Phillips, Alexander Quinn, and Jeff Henderson from AECOM were major contributors. Nada Djordjevich and the team from G&A Associates led a stellar public outreach and participation process; and Ryan Bell of the General Services Agency gave invaluable input, advice, and technical support throughout the process.

A special thanks to the Bay Area Air Quality Management District (BAAQMD) for providing grant funding through its Climate Protection Grant Program to support the preparation of the County's CAP. A special thanks also to Stopwaste.Org for their initiative and drive in promoting and supporting climate action, and for directly funding the county's emissions inventory report, which was a key foundational element for the development of this CAP.

Thank you to Bruce Jensen, Senior Planner; Howard Lee, Planner; and Elizabeth McElligott, Assistant Deputy Director of the Alameda County Planning Department, for their leadership and support in managing the CAP process. Thank you to Chris Bazar, Alameda County Community Development Agency Director, for his vision in initiating this project. Finally, thanks to the County Board of Supervisors for their continued commitment and leadership: to taking steps to reduce greenhouse gas emissions; preparing for the eventual impacts of climate change; requiring an interagency approach for meeting the County's emission reduction targets; and calling for an integration of climate protection into the County's planning, budgetary, and other processes.

In recognition and honor, the County dedicates the CAP to family, friends, and children, and future generations of unincorporated Alameda County who will be the beneficiaries of our successes.

Albert V. Lopez, M.C.P. Planning Director

Alameda County Board of Supervisors:
Scott Haggerty, District 1
Nadia Lockyer, District 2
Wilma Chan, District 3
Nate Miley, District 4
Keith Carson, District 5

Alameda County Community Development Agency:
Albert Lopez, Planning Director
Elizabeth McElligott, Assistant Planning Director
Bruce Jensen, Planning Department
Howard Lee, Planning Department

General Services Agency:
Ryan Bell, Sustainability Program
Carolyn Bloede, Sustainability Program
Aki Nakao, General Services Agency

Public Works Agency:
Kwablah Attiogbe, Environmental Section
Art Carrera, Road Division
Daniel Woldesenbet, Public Works Agency

Bay Area Air Quality Management District:
Abby Young, Principal Environmental Planner

Reviewers:
Kwablah Attiogbe, Public Works Agency
Ryan Bell, General Services Agency
Art Carrera, Public Works Agency
Eileen Dalton, Redevelopment Agency
Darryl Gray, Neighborhood Preservation and Sustainability
Bill Lambert, Redevelopment Agency
Albert Lopez, Planning Department
Mona Mena, Public Health Department
Daniel Woldesenbet, Public Works Agency

Consultants:
Claire Bonham-Carter, AECOM
Christopher Clement, AECOM
Culley Thomas, AECOM
Heather Phillips, AECOM
Alexander Quinn, AECOM
Jeff Henderson, AECOM
Nada Djordjevich, Gibson & Associates

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Preface CALL TO ACTION

A decade into the 21st century, it is clear that climate change may well represent the greatest challenge to our society's future well-being. Residents of unincorporated Alameda County and its elected leadership have only just begun to address climate change and pursue its goal to shift "business-as-usual" practices across all sectors and towards reducing greenhouse gas emissions. Although the County has received remarkable recognition for its work thus far, it is high praise on a low standard. Perhaps the most important lesson learned to date from integrating sustainability and climate protection principles into County processes and operations to date is the forthright recognition that this is only an opening platform for challenges yet to come.

Each year, we as a society delay action to control emissions, increasing the risk of unavoidable consequences that could necessitate even steeper reductions in the future, with potentially greater economic cost and social disruption. Acting sooner, rather than later, preserves valuable response options, narrows the uncertainties associated with changes to the climate, and potentially lowers the costs of mitigation and adaptation. For these reasons, the County Board of Supervisors unanimously adopted the Climate Protection Leadership Resolution (R-2006-04) and the Cool Counties Climate Stabilization Declaration (R-2007-336), which directed staff to inventory the county's greenhouse gas emissions, to work across agencies to develop a plan for reducing those emissions, and set a goal of reducing emissions by 80 percent by the year 2050. Cities, counties, and other local and regional entities throughout California, North America, and the world, recognize the challenge and have joined the pursuit of reducing global green house gas emissions.

Alameda County's Strategic Vision was adopted by the Board of Supervisors in November 2008 to provide a multi-year, comprehensive, and far-reaching road map that establishes Alameda County as one of the best counties in which to live, work, and do business. The County recognizes that in order to achieve such a vision, climate action must be at the forefront.

Alameda County's elected leadership and its community members know it cannot continue conventional, "business-as-usual" practices when approaching land use, transportation, energy, waste, water, and infrastructure related issues. What is required is nothing short of the transformation and paradigm shift of both the region's economy and its communities, while strengthening the quality of life. Although the County acknowledges such a vision may appear intimidating, it recognizes the immediate need for action, as well as equitable participation from the entirety of unincorporated county community members.

Rendering of pedestrian and bike friendly community.

Preface

CALL TO ACTION

Rendering of transit-oriented development, mixed-use district.

Alameda County residents have a strong tradition of proactive public participation and engagement, actively working to find innovative solutions and taking inspiring action to improve their community. Such a history prepares the County well to take on the unparalleled challenge of climate change, but it will not be easy. Mounting scientific evidence of the increasingly rapid rate of climate change demands that the County draw on its desire for progress and innovation, and act with a renewed sense of urgency.

The severity and magnitude of this problem are matched only by the opportunity, unprecedented in modern history, to rethink and improve upon every aspect of the local unincorporated Alameda County community. In the coming years, the County must:

- Build and retrofit a new generation of energy- and resource-efficient buildings, green infrastructure, and energy systems that both embrace and mimic nature, consuming and producing resources in a closed loop. The vision is that they will be as much a part of the landscape as our waterways, foothills, and other local natural resources.
- Transform all of our neighborhoods into places that provide safe and healthy environments where all residents can meet their trip needs by foot, bike, and public transit.
- Incrementally improve the local economy to generate local green jobs, and bring opportunity and prosperity to every part of our community.
- Ensure that natural systems are healthy, diverse, and resilient in the face of a changing climate.
- Partner with neighboring communities to adapt to climate change, ensuring that the most vulnerable populations are equipped to cope with rising energy prices, and extreme weather events.

Successfully tackling this challenge will require an unwavering commitment to the effort over the course of decades. The County looks forward to what the community and its leadership can accomplish together.

- Staff of the Alameda County Planning Department, Hayward California, 2010

PART 1 INTRODUCTION

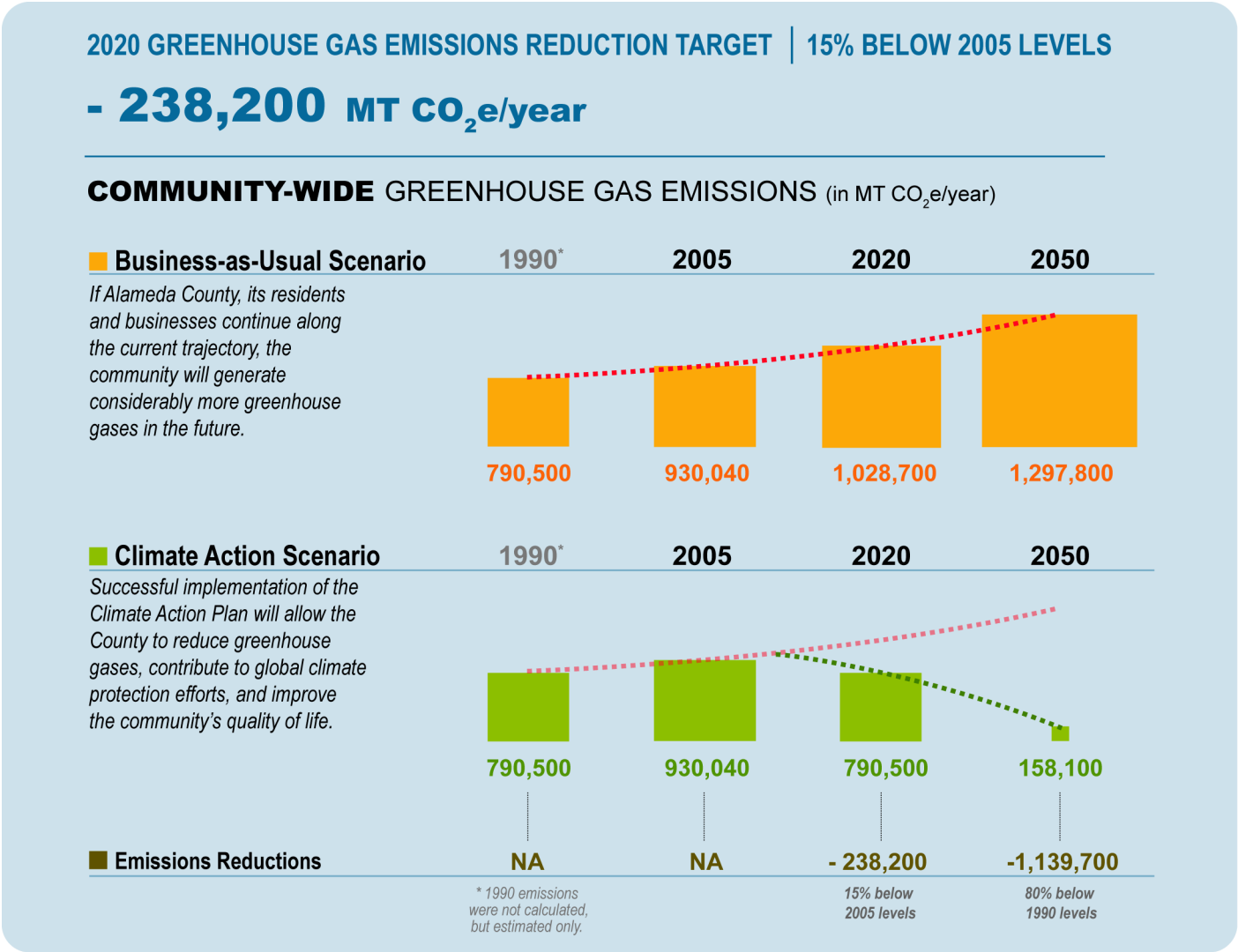
1.1 PURPOSE AND SCOPE OF THE CLIMATE ACTION PLAN

The CAP outlines a course of action to reduce community-wide greenhouse gas (GHG) emissions generated within the unincorporated areas of Alameda County. Successful implementation of the CAP will reduce GHG emissions to 15 percent below 2005 levels by 2020 and set the County on a path toward reducing emissions to 80 percent below 1990 levels by 2050.

The CAP intends to:

- Provide clear guidance to County staff regarding when and how to implement key provisions of the plan
- Demonstrate Alameda County's commitment to comply with State GHG reduction efforts
- Inspire residents and businesses to participate in community efforts to reduce GHG emissions

The graphic below depicts a comparison between two GHG emission scenarios for the unincorporated county: a "business-as-usual" scenario, and a "climate action scenario". The "business-as-usual" scenario illustrates the trend of growth in GHG emissions if current practices were to continue in the county. The "climate action scenario" portrays the trend of reductions in GHG emissions that would be achieved in the county with full implementation of the CAP. The difference in GHG emissions between the two scenarios represents the county's GHG reduction target in terms of metric tons of carbon dioxide equivalent per year (MT CO_2e/yr), which is approximately 238,200 MT CO_2e/yr. This metric equates all GHGs (i.e. carbon dioxide, methane, nitrous oxide, etc.) to their equivalent in global warming potential, a measure of how much a given mass of GHG is estimated to contribute to global warming.



Climate Action

In order to prevent dangerous levels of climate change, humanity will need to dramatically reduce global GHG emissions throughout the coming decades. Between 1990 and 2005, GHG emissions generated in the unincorporated portions of Alameda County grew as population increased. People drove further and more frequently, and consumed more energy in their homes and businesses. If this trend continues, the county will generate considerably more emissions in 2020 and 2050. In order to contribute to global climate protection efforts, the County and its residents and businesses will have to redefine business-as-usual and set a new trajectory toward a low-emissions community.

This CAP defines a path to achieve the county's GHG reduction targets and outlines the detailed implementation steps in the following six action areas: land use, transportation, energy, water, waste, and green infrastructure.

While reducing emissions and improving the quality of life within the community are clear priorities for the County, implementation of the CAP will not be easy. Preparing the CAP is an early step towards achieving the County's GHG reduction targets. For the CAP to be successful, the County will need to partner with federal, State, regional, and local agencies, businesses, organizations, and residents. It will take commitment from the whole community throughout the next decade to translate the vision contained in this document into reality.

1.2 THE CHALLENGE

Direct observations around the globe indicate that warming of the earth's climate system is indisputable. There is consensus among the world's leading climate change scientists that human-generated emissions of heat-trapping GHGs are the primary cause of the current global warming trend. Trend projections indicate that atmospheric concentrations of GHGs will continue to increase throughout this century. If these projections become reality, climate change will threaten our economic well-being, public health, and environment. Data describing atmospheric GHG concentrations over the past 800,000 years demonstrates that concentrations of CO_2 (the primary anthropogenic GHG) have increased dramatically since pre-industrial times, from approximately 280 parts per million (ppm) prior to the industrial revolution in the mid 1800's to approximately 353 ppm in 1990 and approximately 379 ppm in 2005.

In 2000, the United Nations International Panel on Climate Change described potential global emission scenarios for the coming century. The scenarios vary from a best-case characterized by low population growth, clean technologies, and low GHG emissions; to a worst-case where high population and fossil-fuel dependence result in extreme levels of GHG emissions. While some degree of climate change is inevitable, most climate scientists agree that in order to avoid dangerous climate change, atmospheric GHG concentrations need to be stabilized at 350-400 ppm.

Global Effects of Climate Change

Observations from around the globe demonstrate that the earth's global average air and ocean temperatures have steadily increased over the past 100 years. In addition, other prominent evidence indicates that Earth's climate is warming: rapid levels of glacial melt (see figure to the right); considerable reductions in the extent of Northern Hemisphere sea ice; shorter freezing seasons; and decreases in snowpack quantities.

Increasing temperatures threaten to severely impact the world's ecological, social, and economic systems. Potential effects include:

- More frequent and intense extreme weather events
- Increased stress on water resources
- Risk of coastal areas inundation due to sea-level rise
- Reduced food security
- Threats to human health
- Ecosystem loss or degradation
- Economic and geopolitical disruption

Effects of Climate Change in Alameda County

Although most implications of climate change have been examined primarily at global and regional scales, effects on sea level and water supply in Alameda County have also been examined.

Sea Level Rise

The United States Geological Survey (USGS) has created detailed sea level rise projections for the entire San Francisco Bay Area. As indicated in the figure to the right, these projections estimate that by 2100, approximately 200 acres within the unincorporated areas of Alameda County could be inundated if a 4.5-foot increase in sea levels were to occur (Knowles, 2008).

Water Supply

The East Bay Municipal Utilities District (EBMUD) has studied the potential effects of climate change on both water supply and distribution. The agency has determined that the region's water supplies are most vulnerable to a potential shift in the timing of springtime runoff from the normal April-to-July period to winter months, and to decreases in annual runoff volumes. Sea level rise could also threaten Delta water quality and conveyance infrastructure, disrupting water utilities' ability to deliver adequate water supplies to Alameda County.

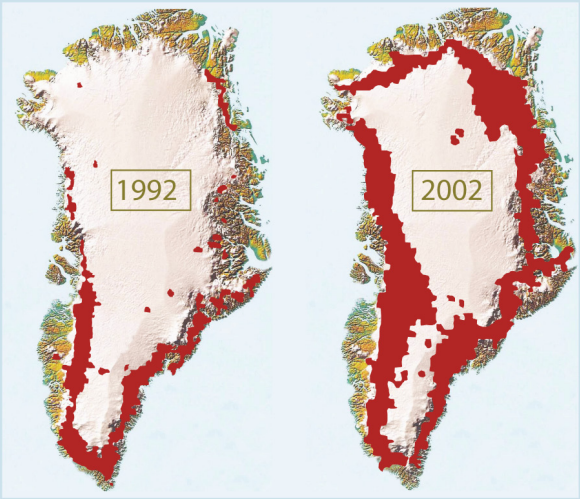
1.3 GLOBAL, FEDERAL, & STATE ACTION

Effective reductions to global GHG emissions will require participation from all leading GHG emitters. The first attempt to set binding GHG emission reduction targets for industrialized countries was embodied in the Kyoto Protocol. While many industrialized nations have ratified the Kyoto Protocol, some major emitting nations have not, including the United States.

During the 15th annual United Nations Climate Change Conference (COP15) held in Copenhagen, Denmark in December 2009, global leaders agreed to take action to limit global warming to 2 degrees Celsius, as compared to a projected rise in average global temperature of approximately 6 degrees Celsius (ranges vary according to the model or study cited). However, the leaders and representatives did not craft a binding international reduction agreement or provide details of how this goal will be achieved.

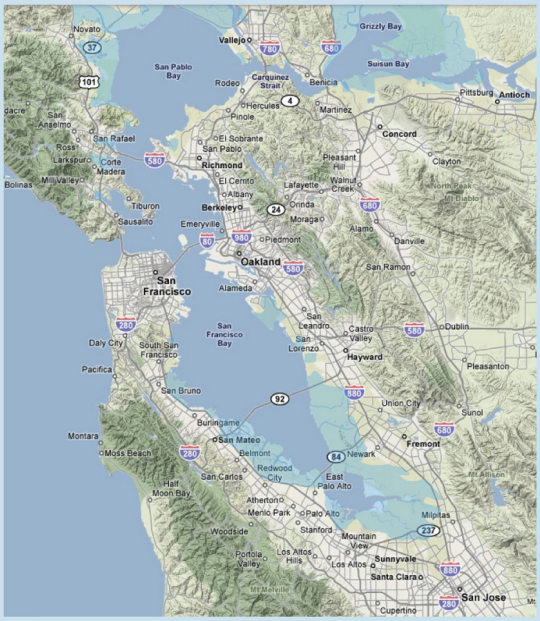
Federal Action

At COP15, President Obama announced plans to reduce U.S. GHG emissions by 17 percent from current levels by 2020. This provisional target is in line with current legislation in both chambers of Congress and if passed would become the nation's working GHG reduction target.



Glacial Melt Extent in Greenland

Source: Arctic Impacts of Global Warming, Cambridge Press, 2004



4.5-Foot Sea Level Rise in SF Bay Area

Source: Knowles, USDA,2009; Adapted by AECOM 2010

State Action

California has adopted executive orders and enacted legislation aimed at reducing the State's GHG emissions. Key statewide emission reduction legislation and actions to date include:

Executive Order S-3-05 (2005)

In June 2005, Governor Schwarzenegger signed Executive Order S-3-05, proclaiming that California is vulnerable to the effects of climate change, including reduced snowpack in the Sierra Nevada Mountains, exacerbated air quality problems, and sea level rise. To address these concerns, the executive order established targets for total GHG emissions which

include reducing GHG emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

Assembly Bill 32 (2006)

In September 2006, Governor Schwarzenegger signed Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. AB 32 requires California to reduce statewide GHG emissions to 1990 levels by 2020.

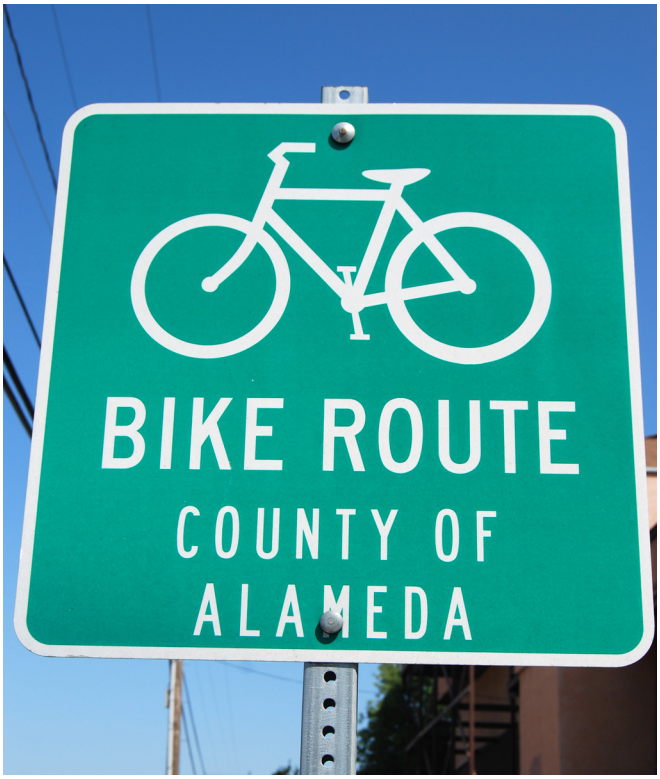
California's Climate Change Scoping Plan

In December 2008, the Air Resource Board (ARB) approved the Climate Change Scoping Plan (Scoping Plan), outlining the State's plan to achieve GHG reductions in California required by AB 32. The Scoping Plan describes the main strategies California will implement to reduce 169 million MT CO_2e, or approximately 28 percent from the State's projected 2020 emission level under a "business-as-usual" scenario. The Scoping Plan also includes ARB-recommended GHG reductions for each emissions sector of the State's GHG inventory.

Local Government Roles & Responsibilities

The State acknowledges that local government will play an important role in achieving California's long-term GHG reduction goals. Cities and counties have sole or partial jurisdiction over a wide range of factors that will affect GHG emissions within the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors.

In the Scoping Plan, ARB encourages local governments to adopt reduction targets for municipal operations emissions and community-wide emissions that parallel the State's climate protection efforts. ARB has also provided guidance for cities and counties to reduce community-wide emissions to 15 percent below 2005 levels by 2020.



1.4 COUNTY ACTION

As is true throughout California, the inhabitants of Alameda County contribute to the problem of climate change by consuming energy in their homes and workplaces, travelling, consuming goods and services, generating waste and other GHG generating activities. Thus, the County and its residents and businesses also have a great potential to take action and contribute to greenhouse gas emissions reduction efforts.

Alameda County Leadership on Climate Change

Alameda County has a long history of promoting environmental sustainability and adopting actions that help to reduce greenhouse gas emissions.

In 2006, the Board of Supervisors voted unanimously to adopt the Climate Change Leadership Resolution (R-2006-20). This resolution committed the County to take steps to reduce greenhouse gas emissions and adapt to the effects of climate change. It also established the County's climate protection strategy, required an inter-agency approach for meeting the established reduction targets, and called for integrating climate protection into the County's planning, budgetary, and other processes.

In 2007, the Alameda County Board of Supervisors voted unanimously to sign the Cool Counties Climate Stabilization Declaration (R-2007-336), which committed the County to work towards achieving an 80 percent reduction in greenhouse gas emissions by 2050.

Through these and other resolutions, Alameda County has formally recognized that:

- Climate change threatens long-term human and environmental health, social well-being, and economic vitality of the county.
- Rapid and significant reductions of greenhouse gas emissions are needed to prevent higher temperatures and the associated severe local effects.
- Counties have a unique role to play in climate action planning due to their jurisdiction over policy areas such as air quality, land use planning, transportation, forest preservation, water conservation, and wastewater and solid waste management.

In 2008, the Board of Supervisors adopted the Alameda County Strategic Vision, which identifies the environment and sustainability as key County priorities. The values expressed within the document further support the County's climate protection initiatives.

Alameda County Statement of Principles

The CAP reflects the values embodied in the Strategic Vision and the greenhouse gas reduction goals of the previously mentioned resolutions. The plan also strives to achieve the following principles:

- Create long term financial savings through the implementation of cost effective measures to achieve the highest levels of energy and resource efficiency possible;
- Provide the highest quality, accessible service to its citizens;
- Foster safe, healthy, and resilient communities and work environments;
- Implement consistent policies and programs throughout the county that provide for flexibility in implementation; and
- Coordinate efforts and leverage partnerships both between agencies and throughout the region to maximize the impact of the County's efforts.

Current Efforts

Although the CAP lays out a comprehensive road map for reducing greenhouse gas emissions, the origin of the County's efforts to mitigate its impact on climate change precedes this plan. Within its own operations, the County government has operated an extensive waste reduction, reuse, and recycling program; is the largest solar power producer of any county government in the United States; and has undertaken a number of initiatives to reduce the use of water, energy, and toxic chemicals. In parallel with the development of this Community CAP, the County has also produced a Government Services and Operations CAP.

Within the county's unincorporated areas, policies have been adopted that decrease the environmental footprint of these communities and reduce greenhouse gas emissions, including the following efforts:

- Adoption of ordinance to achieve 75 percent waste diversion and reduction by 2010.
- Establishment of green building standards, construction and demolition debris diversion requirements, internal water efficiency ordinance, environmental purchasing policies, commercial and curb side recycling and food waste collection programs.
- Leadership in the development of a county-wide financing district to support energy efficiency retrofits for existing residential buildings.
- Participation in regional land use planning efforts that support transit-oriented, pedestrian-friendly design.
- Development of policies and programs that support sustainable, green business development
- Coordination and facilitation of strategic partnerships to support green business development and green-collar jobs.
- Promotion of local sustainable agriculture to reduce carbon emissions associated with food production, processing, and transport.

The County has also worked closely with its cities and various special districts to promote shared vision for a sustainable future.

- In June 2006, the County and the 14 city governments within its boundaries joined the Alameda County Climate Protection Project. All participants agreed to establish a coordinated effort to reduce GHG emissions, improve air quality, reduce waste, reduce energy use, and save money.
- In December 2006, representatives from the County and all 14 cities within its boundaries met at Summit 2016 to discuss local and global trends; climate change was identified as a top priority.
- In July 2007, the Board of Supervisors sent a letter to all 57 counties within California encouraging them to join the Cool Counties campaign and adopt similar local emission reduction targets.
- In January 2009, the County co-hosted a Climate Forum to promote strategic action, build partnerships, and share information. Over 175 representatives attended from local, regional, and state levels. Participants continue to work together in cross-jurisdictional teams focusing on key action areas, such as energy efficiency, public outreach, transportation, land use, and waste reduction.
- In January 2010, funding was approved for the addition of a 250-kilowatt photovoltaic system to the roof of the Castro Valley library, with the help of a $1.18 million

Alameda County Officials Receiving the Governor's Environmental and Economic Leadership Award

American Reinvestment and Recovery Act (ARRA) loan. The electricity generated by the solar system will reduce the County's power use by $90,600 a year, allowing the loan to be repaid from energy savings within 13 years.

1.5 PUBLIC OUTREACH

As with any local planning process, community involvement is an essential part of its success. For the CAP, input was widely sought within the Alameda unincorporated areas to help shape its content to be relevant and realistic. The public outreach strategy included an online and paper based survey, four community meetings, a dedicated email address and website, and direct outreach at public venues, as described below.

Website

A dedicated CAP webpage was developed on the main County website to provide a brief introduction to the CAP, and served as a repository for community meeting information, supporting documents, and presentations related to the CAP.

Survey

The County developed a short survey to gauge the public's interest and willingness to implement climate protection measures and actions. It was sent to targeted county residents and businesses, stakeholder groups (including schools and faith based groups), and community organizations during the initial phases of the CAP development, and was available at the initial community meetings and on the website. A total of 386 surveys were completed throughout the process.

Community Meetings

Four community meetings were held during the CAP development process in both west and east county venues, in which a total of 61 individuals participated with representatives from 25 agencies, organizations and schools. The initial meetings

provided an opportunity for the community to provide ideas relating to potential GHG reduction strategies. The second meeting sought public comment on the proposed measures and policies in the draft CAP. Community members provided valuable input at the first meeting that was used to help select the measures for the Draft CAP. Community feedback at the second meeting led to revision of some measures, addition of some new measures and removal of others.

Other Outreach Channels

Community meeting notifications were published in eight local newspapers and other relevant publications (such as East Bay Bicycle Coalition and Castro Valley Chamber of Commerce), and emailed to community groups and list serves. Targeted community, agency and organizational stakeholders were also contacted directly by phone and email. Finally, direct outreach efforts occurred at two BART stations during the weekday commute and at two Saturday farmer's markets in order to obtain survey responses and advertise the first community meetings. Statistics on the outreach methods and the survey results are provided in Appendix D.

Continued community support for the CAP is critical to its success, and community members will play an active role to both implement the plan and monitor its effectiveness over time.

1.6 EMISSIONS INVENTORY & PROJECTIONS

The emissions inventory and projections identify the source types, distribution, and overall magnitude of GHG emissions generated within the unincorporated county. This information assists policy makers to develop effective climate protection actions.

Emissions Inventory

The County, in coordination with ICLEI, developed a GHG emissions inventory for both community-wide and government-related sources for the 2005 base year. The inventory was compiled using ICLEI's Clean Air Climate Protection (CACP) Software. The community-wide sources within the CACP software are intended to represent the total GHG emissions occurring within the county and include sectors such as residential, commercial, and industrial energy use; transportation; solid waste; and optional user-defined sectors. Municipal sources, which represent all County-operated buildings or vehicles, are a subset of the community-wide sources and include government buildings, vehicle fleet, solid waste, and streetlights, among others. This inventory was recently updated to include water-related emissions and revised transportation assumptions.

The graphic on the following page presents Alameda County's 2005 community-wide GHG emissions inventory and the percent contribution of each emissions sector. Transportation-related activities contributed approximately 60 percent of the county's annual GHG emissions. Electricity and natural gas consumption within buildings contributed nearly 34 percent of the county's community-wide GHG emissions. GHG emissions associated with the residential portion of energy use were approximately 19 percent, whereas GHG emissions from commercial and industrial energy use were approximately 14 percent. Both the waste and water sectors generated approximately 3 percent each of total 2005 emissions.

Emissions Projections

To determine the GHG emission reductions necessary to achieve Alameda County's target (15 percent reduction in GHG emissions relative to 2005 levels by 2020), the county's GHG emissions were projected for the years 2020, 2035, and 2050 under a trend scenario. The trend scenario assumes that projected growth in population and fuel consumption would be representative of future trends in the county without regulatory action. Though projections were developed for 2020, 2035, and 2050, the CAP on references the 2020 projections, as a means of addressing the county's 2020 reduction target, as directed by the Alameda County Climate Change Leadership Resolution. It should be noted that there is uncertainty in projecting 2035 and 2050 activity and associated emission levels, and that these projections should be considered preliminary estimates subject to change. As 2020 approaches, the County will reevaluate its future GHG reduction targets to better represent progress towards the long-term goals.

Assuming that the same type of current emissions-generating practices continue to occur within Alameda County, the county's GHG emissions are anticipated to increase by 11 percent, 23 percent, and 40 percent over the 2005 baseline level in 2020, 2035, and 2050 respectively.

A description of the methods and sources of information used to project the county's 2020, 2035, and 2050 GHG emissions for each end-use sector (e.g., energy, transportation, waste, water) is provided in Appendix A. All GHG emissions have been calculated in MT CO_2e/yr. A summary of the county's baseline GHG emissions (year 2005), 2020, 2035, and 2050 is shown below in Table 1-1.

Table 1-1: Alameda County Baseline and Projected GHG Emissions and Percent Contributions

Emissions Sector	2005 Baseline MT CO_2e (percent of total emissions)	2020 Projected MT CO_2e (percent of total emissions)	2035 Projected MT CO_2e (percent of total emissions)	2050 Projected MT CO_2e (percent of total emissions)
Transportation	556,000 (59.8%)	611,300 (59.4%)	684,500 (59.7%)	783,700 (60.4%)
Residential Energy Use	179,900 (19.3%)	197,700 (19.2%)	217,600 (19.0%)	239,500 (18.5%)
Commercial/Industrial Energy Use	132,800 (14.3%)	148,800 (14.5%)	168,100 (14.7%)	191,200 (14.7%)
Waste	30,400 (3.3%)	33,400 (3.3%)	37,400 (3.3%)	42,900 (3.3%)
Water Consumption	30,900 (3.3%)	37,300 (3.6%)	39,200 (3.4%)	40,600 (3.1%)
Total	**930,000 (100%)**	**1,028,500 (100%)**	**1,146,800 (100%)**	**1,297,900 (100%)**

Sources: ICLEI 2008; AECOM 2009.

Notes: Totals may not sum exactly due to rounding.

2005 UNINCORPORATED AREA OF ALAMEDA COUNTY GREENHOUSE GAS EMISSIONS INVENTORY

930,000 METRIC TONS CO_2e/year

Transportation ~60%

Residential ~19%

Building Energy ~34%

Commercial/Industrial ~15%

Waste ~3%

Water ~3%

Automobiles and other motor vehicles generate the majority of GHG emissions in the unincorporated areas of the County. Energy use in homes and busineses generated one-third of the community's emmisions. Methane gas resulting from waste disposal in landfills and water-related energy use generate the remaining emissions. The Climate Action Plan contains measures directed at reducing emissions in all of these sectors.

PART 2 CLIMATE ACTION AREAS

Achieving Alameda County's adopted climate protection goals will require considerable changes within the community over the next decade. To implement this transformation, the County will take action in six areas:

TRANSPORTATION

Identifies ways to reduce automobile emissions, including improving pedestrian and bicycle infrastructure, enhancing public transit service, and supporting reductions in single-occupancy vehicle use.

LAND USE

Facilitates pedestrian- and transit-oriented development and seeks to improve the existing jobs-housing balance in the unincorporated county.

BUILDING ENERGY

Emphasizes energy efficiency retrofits for existing buildings, energy performance requirements for new construction, increases use of renewable energy, and improves community energy management.

WATER

Contains water conservation measures applicable to both indoor and outdoor water use.

WASTE

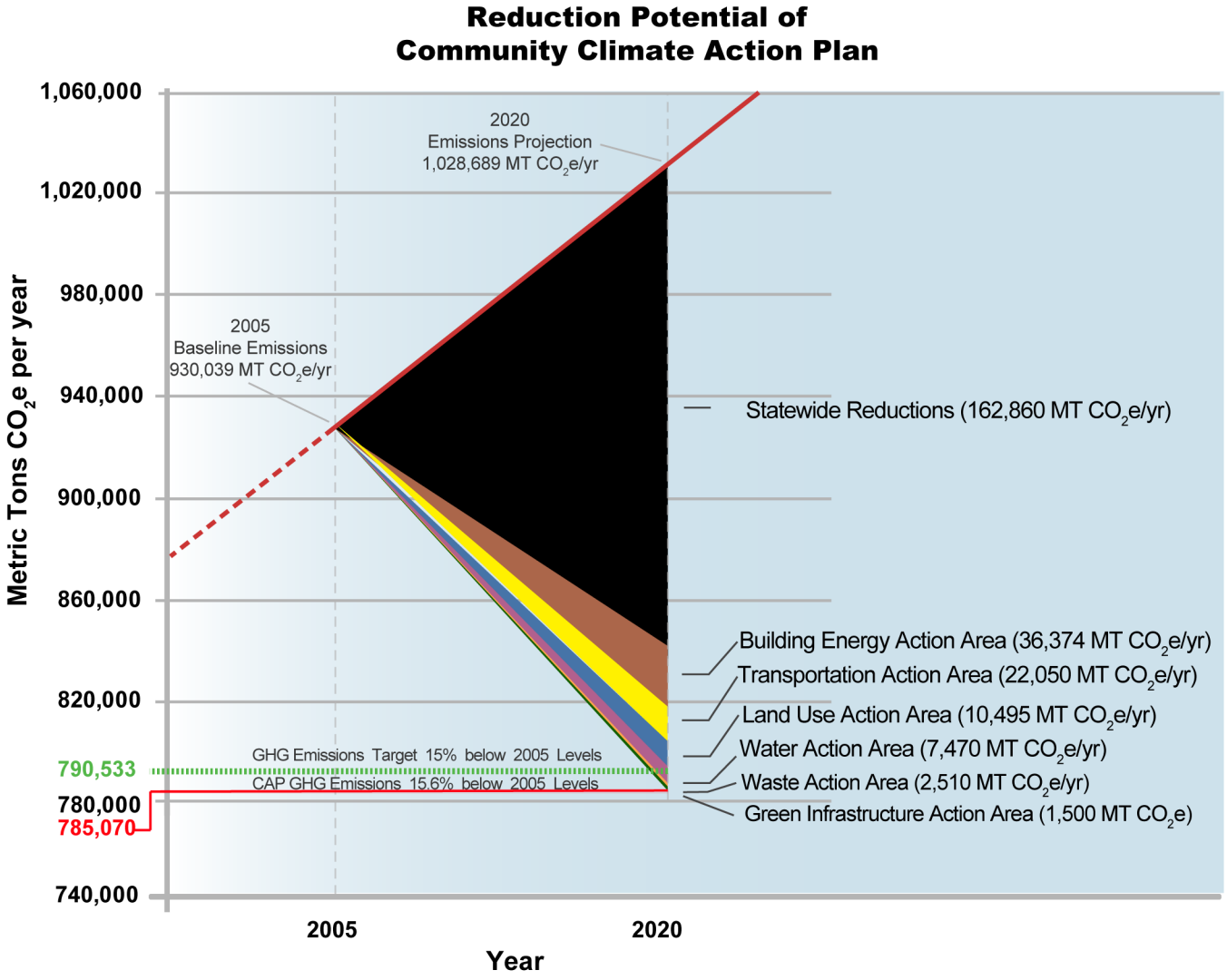
Builds on past County successes by increasing waste diversion rates and encouraging participation in recycling and composting throughout the community.

GREEN INFRASTRUCTURE

Expands the County's urban forest and increase opportunities for urban agriculture.

2.1 GREENHOUSE GAS REDUCTION POTENTIAL

Together, the six action areas have the potential to reduce approximately 243,619 MT CO_2e/yr emissions and accomplish the reduction target of 15 percent below 2005 baseline levels by 2020 (CAP achieves a 15.6 percent reduction below 2005 levels by 2020). The graph below demonstrates that this level of reduction achieves the recommendation of the State's Climate Change Scoping Plan, which calls on local governments to reduce community-wide emissions to 15 percent below current levels by 2020.

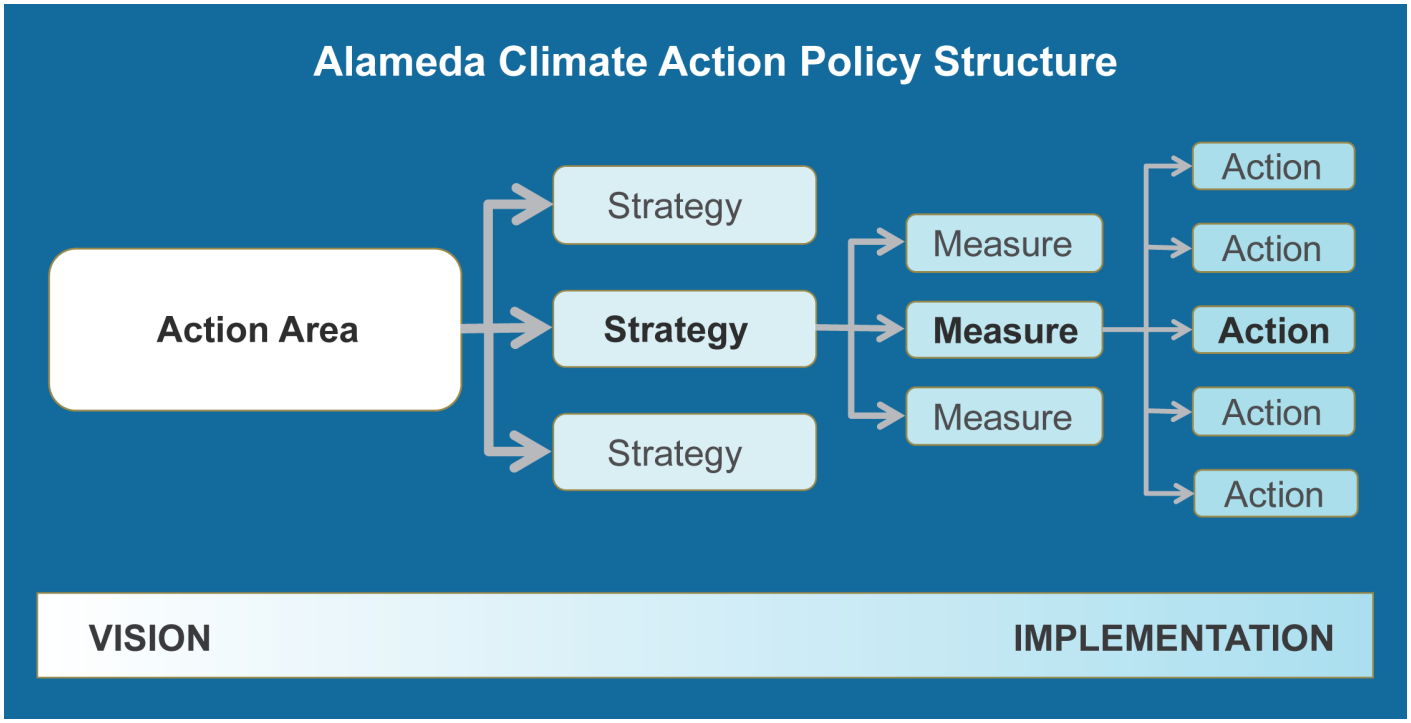


2.2 PART 2 STRUCTURE

This section Part 2 of the CAP is organized into action areas (e.g. transportation, land use, building energy, water, waste, and green infrastructure), which represent the primary avenues for reducing community GHG emissions. Each action area section begins with an introduction to the overarching concepts that tie that particular sector to GHG emission generation and potential reductions. This introduction is followed by the component strategies, measures, and actions that will be used to translate the County's vision into on-the-ground implementation. Strategies identify subcategories within these action areas, are used to group similar measures. Measures define the programs, policies, and projects that the County will take to accomplish its GHG emissions reduction target. Actions, in turn, define the specific steps that County staff and decision-makers will take in order to implement specific measures over the next decade.

Selection of GHG Reduction Measures

The GHG reduction measures were developed through (a) evaluation of existing community conditions, (b) identification of emissions reduction opportunities within the unincorporated county, (c) review of best practices from leading jurisdictions and organizations, and (d) incorporation of State and regional laws, guidelines, and recommendations. After considering a wide range of potential measures, recommended measures were selected based on the following criteria:



- Reduction Potential: estimated level of GHG emissions reductions in 2020
- Estimated Cost: cost of implementation to County and private costs and savings
- Feasibility: technical and political feasibility
- Community Co-benefits: creation additional community enhancements (e.g., quality of life, jobs, etc.)

Measures

While action areas and strategies frame the County's GHG reduction goals, the measures provide policy guidance and direct CAP implementation. For this reason, the bulk of each section is devoted to a discussion of the CAP measures, and contains the following information:

Measure Description

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

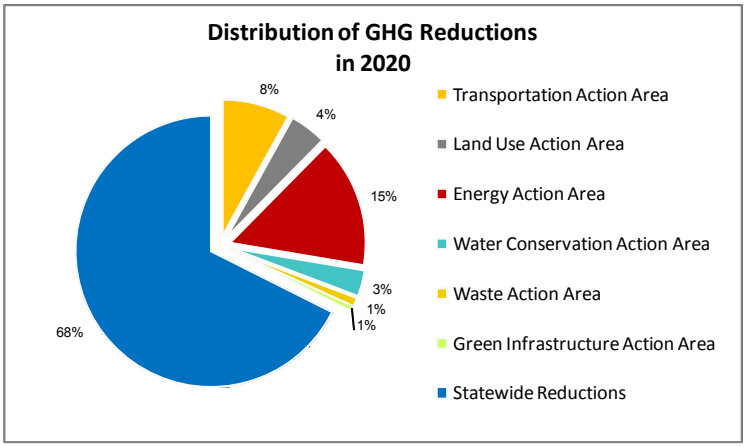
Action and Progress Indicators Tables

Detailed action steps and progress indicators are provided in tables following each measure description. The action table identifies the specific steps that the County will take in order to implement the measure. The table also identifies responsible departments and establishes an implementation schedule for each action. The second table provides progress indicators and performance targets that enable staff, County Supervisors, and the public to track implementation of measures and monitor overall CAP progress.

GHG Reduction Potential

Values within the GHG Reduction Potential column of the summary refer to the estimated annual emission reductions in 2020 in MT CO_2e/yr. The County has quantified the GHG reduction potential of approximately 243,619 MT CO_2e/yr via these measures. Many measures generate directly attributable GHG reductions. Not all measures generate a quantifiable GHG reduction potential, however. Non-quantified measures are included in the CAP either as supporting measures that facilitate the reduction potential of the related quantified measure, or to complement the suite of policies and programs proposed throughout the CAP.

Non-quantified measures consist of measures for which a GHG reduction potential could not be estimated at the time of plan preparation or would not reduce emissions from the 2005 GHG emissions inventory. GHG reduction potential was not be estimated for three reasons: (a) insufficient data exists to quantify GHG reduction potential, (b) no reliable quantification methodology currently exists to calculate these reduc-



tions, or (c) the GHG emission reductions attributable to the measure do not directly reference any component of baseline GHG inventory, and thus cannot be counted towards the County's 2020 emissions reduction target. These measures, however, remain within the CAP because the County and the community recognize that these actions will reduce global GHG emissions and help protect the climate, while also having important community co-benefits. Additional information pertaining to the GHG reduction calculations is provided in Appendix B.

Community Co-Benefits

Beyond reducing GHG emissions, many of the CAP measures have the potential to provide other important benefits to the community. These co-benefits represent an improvement in the quality of our communities and protect the earth's climate. The co-benefits are identified by the following icons:

CO-BENEFITS SYMBOL LEGEND

Costs & Savings

Cost and savings to the County, residents, and businesses are categorized as low, medium, and high. Table 2-1 summarizes the category definitions, and supporting information on costs and savings is provided in Appendix C.

Table 2-1

Cost to County (total)	Low: $0 -$250,000 Medium: $250,001-$500,000 High: $500,001 or greater
Cost to Resident or Property Owner (annual)	Low: $0-$100 Medium: $101-$250 High: $251 or greater
Savings to Resident or Property Owner (annual)	Low: $0-$100 Medium: $101-$250 High: $251 or greater

Funding & Financing

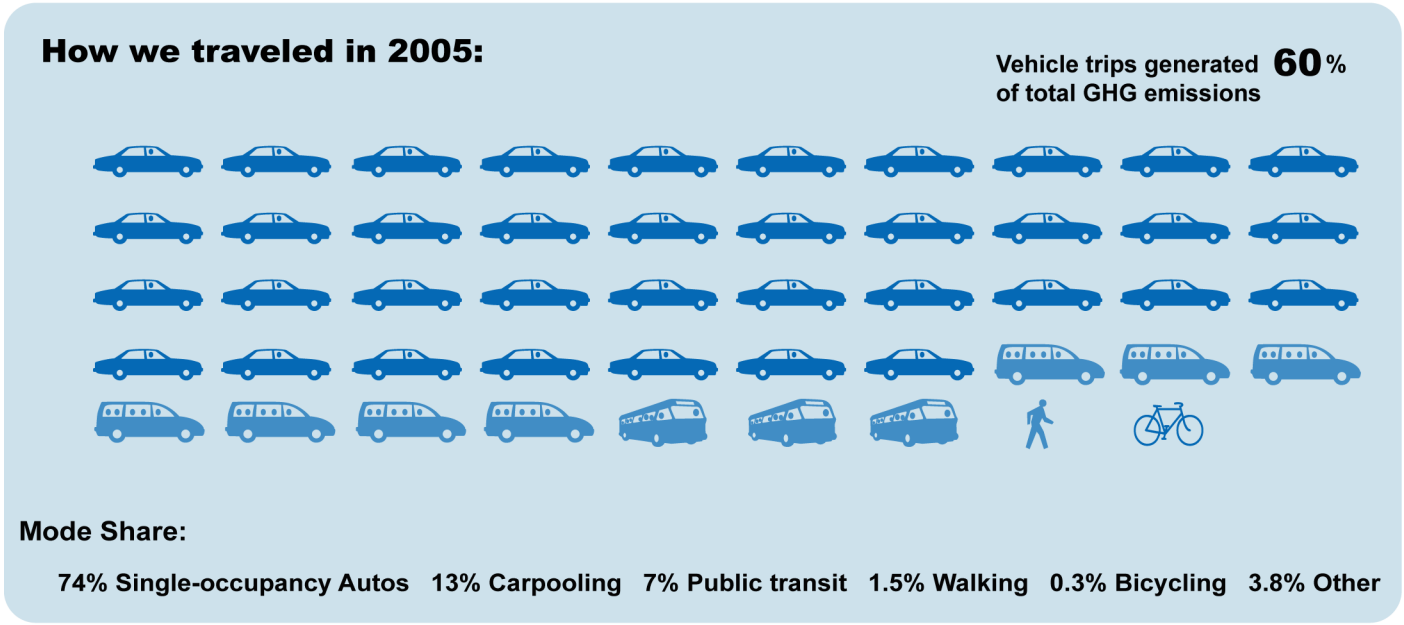
Though the County will bear some financial burden to implement measures in the CAP, a wide range of funding sources and financing strategies can be leveraged to offset the costs to not only the County, but also local residents and businesses. Potential funding or financing sources have been identified for each CAP measure at a general category level in measure descriptions in Part 2. Specific funding sources and financing programs have been identified for each measure in Appendix C. Additional explanations of these funding sources and financing programs are available in Part 3. Most, if not all, of the sources described will require additional effort to access. Although information in the CAP is current as of 2010, the array of funding and financing options for land use, transportation, energy, waste, and water-related conservation and efficiency programs is ever-evolving. It is likely that additional opportunities for funding or financing CAP measures will present themselves over the course of implementing the CAP.

