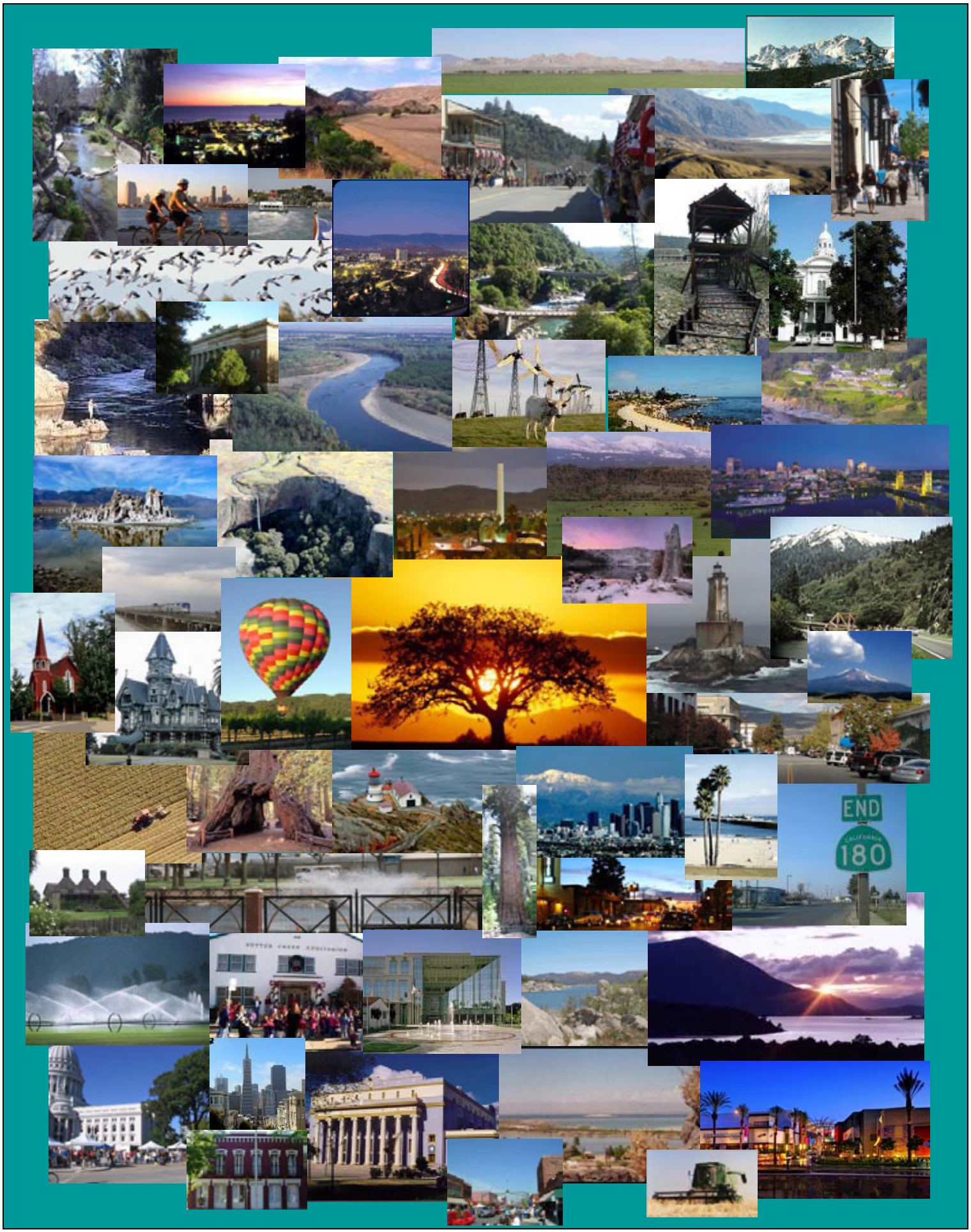
CAPCOA

CALIFORNIA AIR POLLUTION CONTROL OFFICERS ASSOCIATION

Model Policies for Greenhouse Gases in General Plans

A Resource for Local Government to Incorporate General Plan Policies to Reduce Greenhouse Gas Emissions

June 2009


END
180

Disclaimer

The California Air Pollution Control Officers Association (CAPCOA) has prepared this white paper consideration of model policies for addressing greenhouse gas emissions in General Plans to provide a common platform of information and tools to support local governments.

This paper is intended as a resource, not a guidance document. It is not intended, and should not be interpreted, to dictate the manner in which a city or county chooses to address greenhouse gas emissions in the context of its General Plan.

This paper has been prepared at a time of flux in California law and regulation, as well as accepted practice, regarding how climate change should be addressed in government programs. There is pending litigation that may have bearing on these decisions, as well as active legislation at the federal level. And finally, our understanding of the science of climate change continues to evolve, too. In the face of this uncertainty, local governments are working to understand the new expectations, and how best to meet them. This paper is provided as a resource to local policy and decision makers to enable them to make the best decisions they can during this period of uncertainty.

Finally, this white paper reviews requirements, discusses policy options, and highlights methods, tools, and resources available, but it is not intended to provide legal advice and should not be construed as such. Questions of legal interpretation, or requests for legal advice, should be directed to the jurisdiction's counsel.

Acknowledgements

This paper on Model Policies for Addressing Greenhouse Gas Emissions in General Plans benefited from the hard work and creative insights of many people. CAPCOA appreciates the efforts of all who contributed their time and energy to the project. In particular, the Association thanks the following individuals:

Principal Authors

Barbara Lee, NSCAPCD
John Yu, CAPCOA

Project Core Group

Larry Allen, SLOAPCD
Barbara Lee, NSCAPCD
Tim Taylor, SMAQMD
Jill Whynot, SCAQMD
Dave Vintze, BAAQMD
John Yu, CAPCOA

CAPCOA Climate Protection Committee: Model Policies Review Group

Larry Allen, SLOAPCD
Jeane Borkenhagen, SMAQMD
Barbara Lee, NSCAPCD
Greg Tholen BAAQMD
Dave Warner, SJVUAPCD
Jill Whynot, SCAQMD
Molly Wright, SMAQMD
Dave Vintze, BAAQMD
John Yu, CAPCOA
Mel Zeldin, CAPCOA

External Reviewers

Pete Parkinson, County of Sonoma
Nancy McKeever, CEC
Judy Corbett, LGC

Proofing & Layout

Celia Diamond, SCAQMD
Pauline King, CAPCOA
Patricia Whiting, SCAQMD
John Yu, CAPCOA

Contract Support

ICF Jones & Stokes, and Rimpo & Associates

CAPCOA Climate Protection Committee

Larry Allen, SLOAPCD, Chair
Alan Abbs, TCAPCD
Bobbie Bratz, SBAPCD
Jeane Borkenhagen, SMAQMD
Karen Brooks, SLOCAPCD
YuShuo Chang, PCAPCD
Christa Darlington, PCAPCD
Jorge DeGuzman, SMAQMD
Mat Ehrhardt, YSAQMD
Adam Fieseler, SCAQMD
Jean Getchell, MBUAPCD
Larry Greene, SMAQMD
Henry Hilken, BAAQMD
Dave Jones, KCAPCD
Barbara Lee, NSCAPCD
Tom Murphy, SBAPCD
Don Price, VCAPCD
Brad Poiriez, ICAPCD
Violette Roberts, MDAQMD
Jean Roggenkamp, BAAQMD
Greg Tholen, BAAQMD
Tim Taylor, SMAQMD
Mike Villegas, VCAPCD
David Vintze, BAAQMD
Dave Warner, SJVUAPCD
Jill Whynot, SCAQMD
John Yu, CAPCOA
Mel Zeldin, CAPCOA

…and other air district staff members who offered insight and expertise.

Approved For Release by the CAPCOA Board of Directors

Table of Contents

Executive Summary 1
Chapter 1: Introduction 5
Chapter 2: Climate Change Statutes and Regulations in California 13
Chapter 3: Local Government's Role in Reducing Greenhouse Gas Emissions 29
Chapter 4: Planning for Climate Protection 37
Chapter 5: General Plan Structure & Greenhouse Gas Reduction 49
Chapter 6: Model Policies to Reduce Greenhouse Gases 65

Appendix A – Greenhouse Gas Emissions in California
Appendix B – AB 32 Programs
Appendix C – Other Programs to Reduce GHG Emissions
Appendix D – Projected Climate Change Impacts to California
Appendix E – Top 10 Actions by Local Governments and Communities
Appendix F – Agency Responsibilities for Programs on Climate and GHGs
Appendix G – Examples and Resources
Appendix H – California Attorney General Guidance on General Plans

List of Figures

Figure 1 - Temperature History 6
Figure 2 - Temperature Projection Scenarios 6
Figure 3 Thermal Modeling 8
Figure 4 - Projected Sea Level Rise 8
Figure 5 - US Greenhouse Gas Emissions by Gas, 2006 9
Figure 6 - AB 32 Timeline.....14
Figure 7 - Sources of Potential Reductions 14
Figure 8 - Baseline GHGs vs. Scoping Plan.....15
Figure 9 - GHG Reductions by Sector.....16
Figure 10 - Cap and Trade Program 17
Figure 11 - Comparing Pavley Reductions Nationwide 18
Figure 12 - Block Diagram for the Various Components for a Fuel Pathway 19
Figure 13 - California's Primary Energy Sources 20
Figure 14 - Progress Towards RPS Goals 20
Figure 15 - Potential Impacts of Land Use and Transit Strategies on GHG Emissions in California 21
Figure 16 - 2004 STIP Process 23
Figure 17 - Climate Change Significance Criteria Flow Chart 34
Figure 18 - Example Display of Municipal & Community Emissions 42

List of Tables

Table 1 - Element Interrelationships for Greenhouse Gas Emission Reduction Strategies.....63
Table 2 - Worksheet for Model Policies Evaluation 111

List of Acronyms and Abbreviations

Acronym/ Abbreviation	Meaning
AB 32	Assembly Bill 32 Global Warming Solutions Act of 2006
AFV	Alternative Fuel Vehicle
AG	Attorney General
AMI	Advanced Metering Infrastructure
ARB	Air Resources Board
APCD	Air Pollution Control District
APS	Alternative Planning Strategy
AQMD	Air Quality Management District
BAAQMD	Bay Area Air Quality Management District
BOF	Board of Forestry
Cal/EPA	California Environmental Protection Agency
Cal Fire	California Department of Forestry and Fire Protection
CAISO	California Independent System Operator
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resource Board
CAS	Climate Adaptation Strategy
CAT	Climate Action Team
CCA	Community Choice Aggregation
CCAP	Climate Change Action Plan
CCAR	California Climate Action Registry
CCC	California Conservation Corps
CEC	California Energy Commission
CEQA	California Environmental Quality Act
CDFA	California Department of Food and Agriculture
CH_4	Methane
CIWMB	California Integrated Waste Management Board
CO_2	Carbon Dioxide
CO2e	Carbon Dioxide Equivalent
CPUC	California Public Utilities Commission
DOC	Department of Conservation
DFG	Department of Fish and Game
DGS	Department of General Services
DPC	Delta Protection Committee
DTSC	Department of Toxics Substances Control
DWR	Department of Water Resources
EIR	Environmental Impact Report
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPIC	Environmental Protection Indicators for California
EPS	Emissions Performance Standard

List of Acronyms and Abbreviations

Acronym/ Abbreviation	Meaning
ESP	Energy Service Provider
FAR	Floor Area Ratio
GHG	Greenhouse Gas
GWP	Global Warming Potential
HFC	Hydrochlorofluorocarbons
HSR	High Speed Rail
HOV	High Occupancy Vehicle Lanes
ICLEI	International Council for Local Environmental Initiatives (now known as Local Governments for Sustainability)
IOU	Investor Owned Utility
IPCC	International Panel on Climate Change
LAFCO	Local Area Formation Commission
LEED	Leadership in Energy and Environmental Design
LCFS	Low Carbon Fuel Standard
LNG	Liquefied Natural Gas
LUSCAT	Land Use Subgroup of the Climate Action Team
$MMTCO_2e$	Million Metric Tons Carbon Dioxide Equivalent
MPO	Metropolitan Planning Organizations
MWh	Megawatt hour
MVAC	Motor Vehicle Air Conditioning
NAS	National Academy of Sciences
NAST	National Assessment Synthesis Team
N_2O	Nitrous Oxide
NO_X	Oxides of Nitrogen
ODS	Ozone Depleting Substances
OFA	Office of Fleet Administration
OPAR	Caltrans Office of Policy Analysis and Research
OPC	California Ocean Protection Council
OPR	State Office of Planning Research
PIER	Public Interest Energy Research Program
PFC	Perfluorocarbon
PHEV	Plug-In Electric Hybrid Vehicles
PG&E	Pacific Gas & Electric
POU	Publicly Owned Utilities
PM	Particulate Matter
PPB	Parts Per Billion
PPM	Parts Per Million
PPT	Parts Per Trillion
RHNA	Regional Housing Needs Assessment
RPS	Renewable Portfolio Standards
RTAC	Regional Targets Advisory Committee
RTP	Regional Transportation Plan

List of Acronyms and Abbreviations

Acronym/ Abbreviation	Meaning
RTIP	Regional Transportation Improvement Program
RTPA	Regional Transportation Planning Agency
S-3-05	Executive Order S-3-05
SABRC	State Agency Buy Recycled Campaign
SB	Senate Bill
SCAQMD	South Coast Air Quality Management District
SCE	Southern California Edison
SCEA	Sustainable Communities Environmental Assessment
SCS	Sustainable Communities Strategy
SCSA	State and Consumer Services Agency
SDG&E	San Diego Gas & Electric
SEA Change	Strategic Energy Alliance for Change
SJVAPCD	San Joaquin Valley Air Pollution Control District
SF_6	Sulfur Hexafluoride
SLOAPCD	San Luis Obispo Air Pollution Control District
SMAQMD	Sacramento Metropolitan Air Quality Management District
SRI	Solar Reflectance Index
SWAMP	Surface Water Ambient Monitoring Program
SWIM	System for Water Information Management
SWRCB	State Water Resources Control Board
TBD	To Be Determined
TMM	Traffic Mitigation Measures
TPP	Transit Priority Projects
UGB	Urban Growth Boundary
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compounds
WCI	Western Climate Initiative
ZEV	Zero Emissions Vehicle

Executive Summary

Global climate change has been clearly documented and is predicted to have substantial effects on the world we live in, not only in parts of the world that are far away, but here in California. Emissions of greenhouse gases (GHGs) must be curtailed if we hope to minimize the extent and impact of climate change. The majority of GHG emissions come from combustion of fossil fuels for energy and transportation. While renewable energy sources, cleaner fuels, and green technology will help to reduce GHG emissions, we also need significant changes in how we design and construct our "built environment" to meet our climate protection goals.

The General Plans developed and implemented by cities and counties must be at the heart of any effort to change our built environment, and many of these local governments have stepped up to the challenge. In order to support their important efforts, the California Air Pollution Control Officers Association (CAPCOA) has prepared this report of Model Policies for Greenhouse Gases in General Plans. The report is intended to serve as a resource for cities and counties. It discusses General Plan structure and options for including GHG policies in existing General Plan Elements, or by creating a separate GHG Element and/or GHG Reduction Plan. The Model Policies Report contains a menu of model language for inclusion in the General Plan Element(s). The report does not dictate policy decisions, rather, it provides cities and counties with an array of options to help them address GHGs in their General Plans.

The statutory and regulatory landscape affecting GHG emissions and climate planning in California has evolved considerably over the last several years. The Governor's Executive Order 2-3-05, and the Global Warming Solutions Act of 2006 (AB 32) establish the broad policy goals for the state for 2020 and 2050. To meet these goals, the Air Resources Board (ARB) has identified discrete Early Action Measures that will be adopted and enforceable by 2010, and approved a Scoping Plan that lays out the longer term strategy for rulemaking and market mechanisms to reduce GHG emissions. The Scoping Plan specifically includes reductions from local government operations and land use decisions. In addition to this core framework, there are a number of other important statutes and regulations affecting GHGs from motor vehicles, fuels, energy production and use, and land use planning, among others. In particular, SB 375 (Steinberg) was signed by the Governor in 2008, and puts in place the framework for regional targets for GHG reductions, and improved regional planning to meet them. There are also new sources for incentive funding to support clean energy and transportation, and reductions of GHG emissions. And the implementation of some programs that have been in place for a long time, such as the building standards in Title 24 and the California Environmental Quality Act (CEQA), is evolving in response to our heightened concern about climate change.

The role of local governments is increasingly in the spot light as we choose our path to a greener and more sustainable future. There are a number of ways cities and counties can reduce GHG emissions. Reductions need to be made in GHG emissions from local government operations, including energy use, waste and recycling, water delivery and wastewater treatment, transportation, and the built environment. Local governments also have a key role to play in educating local businesses and communities, and supporting

their efforts to reduce GHG emissions. Cities and counties can also ensure the impacts of GHG emissions are mitigated when projects are reviewed under CEQA. And, of course, GHG reduction polices can be incorporated into the regional and local planning efforts, including the General Plan.

Integrated regional planning (as supported by Steinberg's SB 375) can provide a framework for cities and counties to contribute to GHG reductions needed for the region to meet the target set by ARB. Cities and counties can also make explicit local commitments to reduce GHG emissions, and adopt Climate Action Plans to make those reductions happen. Policies can be incorporated into existing General Plan Elements. Alternatively a separate element can be created specifically to address GHGs and climate change. In order to be effective, local planning efforts alternatives must be evaluated for consistency with regional plans, including Blueprint Plans, Air Quality Management Plans, and Regional Transportation Plans. The robust and coordinated planning effort envisioned here provides important opportunities to streamline the CEQA review process while ensuring the environment is protected.

As we plan for and implement GHG reduction strategies, it is critical that we review our progress, not only to ensure that we are reaching our goals, but also to ensure that we are not creating unintended and potentially adverse outcomes. Air quality and public health must still be protected, and we must ensure equal protection for all Californians regardless of their income status or ethnic background.

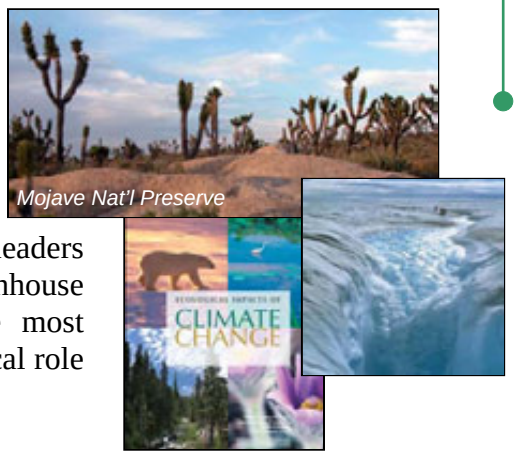
General Plans are, in a broad sense, comprised of goals, objectives, policies, standards, and/or implementation measures, as well as a set of maps and diagrams that describe a vision for the community's future development. The law requires that the General Plan be internally consistent, and there are specific measures of that consistency. Because of this, new policies for GHG need to be considered in the context of the existing elements. These include the mandatory elements, including land use, conservation, circulation, open space, housing, noise, safety, and, in certain circumstances, air quality, as well as non-mandatory elements, such as energy, economic development, capital improvements and public facilities, community design, water, and agriculture. The way the different elements interrelate is an important consideration when incorporating policies for GHGs in the General Plan, and ensuring that those policies are internally consistent throughout the Plan.

The majority of this report is comprised of model policies for GHG reduction that can be incorporated into a jurisdiction's General Plan. Model language is provided in nine major categories: GHG Reduction Planning (overall); Land Use and Urban Design; Transportation; Energy Efficiency; Alternative Energy; Municipal Operations; Waste Reduction and Diversion; Conservation and Open Space; and Education. In addition to the model language, the report provides a worksheet in the form of a table to facilitate the evaluation of the policies for local use, considering specific local factors and criteria. The table also has links to examples of plans that have incorporated the model policy, or a similar policy, to provide a more in-depth understanding of what has been done, under what circumstances, and how.

Finally the report contains technical appendices that provide more detailed information about greenhouse gases, programs that address them, the projected impacts of climate change, climate science, the top ten actions local governments should take, the roles of different agencies on climate and GHG, and examples of plans and policies that have been adopted in California as well as other resources.