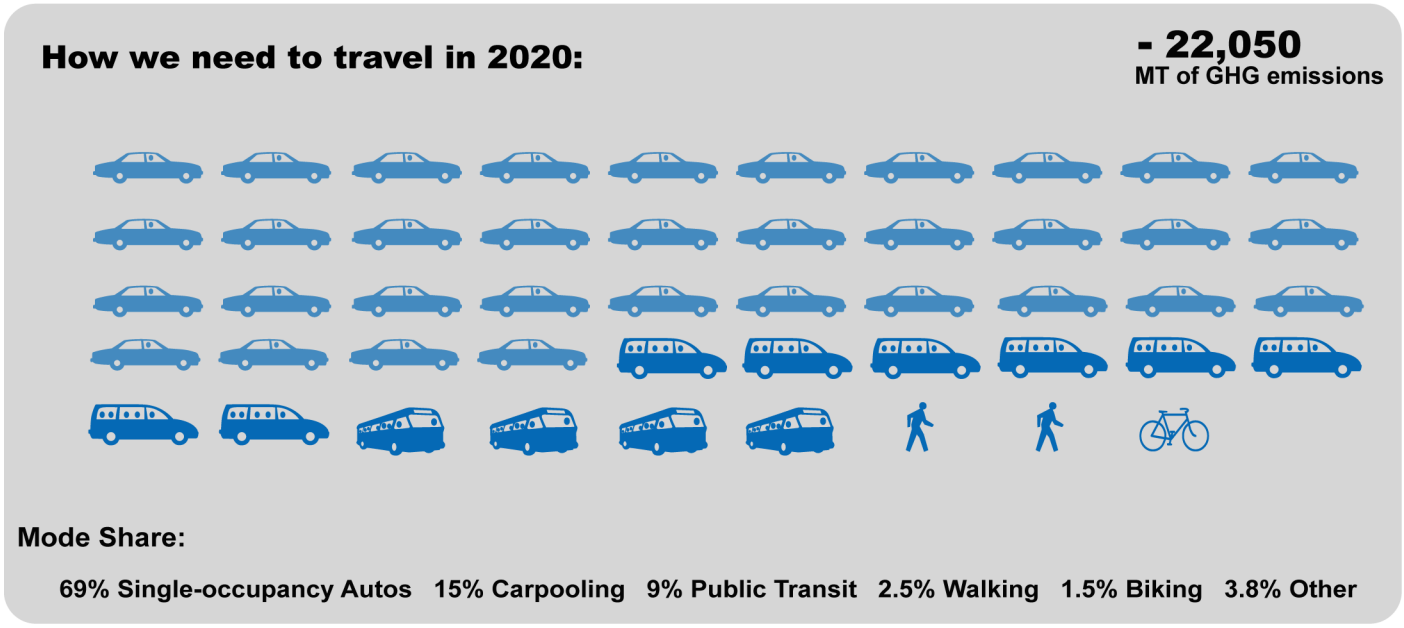
Measure Applicability

Land use in the unincorporated county varies from the urbanized western areas of the county (e.g., Castro Valley, Ashland, Cherryland, and San Lorenzo) to rural and agricultural areas in the eastern portion of the county. All of the CAP measures apply to the entire unincorporated county. However, some CAP measures are more applicable to the west county communities than the east county communities due to the higher density of these areas; for example, smart growth, some bike and pedestrian infrastructure, and transit-oriented development related measures.

2.3 Transportation Action Area

The transportation of people and goods generates the largest portion (~59 percent) of the unincorporated county's GHG emissions in 2005. Single-passenger automobile trips create the majority of these emissions. Technological advancements, such as improvements to vehicle fuel efficiency and reductions in fuel carbon content that may result from State legislation, will likely help reduce vehicle emissions in the future. However, these advancements alone will not be enough to achieve the necessary level of GHG emission reductions. Improving pedestrian, bicycle, and transit infrastructure; increasing carpooling; and discouraging driving also are essential components to achieving the County's 2020 reduction targets. The graphic below represents the shift from single-occupancy vehicle travel to alternative modes of travel that is necessary for the County to meets in GHG reduction target, equating to a reduction in GHG emissions of 22,050 MT CO_2e/yr by 2020. The Transportation Action Area describes ways to encourage these transformations.





TRANSPORTATION STRATEGIES & MEASURES:

Walking and Bicycling

Walking and bicycling are climate neutral modes of travel, and thus will be key strategies to reduce transportation-related GHG emissions. Pedestrian and bicycle infrastructure is currently limited in many portions of the unincorporated county. To encourage residents to shift from their cars to these alternative modes, the County will need to improve pedestrian and bicycle network connectivity and safety conditions. The Walking and Bicycling strategy contains the following measures:

- **T-1** Improve bicycle infrastructure near community activity areas
- **T-2** Develop appropriate bicycle infrastructure for high traffic intersections and corridors
- **T-3** Increase the number of bicycle racks and storage facilities in underserved civic and commercial area
- **T-4** Enhance pedestrian infrastructure within easy walking distance from community activity centers
- **T-5** Expand the Traffic Calming Program to improve pedestrian safety
- **T-6** Improve pedestrian connectivity and route choice in neighborhoods
- **T-7** Work with school districts to develop a School Alternative Transportation Plan by improving/expanding walking school bus, safe routes to school program, and school bus services

Public Transit

Riding on public transit, such as BART, bus, or train, generates considerably fewer GHG emissions than automobile travel. For residents and employees to switch from their cars to public transit, it needs to be convenient, comfortable, and reliable. The County will work with relevant transit agencies to identify and remove existing barriers to ridership and improve the overall transit experience. The Public Transit strategy contains the following measures:

- **T-8** Conduct a public transit study and implement ridership enhancement programs
- **T-9** Work with AC transit to increase service frequency on select bus routes
- **T-10** Provide transit buses with signal prioritization devices to facilitate time effective public transit service
- **T-11** Work with AC Transit to provide transit with essential improvements including shelters, route information, benches, and lighting
- **T-12** Work with public transit agencies to better accommodate bicycles

Ridesharing

"Ridesharing" is a general term that refers to more than one person sharing a ride in one vehicle, the most common form of which is carpooling, in which participants travel together, share costs, and often take turns driving. Vanpooling is a more formal form of ridesharing and involves more riders, formalized schedules and payments, and is often organized with the assistance of employers. This practice results in the generation of considerably fewer GHG emissions than if each passenger drives separately. The County will work to expand rideshare matching systems and develop rideshare stations to facilitate this important travel mode. The Ridesharing strategy contains the following measure:

- **T-13** Enhance rideshare infrastructure and services to increase community participation in this important travel mode

Parking Management

As the availability of cheap and abundant parking has a tendency to increase automobile ownership and use, parking fees can help reverse this relationship, and decrease congestion-inducing driving behavior and increase use of other travel modes. The County will, therefore, explore reducing parking requirements for mixed-use, pedestrian, and transportation-oriented development areas can also remove a barrier to project completion and improve the overall quality of the community. The County will revise parking standards to encourage these types of development. The Parking Management strategy contains the following measure:

- **T-14** Reduce minimum parking requirements for mixed-use, pedestrian and transit-oriented development

WALKING AND BICYCLING

T-1: Improve bicycle infrastructure near community activity areas.

Measure Description:

Bicycle infrastructure improvements can help reduce transportation-related GHG emissions by increasing the viability of bicycling as a travel mode within the community. To further its adopted climate protection goals, the County will amend the 2007 Alameda County Bicycle Master Plan to prioritize bicycle infrastructure improvements that enhance residents' access to key community activity areas, including major transit stations, schools, employment centers, neighborhood commercial centers, and downtown business districts.

The 2007 Alameda County Bicycle Master Plan outlines a vision for making bicycling an integral part of the transportation system in Alameda County unincorporated areas. While development of all proposed paths, lanes, and routes would be ideal, the plan recognizes that full implementation is unlikely in the near to medium-term due to budget constraints. The Plan recognizes the need for criteria to prioritize bicycle infrastructure investments. Key criteria contained in the plan include the following:

- Will the project increase bicycle commuting in the community?
- Will the project improve continuity with existing bikeways?
- Will the project provide a direct route to activity centers?
- Will the project eliminate bicycle travel problem areas?
- Does the project have local support?

While supporting these criteria, the County will amend the existing plan to place additional emphasis on the requirement for "direct routes to activity centers". Primary investments should focus on the development of infrastructure serving schools and transit stations, followed by infrastructure that serves employment centers, neighborhood commercial centers, and downtown business districts. Regional connections should be developed when resources are available, but the County believes investment in activity center-serving infrastructure will provide the greatest benefit to the community.

Residents would be the primary beneficiaries of these investments, and could accrue substantial financial savings* by electing to reduce local car use in favor of bicycle travel.

GHG Reduction Potential:
5,749 MT CO_2e/yr

Community Co-Benefits

Cost to County:
Medium

Cost to Resident or Building Owner:
None

Savings to Resident or Building Owner:
High

Potential Funding Sources:
State & Regional Grants; Partnerships w/ Organizations

	Implementation Action	Timetable	Responsibility
A	Amend existing Bicycle Master Plan to prioritize bicycle infrastructure improvements that increase resident access to community activity centers.	Short Term (1–2 years)	Public Works
B	Implement bicycle infrastructure improvements serving schools and transit stations.	Medium Term (2–5 years)	Public Works
C	Implement bicycle infrastructure improvements serving employment centers, neighborhood commercial centers, and downtown business districts.	Long Term (5–10 years)	Public Works
	Performance Indicator	**Target**	
i	Bicycle travel mode share in the unincorporated county.	1.2% in 2010 1.4% by 2015 1.5% by 2020	

** According to the Victoria Transport Policy Institute report, Traffic Calming Benefits, Costs and Equity Impacts, a resident would save approximately nearly $4 per trip for non-motorized travel during peak hours in urban areas, with smaller savings occurring during non-peak hours in urban areas and for rural travel.*

WALKING AND BICYCLING

T-2: Develop appropriate bicycle infrastructure for high traffic intersections and corridors.

Measure Description:

As streets with high-speed and high-volume traffic present considerable barriers to cyclists, the County will identify key intersections and road segments that require specialized bicycle infrastructure to enhance cyclist safety. The County will develop separated Class I bike paths, or *Cycletracks*, on all streets with greater that 7,000 average daily trips (ADT) or average speeds over 30 miles per hour (MPH). The County will also develop bicycle boxes and bicycle priority signals at critical bicycle route/major street intersections. In some instances, the County will redesign problem intersections in order to improve cyclist and pedestrian safety benefits to the community.

Residents would be the primary beneficiaries of these investments, and could accrue substantial financial savings* by electing to reduce local car use in favor of bicycle travel.

	Implementation Action	Timetable	Responsibility
A	Conduct analysis of bicycle network segments on streets with 7,000 ADT or average speeds greater than 30 MPH and evaluate the potential for Class I bike paths and cycletracks.	Short Term (1–2 years)	Public Works
B	Construct Class I bike paths (cycletracks) on all qualifying street segments.	Long Term (5–10 years)	Public Works
C	Create criteria for the installation of bicycle boxes and bicycle priority signals at bicycle route/major street intersections. Construct where appropriate.	Long Term (5–10 years)	Public Works
D	Identify and redesign problem intersections for improved pedestrian and bicycle travel.	Medium Term (2–5 years)	Public Works
	Performance Indicator	**Target**	
i	Percentage of bike route/major street intersections with bicycle boxes and/or bicycle priority signals.	100% by 2020	

GHG Reduction Potential:

Supporting T-1

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

High

Potential Funding Sources:

State & Regional Grants; Partnerships w/ Organizations

GHG Reduction Potential:

Supporting T-1

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

Medium

Potential Funding Sources:

State & Regional Grants; Partnerships w/ Organizations

WALKING AND BICYCLING

T-3: Retrofit bicycle racks and parking facilities in underserved civic and commercial areas.

Measure Description:

Few bicycle racks exist in the civic and commercial areas of unincorporated Alameda County, which deters residents from using their bicycles for commuting, shopping, or running daily errands. The County will identify commercial and civic areas that lack appropriate levels of bicycle parking and will install the needed facilities. Minimum bicycle parking requirements will reflect adjacent land uses as defined in Table 2.3 below.

Table 2.3. New Development Minimum Bicycle Parking Requirements

Land Use	Minimum Number of Parking Spaces
School	10% of students, plus 3% of employees
Commercial (retail or office)	10% of the number of automobile spaces
Sports or Recreation Center	20% of the number of automobile spaces
Movie Theater or Restaurant	10% of the number of automobile spaces
Industrial	5% of the number of automobile spaces
Multi-Family Housing	1 space per 1–2 apartments
Public Transit Station	Varies, but not less than 10% of the number of automobile spaces

Bicycle parking will be located in close proximity to end uses. If appropriate space does not exist, automobile parking spaces will be converted into bicycle parking areas. The County will evaluate the potential for Class I bicycle parking facilities at bus stops.

Residents would be the primary beneficiaries of these investments, and could accrue substantial financial savings by electing to reduce local car use in favor of bicycle travel. Business owners may also benefit from increased bicycle traffic.

	Implementation Action	Timetable	Responsibility
A	Conduct bicycle parking analysis in County's commercial and civic areas.	Short Term (1–2 years)	Planning
B	County shall install bicycle parking facilities in underserved areas.	Medium Term (2–5 years)	Public Works Redevelopment
	Performance Indicator	**Target**	
i	Community-wide bicycle-to-auto parking ratio.	1:30 by 2015 1:20 by 2020	

WALKING AND BICYCLING

T-4: Enhance pedestrian infrastructure within easy walking distance from community activity centers.

Measure Description:

Safe, convenient, and enjoyable pedestrian access to and from community activity centers is essential for improving residents' quality of life and reducing transportation-related GHG emissions. Pedestrian infrastructure is incomplete in many areas of the unincorporated county, but financial constraints require the County to focus infrastructure improvements on areas that will provide the greatest benefit. The County will prioritize infrastructure investments that enhance access to key community activity centers.

A pedestrian shed encompasses the area within an easy walking distance from an activity center. Transportation and urban planning research demonstrates that people are generally willing to walk approximately ¼ mile to neighborhood services (e.g., grocery stores, cafes, post office, bus stops) and approximately ½ mile to a major transit station (e.g., Castro Valley BART station). In order to maximize benefits to the community, the County will prioritize pedestrian infrastructure investments within the pedestrian sheds of key community activity centers.

To efficiently implement the necessary improvements the County will conduct a pedestrian obstacle study that identifies existing barriers and impediments to walking within the selected pedestrian sheds. Infrastructure improvements will include, but are not limited to: the expansion and repair of the sidewalk network, signalized crosswalks, countdown signals, planting of shade trees, and installation of other traffic calming features (see Measure T-5). The County will ensure sidewalks and crosswalks are maintained in good condition and will regularly evaluate pedestrian safety indicators (e.g., citizen complaint and collision data) and make investments necessary to enhance pedestrian safety.

Residents would be the primary beneficiaries of these investments, and could accrue substantial financial savings* by electing to reduce local car use in favor of pedestrian travel.

	Implementation Action	Timetable	Responsibility
A	Conduct a pedestrian obstacle study.	Short Term (1–2 years)	Public Works
B	Develop pedestrian improvement plan for the unincorporated county that prioritizes investments that enhance access to community activity centers.	Short Term (1–2 years)	Public Works
C	Construct pedestrian improvements identified in the pedestrian obstacle study and improvement plan.	Long Term (5–10 years)	Public Works
	Performance Indicator	**Target**	
i	Pedestrian travel mode share in the unincorporated county.	1.6% in 2010 2.0% by 2015 2.3% by 2020	

GHG Reduction Potential:

2,683 MT CO_2e/yr

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

High

Potential Funding Sources:

State & Regional Grants; Partnerships w/ Organizations

WALKING AND BICYCLING

T-5: Expand the traffic calming program to improve pedestrian safety.

Measure Description:

Traffic calming aims to reduce vehicle speeds, improve pedestrian safety, and increase quality of life. Traffic calming design features can dramatically improve pedestrian mobility, such as speed bumps, street trees, traffic circles, neckdowns, raised crosswalks, and realigned intersections.

The County will expand the existing Traffic Calming Program and seek increased community participation in both design and implementation. The County will make special efforts to implement traffic calming improvements in the key activity areas including, neighborhood commercial centers, schools, major transit stations, and downtown business districts. The Program will also broaden beyond its current focus on local and minor collector streets to include pedestrian mobility improvements to major collector and arterial streets in the identified key activity areas. In these key areas pedestrian and bicycle mobility will have equal or greater standing than vehicle level of service criteria.

Implementation Action		Timetable	Responsibility
A	Expand funding for the Traffic Calming Program to provide increased community outreach and implementation.	Medium Term (2–5 years)	Public Works Finance
Performance Indicator		**Target**	
i	Additional neighborhood traffic calming projects.	20 by 2015 40 by 2020	

GHG Reduction Potential:

Supporting T-4

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

State & Regional Grants

WALKING AND BICYCLING

T-6: Improve pedestrian connectivity and route choice in neighborhoods.

Measure Description:

In order to reduce walking distances within neighborhoods, the County will identify and develop pathways, pedestrian alleys, punch-throughs, and similar design features that increase pedestrian connectivity and route choice. New development will be required to incorporate such features when feasible.

Residents would be the primary beneficiaries of these investments, and could accrue substantial financial savings* by electing to reduce local car use in favor of pedestrian travel.

	Implementation Action	Timetable	Responsibility
A	Conduct analysis of pedestrian network, and identify areas of low connectivity and route choice.	Short Term (1–2 years)	Planning Public Works
B	Where possible, use public rights of way and easement acquisition to develop pedestrian alleys, punch-throughs, and similar design features.	Long Term (5–10 years)	Planning Public Works
C	Adopt a General Plan Circulation Element amendment that requires pedestrian connectivity features in all new development, when feasible.	Long Term (5–10 years)	Planning Public Works
	Performance Indicator	**Target**	
i	Level of pedestrian route coverage within ¼ mile of community activity centers.	98% by 2020	

GHG Reduction Potential:

Supporting T-4

Community Co-Benefits

Cost to County:

High

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

High

Potential Funding Sources:

State & Regional Grants

GHG Reduction Potential:

1,916 MT CO_2e/yr

Community Co-Benefits

Cost to County:

T-Staff

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

State & Regional Grants; Partnerships w/ Organizations

WALKING AND BICYCLING

T-7: Work with school districts to develop a School Alternative Transportation Plan by improving/expanding walking school bus, safe routes to school program, and school bus services.

Measure Description:

A large percentage of children in Alameda County are driven to school each day in private automobiles. The County will work with area school districts to create trip reduction programs that encourage walking, bicycling, carpooling, and public transit use. To facilitate the use of alternative travel modes, the County will work to improve pedestrian and bicycle infrastructure near schools. Additionally, the County and schools will develop public outreach activities to encourage participation in Walking School Bus Programs, where children walk to school in adult-supervised and school-coordinated groups. The County will ask school districts to evaluate the expansion of school bus services in certain areas of the unincorporated county where schools are not easily accessible by alternative travel modes.

Implementation Action		Timetable	Responsibility
A	Work with school districts to develop outreach program that promotes alternative travel modes for school-related trips.	Short Term (1–2 years)	Transportation
B	Work with school districts to develop educational modules that promote safe bicycle travel.	Short Term (1–2 years)	Transportation
Performance Indicator		**Target**	
i	Increase in student walking, biking, carpooling, and public transit use.	Total of 5% above current mode share	

PUBLIC TRANSIT

T-8: Conduct a public transit study and implement ridership enhancement program.

Measure Description:

The County aims to increase transit ridership to 9 percent of all trips by 2020, a 2 percent increase from the 2005 transit ridership level of 7 percent. The County will work with BART, Alameda Corridor-East Construction Authority (ACE), AC Transit, and the Livermore Amador Valley Transit Authority (WHEELS) to conduct a public transit study and evaluate ways to increase transit ridership. The study will identify existing transit conditions and document deficiencies and opportunities for improvement. The study will use community input and market research to create effective transit provision improvements. The study will evaluate a wide variety of potential service improvements including, but not limited to, increased service frequency, route coverage, extended service hours, direct routing (e.g., express buses), and improvements to riding environment and station access and safety. The study will provide the County and transit agencies with information needed to refine future transit investments and public outreach programs. Following the public transit study, the County will lead an inter-agency public transit ridership enhancement program in partnership with transit agencies and other local governments.

	Implementation Action	Timetable	Responsibility
A	Conduct public transit study in partnership with transit agencies.	Short Term (1–2 years)	Public Works
B	Develop and implement County-led inter-agency public transit ridership enhancement program.	Long Term (5–10 years)	Public Works
	Performance Indicator	**Target**	
i	Increase in unincorporated county public transit commute mode share.	8% transit mode share by 2015 9% transit mode share by 2020	

GHG Reduction Potential:

7,666 MT CO_2e/yr

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

State & Regional Grants; Partnerships w/ Organizations

GHG Reduction Potential:

Supporting T-8

Community Co-Benefits

Cost to County:

T-Staff

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

State & Regional Grants; Partnerships w/ Organizations

PUBLIC TRANSIT

T-9: Work with AC transit to increase service frequency on select bus routes.

Measure Description:

Increasing bus service frequency along key routes reduces passenger wait times (e.g., from 20 minutes to 10 minutes) and encourages transit ridership. The County will encourage AC transit to increase bus frequency on select routes during peak use hours. Specifically the County encourages increase frequency on routes during AM and PM peak hours.

The County will also encourage the expansion of the AC Transit Bus Rapid Transit (BRT) service into the unincorporated county along the East 14th Street, Mission Street and Castro Valley Avenue corridors. A BRT system consists of using buses to provide a service that is of a higher speed than an ordinary bus line. Often this is achieved by making improvements to existing infrastructure, vehicles, and scheduling.

Implementation Action		Timetable	Responsibility
A	Request that AC Transit evaluate the potential for increasing service frequency on key routes.	Short Term (1–2 years)	Transportation Planning
B	Prepare formal request for AC Transit to extend BRT bus service to the unincorporated county. Determine the conditions necessary for BRT route expansion.	Short Term (1–2 years)	County Supervisors Transportation Planning
Performance Indicator		**Target**	
i	Increase in walking, biking, carpooling, and public transit use.	Increasing	

PUBLIC TRANSIT

T-10: Provide transit buses with signal prioritization devices to facilitate time effective public transit service.

Measure Description:

Transit signal prioritization (TSP) reduces the time transit vehicles are slowed down by traffic signals, thereby improving transit travel times and reliability, and increasing the attractiveness of public transit as an alternative to single-occupant vehicle travel. In Tacoma, Washington, the combination of TSP and signal optimization reduced transit signal delay by 40 percent along two corridors. In Los Angeles, transit providers have experienced up to a 25 percent reduction in bus travel times.

The County will partner with AC Transit to install signal prioritization devices on selected bus routes. As part of the TSP project, the County will conduct signal re-timing to enhance and optimize traffic flow. The County will also consider establishment of queue bypass lanes at congested locations to enhance transit vehicle efficiency. In all cases emergency vehicles will have priority over transit vehicles.

	Implementation Action	Timetable	Responsibility
A	Work with AC Transit to evaluate key bus routes for TSP integration.	Short Term (1–2 years)	Transportation Public Works
B	Work with AC Transit to install TSP infrastructure at intersections and in buses.	Short Term (1–2 years)	Transportation Public Works
C	Evaluate need for queue bypass lanes and implement any necessary intersection rede-signs.	Medium Term (2–5 years)	Transportation Public Works
	Performance Indicator	**Target**	
i	Reduction in travel time on routes with TSP.	10% by 2015	

GHG Reduction Potential:

Supporting T-8

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

High

Potential Funding Sources:

State & Regional Grants; Partnerships w/ Organizations

PUBLIC TRANSIT

T-11: Work with AC Transit to provide transit with essential improvements including shelters, route information, benches, and lighting.

Measure Description:

Improvements to the safety, comfort, and convenience of transit stations encourage higher levels of transit ridership. The County will work with AC Transit to provide shade, weather protection, seating, lighting, and route information at all transit stops in the community.

The County will also work with AC Transit and Alameda County cities to evaluate the potential for Global Positioning System (GPS)-based bus locator technology that provides riders at bus stops with time of arrival information. Major stations would have time of arrival display boards. Riders at minor bus stops could access time of arrival information on cellular phones.

Implementation Action		Timetable	Responsibility
A	Consult with AC Transit to ensure that bus stops provide shade, weather protection, seating, lighting, and route information.	Medium Term (2–5 years)	Transportation
Performance Indicator		**Target**	
i	Percentage of bus stops with shade, weather protection, seating, lighting, and route information.	80% by 2015 100% by 2020	

GHG Reduction Potential:

Supporting T-8

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

State & Regional Grants; Partnerships w/ Organizations

PUBLIC TRANSIT

T-12: Work with public transit agencies to better accommodate bicycles.

Measure Description:

Public transportation systems typically move riders effectively from station to station, but transit riders' trips do not begin or end at these stations; riders rely on walking, bicycling, and driving for the first and last segment of their trips. Accommodation of bicycles on public transit is currently limited and improvement of these conditions would facilitate transit ridership.

Buses can often only accommodate two bicycles, so if the bike carrier is full, the cyclist has to wait for the next bus to arrive. This problem is compounded because most bus stops do not have secure bicycle storage options. BART does not allow bicycles during peak commute hours in many locations and many stations have limited secure storage options. Access to elevated or subsurface stations can also present problems for some cyclists.

The County will install secure bike storage at bus stops and will work with AC transit to find creative ways to accommodate more bicycles on buses. Additionally the County will encourage BART to upgrade and add bicycle parking throughout its system, adding bicycle stair ramps at stations and expanding the use of special bike train cars. The County will also work with BART and other Bay Area jurisdictions to develop bike-share programs at key stations.

	Implementation Action	Timetable	Responsibility
A	Install Class I bike storage lockers at heavily used bus stops.	Short Term (1–2 years)	Transportation Public Works
B	Formally request BART to develop Class I bicycle storage at the Castro Valley and Bay Fair stations and to provide special bicycle train cars for cross bay travel.	Short Term (1–2 years)	Transportation Public Works
	Performance Indicator	**Target**	
i	Number of bus stops with Class 1 bike storage.	10 by 2015	

GHG Reduction Potential:

Supporting T-8

Community Co-Benefits

Cost to County:

T-Staff

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

State & Regional Grants; Partnerships w/ Organizations

RIDESHARE

T-13: Enhance rideshare infrastructure and services to increase community participation in this important travel mode.

Measure Description:

In Alameda County, ridesharing currently makes up 13 percent of all commute trips while single-occupancy vehicle trips make up 74 percent. The County aims to increase participation in rideshare programs and have 15 percent of commuters use this travel mode by 2020. This transition would benefit the community by reducing congestion, travel costs, and GHG emissions.

The County will work with the Alameda County Congestion Management Agency (ACCMA), the Metropolitan Transportation Commission (MTC), and other relevant agencies to facilitate ridesharing opportunities, which include both carpooling and vanpooling. Specifically the County will work with partners to upgrade ride-matching systems to utilize the most current technologies (e.g., cell phone enabled ridematch applications), and develop a ridematch social networking website; online electronic payment options; and rideshare stations that provide covered shelter, lighting, and secure bicycle parking. The County will also work to improve rideshare-parking privileges, by providing preferential parking at all public lots and requiring preferential parking spaces for ridesharing vehicles in all new office or commercial construction with 75 or more employees.

GHG Reduction Potential:

4,035 MT CO_2e/yr

Community Co-Benefits

Cost to County:

T-Staff

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

Medium

Potential Funding Sources:

State & Regional Grants; Partnerships w/ Organizations

	Implementation Action	Timetable	Responsibility
A	Work with ACCMA and MTC to develop a plan and schedule for updating ride-match systems to the most advanced technologies.	Short Term (1–2 years)	Transportation
B	Work with ACCMA to encourage employers to create rideshare databases for their employees and employees of adjacent businesses.	Short Term (1–2 years)	Transportation
C	Identify locations for community ride-share stations and develop appropriate infrastructure.	Medium Term (2–5 years)	Transportation Public Works
D	Adopt an ordinance that requires new offices with 50 or more employees to provide preferential parking spaces for ride-share commuters.	Short Term (1–2 years)	County Supervisors Planning
	Performance Indicator	**Target**	
i	unincorporated county rideshare mode share for commute trips.	14% mode share by 2015 15% mode share by 2020	

PARKING MANAGEMENT

T-14: Reduce minimum parking requirements for mixed-use, pedestrian and transit-oriented development.

Measure Description:

Parking policies can affect both the quality and feasibility of mixed-use and transit-oriented development (TOD). The cost of parking in TOD projects can be very high, amounting to $30,000 – $60,000 for construction per structured parking unit. Excessive parking requirements drive up the cost of development and housing and undermine the use of other travel modes — especially walking and transit — even in areas with high-quality transit and pedestrian amenities provided at considerable public expense. County Planning will work with the Redevelopment Agency evaluate and revise its parking requirements to better accommodate mixed-use or TOD projects, and bring the analysis to public review. The County will also evaluate shared parking strategies as a way to facilitate higher density/intensity development in appropriate areas.

	Implementation Action	Timetable	Responsibility
A	Conduct an evaluation of the County's parking policies and their effects on mixed-use, TOD, and similar development.	Short Term (1–2 years)	Planning
B	Reduce parking requirements in areas targeted for mixed-used and TOD development, while ensuring that neighborhoods are not adversely affected. The actual requirements for mixed use parking should be accurately evaluated.	Medium Term (2–5 years)	County Supervisors Planning
C	Evaluate potential for shared parking strategies in the unincorporated county.	Short Term (1–2 years)	Planning Redevelopment
	Performance Indicator	**Target**	
i	NA	NA	

GHG Reduction Potential:

Recommended Policy

Community Co-Benefits

Cost to County:

T-Staff

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

State & Regional Grants; Partnerships w/ Organizations

2.4 Land Use Action Area

Community land use patterns have a strong impact on transportation-related GHG emissions. Where people live dictates how far they have to travel to work, shopping, and other destinations, and influences whether they choose to walk, bike, use public transit, or drive. If residents live close to transit stations, neighborhood-serving commercial centers, or their work places, they are more likely to use alternative lower-emissions travel modes than drive. The County recognizes that in order to achieve its GHG reduction targets, it will need to focus new development in areas that facilitate the use of alternative travel modes, enhance and expand neighborhood commercial centers, and improve the jobs-to-housing balance. This pattern of growth will also become increasingly important as the County attempts to comply with the regional vehicle miles traveled (VMT) reduction targets set forth in Senate Bill 375. This Action Area is responsible for approximately 10,495 MT CO_2e/yr.

Typical Single-Use, Automobile-Oriented Commercial Center, 2010:

Source: Urban Advantage

Land use patterns strongly influence the amount of transportation-related emissions in a community.

Mixed-use, Pedestrian- & Transit-Oriented Commercial Center, 2020:

Source: Urban Advantage

Land use improvements could reduce approximately 10,495 metric tons of greenhouse gases by 2020.

In unincorporated Alameda County, transportation emissions range from approximately 17 to 59 pounds CO_2e per household per day. Areas with low levels of transportation emissions are typically located near existing transit infrastructure, whereas areas with high levels of transportation emissions tend to be located further from existing transit infrastructure, thus necessitating more car travel for daily transportation needs and commuting.

LAND USE STRATEGIES & MEASURES:

Transit-Oriented Development

Transit-oriented development (TOD) refers to the creation of compact, walkable communities centered around high-quality light rail, train, or bus transit systems. Research by the San Francisco Bay Area Metropolitan Transportation Commission (MTC) in 2006 indicates that persons in households living less than ½ mile from major transit stations drive approximately half as much as those living further away. The County will use a variety of incentives and regulations to focus new growth in these areas and ensure that development is well designed, pedestrian-friendly, and compatible with existing neighborhoods. The Transit-Oriented Development strategy contains the following measures:

- **L-1** Facilitate the establishment of mixed-use, pedestrian-, and transit-oriented development near major transit stations or transit corridors.
- **L-2** Reduce restrictions on second units in single-family residential districts near transit stations, major bus route corridors, neighborhood commercial centers, and central business districts.

Neighborhood Commercial District

Neighborhood commercial districts that provide a diversity of shops and services help neighborhood residents spend less time in their cars. Research* indicates that average daily shopping and errand trips in well-serviced neighborhoods are less than half the distance than in neighborhoods with low levels of diversity. This research also indicates residents who live within a ¼ mile of vibrant neighborhood centers are more likely to walk or bike in order to purchase daily goods and services. Enhancing the quality and diversity of uses in Alameda County's neighborhood commercial centers will help decrease transportation-related GHG emissions and improve residents' quality of life. The County will facilitate improvements to existing neighborhood commercial centers by developing small business incentive programs, removing regulatory barriers that may impede high quality mixed-use development, and establishing design guidelines for neighborhood centers. The County will also work to identify potential locations for new neighborhood commercial centers in underserved areas of the west county. The Neighborhood Commercial District strategy contains the following measures:

- **L-3** Increase the diversity of uses in neighborhood-serving commercial centers.
- **L-4** Improve the vitality of mixed-use neighborhood-serving commercial centers through increased density allowances and enhanced design.
- **L-5** Conduct land use and market analyses to identify sites within expansive residential areas that could support new or expanded neighborhood commercial centers.

** Victoria Transport Policy Institute (2008)*

GHG Reduction Potential:

2,829 MT CO_2e/yr

Community Co-Benefits

Cost to County:

Medium

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

State & Regional Grants; Partnerships w/ Organizations

TRANSIT ORIENTED DEVELOPMENT

L-1: Facilitate the establishment of mixed-use, pedestrian- and transit-oriented development near major transit stations or transit corridors.

Measure Description:

Opportunities for mixed-use TOD exist within the more urban portions of the unincorporated county, such as areas adjacent to the Castro Valley BART station, Bay Fair BART station, and the Hayward Amtrak station. Additionally, if BART service expands into the unincorporated county, potential mixed-use TOD sites would exist at key nodes along the transit corridors (e.g., East 14th Avenue). To facilitate TOD, the County will establish partnerships; develop a guiding vision; and work to reduce regulatory, land assembly, and infrastructure barriers.

Successful TOD requires partnership and communication between the County, transit agencies, developers and community members. To ensure that TOD projects achieve the community's objectives, the County will develop specific plans and design guidelines for each TOD site. As part of this process, the County will conduct an audit of the existing zoning code, development standards, and other regulations and evaluate their compatibility with TOD, such as height restrictions, setbacks, and open space and parking requirements. The County will also consider establishing minimum densities and floor-area ratios in order to prevent underutilization of these areas. While ensuring the protection of public health, safety, and welfare, the County will revise standards that act as regulatory barriers.

Fragmented property ownership patterns are also frequently a barrier to TOD, because it makes coordinating redevelopment in those areas time-consuming and costly for the County. The County will work with existing owners to assemble multiple parcels into usable properties. The County will also take a leadership role and invest in basic infrastructure improvements, streetscaping, and other amenities in order to provide developers with confidence that the public sector is making a commitment to the project areas.

	Implementation Action	Timetable	Responsibility
A	Conduct audit of existing zoning, development standards, etc. for compatibility for TOD.	Short Term (1–2 years)	Planning Redevelopment Agency
B	Develop and adopt specific plans for each TOD area.	Short Term (1–2 years)	County Supervisors Planning
C	Develop TOD land assembly program.	Short Term (1–2 years)	Redevelopment Agency
D	Create TOD infrastructure investment program that identifies and implements basic infrastructure improvements needed to attract TOD developers.	Short Term (1–2 years)	Redevelopment Agency
	Performance Indicator	**Target**	
i	Number of new residential dwelling units within ½ mile of major transit station.	200 units by 2015 700 units by 2020	
ii	Mix of uses within new TOD projects in 2020.	approximate balance of uses suitable to the characteristics of the location	

TRANSIT ORIENTED DEVELOPMENT

L-2: Reduce restrictions on second units in single-family residential districts near transit stations, major bus route corridors, neighborhood commercial centers, and central business districts.

Measure Description:

The County will amend area plans, the zoning code and relevant specific plans to allow second units in R-1, RS-5, and CBD Sub-Area (11 districts within ½ mile walking distance of major transit stations, neighborhood commercial centers, and the Castro Valley Central Business District). Second units are often termed "granny flats" or "mother-in-law units", and used to increase the number of dwelling units in targeted areas. Second units, therefore, increase the vitality of nearby commercial centers through allowing more residents to live within a walkable distance to transit and neighborhood serving businesses. They also provide property owners with the potential for rental income, which can improve home affordability. Additionally the County will review second unit development standards (e.g., parking requirements) and consider revising standards that staff deem restrictive to second unit development and are not essential for the protection of health, safety, and welfare of the community. The County will inform affected property owners of these changes.

	Implementation Action	Timetable	Responsibility
A	Revise zoning code, development standards, and relevant specific plans to allow second units in R-1, RS-5, and Residential Low Density Areas within ½-mile walking distance of major transit stations.	Short Term (1–2 years)	Planning
B	Revise parking requirements for new second units to 1 space per unit.	Short Term (1–2 years)	Planning
C	Provide outreach to affected property owners.	Short Term (1–2 years)	Planning
	Performance Indicator	**Target**	
i	New second units within ½-mile of transit stations.	200 new second units by 2020	

GHG Reduction Potential:

Supporting L-1

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

State & Regional Grants; Partnerships w/ Organizations

GHG Reduction Potential:

Supporting L-4

Community Co-Benefits

Cost to County:

L-Staff

Cost to Resident or Building Owner:

Medium

Savings to Resident or Building Owner:

None

Potential Funding Sources:

State & Regional Grants; Partnerships w/ Organizations

NEIGHBORHOOD COMMERCIAL DISTRICTS

L-3: Increase the diversity of uses in neighborhood-serving commercial centers.

Measure Description:

While a number of neighborhood commercial centers exist in the urban areas of unincorporated Alameda County, many of them only offer basic services. Increasing the diversity of uses within these centers will help reduce transportation-related GHG emissions for residents and employees in the neighborhood, through accommodating some portion of the neighborhood demand for retail and services within bicycling, walking, or short driving distances.

The County will develop business incentive programs targeted at attracting small businesses to neighborhood commercial centers and improving existing uses. Two potential strategies are a retail tenant improvement program or a business improvement assessment district (BID) program. A retail tenant improvement program would provide incentives to attract key retail businesses, while the business improvement assessment district program would assist merchants and property owners establish BIDs in neighborhood commercial centers. The BIDs would be voluntary, self-imposed assessment districts and the collected fees would pay for maintenance, security, and management. These districts would be developed in cooperation with community groups and the Chamber of Commerce.

Implementation Action		Timetable	Responsibility
A	Develop small business incentive programs targeted at neighborhood commercial centers.	Medium Term (2–5 years)	Community Development Redevelopment
Performance Indicator		**Target**	
i	Amount of new commercial uses in neighborhood centers county-wide.	50,000 square feet by 2015 150,000 square feet by 2020	

NEIGHBORHOOD COMMERCIAL DISTRICTS

L-4: Improve the vitality of mixed-use neighborhood-serving commercial centers.

Measure Description:

Neighborhood commercial districts thrive when they are well designed and have adequate residential and employee populations to support them. To facilitate these conditions, the County will revise development standards that act as barriers to mixed-use projects, and establish clear and concise design guidelines that ensure compatibility of such projects with adjacent residential uses.

Within the Castro Valley Area Plan, the maximum allowable residential density in Neighborhood Commercial land use designations is 22 units per acre and the maximum floor-area ratio is 1.0:1. The County will process General Plan and Area Plan amendments designed to achieve an increase in maximum allowable densities to 35 units per acre and maximum floor-area ratios to 2.0:1 in Neighborhood Commercial designations. These revisions would provide development projects with greater design flexibility and would increase the number of residents and commercial uses within the centers. The County will also evaluate other development standards including, but not limited to, parking requirements, building height limits, setbacks, and landscaping requirements.

The Eden Area Plan identifies five commercial districts to serve as community activity centers that attract residents, employees, shoppers, and visitors. The maximum floor-area ratios are 1.0:1 throughout these districts. The County will process General Plan and Area Plan amendments designed to achieve an increase of floor-area ratios to 2.0:1 in these districts. The Plan currently allows appropriate levels of residential density within these districts.

The County will establish design guidelines for mixed-use projects in neighborhood commercial centers to facilitate the development of high-quality projects and help ensure compatibility with surrounding residential districts. They will also emphasize effective transitions from single-family areas to higher intensity mixed-use and commercial areas.

	Implementation Action	Timetable	Responsibility
A	Increase allowable residential densities and commercial floor-area-ratios in neighborhood commercial centers.	Short Term (1–2 years)	Planning
B	Revise development standards that conflict with mixed-use development in neighborhood centers.	Short Term (1–2 years)	Planning Redevelopment Agency
C	Establish design guidelines for development within neighborhood commercial centers.	Short Term (1–2 years)	Planning Redevelopment Agency
	Performance Indicator	**Target**	
i	Amount of new mixed-used development in neighborhood districts.	150,000 square feet of neighborhood-serving commercial uses and 300 residential units by 2020	
ii	Amount of new residential unit development in existing neighborhood districts.	1,200 residential units by 2020	

GHG Reduction Potential:

7,666 MT CO_2e/yr

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

State & Regional Grants; County Funds

GHG Reduction Potential:

Supporting L-4

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

State & Regional Grants; County Funds

NEIGHBORHOOD COMMERCIAL DISTRICTS

L-5: Conduct land use and market analyses to identify sites within expansive residential areas that could support new or expanded neighborhood commercial centers.

Measure Description:

The Castro Valley and Eden planning areas contain expansive residential areas with no commercial land uses. Other residential areas only have minimal neighborhood-serving commercial uses. Increasing the diversity of uses could reduce household transportation-related GHG emissions by reducing the distance residents need to drive to obtain daily goods and services and by encouraging more people to walk and bicycle within their communities.

As many of these areas have vacant or underutilized lots where new or expanded neighborhood commercial centers could be established, the County will conduct a land use and market analysis to identify potential locations for new neighborhood commercial centers. It will evaluate a range of commercial scales for each location, from simple corner stores to more extensive centers. Once potential locations are identified, the County will work with property owners and the surrounding community to explore appropriate development options.

Where existing neighborhood commercial centers are very small and offer limited services to local residents, the County will evaluate the potential for expanding these districts where appropriate.

	Implementation Action	Timetable	Responsibility
A	Conduct land use and market analysis to identify potential locations for new or expanded neighborhood commercial centers.	Short Term (1–2 years)	Redevelopment Agency
B	Work with land owners, community, and interested developers to implement new neighborhood commercial centers.	Long Term (5–10 years)	Redevelopment Agency
	Performance Indicator	**Target**	
i	See Measure L-4	See Measure L-4	

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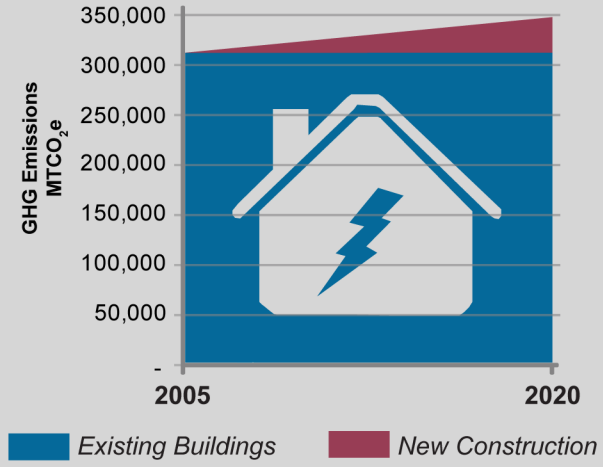
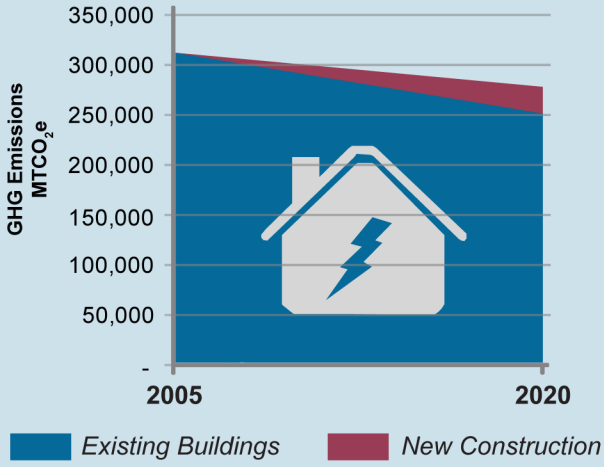
2.5 Building Energy Action Area

The consumption of electricity and natural gas within residential, commercial, and industrial buildings generates over 1/3 of the unincorporated county's GHG emissions. Reducing these emissions will require two fundamental changes: reducing the carbon intensity of the county's energy sources and improving the energy efficiency of existing and future buildings. To reduce the carbon intensity of energy, the County will work to increase the amount of renewable energy within the electricity grid's generation portfolio and will encourage the installation of rooftop solar photovoltaic and solar hot water systems throughout the community. The County will achieve greater levels of energy efficiency through a combination of education, incentives, and regulations. The combined impact of the community energy, energy efficiency, and renewable energy strategies is expected to generate reductions of approximately 36,734 MT CO_2e/yr, the largest contributor of GHG reductions of any of the Action Areas.