(page intentionally left blank)

Chapter 1: Introduction



NAS Brochure

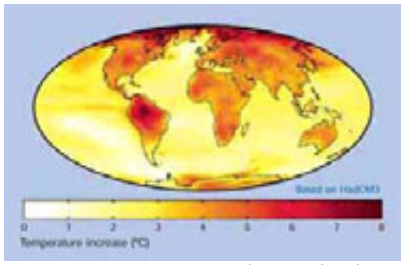
Climate change has already begun to have real and significant impacts on our world and our lives. Some of the changes seem trivial, while others are alarming. As the climate changes more over the next decades, the impacts we see will affect us in increasingly dramatic ways. Recognizing this, the public and government leaders have called for action to reduce emissions of greenhouse gases in the hope that we can stave off the most catastrophic effects. Local government has a critical role to play in this effort.

Because the vast majority of greenhouse gas emissions come from burning fossil fuels, there is tremendous interest in alternative fuels, renewable energy, green technology, and energy conservation as means to cut emissions. There is great promise in these solutions, however alone they are not enough. Studies show that in order to cut emissions to the levels needed, in time to make a difference, we will have to make significant changes in how we live our daily lives, and specifically in how we organize our communities and infrastructure. The key to this organization, and to changing it, is the General Plan that cities and counties develop and implement.

Addressing climate change in a General Plan is no small task. Historically, local air districts have assisted cities and counties in developing the Air Quality Element of their General Plans. In the last few years, air districts across California have been asked by cities and counties for help integrating greenhouse gas emission reduction strategies into their General Plans as they update them. In response, the air districts have pooled their resources through the California Air Pollution Control Officers Association (CAPCOA) to develop a series of Model Policies for Greenhouse Gases in General Plans, and supporting material. CAPCOA would like to acknowledge the Climate Focus Group at ICF Jones & Stokes, and Rimpo and Associates, for their assistance in collecting and compiling information on policies that have been adopted to address GHG emissions.

General Information on Climate Change

An understanding of climate change, and its current and potential future effects on our communities and resources, is essential to good decision making. A detailed description of the science and implications of climate change is provided in the technical appendices at the end of this document. The following provides a basic summary of the issue.



Source: www.scienceschools.org

Climate change is a shift in the "average weather" that a given region experiences. This is measured by changes in the features that we associate with weather, such as temperature, wind patterns, precipitation, and storms. Global climate change means change in the

climate of the Earth as a whole. The Earth's natural climate has always been, and still is, constantly changing. The climate change we are seeing today, however, differs from previous climate change in both its rate and its magnitude.

Human activities are exerting a major influence on some of the key factors that govern climate by changing the composition of the atmosphere and by modifying the land surface. The concentration of carbon dioxide (CO2) in the atmosphere has risen about 30 percent since the late 1800s (National Assessment Synthesis Team [NAST], 2001). This increase has resulted from the burning of coal, oil, and natural gas, and the destruction of forests around the world to provide space for agriculture and other human activities. Concentrations of other greenhouse gases caused by human activities have also increased significantly: for example methane has risen nearly 20% and nitrous oxides over 150% during the same period. Average global surface temperatures have shown a corresponding increase of more than 1° F over the past 100 years, with an average increase of 9° F in the polar regions. The nine warmest years on record have all occurred in the last decade. Figure 1 (right) shows the change in temperature over the last one thousand years. Figure 2 (below) provides thermal maps representing the high and the low in the range of predicted changes in temperature.

Figure 1: Temperature History

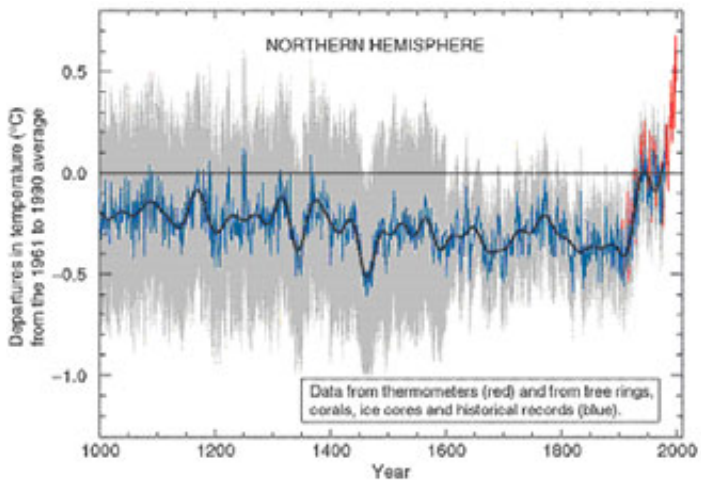
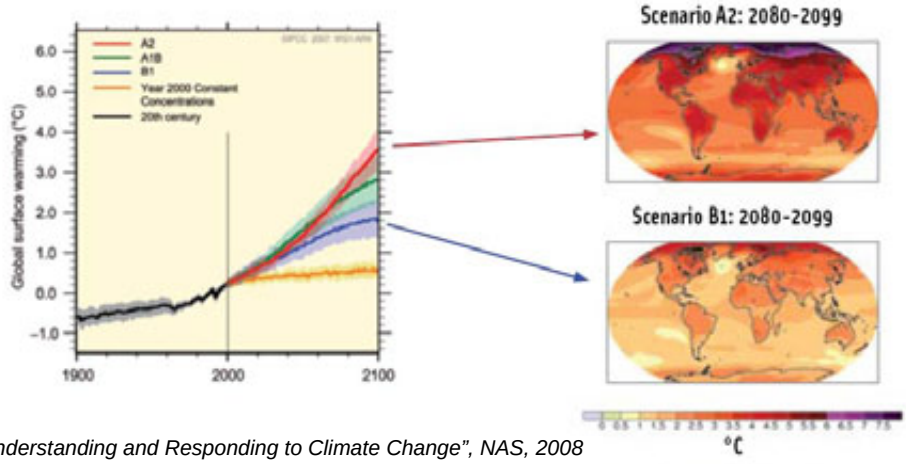


Figure 2:
Temperature Projection Scenarios

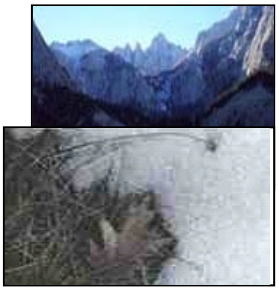


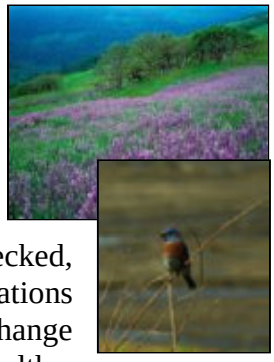
Source: "Understanding and Responding to Climate Change", NAS, 2008

Global projections of population growth and assumptions about energy use indicate that the CO2 concentration will continue to rise, likely reaching between two and three times its late-19th-century level of 280 ppm (parts per million) by 2100, depending on the level and timeliness of preventative actions taken by California and the rest of the world. Such increases in CO2 and other GHGs in the atmosphere and the resulting increase in average global temperatures are predicted to have significant consequences worldwide that will vary in nature and severity depending on location. Impacts predicted for California are summarized below.

Projected Climate Change Impacts in California

In California and throughout western North America, signs of a changing climate are evident. During the last 50 years, winter and spring temperatures have been warmer, spring snow levels in lower- and mid-elevation mountains have dropped, snowpack has been melting one to four weeks earlier, and flowers are blooming one to two weeks earlier. These regional changes are consistent with global trends. If left unchecked, by the end of the century CO2 concentrations could reach levels at which climate change impacts would severely impact our public health, economy, and environment.

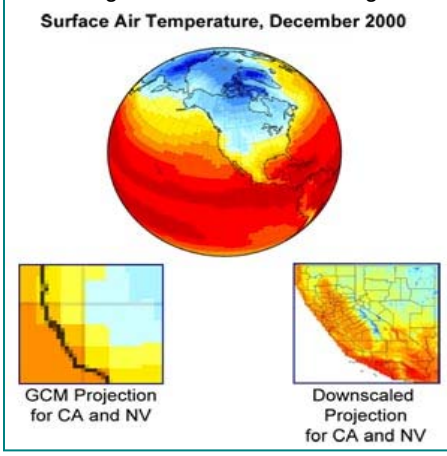




State of the art climate modeling was performed for the California Energy Commission (CEC) to determine potential future impacts of climate change in California under three different scenarios: a low emissions scenario that assumes aggressive action is taken to reduce GHG emissions, a medium emissions scenario assuming a moderate level of GHG reductions, and a high emissions scenario that assumes little action is taken to reduce emissions. The range of potential impacts modeled was summarized in a 2006 CEC document called: *"Our Changing Climate: Assessing the Risks to California."* This document outlines the growing severity of consequences predicted statewide as temperature rises, and also identifies those impacts that may be unavoidable and for which we will need to develop coping and adaptation strategies. The report contains significant existing climate change scientific evidence to support the need for regulating GHG emissions. The CEC prepared a biennial update on the risks to California from climate change, and has summarized key points in the brochure: *"The Future is Now."*

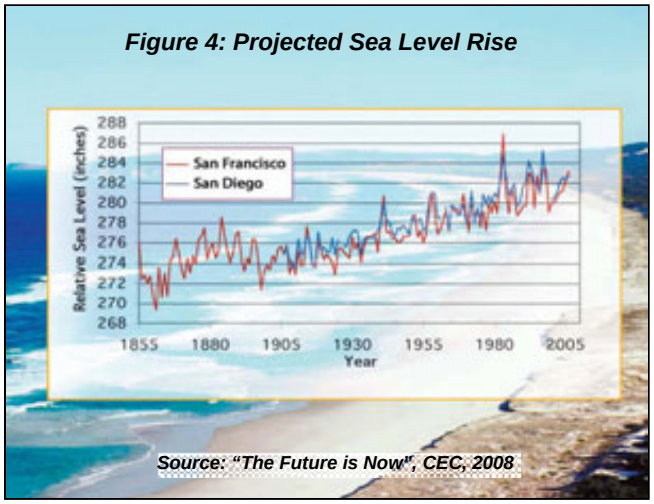
As the atmospheric concentration of GHGs increases, California can anticipate increased average temperatures of 1 to 2 degrees F in the next few decades, and perhaps as much as 10°F by the end of the century. Figure 3 (right) shows results of thermal modeling performed for the CEC, including grid scales for the western region of the U.S., downscaled to California and Nevada. The higher temperatures will increase the formation of smog during summer months with the number of days with unhealthy air more than doubling under the worst-case scenario. In addition, there will be as many as 100 more days each year where temperatures exceed 90°F, and a corresponding rise in illness and death from extreme heat. While total annual precipitation in the state is not expected to change substantially, a much greater percentage will fall as rain instead of snow, with a corresponding decrease in snowpack and the spring runoff that supplies water to the state's agriculture and major urban centers. Reduced water supplies and increased temperatures will directly impact which crops can be grown in California, and this may lead to a greater incidence of disease and pest damage. This damage will also affect the state's forests which will likely sustain a sharp increase in catastrophic wildfires. Finally, as shown in Figure 4, the predicted rise in sea level from 1 to 3 meters by the end of the century will drastically alter California's extensive coast, as well as low-lying inland areas, and land along tributaries, inlets, and bays. A more detailed discussion of predicted impacts is presented in Appendix D.

Figure 3: Thermal Modeling



Source: "Climate Change Impacts Assessment: Second Biennial Science Report to the California Climate Action Team", CEC, 2008

Figure 4: Projected Sea Level Rise



Source: "The Future is Now", CEC, 2008

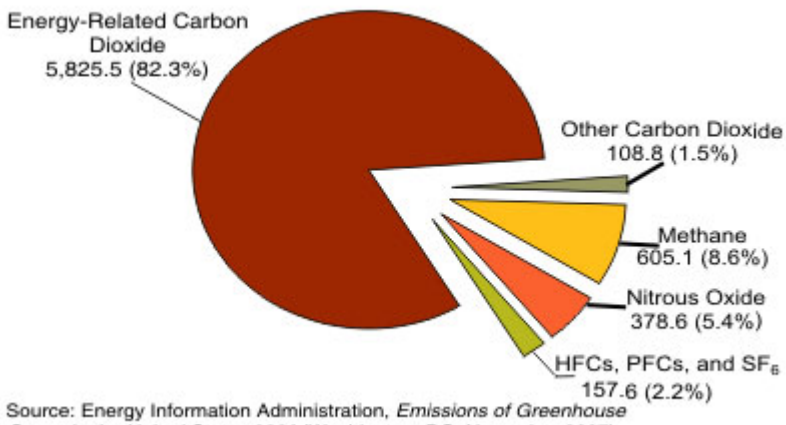
Greenhouse Gases and Their Sources

Carbon dioxide is the most dominant greenhouse gas; however a number of other gases also contribute significantly to climate change, including methane (CH4), nitrous oxide (N2O), sulfur hexafluoride (SF6), hydrochlorofluorocarbons (HFCs) and perfluorocarbons (PFCs). Each gas has a different heat trapping capacity compared to CO2. For instance, methane is 21 times more effective at trapping heat in the atmosphere compared to the same mass of CO2, while some of the fluorocarbons have thousands of times more heat trapping capacity as CO2. To account for these differences when

comparing emissions for the different compounds, the emissions are generally expressed in terms of CO2 equivalents (CO2e). Thus, generic references to GHG emissions generally mean CO2 equivalent emissions.

As shown in Figure 5, CO2 makes up approximately 84% of total GHG emissions by volume, with nitrous oxide and methane contributing about 6% and 7% respectively. SF6, HFCs and PFCs, collectively referred to as high global warming potential (GWP) gases, represent the remaining 3% of statewide GHG emissions. High GWP gases are compounds with significantly higher heat-trapping capacity than CO2.

Figure 5: US Greenhouse Gas Emissions by Gas, 2006



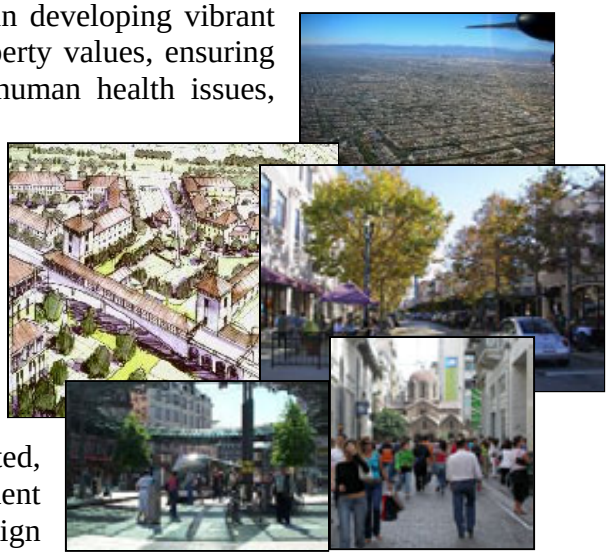
Source: Energy Information Administration, *Emissions of Greenhouse Gases in the United States 2006* (Washington, DC, November 2007)

From a land use standpoint, carbon dioxide and methane are the most important GHGs that local government has the potential to significantly influence and will be the primary focus of the recommended policies and reduction strategies identified in this document.

Increasing CO2 concentrations in the atmosphere primarily result from increased combustion of fossil fuels. Fossil fuel combustion accounts for 98 percent of California CO2 emissions, generating 360 million metric tons of CO2 in 2002; this represents approximately 7 percent of total U.S. emissions from this source category. The transportation sector is the largest contributor in California, accounting for 38% of CO2 emissions, with gasoline combustion the greatest portion of those emissions.

Methane accounted for approximately 6 percent of California's total GHG (CO2e) emissions in 2002. Methane is produced during anaerobic decomposition of organic matter in biological systems. Decomposition occurring in landfills accounts for the majority of anthropogenic CH4 emissions in California and in the United States as a whole. Agricultural processes such as enteric fermentation, manure management, and rice cultivation are also significant sources of CH4 in California.

What Is The Land Use Connection?



Land use planning is a critical element in developing vibrant and livable communities, increasing property values, ensuring economic vitality, addressing potential human health issues, promoting transportation efficiency, ensuring affordable housing, and improving environmental protection. The distribution of different types of land uses, their design, their accessibility, and their intensity can have profound effects on energy use, water use, and vehicle miles of travel.

When properly designed and located, compact, accessible, mixed-use development using energy and water-saving design techniques requires less energy and less vehicle travel than the typical development patterns over the past 60 years. Thus, land use planning is an area of opportunity for guiding development and land use decisions in a manner that considers the heat-trapping emissions of human activity and aims to reduce such emissions. Unfortunately, there is no "one size fits all," cookie cutter approach to effective land use planning. A project that might be beneficial, and reduce VMT and other energy needs, in one situation can actually work in the negative, increasing VMT and energy demands, if sited without proper regard to the circumstances and needs of the site, the community, and the region. For this reason, recommended strategies and approaches should always be considered in context, and evaluated for their appropriateness based on the specific circumstances in which they would be implemented.

What Does This Document Contain?

The California Air Pollution Control Officers Association (CAPCOA) Model Policies for GHGs in General Plans (Model Policies Report) is a resource document intended to help cities and counties address climate change and GHG emissions in their General Plans. The Model Policies Report provides a variety of useful information, including a toolbox of policies, strategies and model language that can be used in General Plans. The Model Policies Report identifies the various issues related to GHG emissions that may cut across several elements of a General Plan; interrelationships of these elements were considered when developing the set of potential development policies for consideration. In addition, the Model Policies Report reviews and analyzes the efficacy of the different goals, objectives, policies & implementation measures available to reduce GHG emissions.

Finally, the Model Policies Report provides model language for GHG policies in General Plan elements, including a list/menu of approaches that are currently being used so that jurisdictions can choose which approaches are most appropriate to them. The Model Policies Report is intended to offer flexible guidance to allow for different approaches to address GHG in General Plans.

This document is focused on issues surrounding the reduction of greenhouse gas emissions. An equally important challenge related to climate change is planning for adaptation to environmental change (such as sea level rise and other climate effects) that is inevitable, regardless of success in reducing greenhouse gas emissions. Local land use planning should also consider how to plan for climate-resilient communities in light of foreseeable environmental change, but that is not the focus of this document.

What Is the Purpose of This Document?

This document provides local jurisdictions with relevant information for considering climate change and GHG reductions in General Plan development and updates. Since the passage of the Global Warming Solutions Act of 2006 (Assembly Bill 32, or AB 32), and Executive Order S-03-05 (EO S-03-05), there has been substantial interest at the State level in finding ways to reduce statewide GHG emissions. The California Air Resources Board (ARB) is given the primary responsibility to develop strategies and regulations to reduce California's overall GHG emissions to 1990 levels by 2020. As required under AB 32, the ARB adopted a Scoping Plan calling for targeted reductions of CO2 from various sectors, including a proposed 2 million metric ton reduction from land use and local government.

The California Attorney General's Office (AG) has taken an active role in the cause of climate change and GHG emissions reductions. The AG has written over 20 extensive project comment letters concerning climate change, some of which were directed toward cities and counties addressing climate change in their General Plans. As an example of his commitment to this role, the AG litigated San Bernardino County based on its failure to analyze in its General Plan Environmental Impact Report (EIR) the increased greenhouse gas emissions that would result from the county's proposed General Plan update. The suit was settled, and although not binding on other communities, the precedent-setting settlement between the AG and San Bernardino County has led many to believe that an EIR for a General Plan must inventory GHG emissions, describe impacts due to the forecasted emissions, and identify feasible mitigation measures to reduce those emissions. Further, mitigations adopted in a General Plan EIR often will require the amendment of General Plan goals, objective, policies, or implementation measures in order to feasibly reduce GHG emissions.

Local governments will face many challenges ahead in reducing GHG emissions. To help provide foundational information, in January 2008, CAPCOA published a white paper entitled, "CEQA & Climate Change"-- a resource document developed to assist public agencies in establishing procedures for reviewing GHG emissions from projects subject to the California Environmental Quality Act (CEQA). This Model Policies Report

continues CAPCOA's efforts to provide meaningful information and tools to local jurisdictions in response to the rapidly evolving regulations in regards to GHGs and climate change. When developing the Model Policies Report, CAPCOA took into account the range of requirements a community must address in preparing or updating a General Plan: internal consistency; equal status among elements; consistency between elements; consistency within elements; area plan consistency; and long-term perspective.

For Whom Is This Document Intended?

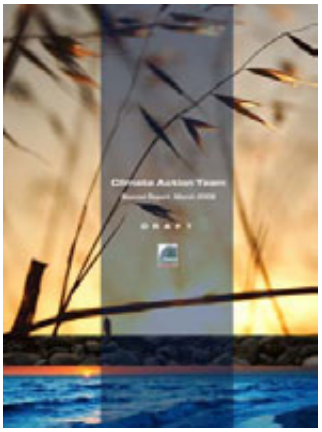
This document is intended for use by local city and county policy and decision makers. The State of California requires each city and county to prepare a comprehensive, long-term General Plan. One of the main purposes of a General Plan is for the jurisdiction to articulate its development goals, objectives, principles and policies for all land areas under its control. Decision and policy makers may find this document useful when evaluating how to incorporate policies and goals related to climate change in their General Plan. Planners and General Plan practitioners may also find this document useful as a general reference.

Colusa County

Over the last several years, a number of new programs have been established to reduce emissions of GHGs. While most of these do not operate directly on or through General Plans, they create a strong foundation upon which General Plan elements for GHGs can be built. This section of the report provides a brief summary of the key programs. Appendix B provides additional description of programs specifically implementing AB 32. Additional information on other programs is summarized in Appendix C. The appendices also provide links to respective program websites where more detailed information can be found.

State Reduction Targets for GHGs (Executive Order S-3-05)

The first comprehensive state policy to address climate change was established through an Executive Order of the Governor of California. In 2005, Governor Schwarzenegger issued California Executive Order S-3-05, which established ambitious GHG reduction targets for the state: reduce GHG emissions to 2000 levels by 2010, reduce to 1990 levels by 2020, and reduce emissions 80% below 1990 levels by 2050. These targets reflect the world-wide emission reduction trajectory identified by the International Panel on Climate Change (IPCC) as being necessary to avert catastrophic global climate change. Under the Executive Order, each state agency is directed to identify and pursue actions within their purview that could contribute to the necessary emission reductions. The Secretary of the California Environmental Protection Agency (Cal/EPA) has the role of coordinating the emission reduction efforts, through the Governor's Climate Action Team, which the Secretary chairs.



On April 1, 2009, California's Climate Action Team released a draft of its second report to the Governor and the Legislature.

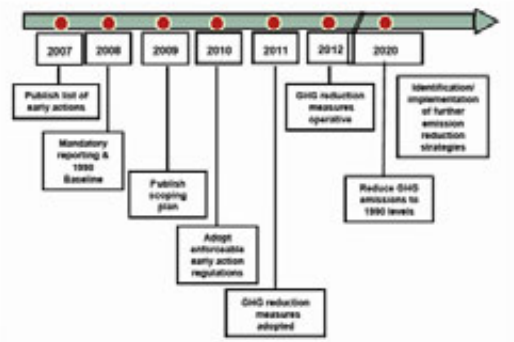
This Executive Order is binding only on state agencies, and has no force of law for local governments; however, S-3-05 was important for two reasons. First, it obligated state agencies to implement GHG emission reduction strategies. Second, the signing of the Order sent a clear signal to the Legislature about the framework and content for legislation to reduce GHG emissions.

Global Warming Solutions Act of 2006 (AB 32)

California AB 32, the "Global Warming Solutions Act of 2006," codifies the State's GHG emissions target by directing the ARB to reduce the State's global warming emissions to 1990 levels by 2020. ARB regulations must begin phasing in by 2012. AB 32 was co-authored by Assembly Member Fran Pavley and Assembly Speaker Favian Núñez; it was signed and passed into law by Governor Arnold Schwarzenegger on September 27, 2006.

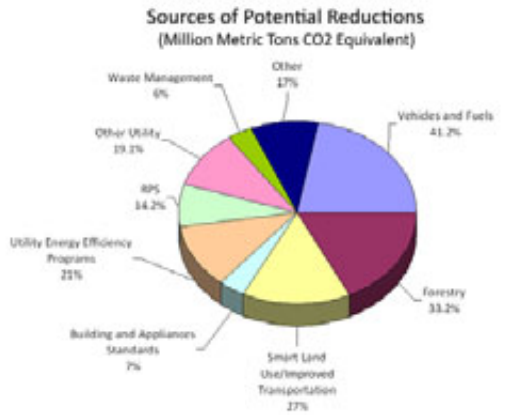
As shown in Figure 6, AB 32 defines a number of milestones to be met in the effort to achieve the 2020 emissions target. It vests the principle authority to implement the program in the ARB, but provides that the Secretary of Cal/EPA will coordinate across state agencies. The cornerstone of the program is the development and adoption by ARB of a Scoping Plan that identifies specific reduction strategies, implementation mechanisms, and timelines. The statute requires that ARB adopt the Scoping Plan by the end of 2008, and that regulations to implement the Plan's strategies must be enforceable by 2012. The statute also requires the ARB to adopt discrete early action measures in 2007, and to study the feasibility and effectiveness of market mechanisms to achieve the needed emission reductions. Finally, it provides that progress towards attainment of criteria air pollutant standards should not be impaired by the climate program, nor should the program create or exacerbate impacts on communities. Figure 7 shows the key GHG emitting sectors of California's economy.

Figure 6: AB 32 Timeline



Source: ARB Staff Report on Early Action Measures

Figure 7:



Source: March 2006 Climate Action Team Report

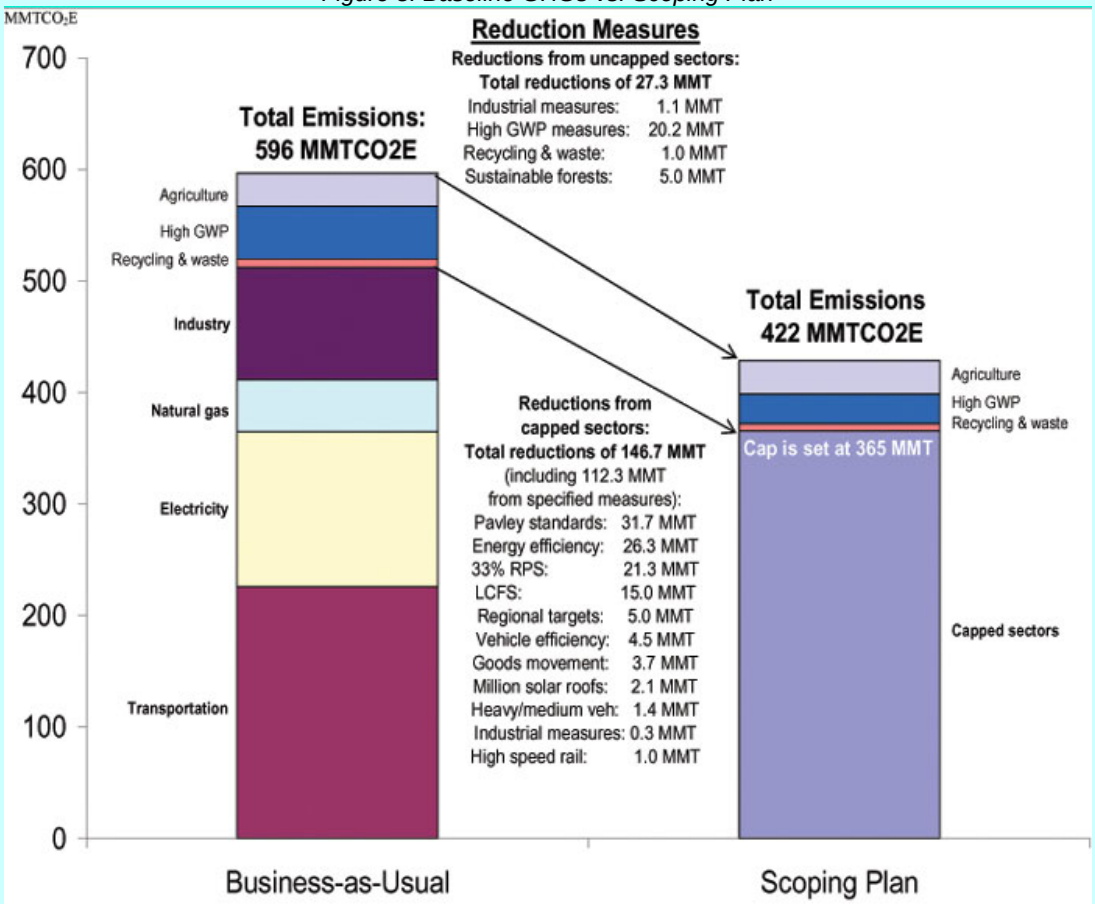
Early Action Measures:

The ARB approved a package of discrete early action measures in June, 2007. The core measures are three proposed rulemakings, including the codification of the Low Carbon Fuel Standard called for in the Governor's Executive Order S-1-07 (see discussion later in this chapter), the capture and recovery of refrigerants with high global warming potential during the servicing of automobile air conditioning systems, and the capture and recovery of methane from landfills, with additional reductions to come from other smaller scope regulations, and as co-benefits from criteria pollution rulemaking efforts. In October, 2007, the ARB added measures to the list, including reductions anticipated from improved energy efficiency at cement manufacturing plants, rulemaking on refrigerants, tire inflation programs, and other programs in trucking and at the ports. Further details on these programs are provided in Appendix B of this report.

Scoping Plan: The Scoping Plan was approved by the ARB Board in November, 2008. The Plan does several things. First, it specifies the target level of GHG emissions that must be achieved by 2020, and estimates the levels that would occur in the absence of measures to reduce emissions – the "business-as-usual" scenario. The difference represents the quantity of emissions that must be reduced by the measures in the plan. Second, the Plan identifies a mix of strategies to achieve the mandated reductions, and estimates the emission reductions that can be expected from each strategy or measure. Finally, the Plan provides general direction for the implementation of key strategies, recognizing that the details of the requirements will be developed through the public rulemaking process.

In December of 2007, the ARB approved the baseline inventory analysis of the GHG emissions in California in 1990; total GHG emissions were 427 MMTCO2(e). ARB estimates that under the business-as-usual scenario, GHG emissions will rise to 596 MMTCO2(e) by 2020. In order to comply with the mandates of AB 32, California must implement strategies sufficient to remove 169 MMTCO2(e). This represents an overall reduction of 30% from business-as-usual, and about 10% from the levels emitted today.

Figure 8: Baseline GHGs vs. Scoping Plan

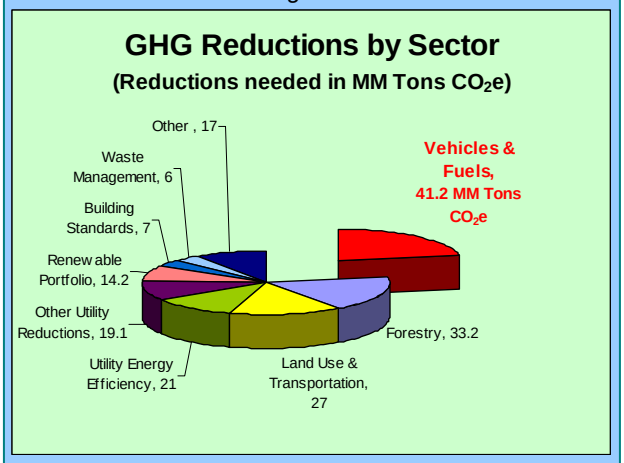


Source: ARB Scoping Plan, Fig. 3, p. 21

On a per capita basis, each Californian will be responsible for nearly 14 tons of CO2(e) in 2020 under a business-as-usual scenario, and that needs to be reduced to about 10 tons for each man, woman, and child. Figure 8 shows the GHG emissions under baseline conditions, and as they are projected to be in 2020, with full implement-tation of the Scoping Plan.

The Scoping Plan identifies measures and strategies in 19 basic categories, and Figure 9 shows the reductions needed from key categories. The greatest contribution comes from the transportation sector, which is responsible for about 60.2 MMTCO2(e) in reductions.

Figure 9



Data from CEC

The reductions (shown parenthetically in MMTCO2(e) for each category) come from implementation of GHG emission standards for vehicles (31.7), the Low Carbon Fuel Standard (15), vehicle efficiency measures (4.8), goods movement improvements (3.7), reductions from medium and heavy duty vehicles (2.5), and implementation of high speed rail (1). The electricity sector is the second largest contributor, with a total of 49.7 MMTCO2(e), coming from energy efficiency measures (26.4), acceleration of the Renewable Energy Portfolio Standard (21.2), and deployment of SB 1 (Murray) the Million Solar Roofs Initiative (2.1). Other sectors include reductions in emissions of GHGs with high global warming potential (16.2), sustainable forestry (5), efficiencies in water movement, treatment, and storage (4.8), improvements in land use (5), direct local government actions to reduce GHGs (15% reduction below present levels; tons TBD), control of methane at landfills (1), and methane capture at large dairies (1). The amount of reductions from the large industrial sector is yet to be determined, and the balance of the needed emission reductions is expected to come from the market-based cap and trade program (34.4).

Specifically in regard to reductions from improvements in land use, the Scoping Plan discusses establishing Regional Targets for GHG reduction, and requiring an integrated planning process for transportation, air quality, and General Plans. This approach is further supported by SB 375 (Steinberg), which the Governor signed in September, 2008. The legislation is discussed below, and the concept of Regional Targets and integrated planning is further explored in Section 4 of this report.

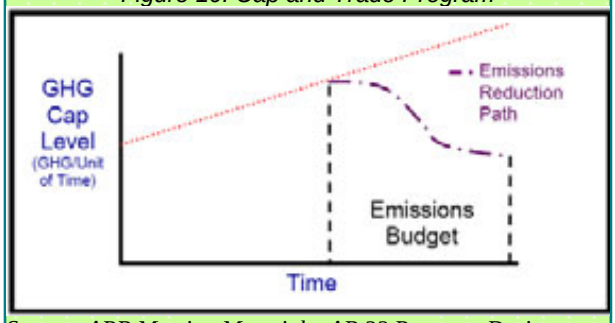
Toolkit available at: www.coolcalifornia.org

The Scoping Plan discusses two primary ways in which local governments can achieve direct GHG reductions (that is, reductions that do not result from improved land use planning). Local governments can take actions to reduce energy use at their own facilities, increase their recycling, reduce their waste and water use, reduce the energy used in the handling and treatment of waste and

water, and reduce the carbon emissions from their vehicle fleets and from trips to and from their facilities. Similarly, local governments can adopt policies that support reductions in these same areas by businesses and residents within their communities. These kinds of local government actions form the fabric of the Model Policies, and the effective development and integration of thee strategies is the focus of the remaining sections of this report.

There has been considerable interest in the market-based elements of the AB 32 program. Although many of the details remain to be determined through public rulemaking, the Scoping Plan provides certain basic information about market-based efforts. Market-based programs generally fall into three categories: incentives, fees and fee-bates, and cap-and-trade systems. The Scoping Plan envisions a role for all three. Incentives are contemplated for broad, consumer-based programs, such as installation of solar technology, or early adoption of energy efficiency technologies. Fees are envisioned primarily as a mechanism to fund program administration, not as an emission reduction strategy; however, some consideration is given to establishing a fee on upstream carbon (attached to distribution of fuels and electricity) as a backstop measure. The greatest attention is given to a cap-and-trade market mechanism, a system in which a limited number of "allowances" to emit GHG are available, and emitters must either reduce emissions to match the allowances they hold, or they must purchase allowances from another emitter who holds more than needed to cover emissions. The total available allowances would decrease as the 2020 deadline approaches. The Scoping Plan proposes a market that would initially cover a subset of sectors, but would expand to include essentially all sectors over time. The Plan also contemplates a market that is initially linked throughout the western U.S. and Canada, and in which initial allowances are assigned through a combination of targeted allocation and open auction, but which transitions to a market where all allowances are auctioned. It is not yet clear how local governments would be covered under a market system. Figure 10, above, gives a graphical representation of the baseline emissions over time (shown in red) compared to the declining cap (shown in purple). Additional discussion of the cap-and-trade program is provided in Appendix B.

Figure 10: Cap and Trade Program



Source: ARB Meeting Materials- AB 32 Program Design Technical Stakeholders Meeting, April 25, 2008, p. 3

Greenhouse Gas Emission Standards for Vehicles (AB 1493)

Passed in 2002, before the overarching climate program was established, AB 1493 (Chapter 200, Statutes of 2002) was authored by Assembly Member Fran Pavley. The bill required ARB to develop and adopt the nation's first GHG emission standards for automobiles, and the emission

limits it requires are commonly referred to as the Pavley Standards. The ARB approved GHG emission limits for light duty vehicles in 2004. The standards become effective in 2009 and would reduce GHG emissions from California passenger vehicles by about 22 percent by 2012 and about 30 percent by 2016.

Although the federal government generally reserves the authority to establish tailpipe emission standards for motor vehicles, the federal Clean Air Act provides that California may establish such standards; however, any standards adopted by the state must be granted a waiver from the federal preemption by the U.S. EPA before they can be enforced. In December, 2007, EPA denied California's waiver request for the Pavley standards and in early 2008 California's Attorney General filed a petition in federal court to challenge that denial. Seventeen states supported the petition, and the U.S. Congress lodged inquiries into the EPA decision. The Obama administration agreed to review the matter, and in February, 2009, the Administrator of EPA requested comments on the reconsideration of the waiver petition.

In addition to the waiver denial, implementation of the standards has also been challenged in court in a lawsuit filed by automobile manufacturers. The suit alleges that the standards are de facto fuel efficiency standards, which are the exclusive purview of the federal government.

The Pavley standards account for about 19 percent of the emission reductions specified in the Scoping Plan. Although the federal government has adopted new fuel efficiency standards, ARB estimates that between 2009 and 2016, Pavley standards will achieve 56% more reduction in GHG emissions in California (about 19 million metric tons) compared to the federal standards, and by 2020 the difference is 49%. Figure 11 compares the total national emission reductions achieved by different implementation scenarios for the Pavely standards. If the Pavley standards are not ultimately

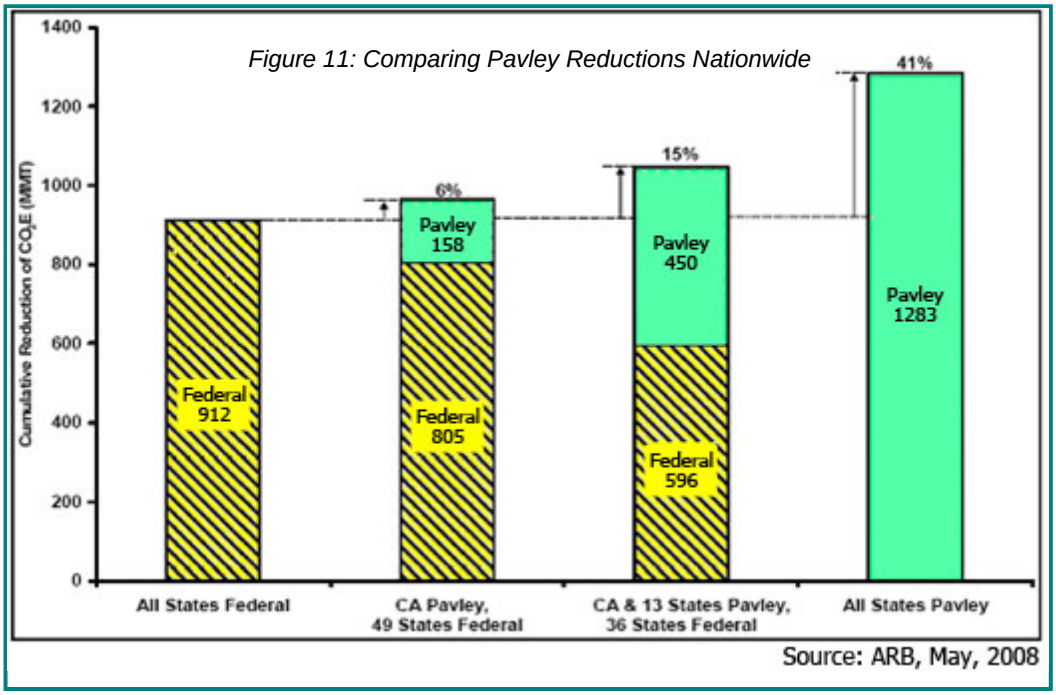


Figure 11: Comparing Pavley Reductions Nationwide

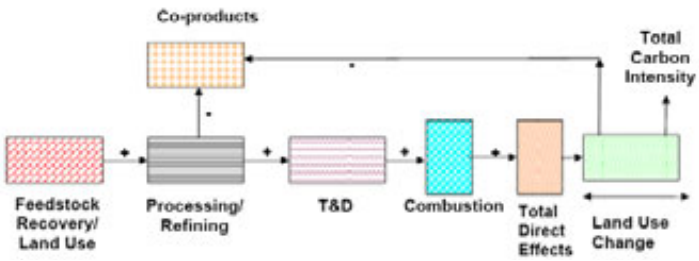
implemented, the lost reductions of GHG will need to be recovered through additional measures, beyond the reductions already identified in the Scoping Plan. ARB suggests the use of a carbon fee on the sale of new vehicles with GHG emissions greater than would have been allowed under the Pavley standards; the fees would be rebated back to the purchasers of vehicles with GHG emissions lower than the Pavley standards. The fees would have to be established at a price point that would inventivize purchasing behavior that results in the same emissions profile as the Pavley standards would have.