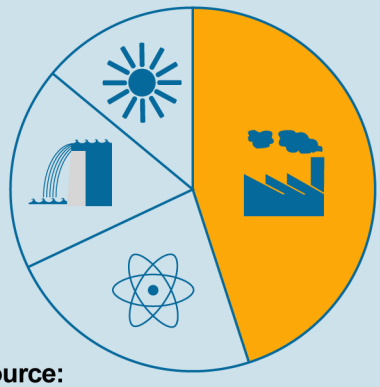
Building Emissions (business-as-usual): Buildings generate **34%** of total GHG emissions



Building Emissions (CAP): **- 36,734** metric tons of greenhouse gases



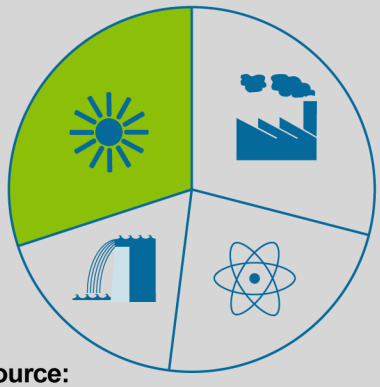
Energy Generation Portfolio (2005):



Energy Source:

- 45% Natural Gas & Coal
- 23% Nuclear
- 18% Large-scale Hydroelectric
- 14% Renewable

Energy Generation Portfolio (2020):



Energy Source:

- 29% Natural Gas & Coal
- 23% Nuclear
- 18% Large-scale Hydroelectric
- 30% Renewable

BUILDING ENERGY STRATEGIES & MEASURES:

Community Energy

Making fundamental changes to the community's energy system could reduce large quantities of building-related GHG emissions. The key strategies are integrating smart grid technology into homes and businesses, and incorporating district energy systems in mixed-use districts. The Community Energy strategy contains the following measures:

- **E-1** Work with PG&E and Alameda County cities to accelerate smart grid integration in the community.
- **E-2** Evaluate the potential for district energy systems and develop an implementation plan.

Energy Efficiency in Existing Residential Buildings

Approximately 80 percent of the housing stock in the unincorporated county was built prior to the adoption of California's Title 24 energy standards in 1978. Improving the energy efficiency of the county's existing housing stock will reduce considerable amounts of GHG emissions, while also decreasing home energy bills. The County will establish a program to educate homeowners about energy efficiency upgrades, facilitate home energy audits and efficiency upgrades, and provide financial incentives. The Energy Efficiency in Existing Residential Buildings strategy contains the following measures:

- **E-3** Develop a comprehensive outreach program to facilitate voluntary home energy efficiency improvements.
- **E-4** Identify and develop financing programs that encourage energy efficiency and renewable energy.
- **E-5** Expand outreach to low-income homeowners regarding energy efficiency and weatherization programs.
- **E-6** Identify and implement opportunities to improve efficiency of rental units.

Energy Efficiency in Existing Commercial Buildings

Improvements to commercial building energy efficiency will help community businesses reduce long-term energy costs and provide important GHG emissions reductions. The County will provide a comprehensive commercial energy conservation program that provides education, outreach, and financial incentives. The County expects that educational programs and financial incentives will encourage many businesses to invest in efficiency improvements. The Energy Efficiency in Existing Commercial Buildings strategy contains the following measures:

- **E-7** Develop and implement an outreach and financial assistance program that encourages businesses to invest in efficiency improvements.

Energy Performance in New Construction

New buildings offer a significant opportunity for achieving high levels of energy efficiency through advanced materials and design. The County will require a high level of energy performance in all new construction and will provide incentives for exemplary buildings. The Energy Performance in New Construction strategy contains the following measures:

- **E-8** Renew the County Green Building Ordinance.
- **E-9** Provide incentives for buildings that exceed the California Title-24 standards for energy efficiency by 30 percent (Tier 2).
- **E-10** Require new construction to use building materials containing recycled content.
- **E-11** Require new commercial parking lots to incorporate heat gain-mitigating design strategies.
- **E-12** Require all new multi-unit buildings and major renovations to existing multi-unit buildings to be "submetered" in order to enable each individual unit to monitor energy and water consumption.

Renewable Energy

To achieve the County's GHG reduction target, the county will need to reduce the use of fossil fuel-based energy, through expanding renewable energy generation within the unincorporated county. The County will develop a renewable energy program that educates residents and businesses about the potential for solar energy generation and provides financing mechanisms. The strategy will primarily focus on solar photovoltaic and solar hot water systems. The Renewable Energy strategy contains the following measures:

- **E-13** Establish Solar EmPowerment Districts that remove barriers to and facilitate the installation of solar photovoltaic systems.
- **E-14** Facilitate the installation of solar hot water heating systems on large commercial buildings.
- **E-15** Develop a comprehensive residential renewable energy program that provides outreach, financing, and other forms of assistance.

Green Jobs

To achieve the County's GHG reduction target, the County will need to increase "green jobs."

- **E-16** Develop a green jobs program for the unincorporated areas of Alameda County.

GHG Reduction Potential:

5,074 MT CO_2e/yr

Community Co-Benefits

Cost to County:

E-Staff

Cost to Resident or Building Owner:

Medium

Savings to Resident or Building Owner:

Low

Potential Funding Sources:

Partnerships w/ Organizations; County Funds

COMMUNITY ENERGY

E-1: Work with PG&E and Alameda County cities to accelerate smart grid integration in the community.

Measure Description:

The existing electricity delivery system in Alameda County relies on 100-year old technology: electricity flows over the grid from far-away power plants to consumers and reliability is ensured by maintaining excess capacity. The result is an inefficient and environmentally wasteful system that emits large amounts of GHGs, relies heavily on fossil fuel power plants, and is not well-suited to distribute renewable solar or wind energy sources. The smart grid is an emerging energy management system, which combines information technology with renewable energy to significantly improve how electricity is generated, delivered, and consumed. The smart grid will reduce energy demand, improve integration of distributed energy production, and increase the efficiency of electricity transmission and distribution. These changes will help residents and business save energy, and can reduce GHG emissions associated with energy production.

The County will work with PG&E and other neighboring cities to encourage full implementation of smart grid technologies. PG&E is already planning to install SmartMeters™, a key component of the larger smart grid, in all homes and businesses in the Bay Area by 2010. As of September, 2010, 86 percent of homes and buildings in Alameda County (both incorporated and unincorporated) have had SmartMeters™ installed, with the remainder scheduled for installation in the near future. However, the real value of the smart grid does not end at the meter; its full value is realized when it enables County residents and businesses to access the technology to manage their energy use to optimize savings. In order to ensure that County residents and businesses are able to take full advantage of the smart grid, the County and its partners will promote the use of smart appliances in homes and businesses through outreach and incentives. The County will also consider an ordinance to require smart grid-compatible major appliances (e.g., heating, ventilation, air conditioning) in new construction when technologies are available.

While full integration of the smart grid will take time to realize, energy analysts estimate that it will ultimately be capable of reducing electricity-related GHG emissions by between four and 30 percent below current levels (CISCO 2008). When estimating the potential GHG emission reductions associated with implementation of the smart grid, the County included the energy efficiency improvements gained from integrating smart grid energy management systems for control lighting, heating, ventilation, and air conditioning and other major appliances in residential and commercial buildings. Implementation of these systems is expected to reduce residential building energy consumption by 5 percent and commercial building energy consumption by 6 percent*.

Implementation Action		Timetable	Responsibility
A	Partner with PG&E and develop a community smart grid integration plan.	Short Term (1–2 years)	Planning
B	Develop an outreach program that informs property owners and businesses about benefits of smart grid and smart appliances.	Medium Term (2–5 years)	Planning
C	Adopt ordinance that requires smart grid energy management system and compatible heating, ventilation, air conditioning and lighting in new construction.	Medium Term (2–5 years)	County Supervisors Planning
Performance Indicator		**Target**	
i	Percent of existing buildings that achieve energy savings through the Smart Grid.	50% by 2020	
ii	Percent of new buildings that achieve energy savings through the Smart Grid.	75% by 2020	
iii	Percent of energy savings from Smart Grid Integration (not all buildings will achieve the same energy savings).	5% in residential buildings by 2020 6% in non-residential buildings by 2020	

** Pacific Northwest National Laboratory, 2004*

COMMUNITY ENERGY

E-2: Evaluate the potential for district energy systems in mixed-use and higher density areas of the community, and develop an implementation plan for cost-effective systems.

Measure Description:

District heating and cooling systems could provide considerable energy savings for new higher density mixed-use development in the unincorporated county. In a conventional urban center, each building has its own individual heating and cooling equipment. A district energy system has a central plant that provides heating and cooling through a network of pipes to all buildings within a neighborhood. District heating can be approximately 27 percent more efficient and district cooling can be 45 percent more efficient than individual buildings running their own heating and air conditioning equipment. When district heating and cooling are combined with electricity generation the resulting tri-generation plant is even more efficient. The systems are often feasible at medium densities or higher; mixed-use development is ideal for district energy systems as energy users are present throughout the day. The County will collaborate with infill developers to evaluate the feasibility of different district energy options and create an implementation program for cost-effective systems.

	Implementation Action	Timetable	Responsibility
A	Conduct an analysis of district heating potential in the Central Business District Specific Plan area, the San Lorenzo Specific Plan Area, and other neighborhood commercial centers.	Short Term (1–2 years)	Planning Public Works
B	Develop an implementation plan for cost-effective systems.	Short Term (1–2 years)	Planning Public Works
	Performance Indicator	**Target**	
i	Study completed with policy recommendations.	By December 31, 2012	

GHG Reduction Potential:

Recommended Policy

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

High

Savings to Resident or Building Owner:

High

Potential Funding Sources:

ARRA; Public Finance; County Funds

GHG Reduction Potential:

Supporting E-4

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

ARRA; Partnerships w/ Organizations

ENERGY EFFICIENCY IN EXISTING RESIDENTIAL BUILDINGS

E-3: Develop a comprehensive outreach program to facilitate voluntary home energy efficiency improvements.

Measure Description:

Residential energy efficiency improvements have the potential to reduce energy bills and considerable amounts of GHG emissions. The County will partner with PG&E and other community organizations to conduct public education and outreach campaigns that encourage residents to voluntarily make energy efficiency improvements within their homes and to take advantage of the low-cost energy efficiency financing program described in Measure E-4. As part of the outreach program, the County will maintain a website providing information on existing energy efficiency rebates and other financial incentives. The website will also contain local case studies of homes and businesses that have implemented cost effective energy efficiency improvements.

Additionally, the County will partner with community non-profits (e.g., California Youth Energy Services) to provide residents with free home energy audits and free installation of basic energy and water efficiency improvements. The County will provide these organizations with assistance in order to ensure that the programs effectively reach a large number of households in the unincorporated county.

Implementation Action		Timetable	Responsibility
A	Work with PG&E and other community organizations to develop energy efficiency outreach programs for residents and multi-family property owners.	Short Term (1–2 years)	Community Development
B	Develop and maintain a website describing energy efficiency rebates, incentives, and case studies.	Short Term (1–2 years)	Community Development
Performance Indicator		**Target**	
i	Number of households serviced by community-based energy efficiency organizations.	1,250 by 2015 2,500 by 2020	
ii	Participation in energy efficiency rebate programs (currently around 5% of all accounts).	10% by 2015	

ENERGY EFFICIENCY IN EXISTING RESIDENTIAL BUILDINGS

E-4: Identify and develop low-cost financing products and programs that encourage investment in energy efficiency for existing residential buildings.

Measure Description:

The up-front costs of energy efficiency improvements can be a considerable barrier for many homeowners. Alameda County, in partnership with ABAG and State programs, will provide a series of cost-effective financing options to help reduce this burden for homeowners that elect to implement energy efficiency upgrades for their home. The County will evaluate various financing products that would encourage property owners to voluntarily invest in energy efficiency upgrades in existing homes.

The structure of the potential programs and products varies greatly. On-bill financing, low interest loans, and energy-efficient mortgages establish a lender/borrower relationship in which the County, utility, or private lender loans the building owner money to pay for upgrades, which is paid back over time. The cost (or payback) to the County is wholly dependent on how much it subsidizes interest rates. In the case of the bond, the County would administer a revolving loan fund with the bond proceeds, pursuant to provisions of AB 811. The County could also participate in the CaliforniaFIRST property assessed clean energy (PACE) program, as a means to help facilitate the program initiation and administration (see Implementation section for more details on program and current status). It would also depend on the increase in energy costs, energy efficiency rebates, and potential federal tax credits.

A number of other complementary options are available to the County. One option is program in which a property owner could voluntarily participate in a County-wide program where homes could obtain an energy audit by a certified specialist who could calculate the estimated energy efficiency improvement cost. This amount would either be charged as a voluntary property tax assessment paid over a pre-defined period (i.e., the length of payment would be based on the length of the bond); or the property owner would be charged an additional property transfer tax. Property owners would then make improvements to their home based on the recommended changes and would be reimbursed after confirmation by a certified energy audit specialist.

Another option includes on-bill financing, which would amortize the cost of energy efficiency retrofits to the property's monthly energy bills. In this scenario, the property owner would be reimbursed by PG&E. The intent would be to create marginal to no financial impacts to the property owner as the amortized costs would be similar to the monthly energy savings.

As a tracking mechanism, the County can develop a website (perhaps building on the Energy Upgrade California platform) where home and building owners can log energy efficiency retrofits and home/building improvements. The County could work with local contractors, building supply companies like Home Depot and Lowe's, and PG&E to publicize the service, with incentives such as free CFL light bulbs or other energy efficient technology for participants.

Implementation Action		Timetable	Responsibility
A	Evaluate financing programs including AB 811 that are being developed by regional /state agencies and select the appropriate programs.	Short Term (1–2 years)	Neighborhood Preservation & Sustainability (NP&S)
B	Develop capacity to administer energy efficiency financing program.	Short Term (1–2 years)	NP&S; Building
C	Develop monitoring website and publicity strategy with local contractors, building supply companies, and PG&E.	Short Term (1–2 years)	NP&S; Building
Performance Indicator		**Target**	
i	Percentage of households that achieve a 15% improvement in building energy efficiency.	10% of residential units by 2015 20% of residential units by 2020	

GHG Reduction Potential:

3,167 MT CO_2e/yr

Community Co-Benefits

Cost to County:

Low to Medium

(depending on finance program)

Cost to Resident or Building Owner:

Low to High

(depending on finance program)

Savings to Resident or Building Owner:

Low to High

(depending on finance program)

Potential Funding Sources:

ARRA; Partnerships w/ Private Companies; Partnerships w/ Organizations

GHG Reduction Potential:

Supporting E-4

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

High

Potential Funding Sources:

ARRA; Public Finance; Partnerships w/ Organizations

ENERGY EFFICIENCY IN EXISTING RESIDENTIAL BUILDINGS

E-5: Expand outreach to low-income homeowners in order to encourage participation in federally funded energy efficiency and weatherization programs.

Measure Description:

The County will partner with Spectrum Community Services, the California Department of Community Services and Development-designated energy services provider for the unincorporated county to facilitate expanded implementation of the U.S. Department of Energy Weatherization Assistance Program (WAP). The WAP reduces heating and cooling costs for low-income families by improving the energy efficiency of their homes. Among low-income households, the program focuses on those with elderly residents, individuals with disabilities, and families with children.

The County and Spectrum Community Services will develop a program that provides direct outreach to target households in an effort to enhance community participation in the federally funded WAP program. From 2005 to 2010, the WAP program provided efficiency upgrades to approximately 150 households per year, and expects to serve 300 households per year by 2020. The combined outreach programs and enhanced funding from the ARRA are expected to increase participation in the program.

Implementation Action		Timetable	Responsibility
A	Apply for funding from the Federal Recovery Act and other sources to fund expanded community participation in the Weatherization Assistance Program.	Short Term (1–2 years)	Neighborhood Preservation & Sustainability
B	Develop an outreach program to encourage participation in WAP by eligible low-income households.	Short Term (1–2 years)	Neighborhood Preservation & Sustainability
Performance Indicator		**Target**	
i	Number of households with WAP energy efficiency improvements since 2005.	750 by 2015 2,250 by 2020	

ENERGY EFFICIENCY IN EXISTING RESIDENTIAL BUILDINGS

E-6: Identify and implement opportunities to improve efficiency of rental units.

Measure Description:

Energy conservation is especially challenging in the residential rental sector because landlord, who is typically responsible for financing an energy efficiency improvement, does not benefit from the utility cost savings that would be generated from the investment, as the beneficiary of lower utility bills is usually the tenant. Few tenants would make investments in property they do not own, and furthermore, in multi-family buildings without individual unit metering, tenants have few incentives to conserve energy because they pay a flat rate utility bill based on the average energy consumption of other tenants. This market failure leads to inefficient rental housing stock, high energy bills for tenants, and unnecessarily high GHG emissions.

Rental properties represent about one-third of the housing market in the urban portions of the unincorporated county. The potential energy and GHG savings associated with bringing the rental housing stock up to a high level of energy efficiency are large. Energy efficiency is particularly important in the case of affordable housing and low-income rental properties, as these residents devote a much higher portion of their household income to utility bills.

The County will develop an outreach and incentive program targeted at encouraging efficiency upgrades in residential rental buildings. Additionally, the County will partner with rental associations to create and promote a website that identifies energy-efficient rental properties.

As a tracking mechanism, the County can develop a website (perhaps building on the Energy Upgrade California platform) where home and building owners can log energy efficiency retrofits and home/building improvements. The County could work with local contractors, building supply companies like Home Depot and Lowe's, and PG&E to publicize the service, with incentives such as free CFL light bulbs or other energy efficient technology for participants.

	Implementation Action	Timetable	Responsibility
A	Conduct a review of various municipalities' multi-family energy efficiency improvement programs.	Short Term (1–2 years)	Neighborhood Preservation & Sustainability
B	Develop rental property energy efficiency outreach and incentive program.	Short Term (1–2 years)	Neighborhood Preservation & Sustainability
C	Create and publicize a web-based database of energy efficient rental properties in the community.	Short Term (1–2 years)	Neighborhood Preservation & Sustainability
D	Develop monitoring website and publicity strategy with local contractors, building supply companies, and PG&E.	Short Term (1–2 years)	Neighborhood Preservation & Sustainability; Building
	Performance Indicator	**Target**	
i	Percentage of rental properties with energy efficiency improvements since 2005.	15% by 2015 30% by 2020	

GHG Reduction Potential:

Supporting E-4

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

High

Savings to Resident or Building Owner:

High

Potential Funding Sources:

ARRA; Public Finance; Partnerships w/ Organizations

GHG Reduction Potential:

2,887 MT CO_2e/yr

Community Co-Benefits

Cost to County:

Low to Medium

(depending on finance program)

Cost to Resident or Building Owner:

Low to High

(depending on finance program)

Savings to Resident or Building Owner:

Low to High

(depending on finance program)

Potential Funding Sources:

ARRA; Public Finance; Partnerships w/ Organizations

ENERGY EFFICIENCY IN EXISTING COMMERCIAL BUILDINGS

E-7: Develop and implement an outreach and financial assistance program that encourages businesses to invest in efficiency improvements.

Measure Description:

Investments in commercial building energy efficiency retrofits can save considerable amounts of energy and reduce a business's operational costs. The greatest barriers to these improvements are lack of information about efficient practices and scarcity of low-cost financing for the initial capital costs.

In cooperation with PG&E and the EBMUD, the County will provide outreach programs aimed at maximizing voluntary energy conservation within community businesses. These programs will target specific commercial sectors such as restaurants, supermarkets, retail, office, and manufacturing uses to provide useful energy and cost savings recommendations. The program will encourage businesses to conduct energy audits of their entire operations.

Another essential part of the program will be the provision of low-cost financing for commercial efficiency upgrades. Measure E-4 describes the types of financing programs that will be provided. Cost savings calculators for specific commercial sectors will be created to help businesses understand the benefits of these important investments.

As a tracking mechanism, the County can develop a website (perhaps building on the Energy Upgrade California platform) where building owners can log energy efficiency retrofits and building improvements. The County could work with local contractors, building supply companies like Home Depot and Lowe's, and PG&E to publicize the service, with incentives such as free CFL light bulbs or other energy efficient technology for participants.

	Implementation Action	Timetable	Responsibility
A	Work with PG&E and EBMUD to expand energy and water efficiency outreach programs for commercial and industrial businesses.	Short Term (1–2 years)	Redevelopment Agency Community Development
B	Provide commercial energy efficiency and renewable energy financing products to business (See E-4).	Short Term (1–2 years)	Redevelopment Agency Community Development
C	Develop tools that demonstrate the financial benefits of the efficiency upgrades.	Short Term (1–2 years)	Finance Community Development
D	Develop monitoring website and publicity strategy with local contractors, building supply companies, and PG&E.	Short Term (1–2 years)	Neighborhood Preservation & Sustainability; Building
	Performance Indicator	**Target**	
i	Percentage of businesses that have enrolled in financing program and achieved 15% improvement in building energy efficiency.	10% of businesses by 2015 25% of businesses by 2020	

ENERGY PERFORMANCE IN NEW CONSTRUCTION

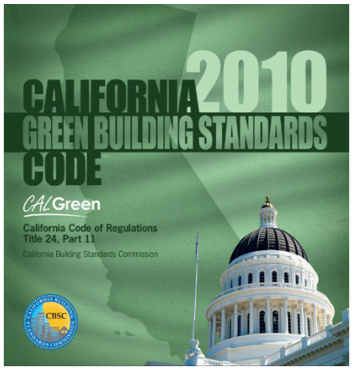
E-8: Renew the County Green Building Ordinance.

Measure Description:

Alameda County will renew its existing Green Building Ordinance and remove the existing sunset clause to continue its implementation. The County's current Green Building Ordinance stipulates that new residential projects must achieve minimum certification under either LEED for Homes, Build It Green's Green Point rated system, or another nationally recognized program. New non-residential projects between 3,000 and 10,000 square feet must submit a LEED checklist, whereas projects over 10,000 square feet must meet a minimum certification under the LEED for New Construction (LEED-NC) standard. Each of these systems includes a requirement to achieve a specified energy efficiency benchmark. In the Green Point Rated standard, section J.1.a states that a residential project is required to "exceed Title 24 standards by a minimum of 15 percent". The LEED-NC rating system contains a requirement within the Energy and Atmosphere section - EA Credit 1: Optimize Energy Performance, which offers two compliance pathways: Option 1 - Whole Building Energy Simulation or Option 2 - Prescriptive Compliance Path. Option 1 requires a minimum building energy performance of 12 percent better than ASHRAE Standard 90.1-2007, whereas Option 2 offers a prescriptive list of energy conservation measures. The Green Building Ordinance will also be updated along with future California Green Building Code (CALGreen) updates.

The County has already implemented this ordinance, which will serve to increase the energy efficiency of new residential and commercial buildings and could considerably reduce homeowners' and businesses' energy bills. There would be some administrative and monitoring costs associated with this measure, though the use of development fees could partially or totally offset this cost the County.

	Implementation Action	Timetable	Responsibility
A	Amend the County's Green Building Ordinance to comply with 2010 CALGreen, and readopt the County GBO without future sunset clause(s).	Short Term (1–2 years)	County Supervisors Building
	Performance Indicator	**Target**	
i	NA	NA	



GHG Reduction Potential:

7,530 MT CO_2e/yr

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

Medium

Potential Funding Sources:

Partnerships w/ Organizations; Self-financing; County Funds

GHG Reduction Potential:

557 MT CO_2e/yr

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

High

Savings to Resident or Building Owner:

Medium

Potential Funding Sources:

Partnerships w/ Organizations; County Funds

ENERGY PERFORMANCE IN NEW CONSTRUCTION

E-9: Provide incentives, such as priority permitting for buildings that exceed the current California Title-24 standards for energy efficiency by 30 percent (Tier 2).

Measure Description:

The County will encourage the development of buildings that exceed the 2010 Title-24 energy efficiency requirements by 30 percent (Tier 2 standards contained in Section A4.203.1 for residential and A5.203.1 for non-residential of the 2010 CALGreen) by providing incentives such as expedited permit processing. Priority-permitting for energy-efficient buildings creates an incentive for developers to incorporate energy efficient building practices by giving greater assistance and facilitation through the permitting process for qualified projects. The reduced permitting time can generate significant savings for developers that are paying interest on construction or bridge loans during that process.

Implementation Action		Timetable	Responsibility
A	Evaluate and select incentives for projects that exceed 2010 Title 24 energy efficiency requirements by 30% (Tier 2).	Short Term (1–2 years)	County
Performance Indicator		**Target**	
i	Percentage of new construction that exceeds 30% above 2010 Title 24 energy efficiency requirements.	5% by 2015 10% by 2020	

ENERGY PERFORMANCE IN NEW CONSTRUCTION

E-10: Require or provide incentives for new construction to use building materials containing recycled content.

Measure Description:

Building products with recycled content effectively reduce the extraction of virgin materials, reduce solid waste generation, and support recycling of construction and demolition waste materials. The County will either amend the Green Building Ordinance to require or develop an incentive program to encourage new developments to incorporate materials with recycled content. Developments that include materials with recycled content should be considered those for which the sum of post-consumer recycled content plus one-half of the post-industrial content constitutes at least 10 percent of the total value of the materials in the project. If the County elects to develop an ordinance, which would also conform with any Green Building Ordinance requirements, exemptions will be provided if the applicant proves that the requirement is unattainable for a specific project. In these cases, the highest feasible level will be required.

Construction materials with recycled content are derived in two basic ways:

- Pre-consumer material: Material diverted from the waste stream during a manufacturing process.
- Post-consumer material: Material generated by households or by commercial, industrial and institutional facilities in their role as end-users of the product, which can no longer be used for its intended purpose.

According to CalRecyle, the cost of construction materials that contain recycled content versus conventional construction materials is highly variable, ranging from a negligible cost differential to substantial, depending on the type of material and the source of the recycled content. CalRecyle also maintains a comprehensive list of construction materials with recycled content, and their specifications.

	Implementation Action	Timetable	Responsibility
A	Adopt an ordinance that requires OR develop an incentive program to encourage the use of recycled materials for 10% of building materials in new construction.	Medium Term (2–5 years)	County Supervisors Building
B	Develop an outreach program to design and building professionals about the availability of recycled building materials in construction.	Medium Term (2–5 years)	Building
	Performance Indicator	**Target**	
i	NA	NA	

GHG Reduction Potential:

Recommended Policy

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

Variable

Savings to Resident or Building Owner:

None

Potential Funding Sources:

Partnerships w/ Organizations

GHG Reduction Potential:

Recommended Policy

Community Co-Benefits

Cost to County:

E-Staff

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

Partnerships w/ Organizations; County Funds

ENERGY PERFORMANCE IN NEW CONSTRUCTION

E-11: Require new commercial parking lots with over 20 spaces to mitigate heat gain through the use of shade trees, solar arrays, or cool pavement.

Measure Description:

Trees, shade structures, and cool (low albedo) paving materials reduce heat gain in parking lots. This in turn can decrease ambient air temperatures in warm summer months and reduce the use of building energy required for air conditioning. The County will amend the Zoning Code to require one of the following parking lot heat gain mitigation strategies be achieved in new parking lots with 200 parking spaces or more: (a) trees will be planted and maintained throughout a parking lot to ensure that at least 50 percent of the parking lot will be shaded within 15 years after establishment of the lot, (b) solar photovoltaic panels will shade 50 percent of the parking lot, or (c) cool pavements with an albedo greater than 40 percent will be used if tree planting and solar arrays are infeasible due to project-specific constraints.

	Implementation Action	Timetable	Responsibility
A	Amend the Zoning Code to require one out of three following elements for new parking lots with 200 or more parking spaces: (a) 50 percent of the parking lot to be shaded by tree canopy, (b) solar photovoltaic panels, (c) or the use of cooling pavements or pavement coatings with albedos greater than 40% if trees and solar panels are impractical due to site considerations.	Short Term (1–2 years)	County Supervisors Planning
B	Develop parking lot heat gain mitigation design guidelines to facilitate construction and review process.	Short Term (1–2 years)	Planning Building Public Works
	Performance Indicator	**Target**	
i	NA	NA	

ENERGY PERFORMANCE IN NEW CONSTRUCTION

E-12: Require all new construction and major renovation of multi-unit buildings to be "sub-metered" to enable each individual unit to monitor energy consumption.

Measure Description:

Multi-family residential buildings typically do not have separate gas and electric meters for each unit. Group meters, consequently, require landlords to charge a flat rate to all tenants. This flat rate reduces an individual tenant's incentive to conserve energy. Providing information on energy consumption can help in aligning the incentives for conservation. Even if sub-metering may not directly induce conservation, it does make sure that the benefits of conservation accrue to the tenant.

Sub-metering is viewed as a more directed way assessing an individual unit's energy consumption than Ratio Utility Billing Systems (RUBS), an approach that estimates each tenant's usage and share of costs based on the square footage of the apartment or number of occupants. Though there is some correlation between square footage and energy usage, it is not an accurate representation of the actual energy consumption in a unit. A sub-metering system measures actual energy usage, and does not rely on the approximations that the RUBS approach relies on.

The County will amend the Building Code to require that all new construction and major renovation of multi-family buildings be sub-metered for gas and electric for each unit to encourage conservation.

When a building is undergoing a major renovation, typically walls and electrical systems are upgraded. This is the opportune time to install a sub-metering system, while minimizing the system cost to the building owner. Major renovations are considered those by which (a) the total cost of the renovation related to the building envelope or the technical building systems is higher than 25 percent of the value of the building (excluding the land value) or (b) more than 25 percent of the building envelope surface undergoes renovation.

	Implementation Action	Timetable	Responsibility
A	Amend the building code to require each new and major renovation of multi-family development to install electricity and gas meters for each unit.	Short Term (1–2 years)	County Supervisors Building
Performance Indicator		**Target**	
i	NA	NA	

GHG Reduction Potential:

Supporting E-8

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

High

Savings to Resident or Building Owner:

Medium

Potential Funding Sources:

Partnerships w/ Organizations; County Funds

GHG Reduction Potential:

10,268 MT CO_2e/yr

Community Co-Benefits

Cost to County:

E-Staff

Cost to Resident or Building Owner:

None to Low

(depending on power purchase agreement)

Savings to Resident or Building Owner:

None to Medium

(depending on power purchase agreement)

Potential Funding Sources:

ARRA; Public Finance; Partnerships w/ Private Companies; Partnerships w/ Organizations

RENEWABLE ENERGY

E-13: Establish Solar EmPowerment Districts that remove barriers to and facilitate the installation of solar photovoltaic systems on eligible commercial and industrial buildings and parking lots.

Measure Description:

Commercial and industrial rooftops and parking lots provide an excellent opportunity for solar energy generation. These facilities tend to have large, flat roofs that are often well-suited for solar photovoltaic (PV) energy generation. To facilitate the installation of renewable energy systems, the County will create Solar EmPowerment Districts in commercial and industrial areas with optimal solar orientation and building structure conditions. Within each Solar EmPowerment District, the County will work to remove or minimize existing regulatory and structural barriers that inhibit the installation of solar energy systems. Once the County has identified optimal districts for solar PV installations, a streamlined permitting process will be developed to further promote and expedite the installation of PV systems and reduce associated costs.

The Solar EmPowerment Districts will also link interested property owners with proven solar energy companies. By partnering with solar energy companies, building owners can have PV systems installed on their roofs or parking lots with no up-front cost. The solar energy company retains ownership of the installed PV systems and provides maintenance and repairs over the equipment lifespan. Property owners purchase the generated electricity from the solar energy company through a power purchase agreement.

There are economic advantages for both the private solar contractors and property owners. Through working at the scale of a Solar EmPowerment District, private solar contractors are able to reduce marketing costs, package solar tax incentives to minimize administrative costs, and lower installation costs through batch processing. Property owners can benefit from long-term stable electricity rates in their power purchase agreements, which can lower energy costs during the lease period.

To achieve the stated GHG reductions, the Community must install PV systems on two million square feet of eligible structures and parking areas (approximately 100 medium- to large-size buildings or parking lots) within defined Solar EmPowerment Districts, which would cover approximately 13 percent of this space. In the unincorporated county, there are approximately 5.4 million square feet of commercial and industrial building rooftop space, with an additional 10 to 20 million square feet of parking area. To maximize participation, the County will provide outreach and technical assistance to interested property owners.

	Implementation Action	Timetable	Responsibility
A	Identify commercial and industrial areas with optimal solar orientation, building structure, and land ownership/management conditions.	Short Term (1–2 years)	Planning Redevelopment
B	Adopt ordinance that establishes Solar EmPowerment Districts in high potential areas.	Short Term (1–2 years)	County Supervisors Planning
C	Conduct analysis of potential regulatory, structural, and market barriers to installation of photovoltaic systems on commercial buildings and parking lots within defined districts.	Short Term (1–2 years)	Planning Comm. Development Building
D	Minimize barriers and streamline permitting for solar PV installation in EmPowerment Districts.	Short Term (1–2 years)	Planning Building
E	Develop outreach and technical assistance programs to encourage the installation of solar PV systems.	Short Term (1–2 years)	Planning Comm. Development Building
	Performance Indicator	**Target**	
i	Square feet of photovoltaic panels on commercial and industrial buildings.	1,000,000 square feet by 2015 2,000,000 square feet by 2020	

RENEWABLE ENERGY

E-14: Facilitate the installation of solar hot water heating systems on large commercial buildings.

Measure Description:

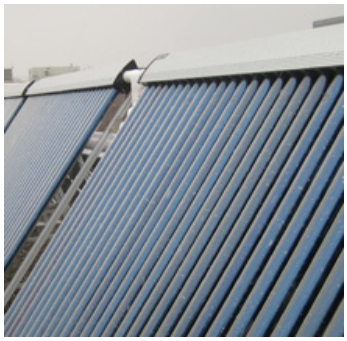
Commercial-scale solar water heating (SWH) systems are designed to provide large quantities of hot water to large commercial buildings, heated using solar energy. A typical system includes roof or wall mounted solar collectors that work along with a pump, heat exchanger, and one or more large storage tanks. SWH systems can dramatically reduce the amount of natural gas or electricity used for heating water in conventional systems, which lowers the GHG emissions associated with water heating.

In January 2010, the California Public Utility Commission approved a decision that creates a new statewide program providing $358.3 million in financial incentives and market development funding for SWH and other solar thermal technologies. The California Solar Initiative's new Thermal Program sets aside $305.8 million for direct financial incentives for consumers of SWH systems and another $31.25 million for market facilitation, with the balance going to program administration, inspections, measurement, and evaluation.

Commercial customers who install certified SWH systems will qualify for incentives of up to $500,000 to offset capital costs, beginning on June 1, 2010. Incentive levels will decline in four stages as the solar thermal market grows, similar to the general market CSI-PV program. Actual incentive payments will be determined by the thermal output of the system.

The County, in partnership with utilities and other relevant organizations, will take an active role in promoting and facilitating the installation of SWH systems on commercial buildings in the community. The County will create an outreach program aimed at maximizing the number of businesses that invest in SWH systems. The County will also streamline building permitting process for SWH system installation. To achieve the stated GHG reductions, approximately 5 percent of large commercial buildings would need to install such systems by 2020.

	Implementation Action	Timetable	Responsibility
A	Create outreach program that promotes SHW systems and educate business owners about the CSI - Thermal Program and related federal incentives.	Short Term (1–2 years)	Community Development
B	Remove unnecessary regulatory barriers to SHW system installation and streamline permitting processes.	Short Term (1–2 years)	Community Development Planning Building
	Performance Indicator	**Target**	
i	Percentage of large commercial buildings that have installed solar hot water systems since 2005.	2.5% by 2015 5% by 2020	



GHG Reduction Potential:

628 MT CO_2e/yr

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

High

Savings to Resident or Building Owner:

High

Potential Funding Sources:

ARRA; Public Finance; Partnerships w/ Private Companies; Partnerships w/ Organizations

GHG Reduction Potential:

6,623 MT CO_2e/yr

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

High

(depends on renewable energy technology)

Savings to Resident or Building Owner:

None to High

(depending on power purchase agreement)

Potential Funding Sources:

ARRA; Public Finance; Partnerships w/ Private Companies; Partnerships w/ Organizations

RENEWABLE ENERGY

E-15: Develop a comprehensive residential renewable energy program that provides outreach, financing, and other forms of assistance.

Measure Description:

Alameda County will develop a comprehensive residential renewable energy program that encourages homeowners to install solar hot water and solar photovoltaic systems through outreach, low-cost financing, and permit streamlining. Outreach efforts will aim to maximize community participation in renewable energy generation, and emphasize energy bill reductions and climate protection benefits. The County will identify and contact homeowners whose properties have the potential for optimal solar generation. The County will provide or identify an online calculator that provides residents with an estimate of the costs and savings associated with solar systems.

The County will emphasize encouraging home and apartment owners to install solar hot water systems. This proven technology has a fast payback, providing owners with energy bill savings within two to three years, if financed solely by the home or building owner. The County has set a goal that ten percent of the residences install solar hot water systems, five percent of residences install solar photovoltaic systems, and five percent of small commercial buildings install solar hot water systems by 2020.

Financing is critical to the success of the residential renewable energy program. Under Assembly Bill 811, property owners can install solar systems on their homes with reduced upfront costs. As described in Measure E-4, the County will partner with ABAG or the State to create an effective energy efficiency financing program which can also be used to fund renewables. The Renewable Technologies component of the financing program will allow residential and commercial property owners to repay the cost of solar energy systems through a voluntary tax increment on their property tax bill. The program will pay the installation cost of a renewable energy system for approved applicants. In turn, the County will add a line item to the owners' property tax bill sufficient to repay the cost of the energy project plus interest over 20 years. If the property is sold, both the renewable energy system and the remaining debt stay with the property. Property owners will be able to finance the renewable systems by using this program in conjunction with the California Solar Initiative rebate program.

To further facilitate participation, the County will work to streamline the permitting process for system installation. The County will create a specific solar installation permit and only include submittal requirements directly related to solar systems.

Implementation Action		Timetable	Responsibility
A	In partnership with ABAG and/or the State, develop a financing program to fund residential investment in renewable energy (see Measure E-4).	Short Term (1–2 years)	Neighborhood Preservation & Sustainability
B	Develop a targeted outreach program to maximize residential installation of solar hot water systems.	Short Term (1–2 years)	Neighborhood Preservation & Sustainability
C	Streamline permitting for photovoltaic and solar hot water system installation.	Short Term (1–2 years)	Planning Building
Performance Indicator		**Target**	
i	Percentage of residences that have installed photovoltaic systems since 2005.	2.5% by 2015 5% by 2020	
ii	Percentage of residences that have installed solar hot water systems since 2005.	5% by 2015 10% by 2020	
iil	Percentage of small commercial buildings that have installed solar hot water systems since 2005.	2.5% by 2015 5% by 2020	

GREEN JOBS

E-16: Develop a green jobs program for the unincorporated areas of Alameda County.

Measure Description:

The County shall develop a job-training and employment pipeline providing enhanced job opportunities in "green collar" jobs for low-income adults in the unincorporated areas of Alameda County. This program would prepare trainees for careers in the Bay Area's most vibrant green industries, including energy efficiency, green construction, and solar. The County shall seek partners in the Bay Area to help facilitate the development of this program. Potential partners include the Ella Baker Center, local community and state colleges, or other relevant green jobs organization, as deemed appropriate.

A typical green jobs program would train young adults through a four stage process: recruitment, pre-education and training, green-collar skills training and education, and on-the-job training with green employers.

Stage 1 - Outreach, Recruitment, and Assessment: would involve community outreach to recruit low-income young adults in the unincorporated county and could include a college placement assessment.

Stage 2 - Pre-Construction and Basic Skills Training: could provide a range of services, including introduction to the skilled trades; carpentry; GED preparation; basic literacy and math; job readiness including resume development, interviewing skills, and financial planning.

Stage 3 - Solar and Green Construction: would focus on the education and training specifically needed for green collar employment. Education and training would emphasize solar installation, energy efficiency in buildings, green construction, and an introduction to the principles of ecology, environmental sustainability, and environmental justice.

Stage 4 - Paid Work Experience, On-the-Job Training: would place participants into paid on-the-job training opportunities and apprenticeships. The program would provide case management and support services for both employers and trainees throughout this phase to maximize retention and success.

The ultimate goal of the program would be to place graduates in full time jobs with companies such as solar firms and green construction contractors. The typical starting wage in the solar industry is in the range of $15 per hour. The wages for starting apprentices in the construction trades range from $12 to $16 per hour.

	Implementation Action	Timetable	Responsibility
A	Partner with local organizations and community colleges, as appropriate to develop a green jobs program for the unincorporated areas of Alameda County.	Medium Term (2–5 years)	Community Development
	Performance Indicator	**Target**	
i	Develop program for unincorporated areas of Alameda County.	by 2013-2014	

GHG Reduction Potential:

Recommended Policy

Community Co-Benefits

Cost to County:

E-Staff

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

Partnerships w/ Organizations

2.6 Water Use Action Area

Substantial amounts of energy are used to pump, treat, transport, heat, and cool water for consumption (potable) and wastewater treatment. Thus, water conservation reduces energy consumption, lowers GHG emissions, and protects the region's valuable water resources. Water conservation will become increasingly important if climate change decreases available water supplies throughout the State. The County recognizes that the community needs to reduce water use within existing and future buildings and landscapes, and will use outreach, incentives, and regulations to achieve a minimum 20 percent reduction in per capita water consumption by 2020. The Water Conservation Action Area is responsible for approximately 7,470 MT CO_2e/yr.

Water Consumption:

Water use generates **4%** of total GHG emissions

Many buildings and landscapes in the unincorporated County use water inefficiently.

= Toilets made before 1993 use **3.5 to 8 Gallons** per flush.

Source: Water Conservation in and around the Home, Colorado State University Extensions, 2006

Water Conservation:

- 7,500 metric tons of GHGs

Water conservation measures will protect this valuable resource and reduce GHG emissions.

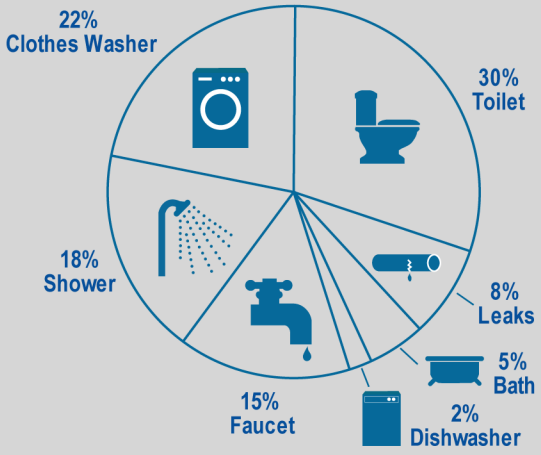
= Modern toilets use less than **1.6 Gallons** per flush. A family of four could save up to 25,000 gallons per year by updating their toilets.

Source: Water Conservation in and around the Home, Colorado State University Extensions, 2006

Single-Family Residential Indoor and Landscape Water Use:

Source: EBMUD - 2040 Water Management Plan

Single-Family Residential Indoor Water Use:



Source: EBMUD - 2040 Water Management Plan

WATER STRATEGIES & MEASURES:

Water Conservation - Building and Landscape Efficiency

Replacing antiquated water fixtures, appliances, and irrigation systems can generate valuable water conservation benefits. The County will encourage property owners to make water efficiency upgrades in existing buildings and landscapes. As landscapes for new buildings present opportunities for considerably reducing potable water consumption, the County will require that large landscape projects incorporate best practices in both design and operation. Additionally, the County will expand water conservation educational and rebate programs. The Water Conservation - Building and Landscape Efficiency strategy contains the following measures:

- **WT-1** Encourage residents and businesses to conserve water in existing buildings and landscapes.
- **WT-2** Require new landscape projects to reduce outdoor potable water use by 40 percent.
- **WT-3** Adopt an ordinance that allows the installation and use of greywater (recycled) systems for subsurface irrigation.

Water Conservation - Consumer Education

Research from the University of Delaware demonstrates that water utility customers most often use their utility bills to check for unusual consumption or to evaluate the effect of conservation measures. The Water Conservation - Consumer Education strategy contains the following measure:

- **WT-4** Work with EBMUD and Zone 7 to redesign the water bill format to encourage water conservation in residential and commercial users.

GHG Reduction Potential:

6,762 MT CO_2e/yr

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

Low

Savings to Resident or Building Owner:

Low

Potential Funding Sources:

ARRA; Partnerships w/ Organizations; County Funds

WATER CONSERVATION – BUILDING AND LANDSCAPE EFFICIENCY

WT-1: Encourage residents and businesses to conserve water in existing buildings and landscapes.

Measure Description:

The water conservation targets in this measure are, in great part, driven by a state-level policy, SB 7. This policy requires a reduction in per capita water consumption by 2020 - either the "standard target", a 20 percent reduction from the average water demand between 1994 and 2004, or the "alternative minimum", a five percent reduction from the average water demand between 2003 and 2007. EBMUD, and to a less extent Zone 7, have yet to determine the specific SB 7 target that it will attempt to achieve, and, therefore, there is uncertainty in developing guidelines for their compliance.

The majority of residential and commercial buildings in the community are more than 30 years old. Water fixtures and appliances have improved considerably since that time, and replacing antiquated equipment would result in valuable water conservation benefits. Alameda County will partner with EBMUD, Zone 7, and Stopwaste.Org to encourage voluntary water conservation in existing residential and commercial buildings and landscapes. The partnership will provide targeted outreach programs, free water efficiency audits, and rebate incentives.

In order to improve indoor water efficiency, outreach programs will focus on upgrades to water fixtures, fixture fittings, leak repair, and appliances (e.g., dishwashers and clothes washers). Property owners will be encouraged to increase indoor water efficiency by 20 percent or greater. Outreach focused on water-efficient landscaping will build on the existing Bay-Friendly Landscaping program and encourage property owners to use climate-appropriate plants, efficient irrigation systems, rainwater capture, and greywater. Property owners will be encouraged to reduce the use of potable water for irrigation by 50 percent or more. The progress indicators shown below represent aspirational goals for these water conservation programs, recognizing that in order to achieve the SB 7 target, additional water conservation will be required.

	Implementation Action	Timetable	Responsibility
A	Work with utilities and Stopwaste.Org to expand water conservation outreach and rebate programs.	Short Term (1–2 years)	Community Development Public Works
B	Develop a targeted landscape irrigation outreach program for landscape professionals.	Short Term (1–2 years)	Community Development Public Works
C	Adopt an ordinance that prohibits home owners associations from preventing the use of water-conserving landscaping techniques (e.g., xeriscaping, native plants and grasses, etc). Home owners associations will still retain authority to apply minimum standards for appearance, quality and maintenance of landscapes.	Short Term (1–2 years)	County Supervisors Planning
	Performance Indicator	**Target**	
i	Percentage of households and businesses that voluntarily reduce indoor water consumption by 20% or more.	25% by 2015 50% by 2020	
ii	Percentage of households and businesses that voluntarily reduce irrigation water consumption by 50% or more.	25% by 2015 50% by 2020	
iii	To achieve the SB 7 target of a 20 percent reduction in per capita urban water consumption, additional water conservation efforts are required.	TBD	

WATER CONSERVATION – BUILDING AND LANDSCAPE EFFICIENCY

WT-2: Require new landscape projects to reduce outdoor potable water use by 40 percent.

Measure Description:

The County will amend the existing Building Code to require major landscape projects to reduce potable water use for landscape irrigation by 60 percent of the baseline initial requirements for plant installation and establishment (Section 5.304) as identified in Section A4.304.4 Tier 2 (residential) and A5.304.4 Tier 1 (non-residential) of the 2010 CALGreen. A major landscape project is to be defined as all landscape designs associated with new construction (residential and non-residential) over 2,500 square feet in size. This standard will complement the County's existing Bay Friendly Landscaping Resolution.

The County, in partnership with Stopwaste.Org, will provide landscape professionals and other interested community members with training in how to design and implement highly water-efficient landscapes.