Low Carbon Fuel Standard (Executive Order S-1-07)

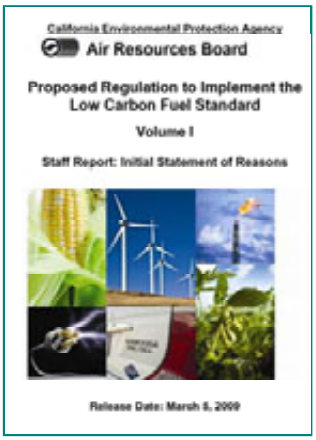
In his January 2007 State of the State message, Governor Schwarzenegger asserted California's leadership in clean energy and environmental policy by establishing a Low-Carbon Fuel Standard (LCFS) by Executive Order. This first-in-the-world greenhouse gas standard for transportation fuels will spark research in alternatives to oil and reduce GHG emissions. Executive Order S-1-07, the Low Carbon Fuel Standard (LCFS) (issued on January 18, 2007), calls for a reduction of at least 10 percent in the carbon intensity of California's transportation fuels by 2020. The carbon intensity of a fuel is a direct measure of the GHGs emitted during the full life-cycle of the fuel, including directly emitted CO2 as well as other GHG associated with each step in the fuel cycle (a.k.a., “well-to-wheels” for fossil fuels and “seed-to-wheel” or “field-to-wheel” for biofuels). Figure 12 shows the components of a combustion fuel life cycle. The Executive Order instructed the California Environmental Protection Agency to coordinate activities between the University of California, the California Energy Commission and other state agencies to develop and propose a draft compliance schedule to meet the 2020 target. Furthermore, it directed ARB to consider initiating regulatory proceedings to establish and implement the LCFS.

Figure 12:

Block Diagram for the various Components for a Fuel Pathway



source: ARB LCFS Staff Report

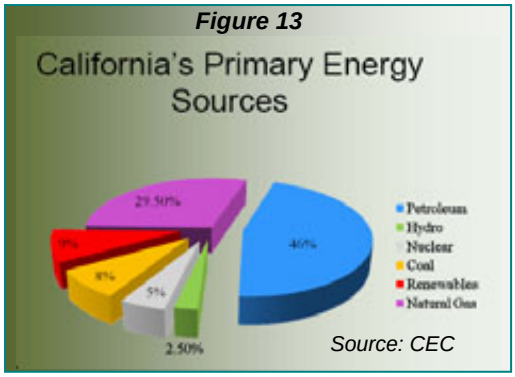


In response, ARB identified the LCFS as an early action item with a regulation to be adopted and implemented by 2010. The standard was approved by the Board in April, 2009. It establishes a baseline level of carbon intensity for affected providers, and places a declining cap on that intensity where each year fewer GHGs may be emitted. This is a market-based program that uses carbon intensity credits for fuels sold, where fuels that have lower carbon intensity than required yield “excess” credits that may be used to offset other, higher intensity fuels, or may be banked for use in future years, or sold to other providers who have not been able to reduce the intensity of their fuels to meet the cap.

Renewable Energy Portfolio (SB 1078 and SB 107)

Established in 2002 under SB 1078 (Sher, see: Chapter 516, Statutes of 2002) and accelerated in 2006 under SB 107 (Simitian, see: Chapter 464, Statutes of 2006), California's Renewable Portfolio Standard (RPS) obligates investor-owned utilities (IOUs), energy service providers (ESPs) and community choice aggregators (CCAs) to procure an additional 1% of retail sales per year from eligible renewable sources until 20% is reached, no later than 2010. ARB's Scoping Plan identifies a target RPS of 33% by 2020.

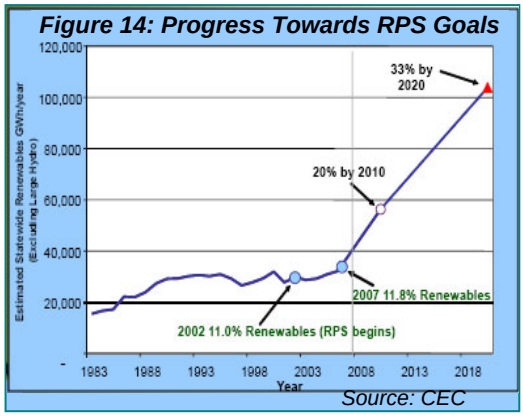
Figure 13



Source: CEC

The California Public Utilities Commission (CPUC) and California Energy Commission (CEC) are jointly responsible for implementing the program. Figure 14a shows the mix of energy sources in California in 2008, and Figure 14b shows progress towards the RPS goals. As of July, 2008, the largest IOUs in California had renewable portfolios as follows: Pacific Gas and Electric (PG&E) - 11.4% ; Southern California Edison (SCE) - 15.7%; San Diego Gas & Electric (SDG&E) - 5.2%.

Figure 14: Progress Towards RPS Goals



Source: CEC

Improved Land Use Planning (SB 375)

In September, 2008, the Governor signed Senate Bill 375 (Steinberg). This bill has five main provisions:

1. It requires ARB to establish regional targets for reductions in greenhouse gas emissions from use of light duty vehicle (passenger cars and small trucks) associated with land use decisions.

2. It requires that metropolitan planning agencies (MPOs) create a Sustainable Communities Strategy (SCS) in their Regional Transportation Plans (RTPs) to meet the reduction targets established by ARB.

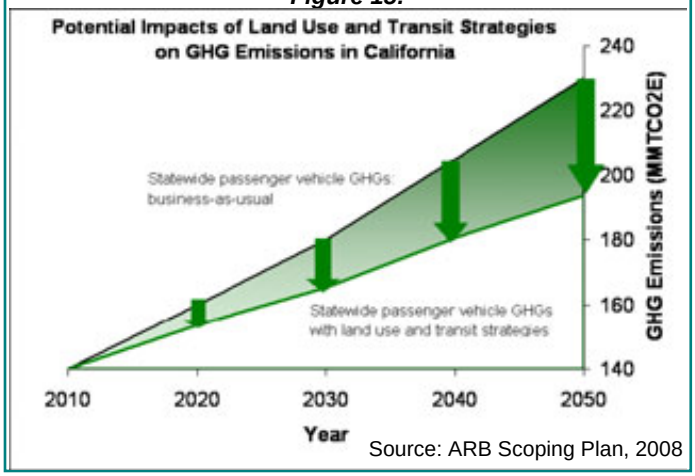
3. It requires that funding decisions for regional transportation projects be internally consistent within the RTP.

4. It aligns the Regional Housing Needs Assessment (RHNA) with the RTP.

5. It provides CEQA relief, in the form of streamlining and exemptions, for projects that are consistent with the SCS.

Targets- ARB is required to approve regional GHG emission reduction targets by September 30, 2010, and to review them, and update them as appropriate, on an eight-year schedule. The targets may be expressed in terms of total tons of emissions to be reduced, reductions per capita, per household, or another metric identified by the air board. ARB has already indicated that the reductions attributed to land use in the Scoping Plan are not, necessarily, the same as the reduction targets that will be assigned to regions under SB 375. ARB believes the Scoping Plan is not an enforceable commitment (unlike the State Implementation Plan for attaining national ambient air quality standards, for example); rather, it is a best estimate, and a general road map. ARB believes the SB 375 process will result in more accurate and specific assessments of the magnitude of reductions that are achievable through sustainable transportation planning. Figure 15 shows the emissions projected from passenger vehicles between 2010 and 2050, and the reductions targeted in the Scoping Plan for that sector.

Figure 15:



Source: ARB Scoping Plan, 2008

To guide the establishment of the regional targets, from which all other provisions flow, SB 375 creates a Regional Targets Advisory Committee (RTAC) with representation from affected stakeholders, including local government, air districts, and MPOs. The committee will make recommendations to ARB on the factors to be considered by ARB in setting the targets, and on the methodologies to be used. The RTAC does not give explicit recommendations about the targets themselves; however, individual MPOs may make recommendations regarding their own specific target. The RTAC recommendations are due to the ARB by September 30, 2009, which leaves the ARB one year to establish the targets after the RTAC makes its recommendations.

Sustainable Communities Strategy- Metropolitan Planning Organizations (or their subdivisions) are required to develop a Sustainable Communities Strategy that will constitute the land use element of the Regional Transportation Plan. The SCS is required to do all of the following:

- Identify the general location of uses, residential densities, and building intensities within the region;

- Identify areas within the region sufficient to house all the population of the region, including all economic segments of the population, over the course of the planning period of the RTP (i.e., 25 years), taking into account net migration into

the region, population growth (presumably referring to natural increase), household formation, and employment growth;

- Identify areas within the region sufficient to house an eight-year projection of the regional housing need (i.e., an eight-year RHNA);
- Identify a transportation network to service the transportation needs of the region;
- Gather and consider the best practically available scientific information regarding resource areas and farmland in the region;
- Consider state housing goals;
- Forecast a development pattern for the region, which when integrated with the transportation network and other transportation measures and policies, will achieve, to the extent practicable, the targeted greenhouse-gas emission reduction from automobiles and light trucks, while also permitting the RTP to comply with the Clean Air Act;
- In doing all of the above, consider spheres of influence that have been adopted by Local Area Formation Commissions (LAFCOs).

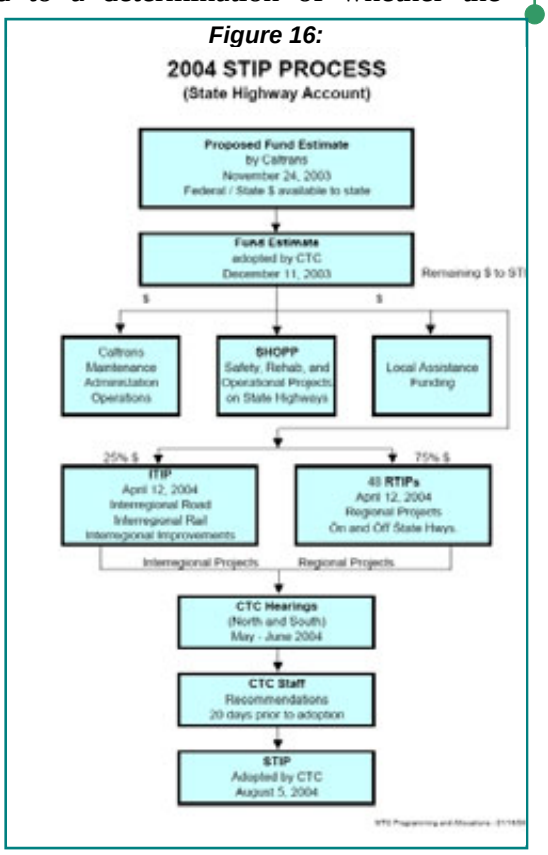
The SCS will also embody the plan to achieve the GHG reductions needed to meet the region's target. It must contain all feasible measures to reduce GHG, but the determination of feasibility is left to the MPOs. The MPOs are required to quantify the emissions reductions that will result from implementation of the SCS, and compare the expected reductions to what is required to meet the targets established by ARB. The bill acknowledges that implementing all feasible strategies under the SCS may not yield sufficient emission reductions to meet the regional target. If that is the case, the MPO is required to develop an Alternative Planning Strategy (APS) that includes additional strategies (including those that were rejected from the SCS on the basis of feasibility) sufficient to reach the target.

Because the SCS is part of the RTP, it is tied to federal transportation planning law and structures. The bill specifies, however, that the SCS is *not* a land use plan, and SB 375 does not confer land use authority on the MPOs. Technically, SB 375 does not require the local General Plan to conform to the SCS. Conformity is strongly encouraged, however, through funding incentives and CEQA streamlining. It is important to note here that the APS is not part of the SCS, and is therefore not part of the RTP. Under SB 375, the APS is not a binding

commitment; however, consistency with the APS can provide some streamlining and regulatory relief under CEQA. Finally, both the SCS and the APS are subject to approval by ARB, but ARB's role is limited to a determination of whether the measures included in the SCS and/or the APS will achieve the target ARB established for the region.

Funding- Although SB 375 does not explicitly direct transportation funding to specific types of projects or measures, it does affect the flow of transportation dollars indirectly. The bill requires that the RTP be internally consistent, meaning that transportation funding allocated under the umbrella of the RTP must be allocated consistent with the programmatic elements of the plan, including the SCS. So if the SCS calls for or prioritizes a specific type of transportation project, funding must be allocated to that type of project, rather than a project type that is not included in the RTP or has been awarded low priority. The same construct does not extend to the APS, however, because it is explicitly not part of the RTP. Figure 16 is a diagram of the process by which the RTIP is created in the Bay Area; for further information, see www.mtc.ca.gov.

Figure 16:



Source: MTC

Affordable Housing- The bill makes specific changes to the requirements for the housing element of the General Plan, to align the Regional Housing Needs Assessment (RHNA) with the RTP. Broadly, it does the following:

- In areas where the RTP is on a four-year review cycle, the bill changes the review cycle under RHNA to eight years, such that the RTP and the RHNA will be reviewed together on a regular basis. In areas where the RTP remains on a five-year review cycle, the RHNA cycle remains at five years.

- Requires that the concurrent review of the RTP and the RHNA begin in the first RTP update after 2010, and that two assessments be consistent. Cities and counties are required to amend the Housing Element in their General Plans within the specified time frame, or to be placed on a more frequent four-year RHNA review cycle.

- Establishes a timeline for completing zoning changes to reflect the RHNA, and severely restricts the local authority on project review for affordable housing if the timeline is not met. Specifically, the local authority may only act to disapprove a project, and only if the project would result in a serious health risk.

Streamlining of CEQA- To incentivize projects that are consistent with the SCS or APS, the bill provides certain exemptions from, or streamlining of, requirements under CEQA. Specifically, streamlining is provided for residential projects meeting certain criteria, and for projects that fall under the newly defined category of "transit priority project."
Residential Projects Consistent with SCS/APS: The bill reduces CEQA requirements for a residential development (or a mixed-use development that devotes at least 75% of the square footage to residential uses) if it meets both of the following requirements: 1) the project is consistent with an SCS or APS that ARB has determined will achieve the regional targets, and 2) the project implements the mitigation measures required under an applicable prior environmental document. A project meeting these criteria does not have to describe or discuss in any CEQA document growth-inducing impacts, any project-specific or cumulative vehicle impacts on global warming or the regional transportation network, or a reduced residential density alternative to vehicle impacts.

Transit Priority Projects: The bill defines a new category of project, "Transit Priority Projects," and establishes a categorical exemption from review under CEQA for such projects, provided they meet additional specified criteria. Projects that meet the definition of the category, but not the additional criteria, are afforded other streamlining of CEQA requirements, but are not fully exempt. The definition of "Transit Priority Projects" is based on four factors:

- The project is consistent with the SCS or APS, whichever has been determined by ARB to meet the assigned reduction targets; and
- The project meets specified mixed-use criteria; and
- The project has a minimum net density of at least 20 units per acre; and
- The project is within a half mile of a major transit stop (existing or planned), or a "high quality" transportation corridor.

A categorical exemption is provided for TPPs that conform to all criteria on a specified list, as well as at least one additional criterion from a list of options. The TPP must meet all of the following criteria:

- The project is no larger than 8 acres and not more than 200 units;
- The project can be served by existing utilities and has paid all applicable in-lieu and development fees;
- The project does not have a significant effect on historical or environmental resources (e.g. natural habitat);

- The project has remediated any environmental hazards to applicable standards and is not subject to significant and defined catastrophic risks;

- The project is not located on developed open space;

- The buildings in the project are 15 percent more energy efficient than required by California law and the project is designed to achieve 25 percent less water usage than the average household use in the region;

- The project does not result in the net loss of affordable housing units in the area;

- The project does not include any single-story building larger than 75,000 square feet;

- The project incorporates mitigation measures from previous environmental impact reports;

- The project does not conflict with nearby industrial uses.

To meet the categorical exemption, the TPP must also conform to at least one of the following:

- At least 20 percent of the housing units will be sold to families of moderate income, or not less than 10 percent of the housing will be rented to families of low income, or not less than 5 percent of the housing will be rented to families of very low income and the developer commits to the continued availability of the non-market units (55 years for rental units, 30 years for ownership units); **or**

- The developer pays in-lieu fees equivalent to costs of meeting the first requirement; **or**

- The project provides public open space equal to or greater than five acres per 1,000 residents.

TPPs that do not meet the criteria for a full categorical exemption from CEQA can qualify for streamlining under a Sustainable Communities Environmental Assessment or by implementing approved Traffic Mitigation Measures.

A TPP may be reviewed under a Sustainable Communities Environmental Assessment (SCEA) if the project incorporates all feasible mitigation measures, performance standards, or criteria from an applicable prior environmental impact report. The SCEA is similar to an EIR, but it does not have to address potential growth-inducing impacts, any project-specific cumulative impacts on climate change from the use of light duty

vehicles, or any other cumulative effects of the project that have been addressed and mitigated in prior environmental documents. In addition to this streamlining, the bill provides that a legal challenge of the SCEA is to be reviewed under a standard of "substantial evidence" rather than under the "fair argument" standard that is generally applied to EIRs.

The bill also authorizes cities and counties to adopt specific Traffic Mitigation Measures (TMMs) to apply specifically to TPPs. The TMMs include such measures as requirements for the installation of traffic control improvements, street or road improvements, transit passes for future residents, or other measures that will avoid or mitigate the traffic impacts of transit priority projects. Any TPP that implements the approved TMMs is not required to identify or implement any additional measures to mitigate traffic impacts under CEQA.

Alternative and Renewable Fuel & Vehicle Technology Program (AB 118)

In October 2007, Governor Schwarzenegger signed AB 118 (Nunez, Statutes of 2007), into law. AB 118 provides approximately $200 million annually through 2015 for three new programs to fund air quality improvement projects and develop and deploy technology and alternative and renewable fuels. The bill creates a dedicated revenue stream for the programs via increases to the smog abatement, vehicle registration, and vessel registration fees. The three new programs are: the Air Quality Improvement Program administered by ARB, the Alternative and Renewable Fuel and Vehicle Technology Program administered by the California Energy Commission, and the Enhanced Fleet Modernization Program administered by the Bureau of Automotive Repair.

The Air Quality Improvement Program will provide about $50 million per year for grants to fund clean vehicle and equipment projects which reduce criteria and toxic air pollutants as well as research on the air quality impacts of alternative fuels and advanced technology vehicles. ARB will be developing guidelines for the Air Quality Improvement Program and the Alternative and Renewable Fuel and Vehicle Technology Program to ensure that both programs complement efforts to meet the federal and state ambient air quality standards and to reduce air toxics.