	Implementation Action	Timetable	Responsibility
A	Amend the Building Code to require major landscape projects to reduce potable water use for landscape irrigation by 40% below the initial requirements for plant installation and establishment as identified in Section A4.304.4 Tier 2 (residential) and A5.304.4 Tier 1 (non-residential) of 2010 CALGreen.	Short Term (1–2 years)	Redevelopment Agency Planning Public Works
	Performance Indicator	**Target**	
i	Percentage of new landscapes that will achieve a 40% reduction in water consumption.	100% following amendment of Building Code	

GHG Reduction Potential:

708 MT CO_2e/yr

Community Co-Benefits

Cost to County:

WT-Staff

Cost to Resident or Building Owner:

Low

Savings to Resident or Building Owner:

Low

Potential Funding Sources:

Partnerships w/ Organizations; County Funds

WATER CONSERVATION – BUILDING AND LANDSCAPE EFFICIENCY

WT-3: Adopt an ordinance that allows the installation and use of greywater (recycled) systems for subsurface irrigation.

Measure Description:

In order to provide property owners with a full range of potable water conservation techniques, the County will adopt an ordinance to explicitly permit the installation and use of greywater (recycled) systems that conform to Title 24 Part 5 of the California Plumbing Code. The County will also provide public outreach that educates residents and businesses about the opportunities to construct greywater and rainwater collection systems on their properties and integrate them into irrigation systems. County Planning and Building staff will receive training to help interested parties understand the State code requirements for greywater systems.

Implementation Action		Timetable	Responsibility
A	Adopt an ordinance that allows the installation and use of greywater systems that conform to Title 24 Part 5 of the California Plumbing Code.	Short Term (1–2 years)	County Supervisors Building
Performance Indicator		**Target**	
i	Adoption of ordinance to permit the installation and use of greywater (recycled) systems.	by 2012	

GHG Reduction Potential:

Supporting WT-1

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

High

Savings to Resident or Building Owner:

Medium

Potential Funding Sources:

ARRA; Partnerships w/ Organizations; County Funds

WATER CONSERVATION – CONSUMER EDUCATION

WT-4: Work with EBMUD and Zone 7 to redesign water bill format to encourage water conservation in residential and commercial users.

Measure Description:

EBMUD, Zone 7, and the Hetch-Hetchy Water System provide residents and businesses with water. The County will encourage EBMUD and Zone 7 to provide comparative water conservation metrics and educational statements on customers' utility bills. The bill would compare the consumer's consumption to the average consumption rates in the region. The bill should also be used to encourage efficient water consumption behaviors, and provide practical information on how to reduce water consumption and utility bills.

	Implementation Action	Timetable	Responsibility
A	Work with EBMUD and Zone 7 to establish comparative metrics on all residential water bills.	Short Term (1–2 years)	Planning Public Works
	Performance Indicator	**Target**	
i	NA	NA	

GHG Reduction Potential:

Supporting WT-1

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

Low

Savings to Resident or Building Owner:

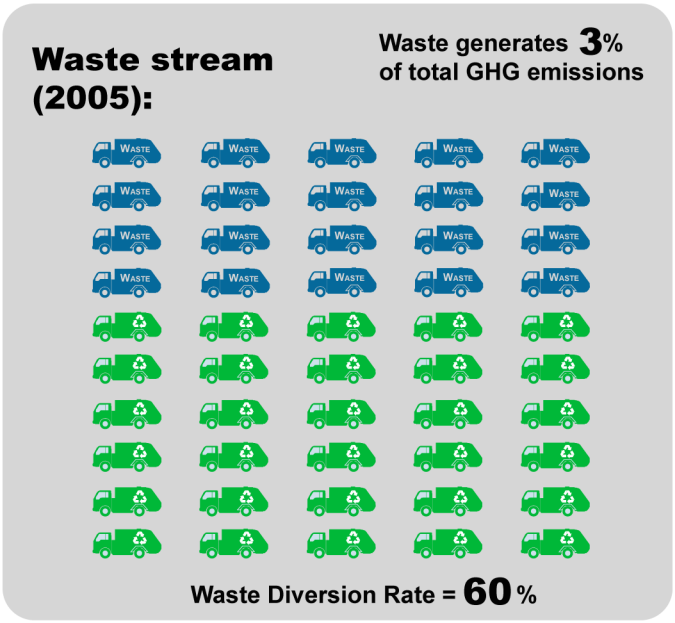
Low

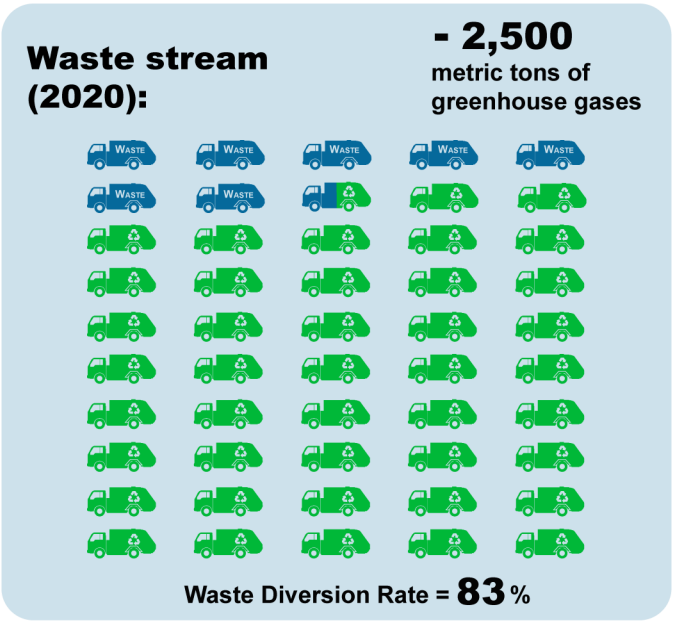
Potential Funding Sources:

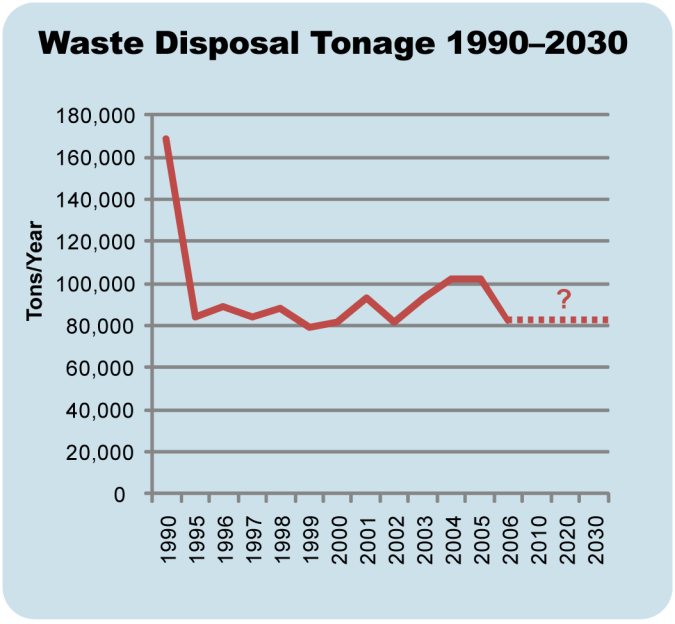
Partnerships w/ Organizations; County Funds

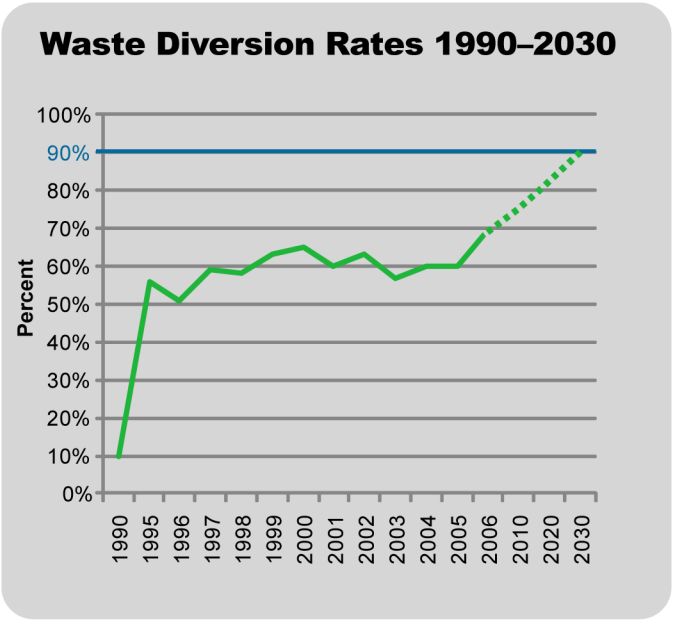
2.7 Waste Action Area

The type of goods we consume and how we dispose of them strongly influences the amount of waste-related GHG emissions released into the atmosphere. Waste disposal creates emissions when organic waste (e.g., food scraps, yard clippings, paper, and wood) is buried in landfills and anaerobic digestion creates methane, a potent greenhouse gas. Additionally, the extraction and processing of raw materials and the manufacture, distribution, and disposal of consumer products, generates a large portion of global GHG emissions. To reduce the community's waste-related GHG emissions, the County will build on its already exemplary waste management programs and establish a target of diverting 90 percent of all waste from landfills by 2030 with an interim goal of 82.5 percent by 2020. The Waste Action Area is responsible for approximately 2,510 MT CO_2e/yr.









WASTE STRATEGIES & MEASURES:

Waste Reduction and Diversion

Alameda County has one of the highest waste diversion rates in the nation. To accomplish the 90 percent waste diversion target by 2030, the County will expand existing outreach, construction and demolition waste, and food waste programs. The County will also emphasize the improvement of waste services for residents and businesses in rural areas. The Waste Reduction and Diversion strategy contains the following measures:

- **WS-1** Increase solid waste reduction and diversion to 90 percent by 2030.
- **WS-2** Strengthen the Construction and Demolition Debris Management Ordinance.
- **WS-3** Develop a food waste collection program and an ordinance that requires all household and commercial food wastes and food soiled paper to be placed in organics carts.

Extended Producer Responsibility

If manufacturers were to improve the recyclability of their products and packaging, substantial GHG emission reductions could be achieved. The County will urge the State and Federal governments to create legislation that requires extended producer responsibility and improves the recyclability of products and packaging. `The Extended Producer Responsibility strategy contains the following measure:

- **WS-4** Work with StopWaste.Org, Alameda County cities, and other organizations to urge adoption of legislation that requires extended producer responsibility and improves the recyclability of products and packaging.

GHG Reduction Potential:

2,510 MT CO_2e/yr

Community Co-Benefits

Cost to County:

WS-Staff

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

Partnerships w/ Organizations; County Funds

WASTE REDUCTION & DIVERSION

WS-1: Increase solid waste reduction and diversion to 90 percent by 2030.

Measure Description:

Alameda County will adopt an amendment to its Waste Diversion Resolution to raise the goal for waste reduction and diversion to 90 percent by 2030. Achieving this aggressive target will require full participation from residents and businesses, and collaboration with StopWaste.org and other Bay Area cities and the County. The County, in partnership with Stopwaste.Org, will prepare a zero-waste plan that identifies strategies and actions for minimizing waste in the unincorporated county over the next 20 years.

In the short-term, the County will augment existing waste diversion programs, conduct a variety of outreach programs to increase participation in waste reduction, recycling, and composting programs, and adopt mandatory requirements to ensure achievement of this important goal. The County will implement a phased approach that focuses on education first and enforcement second.

Implementation Action		Timetable	Responsibility
A	Adopt an amendment to the Waste Diversion Resolution to achieve 90 percent waste reduction and diversion by 2030.	Short Term (1–2 years)	Board of Supervisors Planning
B	Expand outreach programs to maximize participation in waste reduction and diversion programs.	Short Term (1–2 years)	Planning
Performance Indicator		**Target**	
i	Community waste diversion rate.	75% by 2010 82.5% by 2020 90% by 2030	

WASTE REDUCTION & DIVERSION

WS-2: Strengthen the Construction and Demolition Debris Management Ordinance.

Measure Description:

Construction and demolition waste constitutes a large portion of the county's waste flows. Wood and vegetative materials generate methane emissions when put in landfills, and metals and other salvageable materials are recyclable. Section 470.4 of the County's current Green Building Ordinance requires 75 percent of inert construction and demolition waste (e.g., concrete, asphalt, and stone) and 50 percent of all remaining designated project-related construction and demolition waste (e.g., wood, vegetative materials, and metals) to be recycled or reused. The County will amend this ordinance to correspond with the current Construction and Demolition model ordinance being support by CALGreen and StopWaste.org. The new diversion standards will be the following: (1) 100% of inert waste and 50% wood/vegetative/scrap metal net of (not including) Alternative Daily Cover (ADC) and unsalvageable material put to other beneficial uses at landfills and (2) recycling and beneficial reuse of 100% of inert materials – concrete and asphalt. The increased diversion rate goal will help encourage composting, recycling, or reuse of the "remaining designated" material types.

	Implementation Action	Timetable	Responsibility
A	Amend an ordinance to require diversion of (1) 100% of inert waste and 50% wood/vegetative/scrap metal net of Alternative Daily Cover (ADC) and unsalvageable material put to other beneficial uses at landfills and recycling and (2) beneficial reuse of 100% of inert materials – concrete and asphalt by 2015.	Short Term (1–2 years)	County Supervisors Community Development Building
B	Work with Stopwaste.Org to develop educational programs for construction professionals about advanced construction and demolition waste diversion techniques.	Medium Term (2–5 years)	Community Development Building
C	Partner with Stopwaste.Org and local businesses to establish a construction and demolition material recycling industry in the area.	Medium Term (2–5 years)	Community Development
	Performance Indicator	**Target**	
i	Waste diversion rates for construction and demolition inert waste.	100% by 2015	
ii	Waste diversion rates for construction and demolition wood/vegetative/scrap metal wastes net of ADC and unsalvageable material.	50% by 2015	

GHG Reduction Potential:

Supporting WS-1

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

High

Savings to Resident or Building Owner:

None

Potential Funding Sources:

Partnerships w/ Organizations; County Funds; Self-financing

GHG Reduction Potential:

Supporting WS-1

Community Co-Benefits

Cost to County:

WS-Staff

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

Partnerships w/ Organizations; General Fund

WASTE REDUCTION & DIVERSION

WS-3: Develop a food waste collection program and adopt an ordinance that requires all household and commercial food wastes and food-soiled paper to be placed in organics carts.

Measure Description:

Stopwaste.Org's 2004 Food Scrap Recycling Program survey identified that approximately 62 percent of households do not participate in the County's food waste- and food-soiled paper composting program. These results indicate that a large portion of compostable material is being disposed of in landfills, generating methane emissions. To aid the achievement of the 2030 solid waste reduction and diversion goal, and reduce landfill GHG emissions, the County will partner with Stopwaste.Org to expand food waste outreach programs. The County will also amend the existing Waste Management Resolution to prohibit the disposal of household and commercial food scraps and food-soiled paper with other household waste. This amendment will require food wastes to be placed in organic waste containers or composted on-site. Separate fines for non-compliance will be developed for residential and commercial uses. Code enforcement will educate residents prior to the levy of any fine. Residents and businesses without standard recycling services will be exempt from the ordinance.

Implementation Action		Timetable	Responsibility
A	Develop a residential and commercial food waste collection and composting outreach and education program.	Short Term (1–2 years)	Community Development
B	Amend the County's Waste Management Resolution to prohibit the disposal of household and commercial food scraps and food-soiled paper with other household waste.	Short Term (1–2 years)	County Supervisors Community Development
Performance Indicator		**Target**	
i	Percentage of household and commercial food waste composted.	100% by 2015	

EXTENDED PRODUCER RESPONSIBILITY

WS-4: Work with Stopwaste.Org, Alameda County cities, and other organizations to urge adoption of State and federal legislation that requires extended producer responsibility, and improves the recyclability of products and packaging.

Measure Description:

The County will work with Alameda cities and other Bay Area communities to collectively urge the State and federal governments to pass legislation that requires extended producer responsibility, and improves the recyclability of products and packaging. Such legislation would reduce waste streams to landfills, and greatly reduce lifecycle emissions and other environmental impacts associated with many consumer products.

While the County recognizes the importance of extended producer responsibility legislation to the achievement of the 90 percent diversion rate target, only emissions reductions stemming from decreased methane production in landfills are included in the quantification of the waste action area's GHG emission reductions. The rationale of this decision is due to the fact that extended producer responsibility would not reduce emissions contained in the county's 2005 baseline inventory.

	Implementation Action	Timetable	Responsibility
A	Develop a resolution of support to encourage the State and federal governments to pass legislation that requires extended producer responsibility and improves recyclability of products and packaging.	Short Term (1–2 years)	County Supervisors Community Development
	Performance Indicator	**Target**	
i	NA	N/A	

GHG Reduction Potential:

Recommended Policy

Community Co-Benefits

Cost to County:

WS-Staff

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

Partnerships w/ Organizations; General Fund

2.8 Green Infrastructure Action Area

Green infrastructure is the interconnected network of open spaces and natural areas (e.g., greenways, wetlands, parks, forest preserves, and native plant vegetation) that naturally manage stormwater, reduces flooding risk, and improves water quality. These benefits are a sample of the ecosystem services that we receive from healthy, functioning ecosystems. In unincorporated Alameda County, there exists a network of green infrastructure, such as the urban forest, natural habitat areas, community gardens, farms, vineyards, and natural stormwater-absorbing landscapes. The County recognizes the multiple benefits that green infrastructure provides and will work to enhance these valuable resources. Expanding the urban forest, restoring riparian forests, and creating new community gardens and urban farms will help the County protect the climate and improve the quality of life for its residents. The Green Infrastructure Action Area is responsible for approximately 1,500 MT CO_2e.

The role of urban forests in climate protection: - 1,500 metric tons of greenhouse gases

Carbon Sequestration:
Trees capture atmospheric CO_2 within their trunk, branches, leaves, and roots as they grow.

= **1 Tree** captures about 13 lbs of CO_2 per year.

= **1 Acre** of trees captures approximately 2.6 metric tons of CO_2 per year, the equivalent of taking 2.2 cars off the road.

Building Energy Use Reduction:
Trees can shade buildings from hot afternoon sun and reduce building air conditioning energy consumption.

= **1 Tree** can reduce energy consumption by around 200 kilowatt hours per year for a home located in the northern california coastal climate zone.

= If **1,000 Homes** planted shade trees, the energy savings would reduce about 84 metric tons of GHGs per year, the equivalent of taking 70 cars off the road.

Source: Center for Urban Forestry Research, US Forest Service, 2010, Adapted by AECOM 2009

The role of local agriculture in climate protection:

Food that is grown out-of-season and transported by air results in high levels of GHG emissions.
Community gardens and local farms offer residents access to in-season and healthy food.
Out-of-season produce transported from distant farms can result in five times more emissions than in-season local produce (USDA).

In-Season Produce Grown on Local Farms

~1 Metric Ton of GHG Emissions

Produce Transported from Distant Farms

~5 Metric Tons of GHG Emissions

GREEN INFRASTRUCTURE STRATEGIES & MEASURES:

Urban Forest

Trees beautify neighborhoods, increase property values, reduce noise and air pollution, create privacy, and establish habitat for bird species. The urban forest also mitigates GHG emissions, primarily through sequestering carbon as trees grow, but also through providing shading for buildings and paved areas (i.e., streets, sidewalks, parking lots, etc.), which reduces air conditioning loads and associated energy consumption. The County will develop an Urban Forest Management Plan and increase tree-planting efforts in Castro Valley, Cherryland, Ashland, and San Lorenzo through the following measure:

- **G-1** Expand the urban forest (e.g., street trees and trees on private lots) in order to sequester carbon and reduce building energy consumption.

Carbon Sequestration in Natural Areas

Establishing and restoring riparian forests, wetlands (primarily in western areas), and other types of habitat can improve ecosystem function, and result in increased carbon sequestration potential, as well as other ecosystem services, such as water filtration, air purification, urban heat island attenuation, and erosion prevention. A variety of publicly-owned lands in eastern and western portions of the unincorporated county offer excellent opportunities for ecosystem restoration. The County will evaluate the carbon sequestration potential of future restoration projects and apply these sequestration levels to the achievement of the County's GHG emissions reduction target, through the following measure:

- **G-2** Include carbon sequestration as an objective within County-led natural area restoration projects.

Community Gardens and Urban Agriculture

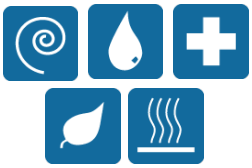
Alameda County recognizes the importance of community food security and providing residents with the ability to grow or purchase fresh produce. Increasing the availability of locally grown and seasonal food is an important way to reduce GHG emissions associated with food production, storage, and distribution. The County will work to increase the number of community gardens and urban-edge farms, as well as establish farmers markets in strategic areas of the community.

- **G-3** Establish a local community garden program to increase local food security and provide local recreation amenities.
- **G-4** Work with local farmers and agricultural non-profits to develop urban-edge farming opportunities in the unincorporated county.
- **G-5** Work with local organizations to establish farmers' market sites in the unincorporated county.

GHG Reduction Potential:

1,000 MT CO_2e

Community Co-Benefits



Cost to County:

Low

Cost to Resident or Building Owner:

Medium to High

(depending on quantity and species of trees)

Savings to Resident or Building Owner:

None to Low

(depending on location and species of trees)

Potential Funding Sources:

State & Regional Grants; Partnerships w/ Organizations; County Funds

URBAN FOREST

G-1: Expand the urban forest (e.g., street trees and trees on private lots) in order to sequester carbon and reduce building energy consumption.

Measure Description:

The County will expand the Urban Forestry Program and increase planting and maintenance of public trees throughout the unincorporated county. The program will also encourage property owners to plant trees on private land.

To implement this policy, the County will develop an Urban Forest Management Plan that creates design, planting, and maintenance guidelines, and coordinates implementation between departments and relevant utilities. Separate guidelines will be created for the different land use contexts within the county. An important component of the management plan will be a public tree inventory and canopy coverage analysis that examine existing urban forest conditions and identify priority management areas. The public tree inventory will be updated annually and used to monitor tree health and evaluate the carbon sequestration potential of the urban forests. The Urban Forestry Program will also provide expanded public outreach and education regarding the benefits of the urban forest. This effort will seek volunteer assistance in planting and caring for public trees.

The Urban Forestry Program will set a goal of planting 5,000 new public trees by 2020 (500 new trees per year). The GHG reduction potential attributed to this measure further assumes that an additional 1,000 trees will be planted on private property between 2010 and 2020. Outreach to property owners and neighborhood organizations will be an important component in achieving this target. On public rights-of-way, the County will require planting of tree species that are known to be low-maintenance (compatible with hardscape), and provide high levels of sequestration and optimal building energy reduction benefits.

Implementation Action		Timetable	Responsibility
A	Develop an Urban Forest Management Plan.	Short Term (1–2 years)	Public Works Redevelopment Agency
B	Develop an outreach program to educate the community about urban forest benefits and encourage the planting of additional trees on private property.	Short Term (1–2 years)	Public Works Redevelopment Agency
C	Expand public/private partnership programs to encourage urban forestry through planting, preserving, maintaining, and controlling invasive species.	Short Term (1–2 years)	Public Works Redevelopment Agency
Performance Indicator		**Target**	
i	Number of trees planted per year on public land within rights-of-way.	500 trees	
ii	Total number of trees planted within public rights-of-way between 2010–2020.	5,000 trees	
iii	Total number of trees planted on private property between 2010–2020.	1,000 trees	

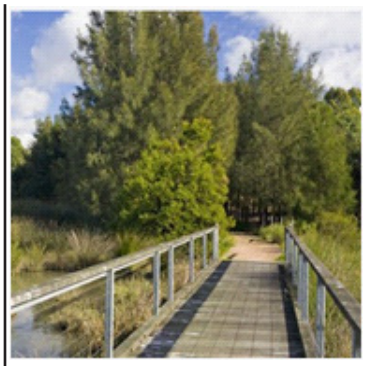
CARBON SEQUESTRATION IN NATURAL AREAS

G-2: Include carbon sequestration as an objective within County-led natural area restoration projects.

Measure Description:

Flood Control District lands, recreational trails, and creeks offer important opportunities for ecosystem restoration in the county. While protecting water quality, enhancing biological habitat value, and providing flood control should remain the primary purposes of restoration projects, these projects can also sequester considerable amounts of carbon. Using Climate Action Registry protocols, the County will actively evaluate the carbon-sequestration potential of County-led restoration projects. Specifically, the County has identified restoration of riparian forests on Flood Control District land as a prime opportunity for carbon sequestration. The GHG reduction potential associated with this measure assumes that approximately 2,500 trees will be planted County-wide in riparian forest restoration projects from 2010 to 2020.

	Implementation Action	Timetable	Responsibility
A	Evaluate the carbon sequestration potential of riparian forest restoration projects.	Short Term (1–2 years)	Public Works
Performance Indicator		**Target**	
i	Number of trees planted per year in restoration projects between 2010–2020.	250 trees	
ii	Total number of trees planted in restoration projects between 2010–2020.	2,500 trees	



GHG Reduction Potential:

500 MT CO_2e

Community Co-Benefits

Cost to County:

G-Staff

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

State & Regional Grants; Partnerships w/ Organizations; County Funds

GHG Reduction Potential:

Recommended Policy

Community Co-Benefits

Cost to County:

Low

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

Partnerships w/ Organizations; Self-Financing; County Funds

COMMUNITY GARDENS AND URBAN AGRICULTURE

G-3: Establish a local community garden program to increase local food security and provide local recreation amenities.

Measure Description:

Community gardens are plots of land located in urban, suburban, or rural neighborhoods that offer residents a place to grow food, flowers, and other crops. The gardens increase community members' access to fresh produce, preserve urban green space, promote inter-generational and intercultural interaction, and provide an alternative form of recreation. Many potential community garden sites exist within the unincorporated county.

Successful community gardens require defined management policies and high levels of community involvement. The County Community Development department will work with EBMUD, East Bay Regional Parks Department (EBRPD), Hayward Area Recreation and Park District (HARD), and other appropriate entities to develop community gardens wherever practical, along with necessary infrastructure and management policies. This community garden program will identify potential sites for community gardens and develop gardens in selected locations. The County and partners will focus on locating gardens near residential populations with an interest in urban food production. Both public and private land (in partnership with property owners) will be considered. The County and partners will provide basic infrastructure required for community gardening and develop garden rules and management policies.

Implementation Action		Timetable	Responsibility
A	Develop a community garden program in partnership with EBMUD, EBRPD, HARD, and other organizations.	Short Term (1–2 years)	Community Development
B	Identify potential community garden sites.	Short Term (1–2 years)	Community Development
C	Develop community gardens and necessary infrastructure and management policies.	Short Term (1–2 years)	Community Development
Performance Indicator		**Target**	
i	Number of new community garden plots per year.	8 garden plots	
ii	Total number of community garden plots by 2020.	80 garden plots	

COMMUNITY GARDENS AND URBAN AGRICULTURE

G-4: Work with local farmers and agricultural non-profits to develop urban-edge farming opportunities in the unincorporated county.

Measure Description:

Alameda County contains areas of high-quality farmland and local farms that provide fresh seasonal produce, connect Bay Area residents with their food supply, and preserve open space. While urban-edge agriculture provides the County with numerous benefits, high land prices and land use conflicts often act as a barrier to entry for new farmers. The County has the opportunity to facilitate the establishment of urban-edge farms by expanding the number of Agricultural Parks in the unincorporated county.

An Agricultural Park is a combination of a working farm and a municipal park that is located at the urban edge. They allow small farm operations access to secure land and close proximity to urban markets. Agricultural Parks can be located on either public or private land, can vary in acreage, can host single or multiple tenants, and can have a variety of both agricultural and recreational components.

An example in the unincorporated county is the Sunol Water Temple Agricultural Park. The park is located on 18 acres of land leased by the non-profit group, Sustainable Agriculture Education (SAGE), for nine years from the San Francisco Public Utilities Commission. Six farmer tenants work rented plots in the park and sell their produce at farmers' markets, produce stands, to restaurants, and through CSA (Community Supported Agriculture) programs. Tenants share infrastructure, get training in organic agriculture practices, and pay rent and water costs.

The County will partner with local farmers, landowners, and agricultural non-profits to develop an agricultural parks program. The program will identify potential sites on public or private land and identify interested farmers. The program will also develop infrastructure, technical support, and management systems that support the operations and viability of the farmer tenants.

	Implementation Action	Timetable	Responsibility
A	Develop an agricultural parks program with local farmers and relevant non-profits.	Short Term (1–2 years)	Community Development Agriculture Department
B	Identify potential agricultural parks and interested farmers.	Short Term (1–2 years)	Community Development Agriculture Department
C	Develop infrastructure, technical support, and management policies to support Agricultural Parks.	Medium Term (2–5 years)	Community Development Agriculture Department
	Performance Indicator	**Target**	
i	Acres of new agricultural park in unincorporated county.	20 by 2015 50 by 2020	

GHG Reduction Potential:

Recommended Policy

Community Co-Benefits

Cost to County:

G-Staff

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

Partnerships w/ Organizations; County Funds

GHG Reduction Potential:

Recommended Policy

Community Co-Benefits

Cost to County:

G-Staff

Cost to Resident or Building Owner:

None

Savings to Resident or Building Owner:

None

Potential Funding Sources:

Partnerships w/ Organizations; County Funds

COMMUNITY GARDENS AND URBAN AGRICULTURE

G-5: Work with local organizations to establish farmers' market sites in the unincorporated county.

Measure Description:

Farmers' markets provide residents with direct access to seasonal harvests and other regionally-produced foods. They also play an important role in supporting the regional agricultural economy by strengthening ties between farmers and consumers, and celebrating the region's agricultural diversity.

The County will promote local sustainable agriculture and emphasize the climate protection benefits of eating seasonal, low-processed foods, through partnering with farmers' market associations to explore potential sites for farmers' markets in the unincorporated county. Priority will be placed on locating markets in neighborhood centers with substantial residential populations. If markets achieve a high level of success, the County will evaluate the installation of permanently covered structures.

Implementation Action		Timetable	Responsibility
A	Work with farmers' market associations to identify potential sites for farmers markets in the unincorporated county.	Short Term (1–2 years)	Planning; Redevelopment Agency
B	Assist farmers' markets associations develop markets in appropriate locations throughout the unincorporated county.	Short Term (1–2 years)	Planning; Redevelopment Agency
C	Promote farmers' markets through community outreach programs.	Short Term (1–2 years)	Planning; Redevelopment Agency
Performance Indicator		**Target**	
i	Number of weekly farmers markets in the unincorporated county.	2 by 2015 4 by 2020	

STAFF TIME FOR CAP IMPLEMENTATION

The successful implementation of the CAP will, in great part, be achieved through voluntary programs that will be managed and overseen by County staff. The emphasis on voluntary programs was a result of feedback from County staff, community members, and local professionals that the CAP should limit the number of mandates imposed on the community. Consequently, many measures require staff time to develop programs, implement outreach campaigns, and oversee policy development such as ordinances. The cumulative staff requirements for each Action Area were assessed, with the results shown in the table below. Since there are many potential synergies in measure implementation (i.e., energy efficiency and solar programs for residences may have joint implementation as the target audience of that suite of measures is the same constituency). Furthermore, as the implementation of many measures only requires staff time (with, for instance, no capital cost requirement), the total staff time requirement and associated cost is aggregated at the level of the Action Area. See Appendix C for more details on the costs and savings analysis.

It should be noted that these staff requirements do not necessarily represent additional County hires; the staff time requirements to implement the CAP could potentially be included in an existing staff member's job description.

Action Area		Estimated Staff Requirements	Total Estimated Cost (through 2020)	Cost Category
T	Transportation	Approximately 0.4 FTE	$1,025,000	High
L	Land Use	Approximately 0.2 FTE	$512,000	High
E	Building Energy	Approximately 0.5 FTE	$1,281,000	High
WT	Water Conservation	Approximately 0.1 FTE	$256,000	Medium
WS	Waste	Approximately 0.1 FTE	$256,000	Medium
G	Green Infrastructure	Approximately 0.1 FTE	$256,000	Medium
A sustainability professional will have a salary of approximately $80,000 + benefits/overhead (2.5 multiplier) = $200,000/year. Salary and benefits grow at the rate of inflation (3%). The Total Estimated Cost shown above is the total employee cost through 2020, with salary and benefits/overhead inflated over time. See Appendix C for more details on costs. This professional would be required to implement a specific set of strategies contained within the CAP.				

STATEWIDE INITIATIVES

Statewide reductions from implementation of Assembly Bill 1493, Low Carbon Fuel Standards (LCFS), and the Renewable Energy Portfolio Standard (RPS) were also considered during the development of the GHG emission reduction measures, and assessment of the overall target. Counting only these three statewide initiatives towards the GHG reduction target is considered a conservative approach.

The California Air Resources Board (ARB) estimates that implementation of GHG emission reduction standards for new passenger cars, pickup trucks, and sport utility vehicles, as described in AB 1493, will achieve a 15.76 percent increase in vehicle performance and therefore reduce the overall GHG emissions from on-road mobile sources by 2020 (ARB Scoping Plan). This increase in statewide vehicle efficiency standards was considered in evaluating achievement of the GHG reduction target. These standards can effectively reduce GHG emissions in the transportation sector by 83,260 MT CO_2e/yr.

The County recognizes that statewide reductions will also occur from implementation of LCFS. Based on current available data, LCFS standards are projected to reduce overall statewide GHG emissions attributable to vehicle fuels by approximately 10 percent. This increase in statewide vehicle-fuel efficiency can effectively reduce GHG emissions in the transportation sector by 44,500 MT CO_2e/yr.

Pacific Gas & Electric (PG&E) emission factors incorporate the mandated requirements of RPS, which require 33 percent of PG&E's electricity production to be from renewable sources. The current percentage of PG&E portfolio that is accounted for through renewable energy generation is 14 percent. In accounting for the 19 percent of additional renewable energy capacity that will be developed by 2020, the additional emissions reductions attributed to the RPS are estimated to be 35,100 MT CO_2e/yr.

The County's actions, together with the effects of AB 1493, LCFS, and the RPS in the unincorporated areas of Alameda County, generate a combined reduction of 243,619 MT CO_2e/yr, or approximately 15.6 percent below 2005 levels. While statewide reductions result in a significant contribution toward achieving the County's target, the extent of their implementation and magnitude of the impacts on GHG emissions is limited and additional action by the community and County government is required to reach the reduction goal. The recommended CAP measures outline a path to achieving the GHG reduction target in conjunction with statewide reductions.

SUMMARY

The table below provides a summary of the GHG reductions achieved by all the quantified measures. The GHG reduction potential can only be realized if the progress indicators and targets are achieved during CAP implementation. As a whole, the measures were designed and benchmarked to specific standards, in order for the County to be able to achieve its GHG reduction target of 15 percent below 2005 levels by 2020. As planned, the CAP achieves this target, with a projected 15.6 percent reduction. There are, of course, measures that will achieve GHG emission reductions, but could not be quantified, due to technical reasons or the limitations of quantifying the impact of less tangible programs and policies. In order for the CAP to successfully guide the County to meet in GHG reduction target, the County must play a prominent role in implementing the CAP's programs and policies. But also of great importance is the role that the public must play in participating in and ensuring the success of the programs and policies in the CAP.

Summary Table of GHG Reduction Measure Performance in the CAP

Measure Number and Title	Percent GHG Emission Reduction	GHG Emission Reduction (MT CO_2e/yr)
T-1 – T-3	0.37%	5,749
T-4 – T-6	0.17%	2,683
T-7	0.12%	1,916
T-8 – T-12	0.49%	7,666
T-13	0.26%	4,035
TRANSPORTATION TOTAL	**1.41%**	**22,050**
L-1	0.18%	2,829
L-3 – L-5	0.49%	7,666
LAND USE TOTAL	**0.67%**	**10,495**
E-1	0.32%	5,074
E-3 – E-6	0.20%	3,167
E-7	0.18%	2,887
E-8 + E-12	0.48%	7,530
E-9	0.04%	557
E-13	0.66%	10,268
E-14	0.04%	628
E-15	0.42%	6,623
BUILDING ENERGY TOTAL	**2.35%**	**36,734**
WT-1, WT-3 – WT-4	0.43%	6,762
WT-2	0.05%	708
WATER TOTAL	**0.48%**	**7,470**
WS-1 – WS-3	0.16%	2,510
WASTE TOTAL	**0.16%**	**2,510**
G-1	0.06%	1,000
G-2	0.03%	500
GREEN INFRASTRUCTURE TOTAL	**0.10%**	**1,500**
Pavley	5.33%	83,260
Low Carbon Fuel Standard	2.85%	44,500
Renewable Portfolio Standard	2.25%	35,100
Statewide Initiatives	**10.42%**	**162,860**
GHG Target Attainment	**15.59%**	**243,619**

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PART 3 IMPLEMENTATION

3.1 INTRODUCTION

For the unincorporated areas, Alameda County recognizes that climate change is one of the most critical challenges facing the world today. The CAP provides vision and guidance for the County's climate protection efforts. To achieve the GHG emissions reduction targets, the County will need to translate this vision into real change within the unincorporated county. This chapter describes how the County will implement the GHG reduction measures and CAP as a whole. The chapter contains the following four sections:

- *Measure Implementation*: Describes how County staff will implement CAP measures and the related actions, and the role of the progress indicators, timetables, and other guidance provided within the measure implementation matrices.
- *Plan Evaluation and Evolution*: Discusses the need to evaluate, update, and amend the CAP over time, in order to ensure that the plan remains effective and current.
- *Relationship to the California Environmental Quality Act (CEQA)*: Describes the relationship between the CAP and CEQA, and establishes criteria for staff to use when determining if a proposed development project is consistent with the CAP.
- *Funding Strategies and Financing Mechanisms*: Describes funding strategies, sources, and mechanisms available to implement CAP measures and actions. Potential future financing structures and tools are also identified that can aid the County both in implementing community CAP measures, and government operations CAP programs and projects

3.2 MEASURE IMPLEMENTATION

Ensuring that the measures translate from policy language into on-the-ground results is critical to the success of the CAP. To facilitate this, each measure described in Part 2 contains a table that identifies the specific actions the County will carry out. The table also identifies responsible departments and establishes an implementation schedule for each action.

The second section of each table provides progress indicators and performance targets that enable staff, County Supervisors, and the public to track measure implementation and monitor the overall CAP progress. The tables provide both interim and final progress indicators where possible. Interim progress indicators are especially important as they provide mid-course checks to evaluate if a measure is on the right path to achieving its GHG reductions.

Upon adoption of the CAP, the identified County departments will become responsible for implementing assigned actions. Key staff in each department will facilitate and oversee action implementation. In order to assess the status of County efforts, CAP implementation meetings will occur every three months. Some actions will require inter-departmental or inter-agency cooperation and appropriate partnerships will be established accordingly.

3.3 PLAN EVALUATION & EVOLUTION

The 2010 CAP represents the County's best attempt to create an organized, community-wide response to the threat of climate change at the time of preparation. Staff will need to evaluate the plan's performance over time and be ready to alter or amend the plan if it is not achieving the reduction target.

Plan Evaluation

Two types of performance evaluation are important: evaluation of the CAP as a whole and evaluation of the individual component measures. Community-wide GHG emission inventories will provide the best indication of CAP effectiveness, although it will be important to reconcile actual growth in the unincorporated county versus the growth projected when the CAP was developed. Conducting these inventories periodically will allow direct comparison to the 2005 baseline inventory and will demonstrate the CAP's ability to achieve the adopted reduction target. The County's Planning Department will coordinate community-wide inventories in 2014 and 2018, with another inventory conducted in 2020 to gauge the level of GHG reduction target attainment.

While community-wide inventories will provide information about overall GHG reductions, it will also be important to understand the effectiveness of the measures.

Evaluation of the emissions reduction capacity, costs, and benefits of individual measures will improve staff and decision makers' ability to manage and implement the CAP. The County can promote successful measures and reevaluate or replace under-performing measures. Evaluating measure performance will require data regarding community participation rates and measurement of GHG reduction capacity.

The County's Planning Department will coordinate measure evaluation on the same schedule as the community-wide inventories, and summarize the progress towards meeting the GHG reduction target in a report that describes:

- Estimated annual GHG reductions
- Achievement of progress indicators
- Participation rates (where applicable)
- Implementation costs
- Cost savings and payback (when feasible)
- Community co-benefits realized
- Remaining barriers to implementation

Plan Evolution

To remain relevant, the County must be prepared to adapt and evolve the CAP over time. It is likely that new information about climate change science and risk will emerge, new GHG reduction technologies and innovative municipal strategies will be developed, new financing options will materialize, and State and federal legislation will advance. It is also possible that community-wide inventories will indicate that the community is not achieving its adopted target. As part of the evaluations identified above, the County will assess the implications of new findings in the field of climate change, explore new opportunities for GHG reduction and climate adaptation, respond to changes in climate policy, and incorporate relevant changes to ensure an effective and efficient CAP.

3.4 RELATIONSHIP TO THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA requires the County to identify any significant environmental impacts of its discretionary actions and to avoid or mitigate those impacts, if feasible. Senate Bill 97 (2007) acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA. When the County undertakes a discretionary action, such as approval of a proposed development project, plan, policy, or code change, the County will evaluate whether that action would result in a significant climate change impact. Adoption of the CAP itself by the County is considered a project under CEQA. The overall purpose of the CAP is to reduce the impact that the community will have on global climate change; i.e., reduce its impact on the environment. However, as with any proposal involving construction, implementation of the CAP could potentially result in adverse impacts on the physical environment, such as degrading visual, biological, or cultural resources. An Initial Study leading to the preparation of either a Mitigated Negative Declaration (MND) or full Environmental Impact Report (EIR) will need to be prepared by the County, pursuant to CEQA, to evaluate the potential impacts of implementing the CAP. Because the CAP will have undergone environmental review under CEQA, and is intended to reduce the county's impact on climate change, determining the consistency of a proposed project with the CAP is one way to evaluate whether a project would have a significant climate change impact.

When determining whether a proposed project is consistent with the CAP, staff should consider the following:

- The extent to which the project supports or includes applicable strategies and measures, or advances the actions identified in the CAP
- The consistency of the project with ABAG population growth projections, which are the basis of the GHG emissions inventory's projections
- The extent to which the project would interfere with implementation of CAP strategies, measures, or actions

If the County determines in its environmental review that a proposed project would conflict with the CAP, the County would be required to incorporate mitigation measures, where feasible, within the proposed project to minimize its GHG emissions and/or environmental impact. If mitigation measures are determined infeasible, the County has the option to adopt a statement of overriding considerations as described in the State CEQA Guidelines.

3.5 FUNDING SOURCES & FINANCING MECHANISMS

This section describes potential funding sources and financing mechanisms that Alameda County could pursue to offset the financial burden of implementing the CAP measures described in Part 2. Each measure is accompanied by an analysis of costs and savings, and potential funding sources, financing strategies, and partnership opportunities.

The spectrum of public and private funding options for the measures outlined in this CAP is ever evolving. This section outlines viable funding options that are current to the CAP, but will eventually become out of date. However, there are general sources of funding that provide the most up-to-date information possible, including:

- U. S. Department of Energy (DOE)
- California Energy Commission (CEC)
- California Infrastructure and Economic Development Bank
- Metropolitan Transportation Commission (MTC)
- Association of Bay Area Governments (ABAG)
- Pacific Gas & Electric (PG&E)
- East Bay Municipal Utility District (EBMUD)
- TransForm
- Alameda County Transit (AC Transit)

Costs & Savings

The County is not the only entity bearing financial responsibility for implementing for CAP measures; there will be a private cost borne by residents and businesses for specific measures. In recognition of this, a costs and savings analysis was performed for each measure to evaluate the cost to County, as well as potential costs and savings to residents or property owners. A summary of this analysis can be found in Part 2, with analytical background information provided in Appendix C.

Measures vary in the distribution of costs. Some measures require only funding from the County or other public entities, whereas others require that residents and businesses to contribute. In nearly all measures that require some investment by residents or business owners, there are substantial long-term savings that will allow recuperation of initial investments, as well as other benefits such as improved air quality or publicly owned spaces such as streetscapes, open spaces, rights-of-way, etc. There are also measures that require no private investment, but generate savings for the resident or business owner.

Funding Strategy

The CAP will require strategic public funding by the County, regional government agencies, and the state government for capital projects, incentives, outreach/education, and new regulations necessary to achieve the plan's objectives. To decrease costs and improve the plan's efficiency, actions should be pursued concurrently whenever possible. For example, the County should pursue land use and transportation-related actions together during upcoming General Plan updates and in the development of Specific Plans in the unincorporated areas. The County could also look to address water- and waste-related measures with the related utilities and agencies (e.g., EBMUD/Zone 7 and the Alameda County Waste Management Authority/Stopwaste.Org); inter-agency collaboration will be paramount to the success of the CAP.

Funding sources have not been identified for all actions; however, numerous federal, State, and regional grants are available to assist with funding. More details on these programs and others follow in the subsequent sections.

Additionally, Alameda County should partner with nearby cities and jurisdictions to administer joint programs when feasible. As many businesses in the Bay Area are leaders in resource efficiency, renewable energy, and green infrastructure, potential opportunities exist to partner with the private sector to decrease implementation costs. Finally, many of the measures and actions have the potential to be self-financing if properly designed and implemented.

State & Regional Grants

Many State and regional grant programs are available to fund transportation and infrastructure improvements. The programs listed below represent the current status of the most relevant of these programs. It is, however, important to evaluate the status of a given program before seeking funding, as availability and application processes are updated periodically.

Transportation Fund for Clean Air

The Transportation Fund for Clean Air (TFCA) is a Bay Area Air Quality Management District (BAAQMD) grant program funded by a surcharge on motor vehicles registered in the Bay Area. The purpose of the TFCA program is to provide grants to support Bay Area projects that will decrease motor vehicle emissions and thereby improve air quality.

TFCA funds are available through two main channels: the Regional Fund and the County Program Manager Fund. The Regional Fund receives about 60 percent of the TFCA revenues and is administered directly by BAAQMD. The Program Manager Fund receives approximately 40 percent of the TFCA revenues and is administered in coordination with the Bay Area's nine county Congestion Management Agencies (CMAs). Total yearly funds (2010) are approximately $22 million, which is generated through a $4 surcharge on vehicles registered in the Bay Area.

The TFCA program can fund a wide range of project types, including the purchase or lease of clean air vehicles; shuttle and feeder bus service to train stations; ridesharing programs to encourage carpool and transit use; bicycle facility improvements such as bike lanes, bicycle racks, and lockers; arterial management improvements to speed traffic flow on major arterials; smart growth projects; and projects to enhance the availability of transit information.

Safe Routes to Transit

Bicycling and walking are cost-effective and sustainable ways to reach regional transit stations, yet many commuters cite safety as the main reason they drive instead. Safe Routes to Transit (SR2T) promotes bicycling and walking to transit stations by funding projects and plans that make important feeder trips easier, faster, and safer. Improvements in the safety and convenience of bicycling and walking to regional transit will give commuters the opportunity to leave their cars at home.

The Safe Routes to Transit Program awards $20 million in grants to facilitate walking and bicycling to regional transit. The program is funded by Regional Measure 2 ($1.00 bridge toll increase) and is administered by TransForm and the East Bay Bicycle Coalition.

To date (2010), nearly $8 million has been awarded to over 20 capital and planning projects. Funding cycles are approximately every two years, with the last round of awards in November of 2009.

MTC Livable Communities & Housing Incentive Program

The purpose of MTC's Transportation for Livable Communities (TLC) Capital and Planning Program is to support community-based transportation projects that bring new vibrancy to downtown areas, commercial cores, neighborhoods, and transit corridors by enhancing their amenities and ambiance and making them places where people want to live, work, and visit. TLC provides funding for projects that are developed through an inclusive community planning effort, provide for a range of transportation choices, and support connectivity between transportation investments and land uses.

As part of the TLC program, the Housing Incentive Program (HIP) rewards local governments that build housing near transit stops. The key objectives of this program are to:

- Increase the housing supply in areas of the region with existing infrastructure and services in place
- Locate new housing where non-automotive transportation options are viable transportation choices
- Establish the residential density and ridership markets necessary to support high-quality transit service

HIP funds are intended for transportation capital projects that support TLC goals, such as pedestrian and bicycle facilities that connect housing projects to adjacent land uses and transit; improved sidewalks and crosswalks linking housing to a nearby community facility, such as a school or public park; or streetscape improvements that support increased pedestrian, bicycle, and transit activities and safety.

MTC Transit-Oriented Development Policy

To promote cost-effective transit, ease regional housing shortages, create vibrant communities and preserve open space, MTC has adopted a Transit-Oriented Development (TOD) policy that will be applied to transit extension projects in the Bay Area. MTC's TOD policy includes three key elements.

- Corridor-based performance measures to quantify minimum thresholds of development around transit stations, based on the transit mode; higher thresholds will more capital-intensive modes, such as BART.
- Aid for funding Station Area Plans (SAPs) to promote a jobs and housing balance, station access, design standards, parking and other amenities based on unique circumstances, and community character.
- Creation of corridor working groups to bring together local government staff, transit agencies, county congestion management agencies (CMAs) and other key stakeholders along the corridor to help develop station area plans to meet MTC's corridor-wide land-use thresholds.

As this policy is still in development, the County should keep track of its progress and applicability to the CAP.

Corridors Program

ABAG has developed a "corridors program" to encourage increased coordination of land use and transportation planning along three major transportation corridors in the Bay Area: East 14th/International Boulevard, El Camino Real, and San Pablo Avenue. Since these corridors are located in existing communities with transit services, they represent key potential areas to accommodate future growth through infill development and increased housing densities. Although none of the corridors, as defined in 2010, pass through the unincorporated county, the possibility of extending the East 14th/International Boulevard corridor designation into Ashland is being explored (2010).

Safe Routes to Schools

Safe Routes to Schools is an international movement focused on increasing the number of children who walk or bicycle to school by funding projects that remove barriers to doing so. These barriers include lack of infrastructure, safety, and limited programs that promote walking and bicycling through education/ encouragement programs aimed at children, parents, and the community. In California, two separate Safe Routes to School programs are available: the State program referred to as SR2S, and the federal program referred to as SRTS; both fund qualifying infrastructure projects.

Alameda County Transportation Improvement: CALTRANS Planning Grants

Community Based Transportation Planning (CBTP) grants fund transportation and land use planning that promotes public engagement, livable communities, and a sustainable transportation system (e.g., mobility, access, and safety). The maximum award is $300,000, and a local match of 20 percent of the grant request is required.

CAL FIRE Climate Change Program

Under the authority of the Urban Forestry Act, the Urban Forestry Program offers grants of over $1 million dollars per year to plant trees, and over $2.5 million for related forestry projects in urban communities throughout California.

CAL FIRE has identified five forestry strategies for reducing or mitigating GHG emissions, which are:

- Reforestation to promote carbon sequester
- Forestland conservation to avoid forest loss to development
- Fuel reduction to reduce wildfire emissions and utilization of those materials for renewable energy
- Urban forestry to reduce energy demand through shading, increase sequestration, and contribute biomass for energy generation

- Improved management to increase carbon sequestration benefits and protect forest health

These strategies were recognized by the Governor's Climate Action Team reports in 2006 and 2007, and by the Air Resources Board in its Climate Change Scoping Plan.

ARRA Funding and Related Programs

ARRA is an economic stimulus package enacted by the 111th United States Congress in February 2009. The Act is intended to stimulate the U.S. economy in the wake of the economic downturn. Most of the programs relevant to the CAP concern energy infrastructure and conservation. Access to these funds will be available for a limited period, and the County should seek the most up-to-date information regarding the status of the ARRA programs listed below.

California FIRST: Property-Assessed Clean Energy (PACE)

The CaliforniaFIRST Program is a property-assessed clean energy (PACE) finance program that is enabled through the AB811 legislation. The CaliforniaFIRST Program permits property owners within participating regions to finance the installation of energy and water improvements within their home or business and payback the amount as a line item on their property tax bill. This bill allows land-secured loans for homeowners and businesses who install energy-efficiency projects and clean-energy generation systems, to be paid back through assessments on individual property tax bills. If the property is sold, the outstanding loan balance is taken over by the new owner, allowing property owners to avoid up-front installation costs, while at the same time requiring little or no investment of local government general funds.

The CaliforniaFIRST Program is sponsored by the California Statewide Communities Development Authority (California Communities), an association of counties and cities in partnership with Renewable Funding and the Royal Bank of Canada Capital Markets. Following a successful pilot, California Communities intends to extend CaliforniaFIRST to include all interested counties and cities.

Recent legislation, AB474, expanded the program's reach to include the financing of water efficiency projects. Eligible projects under the CaliforniaFIRST Program may include, but are not limited to: air sealing, wall and roof insulation, energy-efficient windows, tankless water heaters, solar photovoltaics, and low-flow toilets.

Due of a set of legal concerns raised by Fannie Mae and Freddie Mac, implementation of this program has been delayed until resolution has been reached.

California Energy Commission Energy Efficiency Financing

The California Energy Commission offers low-interest loans for public institutions to finance energy-efficient projects and programs. Interest rates are currently at between one and three percent. Projects with proven energy and/or capacity savings are eligible, provided they meet the eligibility requirements for Energy Conservation Assistance Account (ECAA) loans. Examples of projects include:

- Lighting systems
- Pumps and motors
- LED streetlights and traffic signals
- Automated energy management systems/controls
- Building insulation
- Renewable energy generation and combined heat and power projects
- Heating and air conditioning modifications
- Waste water treatment equipment

Loans for energy projects must be repaid from energy cost savings within 15 years, including principal and interest (approximately 13 years simple payback for the one percent interest rate funding and approximately 11 years simple payback for the three percent interest rate funding). Simple payback is calculated by dividing the dollar amount of the loan by the anticipated annual energy cost savings.

Only project-related costs, with invoices dated after loans are officially awarded by the Energy Commission at a Business Meeting, are eligible to be reimbursed from loan funds. The final ten percent of the funds will be retained until the project is completed. Interest is charged on the unpaid principal computed from the date of each disbursement. The repayment schedule is up to 15 years and will be based on the annual projected energy cost savings from the aggregated projects.

At the time of preparation of the CAP, the CEC Energy Efficiency Financing program had recently closed due to oversubscription of funds. There is not set date for reinstituting the program.

Energy Efficiency and Conservation Block Grant (EECBG)

The CEC has developed guidelines to help implement and administer the EECBG program for small cities and counties that did not receive an initial allocation through the DOE program, such as Alameda County. The purpose of the EECBG Program is to implement projects and programs that will:

- Reduce fossil fuel emissions in a manner that is environmentally sustainable, and maximizes benefits for local and regional communities
- Reduce total energy use
- Improve energy efficiency in the building, transportation, and other appropriate sectors

As established by Assembly Bill 2176, which grants the Energy Commission authority to administer the EECBG Program, the CEC must prioritize cost-effective energy efficiency projects (i.e., projects that achieve minimum energy savings per dollar spent, or 10 million source British Thermal Units (BTUs) per each $1,000 spent). Dollars spent/project costs include only EECBG funds. No utility rebates or incentives, loan funding, or other potential sources of matching funds may be considered in the dollars spent/project cost when calculating this cost effectiveness ratio.

In order to be eligible for funding under the EECBG Program, projects must meet the minimum criteria listed below. In addition to qualifying as a "small county", additional criteria for funding eligibility includes:

- Projects must focus on energy efficiency
- Projects must be cost-effective as defined above
- Projects must include a feasibility study that provides estimates of costs and energy savings
- Project administration cost must be below five percent of the funding award received from the CEC
- Applicants must demonstrate ability to comply with State and federal reporting obligations, including documentation of jobs created and greenhouse gas impacts

Energy Upgrade California

The Energy Upgrade California is a program under the State Energy Program (SEP), which is administered by the CEC. The purpose of the Program is to create jobs and stimulate the economy through a comprehensive program to implement energy retrofits in existing residential buildings. The Program will focus on deploying re-trained construction workers and contractors, and youth entering the job market to improve the energy efficiency and comfort of California's existing housing, creating a sustainable energy workforce in the process.

In May 2010, the Association of Bay Area Governments (ABAG) was approved for $10.7 million from the CEC to administer a region-wide energy retrofit program for residential home energy retrofits. Across the Bay Area, this program is targeted to achieve energy efficiency upgrades in up to 15,000 single family and 2,000 multi-family residences. Program elements include homeowner rebates to attract participation, as well as contractor business expansion loans and scholarships, green workforce training, and an expansive outreach campaign.

The retrofit program will:

- Establish sets of verifiable retrofit standards for energy efficiency and other green improvements that are easy for building owners and contractors to understand
- Train contractors to implement these standards in their retrofit projects
- Create quality assurance procedures to help ensure that retrofit work meets program requirements and performance expectations
- Offer financing for eligible improvements through CaliforniaFIRST
- Bundle potential rebates and other incentives to make them more accessible to property owners
- Conduct a countywide marketing and public outreach campaign to get the word out to property owners and building industry contractors about best practices for energy efficiency and green retrofits, as well as financing and incentive opportunities.

ABAG facilitate cross-cutting tasks that benefit all countywide programs, but Alameda County would be responsible for implementing its specific scope of work.

Other Public Finance

Qualified Energy Conservation Bonds (QECBs)

A Qualified Energy Conservation Bond (QECB) is a tax credit bond; issuers repay principal on a regular schedule, but generally do not pay interest. Instead, the holder of a QECB receives a federal tax credit in lieu of interest, which may be applied against the bond holder's regular and alternative minimum tax liability. The tax credit amount is treated as taxable interest income to the holder of the bonds. For example, if the tax credit amount is $100 and the holder is in the 35 percent tax bracket, the credit provides a $65 benefit to the holder. Under this program, QECBs must be issued by the end 2010.

Alameda County has been awarded $6,312,864.19 of QECB allocations, $4,419,004.93 of which is the required minimum use of QECB allocation for governmental projects and programs. The proceeds of the QECBs can be used for one or more or the following "qualified conservation purposes":

- Type I: Capital expenditures incurred for purposes of (i) reducing energy consumption in publicly-owned buildings by at least 20 percent, (ii) implementing green community programs (including the use of loans, grants, or other repayment mechanisms to implement such programs), (iii) rural development involving the production of electricity from renewable energy resources, or (iv) any qualified facility eligible for the production tax credit under Section 45 of the IRS Code.
- Type II: Expenditures with respect to research facilities and research grants to support research in: (i) development of cellulosic ethanol or other non-fossil fuels; (ii) technologies for the capture and sequestration of carbon dioxide produced through the use of fossil fuels, (iii) increasing the efficiency of existing technologies for producing non-fossil fuels; (iv) automobile battery technologies and other technologies to reduce fossil

fuel consumption in transportation, or (v) technologies to reduce energy use in buildings

- Type III: Mass commuting and related facilities that reduce the consumption of energy, including expenditures to reduce pollution from vehicles use
- Type IV: Demonstration projects designed to promote the commercialization of (i) green building technology; (ii) conversion of agricultural waste for use in the production of fuel or otherwise; (iii) advanced battery manufacturing technologies; (iv) technologies to reduce peak use of electricity; or (v) technologies for the capture and sequestration of carbon dioxide emitted from combining fossil fuels to produce electricity
- Type V: Public education campaigns to promote energy efficiency

Alameda County can consider apportioning these funds to implement a wide range of measures and activities in the CAP. Though some eligible projects would be considered public projects, and would fall, therefore, under the Alameda County Government Services and Operations CAP, other eligible projects are pertinent to specific measures in this CAP. In particular, the following eligible project types could have broad applicability in funding the measures in this CAP: Type II-(ii) green community programs, Type III mass commuting facilities, and Type V public education campaigns.

Clean Renewable Energy Bonds (CREBs)

Renewable energy projects, when compared to conventional generation facilities, are much more expensive and less economically feasible for many electric cooperatives. By providing low-cost loans through the Clean Renewable Energy Bonds (CREBs), this program aims to make renewable energy projects more affordable to the rural communities, electric cooperatives, and public power systems served.

CREBs are part of the Energy Policy Act of 2005, designed to give electric cooperatives and public power systems an incentive to develop clean, renewable energy sources by providing very low-cost capital. They are designed to provide a similar incentive to the production tax credit (PTC) program, currently offered to private investors and IOUs.

Under the Energy Policy Act, a qualified issuer, such as an electric cooperative or cooperative lender, can issue CREBs. Then, instead of the issuer paying interest to the bondholder, the federal government provides a tax credit to the bond purchaser. The proceeds from these bonds are then available to finance new renewable energy projects. Electric cooperatives or public power suppliers can apply for a low-cost loan for a qualified renewable energy project. (Electric cooperatives and public power entities can also issue CREBs.)

The same projects that qualify under the production tax credit program are eligible under this program, such as solar, wind, closed-loop biomass, refined coal production, small irrigation power, landfill gas, and qualified hydropower.

Infrastructure State Revolving Fund Program

The Infrastructure State Revolving Fund Program provides direct low-cost loans for local governmental public infrastructure projects, including:

- County Streets
- County Highways
- Environmental Mitigation Measures
- Parks and Recreational Facilities
- Public Transit
- Solid Waste Collection and Disposal

Alameda County can consider applying for these low-interest loans to implement a wide range of CAP measures. Though some eligible projects would be considered public projects, and would fall, therefore, under the Alameda County Government Services and Operations CAP, other eligible projects are pertinent to specific measures in this CAP. In particular, the transportation- and waste-related measures could seek financing through this program. Loans are available in amounts ranging from $250,000 to $10 million per applicant for Tier 1 loans, and $250,000 to $2.5 million per applicant for Tier 2 loans (the tier system is based on evaluation of project impact; the greater the project impact, the higher the cap on available funds).

Industrial Development Bond Financing Program

The California Industrial Development Financing Advisory Commission (CIDFAC) approves the issuance of IDBs. IDBs provide manufacturing and processing companies with low-cost, low-interest financing for capital expenditures. Eligible capital expenditures include the acquisition of land, building construction, building renovation, and the purchase of machinery and equipment. IDBs are a financing tool that can be used to encourage manufacturing businesses to locate or remain in a community. The borrower must be a manufacturing company: requesting from $1 million to $10 million. The financing program could be used in the job creation-related measures and as an incentive for businesses to participate in the special districts.

Partnerships with Private Companies and Other Organizations

The Bay Area is home to numerous private companies who provide renewable energy or green infrastructure. The success of the CAP depends in part on collaboration between these businesses and the County and public. For example, numerous companies are involved in developing electric plug-in auto charging station infrastructure throughout the Bay Area. PG&E and EBMUD also administer numerous energy efficiency and water conservation programs that the

County can leverage and help advertise to residents. Solar companies will also be an important asset to the CAP, as the advent of the Power Purchase Agreement (PPA) enables businesses, residents, and the County to install solar panels and access solar power at no cost. Partnering with these businesses, as well as new businesses as they arise, will enable the County to both save money and provide the community with the most up-to-date green infrastructure.

Power Purchase Agreements

Renewable energy has become increasingly more accessible and cost-effective due to Power Purchase Agreements (PPAs). In a PPA, a private company or third party installs a renewable energy technology, often solar panels, at no cost to the consumer and maintains ownership of the installed panels, selling customers the power produced on a per kilowatt-hour basis at a contractually-established rate. The rate is lower than what customers pay their utility today, and increases at a fixed percentage (usually 2.5 to 4.0 percent) annually which is typically lower than the rate escalation by the utilities. In addition to installing the panels, the third party monitors and maintains the systems to ensure functionality. The contract period for a PPA is typically 15 years, at which point the third party will either uninstall the panels or sign a new agreement with the building owner. These agreements are ideal for demonstration projects implemented by the County and residents or businesses with interests in reducing the carbon emissions associated with energy consumption in their homes and businesses.

Energy Performance Contract with Energy Service Providers (ESP)

Energy services performance contracting is a common way to implement energy efficiency improvements and frequently covers financing for the needed equipment. An energy services performance contract would be an agreement between Alameda County and an ESP. The ESP would implement a renewable energy or energy efficiency program and guarantee that the energy savings will meet or exceed annual payments to cover all project costs. Typical projects include:

- Lighting
- Heating, air conditioning, and ventilation
- Control systems
- Building envelope improvements (e.g., insulation)
- Cogeneration and combined heat and power (CHP)
- Demand response
- Renewables and biomass
- Water and sewer (metering and use reduction)
- Sustainable materials and operations

If the savings do not materialize, the ESP pays the difference. Performance contracts tend to contain three elements: a project development agreement, an energy services agreement, and a financing agreement. As evidenced by the above project types, the ESP financing option may not be directly applicable to the measures in this CAP; it would, however, be relevant for the municipal operations CAP being developed by the GSA. If the County were interested in demonstration projects for particular energy savings technologies, this financing mechanism would apply.

Energy Savings Performance Contracting (ESPC)

The basic concept of the ESPC is that an Energy Services Company (ESCO) guarantees the amount of energy saved, and further guarantees that the value of that energy would be sufficient to make the debt service payments as long as the price of energy does not fall below a stipulated floor price. The key benefits of the guaranteed savings include:

- The amount of energy saved is guaranteed
- The value of energy saved is guaranteed to meet debt service obligations down to a stipulated floor price
- The County carries the credit risk
- A smaller piece of the investment package goes to "buy" money
- Tax-exempt institutions can use their legal status for much lower interest rates
- ESCO carries only the performance risk

Typically, an ESPC project would have a simple payback of 10 years or less to allow for the cost of money and other fees to be included in the overall project payback. Lending institutions look for less than 15 years including all fees.

Typical projects include:

- Energy management systems
- Interior and exterior lighting
- Boiler replacement/repair of steam systems
- High-efficiency HVAC systems
- LED traffic systems
- Wastewater treatment plant pumps and motors

There are numerous ESCOs with track records in the Bay Area. As evidenced by the above project types, the ESPC financing option may not be directly applicable to the measures in this CAP; it would be relevant for the municipal operations CAP being developed by the GSA. If the County were interested in demonstration projects for particular energy savings technologies, this financing mechanism would apply.

On-Bill Financing

Through partnering with PG&E, Alameda County could facilitate the repayment of loans for efficiency upgrades on utility

bills. PG&E is in the process of implementing a pilot on-bill financing program for small businesses. The system could function through either loans or tariffs. A loan is assigned directly to the customer who must pay it back even if he/she moves. In contrast, the tariffs approach links the charge to the meter, meaning that whoever lives at the house or owns the business pays the fee. If the customer moves, the new occupant picks up the payment. The tariff approach allows for a long payment term and therefore lower monthly costs. It also encourages renters to participate in the program because they only pay for energy saving measures while they benefit from them, and remain in the premises.

Upgrades would be selected by the building owner (in coordination with the County) such that the efficiency savings would pay for the investment over a fixed period of time. Customers would "share" monthly energy efficiency savings with the utility until the loan is paid back, at which point all savings would be reflected in lower monthly bills.

The goal is to simplify loan repayment and (in combination with a funding source) reduce upfront cash outlay by property owners. In addition, some models of on-bill financing would allow for the loan to remain with the property (even if sold by the current owner), thereby sharing the cost of upgrades over time with future beneficiaries of those upgrades.

Energy Efficiency Mortgages

Energy Efficiency Mortgages can provide owners additional financing (whether at time-of-sale or upon refinancing) for energy efficiency improvements at discounted interest rates. Energy efficiency upgrades could be chosen that would allow owners to realize a net monthly savings. The goal is to provide capital for energy efficiency upgrades at a discounted interest rate. The Federal Housing Administration (FHA) offers an Energy Efficient Mortgage Loan program. This program helps current or potential homeowners significantly lower their monthly utility bills by enabling them to incorporate the cost of adding energy-efficient improvements into their new home or existing housing. This FHA program eliminates the need for homeowners who are interested in making their home more energy efficient to take out an additional mortgage to cover the cost of the improvements. The improvements can be included in a borrower's mortgage only if the total cost is less than the total dollar value of the energy that will be saved during its useful life. The program is available as part of a FHA insured home purchase or by refinancing a current mortgage loan.

ENERGY STAR, a program under the DOE, offers another energy efficient mortgage option, though it is in its pilot phase and not currently available in California. This program is designed to encourage comprehensive energy efficiency improvements to new and existing homes by increasing the affordability and availability of energy efficiency mortgages for homeowners and homebuyers. These mortgages include the cost of energy efficiency investments in the loans themselves so that borrowers can pay for those investments over the life of their loans, as well as deduct the interest from their federal and State income taxes. One of the key benefits of an ENERGY STAR mortgage is that a borrower can finance energy-saving improvements to their home without paying more than he/she would for a typical mortgage. Following the completion of the pilot phase, this program will be extended to California.

Partnerships with Other Jurisdictions and Organizations

As the unincorporated areas of Alameda County are a relatively small portion of the county in terms of population, partnering with neighboring jurisdictions is another key implementation strategy supporting the CAP. Various jurisdictions within Alameda County could serve as potential partners in implementing the CAP strategies. The County should seek to partner with appropriate local governments, as identified in the CAP measure implementation sections, other potential partners including:

- Metropolitan Transportation Commission (MTC)
- Association of Bay Area Governments (ABAG)
- Pacific Gas & Electric (PG&E)
- East Bay Municipal Utility District (EBMUD)
- TransForm
- Alameda County Transit (AC Transit)
- Stopwaste.Org
- East Bay Bicycle Coalition
- Build It Green
- California ReLeaf
- Slow Food
- Sustainable Agriculture Education (SAGE)
- United States Green Building Council (USGBC)
- Oakland Green Jobs Corps
- Rental Housing Owners Association of Southern Alameda County
- Bay East Association of Realtors

Self-Financing Strategies

CAP measures include incentives, as well as regulations or fees, to change the community's behavior. It is important that the fees established in the CAP be self-financing. The money raised through the fees would then be used to implement the CAP measures determined to provide the best mitigation results. Alameda County will actively explore opportunities to establish programs that are self-financing, and thus sustainable over the long term.

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APPENDIX A GHG EMISSIONS INVENTORY & PROJECTIONS

INTRODUCTION

This appendix presents Alameda County's GHG emissions inventory, establishes an emissions baseline from the inventory, projects 2020, 2035 and 2050 emissions, and describes the County's adopted emissions reduction target. The purpose of the GHG emissions inventory is to assist policy-makers and planners by identifying the source types, distribution, and overall magnitude of GHG emissions to support adoption of effective GHG reduction measures and implementation actions contained in the CAP.

ICLEI GHG EMISSIONS INVENTORY

This section describes Alameda County's GHG emissions inventory. The County, in coordination with ICLEI, developed a GHG emissions inventory for both community-wide and government-related sources for the 2005 base year. The inventory was compiled using ICLEI's Clean Air Climate Protection (CACP) Software. The community-wide sources within the CACP software are intended to represent the total GHG emissions occurring within the County and include sectors such as residential, commercial, and industrial energy use; transportation; solid waste; and optional user-defined sectors. Municipal sources, which represent all County-operated buildings or vehicles, are a subset of the community-wide sources, and include government buildings, vehicle fleet, solid waste, and streetlights, among others. A summary of the inventory by emission sector (i.e. energy, transportation, waste) is provided and discussed below.

REVISED GHG EMISSIONS INVENTORY

Table A-1 presents Alameda County's 2005 community-wide GHG emissions inventory and the percent contribution of each emissions sector. As shown below, transportation-related activities contributed approximately 51 percent of the County's annual GHG emissions. Electricity and natural gas consumption within buildings contributed 45 percent of the County's community-wide GHG emissions. GHG emissions associated with the residential portion of energy use are approximately 26 percent, whereas GHG emissions from commercial and industrial energy use are approximately 19 percent. The waste sector accounted for approximately four percent of the total GHG emissions in 2005.

EMISSIONS BASELINE

To refine the 2005 emissions inventory to establish an effective baseline for the CAP, the County elected to include two elements that were missing from the original inventory conducted by ICLEI: a portion of GHG emissions associated with local travel on state highways, and GHG emissions associated with water consumption. Table A-2 on the next page identifies the County's GHG emissions baseline for the year 2005 for purposes of the CAP. The County's GHG reduction target of 15 percent below the 2005 baseline emissions by 2020 applies to the emissions estimates in Table A-2.

Transportation

The 2005 GHG emissions inventory prepared by ICLEI did not include an emissions contribution from automobiles traveling on state highways. Due to the large geographic area of the County, many of the vehicle trips that would occur on state highways would be internal trips to the County. Therefore, the County's consultant developed a methodology with consultation from MTC to allocate a portion of locally-generated state highway-related VMT and associated GHG emissions to Alameda County's GHG emissions baseline. This methodology attempts to omit "pass through" highway trips, over which the County has no control, from Alameda County's emissions inventory. An example of a "pass

Table A-1: 2005 Community-wide GHG Emissions and Percent Contributions

Community Sector	GHG Emissions	
	MT CO_2e/yr	Percent
Transportation	351,264	50.6%
Residential Energy Use	179,864	25.9%
Commercial/Industrial Energy Use	132,768	19.1%
Waste	30,419	4.4%
Total	**694,315**	**100%**

Source: Data compiled by AECOM 2009 from ICLEI's CACP inventory.

Notes: Percent represents is the percent contribution of a particular sector to the total community-wide inventory.

through" highway trip is a trip that originates in Contra Costa County, drives through Alameda County, to Oakland via Interstate 580. The modifications made to the GHG inventory are anticipated to more accurately represent the contribution of transportation-related GHG emissions to Alameda County's emissions baseline in support of the CAP.

According to Alameda County's 2005 GHG Emissions Inventory, 648,648,800 annual VMT were associated with state highways in the unincorporated county, while 634,216,700 annual VMT were associated with local roadways (i.e., roadways other than state highways and freeways) in the unincorporated county. According to the emissions inventory, vehicle travel on local roadways contributed 351,000 MT CO_2e/year to the County's total GHG emissions.

MTC's Bay Area Simplified Simulation of Transportation Energy and Greenhouse Gases (BASSTEGG) model output data for 2006 was obtained for Alameda County within Superdistricts 17 and 15, which represent the unincorporated areas of Alameda County. Model output data for year 2006 was obtained for each Travel Analysis Zone (TAZ) in unincorporated Alameda County. The 2006 data was treated as representative of 2005 conditions, since a 2005 data set was not available. BASSTEGG model output data that was used for the purposes of this analysis included locally-generated (internal) average VMT per household (HH) per TAZ, and total internal VMT per TAZ. The data was sorted in ascending order by average VMT per household per TAZ. The data ranged from an average of 16.87 VMT/HH/day to 63.39 VMT/HH/day across the TAZs in the unincorporated county.

A distribution of estimated travel time to work for each census tract was collected for the unincorporated county. Census tracts were aligned with corresponding TAZs. It was assumed that commute times that exceeded 10 minutes would use the highway system. Of the residents in the distribution that did not work from home, the frequency of commute times greater than 10 minutes was used to calculate a percentage of vehicle trips that would use the highway system. A range of 82 to 97 percent of trips was assumed to use the highway system, depending on the TAZ in question.

A gradient of 40 to 80 percent was applied to the data set of average VMT/HH/TAZ to represent the length of the trip that would use the highway system. In other words, it was assumed that 40 to 80 percent of a highway trip's distance would occur on a highway segment, with an increment of approximately 0.4 percent increase in highway VMT for each TAZ in the data set.

The percentage of average household locally-generated highway VMT per TAZ was multiplied by total VMT/TAZ and summed to derive the total locally-generated highway VMT in the unincorporated county. Because the BASSTEGG model is a different data set than was relied upon for preparation of the County's emissions inventory, the BASSTEGG model data was only used to determine a ratio of locally-generated highway VMT to total internal VMT within the unincorporated county. This analysis resulted in an estimation that 57 percent of total internal VMT in unincorporated Alameda County occurs on a highway. The total state highway VMT from the County's emissions inventory, 648,648,800 VMT/year, was multiplied by 57 percent to obtain the locally-generated highway VMT that would contribute to the County's GHG emissions baseline. Thus, approximately 369,730,000 internal VMT per year would occur on highways in unincorporated county. Under the adjusted transportation emissions baseline, local VMT in Alameda County compose 63.2 percent of total VMT, whereas internal highway VMT compose 36.8 percent of total VMT. GHG emissions from the transportation sector, which were originally only calculated for local roadway VMT in the County's GHG inventory, were scaled up by 36.8 percent from 351,000 MT CO_2e/yr to 556,000 MT CO_2e/yr in 2005.

Table A-2: Alameda County Baseline GHG Emissions and Percent Contributions

Community Sector	**GHG Emissions**	
	MT CO_2e/yr	Percent
Transportation	556,041	59.8%
Residential Energy Use	179,864	19.3%
Commercial/Industrial Energy Use	132,768	14.3%
Waste	30,419	3.3%
Water Consumption	30,947	3.3%
Total	**930,039**	**100%**

Source: ICLEI 2008; AECOM 2009.

Notes: Totals may not sum exactly due to rounding.

1 Transportation-related emissions occurring in the unincorporated county were updated to include locally-generated travel on state highways, which accounts for approximately 36.8% of transportation-related CO_2e per year.

Water Consumption

Energy use associated with water consumption accounts for approximately 20 percent of California's total energy use (CEC 2006). However, the County's 2005 GHG inventory conducted by ICLEI did not include GHG emissions associated with water consumption. In order to more accurately portray existing conditions, water-related GHG emissions in Alameda County were added to the 2005 baseline. The County's consultant obtained water consumption data from EBMUD and Zone 7 Water Agency for the unincorporated county. The 2005 water consumption data were used to calculate the County's GHG emissions associated with water consumption, conveyance, treatment, and distribution.

The CEC has estimated the level of electricity use associated with water supply and conveyance, water pre-treatment, water distribution, and wastewater treatment in both Northern and Southern California (CEC 2006). Assumptions used to estimate water-related electricity consumption for Alameda County are specific to Northern California. The California Climate Action Registry's General Reporting Protocol Version 3.1 GHG emission factors for electricity use were then used to calculate MT CO_2e emissions associated with water-related electricity use. Residential and commercial/industrial GHG emissions associated with energy consumption were inventoried using PG&E-specific assumptions. However, due to range of utility providers potentially engaged in the water delivery process, California statewide-average GHG emission assumptions were used to project emissions associated with water-related energy consumption in the County.

GHG EMISSION PROJECTIONS

To determine the GHG emission reductions necessary to achieve the County's target (i.e., a 15 percent reduction in emissions relative to 2005 emission levels by 2020), the County's GHG emissions were projected for the years 2020, 2035, and 2050 under a trend scenario. The trend scenario assumes that projected growth in population and fuel consumption would be representative of future trends in the County without regulatory action at the local or State level. The CAP only addresses the County's 2020 target; the 2035 and 2050 projections are provided as a matter of reference, and it should be noted that there is uncertainty in projecting 2035 and 2050 activity and associated emission levels. As 2020 approaches, the County will reevaluate its GHG reduction target to better represent progress towards long-term County and State GHG reduction goals.

Assuming that the same type of current emissions-generating practices continue to occur within the unincorporated county, its GHG emissions would be anticipated to increase from approximately 930,000 MT CO_2e/yr in 2005 to 1,028,500 MT CO_2e/yr in 2020, 1,146,800 MT CO_2e/yr in 2035, and 1,297,900 MT CO_2e/yr in 2050. This represents an 11 percent, 23 percent, and 40 percent increase over the 2005 baseline level in 2020, 2035, and 2050, respectively. In comparison, the unincorporated county's projected population is expected to increase 10 percent by 2020 from 2005 (ABAG 2002). Therefore, if current practices continue, Alameda County's GHG emissions may be expected to increase at a slightly higher rate than its population by 2020. This trend can be explained by increases in per capita activity levels (e.g., increases in per capita energy consumption and vehicle miles traveled).

A summary of the County's baseline GHG emissions (year 2005), and projected GHG emissions for 2020, 2035, and

Table A-3: Alameda County Baseline and Projected GHG Emissions and Percent Contributions

Emissions Sector	2005 Baseline MT CO_2e/yr (percent of total emissions)	2020 Projected MT CO_2e/yr (percent of total emissions)	2035 Projected MT CO_2e/yr (percent of total emissions)	2050 Projected MT CO_2e/yr (percent of total emissions)
Transportation	556,000 (59.8%)	611,300 (59.4%)	684,500 (59.7%)	783,700 (60.4%)
Residential Energy Use	179,900 (19.3%)	197,700 (19.2%)	217,600 (19.0%)	239,500 (18.5%)
Commercial/Industrial Energy Use	132,800 (14.3%)	148,800 (14.5%)	168,100 (14.7%)	191,200 (14.7%)
Waste	30,400 (3.3%)	33,400 (3.3%)	37,400 (3.3%)	42,900 (3.3%)
Water Consumption	30,900 (3.3%)	37,300 (3.6%)	39,200 (3.4%)	40,600 (3.1%)
Total	**930,000 (100%)**	**1,028,500 (100%)**	**1,146,800 (100%)**	**1,297,900 (100%)**

Sources: ICLEI 2008; AECOM 2009.

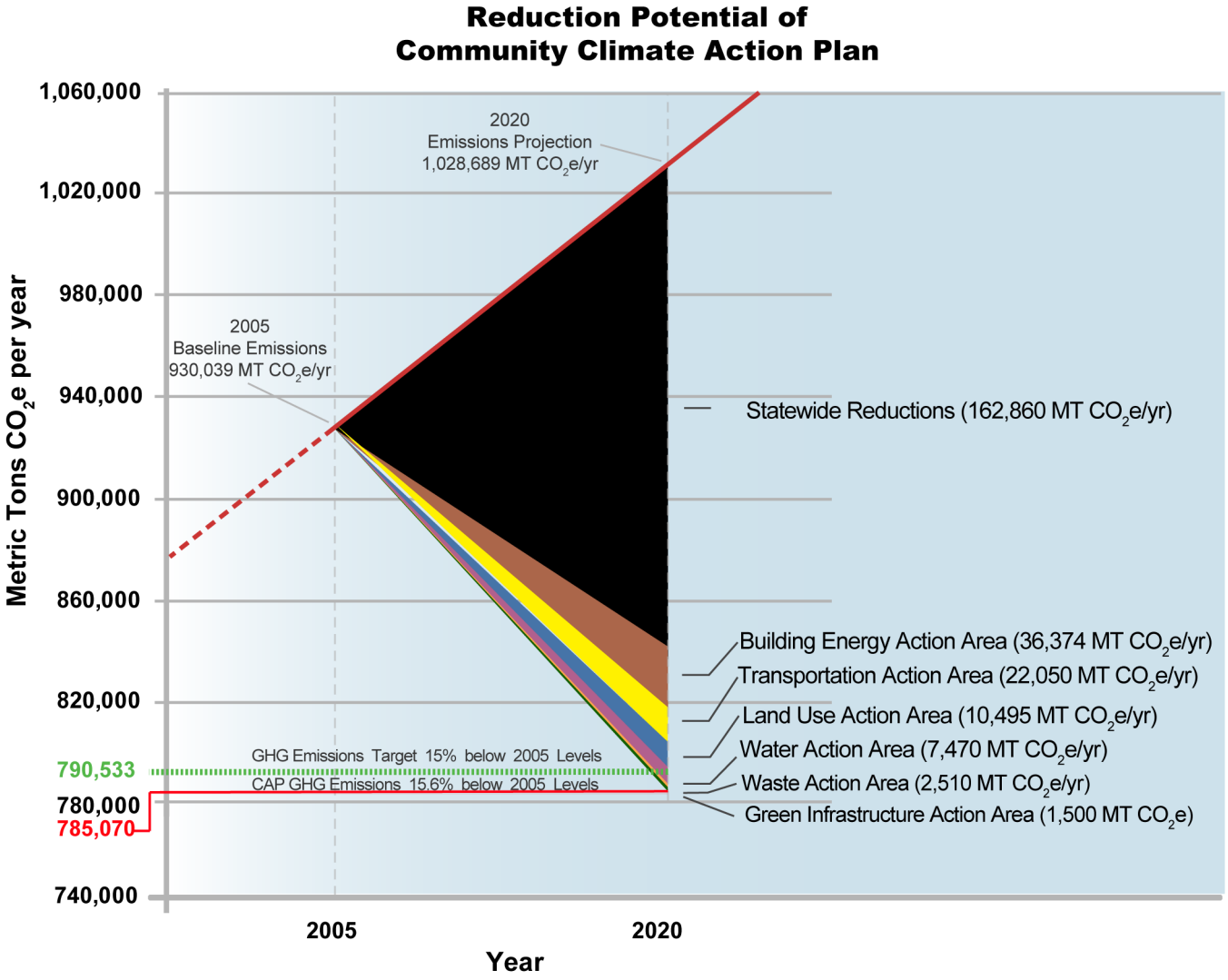
Notes: Totals may not sum exactly due to rounding.

2050 is shown below in Table A-3.

GHG EMISSIONS TARGET

The County's adopted GHG emissions reduction target of 15 percent below 2005 baseline emission levels by 2020 is consistent with the recommendation contained within the State's Climate Change Scoping Plan, which calls on local governments to reduce emissions to 15 percent below current levels by 2020. The County has also adopted a longer-term target of 80 percent below 1990 emission levels by 2050.

The County's GHG reduction target will contribute to the stabilization of global GHG emission concentrations and achievement of AB 32 goals. To attain the adopted target, the County will need to reduce community-wide GHG emissions to approximately 790,000 MT CO_2e/yr per year by 2020. This represents a 23 percent reduction (or approximately 238,000 MT CO_2e/yr) from projected 2020 GHG emissions levels, which takes into account population growth and continued consumption. The graphic below summarizes the GHG reduction target and how the CAP achieves this goal through reductions in the building energy, transportation, land use, water, water, and green infrastructure sectors.



APPENDIX B GHG EMISSIONS REDUCTION ANALYSIS

SUMMARY

This appendix summarizes the assumptions and parameters used to calculate GHG emission reduction performance of CAP measures. The table below summarizes the GHG reductions generated by measures in the CAP.

Summary Table of GHG Reduction Measure Performance in the CAP		
Measure Number and Title	**Percent GHG Emission Reduction**	**GHG Emission Reduction (MT CO_2e/yr)**
T-1 – T-3	0.37%	5,749
T-4 – T-6	0.17%	2,683
T-7	0.12%	1,916
T-8 – T-12	0.49%	7,666
T-13	0.26%	4,035
TRANSPORTATION TOTAL	**1.41%**	**22,050**
L-1	0.18%	2,829
L-3 – L-5	0.49%	7,666
LAND USE TOTAL	**0.67%**	**10,495**
E-1	0.32%	5,074
E-3 – E-6	0.20%	3,167
E-7	0.18%	2,887
E-8 + E-12	0.48%	7,530
E-9	0.04%	557
E-13	0.66%	10,268
E-14	0.04%	628
E-15	0.42%	6,623
BUILDING ENERGY TOTAL	**2.35%**	**36,734**
WT-1, WT-3 – WT-4	0.43%	6,762
WT-2	0.05%	708
WATER TOTAL	**0.48%**	**7,470**
WS-1 – WS-3	0.16%	2,510
WASTE TOTAL	**0.16%**	**2,510**
G-1	0.06%	1,000
G-2	0.03%	500
GREEN INFRASTRUCTURE TOTAL	**0.10%**	**1,500**
Pavley	5.33%	83,260
Low Carbon Fuel Standard	2.85%	44,500
Renewable Portfolio Standard	2.25%	35,100
Statewide Initiatives	**10.42%**	**162,860**
GHG Target Attainment	**15.59%**	**243,619**

OVERVIEW OF APPROACH TO EMISSION REDUCTIONS

Existing methods for quantifying GHG emission reduction measure performance include both top-down and bottom-up calculations. The approach taken in this CAP to quantification of GHG emission reduction measures involved a high level of diligence to ensure that the CAP was of the highest, most defensible quality. Evidence (e.g., literature, academic research, scientific studies) in support of emission reduction performance was requisite in order to report the performance of any GHG reduction strategy or program, which was reported in as transparent a manner as possible in this appendix.

Our top-down calculation methodology begins with the GHG emissions inventory. A particular GHG emission reduction measure (e.g., energy efficiency) targets a certain emission sector (e.g., natural gas, electricity), emissions sub-sector (e.g., residential, commercial), and portion thereof (e.g., space heating, water heating, air conditioning). Thus, the GHG emissions inventory was scaled according to the applicability of the CAP measure being evaluated. Reasonable assumptions for participation rates (i.e., the portion of the community or County that would participate in a CAP program [e.g., % of residential units that would implement energy efficiency improvements]) were developed in consultation with County and agency staff, as well as the community. The GHG emission reduction is converted into metric tons of carbon dioxide equivalent per year (MT CO_2e/yr) reduced. This approach to quantifying GHG emissions reductions is often conservative, but maintains a relationship between the sum of GHG reductions from implementation of CAP measures and the GHG emissions inventory. This approach allowed the CAP to achieve the GHG reduction target, and withstand scrutiny from the Bay Area Air Quality Management District (BAAQMD).

In contrast, a bottom-up approach to quantifying GHG emissions reductions involves starting with a GHG reduction strategy (e.g., installation of photovoltaic panels). If the strategy is assumed to reduce electricity demand by a certain number of kilowatt-hours, this can be converted to GHG emissions reductions using an emission factor for electricity generation. However, it is critical that the assumed emission factor be the same factor that was used to calculate GHG emissions from electricity generation in the community's GHG emission inventory.

A top-down approach ensures a close relationship between GHG emissions reduction performance of individual strategies to the GHG emissions inventory. Thus, we maximized use of top-down quantification methods when preparing CAPs. However, bottom-up calculations were also employed as long as the emission factors used to quantify the effectiveness of GHG reduction strategies were consistent with those used to develop the GHG emissions inventory. Both methods were employed to assist both in quantifying the programs and policies in the CAP, and to meet its GHG reduction target.

The approach to quantifying GHG reduction potential also relied on key input from County and agency staff, as well as the community throughout the process to assist in assessing the technical, political, and economic feasibility of potential GHG reduction measures. This input fed into the GHG reduction measure prioritization and refinement process.

APPENDIX FORMAT

Measure Number and Title (S = Supporting Measure)

Performance Indicator

Methodology description

Analysis Summary (generalized table below):

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT CO_2e/year)
Sources of information:				

TRANSPORTATION MEASURES

T-1: Improve bicycle infrastructure near community activity areas.

Shift in mode share comprised by bicycle travel from 1.2% to 1.5%.

T-2: Develop appropriate bicycle infrastructure for high traffic intersections and corridors. (S)

100% of bike route/major street intersections with bicycle boxes and/or bicycle priority signals.

T-3: Retrofit bicycle racks and parking facilities in underserved civic and commercial areas. (S)

1:20 ratio of community-wide bicycle-to-auto parking by 2020.

Bicycle infrastructure includes bike lanes on sides of streets, bike racks, and other traffic calming and bike safety features. The performance of this group of measures would collectively achieve 1.5 percent reduction in vehicle trips (based on Table 1-2 on page 6 and text on page 2 of Bicycle Master Plan). Because community activity centers are primarily located in the west county, these measures would be applicable to this portion of vehicle trips.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Transportation)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction ($MT CO_2e$/year)
1.5%	59.4%	62.7%a	0.6%	5,749
a Applied to vehicle trips in the west county.				
Sources of information: *Alameda County unincorporated areas Bicycle Master Plan.* *Dierkers, G., E. Silsbe, S. Stott, S. Winkelman, an M. Wubben. 2007. CCAP Transportation Emissions Guidebook. Center for Clean Air Policy. Washington, D.C. Available: <http://www.ccap.org/safe/guidebook.php>. as cited in California Air Pollution Control Officers Association (CAPCOA) 2008. CEQA and Climate Change.* *Caltrans. 2005 Highway Performance Monitoring System (HPMS) database. www.dot.ca.gov/hq/tsip/hpms/datalibrary.php.*				

T-3: Enhance pedestrian infrastructure within walking distance from community activity centers.

Shift in mode share comprised by pedestrian travel from 1.6% to 2.3%.

T-4: Expand the traffic calming program to improve pedestrian safety. (S)

40 additional neighborhood traffic calming projects by 2020.

T-5: Improve pedestrian connectivity and route choice in neighborhoods. (S)

98% pedestrian route coverage within ¼ mile of community activity centers.

Pedestrian infrastructure includes pedestrian sidewalks on sides of streets; traffic calming features such as pedestrian bulb-outs, cross-walks, traffic circles; and elimination of physical and psychological barriers (e.g., sound walls and large arterial roadways, respectively). The performance of this group of measures would collectively achieve 0.7 percent reduction in vehicle trips (based on goal to improving current unincorporated (1.8%) toward the Alameda County wide average (3.2) and assuming improvements can achieve = (3.2 - 1.8)/2 = 0.7%). Because community activity centers are primarily located in the west county, these measures would be applicable to this portion of vehicle trips.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Transportation)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction ($MT CO_2e$/year)
0.7%	59.4%	62.7%a	0.3%	2,683
a Applied to vehicle trips in the west county.				
Sources of information: *Dierkers, G., E. Silsbe, S. Stott, S. Winkelman, an M. Wubben. 2007. CCAP Transportation Emissions Guidebook. Center for Clean Air Policy. Washington, D.C. Available: <http://www.ccap.org/safe/guidebook.php>. as cited in California Air Pollution Control Officers Association (CAPCOA) 2008. CEQA and Climate Change.* *Caltrans. 2005 Highway Performance Monitoring System (HPMS) database.www.dot.ca.gov/hq/tsip/hpms/datalibrary.php.*				

T-7: Work with school districts to develop a School Alternative Transportation Plan by improving/ expanding walking school bus, safe routes to school program, and school bus services.

5% increase in student walking, biking, carpooling, and public transit use.

It was assumed that children in the east county would continue to be driven or be bused to school, thus, this measure was applied to vehicle trips in the west county only. The Bay Area Transportation Survey indicates that 29% of grade school children and 13% of high school students within the Southern Alameda County area walk to school. This measure assumes that district and County safe-routes-to-school programs would increase total student bike and pedestrian mode share by 5%.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Transportation)	Participation Rate	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT CO_2e/year)
5%	59.4%	62.7%[a]	10%[b]	0.2%	1,916
a Applied to vehicle trips in the west county. b 10-15% of peak hour vehicle trips are associated with school children.					
Sources of information: *The Bay Area Transportation Survey, MTC.* *Victoria Transport Policy Institute. 2009. Online TDM Encyclopedia (School Transport Management). Available: <http://www.vtpi.org/tdm/tdm36.htm>. Accessed 2009.* *Dierkers, G., E. Silsbe, S. Stott, S. Winkelman, an M. Wubben. 2007. CCAP Transportation Emissions Guidebook. Center for Clean Air Policy. Washington, D.C. Available: <http://www.ccap.org/safe/guidebook.php>. as cited in California Air Pollution Control Officers Association (CAPCOA) 2008. CEQA and Climate Change.* *Caltrans. 2005 Highway Performance Monitoring System (HPMS) database. www.dot.ca.gov/hq/tsip/hpms/datalibrary.php*					

T-8: Conduct a public transit study and implement ridership enhancement program.

Increase in unincorporated County public transit commute to 9% mode share by 2020.

T-9: Work with AC transit to increase service frequency on select bus routes. (S)

Increase in walking, biking, carpooling, and public transit use.

T-10: Provide transit buses with signal prioritization devices to facilitate time effective public transit service. (S)

10% reduction in travel time on routes with TSP.

T-11: Work with AC Transit to provide transit with essential improvements including shelters, route information, benches, and lighting. (S)

100% of bus stops with shade, weather protection, seating, lighting, and route information by 2020.

T-12: Work with public transit agencies to better accommodate bicycles. (S)

10 bus stops with Class 1 bike storage by 2015.