California Energy Efficiency Standards (Title 24, Chapter 6)

Title 24, Part 6 (California's Energy Efficiency Standards for Residential and Nonresidential Buildings) of the California Code of Regulations was first established in 1978 in response to a legislative mandate to reduce California's energy consumption. The standards are updated periodically to allow consideration and

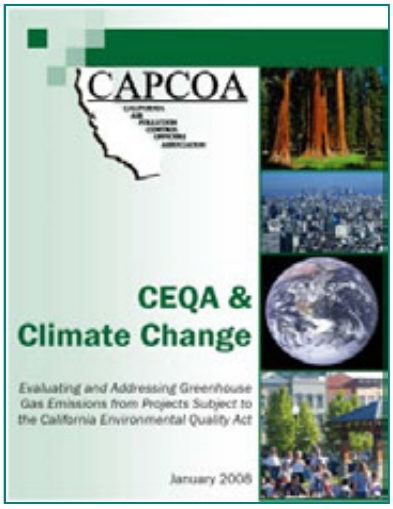
incorporation of new energy efficiency technologies and methods. These standards are mandatory and thus new building permitted by City and County governments must comply with the standards in effect at the time. These standards also promote cost-effective means to reduce energy use and thus GHG emissions for new development relative to business as usual conditions.

The Energy Commission adopted the 2008 Standards on April 23, 2008, and the Building Standards Commission approved them for publication on September 11, 2008. These new Standards will be in effect as of July 1, 2009. The requirement for when the 2008 Standards must be followed is dependent on when the application for the building permit is submitted. If the application is submitted after 7/1/09, the 2008 Standards must be met.

California Environmental Quality Act

The California Environmental Quality Act (CEQA) (Pub. Res. Code §21000 et seq.) is not specific to GHG regulation and does not create specific new mandates for General Plans; however, its basic goal is to ensure that environmental impacts of proposed projects are evaluated, and significant impacts are mitigated and disclosed to the public. CEQA substantially influences the approval process for General Plans. The evaluation is done through an Environmental Impact Report (EIR) which provides State and local agencies and the general public with detailed information on potentially significant environmental impacts a proposed project is likely to have and ways to mitigate those impacts, and also to evaluate potential alternatives to the project.

Because of the global nature of the climate change problem, most projects will not result in GHG emissions that are individually significant. CEQA also requires consideration of whether impacts are *cumulatively* significant, however. The determination of significance is made by the agency with primary jurisdiction over the project. CEQA allows the agency to establish thresholds for significance, based upon sufficient scientific evidence, but thresholds are not required.



In January of 2008, CAPCOA released a resource document called *CEQA and Climate Change*, that reviewed the various options available to lead agencies to determine significance of a project. The document also evaluated tools and methodologies, and provided a list of mitigation strategies. A more comprehensive discussion of CEQA and its applicability to GHG emissions is provided in that document.

On April 13, 2009, the Governor's Office of Planning and Research sent proposed amendments of the CEQA Guidelines to the Secretary of the Resources Agency for promulgation. The proposed amendments contain

recommended changes to fourteen sections of the existing guidelines, including: the determination of significance as well as thresholds; statements of overriding consideration; mitigation; cumulative impacts; and specific streamlining approaches. Overall, the proposal includes the same basic approaches covered in the CAPCOA document. The proposed Guidelines also include an explicit requirement that EIRs analyze GHG emissions resulting from a project when the incremental contribution of those emissions may be cumulatively considerable. A copy of the full proposal, as well as the letter of transmittal, may be found at: www.opr.ca.gov.

An important consideration of CEQA with respect to planning is the growing consensus that a robust effort to address GHG emissions at the General Plan level can substantially streamline subsequent project review under CEQA, provided the project is consistent with the GHG reduction policies in the Plan. This is specifically allowed in the OPR proposal, and is being further developed in the context of SB 375. Although the specifics of what is entailed here have yet to be established, the concept is important to consider in shaping the policies included in the General Plan.

Local government has an enormously important role to play in reaching the goals of AB 32, and more importantly, in the achieving the greater long term goal of preventing catastrophic climate change. There are many strategies a local government can undertake that will reduce GHG emissions, and help minimize the extent of climate change that does occur. Some of the strategies depend on coordinated action with other agencies and levels of government; others can be implemented independently.

This section of the report is mainly focused on the more immediate actions local governments can take, including direct reductions from local government operations; the role of local government in fostering reductions in the business sector and in local communities; and lead agency obligations to address GHG emissions under CEQA. This chapter also touches briefly on the crucial, longer term role of local government: establishing over-arching plans that will achieve reductions through changes to land use and transportation, resource management, and the efficiency of the built environment. The Institute for Local Government provides resources and a forum for sharing ideas on many of these important topics (see www.cacities.org). The role of local government in planning for GHG reductions is explored more fully in Chapter 4.

Source: Institute for Local Government

Reductions in Local Government Operations

There are five core areas of local government operations that are responsible for GHG emissions. These include: energy use, waste and recycling, water delivery and wastewater treatment, transportation, and the build environment.

In addition, there are actions the local government can take to preserve open space and undertake reforestation, for example, that can mitigate or offset the emissions resulting from operations.

A brief discussion of each operational area is included below. These lists are not exhaustive; rather, they provide a sampling, and links are provided in the References section of this report where additional information and examples can be found. Finally, the discussion here is limited to emissions from operations as opposed to those associated with policies governed by the General Plan, a discussion of which follows.

Energy Use: The buildings, equipment, and infrastructure of local government all use energy. In general, newer purchases and installations tend to be more energy efficient, but there are plenty of opportunities to enhance efficiency and cut energy use. Buildings can be made more efficient by upgrading insulation and installing low emissive glass, using high-efficiency lighting with timers and sensors, installing cool roofs, and simply adjusting heating and cooling levels. Alternative energy sources can be developed, such as installation of solar collectors, or landfill gas to energy projects. Local governments can also change the emissions profile of the energy they purchase from their energy providers. Equipment that heats and cools buildings can be upgraded to the most efficient models, as can computers, telecommunications, and office equipment. And infrastructure such as street lighting and traffic signals can be upgraded with state-of-the art technology such as halogen bulbs and solar collectors and storage at power or signal poles. Lifecycle carbon costs of maintaining infrastructure as diverse as roads, bridges, and transit facilities can be evaluated so that the least carbon-intensive materials and procedures are used.

Waste and Recycling: There are GHG emissions associated with the energy involved in waste handling, and due to methane from waste decomposition as well as some GHG with high global warming potential from foam products and refrigerants released during the handling of these materials. Local governments are users of waste and recycling systems for their own operational waste. To reduce emissions from their own operational waste stream, jurisdictions can enhance employee access to recycling, create purchasing guidelines to emphasize recycled materials, less packaging, and to avoid products that release more potent GHGs. In one creative example, the City of San Francisco is replacing bottled water at coolers and in dispensers with filters on drinking fountains. Local governments also may operate or exercise contractual control over waste handling programs, depending on how these services are structured and provided in their jurisdictions. Emissions from this portion of the waste stream can be reduced through methane recovery, recovery of potent GHG from foam and refrigerant systems, and other adjustments to collection systems.

Water Delivery and Wastewater Treatment: Movement, storage, and treatment of water and wastewater use significant amounts of energy. Local governments can reduce their own water use by installing low-flow fixtures, by inspecting, repairing and replacing leaking components, especially irrigation and other water supply at remote sites that often go unnoticed for long periods, and through xeriscaping. Water reclamation and graywater systems can also trim the carbon footprint from water use, and managing time of demand with large water users can significantly alter the energy needs at peak delivery times.

Transportation: Local governments can reduce the GHG emissions of their vehicles by replacing older vehicles with the highest efficiency vehicle that can perform the needed function. They can also reduce the overall size of the fleet by increasing the use of pooled vehicles instead of assigned vehicles, and encouraging carpooling when on government business. As employers, local governments can institute programs to increase employee use of alternate modes of transportation, such as transit, carpooling, biking, and walking to work, and they can offer compressed work schedules, telecommuting, and even satellite offices. If properly designed, many of these strategies can also help decrease GHG from the public accessing the jurisdiction's services, as can offering access to services online.

The Built Environment: Commitments to highly efficient construction in their own new facilities is one way local governments can reduce carbon emissions from the built environment. Many local governments are building or retrofitting their facilities to LEED certification standards. The siting of new facilities is also an opportunity to improve access by employees and the public and reduce transportation related emissions. In addition, when it establishes the building codes for its jurisdiction, local government has the opportunity to significantly alter the energy used in constructing, maintaining, and using the built environment. A careful review of local needs and practices can identify opportunities for energy performance well beyond what is required under California's Title 24 standards.

California Academy of Sciences

Mitigation Projects: Separate from its core operational mission, a local jurisdiction can undertake projects or actions for the purpose of mitigating or offsetting GHG emissions. Examples of these projects include securing the development rights to land that might otherwise be developed (especially where the site does not lend itself to sustainable transportation planning) and undertaking reforestation projects either in open space that has been previously deforested, or through urban forestry efforts. Advanced technology demonstration projects can also ease the transition to new technologies and enhance public acceptance of them, for example purchasing or leasing a plug-in hybrid, fuel cell, or full electric vehicle and demonstrating its use at public events. Some local governments purchase emissions offsets for certain transportation-related emissions, such as

air travel, although any GHG emissions can be offset. When offsets are purchased, the jurisdiction should take extra precaution in verifying the value of the offsets, as some are of dubious origin.

Fostering GHG Reductions in the Business and Community Sectors

In addition to implementing programs to reduce its own carbon emissions, local government has an important role to play in bringing others to the table and helping them to reduce their GHG emissions. Local governments can develop public education and outreach programs, can establish public-private partnerships and programs to publicly recognize achievements, and offer incentives (non-monetary as well as financial) for actions that reduce GHG emissions. Examples of these types of actions are also provided as model policies in Chapter 6, but they can also be implemented without the benefit of an overarching plan.

Education and outreach programs would include events such as conferences, workshops, or fairs, featured speakers, public service announcements, print messages, and online information or interactive sites. Ideally, topics will span a broad range, including the fundamentals of climate change and how our actions contribute to it, down specific actions or projects, such as a "lights out" campaign, a "green tip of the day" or a how-to workshop on gardening with drought-tolerant, native plants. Programs involving schools are also beneficial, and model units on climate and conservation are available; events like poster contests and recycle drives are a good way to get children involved.

Local governments are also in a unique position to work with local businesses on climate protection projects and partnerships. Many of the GHG reduction strategies that rely on improved efficiency in energy, water, fuel use, or waste reduction, can generate significant cost savings for businesses over a fairly short time frame. A local government that has implemented some of these strategies in its own municipal operations is in a good position to demonstrate savings, but even if the government does have data of its own to share, it can encourage business participation in these types of programs.

Small Business Toolkit available at: www.coolcalifornia.org

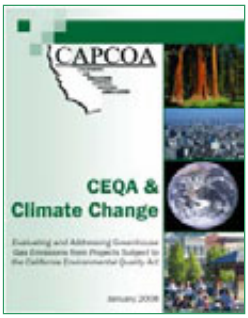
Suggestions include working with the local chamber of commerce, business associations, or business-focused civic groups to establish a forum to share efforts and results, such as

newsletters, or a monthly breakfast meeting or luncheon. Local government can also help establish demonstration projects, and can publicly recognize local leaders with awards or in public service messages.

Incentives are another important tool to encourage actions that reduce GHG emissions in the near term. To be effective, the incentive does not have to be monetary. As noted above, public recognition can be a powerful motivator, but local governments have other tools they can use to promote GHG emission reductions. Examples include preferred parking for electric or alternative fuel vehicles, and express permitting of projects on a "green project" list. Financial incentives can be small or large, beginning with free compact fluorescent light bulbs or reduced transit fairs on a designated "don't drive" day, to rebates for high efficiency toilets and electric lawn mowers, to creative financing for energy efficiency improvements or installation of solar panels. In some cases, the government can partner with the private sector for sponsorship of these kinds of efforts, which can help defray some of the costs.

Mitigating Impacts through Project Review

Local governments review proposed projects under CEQA, either as a lead or a responsible agency. Until recently, climate change was not considered an environmental impact under CEQA, and GHG emissions associated with projects were not quantified, disclosed, or mitigated. This has changed, however, and there is now broad recognition that these are potentially significant impacts, either individually or cumulatively, and that they do need to be addressed. Some jurisdictions recognized this early on and began to evaluate climate impacts during their CEQA review process. Following the passage of AB 32 in 2006, greater attention was paid to this issue, and in 2007, California's Attorney General put local governments on notice that these impacts could no longer be overlooked. There was a fair amount of confusion, however, about how to quantify GHG emissions, at what level they would be considered significant, and what steps could be taken to mitigate them.



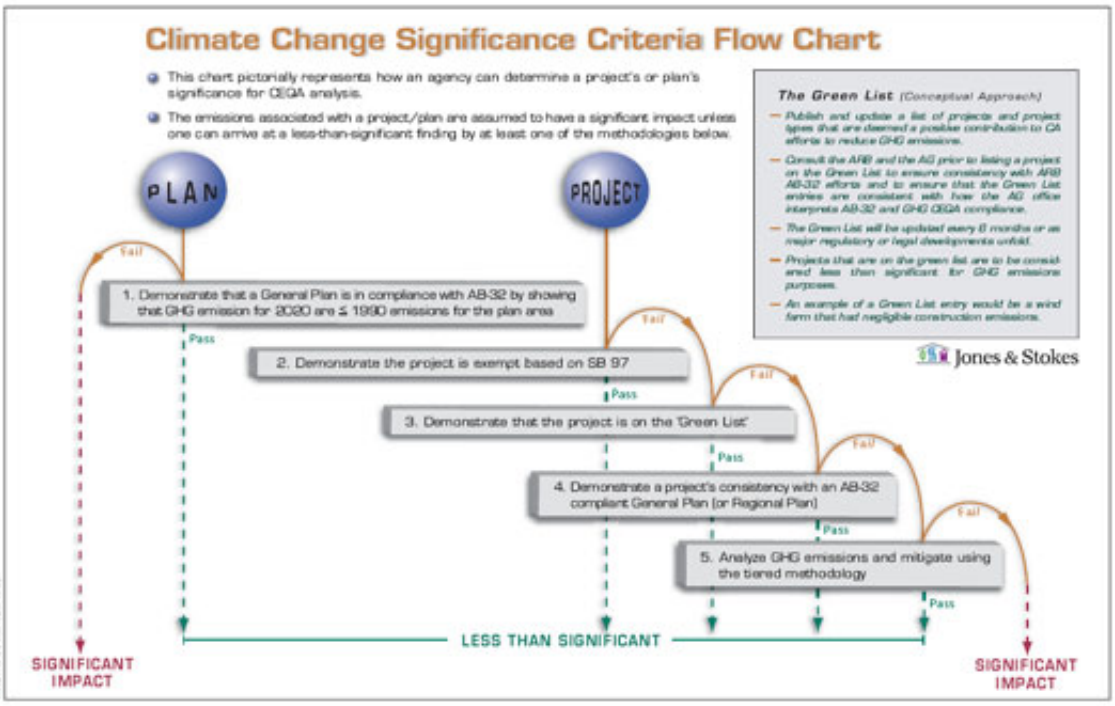
In January of 2008, CAPCOA released a resource document, *CEQA and Climate Change*, that collected and presented information to support local governments as they undertake a review of GHG emissions from projects subject to CEQA. The document considered approaches to determining significance of emissions, evaluated available methodologies and tools for quantifying GHG emissions, and provided a summary of GHG mitigation measures for projects.

Three approaches to determining significance are explored in the CAPCOA document, including the benefits and potential concerns associated with each. Significance can be determined without first establishing a significance threshold; in this case, the determination will be made on a case by case basis, which creates uncertainty and may be

vulnerable to challenge. A significance threshold can be set at zero, on the premise that any GHG emissions contribute in a cumulative way to the global problem; this approach is simple in its construct and provides certainty, but the work associated with preparing and reviewing EIRs on all projects is likely to overwhelm the system and lessen the effectiveness of review across the board. A significance threshold can be set at an emission level other than zero; the chief challenge for this approach is to identify and scientifically support an appropriate threshold, and the CAPCOA report evaluates several different options for doing this. Of particular interest are two elements discussed in the non-zero approach. These are: the role of robust treatment of GHG emission reduction policies in the General Plan, and the creation of a "Green List" of projects that will reduce or mitigate GHG emissions, both which could be used to substantially streamline the review process under CEQA. Figure 17 presents these non-zero threshold concepts in a flow diagram.

The CAPCOA report also evaluates a number of technical models and tools currently

Figure 17



Source: CEQA and Climate Change, CAPCOA 2008

available for quantifying GHG emissions, as well as several that are still under development. The report concludes that there is currently sufficient information to quantify GHG emissions for the purposes of evaluating projects under CEQA, but that improvements in several key areas will greatly improve the sensitivity and usefulness of available methods.

Finally the CAPCOA report compiles and presents information on measures to mitigate GHG emissions. It includes tables that provide information on measure applicability, jurisdiction, feasibility, effectiveness, secondary effects, and cost.

CAPCOA will provide a supplement to its report in 2009, with a summary of new developments in CEQA review of GHG, including policies and thresholds adopted since the original report, advances in methods and tools, and innovative strategies to mitigate impacts. Readers interested in additional information about mitigating emissions of GHGs from projects subject to CEQA are encouraged review CAPCOA's report and the 2009 supplement. Readers should also keep in mind that many of the mitigation strategies that are summarized in the CAPCOA report can be implemented even if there is no project subject to CEQA review, on a voluntary basis.

Finally, as discussed in Chapter 2, on April 13, 2009, the Governor's Office of Planning and Research recommended CEQA Guidelines changes to the Secretary of Natural Resources. The proposed changes include a new section that specifies that previously established standards of mitigation apply to GHG emissions. They also address the use of General Plans to streamline mitigation requirements, and specify that in order to use this approach, the General Plan must be specific enough in its treatment of the project type in an actual measure. The OPR package also proposes revisions to Appendix F that contain specific energy efficiency measures that may reduce GHG emissions.

Reducing Emissions through Planning

Historic & Projected Urbanization
Source: Climate Action Team draft 2009 Report to the Governor & Legislature

Transportation and energy use account for most of the emissions of GHGs. In order to achieve substantial and lasting reductions in these emissions, we need technological advances and we need policy advances. On the technology front, development alternative energy sources and low carbon fuels, more efficient vehicles and products that use less energy, and mechanisms to recover energy lost without beneficial work, or to capture and sequester or destroy emissions, will make a significant cut in the GHGs emitted by living and working in our world as we do now. But that is not enough to avoid the worst impacts of global climate change. We also need innovative policies that change the patterns of our lives to produce fewer GHGs. This means creating communities that are designed to decrease the use of single occupancy vehicle travel, to encourage the use of local products, and to minimize waste. The key to creating these communities is the General Plan.

Powerful forces and competing needs have combined to create the land use patterns we see today across California. It is neither quick nor easy to change these patterns, and

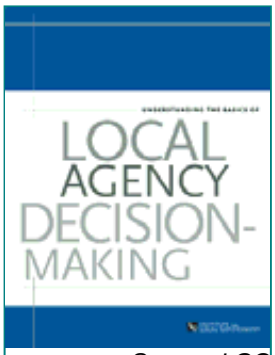
there are significant obstacles to overcome. Funding is one of the obstacles. In the Scoping Plan, ARB commits to work with other State agencies and with local governments to secure funding to support the planning needed to achieve real changes. Another obstacle is the uncertainty about outcome. Notwithstanding such obstacles, some local governments have moved forward with creative planning that has revitalized the urban core zones in their areas with transit-oriented, mixed-use, high-density development of brownfield sites. The results are vibrant, livable, walkable communities where local residents work, shop, and play, and which attract visitors and bring economic vitality along with quality of life. Examples can be seen in both urban settings such as Sacramento, as well as in suburban areas like Fruitvale in the San Francisco East Bay, and even more rural settings, such as Petaluma and Windsor in Sonoma County. By encouraging more of these models of sustainable design, we can demonstrate that they are not only feasible, but successful. In its Scoping Plan, ARB suggests that one possible use of revenue from the auction of credits in a cap and trade system, or from carbon fees, would be to provide incentives for sustainable land use design. Opportunities to support sustainable planning should be cultivated, to ensure that the most successful approaches are recognized and replicated.