The Center for Clean Air Policy Transportation Emissions Guidebook states that a 0.5% reduction in VMT per every 1% improvement in transit service frequency. The performance of this measure would result in approximately 2% reduction in VMT.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Transportation)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT CO_2e/year)
2%	59.4%	62.7%a	0.7%	7,666
a Applied to vehicle trips in the west county.				
Sources of information: *Caltrans. 2005 Highway Performance Monitoring System (HPMS) database. www.dot.ca.gov/hq/tsip/hpms/datalibrary.php.* *CCAP Transportation Emissions Guidebook (Center for Clean Air Policy)*				

T-13: Enhance rideshare infrastructure and services to increase community participation in this important travel mode.

unincorporated County 15% rideshare mode share for commute trips by 2020.

US Census indicates that in 2000 13% of unincorporated Alameda County commuters traveled to work by rideshare. Literature indicates that ridesharing programs typically attract 5-15% of commute trips if they offer only information and encouragement, and 10-30% if they also offer financial incentives such as parking cash out or vanpool subsidies (York and Fabricatore, 2001). This corresponds to existing literature. This measure aspires to increase non-single-occupancy vehicle mode share in the County from 13 percent to 20 percent by 2020 through implementation of various transportation demand management strategies, as determined by the County. Thus, single-occupancy vehicle trips in the west county would be reduced by 7 percent. It was assumed that this measure would be most applicable to commute-related trips.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Transportation)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT CO_2e/year)
2%	59.4%	33%[a]	0.4%	4,035
a Applied to vehicle trips in the west county.				
Sources of information: *Urban Emissions Model version 9.2.4. 2007. http://www.urbemis.com/.* *Bryon York and David Fabricatore (2001), Puget Sound Vanpool Market Assessment, Office of Urban Mobility, WSDOT*				

LAND USE MEASURES

L-1: Facilitate the establishment of mixed-use, pedestrian- and transit-oriented development near major transit stations or transit corridors.

700 new residential dwelling units within ½ mile of major transit station by 2020.

Mix of uses within new TOD projects in 2020.

L-2: Reduce restrictions on second units in single-family residential districts near transit stations, major bus route corridors, neighborhood commercial centers, and central business districts. (S)

200 new second units within ½-mile of transit stations.

The performance of these measures is based on 900 units of future development in the unincorporated county being located in designated TOD areas. Future development patterns will be impacted by programs and incentives described in L-1, resulting in increased focus of development around TODs.

The following formula describes the potential for trip reductions associated with proximity of residential uses to public transit and neighborhood centers for non-employment-related trips:

Trip reduction = 0.6 x (1-(19,749 x ((4.814+households per residential acre)/(4.814+7.14))^-6.39)/25,914).

Transportation Analysis Zones (TAZs) that are within ½ mile of a BART station, or were within ¼ mile of an existing or potential new neighborhood center, were identified. The associated percent of total VMT in the unincorporated county was calculated for each TAZ. The residential density in each TAZ was used to calculate the "base" trip reduction in 2005 under existing conditions. A scenario in which projected growth was focused within these "priority growth areas" instead of throughout the entire unincorporated county was developed, and associated trip reduction with the "focused growth" residential density was calculated. The difference between the "base" and "focused growth" trip reductions was used to derive the estimated aggregate reduction in VMT associated with focusing growth in priority growth areas.

TAZ	Total VMT	% VMT	2005 Density per Acre	Trip reduction (% reduction in VMT)	2020 Density per Acre	Trip Reduction (% reduction in VMT)	Δ (% reduction in VMT)	Δ (scaled % reduction in VMT by TAZ)
Within 1/2 mile of TOD								
840	93,057	1.2%	9.7	47%	10.4	50%	3%	0.04%
842	50,220	0.7%	8.6	38%	9.7	47%	9%	0.06%
846	80,192	1.1%	5.8	-36%	6.3	-13%	24%	0.25%
847	34,486	0.5%	7.2	16%	8.3	34%	18%	0.08%
848	50,929	0.7%	9.7	47%	10.6	51%	4%	0.03%
Total	**7,577,062**	**4.1%**						**1.5%**

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Transportation)	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT CO_2e/year)
0.5%	59.4%	0.3%	2,289

Sources of information:

Nelson/Nygaard Consultants. 2005. Nelson/Nygaard Consultants. 2005. Crediting Low-Traffic Developments: Adjusting Site-Level Vehicle Trip Generation Using URBEMIS. (Holtzclaw et al 2002) Trip reduction formula, pg 11.

Caltrans. 2005 Highway Performance Monitoring System (HPMS) database. Available: http://www.dot.ca.gov/hq/tsip/hpms/datalibrary.php.

Metropolitan Transportation Commission. 2009. BASSTEGG model (Bay Area Simplified Simulation of Transportation Energy and Greenhouse Gases) data for Alameda County. Available: ftp://ftp.abag.ca.gov/pub/mtc/planning/forecast/BASSTEGG/

L-3: Increase the diversity of uses in neighborhood-serving commercial centers. (S)

L-4: Improve the vitality of mixed-use neighborhood-serving commercial centers.

150,000 square feet of new commercial uses and 300 residential units in neighborhood districts county-wide by 2020.

1,200 residential units in existing neighborhood districts county-wide by 2020.

L-5: Conduct land use and market analyses to identify sites within expansive residential areas that could support new or expanded neighborhood commercial centers. (S)

The performance of this measure is related to the elasticity of increased diversity of uses. The neighborhood-serving commercial uses that would result from increased diversity (150,000 square feet of new neighborhood commercial centers with 300 residential units and 1,200 new residential units in existing neighborhood commercial centers) would result in a 2 percent reduction in non-work-related vehicle trips in the west county.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Transportation)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT CO_2e/year)
2%	59.4%	62.7%[a]	0.7%	7,666

a Applied to vehicle trips in the west county.

Sources of information:

Criterion Planners. April 2004. Index PlanBuilder Indicator Dictionary (Appendix A). Ewing, Reid, et al. 2001. Travel and the Built Environment: A Synthesis. Transportation Research Record 1780. Paper No. 01-3515 as cited in Urban Land Institute. 2008. Growing Cooler. ISBN: 978-0-87420-082-2. Washington, DC

Ewing, Reid, et al. 2001. Travel and the Built Environment: A Synthesis. Transportation Research Record 1780. Paper No. 01-3515 as cited in Urban Land Institute. 2008. Growing Cooler. ISBN: 978-0-87420-082-2. Washington, DC

Nelson/Nygaard Consultants. 2005. Nelson/Nygaard Consultants. 2005. Crediting Low-Traffic Developments: Adjusting Site-Level Vehicle Trip Generation Using URBEMIS.

BUILDING ENERGY MEASURES

E-1: Work with PG&E and Alameda County cities to accelerate smart grid integration.

50% of existing buildings that achieve energy savings through the Smart Grid by 2020.

75% of new buildings that achieve energy savings through the Smart Grid by 2020.

This measure would catalyze the County's integration into the "Smart Grid" system. This system would help the County manage and serve its electricity demand more efficiently in every demand scenario (e.g., peak and off-peak). The County's integration into the "Smart Grid" system is anticipated to reduce total electricity consumption from the residential and non-residential sectors by 5 percent and 6 percent, respectively.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Energy)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT CO_2e/year)
5% (existing)	6.4% (residential)	50%	0.2%	1,634
6% (existing)	8.5% (non-residential)	50%	0.3%	2,619
5% (new construction)	(residential)	75%	0.0%	139
6% (new construction)	(non-residential)	75%	0.1%	682
Total			**0.7%**	**5,074**

Sources of information:

SMART 2020: Enabling the low carbon economy in the information age, The Climate Group on behalf of the Global eSustainability Initiative (GeSI)

Estimating the Benefits of the GridWise Initiative Phase I Report Walter S. Baer, Brent Fulton, Sergej Mahnovski TR-160-PNNL, May 2004 Prepared for the Pacific Northwest National Laboratory PAGE 25

E-3: Develop an outreach program to facilitate voluntary home energy efficiency improvements.

2,500 households serviced by community-based energy efficiency organizations by 2020.

10% participation in energy efficiency rebate programs by 2015.

E-4: Identify/develop financing programs to encourage energy efficiency & renewable energy. (S)

20% of households that achieve a 15% improvement in building energy efficiency by 2020.

E-5: Expand outreach to low-income homeowners regarding energy efficiency & weatherization programs. (S)

2,250 households with Weather Assistance Program energy efficiency improvements by 2020.

E-6: Identify and implement opportunities to improve efficiency of rental units. (S)

30% of rental properties with energy efficiency improvements by 2020.

This measure assumes a performance standard of a combined 15 percent increase in energy efficiency in existing residential units. Participation rates were calculated based on the average turnover of building stock per year. It was assumed that this proportion of the building stock would undergo an energy efficiency retrofit each year. The incentive programs in this measure would encourage participation over and beyond the natural rate of turnover in the building stock. It was assumed these programs would generate participation of between 10 and 20 percent of new residential homes on the market. These calculations were aggregated for the implementation period through 2020 to arrive at the total percentage of the residential building stock (20 percent) that would perform at this energy efficiency target.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Energy)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT CO_2e/year)
6.0% (40% of energy)	6.4% (Electricity)	20%	0.1%	784
9.0% (60% of energy)	12.9% (Natural gas)	20%	0.2%	2,383
Total			**0.3%**	**3,167**

Sources of information:

California Energy Commission [CEC] 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings

E-7: Develop and implement an outreach and financial assistance program that encourages businesses to invest in efficiency improvements.

25% of businesses enrolled in financing program and achieved 15% improvement in building energy efficiency by 2020.

This measure would improve energy efficiency of commercial buildings by a combined 15 percent for natural gas and electricity consumption. Participation rates were calculated based on the average turnover of commercial building stock per year based on 20-year average lease terms. It was assumed that this proportion of the commercial building stock would undergo an energy efficiency retrofit each year. The incentive programs in this measure would encourage participation over and beyond the natural rate of turnover in the building stock. It was assumed these programs would generate participation of approximately 25 percent of existing commercial or industrial buildings.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Energy)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT CO_2e/year)
9.0% (60% of energy)	8.5% (electricity)	25%	0.2%	1,964
6.0% (40% of energy)	6.0% (natural gas)	25%	0.1%	923
Total			**0.3%**	**2,887**

Sources of information:

California Energy Commission [CEC] 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings

E-8: Renew County Green Building Ordinance.

E-12: Require all new multi-unit buildings and major renovations to existing multi-unit buildings to be "sub-metered" in order to enable each individual unit to monitor energy and water consumption. (S)

The CEC 2008 Impact Analysis report makes estimates for the average reduction in energy consumption for residential and non-residential buildings in order to comply with Title 24. These percentages were used as the reduction level for all new buildings. For the residential building calculation, it was assumed that 61% of residential buildings in the unincorporated areas are single family, with the remaining 39% being multifamily. Using these percentages, a blended average was calculated for the percentage reduction in energy consumption for residential buildings. It was assumed that the energy performance of non-residential buildings approximately corresponds to the figures in the CEC 2008 Impact Analysis report.

It was assumed that, on average, residential buildings would comply with the Build It Green standard, which calls for CALGreen Tier 1 energy efficiency standards or 15% reduction below baseline. It was assumed that, on average, non-residential buildings would meet the minimum LEED EA Credit1 energy efficiency standard of a 12% reduction below the ASHRAE 90.1-2007 baseline. These percentages were added to the difference between a standard existing building and baseline Title 24.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Inventory (MT GHG/year from new growth)	GHG Emissions Reduction (MT CO_2e/year)
9.1% (baseline) + 15% = 24.1% (res.elec.)	14,184	3,414
21.8% (baseline) +15% = 36.8% (res. nat. gas)	3,700	1,361
9.4% (baseline) + 12% - 21.4% (non-res. elec.)	909	195
4.9% (baseline) + 12% = 16.9% (non-res. nat. gas)	15,153	2,561
Total		**7,530**
Sources of information: *California Energy Commission [CEC] 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings*		

E-9: Provide incentives, such as priority permitting for buildings that the exceed current California Title-24 standards for energy efficiency by 30 percent.

10% of new construction that exceeds 30% above 2010 Title 24 energy efficiency requirements.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Inventory (MT GHG/year from new growth)	Participation	GHG Emissions Reduction (MT CO_2e/year)
15% above GBO (residential electricity)	14,184	10%	213
15% above GBO (residential natural gas)	3,700	10%	56
18% above GBO (non-res electricity)	909	10%	16
18% above GBO (non-res natural gas)	15,153	10%	273
Total		10%	**557**
Sources of information: *California Energy Commission [CEC] 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings*			

E-13: Identify and facilitate Solar EmPowerment districts in commercial, industrial, mixed-use portions of City.

2,000,000 square feet of photovoltaic panels on commercial and industrial buildings by 2020.

For commercial/industrial PV systems, a bottom-up calculation was performed assuming a system efficiency of 10 watts per square foot (SolarEstimate 2010) and solar irradiance of 21.6 kilowatt-hours per square foot per year (source) (assuming an average of 6 hours of operation per day per year). Emission reductions associated with commercial/industrial PV systems were calculated using the PG&E specific electricity emission factor (i.e., lb CO2e/kWh). This emission factor was multiplied by solar irradiance to calculate the reduction potential of the proposed PV systems in units of pounds of CO_2e per square foot PV per year. This reduction potential was then multiplied by the assumed 2,000,000 square feet (45 acres) of panel area to calculate total emission reductions.

These assumptions were used to calculate the total kilowatt-hours generated from implementation of the measure. The GHG reduction potential of this measure was calculated using the same PG&E-specific electricity consumption emission factor used to calculate the County's GHG emissions associated with electricity consumption.

System Size (sq ft)	Generation Time (hours/year)	Solar Potential (watts/square foot)	Electricity Production Rate (KWh/sq. ft.)	Generation Capacity (kWh/yr)	PG&E CO_2 Emission Factor (lbs/kWh)	GHG Emissions Reduction (MT CO_2e/year)
2,000,000	2,160	10	21.6	43,200,000	0.636	10,268

Sources of information:

PG&E Energy and Greenhouse Gas Data Reference Key. 2007 verified emission factor.Buildings

E-14: Facilitate the installation of solar hot water heating systems on large commercial buildings.

5% of large commercial buildings install solar hot water systems by 2020.

Installation of solar water heaters on large commercial buildings would reduce the amount of natural gas consumption associated with water heating. An Energy Star study determined that solar water heaters can reduce the amount of annual natural gas used for water heating by 60 percent (51% above basic retrofit). In addition, a CEC study determined that 40 percent of total commercial natural gas consumption is used for water heating. Therefore, assuming a 5 percent participation rate for commercial buildings, these percentages were applied to the commercial natural gas portion of the 2020 GHG emissions inventory to estimate the amount of natural gas and GHG emissions that would be reduced with installation of solar hot water systems.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Energy)	Participation Rate	Sub Sector	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT CO_2e/year)
60% (51% over retrofit)	6.0% (Large Commercial)	5%	40%	0.1%	628

Sources of information:

Energy Star. 2009. Solar Water Heater. www.energystar.gov/ia/new_homes/features/WaterHtrs_062906.pdf; DOE. CEC 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings

CEC source: CEC 2005. Electricity usage during Peak Periods. Available: <www.energy.ca.gov/electricity/peak_loads.html>

E-15: Develop comprehensive renewable energy financing and informational program for residential and commercial uses.

5% of residences install photovoltaic systems by 2020.

10% of residences install solar hot water systems by 2020.

5% of small commercial buildings install solar hot water systems by 2020.

It was assumed that 70 percent (59.5% percent above basic retrofit) of electricity would be generated by solar for participating units from solar panels and a 60 percent reduction in natural gas would occur for solar water heating (51% above basic retrofit).

Strategy	Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Energy)	Sub Sector	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT CO_2e/year)
Solar panels	70% (59.5% over retrofit)	6.4% (Electricity)	100%	5%	0.2%	1,945
Solar water heaters	60% (51% over retrofit)	12.9% (Natural gas, residential)	60%	10%	0.4%	4,051
	60% (51% over retrofit)	6.0% (Natural gas, Small Commerical)	40%	5%	0.1%	628
Total					**0.6%**	**6,623**

Sources of information:

CEC 2005. Electricity Usage During Peak Periods. Available: www.energy.ca.gov/electricity/peak_loads.html

WATER CONSERVATION MEASURES

WT-1: Require residential and commercial remodels and renovations to improve plumbing fixture and fixture fitting water efficiency by 20 percent above the code water efficiency standards.

50% of households and businesses voluntarily reduce indoor water consumption by 20% or more by 2020.

50% of households and businesses voluntarily reduce irrigation water consumption by 50% or more by 2020.

WT-3: Ordinance that allows the installation and use of greywater systems for irrigation. (S)

WT-4: Work with EBMUD and Zone 7 to redesign the water bill format to encourage water conservation in residential and commercial users. (S)

GHG emission reductions in the water sector are, in great part, driven by a state-level policy, SB 7. This policy requires a reduction in per capita water consumption by 2020 - either the "standard target", a 20 percent reduction from the average water demand between 1994 and 2004, or the "alternative minimum", a five percent reduction from the average water demand between 2003 and 2007. EBMUD, and to a lesser extent Zone 7,has yet to determine the specific SB 7 target that it will attempt to achieve, and, therefore, there is uncertainty in developing guidelines for their compliance. However, for the purposes of the CAP, it was assumed that the "standard target" was chosen. It is likely that this target would translate into approximately less than a 20 percent reduction below 2005 levels due to the fact that the average water demand 1994-2004 is likely less than the water demand in 2005.

In order to estimate the GHG reductions associated with implementation of SB 7, water consumption data for 2005 and 2020 provided by Zone 7 and EBMUD were used as baseline estimates. EBMUD provides water exclusively for urban water consumption, while Zone 7 supplies water for agricultural and urban uses. Year 2005 urban water consumption from Zone 7 and EBMUD was used to calculate a baseline per capita water consumption based on ABAG 2005 population data for the unincorporated county. Assuming full implementation of SB 7, a 20 percent reduction from the baseline (2005) per capita water consumption rate and the ABAG projected 2020 population was used to calculate the target water consumption in 2020. The target water consumption was subtracted from the EBMUD and Zone 7 projected 2020 urban water consumption to calculate the annual water savings achieved in year 2020. Similar to the methods used to calculate water-related GHG emissions for the inventory, the annual water savings were used to calculate the amount of electricity consumption and GHG emissions (associated with conveyance, distribution, and treatment of the water) that would be reduced as a result of SB 7.

For the purposes of this measure, it was assumed that indoor water consumption could be reduced by 20% through the installation of high efficiency fixtures and appliances. Likewise, outdoor water consumption could be reduced by 50% through using Bay Friendly Landscaping guidelines. The target participation rates for both programs are 50%, which still does not achieve the SB 7 goal (in conjunction with WT-2). The reduction from this measure is 4,502 MT CO_2e/yr. The total reduction that would generated by SB 7 is 6,762 MT CO_2e/yr, which leaves 2,260 MT CO_2e/yr left to achieve through other water conservation efforts.

Unscaled Measure Performance (% reduction in GHG emissions)	Emissions Sector (Water)	Participation Rate	Scaled Measure Performance (% reduction in GHG emissions)	GHG Emissions Reduction (MT CO_2e/year)
20%	1.9% (Existing Indoor Water)	50%	0.2%	1,919
50%	1.0% (Existing Outdoor Water)	50%	0.3%	2,583
Total			**0.5%**	**4,502**
			Total needed to comply with SB 7	**6,762 (2,260 gap)**

WT-2: Require new landscape projects to reduce outdoor potable water use by 40 percent.

100% of new landscapes that achieve a 40% reduction in water consumption.

The water-efficient landscape ordinance would require new landscape projects and irrigation systems to reduce outdoor water consumption by 40 percent beyond the initial requirements for plant installation and establishment. This measure would be applicable to GHG emissions associated with water consumed by new development (i.e., 1,771 MT CO_2e in 2020), which would result in approximately 708 MT CO_2e/year reduction in 2020.

Department of Water Resources. 2001. Statewide Indoor/Outdoor Split. Accessed December 2, 2008. Available at: <http://www.landwateruse.water.ca.gov/annualdata/urbanwateruse/2001/landuselevels.cfm?use=8>.

WASTE MEASURES

WS-1: Increase solid waste reduction and diversion to 90% by 2030.

82.5% community waste interim diversion rate by 2020 (90% by 2030).

WS-2: Strengthen the Construction and Demolition Debris Management Ordinance. (S)

100% waste diversion rates for C&D inert waste.
50% waste diversion rates for C&D wood/vegetative/scrap metal wastes net of ADC and unsalvageable material.

WS-3: Develop a food waste collection program and an ordinance that requires all household and commercial food wastes and food soiled paper to be placed in organics carts. (S)

100% of household and commercial food waste composted by 2015.

This measure assumes an interpolated 82.5 percent reduction in landfill waste by 2020, based on an expected 75 percent reduction in 2010 and 90 percent in 2030. This measure would apply to GHG emissions associated with new waste generated only (i.e., 3,024 MT CO_2e in 2020), and would not apply to waste in place. Thus, this measure would result in a GHG emissions reduction of approximately 2,510 MT CO_2e/year in 2020.

GREEN INFRASTRUCTURE MEASURES

G-1: Expand urban forest (e.g. street trees and trees on private lots) in order to sequester carbon and reduce building energy consumption.

5,000 trees planted within public rights-of-way between 2010–2020.
1,000 trees planted on private property between 2010–2020.
This measure is based on extrapolating the carbon sequestration potential of a typical tree palette across the public and private land tree planting goals (5,000 trees planted on public land within rights-of-way in the County and 1,000 trees planted on private property by 2020). Carbon sequestration rates specific to the species and age of the planted trees were used calculate the annual sequestration potential of the trees from 2010 to 2020. Total value of measure: 1,000 MT/year.

Sources of information:

The Center for Urban Forest Research Tree Carbon Calculator. Available:<http://www.fs.fed.us/ccrc/topics/urban-forests/>

USDA Forest Service, Pacific Northwest Research Station. "California Study Shows Shade Trees Reduce Summertime Electricity Use." Science Daily 7 January 2009. 20 February 2009 <http://www.sciencedaily.com/releases/2009/01/090105150831.htm>.

California Energy Commission 2005. Electricity Usage During Peak Periods. <www.energy.ca.gov/electricity/peak_loads.html>

California Energy Commission [CEC] 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings

G-2: Include carbon sequestration as an objective within County-led natural area restoration projects.

2,500 trees planted in restoration projects between 2010–2020.

his measure is based on extrapolating the carbon sequestration potential of a typical tree palette across the public and private land tree planting goals (2,500 trees planted on public land within forest restoration projects in the County). Carbon sequestration rates specific to the species and age of the planted trees were used calculate the annual sequestration potential of the trees from 2010 to 2020. Total value of measure: 500 MT/year.

Sources of information:

The Center for Urban Forest Research Tree Carbon Calculator. Available:<http://www.fs.fed.us/ccrc/topics/urban-forests/>

USDA Forest Service, Pacific Northwest Research Station. "California Study Shows Shade Trees Reduce Summertime Electricity Use." Science Daily 7 January 2009. 20 February 2009 <http://www.sciencedaily.com/releases/2009/01/090105150831.htm>.

California Energy Commission 2005. Electricity Usage During Peak Periods. <www.energy.ca.gov/electricity/peak_loads.html>

California Energy Commission [CEC] 2007. Impact Analysis 2008 Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings

APPENDIX C COSTS & SAVINGS ANALYSIS

INTRODUCTION

Economics were a key consideration in determining the feasibility of proposed GHG reduction measures. Cost to the County, as well as costs and savings to the resident or property owner were assessed as part of this analysis for each GHG reduction measure. These costs and savings were categorized into low, medium, and high, using the ranges provided in Table C-1.

COSTS & SAVINGS

The County is not the only entity bearing financial responsibility for implementing for CAP measures; there will be a private cost borne by residents and businesses for some measures. In recognition of this, a costs and savings analysis was performed for each measure, which evaluated the cost to County, as well as potential costs and savings to residents or property owners. Measures vary in the distribution of costs; some measures require only funding from the County or other public entities, whereas others require that residents and businesses contribute. In nearly all measures that require some investment by residents or business owners, there are substantial long-term savings that will allow recuperation of initial investments, as well as other benefits such as improved air quality or public realm (e.g., streetscapes, open spaces, rights-of-way, etc.). There are also measures that require no private investment, but generate savings for the resident or business owner.

Cost to County

For the County, the economic implications of implementing the CAP's GHG reduction measures primarily concern capital costs, program implementation costs, and employee costs, and were assessed as total costs for the implementation period of the CAP through 2020. While some measures require funding of capital costs or program costs, other measures necessitate the hire of sustainability professionals. Overall, the CAP will require two additional staff members to be hired, the costs of which are distributed across the measures for which the employees will be responsible.

Though some GHG reduction measures would certainly generate savings for the County, this was not analyzed due to the uncertain program design details of revenue generating measures, as well as the speculative nature of the impact of some measures on the property tax base. It should be recognized, however, that for measures that will generate a demonstrable increase in property values due to, for instance, energy or water efficiency retrofits, the County would stand to benefit from corresponding property tax increases.

Other measures could have a positive financial impact on the County, as well, such as land use and transportation measures that improve the public realm in and around business districts. There is ample evidence that shows that an enhanced public realm results in better business for retail, which would result in increased taxable sales for the County. These savings were not captured in this analysis, though they should be considered when implementing relevant measures.

Cost to Resident or Business

Though many GHG reduction measures do not result in any notable private costs, the economic implications of some measures to the resident or business merit analysis and quantification, where possible. The cost analysis for residents or property owners was framed in terms of annual costs (or average annual costs). Some costs are mandatory (i.e. Residential Energy Conservation Ordinance), whereas others are voluntary (i.e., water efficiency retrofits). However, there are funding sources and financing mechanisms available to the County to help offset private costs. In order to provide a comparable assessment of costs, the calculations were based on a hypothetical average resident or business. For nearly every measure with private cost implications, there are savings that would accrue over time, defraying some of the initial investments.

Savings to Resident/Property Owner

The savings analysis for residents or property owners was also framed in terms of annual savings, as many savings would be recurring. Not all measures generate savings, though many that deal with energy or water efficiency in the home or business generate long-term utility bill reductions. Even transportation measures can generate savings through decreased frequency of car travel. In order to provide a comparable assessment of savings, the calculations were based on a hypothetical average resident or business.

TABLE C-1

Cost to County (total)	Low: $0 -$250,000 Medium: $250,001-$500,000 High: $500,001 or greater
Cost to Resident or Property Owner (annual)	Low: $0-$100 Medium: $101-$250 High: $251 or greater
Savings to Resident or Property Owner (annual)	Low: $0-$100 Medium: $101-$250 High: $251 or greater

FUNDING SOURCES & FINANCING MECHANISMS

Another major consideration in determining the optimal assortment of effective GHG reduction measures was the availability of funding sources and financing mechanisms that Alameda County could pursue in order to offset the financial burden of implementation. Table C-2 provides a summary of the funding sources and financing mechanisms that were assessed as part of this CAP. This list may not represent a comprehensive assessment of potential options, but characterizes the majority of available funding sources and financing mechanisms. Descriptions of each funding source or financing mechanism can be found in Part 3, and a measure-specific assessment of how these resources can be applied is included in Costs and Savings Matrix (deciphered using the key provided in Table C-2).

The spectrum of public and private funding options for the measures outlined in this CAP is ever evolving. This section outlines viable funding options that are current to the CAP, as of the date of preparation, but will eventually become out of date. However, there are general sources of funding that can be drawn upon to obtain the most up-to-date information possible. More details on these resources are noted in the introduction to Part 2.

TABLE C-2: Funding Sources & Financing Mechanisms Key

FUNDING SOURCES & FINANCING MECHANISMS	Key
State and Regional Grants	**A**
Transportation Fund for Clean Air	A.1
Safe Routes to Transit	A.2
MTC Livable Communities & Housing Incentive Program	A.3
MTC Transit Oriented Development Policy	A.4
Corridors Program	A.5
Safe Routes to Schools	A.6
Alameda County Transportation Improvement: Caltrans Planning Grants	A.7
CAL FIRE Climate Change Program	A.8
American Recovery and Reinvestment Act (ARRA)	**B**
CaliforniaFIRST: Property Assessed Clean Energy (PACE)	B.1
California Energy Commission (CEC) Energy Efficiency Financing	B.2
Energy Efficiency and Conservation Block Grant (EECBG)	B.3
Energy Upgrade California	B.4
Other Public Finance	**C**
Qualified Energy Conservation Bonds (QECBs)	C.1
Clean Renewable Energy Bonds (CREBs)	C.2
Infrastructure State Revolving Fund Program	C.3
Industrial Development Bond (IDB) Financing Program	C.4
Partnerships with Private Companies and Other Orgs	**D**
Power Purchase Agreements (PPAs)	D.1
Energy Performance Contract with Energy Service Provider (ESP)	D.2
Energy Savings Performance Contracting (ESPC)	D.3
On-Bill Financing	D.4
Energy Efficiency Mortgages	D.5
Partnerships with Other Jurisdictions and Orgs	**E**
Metropolitan Transportation Commission (MTC)	E.1
Association of Bay Area Governments (ABAG)	E.2
Pacific Gas & Electric (PG&E)	E.3
East Bay Municipal Utility District (EBMUD)	E.4
TransForm	E.5
Alameda County Transit (AC Transit)	E.6
Stopwaste.Org	E.7
East Bay Bicycle Coalition	E.8
Build It Green	E.9
Local Communities	E.10
Self-Financing Strategies	**F**
County Funds	**G**
County General Fund	G.1
Redevelopment Funds	G.2
Development Fees	G.3

Alameda County Climate Action Plan - Cost to County Analysis						
MEASURE		COSTS TO COUNTY			FUNDING & FINANCING	SOURCES
		Total Cost	Simple Cost	Cost to County Notes		
Transportation						
Walking and Bicycling						
T - 1	Improve bicycle infrastructure near community activity areas.	$325,000	Medium	There can be some variations in cost depending on project needs. Alta Planning cost estimates: Bike Path - $500K - $3M per mile (high end indicates grade-separated crossings every 1 to 2 miles); Bike Lanes - $25K - $50K per mile (could be more if it requires road widening and right o way acquisition); Bike Routes - $5K - $50K per mile (depends on level of treatment: route signage only would be low end, signage and shoulder striping, pavement markings, signal actuation would be higher end). Assumed 5 miles of Bike Lanes and 5 miles of Bike Routes.	A.1, A.2, A.4, A.7, E (TransForm, East Bay Bicycle Coalition)	Alta Planning, Creative Pipe, SFMTA
T - 2	Develop appropriate bicycle infrastructure for high traffic intersections and corridors.	$65,000	Low	There can be some variations in cost depending on project needs. Alta Planning cost estimates: Bike Path - $500K - $3M per mile (high end indicates grade-separated crossings every 1 to 2 miles); Bike Lanes - $25K - $50K per mile (could be more if it requires road widening and right o way acquisition); Bike Routes - $5K - $50K per mile (depends on level of treatment: route signage only would be low end, signage and shoulder striping, pavement markings, signal actuation would be higher end). Assumed 1 mile of Bike Lanes and 1 mile of Bike Routes.	A.1, A.2, A.4, A.7, E (TransForm, East Bay Bicycle Coalition)	Alta Planning, Creative Pipe, SFMTA, Victoria Transport Policy Institute, AECOM
T - 3	Increase bicycle racks and storage facilities in underserved civic and commercial areas.	$39,000	Low	The costs are assumed to be $315 per 4-bike rack ($265 per rack + $50 for installation). Assumes 50 (low estimate) to 200 (high estimate) new bike racks will be needed in the County. Average annual cost assumes installation of bike racks will occur between 2012 and 2015.	A.1, A.2, A.4, A.7, E (TransForm, East Bay Bicycle Coalition)	Nelson Nygaard; AECOM
T - 4	Enhance pedestrian infrastructure within easy walking distance from community activity areas.	$209,000	Low	Pedestrian Master Plan Cost Calculation for Activity Centers, including downtowns, commercial districts, and other identified areas.	A.1, A.2, A.4, A.6, A.7, E (TransForm)	Victoria Transport Policy Institute, AECOM
T - 5	Expand Traffic Calming Program to improve pedestrian safety.	$188,000	Low	Cost assumptions use the following assumptions: 10 speed humps, 5 pedestrian islands, 5 traff circles,4 curb bulbs and 5 chokers.	A.1, A.2, A.4, A.6, A.7	Victoria Transport Policy Institute, AECOM
T - 6	Improve pedestrian connectivity and route choice in neighborhoods.	$532,000	High	Pedestrian Master Plan Cost Calculation for Bus Corridors(~$212,000), Rail and Ferry Station Areas (~$181,000), and Inter-Jurisdictional Trails (~$80,000). Total cost estimated as $493,000 in 2006 dollars.	A.1, A.2, A.4, A.6, A.7	AECOM
T - 7	Work with school districts to develop a School Alternative Transportation Plan by improving/expanding walking school bus, safe routes to school program, and school bus services.	$0	T-Staff	See T-Staff measure for the total staff resource requirements to implement the Transportation Action Area. All staff costs in this Action Area are aggregated in this measure.	A.1, A.2, A.4, A.6, A.7, E (TransForm, Unified School District)	AECOM
Public Transit						
T - 8	Conduct a public transit study and implement ridership enhancement program.	$50,000	Low	It is assumed this study will require some data collection; Costs distributed over 10-year period between 2010 and 2020.	A.1, A.2, A.4, A.7, E (AC Transit, TransForm)	Nelson Nygaard; AECOM
T - 9	Work with AC transit to increase service frequency on select bus routes.	$0	T-Staff	See T-Staff measure for the total staff resource requirements to implement the Transportation Action Area. All staff costs in this Action Area are aggregated in this measure.	A.1, A.2, A.4, A.7, E (AC Transit)	AECOM
T - 10	Provide transit buses with signa prioritization devices to facilitate time effective public transit service.	$0	Low	Cost of installing devices at 5 intersection and equipping 15 buses estimated at approximately $650,000 according to City of Chicago pilot study. Costs primarily borne by AC Transit (~100%).	A.1, A.2, A.4, A.7, E (AC Transit)	City of Chicago; City of New York
T - 11	Work with AC Transit to provide transit with essential improvements including shelters, route information, benches, and lighting.	$0	Low	Assumed that County will provide bus shelters, benches, and existing street lights will provide lighting. AC Transit will pay for maintenance. Estimated that 5-10 stops need enhancement + 10 new stops = 15-20 stops total. $15,000 per transit stop = $225,000-$300,000; Costs distributed over 8-year period between 2012 and 2020. Costs primarily borne by AC Transit (~100%).	A.1, A.2, A.4, A.7, E (AC Transit)	Nelson Nygaard; AECOM
T - 12	Work with public transit agencies to better accommodate bicycles.	$0	T-Staff	See T-Staff measure for the total staff resource requirements to implement the Transportation Action Area. All staff costs in this Action Area are aggregated in this measure.	A.1, A.2, A.4, A.7, E (AC Transit)	AECOM
Ride Sharing						
T - 13	Enhance rideshare infrastructure and services to increase community participation in this important travel mode (, and neighborhood ride-share stations).	$0	T-Staff	See T-Staff measure for the total staff resource requirements to implement the Transportation Action Area. All staff costs in this Action Area are aggregated in this measure.	A.1, A.2, A.4, A.7, E (MTC, AC Transit)	AECOM
Parking Management						
T - 14	Reduce minimum parking requirements for mixed-use, pedestrian and transit-oriented development.	$0	T-Staff	See T-Staff measure for the total staff resource requirements to implement the Transportation Action Area. All staff costs in this Action Area are aggregated in this measure.	A.5, A.7, E (local communities)	AECOM
T - Staff	Staff resources necessary to implement the measures in the Transportation Action Area.	$1,025,000	High	Approximately 0.4 FTE (transportation/sustainability professionals at ($80K + benefits/overhead = $200,000)) are required to implement all strategies related to Transportation in the CAP. Salary and benefits grow at the rate of inflation (3%).	G	AECOM

Alameda County Climate Action Plan - Cost and Savings to Resident or Business							
MEASURE		COSTS AND SAVINGS TO RESIDENT					SOURCES
		Average Annual Cost	Simple Cost	Average Annual Savings	Simple Savings	Costs and Savings to Resident or Business Notes	
Transportation							
Walking and Bicycling							
T - 1	Improve bicycle infrastructure near community activity areas.	None	None	$530	High	Assumed 4 trips per week shifting from car travel to pedestrian travel. According to Victoria Transport Policy Institute, a resident would save $3.58 per trip of shift from driving to non-motorized travel during urban peak, $1.49 during urban non-peak, and $1.905 for rural travel.	Alta Planning, Creative Pipe, SFMTA
T - 2	Develop appropriate bicycle infrastructure for high traffic intersections and corridors.	None	None	$370	High	Assumed 2 trips per week shifting from car travel to pedestrian travel. According to Victoria Transport Policy Institute, a resident would save $3.58 per trip of shift from driving to non-motorized travel during urban peak, $1.49 during urban non-peak, and $1.905 for rural travel.	Alta Planning, Creative Pipe, SFMTA, Victoria Transport Policy Institute, AECOM
T - 3	Increase bicycle racks and storage facilities in underserved civic and commercial areas.	None	None	$190	Medium	Assumed 1 trip per week shifting from car travel to pedestrian travel. According to Victoria Transport Policy Institute, a resident would save $3.58 per trip of shift from driving to non-motorized travel during urban peak, $1.49 during urban non-peak, and $1.905 for rural travel.	Nelson Nygaard; AECOM
T - 4	Enhance pedestrian infrastructure within easy walking distance from community activity areas.	None	None	$370	High	Assumed 2 trips per week shifting from car travel to pedestrian travel. According to Victoria Transport Policy Institute, a resident would save $3.58 per trip of shift from driving to non-motorized travel during urban peak, $1.49 during urban non-peak, and $1.905 for rural travel.	Victoria Transport Policy Institute, AECOM
T - 5	Expand Traffic Calming Program to improve pedestrian safety.	None	None	N/A	None	None	Victoria Transport Policy Institute, AECOM
T - 6	Improve pedestrian connectivity and route choice in neighborhoods.	None	None	$370	High	Assumed 2 trips per week shifting from car travel to pedestrian travel. According to Victoria Transport Policy Institute, a resident would save $3.58 per trip of shift from driving to non-motorized travel during urban peak, $1.49 during urban non-peak, and $1.905 for rural travel.	AECOM
T - 7	Work with school districts to develop a School Alternative Transportation Plan by improving/expanding walking school bus, safe routes to school program, and school bus services.	None	None	N/A	None	None	AECOM
Public Transit							
T - 8	Conduct a public transit study and implement ridership enhancement program.	None	None	N/A	None	None	Nelson Nygaard; AECOM
T - 9	Work with AC transit to increase service frequency on select bus routes.	None	None	N/A	None	None	AECOM
T - 10	Provide transit buses with signal prioritization devices to facilitate time effective public transit service.	None	None	$500	High	Savings calculated based on avoided losses in production, and reductions in commute time. Savings only relevant for public transit users, especially those dependent on buses. Commute time savings estimated at 11%-17% according to New York City pilot study. Reduction in commute time assumed to be 10% for Alameda County. Assumed median individual income of $42,173 - average of male and female income (2007 U.S. Census) with a 2,000 hour work year.	City of Chicago; City of New York
T - 11	Work with AC Transit to provide transit with essential improvements including shelters, route information, benches, and lighting.	None	None	None	None	None	Nelson Nygaard; AECOM
T - 12	Work with public transit agencies to better accommodate bicycles.	None	None	None	None	None	AECOM
Ride Sharing							
T - 13	Enhance rideshare infrastructure and services to increase community participation in this important travel mode (, and neighborhood ride-share stations).	None	None	$190	Medium	Assumed 1 trip per week shifting from single-occupancy car travel to carshare travel. According to Victoria Transport Policy Institute, a resident would save $3.58 per trip of shift from driving to non-motorized travel during urban peak, $1.49 during urban non-peak, and $1.905 for rural travel.	AECOM
Parking Management							
T - 14	Reduce minimum parking requirements for mixed-use, pedestrian and transit-oriented development.	None	None	None	None	None	AECOM
T - Staff	Staff resources necessary to implement the measures in the Transportation Action Area.	None	None	None	None	None	AECOM

Alameda County Climate Action Plan - Cost to County Analysis						
MEASURE		COSTS TO COUNTY			FUNDING & FINANCING	SOURCES
		Total Cost	Simple Cost	Cost to County Notes		
Land Use						
Transit Oriented Development						
L - 1	Facilitate the establishment of mixed-use, pedestrian- and tranist-oriented development near major transit stations or transit corridors.	$300,000	Medium	Cost of revising the Central Business District Specific Plan ranges from $200,000-$400,000 including requisite CEQA analysis and report.	A.1, A.3, A.4, A.5, A.7, E (MTC, TransForm))	AECOM
L - 2	Reduce restrictions on second units in single-family residential districts near transit stations, major bus route corridors, neighborhood commercial centers, and central business districts.	$105,000	Low	Cost of amending of Castro Valley, Eden Area, and East County Area plans, zoning code, and relevant specific plans. Cost of revising general plan: $50,000-$100,000; cost of revising zoning code: $20,000-$40,000; cost of CEQA analysis and report: $100,000.	A.1, A.3, A.5, A.7, G	AECOM
Neighborhood Commercial Districts						
L - 3	Increase the diversity of uses in neighborhood-serving commercial centers.	$0	L-Staff	See L-Staff measure for the total staff resource requirements to implement the Land Use Action Area. All staff costs in this Action Area are aggregated in this measure.	A.1, A.4, A.5, A.7, E (local communities)	AECOM
L - 4	Improve the vitality of mixed-use neighborhood-serving commercial centers through increase density allowance and enhanced design.	$105,000	Low	Cost of amending of Castro Valley, Eden Area, and East County Area plans, zoning code, and relevant specific plans. Cost of revising general plan: $50,000-$100,000; cost of revising zoning code: $20,000-$40,000; cost of CEQA analysis and report: $100,000.	A.1, A.4, A.5, A.7, G	AECOM
L - 5	Conduct land use and market analyses to identify sites within expansive residential areas that could support new or expanded neighborhood commercial centers.	$63,000	Low	Cost of conducting land use and market analysis.	A.1, A.4, A.5, A.7, G	AECOM
L - Staff	Staff resources necessary to implement the measures in the Land Use Action Area.	$512,000	High	Approximately 0.2 FTE (land use/sustainability professionals at ($80K + benefits/overhead = $200,000)) are required to implement all strategies related to Land Use in the CAP. Salary and benefits grow at the rate of inflation (3%).	G	AECOM

Alameda County Climate Action Plan - Cost and Savings to Resident or Business								
MEASURE		COSTS AND SAVINGS TO RESIDENT					SOURCES
		Average Annual Cost	Simple Cost	Average Annual Savings	Simple Savings	Costs and Savings to Resident or Business Notes	
Land Use							
Transit Oriented Development							
L - 1	Facilitate the establishment of mixed-use, pedestrian- and tranist-oriented development near major transit stations or transit corridors.	None	None	None	None	N/A	AECOM
L - 2	Reduce restrictions on second units in single-family residential districts near transit stations, major bus route corridors, neighborhood commercial centers, and central business districts.	None	None	None	None	N/A	AECOM
Neighborhood Commercial Districts							
L - 3	Increase the diversity of uses in neighborhood-serving commercial centers.	$250	Medium	None	None	The BID would be an assessment paid by business owners.	AECOM
L - 4	Improve the vitality of mixed-use neighborhood-serving commercial centers through increase density allowance and enhanced design.	None	None	None	None	N/A	AECOM
L - 5	Conduct land use and market analyses to identify sites within expansive residential areas that could support new or expanded neighborhood commercial centers.	None	None	None	None	N/A	AECOM
L - Staff	Staff resources necessary to implement the measures in the Land Use Action Area.	None	None	None	None	N/A	AECOM

Alameda County Climate Action Plan - Cost to County Analysis						
MEASURE		COSTS TO COUNTY			FUNDING & FINANCING	SOURCES
		Total Cost	Simple Cost	Cost to County Notes		
Energy						
Community Energy						
E - 1	Work with PG&E and Alameda County cities to accelerate "Smart Grid" integration in the community.	$0	E-Staff	See E-Staff measure for the total staff resource requirements to implement the Energy Action Area. All staff costs in this Action Area are aggregated in this measure.	E (PG&E), G.1, G.3	PG&E; DOE - http://www.oe.energy.gov/DocumentsandMedia/Environmentalgroups.pdf
E - 2	Evaluate the potential for district energy systems in mixed-use and higher density areas of the community and develop implementation plan for cost-effective systems.	$150,000	Low	Assume cost of study for district energy systems to be between $125,000 and $175,000.	B.3, B.4, C.2, G.1	Sustainable Housing Design Guideline; http://www.cogeneration.net/District_Heating.htm
Energy Efficiency in Existing Residential						
E - 3	Develop comprehensive outreach program to facilitate voluntary home energy efficiency improvements.	$75,000	Low	Assume many marketing/education-related strategies could be addressed concurrently. AECOM community-outreach professionals recommend a high tech approach consisting of a video clip, newsletter, and website activity. $75,000 per campaign (3-4 strategies per campaign) for strategies-related to marketing. Assume five energy and buildings related measures covered in two comprehensive marketing campaigns costing $150,000. Campaign conducted twice over the course of the 10-year implementation period, for a total cost of $300,000.	B.3, B.4, E (StopWaste)	AECOM
E - 4	Identify and develop low-cost financing products and programs that encourage investment in energy efficiency and renewable energy for existing residential and commercial buildings.	0.0%	see supporting measures for costs	see supporting measures for incentives + costs	B.3, B.4, D.1, E	Cascadia Consulting Group, Inc. Existing Building Energy Policy Analysis; AECOM
E - 4.1	On-bill Financing	$200,000	Low	County could coordinate with PG&E to facilitate the repayment of loans for efficiency upgrades on utility bills. Upgrades would be selected by the building owner (in coordination with the County) such that the efficiency savings would pay for the investment over a fixed period of time. Customers would "share" monthly energy efficiency savings with the utility until the loan is paid back, at which point all savings would be reflected in lower monthly bills. The goal is to simplify loan repayment and (in combination with a funding source) reduce upfront cash outlay by property owners. In addition, some models of on-bill financing would allow for the loan to remain with the property (even if sold by the current owner), thereby sharing the cost of upgrades over time with future beneficiaries of those upgrades.	D.4, E (PG&E)	Cascadia Consulting Group, Inc. Existing Building Energy Policy Analysis; AECOM
E - 4.2	Energy Efficiency Mortgages	$60,000	Low	Energy Efficiency Mortgages can provide owners additional financing (whether at time-of-sale or upon refinancing) for energy efficiency improvements at discounted interest rates. Energy efficiency upgrades could be chosen that would allow owners to realize a net monthly savings. The goal is to provide capital for energy efficiency upgrades at a discounted interest rate. Initial Costs: Partner development: $20,000 – $40,000. Costs to the County would generally be low because these products would be administered through private lenders, but the County would need to devote some financial resources to assisting with partner recruiting. Technology upgrades: $0 – $60,000. Depending on the County's role in administration, there may be costs incurred in development of a database to track and verify energy efficiency upgrades in participating properties.	E (ENERGY STAR)	Cascadia Consulting Group, Inc. Existing Building Energy Policy Analysis; AECOM
E - 4.3	Energy Efficient Local Improvement District	$370,000	Medium	In coordination with ABAG's proposed Solar and Energy Efficiency District program. While implementation costs are likely to be high, once introduced, ongoing policy development costs to the County are likely to be manageable as updates would be conducted in line with the County's existing cyclic code review process. Initial Costs: Cost of Adopting an Ordinance + Training County Staff to administer program/process applications: ~$10,000 - possible additional education and outreach related expenses. Annual Costs: Monitoring and enforcement cost: ~$10,000 + possible additional staff	B.1, E (ABAG)	Renewable and Appropriate Energy Laboratory - UC Berkeley; ABAG; Cascadia Consulting Group, Inc. Existing Building Energy Policy Analysis; AECOM
Energy Efficiency in Existing Residential						
E - 5	Expand outreach to low-income home-owners in order to encourage participation in federally-funded energy efficiency and weatherization programs.	$39,000	Low	DOE Low-Income Home Energy Assistance Program (LIHEAP). Assume many marketing/education-related strategies could be addressed concurrently. AECOM community-outreach professionals recommend a high tech approach consisting of a video clip, newsletter, and website activity. $75,000 per campaign (3-4 strategies per campaign) for strategies-related to marketing. Assume five energy and buildings related measures covered in two comprehensive marketing campaigns costing $150,000. Campaign conducted twice over the course of the 10-year implementation period, for a total cost of $300,000.	B.2, B.3, B.4, C.1, E (DOE, PG&E)	LIHEAP Home Energy Assistance Program
E - 6	Identify and implement opportunities to improve efficiency of rental units.	$44,000	Low	DOE Weatherization Program costs estimates. Assume many marketing/education-related strategies could be addressed concurrently. AECOM community-outreach professionals recommend a high tech approach consisting of a video clip, newsletter, and website activity. $75,000 per campaign (3-4 strategies per campaign) for strategies-related to marketing. Assume five energy and buildings related measures covered in two comprehensive marketing campaigns costing $150,000. Campaign conducted twice over the course of the 10-year implementation period, for a total cost of $300,000.	B.2, B.3, B.4, C.1, E (DOE, PG&E)	DOE/LIHEAP Weatherization Programs