The planning that local governments undertake, namely the General Plan, and any specific Area Plans or Climate Action Plans, can form the basis for thoughtful and effective actions to reduce GHG emissions from local activities. When this planning is undertaken in concert with broader regional planning, such as “Blueprint” planning, regional transportation planning, and air quality planning, the impact of GHG reduction efforts is multiplied many times. Chapter 4 discusses the role of these planning efforts, and how they interrelate to effectively respond to the challenge of climate protection.

Introduction

The commitment to reduce GHG emissions under AB 32, in and of itself, highlights the importance of effective long-term planning by local government to minimize GHG produced by land use and transportation patterns, use of natural resources, and the built environment. When it is considered together with the newly approved changes to regional transportation planning under SB 375, there is an overwhelming call to enhance our planning efforts and remake our communities so that they are sustainable, and sustaining. We have the tools to accomplish this, and now we have a substantial statutory underpinning to support the effort.

There are several key planning approaches a local agency can rely on to address climate protection goals. The intersection of AB 32 and SB 375 will result in regional GHG reduction targets in most metropolitan areas, with accompanying regional planning. This effort will be most effective if local governments support and reflect GHG reduction policies in their own local planning efforts. Local governments can also adopt separate Climate Action Plans that focus on an overarching commitment to greenhouse gas emissions reduction, and set forth the specific policies and mechanisms to achieve that reduction. Jurisdictions can incorporate climate protection goals into their General Plans, either through a stand-alone element or by integrating into existing elements. They can also rely on, draw from, and align with the measures in other regional plans, including "Blueprint" plans, air quality plans, and transportation plans. These options are not mutually exclusive; in fact, they will provide the most robust reductions in greenhouse gases if they are implemented in concert, with careful attention to coordination of goals and optimizing limited resources. An added benefit of a more comprehensive approach is the potential to simplify the administrative process associated with review of projects under CEQA, while ensuring the highest standard of environmental protection.



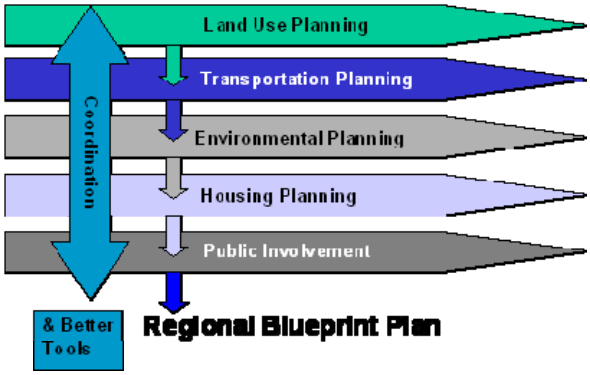
Source: LGC

Finally, as this coordinated planning effort moves forward it is important not to lose sight of the potential for unintended consequences, and to ensure a mechanism to review progress and outcomes, and to ensure those consequences, specifically any that would harm environmental justice goals, are addressed with prompt, mid-course corrections.

Regional Targets and Planning

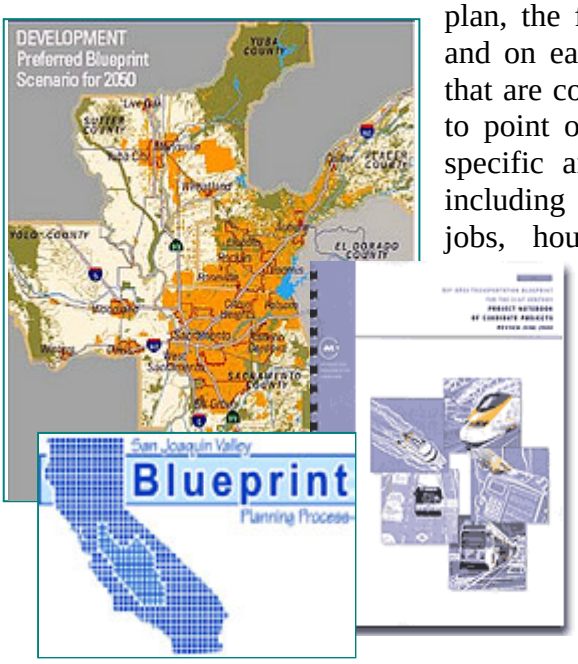
Recent studies with models of land use and transportation related emissions show that improved planning and design can reduce GHG from this sector by a significant amount. In the near term, that is by 2020, the emission reductions are relatively modest, on the order of 4% from the business-as-usual scenario. But because the benefits from these types of improvements accrue incrementally over time, as new planning policies are implemented and transportation patterns and habits change in response, the emission

reductions in out years are much greater. By 2030, reductions are projected to double, and by 2050, could be as much as 18%.



Source: www.fhwa.dot.gov

In order to actually achieve these reductions, air quality, land use, and transportation planning will need to be integrated regionally. These efforts have already begun in several large metropolitan areas, using a "Blueprint" planning model. This model allows the cities and counties within the region to collectively select future growth scenarios for land use and transportation that lead to more sustainable communities and cleaner air, including fewer emissions of GHGs. The plans are developed through a public process and provide for local accountability. Each jurisdiction incorporates the agreed-upon growth scenario into its General Plan. The success of the effort depends on the robustness of the Blueprint plan, the faithful incorporation into each General Plan, and on each jurisdiction making project-level decisions that are consistent with its General Plan. It is important to point out here that the planning needs to be highly specific and consider a number of important factors, including (but certainly not limited to) where current jobs, housing, and transportation infrastructure are placed, and the relationship of those things to the residents the project is intended to serve. While "high density" development is generally considered a product of "good" planning, if it is the wrong project, in the wrong place – that is, if it is implemented without consideration of all of the elements that contribute to the current pattern of land use and transportation – that high density project could actually exacerbate existing problems.



Recognizing the potential for long-term, durable reductions, ARB has proposed to establish regional GHG emission reduction targets. According to the Scoping Plan, ARB envisions a regional planning process that will: (1) Use integrated scenario modeling to align regional transportation plans and local General Plans; (2) Take into consideration other State policy goals; (3) Incorporate performance indicators to monitor progress; (4) Coordinate local and regional planning efforts to achieve maximum emission reductions; and (5) Establish priorities for and direct State resources to help local and regional governments meet the regional GHG targets.

As discussed in Chapter 2 of this report, SB 375 (Steinberg) establishes a statutory framework for this integrated regional planning approach. The Steinberg bill requires that ARB assign regional GHG reduction targets to specified metropolitan areas. Among other things, the bill also provides that ARB must approve the emission reduction quantification that underpins the Sustainable Communities Strategy (SCS) developed by these regions, or their alternate plan that contains additional reduction measures if the primary strategy fails to meet the assigned targets.

Under SB 375, the ARB is not given the authority or responsibility to determine the land use and transportation policies for any given region, nor is the regional planning body (the MPO) given any specific land use authority under SB 375. Land use decisions are still vested in the local city or county government. Because the SCS is part of the Regional Transportation Plan, however, and because SB 375 requires that funding allocated under the RTP be consistent with the programmatic and policy elements of the RTP, the bill essentially ties transportation funding for the RTP to implementation of the SCS policies.

Another important clarification is that the Alternate Plan is not part of the RTP, and therefore transportation funding is not linked to implementation of this plan. In order to incentivize its implementation, the bill provides exemptions from certain CEQA review requirements for projects consistent with SCS and ACS that achieve the regional target reductions in GHG emissions, as approved by ARB.

Finally, while there is material overlap between the policies that will be embodied in the regional SCS and the GHG reductions from measures in the city or county's General Plan or Climate Action Plan, they are not the same. The SCS is a transportation driven strategy, whereas the General Plan and the Climate Action Plan address other important opportunities for GHG reduction in addition to transportation. In the best case, the measures in the SCS will be reflected in and complemented by the measures in the General Plan and the Climate Action Plan.

Source: www.sacregionblueprint.org

Climate Action Plans and Commitments

In the Scoping Plan, ARB recognizes the value of local Climate Action Plans and commitments to reduce GHG emissions. Climate Action Plans provide an overarching policy direction for local governments committed to reducing GHG emissions within their jurisdictions. Many areas have

already established these plans; examples and references are included in Appendix G.

An effective Climate Action Plan will have several core elements, including an inventory of emissions, a target for reductions, timeframes, milestones, and tracking and accountability mechanisms, and strategies for achieving the reductions. First, as its foundation, the Plan will rely on a complete inventory of GHG emissions in what will become the Plan's base year. Although AB 32 identifies 1990 as a base year for California, most local jurisdictions do not have the underlying data necessary to establish GHG emissions in 1990. Rather than approximate emissions in that year, local governments are better served by selecting a year for which they have complete and accurate data on energy use, vehicle miles traveled, and other key parameters that affect GHG emissions. In selecting the year, it is helpful to also choose a year that is not heavily influenced by an unusual event or circumstance.

The inventory should include GHG emissions from three aspects of the local jurisdiction. There are emissions that result directly from local government operations, emissions associated with local government policies and decisions, and emissions from the community within the jurisdiction. Working with ICLEI and CCAR, ARB has adopted a reporting protocol for local government operations' GHG emissions. Information on calculating emissions associated with policies and decisions (essentially, land use and transportation emissions, as well as other sectors address in the General Plan) can be found in the CAPCOA report, *CEQA and Climate Change*, in the section on Analytical Methodologies. ARB is currently developing a reporting protocol for local communities, as well as a "Local Government Toolkit" which is available at www.coolcalifornia.org. Examples of Climate Action Plans that have baseline inventories are provided in Appendix G. There are also businesses and organizations that provide consulting services in this area.

In choosing emission reduction targets, the jurisdiction should consider the statewide GHG reduction targets, any assigned regional targets, and what is feasible for the jurisdiction to achieve. ARB has estimated that reductions of 28% from business-as-usual are needed on a statewide basis to reach the goals of AB 32. But the business-as-usual scenario may be difficult for a local jurisdiction to calculate. If the goals of AB 32 are presented as a reduction from the average statewide GHG emissions between 2002 and 2004, a reduction of almost 10% is needed. If a local government can establish a baseline looking at average annual emissions between 2002 and 2004, a reduction target to reduce the total GHG emissions from the jurisdiction by 10% by 2020 would be

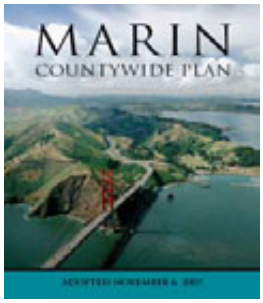
consistent with AB 32. While 10% may not sound like a large number, it is important to remember that the current trend is one of significant emissions growth. Regional targets for metropolitan areas will be developed and assigned pursuant to SB 375. Local feasibility will need to be assessed based on the jurisdiction's inventory and in consideration of local input through a public process.

AB 32 provides a fairly straightforward timeframe for achieving reductions in GHG emissions. Areas that adopted Climate Action Plans before the passage of AB 32 may have identified other deadlines for reaching their targets. For those areas, it may be useful to review their reduction targets and deadlines to ensure that the local commitments are consistent with statewide goals to the extent feasible. In addition to overall deadlines, however, intermediate milestones are important, and the Plan should specify mechanisms to measure progress, as well as make midcourse corrections if reductions are not being realized as anticipated. Milestones can be based on actual reductions in GHG, but because some analysis is needed to determine GHG emissions and reductions, there should also be performance milestones that reflect progress implementing plan elements.

Climate Protection in General Plans

Whether or not a local government adopts a Climate Action Plan, its General Plan should address climate change, its potential impacts, and local contributions to the problem. The Governor's Office of Planning and Research (OPR) is preparing guidance on this, which will be forwarded to the California Resources Agency for formal adoption. In addition, the California Attorney General has challenged the EIRs for General Plans that have failed to address climate change. Policies to mitigate climate change should be incorporated into the General Plan either within existing elements, or in a separate Greenhouse Gas Reduction element.

Incorporating Policies into Existing General Plan Elements- Existing General Plans will invariably contain policies (and any associated goals, objectives, policies, standards and implementation measures) that help to reduce GHG emissions. However, they are just as likely to contain policies that work against that goal. There are opportunities to strengthen existing General Plan policies and/or incorporate new policies that reduce emissions. Several options exist for integrating additional policies, including the three discussed below.



Policies may be incorporated into a jurisdiction's existing General Plan elements through a General Plan amendment. In this scenario, no additional elements would be necessary. Identifying existing policies in each General Plan element that already do or could help reduce GHG emissions would be a critical first step in assessing the type and nature of new policies needed. Categorizing existing helpful policies by their function would greatly aid this assessment; the following are important categories to include: land use, circulation, energy efficiency, alternative energy, municipal operations, waste reduction, conservation, and education. Incorporation of these policies should include a comprehensive review of all elements of

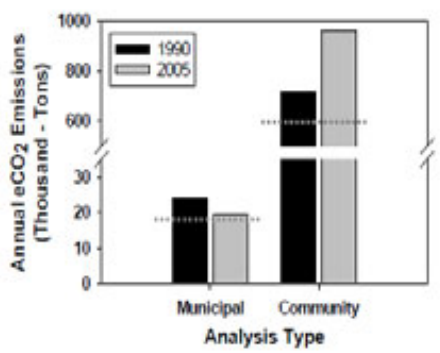
the General Plan to ensure that conflicting policies are eliminated as part of the amendment, in the interest of maintaining internal consistency.

Creating a Climate Change Element- A new climate change element could be added as an amendment to an existing General Plan. This should again be accompanied by a comprehensive review of the General Plan to identify and revise or eliminate conflicting policies. The element could include an introduction about climate change, a GHG inventory if feasible, and new and existing policies organized into the following categories: land use, circulation, energy efficiency, alternative energy, municipal operations, waste reduction, conservation, and education. These three main components of a climate change element are discussed further below.

The Introduction*:* The introduction should provide descriptive background information on climate change and its impacts to inform the reader on the issue and the need for incorporating new General Plan policies to reduce GHG emissions. Information needed for the introduction can be found in the first chapter in this report, as well as in Appendix D. Additional information is available from the Air Resources Board (www.arb.ca.gov), the Energy Commission (www.energy.ca.gov) the Climate Action Team (www.climatechange.ca.gov), and the National Academies of Science, Division of Earth and Life Science (www.dels.nas.edu/dels/).

The GHG Inventory*:* As described for Climate Action Plans, above, a greenhouse gas inventory is an important tool for establishing a baseline of existing emissions within the jurisdiction. This will greatly aid the process of determining the type, scope and number of GHG reduction policies to be included, particularly in the context of meeting regional GHG targets; it will also facilitate tracking of policy implementation and effectiveness. GHG inventories for local jurisdictions typically consist of two distinct components: one for the city/county as a whole defined by its geographical borders, and the second for emissions resulting from the city/county's municipal operations.

Fig. 18: Example Display of Municipal & Community Emissions

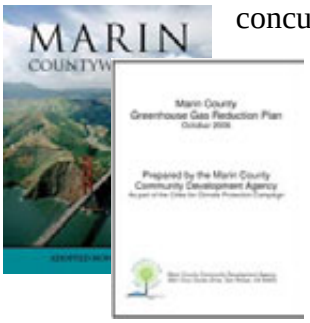


The municipal inventory would effectively be a subset of the community-scale inventory (the two are not mutually exclusive). Preparing an inventory is not required in order to incorporate General Plan policies that reduce GHG emissions, but it's highly advisable and is a critical component of any Climate Action Plan. The inventory may be included as an appendix to the General Plan. Figure 18 shows municipal and community emissions as calculated for the City of Chula Vista.

Objectives and Policies*:* As mentioned above, identifying existing General Plan objectives and policies that could or do reduce GHG emissions and categorizing them appropriately is a key step in determining what new policies may be needed to achieve established GHG reduction goals. The following eight category designations are recommended for this purpose: land use, circulation, energy efficiency, alternative energy, municipal operations, waste reduction, conservation, and education. These categories help associate the identified policies with how the reductions are achieved and indicate which General Plan element would contain related policies. Figure 19 shows how reductions in different categories add together to reach the overall target. The new objectives and policies developed for inclusion in this element would also be categorized in the same fashion, with the document structure similar to the other elements in the existing General Plan. Including a matrix or table of all the new and existing/revised policies in the element and the categories under which they fall is a helpful tool in developing implementation mechanisms.

Preparing a Climate Action Plan and Updating the General Plan

A jurisdiction may prepare a Climate Action Plan (CAP) prior to a General Plan update, concurrently with a General Plan update, or following a General Plan update. As described above, the Climate Action Plan would: provide background information on the causes of climate change and projections of its impacts on California and the jurisdiction; present estimates of the jurisdiction's baseline greenhouse gas emissions inventory and reduction target; describe recommended emission reduction actions in the key target sectors; and, identify next steps required over the near term to implement the plan.



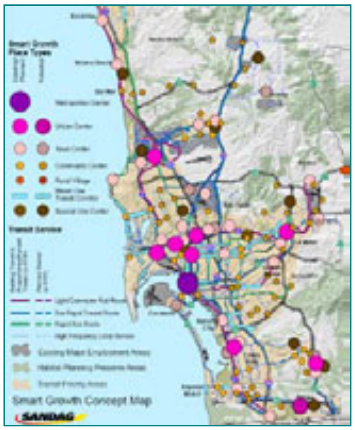
Preparation of a CAP prior to updating the General Plan would provide much of the information needed to incorporate appropriate GHG reduction policies into the update. That may not be feasible, however, and is not essential to the preparation of an effective General Plan update with sufficient climate protection measures. However, developing a CAP subsequent to completing the General Plan update may necessitate further revision of the General Plan to provide a general policy basis for the CAP actions.

Coordination with Other Regional Plans

Coordination with regional blueprint plans, regional transportation plans and air district attainment plans, is critical to ensuring the measures within each plan support and do not conflict with the other plans, and that they are working together to reduce GHG emissions. Communication and coordination can improve effectiveness and reduce costs.

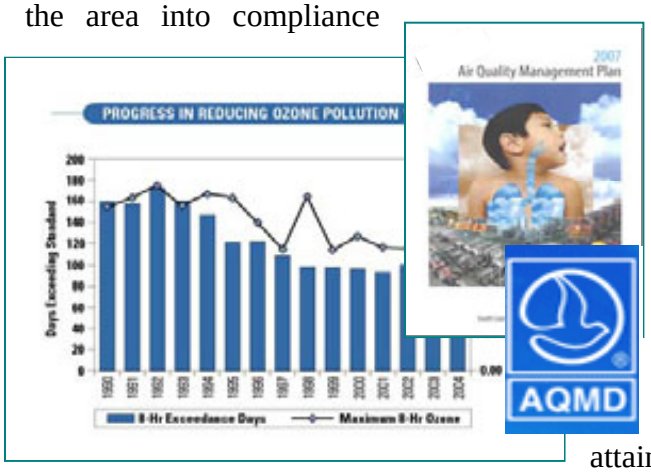
Association of Bay Area Governments
Bay Area Air Quality Management District
Bay Conservation and Development Commission
Metropolitan Transportation Commission

Coordination with Blueprint Plans: As discussed above, the AB 32 Draft Scoping Plan encourages local governments to incorporate regional "blueprint plans" into their General Plans. Blueprint plans are envisioned as regional guidance for land use decision-making that would be adopted by the applicable Regional Transportation Planning Agency or Metropolitan Planning Organization. Each regional blueprint would establish recommended land use patterns, transportation systems, and transportation investments to reduce GHG emissions, as well as other air pollutants and congestion within the defined region. The Proposed Scoping Plan does not identify specific mandates for General Plans, but recommends incentives for promoting consistency with one another, such as CEQA streamlining. Cities and counties should take an active part in drafting the blueprint plans through cooperation with the Regional Transportation Planning Agency or Metropolitan Planning Organization so that the plans reflect the cities' and counties' approaches to GHG emissions reductions.



Coordination with Air Quality Management Plans: California has 35 air pollution control districts (APCDs) and air quality management districts (AQMDs), each covering one or more counties. Air districts are governed by locally elected officials (or individuals appointed by locally elected officials) and have regulatory control over stationary sources of air pollutants such as industrial and manufacturing facilities. They are also responsible under CEQA for evaluating and recommending appropriate mitigation for air quality impacts of new development. Air districts also administer a variety of incentive programs to reduce emissions from diesel equipment, including engines, trucks, construction equipment, commercial vessels and other local emission sources.