Alameda County Climate Action Plan - Cost and Savings to Resident or Business								
MEASURE		COSTS AND SAVINGS TO RESIDENT						SOURCES
		Average Annual Cost	Simple Cost	Average Annual Savings	Simple Savings	Costs and Savings to Resident or Business Notes		
Energy								
Community Energy								
E - 1	Work with PG&E and Alameda County cities to accelerate "Smart Grid" integration in the community.	$220	Medium	$60	Low	Assumed cost of smart meter $220, including installation. Assumed consumer cost of electricity decrease of 6% due to the smart grid technology. Average residential consumption is 600 kWh/month with average rates at $0.15/kWh.		PG&E; DOE - http://www.oe.energy.gov/DocumentsandMedia/Environmentalgroups.pdf
E - 2	Evaluate the potential for district energy systems in mixed-use and higher density areas of the community and develop implementation plan for cost-effective systems.	$600	High	$320	High	Assumed cost of meter ~$400 (with 50% subsidy through grants), plus additional maintenance fee of $8/week. Assumed consumer cost of electricity decreased of 30% due to the district energy system. Average residential consumption is 600 kWh/month with average rates at $0.15/kWh.		Sustainable Housing Design Guideline; http://www.cogeneration.net/District_Heating.htm
Energy Efficiency in Existing Residential								
E - 3	Develop comprehensive outreach program to facilitate voluntary home energy efficiency improvements.	None	None	None	None	Not calculated to avoid double counting with RECO measure.		AECOM
E - 4	Identify and develop low-cost financing products and programs that encourage investment in energy efficiency and renewable energy for existing residential and commercial buildings.	see supporting measures for costs	see supporting measures for costs	see supporting measures for savings	see supporting measures for savings	see supporting measures for savings associated with each incentive		Cascadia Consulting Group, Inc. Existing Building Energy Policy Analysis; AECOM
E - 4.1	On-bill Financing	Residential: $0.50 - $2.00/sf Comm/Indust: $1.00 - $6.00/sf	Residential: $0.50 - $2.00/sf Comm/Indust: $1.00 - $6.00/sf	$40	Low	A basic package of energy conservation measures (~15% energy efficiency improvement) woul cost between $0.50 and $2.00 per square foot for residential and $1.00 to $6.00 per square foot for commercial/industrial. These measures would generally include energy efficient lighting, duct and attic insulation, and potentially heating and cooling system efficiency improvements depending on the building. This incentive primarily addresses the initial capital costs of an energy efficiency retrofit up front, through distributing investment costs over a period of time. This make energy efficiency investments more feasible for individuals who do not have the capital to invest up front. An on-bill financing program would generally offer a discount of 100 basis points relative to prevailing mortgage rates (for home equity financing), amortized over a 10 year period. Savings represents average annual savings.		Cascadia Consulting Group, Inc. Existing Building Energy Policy Analysis; AECOM
E - 4.2	Energy Efficiency Mortgages	Residential: $0.50 - $2.00/sf Comm/Indust: $1.00 - $6.00/sf	Residential: $0.50 - $2.00/sf Comm/Indust: $1.00 - $6.00/sf	$420	High	A basic package of energy conservation measures (~15% energy efficiency improvement) woul cost between $0.50 and $2.00 per square foot for residential and $1.00 to $6.00 per square foot for commercial/industrial. These measures would generally include energy efficient lighting, duct and attic insulation, and potentially heating and cooling system efficiency improvements depending on the building. This incentive provides an incentive through reduced mortgage rates for homes that qualify as energy efficient. Savings calculations are for an assumed average home cost of ~$330,000 with a energy efficient mortgage rate discount of 50 basis points relative to prevailing mortgage rates, amortized over a 30 year period. Savings represent average annual savings.		Cascadia Consulting Group, Inc. Existing Building Energy Policy Analysis; AECOM
E - 4.3	Energy Efficient Local Improvement District	Residential: $0.50 - $2.00/sf Comm/Indust: $1.00 - $6.00/sf	Residential: $0.50 - $2.00/sf Comm/Indust: $1.00 - $6.00/sf	$160	Medium	A basic package of energy conservation measures (~15% energy efficiency improvement) woul cost between $0.50 and $2.00 per square foot for residential and $1.00 to $6.00 per square foot for commercial/industrial. These measures would generally include energy efficient lighting, duct and attic insulation, and potentially heating and cooling system efficiency improvements depending on the building. Assumed consumer cost of energy decrease of 15% due to more stringent building code. Average residential consumption is 600 kWh/month with average rates at $0.15/kWh.		Renewable and Appropriate Energy Laboratory - UC Berkeley; ABAG; Cascadia Consulting Group, Inc. Existing Building Energy Policy Analysis; AECOM
Energy Efficiency in Existing Residential								
E - 5	Expand outreach to low-income home-owners in order to encourage participation in federally-funded energy efficiency and weatherization programs.	None	None	$270	High	The LIHEAP Home Energy Assistance Program (HEAP) provides a direct payment to a low-income client's utility bill to help offset the cost of heating/cooling their home. Average annual savings of $270.		LIHEAP Home Energy Assistance Program
E - 6	Identify and implement opportunities to improve efficiency of rental units.	$1,300	High	$400	High	The DOE Weatherization Assistance program provide weather-stripping, insulation, caulking, water heater blankets, refrigerator replacement, heating/cooling system repairs, and compact fluorescent lamps to make dwellings more energy efficient, thereby reducing energy usage/costs, while safeguarding the health and safety of the household. Average annual savings of $400 with $1,300 initial investment.		DOE/LIHEAP Weatherization Programs

Alameda County Climate Action Plan - Cost to County Analysis						
MEASURE		COSTS TO COUNTY			FUNDING & FINANCING	SOURCES
		Total Cost	Simple Cost	Cost to County Notes		
Energy						
Energy Efficiency in Existing Commercial						
E - 7	Develop and implement an outreach and financial assistance program that encourages businesses to invest in efficiency improvements.	$94,000	Low	Facilitate outreach program to guide small business owners to ENERGY STAR program for Small Business administered locally through PG&E. Assume many marketing/education-related strategies could be addressed concurrently. AECOM community-outreach professionals recommend a high tech approach consisting of a video clip, newsletter, and website activity. $75,000 per campaign (3-4 strategies per campaign) for strategies-related to marketing. Assume five energy and buildings related measures covered in two comprehensive marketing campaigns costing $150,000. Campaign conducted twice over the course of the 10-year implementation period, for a total cost of $300,000.	B.2, B.3, B.4, C.1, E (DOE, PG&E)	www.energyguide.com
Energy Performance in New Construction						
E - 8	Require all new construction to achieve California Green Building Code Tier I Energy Efficiency Standards (Section 503.1.1)	$145,000	Low	Assumed additional funding required by Department of Building Inspection for monitoring and enforcement of $10,000-$20,000. Cost of producing guidance and educational material on how to meet code - $25,000. See E-Staff measure for the total staff resource requirements to implement the Energy Action Area. All staff costs in this Action Area are aggregated in this measure.	E (Build It Green), G.3	California Energy Commission Green Building Code; Builder Magazine
E - 9	Provide incentives, such as priority permitting for buildings that exceed current California Title-24 standards for energy efficiency by 30% (Tier II).	$63,000	Low	Costs assumed for administration of green priority permitting program through Development Services Department: Building Inspection Division. See E-Staff measure for the total staff resource requirements to implement the Energy Action Area. All staff costs in this Action Area are aggregated in this measure.	E (Build It Green), G.3	AECOM study of energy efficiency programs for City of Seattle
E - 10	Require new construction to use building materials with recycled content.	$8,000	Low	Cost of amending Green Building Ordinance to incorporate element on use of passive solar strategies assumed to be negligible. See E-Staff measure for the total staff resource requirements to implement the Energy Action Area. All staff costs in this Action Area are aggregated in this measure.	E (Build It Green, USGBC)	AECOM
E - 11	Require new commercial parking lots over 20 spaces in size to mitigate parking lot heat gain through the use of shade trees, solar arrays, or cool pavement.	$0	E-Staff	Cost of amending Green Building Ordinance to incorporate element on urban heat island mitigation assumed to be negligible. See E-Staff measure for the total staff resource requirements to implement the Energy Action Area. All staff costs in this Action Area are aggregated in this measure.	E (Build It Green, USGBC), G.3	AECOM
E - 12	Require that all new multi-unit buildings be "sub-metered" in order to enable each individual unit to monitor energy and water consumption.	$8,000	Low	Assumed additional funding required by Department of Building Inspection for monitoring and enforcement of $5,000-$10,000. See E-Staff measure for the total staff resource requirements to implement the Energy Action Area. All staff costs in this Action Area are aggregated in this measure.	E (PG&E), G.1, G.3	AECOM; Habitat Magazine
Renewable Energy						
E - 13	Establish Solar EmPowerment Districts program that removes barriers to and facilitate the installation of solar photovoltaic systems on eligible commercial and industrial buildings and parking lots.	$0	E-Staff	Assumes that County will facilitate establishment of Solar Empowerment District and ABAG will administer AB 811 funds for financing projects. See E-Staff measure for the total staff resource requirements to implement the Energy Action Area. All staff costs in this Action Area are aggregated in this measure.	B.2, B.3, C.2, D.1, D.2, E (ABAG)	Environmental and Energy Study Institute; Go Solar Initiative
E - 14	Facilitate the installation of solar hot water heating systems on commercial and multifamily rental buildings.	$188,000	Low	Assume many marketing/education-related strategies could be addressed concurrently. AECOM community-outreach professionals recommend a high tech approach consisting of a video clip, newsletter, and website activity. $75,000 per campaign (3-4 strategies per campaign) for strategies-related to marketing. Assume five energy and buildings related measures covered in two comprehensive marketing campaigns costing $150,000. Campaign conducted twice over the course of the 10-year implementation period, for a total cost of $300,000. See E-Staff measure for the total staff resource requirements to implement the Energy Action Area. All staff costs in this Action Area are aggregated in this measure.	B.2, B.3, C.2, D.1, D.2	Environmental and Energy Study Institute; Go Solar Initiative
E - 15	Develop a comprehensive residential renewable energy program that provides outreach, financing, and other forms of assistance.	$195,000	Low	Assume many marketing/education-related strategies could be addressed concurrently. AECOM community-outreach professionals recommend a high tech approach consisting of a video clip, newsletter, and website activity. $75,000 per campaign (3-4 strategies per campaign) for strategies-related to marketing. Assume five energy and buildings related measures covered in two comprehensive marketing campaigns costing $150,000. Campaign conducted twice over the course of the 10-year implementation period, for a total cost of $300,000. Additional program costs assumed to be primarily in providing financial assistance to approved applicants. Average solar photovoltaic system cost assumed to be $8.10/installed watt with average system size of 4,300 watts for a total cost of $39,000 without rebates; average cost of solar hot water heater assumed to be $3,000. Average annual number of approved applicants: 10-20. See E-Staff measure for the total staff resource requirements to implement the Energy Action Area. All staff costs in this Action Area are aggregated in this measure.	B.2, B.3, C.2, D.1, D.2, E (ABAG)	Environmental and Energy Study Institute; Go Solar Initiative
E - 16	Partner with the Ella Baker Center to extend the Oakland Green Jobs Corps program to the Unincorporated Areas of Alameda County.	$0	E-Staff	See E-Staff measure for the total staff resource requirements to implement the Energy Action Area. All staff costs in this Action Area are aggregated in this measure.	None	N/A
E - Staff	Staff resources necessary to implement the measures in the Energy Action Area.	$1,281,000	High	Approximately 0.5 FTE (green building/sustainability professionals at ($80K + benefits/overhead = $200,000)) are required to implement all strategies related to Land Use in the CAP. Salary and benefits grow at the rate of inflation (3%).	G	AECOM

Alameda County Climate Action Plan - Cost and Savings to Resident or Business							
MEASURE		COSTS AND SAVINGS TO RESIDENT					SOURCES
		Average Annual Cost	Simple Cost	Average Annual Savings	Simple Savings	Costs and Savings to Resident Notes	
Energy							
Energy Efficiency in Existing Commercial							
E - 7	Develop and implement an outreach and financial assistance program that encourages businesses to invest in efficiency improvements.	Commercial: $1.00 - $6.00 per square foot	Commercial: $1.00 - $6.00 per square foot	Low to High	Low to High	On Using Energy Guide website, a hypothetical scenario was developed for an office building in Alameda County. Savings of $1,000-$1,600 for the use of fluorescent lighting; $1,000-$1,500 fo the use of energy efficient office equipment; $900-$1,400 for the use of compact fluorescent lamps; $900-$1,300 for installing a high efficiency boiler; and $500-$800 for installing a new furnace; other energy efficiency improvements with savings of $920-$1,420. Total of $5,220-$8,020 of annual energy savings.	www.energyguide.com
Energy Performance in New Construction							
E - 8	Require all new construction to achieve California Green Building Code Tier I Energy Efficiency Standards (Section 503.1.1)	Residential: $0.80 - $2.00/sf Comm/Indust: $1.00 - $3.00/sf	Residential: $0.80 - $2.00/sf Comm/Indust: $1.00 - $3.00/sf	$160	Medium	It should be noted that developers would likely absorb the incremental costs of complying with the Tier I standard. A basic package of energy conservation measures (~15% energy efficiency improvement) would cost between $0.80 and $2.00 per square foot for residential and $1.00 to $3.00 per square foot for commercial/industrial. These measures would generally include energy efficient lighting, duct and attic insulation, and potentially hot water, heating, and cooling system efficiency improvements depending on the building. Assumed consumer cost of energy decrease of 15% due to more stringent building code. Average residential consumption is 600 kWh/month with average rates at $0.15/kWh.	California Energy Commission Green Building Code; Builder Magazine
E - 9	Provide incentives, such as priority permitting for buildings that exceed current California Title-24 standards for energy efficiency by 30% (Tier II).	Residential: $1.50 - $3.00/sf Comm/Indust: $1.00 - $4.00/sf	Residential: $1.50 - $3.00/sf Comm/Indust: $1.00 - $4.00/sf	$320	High	It should be noted that developers would likely absorb the incremental costs of complying with the Tier I standard. A basic package of energy conservation measures (~15% energy efficiency improvement) would cost between $0.80 and $2.00 per square foot for residential and $1.00 to $3.00 per square foot for commercial/industrial. These measures would generally include energy efficient lighting, duct and attic insulation, and potentially hot water, heating, and cooling system efficiency improvements depending on the building. Assumed consumer cost of energy decrease of 30% due to more stringent building code. Average residential consumption is 600	AECOM study of energy efficiency programs for City of Seattle
E - 10	Require new construction to use building materials with recycled content.	Variable	Variable	$0	None	Cost to building or property owner would depend on the extent and kind of recycled materials used. Potentially cost neutral, or low to medium price premium on construction.	AECOM
E - 11	Require new commercial parking lots over 20 spaces in size to mitigate parking lot heat gain through the use of shade trees, solar arrays, or cool pavement.	None	None	$0	None	The cost of new commercial parking lots over 20 spaces in size mitigating parking lot heat gain through the use of shade trees, solar arrays, or cool pavement would not be borne by homeowner or business.	AECOM
E - 12	Require that all new multi-unit buildings be "sub-metered" in order to enable each individual unit to monitor energy and water consumption.	$344	High	$160	Medium	Cost of installing sub-meters in building assumed to be $500 per unit + $3.00 per month reading fee. For average building with 4 units, cost would be $2000. Energy savings assumed to be 15%.	AECOM; Habitat Magazine
Renewable Energy							
E - 13	Establish Solar EmPowerment Districts program that removes barriers to and facilitate the installation of solar photovoltaic systems on eligible commercial and industrial buildings and parking lots.	None to Low	None to Low	None to Medium	None to Medium	Cost to building owner of installation and administration of PV system negligible to low, depending on power purchase agreement. Savings assumed to be derived from collective negotiation power that Solar Empowerment District would have with solar installers, which would put a downward pressure on installation costs. Solar calculators - http://www.gosolarcalifornia.org/solar101/calculators.html	Environmental and Energy Study Institute; Go Solar Initiative
E - 14	Facilitate the installation of solar hot water heating systems on commercial and multifamily rental buildings.	$1,750	High	$320	High	Cost of installation and administration estimated at $2,500 with 30% rebate through . Assumed consumer cost of electricity decreased of 30% due to the smart grid technology. Average residential consumption is 600 kWh/month with average rates at $0.15/kWh. Energy savings assumed to be 30% for installation of solar water heaters. Solar calculators - http://www.gosolarcalifornia.org/solar101/calculators.html	Environmental and Energy Study Institute; Go Solar Initiative
E - 15	Develop a comprehensive residential renewable energy program that provides outreach, financing, and other forms of assistance.	High	High	None to High	None to High	Cost of installation and administration estimated at $2,500 with 30% rebate through . Assumed consumer cost of electricity decreased of 30% due to the smart grid technology. Cost of Solar PV system - 30-50% tax credit. Energy savings assumed to be 30% for installation of solar wate heaters. Solar calculators - http://www.gosolarcalifornia.org/solar101/calculators.html	Environmental and Energy Study Institute; Go Solar Initiative
E - 16	Partner with the Ella Baker Center to extend the Oakland Green Jobs Corps program to the Unincorporated Areas of Alameda County.	None	None	None	None	None	N/A
E - Staff	Staff resources necessary to implement the measures in the Energy Action Area.	None	None	None	None	N/A	AECOM

Alameda County Climate Action Plan - Cost to County Analysis						
MEASURE		COSTS TO COUNTY			FUNDING & FINANCING	SOURCES
		Total Cost	Simple Cost	Cost to County Notes		
Water						
Water Conservation - Building and Landscape Efficiency						
WT - 1	Encourage residents and businesses to conserve water in existing buildings and landscapes.	$52,000	Low	Assume many marketing/education-related strategies could be addressed concurrently. AECOM community-outreach professionals recommend a high tech approach consisting of a video clip, newsletter, and website activity. $75,000 per campaign (3-4 strategies per campaign) for strategies-related to marketing. Assume three water related measures covered in one comprehensive marketing campaigns costing $75,000. Campaign conducted twice over the course of the 10-year implementation period, for a total cost of $150,000.	B.1, E (EBMUD), G.1	EBMUD Rates and Charges; EBMUD Urban Water Management Plan 2005
WT - 2	Require new landscape projects to reduce outdoor potable water use by 50%.	$0	WT-Staff	Cost of amending Building Code assumed to be negligible. See WT-Staff measure for the total staff resource requirements to implement the Water Conservation Action Area. All staff costs in this Action Area are aggregated in this measure.	E (EBMUD), G.1	EBMUD Rates and Charges; EBMUD Urban Water Management Plan 2005
WT - 3	Adopt an ordinance that allows the installation and use of graywater systems for subsurface irrigation.	$63,000	Low	Cost of adopting new ordinance - $50,000-$75,000. See WT-Staff measure for the total staff resource requirements to implement the Water Conservation Action Area. All staff costs in this Action Area are aggregated in this measure.	B.1, E (EBMUD), G.1	EBMUD Rates and Charges; EBMUD Urban Water Management Plan 2005; Oasis Design; BRAC Greywater Systems
Water Conservation - Consumer Education						
WT - 4	Work with EBMUD and Zone 7 to redesign the water bill format to encourage water conservation in residential and commercial users.	$75,000	Low	Assume many marketing/education-related strategies could be addressed concurrently. AECOM community-outreach professionals recommend a high tech approach consisting of a video clip, newsletter, and website activity. $75,000 per campaign (3-4 strategies per campaign) for strategies-related to marketing. Assume two water related measures covered in one comprehensive marketing campaigns costing $75,000. Campaign conducted twice over the course of the 10-year implementation period, for a total cost of $150,000.	E (EBMUD), G.1	EBMUD Rates and Charges; EBMUD Urban Water Management Plan 2005
WT - Staff	Staff resources necessary to implement the measures in the Water Conservation Action Area.	$256,000	Medium	Approximately 0.1 FTE (green building/sustainability professionals at ($80K + benefits/overhead = $200,000)) are required to implement all strategies related to Land Use in the CAP. Salary an benefits grow at the rate of inflation (3%).	G	AECOM
Waste						
Waste Reduction & Diversion						
WS - 1	Increase solid waste reduction and diversion to 90% by 2030.	$0	WS-Staff	See WS-Staff measure for the total staff resource requirements to implement the Waste Action Area. All staff costs in this Action Area are aggregated in this measure.	E (Stop Waste), G.1	AECOM
WS - 2	Strengthen Green Building Ordinance to require 75% of construction and demolition debris to be recycled or reused by 2011.	$60,000	Low	Cost of amending Green Building Ordinance considered to be negligible. Annual monitoring and enforcement costs range from $5,000 to $10,000.	E (Stop Waste), G.1, G.3	AECOM
WS - 3	Develop a food waste collection program and an ordinance that requires all household and commercial food scraps and food soiled paper to be placed in organics carts.	$0	WS-Staff	See WS-Staff measure for the total staff resource requirements to implement the Waste Action Area. All staff costs in this Action Area are aggregated in this measure.	E (Stop Waste), G.1	AECOM
Extended Producer Responsibility						
WS - 4	Work with StopWaste, Alameda County cities, and other organizations to urge adoption of legislation that requires extended producer responsibility and improves the recyclability of products and packaging.	$0	WS-Staff	See WS-Staff measure for the total staff resource requirements to implement the Waste Action Area. All staff costs in this Action Area are aggregated in this measure.	E (Stop Waste), G.1	AECOM
WS - Staff	Staff resources necessary to implement the measures in the Waste Action Area.	$256,000	Medium	Approximately 0.1 FTE (sustainability professionals at ($80K + benefits/overhead = $200,000)) are required to implement all strategies related to Land Use in the CAP. Salary and benefits grow at the rate of inflation (3%).	G	AECOM

Alameda County Climate Action Plan - Cost and Savings to Resident or Business							
MEASURE		COSTS AND SAVINGS TO RESIDENT					SOURCES
		Average Annual Cost	Simple Cost	Average Annual Savings	Simple Savings	Costs and Savings to Resident Notes	
Water							
Water Conservation - Building and Landscape Efficiency							
WT - 1	Encourage residents and businesses to conserve water in existing buildings and landscapes.	Low	Low	$70	Low	Assumed typical water charges (average of $11.08/month base charge + $2.48 per 100 cubic feet per day for houses that consume between 173 and 393 gallons per day) and consumption (average of 300 gallons per household per day)from EBMUD for residential single family homes as basis for cost savings calculation. Used a conversion ratio of 100 cubic feet to 748 gallons of water. Assumed 20% reduction in household water demand (which comprises 80% of water household demand).	EBMUD Rates and Charges; EBMUD Urban Water Management Plan 2005
WT - 2	Require new landscape projects to reduce outdoor potable water use by 50%.	Low	Low	$50	Low	Assumed typical water charges (average of $11.08/month base charge + $2.48 per 100 cubic feet per day for houses that consume between 173 and 393 gallons per day) and consumption (average of 300 gallons per household per day)from EBMUD for residential single family homes as basis for cost savings calculation. Used a conversion ratio of 100 cubic feet to 748 gallons of water. Assumed 50% reduction in household water demand (which comprises 20% of water household demand).	EBMUD Rates and Charges; EBMUD Urban Water Management Plan 2005
WT - 3	Adopt an ordinance that allows the installation and use of graywater systems for subsurface irrigation.	$3,500	High	$160	Medium	Assumed typical water charges (average of $11.08/month base charge + $2.48 per 100 cubic feet per day for houses that consume between 173 and 393 gallons per day) and consumption (average of 300 gallons per household per day)from EBMUD for residential single family homes as basis for cost savings calculation. Used a conversion ratio of 100 cubic feet to 748 gallons of water. Assumed 65% of total waste water could be used in greywater system, displacing the need to draw that amount of water (~175 gallons/day) from the system. Capital cost of greywater system assumed to be $3,500 according to BRAC Greywater Systems.	EBMUD Rates and Charges; EBMUD Urban Water Management Plan 2005; Oasis Design; BRAC Greywater Systems
Water Conservation - Consumer Education							
WT - 4	Work with EBMUD and Zone 7 to redesign the water bill format to encourage water conservation in residential and commercial users.	Low	Low	$30	Low	Assumed typical water charges (average of $11.08/month base charge + $2.48 per 100 cubic feet per day for houses that consume between 173 and 393 gallons per day) and consumption (average of 300 gallons per household per day)from EBMUD for residential single family homes as basis for cost savings calculation. Used a conversion ratio of 100 cubic feet to 748 gallons of water. Assumed 10% reduction in household water demand (which comprises 20% of water household demand).	EBMUD Rates and Charges; EBMUD Urban Water Management Plan 2005
WT - Staff	Staff resources necessary to implement the measures in the Water Conservation Action Area.	None	None	None	None	N/A	AECOM
Waste							
Waste Reduction & Diversion							
WS - 1	Increase solid waste reduction and diversion to 90% by 2030.	None	None	None	None	None	AECOM
WS - 2	Strengthen Green Building Ordinance to require 75% of construction and demolition debris to be recycled or reused by 2011.	High	High	None	None	Cost to contractor/developer of recycling construction debris estimated at greater than $1,000, but highly variable depending on development type and site conditions.	AECOM
WS - 3	Develop a food waste collection program and an ordinance that requires all household and commercial food scraps and food soiled paper to be placed in organics carts.	None	None	None	None	N/A	AECOM
Extended Producer Responsibility							
WS - 4	Work with StopWaste, Alameda County cities, and other organizations to urge adoption of legislation that requires extended producer responsibility and improves the recyclability of products and packaging.	None	None	None	None	None	AECOM
WS - Staff	Staff resources necessary to implement the measures in the Waste Action Area.	None	None	None	None	N/A	AECOM

Alameda County Climate Action Plan - Cost to County Analysis						
MEASURE		COSTS TO COUNTY			FUNDING & FINANCING	SOURCES
		Total Cost	Simple Cost	Cost to County Notes		
Green Infrastructure						
Urban Forest						
G - 1	Expand urban forest (e.g. street trees, and trees on private lots) in order to sequester carbon and reduce building energy consumption.	$200,000	Low	Public Works Agency - Urban Forestry program stated that the County would approach planting capacity in 8 years with an additional 5,000 trees (there would be an additional 1,000 trees on private land that the County would not pay for). At an average purchase / installation / maintenance cost of $40 per tree, annual County costs would be $20,000 per year for a total of $200,000 over ten years.	A.8, E (Local Communities, California ReLeaf), G.1	City of Albany; Alameda County Public Works Agency
Carbon Sequestration - Natural Areas						
G - 2	Include carbon sequestration as an objective within county-led natural area restoration projects.	$0	G-Staff	See G-Staff measure for the total staff resource requirements to implement the Green Infrastructure Action Area. All staff costs in this Action Area are aggregated in this measure.	A.8, E (Local Communities, California ReLeaf), G.1	Urban Harvest; USDA Department of Forestry; Urban Forestry Research Center
Community Gardens and Urban Farms						
G - 3	Establish a local community garden program to increase local food security and provide local recreation amenities.	$110,000	Low	Costs range from $1,500 to $4,000 per community garden to establish according to Urban Harvest.	E (Local Communities, California ReLeaf, Slow Food), G.1	Urban Harvest; USDA Department of Forestry; Urban Forestry Research Center
G - 4	Work with local farmers and agricultural non-profits to develop urban-edge farming opportunities in the unincorporated County.	$0	G-Staff	See G-Staff measure for the total staff resource requirements to implement the Green Infrastructure Action Area. All staff costs in this Action Area are aggregated in this measure.	E (Local Communities, California ReLeaf, Slow Food), G.1	Urban Harvest; USDA Department of Forestry; Urban Forestry Research Center
G - 5	Work with local organizations to establish farmer's market sites in the unincorporated County.	$0	G-Staff	See G-Staff measure for the total staff resource requirements to implement the Green Infrastructure Action Area. All staff costs in this Action Area are aggregated in this measure.	E (Local Communities, California ReLeaf, Slow Food), G.1	Urban Harvest; USDA Department of Forestry; Urban Forestry Research Center
G - Staff	Staff resources necessary to implement the measures in the Green Infrastructure Action Area.	$256,000	Medium	Approximately 0.1 FTE (sustainability professionals at ($80K + benefits/overhead = $200,000)) are required to implement all strategies related to Land Use in the CAP. Salary and benefits grow at the rate of inflation (3%).	G	AECOM

Alameda County Climate Action Plan - Cost and Savings to Resident or Business							
MEASURE		COSTS AND SAVINGS TO RESIDENT					SOURCES
		Average Annual Cost	Simple Cost	Average Annual Savings	Simple Savings	Costs and Savings to Resident or Business Notes	
Green Infrastructure							
Urban Forest							
G - 1	Expand urban forest (e.g. street trees, and trees on private lots) in order to sequester carbon and reduce building energy consumption.	$275	Medium to High	$40	None to Low	Assumed cost to home or building owner ~$50-$500 for purchasing trees, with $25-$60 of annual energy savings.	City of Albany; Alameda County Public Works Agency
Carbon Sequestration - Natural Areas							
G - 2	Include carbon sequestration as an objective within county-led natural area restoration projects.	None	None	None	None	None	Urban Harvest; USDA Department of Forestry; Urban Forestry Research Center
Community Gardens and Urban Farms							
G - 3	Establish a local community garden program to increase local food security and provide local recreation amenities.	None	None	None	None	None	Urban Harvest; USDA Department of Forestry; Urban Forestry Research Center
G - 4	Work with local farmers and agricultural non-profits to develop urban-edge farming opportunities in the unincorporated County.	None	None	None	None	None	Urban Harvest; USDA Department of Forestry; Urban Forestry Research Center
G - 5	Work with local organizations to establish farmer's market sites in the unincorporated County.	None	None	None	None	Potential fuel savings for residents who elect to reduce grocery shopping trips, and instead shop at the farmer's market.	Urban Harvest; USDA Department of Forestry; Urban Forestry Research Center
G - Staff	Staff resources necessary to implement the measures in the Green Infrastructure Action Area.	None	None	None	None	N/A	AECOM

APPENDIX D PUBLIC OUTREACH

OUTREACH OVERVIEW

A small, Oakland-based firm, Gibson & Associates, was hired to facilitate an inclusive public process to provide residents, business owners, and other stakeholders with a variety of ways to participate in the CAP development process.

Residents and stakeholders were offered the opportunity to participate in the CAP development process through three avenues of communication:

- Attend a public meeting (two East, two West) to share ideas.
  - Eden United Church of Christ, Hayward - September 16 and December 2, 2009
  - Martinelli Event Center, Livermore - September 15 and December 1, 2009
- Participate in an online or paper survey
- Mail or email ideas to the county

Using County-derived residential mailing lists, surveys were sent and public meeting notices to over 600 county residents and businesses. The first mailing occurred in August and the second in late September. An initial list of 50 stakeholders was contacted by phone or email, and through these efforts the list was expanded by 80 percent. These stakeholders were asked to attend meetings and forward information to their constituencies. To ensure that a range of perspectives were represented in the CAP input process, direct outreach was conducted at four different public venues in the unincorporated county during weekday commute hours and Saturdays at two different BART stations and farmers' markets.

As an incentive, a gift certificate to a local bicycle shop to purchase a commuter bicycle, was offered in a raffle for all those who participated in the process through survey completion or meeting attendance (County employees and consultants were ineligible for this prize). The winner of the raffle was selected by a community member at the December Hayward CAP meeting. The winner, a resident of the unincorporated county, had participated in the survey in September.

COMMUNITY PARTICIPATION

- 400 non-duplicate individuals provided input into the plan through survey, email, USPS mail response, or meeting attendance at public meetings.
- 341 individuals completed the survey
- 61 (non-duplicate) individuals participated in one or more of the public meetings
- 25 agencies, schools, offices, and organizations were represented at the public meetings (see Table D-1)

TABLE D-1: Organizations Represented at Community Meetings

Alameda County Agriculture Dept	Offices of Supervisors Lai-Bitker and Miley
Alameda County Green Business Program	Alameda County Public Health
Alameda Creek Watershed Council	ACSO
Build It Green	CAP: Citizens Against Pollution
Cal State University East Bay	Castro Valley Chamber of Commerce CVCAC
CommPre	Congregations Organized for Renewal, COR
East Bay Bicycle Coalition	Grey Panthers
Hayward Area Recreation and Park District	Herrera & Associates
The Independent	League of Women Voters
Livermore Parks & Recreation	PG&E
San Lorenzo Heritage Society	Stopwaste.Org
TransForm: Safe Routes to Schools	Wente Vineyards

OUTREACH SUMMARY

General methods

- Website (www.co.alameda.ca.us/cda/planning/climate_action_plan.htm)
- Designated Email Account (alameda countyclimateaction@yahoo.com)

Communication with stakeholders

- Direct mailings to 640 residents and stakeholders
- Phone calls to community, agency, and organizational stakeholders (88 individuals)
- Emails to stakeholders (over 400 individuals)

Direct outreach at four public venues

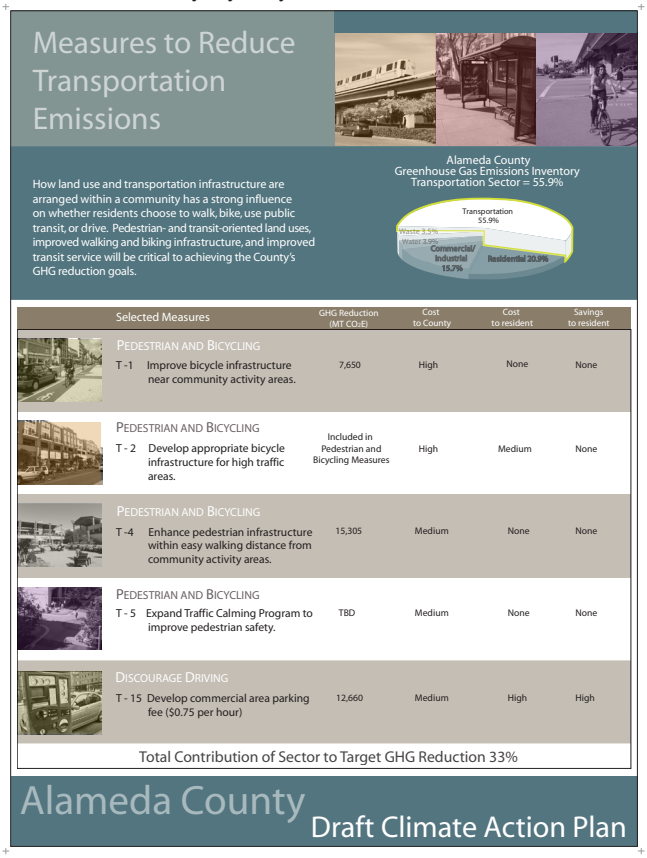
- Castro Valley BART Station - Tuesday, August 18, 2009
- Bay Fair BART Station - Wednesday August 19, 2009
- Castro Valley Farmers' Market - Sat., August 22, 2009
- San Lorenzo Farmers' Market - Sat., August 29, 2009

School, libraries and faith-based organizations - mailings, faxes, and outreach

- 32 Public Elementary and Secondary Schools located in the unincorporated county
- Castro Valley and San Lorenzo Unified School Districts
- 18 Faith Based Groups
- Libraries for Castro Valley, San Lorenzo, and Hayward

Media, print and online advertising

- *San Francisco Chronicle* (East Bay edition) + *SF Gate*
- *Castro Valley Forum*
- *Hayward Daily Review*
- *The Sunolian*
- *The Independent* (story before the initial meeting)
- Castro Valley Chamber of Commerce
- *East Bay Express*
- Greendrinks San Lorenzo
- Express
- Craigslist Community Calendar
- East Bay Bicycle Coalition
- Castro Valley Cyclery



Climate Action Plan Survey Results Fall 2009

Community Climate Action Plan
Unincorporated Areas of Alameda County
Online and Print Survey

Presented by Gibson & Associates

Interpreting Survey Results

329 surveys completed by October 23 included
(an additional 9 surveys were received after the deadline)

95% confidence level with a 5.5% confidence interval for interpreting results for all households.

- 114 from direct mailings
  - (74 from Aug. mailings~22% return; 40 from Sept. mailings~14% return rate)
- 101 from G&A outreach in public locations
  - (San Lorenzo and Castro Valley Farmers Markets, Castro Valley BART station)
- 59 online entries
  - (180 direct emails sent- (can't report on how individuals found survey)
- 31 surveys from September CAP public meetings
- 24 surveys received from county or other

Survey numbers may sometimes add to more than 100 because respondents were asked to check all that apply. Survey numbers may sometimes be less than 100 due to not applicable, no-responses or rounding.

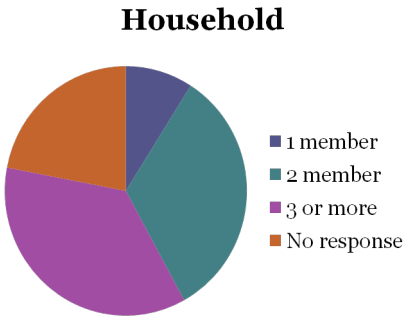
Household Respondent Information

Most survey respondents are homeowners.

- 75% Homeowners
- 16% Renters
- 9% No Response

- Average age - 51

Most reside in households of two or more residents.



Respondent Locations

Number of Respondents

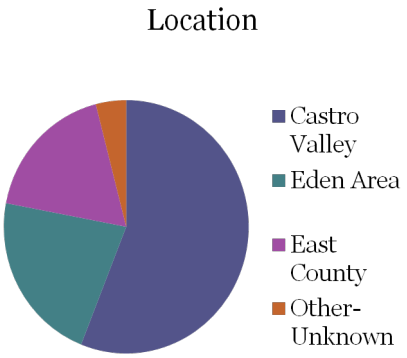
184 Castro Valley

71 Eden Area Codes (San Lorenzo, Fairview, Fairmont, parts of Hayward, Eden, Cherryland)

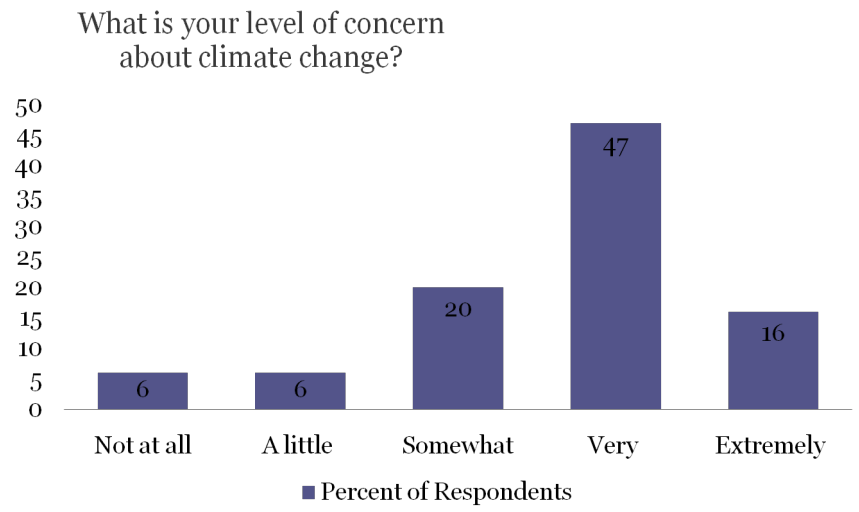
60 East County Residents

14 unknown or other

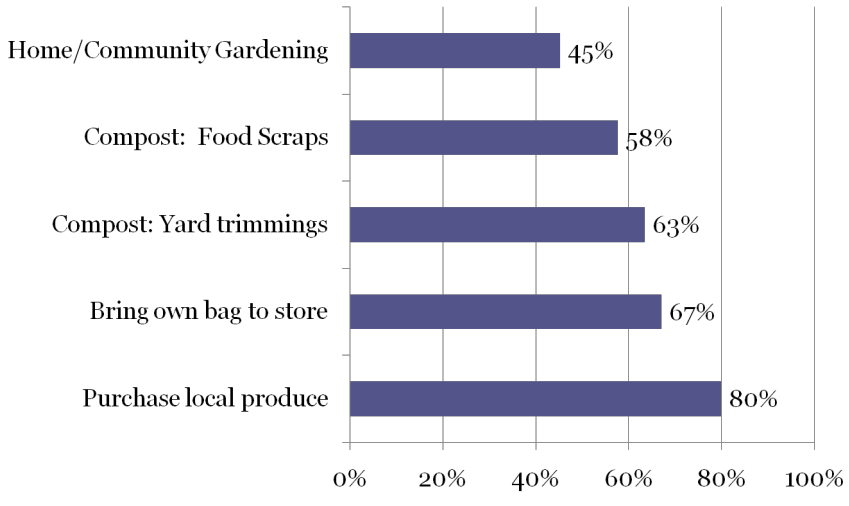
Percent of Respondents

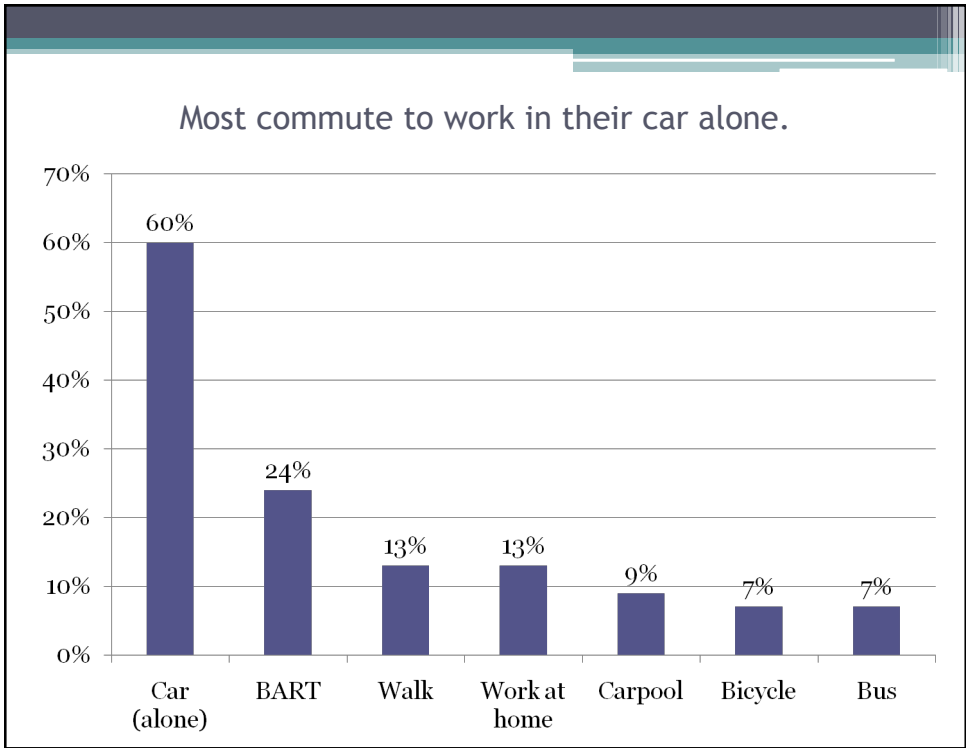


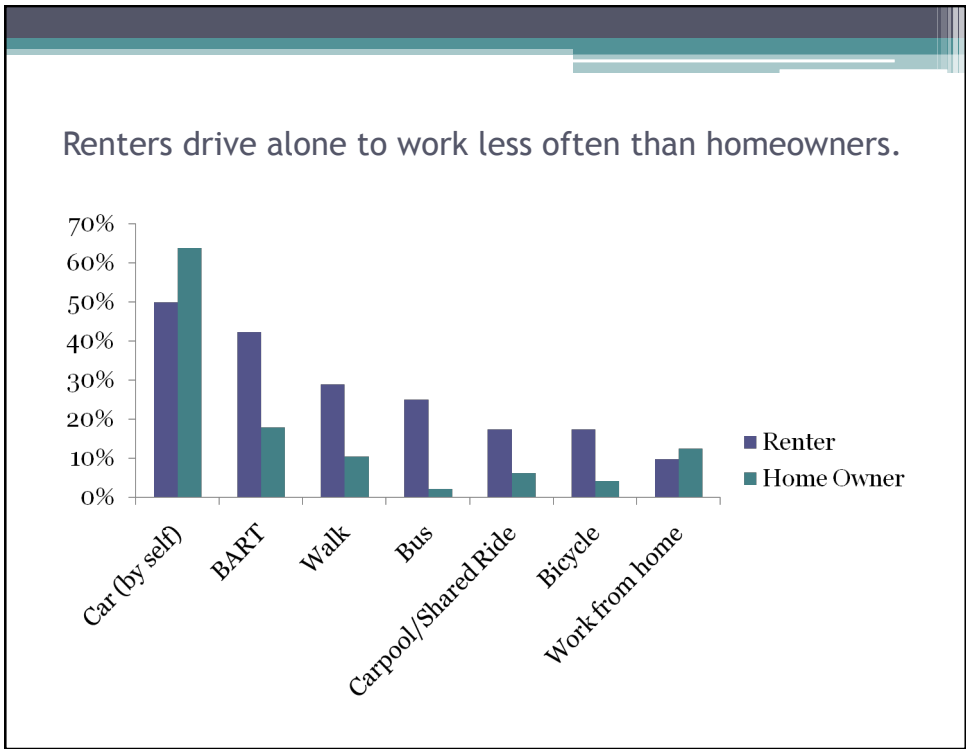
Most indicate a high level of concern about climate change.