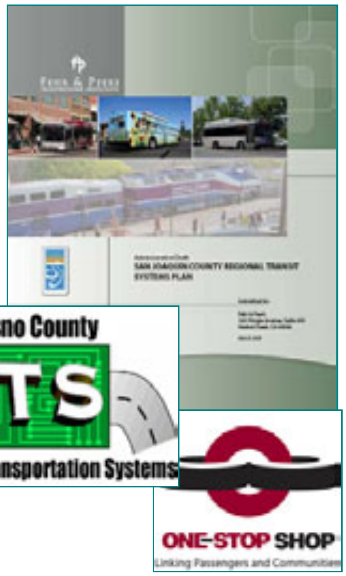
Air quality attainment plans are prepared by an air pollution control district or air quality management district for a county or region designated as a nonattainment area. The plans identify the control measures and market mechanisms that will be implemented to bring the area into compliance with the national and /or California ambient air quality standards within a specified timeframe. There are often policies, regulations, and programs within an attainment plan that may affect or influence local government activities. Participation by jurisdictions in the public review process required prior to adoption of an attainment plan is important to ensure all the planning efforts work together in achieving mutual goals. The local attainment plan can also be an important resource for jurisdictions embarking on GHG planning efforts. Many of the GHG



reduction strategies also reduce other air pollutants, and may therefore already be addressed in the local attainment plan, which can then be a starting point from which to expand the GHG plan. Even if the attainment plan does not contain some of the measures where there is overlap, coordination is important to determine how the two plans will impact each other, and if there are efficiencies, synergies, or even disbenefits between them. For this reason, it is important to contact your local air district when embarking on your GHG Plan.

Coordination with Regional Transportation Plans: The Regional Transportation Plan (RTP) is a long-term blueprint of a region's transportation system. These plans are normally the product of recommendations and studies carried out and put forth by a Metropolitan Planning Organization (MPO) or Regional Transportation Planning Agency (RTPA). The Plan identifies and analyzes the mobility needs of the metropolitan region and creates a framework for prioritizing and funding transportation projects to meet those needs during the timeframe of the plan. RTPs are typically updated every four to five years and have a twenty to thirty year planning horizon.

In developing the RTP, the MPO or RTPA must analyze population and growth trends and projections, regional land use and development patterns, existing transportation system efficiency for travel and goods movement, and the projected funding available to accomplish needed improvements. Thus, the MPO or RTPA must coordinate closely with local governments to ensure the RTP reflects the growth and development expectations of local General Plans. The adopted RTP must also be consistent with federal transportation planning requirements, and the projected emissions from transportation projects listed in the Plan must be incorporated into the local or regional air quality attainment plan.

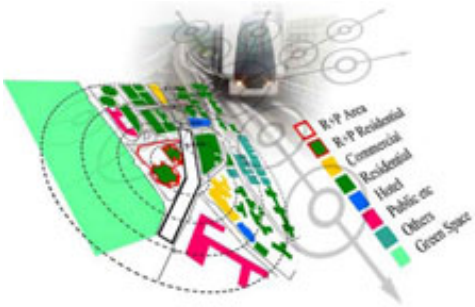


As described in Chapter 2 and at the beginning of this chapter, SB 375 requires RTPs to also contain a Sustainable Communities Strategy and (if needed) an Alternative Planning Strategy designed to meet the regional GHG reduction targets established by ARB. Although the legislation does not require local governments to incorporate the SCS into its own local planning efforts, there are strong incentives to do so.

CEQA Streamlining

The previous discussion of SB 375 outlined specific CEQA streamlining it affords. Even greater streamlining is possible, however, when the local government has adopted a Climate Action Plan, used it as the basis for addressing climate change in its General Plan, and made sure that those efforts reflect, to the extent possible, regional reduction targets and planning for transportation sustainability. When done in a thoughtful and comprehensive way, this integrated planning effort will yield a robust GHG mitigation

strategy with a programmatic EIR that, applied consistently to individual projects, can significantly reduce the procedural and administrative burden of review under CEQA, while ensuring full environmental protection.



The degree to which CEQA requirements can be streamlined will be directly proportional to the specificity of the applicable plans, and the extent to which they are consistent with each other. For example, the exemptions and streamlining under SB 375 generally rely upon the quantitative demonstration that the SCS/APS meets the regional target, and the existence of approved mitigation measures for transportation projects. In order to demonstrate that the target is met, the transportation models will require more detailed information about demand, use patterns, and other specific factors than is typically used in RTPs today. Some of this detail will have to come from local land use patterns and growth commitments. If the coordination between the local and regional plans is poor, the data will either not be available or will be conflicting, which will render the demonstration unapprovable.

The opportunity for CEQA streamlining also calls for greater specificity in the General Plan. For example, by including a "Green List" of projects in the plan and conducting the environmental review of the projects upfront, the local government can provide downstream relief from further review. This saves resources while preserving environmental protection, and it also enhances the viability of desirable projects.

The application of CEQA to a ubiquitous pollutant with such serious global impacts has raised a number of difficult policy questions, not the least of which concerns the appropriate basis for establishing a threshold of significance. Without engaging in a discussion of the various arguments here, it should be pointed out that the debate can be substantially minimized by undertaking a more thorough and coordinated planning effort upfront and limiting the involvement with CEQA for specific projects.

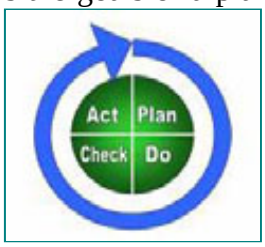
Unintended Consequences and Assuring Environmental Justice

Many of the measures that will be implemented to reduce GHG emissions will have co-benefits reducing criteria and toxic air pollution, and others are specifically designed to enhance the livability of local communities. But sometimes there are conflicts instead of co-benefits, and sometimes changes to communities can adversely affect some groups within the community, especially those who have lower incomes or are people of color. This kind of unintended consequence should be avoided.

A first step in avoiding environmental justice impacts is to actively seek and incorporate participation from all sectors of the community. This should include outreach efforts in

non-traditional as well as traditional media, and may rely on local advocacy groups, and religious and civic organizations. Where languages other than English are used, efforts should be made to provide information and materials in the language(s) most used. The goal of these outreach efforts is true communication, which is two-way. When done successfully, the agency will have explained what it is proposing and what the expected impacts are, and the community members will not only understand those things, but will have the opportunity to have their suggestions and concerns heard and addressed.

In addition to the existing mechanisms for tracking progress towards the goals of a plan or group of plans, it is important to establish a process and a schedule to review the impacts of implementation and especially to look for unintended and potentially adverse outcomes. This review should also include communication with the community. In the unfortunate, and hopefully rare situation where unintended and potentially adverse outcomes are found, steps should be taken to eliminate or mitigate those outcomes right away.



Although addressing climate change is a very important goal, it is not the only goal, and in certain circumstances it is expressly not the goal that governs. Specifically, AB 32 clearly states that climate protection will not come at the expense of air quality and public health protection. In addition, California law guarantees equal environmental protection to all Californians regardless of income status or ethnic background.

(page intentionally left blank)

The General Plan is the gateway to transforming our communities into more efficient, low-carbon, sustainable, vital places for us, our families, and our neighbors to live, work, and play. It is within this framework that the web of interactions between policies can be examined and aligned to produce the world we want for our future. The remainder of this report is devoted to exploring the General Plan process and ways to maximize its effectiveness for reducing GHG emissions and lessening the impact of climate change. This chapter discusses legal requirements for General Plans in California and their relation to potential new goals, objectives, policies, and implementation mechanisms to reduce GHG emissions. The General Plan requirements are set out in Section 65300 et seq. of the California Government.

Introduction

Every city and county must adopt "a comprehensive, long term General Plan" (§65300). The General Plan must cover a local jurisdiction's entire planning area and address the broad range of issues associated with a city's or county's development. The General Plan includes diagrams that illustrate the distribution of land uses, location of hazards, and location of the traffic circulation system. A city or county General Plan is expected to reflect local conditions and circumstances, while meeting the minimum requirements set out in state law (§65300.7).

These requirements are discussed in detail in the *General Plan Guidelines* issued by the Governor's Office of Planning and Research, which offers advisory, not mandatory, suggestions for the content of General Plans. In a broad sense, a General Plan is made up of text describing goals, objectives, policies, standards, and/or implementation measures, as well as a set of maps and diagrams. Together, these constituent parts paint a picture of the community's future development. In framing the model policies set forth in Chapter 6 of this report, CAPCOA used the following framework of goals, objectives, policies, standards, and implementation measures:

- Goal - A goal is a general direction for the jurisdiction. It is an ideal future end related to health, safety, or general welfare. "The General Plan shall consist of a statement of development policies and shall include a diagram or diagrams and text setting forth objectives, principles, standards, and plan proposals." (§65302) A goal is a general expression of community values and, therefore, may be abstract in nature and is generally not quantified or time-dependent. *Example: The County shall reduce its greenhouse gas emissions consistent with state and federal planning to reduce the scale and intensity of climate change effects on the County, the state, and the planet.*

- Objective - An objective is a specified end. It should be achievable, measurable and time-specific. An objective may pertain to one particular aspect of a goal or it may be one of several successive steps toward goal achievement. Consequently, there may be more than one objective for each goal. *Example: The County shall reduce its greenhouse gas emissions by 30 percent relative to business as usual emissions projected for year 2020.*

- Policy - A policy is a specific statement that guides decision-making. It indicates a commitment of the local legislative body to a particular course of action. A policy is based on and helps implement a General Plan's objectives. *Example: The County shall require new residential and commercial buildings to be energy-efficient in order to reduce greenhouse gas emissions.*

- Standards - A standard is a rule or measure establishing a level of quality or quantity that must be complied with or satisfied. Standards define the abstract terms of objectives and policies with concrete specifications. *Example: All new residential buildings shall achieve a minimum of 50 points on the Greenpoints rating system and all new commercial buildings shall achieve a minimum standard of LEED certification.*

- Implementation Measures - An implementation measure is an action, procedure, program, or technique that carries out General Plan policy. The General Plan is a policy document and is implemented by other governmental regulations and actions. Many General Plans include at least one corresponding implementation measure for each policy. *Example: The County shall establish a Green Building Ordinance that includes minimum requirements for residential and commercial energy efficiency within 24 months of adoption of the General Plan.*

Consistency

The overriding legal requirement for a General Plan is that it be internally consistent. "In construing the provisions of this article, the Legislature intends that the General Plan and elements and parts thereof comprise an integrated, internally consistent and compatible statement of policies for the adopting agency." (§65300.5). This requirement will come into play as GHG reducing measures are introduced into a General Plan, because so many of the measures cut across elements. So, for example, a land use policy supporting pedestrian-friendly streetscapes in a neighborhood center must be aligned with the transportation measures affecting that same neighborhood center, to ensure that they are compatible. If the transportation measures called for the removal of a planted median strip and the addition of traffic lanes through the neighborhood center, the elements would not be internally consistent.
Consistency is evaluated in five ways:

- All elements are equal - No element can supersede other elements or be the "default" element for resolution of conflicts between General Plan policies.

- Consistency between elements – The requirements of one element may not conflict with the requirements nor hinder the furtherance of goals and objectives of another element.

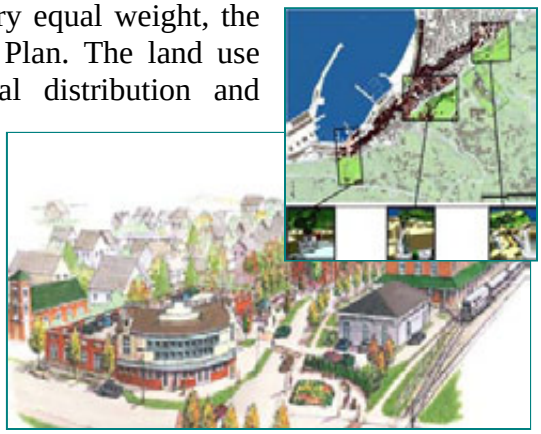
- Consistency within elements – Each element must be internally consistent between its various goals, objectives, and policies.

- Area Plan Consistency – If the General Plan includes Community or Area Plans, those must also be consistent with the overall General Plan.

- Text/Diagram consistency - Diagrams must be consistent with the General Plan's text and vice-versa.

GHG Reduction Opportunities in General Plan Mandatory Elements

Land Use Element



Although all elements of the General Plan carry equal weight, the land use element is the heart of the General Plan. The land use element must address the "proposed general distribution and general location and extent of the uses of the land for housing, business, industry, open space, including agriculture, natural resources, recreation, and enjoyment of scenic beauty, education, public buildings and grounds, solid and liquid waste disposal facilities, and other categories of public and private uses of land" (§65302[a]). The land use element shall include a statement of the standards of population density and building intensity recommended for the various districts and other territory covered by the plan. In addition, the land use element must identify and annually review those areas covered by the plan that are subject to flooding.

The land use element should, consistent with §65302(a), address each of the following issues to the extent that it is relevant:

- Distribution of housing, business, and industry;

- Distribution of open space, including agricultural land;

- Distribution of mineral resources and provisions for their continued availability;

- Distribution of recreation facilities and opportunities;
- Location of educational facilities;
- Location of public buildings and grounds;
- Location of future solid and liquid waste facilities;
- Identify areas subject to flooding;
- Identify existing Timberland Preserve Zone lands; and
- Other categories of public and private uses of land.

The key opportunities in the land use element related to GHG reductions include:

- Foster land use intensity near, along with connectivity to, retail and employment centers and services to reduce vehicle miles travelled and increase the efficiency of delivery of services through adoption and implementation of smart growth principles and policies;
- Improve the local jobs/housing balance to reduce vehicle miles travelled;
- Zone for appropriate mixed use development to encourage walking and bicycling for short trips, rather than vehicles;
- Link residential and commercial development to transit facilities;
- Reduce parking requirements to facilitate higher density development that fosters access by walking, biking and public transit;
- Identify potential sites for renewable energy facilities and transmission lines;
- Promote recycling to reduce waste and energy consumption; and
- Identify appropriate sites for waste recovery facilities to minimize escape of GHGs.

Conservation Element

Generally stated, the conservation element must address "the conservation, development, and utilization of natural resources including water and its hydraulic force, forests, soils, rivers and other waters, harbors, fisheries, wildlife, minerals, and other natural resources" (§65302[d]). This

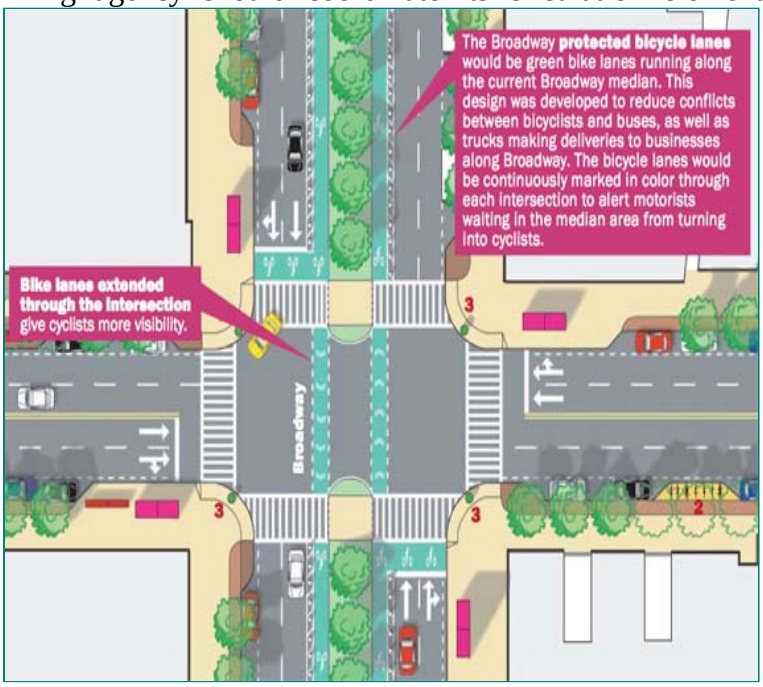
includes, but is not limited to, consideration of water supply to meet future needs, flood protection, the effects of development on water resources, erosion control, pollution prevention, and watershed protection.

The key opportunities in the conservation element related to GHG reductions include:

- Conserve natural lands for carbon sequestration;
- Identify lands suitable for wind power generation;
- Conserve water to promote energy efficiency;
- Promote recycling and waste recovery; and
- Promote urban forestry and reforestation as feasible.

Circulation Element

The circulation element is required "to identify the general location and extent of existing and proposed major thoroughfares, transportation routes, terminals, any military airports and ports, and other local public utilities and facilities, all correlated with the land use element of the plan" (§65302[b]). Typically, the circulation element describes the road system and its minimum development standards, as well as provisions for non-motorized transportation. The local planning agency should coordinate its circulation element provisions with applicable state and regional transportation plans (see §65103[f] and §65080, et seq.). Likewise, the state must coordinate its plans with those of local governments (§65080(a)). The federal government is under a similar obligation (Title 23 USC §134). If the circulation element is to be an effective basis for exactions, it must be based upon traffic studies that are sufficiently detailed to link land uses and related demand to future dedications.



The circulation element's policies can be a means of reducing vehicle miles traveled, a substantial indicator of GHG production from transportation. Key opportunities in the circulation element related to GHG reductions include:

- Identify and prioritize infrastructure improvements needed to support increased use of alternatives to private vehicle travel, including transit, bicycle, and pedestrian modes;
- Coordinate with adjacent municipalities, transit providers, and regional transportation planning agencies to develop mutual policies and funding mechanisms to increase the use of alternative transportation;
- Establish higher priorities for transit funding relative to street and road construction and maintenance;
- Incorporate "Complete Streets" policies that foster equal access by all users, including pedestrians and bicyclists;
- Promote linkages between development locations and transportation facilities;
- Preserve transportation corridors for renewable energy transmission and for new transit lines;
- Identify appropriate locations for intermodal transportation stations; and
- Identify opportunities, in cooperation with transit providers, to provide financing for transit operations and maintenance.

Open Space Element

The open space element is to identify open space for: (1) the preservation of natural resources; (2) the managed production of resources, including but not limited to, forest lands, rangeland, agricultural lands, areas required for recharge of groundwater basins, bays, estuaries, marshes, rivers and streams, and areas containing major mineral deposits; (3) outdoor recreation, including but not limited to, areas of outstanding scenic, historic and cultural value, areas particularly suited for park and recreation purposes, including access to lakeshores, beaches, and rivers and streams; and areas that link major recreation and open-space reservations; (4) for public health and safety; (5) open space in support of the mission of military installations, that comprises areas adjacent to military installations, military training routes, and underlying restricted airspace that can provide additional buffer zones to military activities and complement the resource values of the military lands; and (6) for

the protection of places, features, and objects of cultural value to Native American tribes (§65560).

The key opportunities in the open space element related to GHG reductions include:

- Identify existing and potential future urban growth boundaries to limit sprawling development patterns and foster a more compact urban form;
- Conserve natural lands for carbon sequestration; and
- Promote trail systems to facilitate bicycle and pedestrian trips in lieu of vehicle travel.

Housing Element

A General Plan is required to include a housing element "that facilitate[s] the improvement and development of housing to make adequate provision for the housing needs of all economic segments of the community" (§65580[d]). The housing element must provide opportunities for the private and public sectors to develop sufficient housing meet the jurisdiction's allocated share of the region's housing needs. Unlike the other elements of the General Plan, the housing element requirements are quite detailed and must be followed carefully. In addition, the housing element is subject to review by the state's Housing and Community Development Department for consistency with state law. The housing element must be updated every five years.

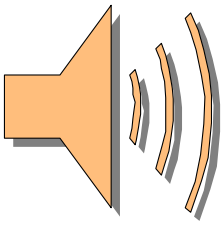
The key opportunities and constraints in the housing element related to GHG reductions include:

- Identify sites for higher density housing closer to employment centers, retail and services, and transit facilities;
- Identify sites for affordable housing for workers close to employment centers;
- Establish or support programs to assist in the energy-efficient retrofitting of older affordable housing units; and
- Balance additional upfront costs for energy efficiency and affordable housing economic considerations by providing or supporting programs to finance energy-efficient housing.