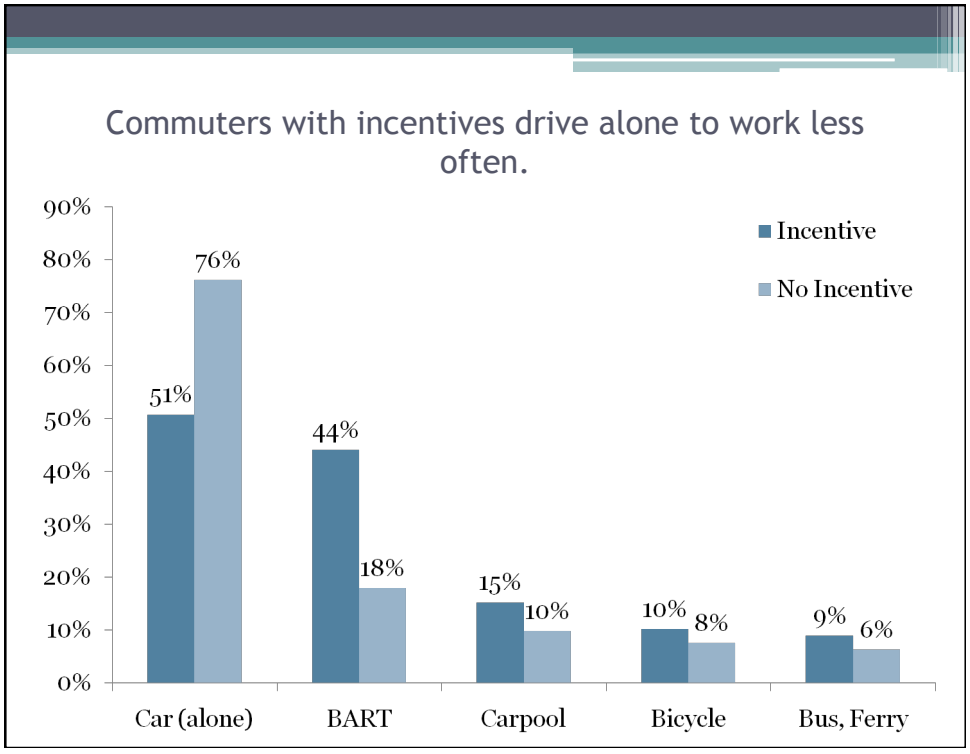
Most participate in some activities that reduce waste and energy usage.

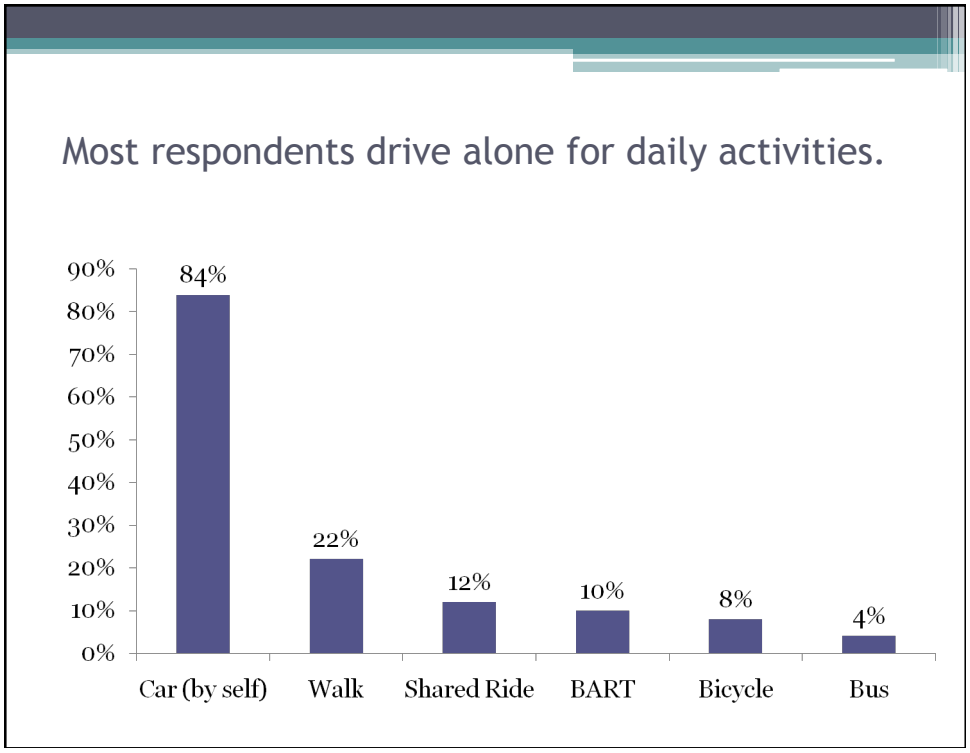


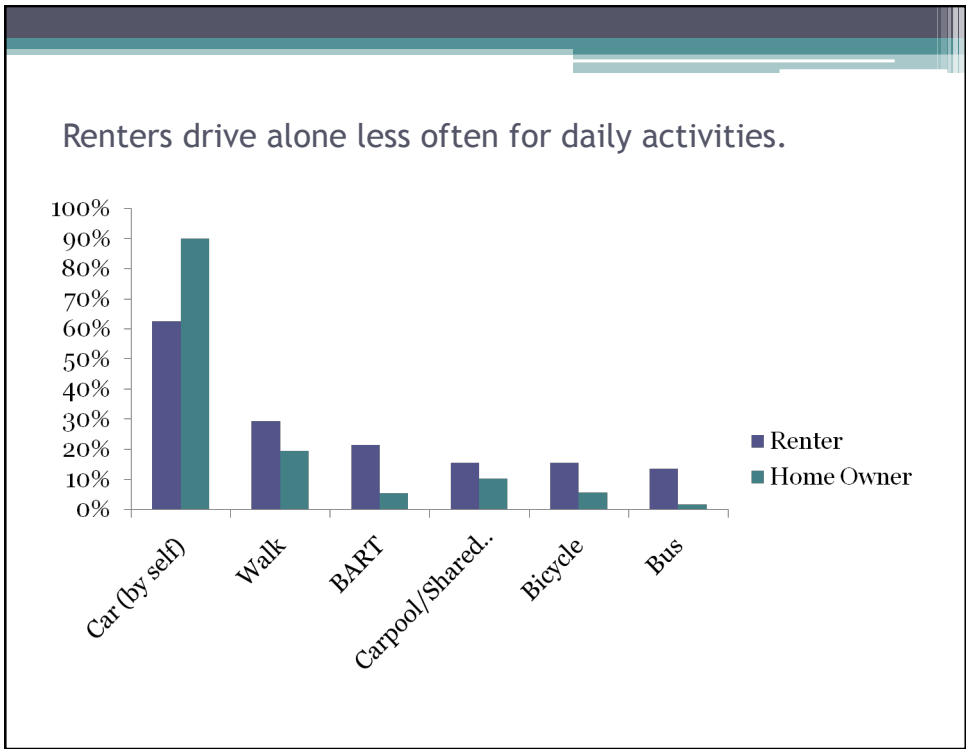

Most commute to work in their car alone.
70%
60%
50%
40%
30%
20%
10%
0%
60%
24%
13%
13%
9%
7%
7%
Car (alone)
BART
Walk
Work at home
Carpool
Bicycle
Bus


Renters drive alone to work less often than homeowners.
70%
60%
50%
40%
30%
20%
10%
0%
Car (by self)
BART
Walk
Bus
Carpool/Shared Ride
Bicycle
Work from home
Renter
Home Owner

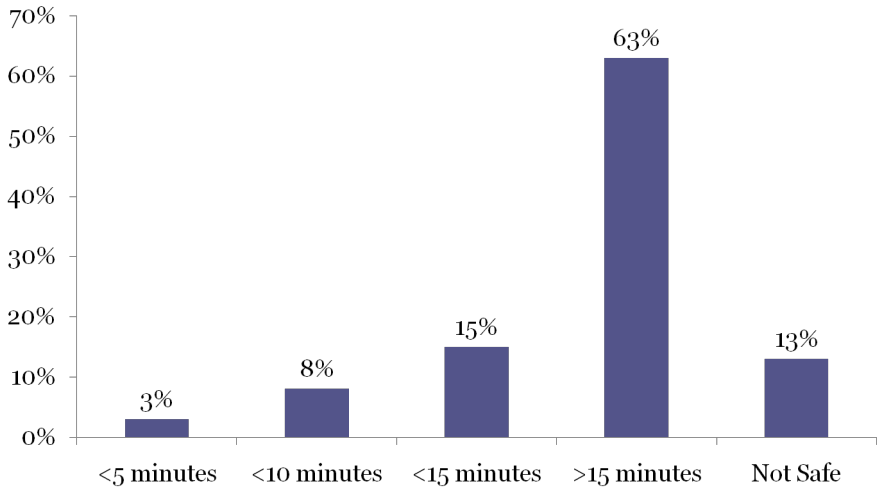

Most do not receive employer incentives to use transit or bike to work.
Incentives
80%
70%
60%
50%
40%
30%
20%
10%
0%
Yes
No
Incentives


Commuters with incentives drive alone to work less often.
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
51%
76%
44%
18%
15%
10%
10%
8%
9%
6%
Car (alone)
BART
Carpool
Bicycle
Bus, Ferry
Incentive
No Incentive

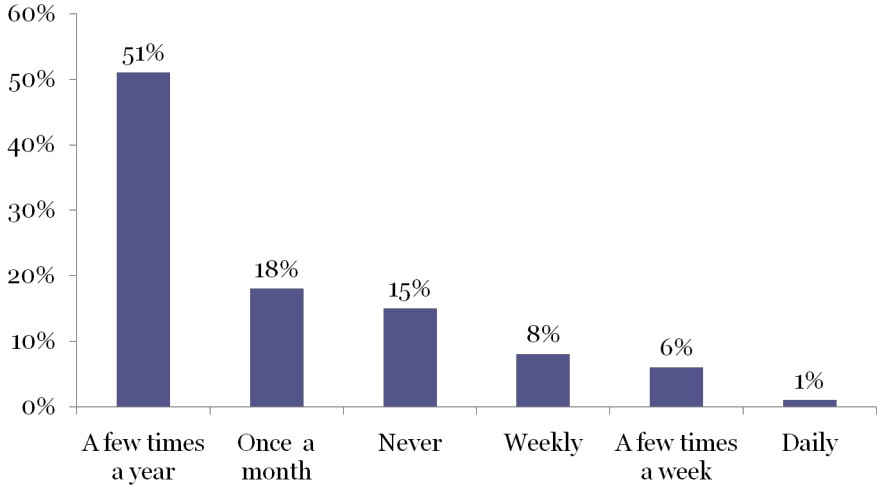

Most respondents drive alone for daily activities.
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
84%
22%
12%
10%
8%
4%
Car (by self)
Walk
Shared Ride
BART
Bicycle
Bus

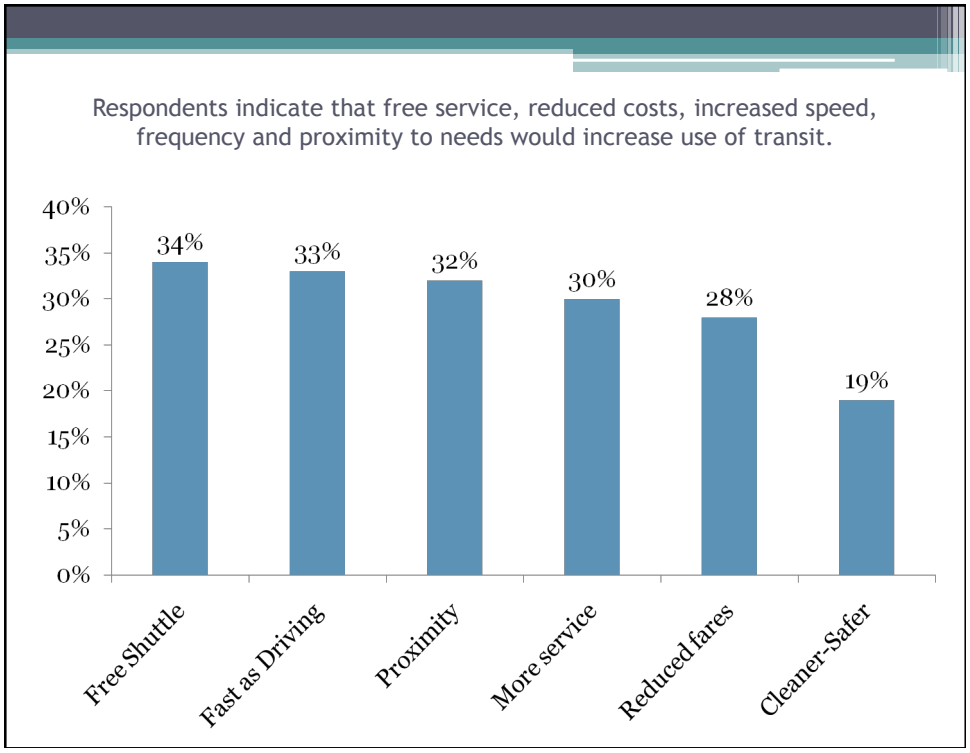

Renters drive alone less often for daily activities.
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Car (by self)
Walk
BART
Carpool/Shared..
Bicycle
Bus
Renter
Home Owner

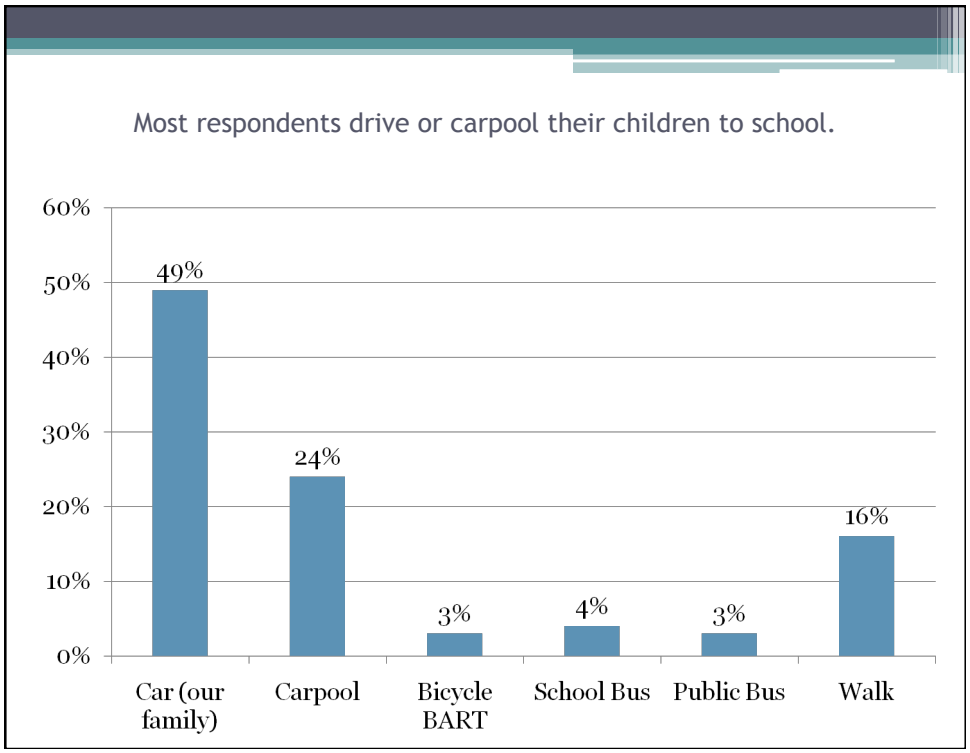
Most indicate that it takes them more than 15 minutes to walk to daily goods and services.

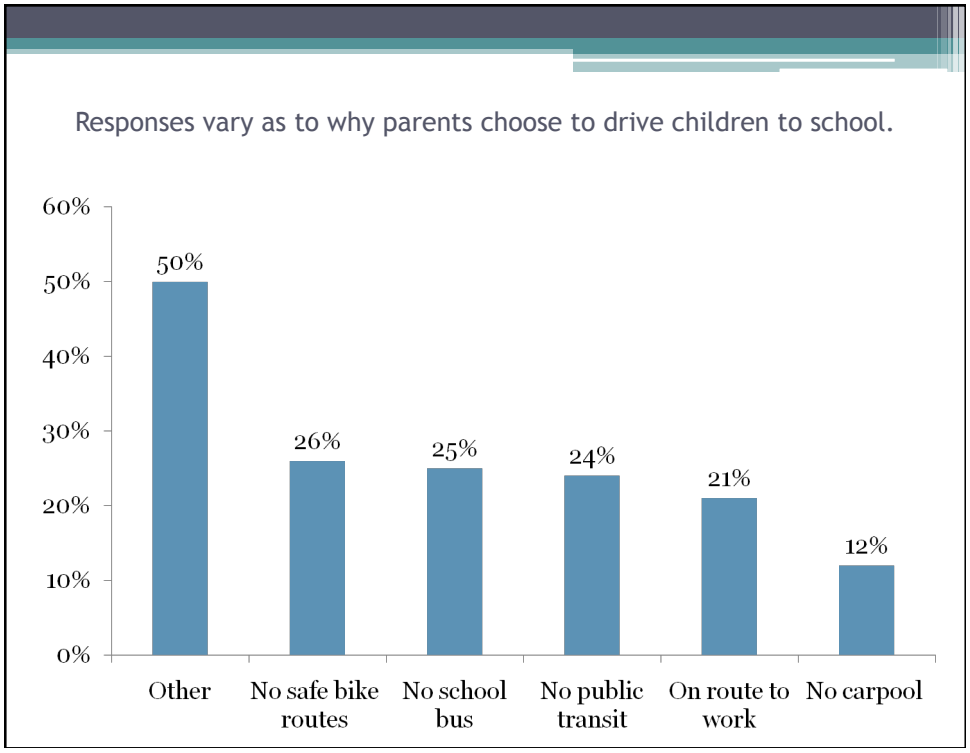


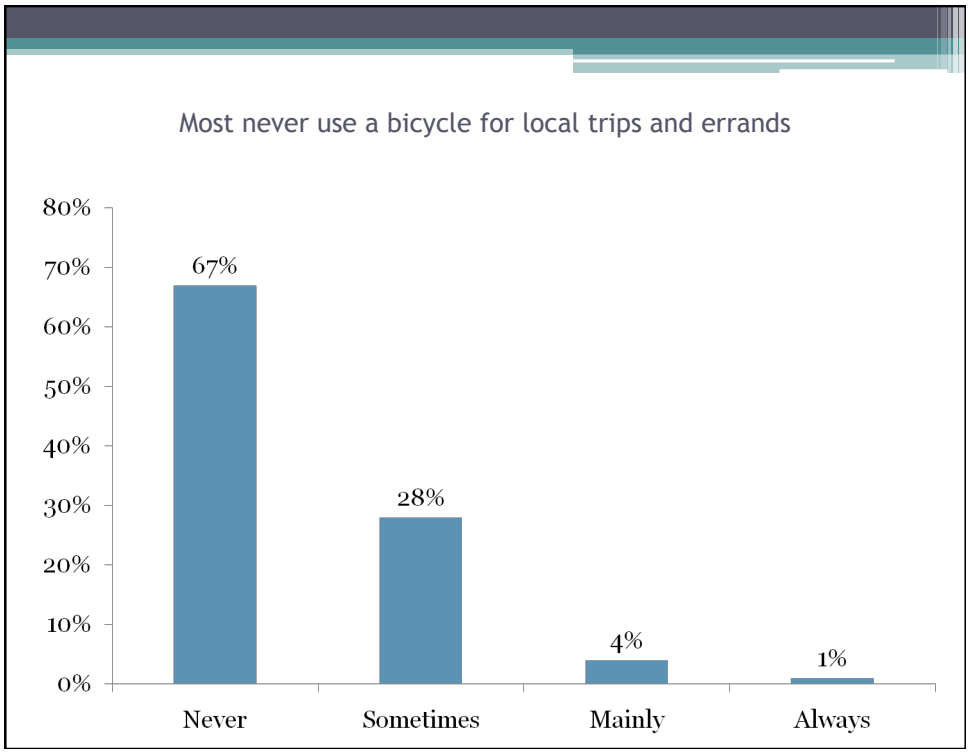
Other than for commuting, public transit is seldom used by most respondents.

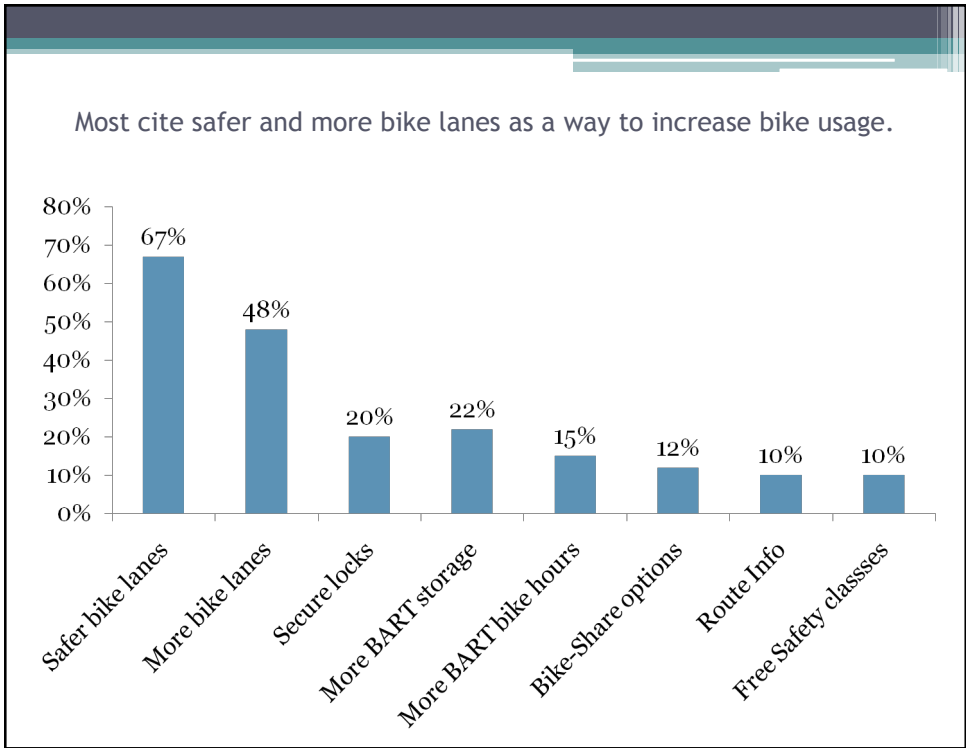


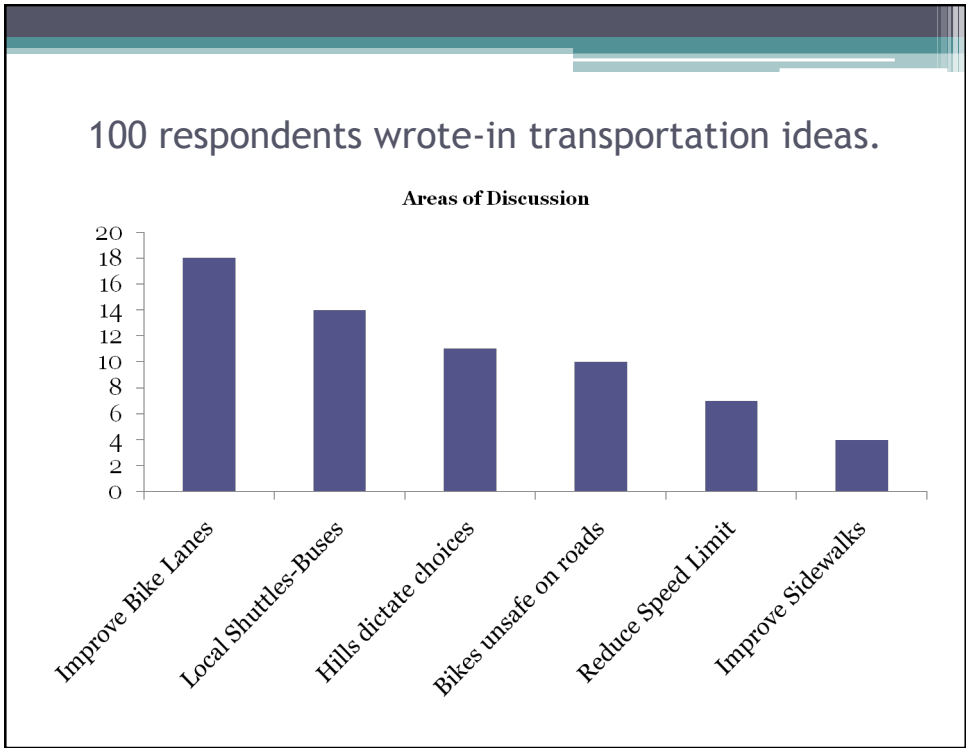

Respondents indicate that free service, reduced costs, increased speed, frequency and proximity to needs would increase use of transit.
40%
35%
30%
25%
20%
15%
10%
5%
0%
34%
33%
32%
30%
28%
19%
Free Shuttle
Fast as Driving
Proximity
More service
Reduced fares
Cleaner-Safer

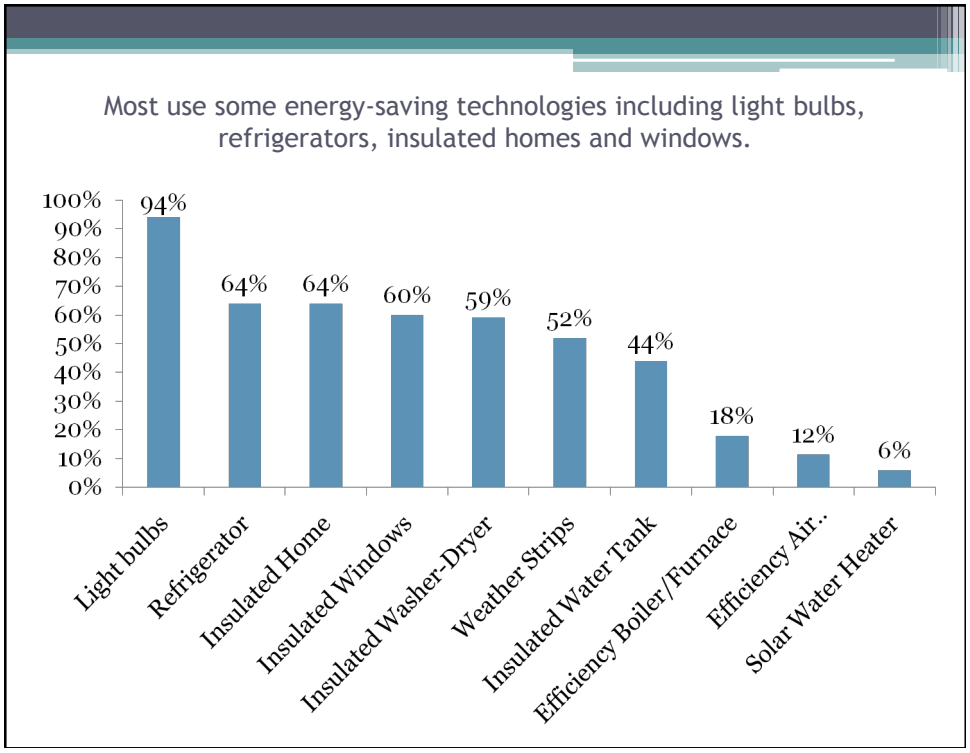

Most respondents drive or carpool their children to school.
60%
50%
40%
30%
20%
10%
0%
49%
24%
3%
4%
3%
16%
Car (our family)
Carpool
Bicycle BART
School Bus
Public Bus
Walk

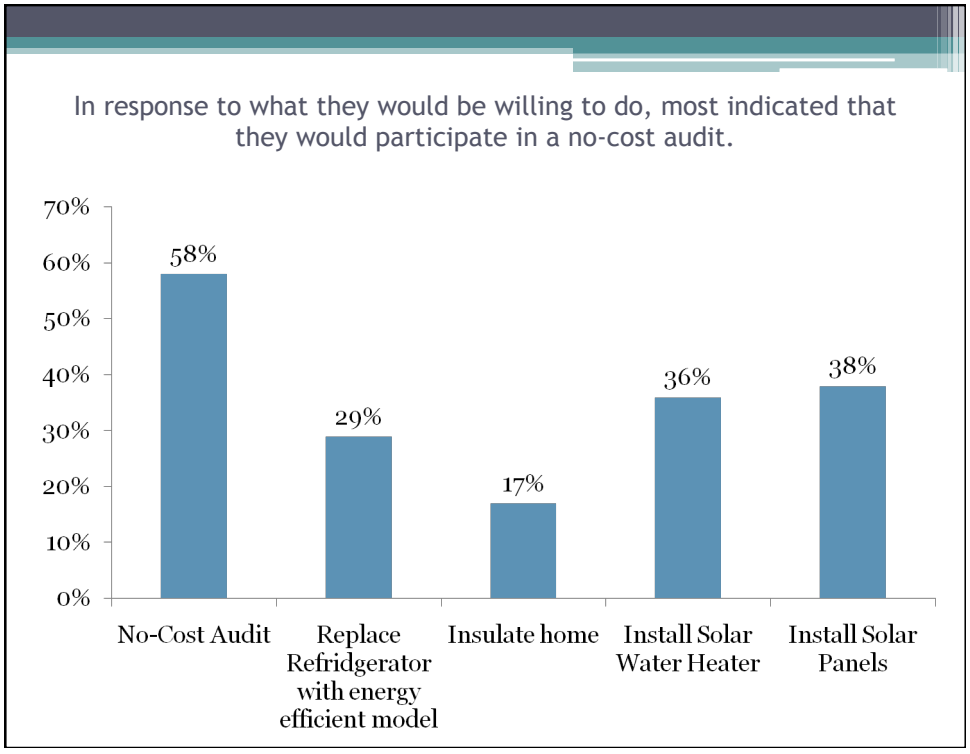

Responses vary as to why parents choose to drive children to school.
60%
50%
40%
30%
20%
10%
0%
50%
26%
25%
24%
21%
12%
Other
No safe bike routes
No school bus
No public transit
On route to work
No carpool

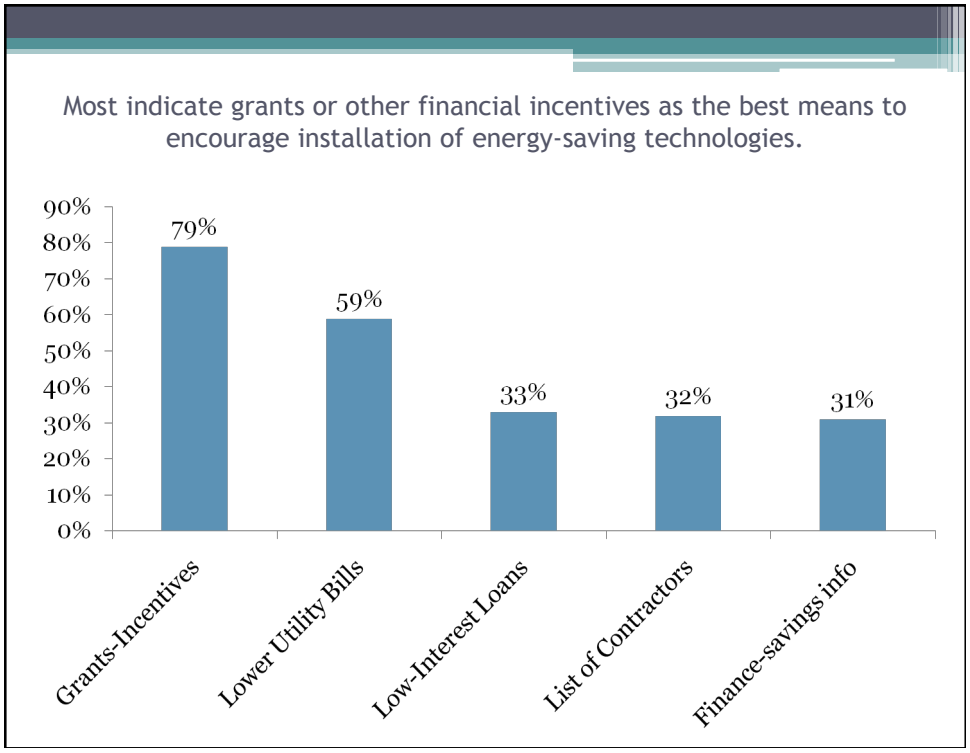

Most never use a bicycle for local trips and errands
80%
70%
60%
50%
40%
30%
20%
10%
0%
67%
28%
4%
1%
Never
Sometimes
Mainly
Always

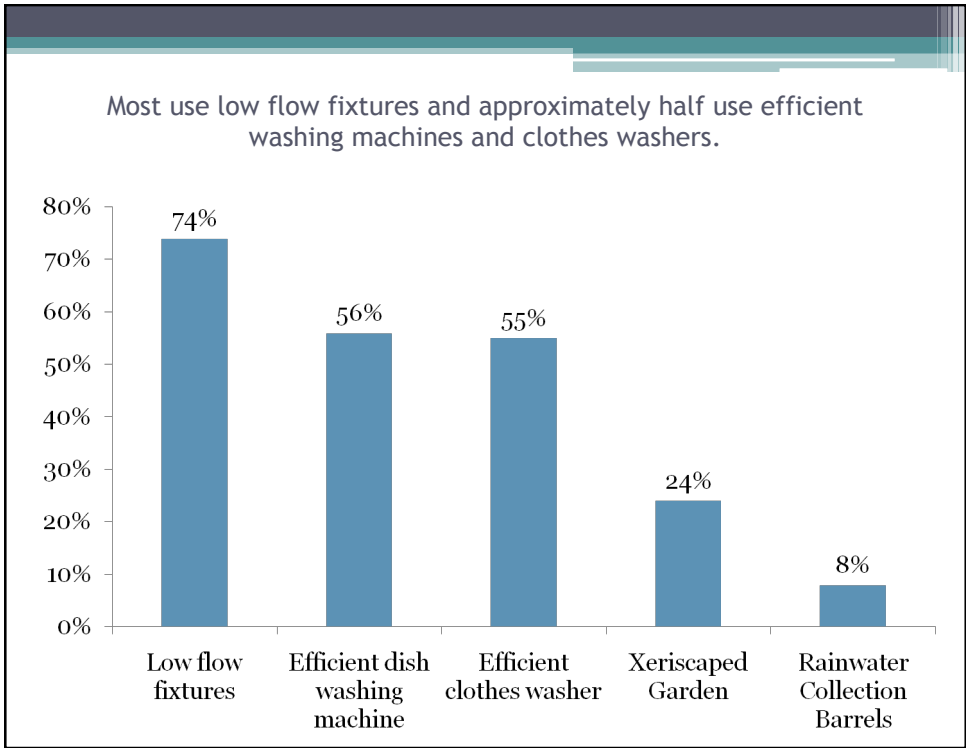

Most cite safer and more bike lanes as a way to increase bike usage.
80%
70%
60%
50%
40%
30%
20%
10%
0%
67%
48%
20%
22%
15%
12%
10%
10%
Safer bike lanes
More bike lanes
Secure locks
More BART storage
More BART bike hours
Bike-Share options
Route Info
Free Safety classses

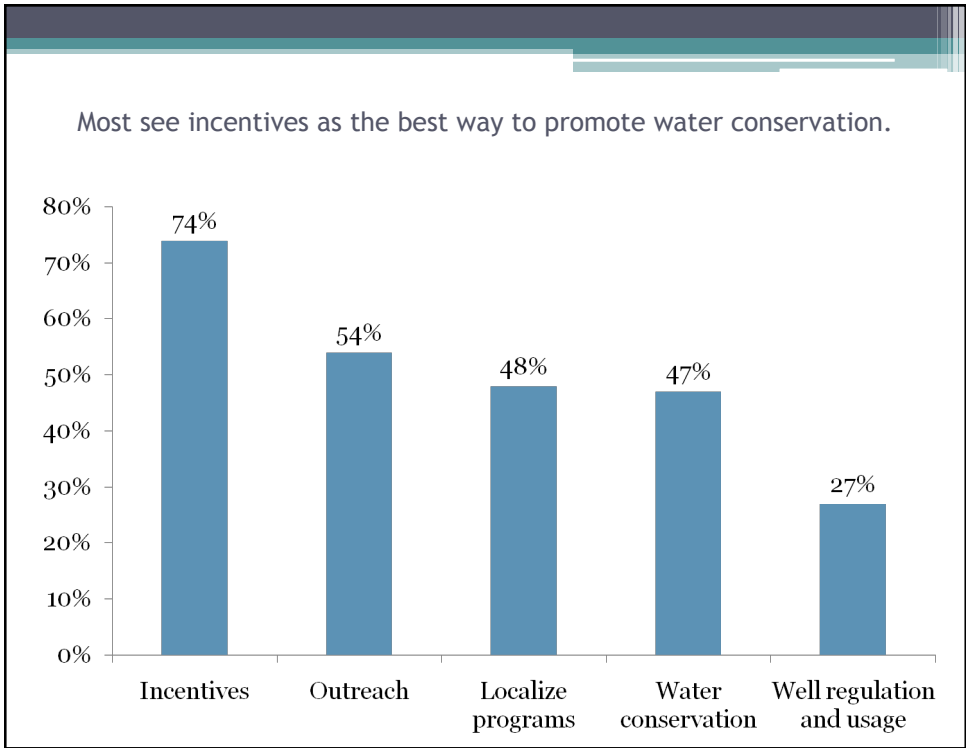

100 respondents wrote-in transportation ideas.
Areas of Discussion
20
18
16
14
12
10
8
6
4
2
0
Improve Bike Lanes
Local Shuttles-Buses
Hills dictate choices
Bikes unsafe on roads
Reduce Speed Limit
Improve Sidewalks

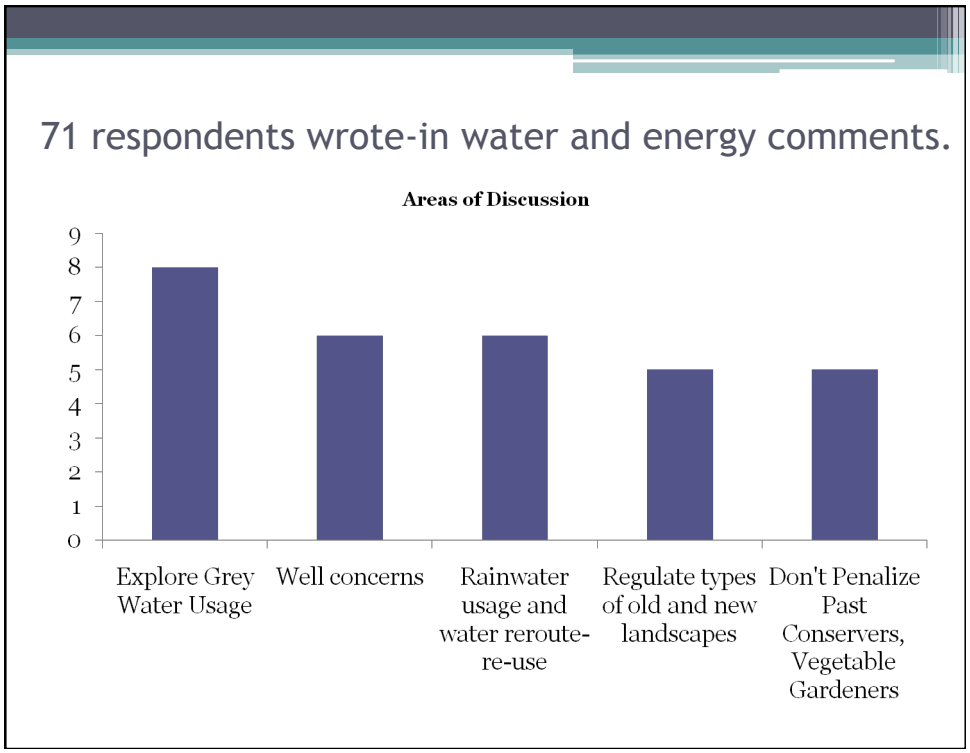

Most use some energy-saving technologies including light bulbs, refrigerators, insulated homes and windows.
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
94%
64%
64%
60%
59%
52%
44%
18%
12%
6%
Light bulbs
Refrigerator
Insulated Home
Insulated Windows
Insulated Washer-Dryer
Weather Strips
Insulated Water Tank
Efficiency Boiler/Furnace
Efficiency Air..
Solar Water Heater


In response to what they would be willing to do, most indicated that they would participate in a no-cost audit.
70%
60%
50%
40%
30%
20%
10%
0%
58%
29%
17%
36%
38%
No-Cost Audit
Replace Refridgerator with energy efficient model
Insulate home
Install Solar Water Heater
Install Solar Panels


Most indicate grants or other financial incentives as the best means to encourage installation of energy-saving technologies.
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
79%
59%
33%
32%
31%
Grants-Incentives
Lower Utility Bills
Low-Interest Loans
List of Contractors
Finance-savings info


Most use low flow fixtures and approximately half use efficient washing machines and clothes washers.
80%
70%
60%
50%
40%
30%
20%
10%
0%
74%
56%
55%
24%
8%
Low flow fixtures
Efficient dish washing machine
Efficient clothes washer
Xeriscaped Garden
Rainwater Collection Barrels


Most see incentives as the best way to promote water conservation.
80%
70%
60%
50%
40%
30%
20%
10%
0%
74%
54%
48%
47%
27%
Incentives
Outreach
Localize programs
Water conservation
Well regulation and usage


71 respondents wrote-in water and energy comments.
Areas of Discussion
9
8
7
6
5
4
3
2
1
0
Explore Grey Water Usage
Well concerns
Rainwater usage and water reroute-re-use
Regulate types of old and new landscapes
Don't Penalize Past Conservers, Vegetable Gardeners

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APPENDIX E BAAQMD QUALIFICATION STANDARDS

BAY AREA AIR QUALITY MANAGEMENT DISTRICT

In 2005, the Bay Area Air Quality Management District (BAAQMD) adopted a resolution to initiate a Climate Protection Program, recognizing the link between climate protection and programs to reduce air pollution in the Bay Area. In 2009, climate protection was added to the Air District's mission, identifying its commitment to pursuing greenhouse gas reduction through all District programs and initiatives.

In June 2010, the BAAQMD produced updated CEQA guidelines which included for the first time thresholds of significance related to GHG emissions from plans and projects. BAAQMD has direct and indirect regulatory authority over sources of air pollution in the San Francisco Bay Area Air Basin (SFBAAB), of which a portion of Union City is a part. The approach to developing the thresholds was to identify levels for which a project would not be expected to conflict with AB32 legislation. If a project would generate GHG emissions above the threshold level, it would be considered to contribute substantially to a cumulative impact, and would be considered significant.

If a long-range plan includes goals, policies, performance standards, and implementation measures achieving GHG emission reductions that can be shown to meet and/or exceed Assembly Bill (AB) 32 mandates, as outlined in Section 4.3 of the June 2010 BAAQMD CEQA Guidelines, subsequent projects consistent with the plan could be relieved of performing GHG analysis as part of their CEQA compliance (BAAQMD CEQA Guidelines, June 2010, Page 9-3). This approach is consistent with the State CEQA Guidelines, Section 15183.5.

The threshold for GHG emissions at a plan level is compliance with a qualified GHG reduction strategy or 6.6 MT CO_2e/service population/yr. This CAP qualifies as a GHG reduction strategy as per the BAAQMD in terms of GHG quantification and measure development; achieving a 15.6 percent reduction in GHG emissions below 2005 levels by 2020 will reduce the GHG emission to service population ratio to approximately 4.4 (see calculation below).

The unincorporated areas of Alameda County Community Climate Action Plan (CAP) fulfills the following requirements of a BAAQMD-qualified GHG Reduction Strategy:

1. Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities with a defined geographic area.

The CAP includes an emissions inventory that quantifies an existing baseline level of emissions for 2005 and projected GHG emissions from a business-as-usual (BAU), no-plan, forecast scenario for 2020 (See Appendix A, GHG Inventory). The baseline year is based on the existing 2005 development pattern. Projected GHG emissions are based on anticipated growth through 2020.

Furthermore:

- The baseline inventory includes one complete calendar year of data for 2005. Carbon dioxide, CO_2, is inventoried for the residential, commercial, industrial, transportation, waste, and water sectors. Methane, CH_4, and nitrous oxide, N_2O, is also accounted for, where feasible.
- BAU emissions are projected in the absence of policies or actions that would reduce emissions.
- The BAU forecast projects emissions from the baseline year using growth factors specific to each of the different economic sectors (See Technical Appendix A, GHG Emissions Inventory and Projections).

2. Establish a level, based on substantial evidence, below which the contribution of GHG emissions from activities covered by the plan would not be cumulatively considerable.

The CAP proposes a reduction target of at least 15 percent below baseline (2005) emission levels by 2020. This target will be adopted by resolution, as a component of the CAP. The County's 15 percent below baseline levels reduction

unincorporated areas of Alameda County Population, 2020 (source: ABAG)	unincorporated areas of Alameda County Employees, 2020 (source: ABAG)	Service Population, 2020 (calculated)	2020 Anticipated GHG Emissions Assuming GHG Reduction Target (MT CO_2e/yr)	Ratio MT CO_2e/yr to Service Population
150,400	27,450	177,850	785,070	4.41
Sources of information: *ABAG 2009 Projections*				

target is identified within BAAQMD's CEQA Guidelines as an appropriate threshold (BAAQMD 2010. California Environmental Quality Act Air Quality Guidelines, Page 4-10).

3. Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area.

The CAP identifies and analyzes GHG reductions from local and state policies and regulations that may be planned or adopted but not implemented to understand the amount of reductions needed to meet its target. Specifically, the CAP identifies and analyzes the effects of statewide GHG emission reductions related to implementation of AB 1493 fuel efficiency standards, the Low Carbon Fuel Standard (LCFS), and the Renewable Energy Portfolio Standard (RPS) (See Part 2, GHG Reduction Measures - Statewide Initiatives).

4. 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.

The CAP includes mandatory and enforceable measures that affect new development projects, including water and energy efficiency ordinances related to the State's Green Building Standards.

The CAP includes quantification of expected GHG emission reductions from each measure where substantial evidence is available (See Part 2, GHG Reduction Measures), including disclosure of calculation methods and assumptions (See Appendix B. GHG Reduction Analysis). Quantification reflects annual GHG reductions and demonstrates how the GHG reduction target will be met.

Together, the proposed CAP measures provide for a reduction of 15.6 percent below 2005 baseline conditions. The anticipated reductions, in the context of planned future population and employment growth in unincorporated areas of Alameda County, would exceed the amount of reductions required to achieve the County's 15 percent below 2005 baseline conditions target, providing much needed flexibility in implementation.

5. Establish a mechanism to monitor the plan's progress toward achieving the level and to require amendment if the plan is not achieving specific levels.

The County will monitor results that are achieved by the various CAP programs and policies. Monitoring results is a critical step in verifying that the measures and actions within the CAP are achieving the anticipated GHG emission reductions.

To ensure that new development projects are incorporating all applicable measures contained within the CAP, the CAP includes an implementation section (See Part 3, Implementation). The following BAAQMD requirements are addressed within the CAP:

- Identification of how each GHG reduction measure will apply to a sector, discerning between voluntary and mandatory measures (See Part 3, Implementation).
- Mechanism for reviewing and determining if all applicable mandatory measures are being adequately applied to new development projects (See Part 3, Implementation)
- Identification of implementation steps and parties responsible for ensuring implementation of each action (See Part 2, GHG Reduction Measures).
- Schedule of implementation identifying near-term and longer-term implementation steps (See Part 2, GHG Reduction Measures).
- Procedures for monitoring and updating the GHG inventory and reduction measures every 3-5 years before 2020 and submitting annual implementation updates to the Board of Supervisors (See Part 3, Implementation).
- Meetings every three to six months to report on the progress of implementation of individual measures, including assessment of how new development projects have been incorporating CAP measures (See Part 3, Implementation).

6. Adopt the GHG Reduction Strategy in a public process following environmental review.

The CAP will be adopted following a public hearing process and preparation of an Initial Study and Mitigated Negative Declaration pursuant to CEQA.

ALAMEDA COUNTY
(UNINCORPORATED AREAS)

Community Climate Action Plan

FINAL DRAFT