Noise Element

The noise element must identify and appraise noise problems in the community for the purpose of avoiding conflicts with noise-sensitive land uses (§65302[f]).

The noise element does not contain any measures that directly reduce GHG emissions. However, some of the potential GHG reduction strategies in other elements such as increased residential density, mixed use, expanded transit services, and wind energy could adversely affect the noise environment, which would be an issue for the noise element to address. The noise element's development standards may need to be strengthened to ensure that higher densities and mixed uses avoid excessive noise exposure for residents. At the same time, some GHG reduction strategies, for example, those that increase energy efficiency by adding insulation, may have a positive impact on the noise environment.



Safety Element

The safety element is to provide for the protection of the community from any unreasonable risks associated with the effects of seismically induced surface rupture, ground shaking, ground failure, tsunami, seiche (wave), and dam failure; slope instability leading to mudslides and landslides; subsidence, liquefaction, and other seismic hazards, and other geologic hazards known to the legislative body; flooding; and wildland and urban fires (§65302[g]).

With inevitable climate change impacts already occurring and predicted to occur in the future, adaptation to changes in safety hazards, such as potential increase in wildland fire potential or coastal or delta flooding resulting from sea level rise, would be topics of discussion in future safety elements. Adaptation planning for climate change impacts is an important and growing issue area that should be incorporated into local and regional planning processes. As this paper only focuses on GHG reductions, issues related to adaptation are not discussed further.

Air Quality Element (Mandatory Only in the San Joaquin Valley)

Many cities and counties throughout the State have adopted air quality elements. They establish policies for reducing emissions from stationary, mobile, and area sources of air pollution. In most cases, the local air district either provides model elements, or assists the city or county in development of the element. The cities and counties within the jurisdiction of the San Joaquin Valley Air Pollution Control District are required to adopt an air quality element. Under statute, the element is to integrate land use plans, transportation plans, and air quality plans, as well as provide for multimodal transportation options that will reduce vehicle trips (§65302.1). Cities and counties

should contact their local air district when developing an air quality element.

The key opportunities and constraints in an air quality element related to GHG reductions include:

- Integrate land use plans and transportation plans;
- Provide multimodal transportation options;
- Co-benefits of criteria pollutant reduction strategies that also reduce GHG emissions and vice versa; and
- Disbenefits of potential GHG emissions reductions strategies on criteria and other pollutants.

GHG Reduction Opportunities in Non-Mandatory Elements

State planning law authorizes cities and counties to adopt additional elements that "address any other subjects which, in the judgment of the legislative body, relate to the physical development of the county or city" (§65303). There are no statutory requirements for the subjects or content of any of these optional elements. Following are some of the common optional elements. Keep in mind that each city and county has its own definition of what the element should contain.

Energy

A number of cities and counties have adopted energy elements as part of their General Plans. There are no energy element guidelines or standard set of required contents. In some jurisdictions, these elements establish policies for energy extraction. In others, they are concerned with the conservation of energy.

The key opportunities in an energy element related to GHG reductions include:

- Energy-efficiency requirements for residential, commercial, and industrial construction under local jurisdiction that exceed current standards;
- Facilitate residential and commercial renewable energy facilities (solar array installations, individual wind energy generators, etc.);
- Promote cogeneration facilities for combined heating and electricity;
- Facilitate renewable energy facilities and transmission line siting;
- Establish energy-efficiency standards for public facilities;

- Establish policies to reduce municipal and community petroleum consumption through changes in the vehicle fleet; enhancement and promotion of public transit, carpooling and other transportation modes to reduce employee and student commute trips;

- Establish policies to reduce GHG production by city and county operations, such as improved energy efficiency of public buildings, recycling at public buildings.

Economic Development

Economic development elements generally establish policies intended to encourage economic development within the community. These may include establishing incentives for development, identifying areas of greatest development potential, and creating the basis for other economic development activities to be undertaken by the jurisdiction.

The key opportunities in an economic element related to GHG reductions include:

- Incentives for investment in and deployment of renewable energy technologies;

- Incentives for development of local green technology businesses and locally produced green products;

- Incentives for investment in residential and commercial energy efficiency improvements;

- Incentives for employers to provide workforce housing, thereby reducing the length of trips to work;

- Policies to enhance sales tax revenues that promote incorporation of larger retail uses within downtown areas and mixed use developments to facilitate access by alternative transportation, in favor of larger retail or mixed use developments on the urban fringe;

- Establish financing districts (in charter cities) to encourage installation of solar panels and other energy-efficient improvements (e.g., City of Berkeley Solar Financing District, 11/07);

- Encourage implementation of AB 811 (Levine, see Chapter 159, Statutes of 2008), Renewable Energy Resource Credit (7/08), for low interest loans for energy improvements; and

- Use AB 811 to finance the installation of distributed generation renewable energy sources or energy efficiency improvements to lots or parcels which are developed and where the costs and time delays involved in creating an assessment district pursuant to other provisions of law would be prohibitively large relative to the cost of the public improvements to be financed.

Capital Improvements/Public Facilities

Capital improvements are often discussed in the circulation element of the General Plan. However, some cities and counties have adopted separate capital improvements or public facilities elements that discuss expected demand resulting from growth under the General Plan and identify necessary facilities to serve that growth. In some cases, the element will estimate costs and recommend implementation methods for raising the needed funding.

Chartwell School, Seaside, LEED Platinum

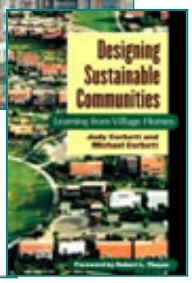
UC Merced, LEED Gold

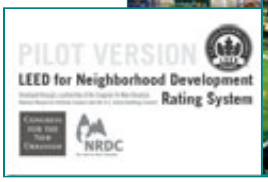
The key opportunities in a capital improvements/public facilities element related to GHG reductions include:

- Establish energy-efficiency standards for public facilities;
- Promote solar installation opportunities for public facilities;
- Other building design energy and water efficiency standards for public facilities;
- Establish purchasing and procurement policies that support the use of green products and services; and
- Identify needs and funding sources for alternative transportation modes such as bicycle facilities and improved transit infrastructure.

Community Design

Community design elements typically provide a set of policies that promote better urban design. These often include provisions for aesthetic treatments, architectural design guidelines, and preferred street design.





The key opportunities in a community design element related to GHG reductions include:

- Incorporate urban design principles that promote higher residential densities in attractive forms with easily accessible parks and recreation opportunities nearby;

- Use urban design standards to facilitate clustered, higher-density, mixed use communities with greater potential for transit ridership, alternatives to vehicle travel, and shorter trips;

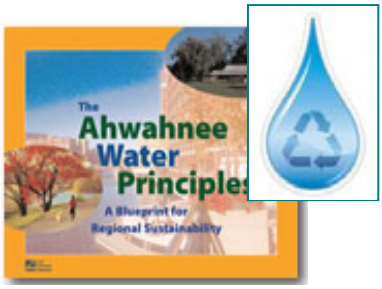
- Establish policies and design principles to incorporate inviting public spaces in high density, mixed use communities;

- Incorporate "Complete Streets" policies that foster equal access by all users, including pedestrians and bicyclists; and

- Promote water-efficient and energy-efficient housing and commercial areas.

Water

A water element typically identifies projected water demand based on the General Plan growth. It describes water supplies within the city or county (most water elements have been adopted by counties) and policies for matching future demand.



Available from: Local Government Commission

The key opportunities in a water element related to GHG reductions include:

- Incorporate water conservation measures for municipal operations and throughout the community to reduce GHG emissions from pumping and water delivery; and

- Adopt policies and standards to facilitate water recycling for use on landscaping, agricultural operations, and other applications where potable water is not required, to reduce pumping-related GHG emissions.

- Because energy used in moving water through the system is a major component of the GHG inventory, include measures that reduce peak demand for water, and therefore allow for smaller pumps that use less energy overall.

Agriculture

Available from: UC Davis Small Farm Center

Agricultural elements typically identify the highest quality farmland within the city or county (most agricultural elements have been adopted by counties) and establish policies that protect that land from premature conversion to other uses. The goals of an agricultural element are usually aimed at preserving the long-term viability of the agricultural economy of the city or county.

The key opportunities in an agricultural element related to GHG reductions include:

- Establishment of minimum parcel sizes for agricultural lands outside of Agricultural Preserves and restrictions on non-agriculture related development and uses on agricultural parcels to enhance the viability of local agriculture and prevent additional sprawl development that increases dependence on and emissions from private vehicles;

- Development of policies and incentives (e.g., carbon credit programs) to promote voluntary preservation of farmland for carbon sink purposes;

- Adoption of policies and programs that facilitate local farmers markets and farmer co-ops that allow residents to purchase local farm goods and reduce emissions from transportation of agricultural products; and

- Support for agricultural industries that reduce the need to move agricultural products long distances for processing or packaging.

- To the extent the agricultural element addresses water use, it should be noted that efficiencies here, or use of alternatives, can provide substantial GHG reductions.

Element Interrelationships

This section discusses the interrelationships between the mandated General Plan elements by identifying the cross-cutting issues for GHG emissions and opportunities for reductions, categorized by each required element. As previously described, a General Plan must be internally consistent across all adopted elements; thus, cross-cutting issues must be evaluated closely to ensure the goals, objectives, policies and implementation measures in one element do not conflict with, or hinder the implementation of, the requirements of other elements. Cross-cutting issues are first identified in a matrix format; those issues are then matched with the critical relationships that must be established across the elements in a General Plan to identify appropriate linkages and enhance internal consistency. Some examples of consistency considerations include the following:

- Density and Transit-Oriented Development – If increased density and transit-oriented development are strategies used to reduce vehicle miles travelled (and their associated GHG emissions), then the General Plan must provide the land use designations to allow such density to occur, identify the locations where those strategies are to be applied, and identify the land and other infrastructure necessary to facilitate transit connections. This requires consistency between the land use, circulation, housing, and possibly other elements of the General Plan. Further, site constraints such as toxics contamination, noise, or air quality emissions hot spots need to be considered before designating sites for high density and transit-oriented development in order to maintain consistency with the noise and safety elements.

- Specific Plans, Community Plans, and Area Plans: These types of land use plans are used to implement the General Plan. Where the General Plan provides for the preparation of any of these more specific land use plans to implement its strategies, those plans must be consistent with the policies of the General Plan. In particular, development intensity, population density, and location within the community, and roads and transportation facilities will be important facets of plan consistency.

- Energy-Efficiency Requirements – If new policies are added to increase the energy-efficiency requirements beyond that established in current Title 24 standards, these requirements could raise the cost of housing, which could affect the jurisdiction's ability to meet its mandatory requirements for the provision of affordable housing under the housing element. Those policies must not impede the jurisdiction's ability to meet its assigned share of the regional housing need. This requires coordination between the land use, housing, and energy (if one exists) elements.

- Renewable Energy – If new policies require further reliance on renewable energy for municipal and community electricity, then the General Plan must also address the availability of land for new facilities and transmission lines and their compatibility with existing and future adjacent uses. This requires coordination between the land use, circulation, and energy (if one exists) elements and possibly the open space and agriculture elements for transmission lines.

Table 1 (on the next page) summarizes the key element interrelationships relevant to broad GHG reduction strategies. This is also not a comprehensive list of GHG reduction approaches, but is intended to highlight the key linkages between General Plan elements for the strategies with greatest potential for GHG reductions that are under the control or influence of local land use authorities.

Table 1. Element Interrelationships for Greenhouse Gas Emission Reduction Strategies

Reduction Strategy	Key Element Interrelationships
Promotion of jobs/housing balance	Local governments can promote economic development to provide employment for the future workforce of the county and housing appropriate to that workforce to reduce out-of-area and out-of County commute miles and associated vehicle emissions. Mandatory Elements: LAND USE, HOUSING Optional Elements: ECONOMIC DEVELOPMENT
Increased housing density/mixed use/TOD/infill development	Local governments can designate areas of increased density in proximity to employment centers, services, transit linkages, and alternatives to single-occupancy vehicle travel. Mandatory Elements: LAND USE, CIRCULATION, HOUSING, OPEN SPACE Optional Elements: COMMUNITY DESIGN, ECONOMIC DEVELOPMENT
Increased transit	Local government can facilitate increased transit use through efficient links between employment centers, services, and clustered residential areas and to different modes of travel in cooperation with adjacent cities/counties, transportation providers, and regional transportation agencies. Local governments must also address safety and noise issues for new facilities. Mandatory Elements: CIRCULATION, LAND USE, NOISE, SAFETY. AIR QUALITY Optional Elements: AIR QUALITY
Alternative vehicles and alternatives to vehicle travel other than transit	Local government can facilitate bicycle and pedestrian linkages between residential areas, schools, services, centers of employment and recreation. Local government can also utilize alternatively-fueled vehicles for municipal operations and require recharging stations for electric vehicles at new private development Mandatory Elements: CIRCULATION, LAND USE, OPEN SPACE Optional Element: PUBLIC FACILITIES, AIR QUALITY
Energy-Efficiency (public)	Local governments can undertake cost-effective energy-efficient investments, while saving energy costs over the long run. Mandatory Element: LAND USE Optional Elements: ENERGY, PUBLIC FACILITIES, COMMUNITY DESIGN
Energy-Efficiency (private)	Local governments can promote or require energy-efficiency in new residential, commercial, and industrial development that will reduce GHG emissions related to electricity and natural gas consumption. This can include support for programs to retrofit existing residences and businesses. Mandatory Elements: HOUSING, LAND USE Optional Elements: ENERGY, COMMUNITY DESIGN

Reduction Strategy	Key Element Interrelationships
Renewable Energy (utility)	Local governments can identify sites for new renewable energy facilities and transmission lines. Mandatory Elements: LAND USE, CIRCULATION, CONSERVATION Optional Element: ENERGY, AGRICULTURE
Renewable Energy (residential/commercial)	Local governments must balance between the GHG reductions from residential/commercial solar and wind installations and concerns about safety, noise, and aesthetics. Policies should encourage these uses while establishing safety, noise, and aesthetics standards, consistent with state law. Mandatory Elements: LAND USE, NOISE, SAFETY Optional Element: ENERGY
Waste Reduction, Recycling, Reuse, and Recovery	Local governments can promote waste reduction, increased recycling, waste diversion, waste to energy and waste recovery through direct action. Mandatory Elements: LAND USE, CONSERVATION, SAFETY Optional Elements: ENERGY, PUBLIC FACILITIES, AIR QUALITY
Water Conservation and Recycling	Local governments can promote water conservation and recycling through landscaping and irrigation requirements and limitations, fixture and appliance requirements, and expanded use of reclaimed water. Plan policies would set the stage for water conservation and recycling ordinances. Mandatory Elements: LAND USE, CONSERVATION, SAFETY Optional Elements: ENERGY, PUBLIC FACILITIES, AIR QUALITY

Introduction

This chapter provides a presentation of an overarching climate change goal (to reduce municipal greenhouse gas emissions in a manner that is consistent with AB 32) and related objectives, policies, and implementation measures for incorporation into a General Plan - whether as part of an Air Quality element, as a separate Climate Change element, or interspersed throughout other existing elements as appropriate within a General Plan. The model policies provided in this section are grouped by General Plan element, and are provided in a format that should be readily included in a city or county's General Plan. The city or county has full discretion on where to place the policies, whether to change their format or content, and, indeed, whether to incorporate them at all. This report and policies in it are not intended in any way to dictate what a city or county chooses to include in its plan; that choice remains the purview of the locally elected officials who approve the city or county's General Plan.

However, if and when a city or county chooses to incorporate GHG reduction strategies into its General Plan, or into another guiding document, such as a Climate Action Plan, the following policies represent the best practices and current knowledge in land use planning. The climate change policies presented here were compiled through an extensive review of General Plans and Climate Action Plans from cities and counties throughout the State that are already moving forward to address climate change and GHG emissions. CAPCOA, with the help of its contractors, surveyed current practices in the field and aggregated them into model policies to ease the burden on staff at already strapped city and county land use agencies. Those staff remain the experts on their local land use circumstances and needs, however, and their knowledge and judgment, with the oversight of their policy boards, will shape when and how GHG reduction strategies are applied within their jurisdictions. This is not an exhaustive list -- local governments are encouraged to address climate change and GHG emissions through additional or reworked policies and implementation measures according to their unique needs.

The Model Policies

The menu of objectives, policies, and implementation measures is grouped around nine General Plan elements, including one new element, "Greenhouse Gas Reduction Planning." A city or county can place the policies it selects into the most relevant existing General Plan element, if the city or county is integrating GHG reduction strategies throughout its General Plan. On the other hand, the city or county may choose to group all GHG reduction policies under one element, in which case the Greenhouse Gas Reduction Planning element could be broadened to accommodate that. The nine greenhouse gas reduction categories for which model policies are provided are as follows:

1) Greenhouse Gas Reduction Planning (overall);
2) Land Use and Urban Design;
3) Transportation;

4) Energy Efficiency;
5) Alternative Energy;
6) Municipal Operations;
7) Waste Reduction and Diversion;
8) Conservation and Open Space; and
9) Education.

These categories do not correspond exactly to standard California General Plan elements. Some of the policies in this chapter correspond to multiple standard elements, and some do not correspond to any of the required California General Plan elements. These policies could be included in a separate Climate Change element. Please see the table at the end of this chapter for suggestions on which standard elements some of the policies may correspond to. A broad policy goal is identified for GHG reductions in each of these nine categories; more specific objectives are identified within each category; and the model policies are grouped by objective, and are numbered accordingly.

Focus of Policies for Different Communities

There are over 500 cities and counties in California. These jurisdictions range in size from the City of Los Angeles, with over 4 million residents, to the City of Dorris, with less than 900 residents. The eastern portion of the state north of San Bernardino County, and the northern tier of counties from Modoc to Mendocino are generally rural, with only small cities. Although climate change is a global concern and activities throughout the state are contributors, the capability to incorporate and implement climate-related General Plan policies and the applicability of those policies varies among cities and counties.

Policies suitable in urban and suburban areas in the Bay Area, San Joaquin Valley, SCAG region, and San Diego may be infeasible in rural areas that have different land use and resource bases . For that reason, the policies discussed above cannot be considered “one size fits all” solutions. Therefore, providing suggestions about the suitability of policies by general region of the state makes sense.

Air Quality Co-benefits from Greenhouse Gas Reduction Measures

When considering the implementation of a climate change measure, it is vital to consider and discuss the environmental co-benefits associated with GHG reduction measures. If one does not clearly show the co-benefits, then a third party could assume that the only function of a GHG reduction measure is to reduce GHG emissions.

It is well known within the environmental planning community that almost all efforts to reduce GHG emissions result in significant reductions in conventional air pollutant emissions. For instance, most efforts to reduce automobile use through smart growth design principles or improvements in public transit should result in reductions in both

GHG emissions and conventional pollutants associated with smog (such as NOx, PM, VOCs, and ozone). Additionally, efforts to conserve electricity will reduce both GHG emissions and conventional pollutant emissions from power plants.

There are limited scenarios where GHG reductions may cause local air quality impacts. For example, efforts to increase certain types of distributed power generation through the non-optimal combustion of landfill gas may produce localized NOx emissions that contribute to regional smog. Likewise, increasing densities near transit hubs and transportation corridors could increase exposure to unhealthy diesel emissions in certain areas. Fortunately, the potential for adverse air quality impacts from GHG reduction programs and plans is small; in the overwhelming majority of cases, measures implemented to reduce GHG emissions will also contribute to improved air quality.

Since a majority of Californians live in areas where air quality does not meet state and federal health standards for at least one pollutant, GHG reduction measures make sense from a direct and *local* public benefit perspective since they would likely contribute to improved local air quality. Clearly identifying the co-benefits of implementing such measures will potentially engender the support of a broader range of the community.

The communities surrounding the major California ports are a good example. Given the public health concern regarding diesel particulate matter emissions from ships and heavy duty vehicle use near ports, it is highly likely that local residents would prefer and support GHG programs that reduce exposure to pre-existing and well-known local air quality problems to a greater extent than GHG reduction programs that do not have local air quality improvement benefits. Addressing both GHG emissions and local health concerns simultaneously should be encouraged and may determine the selection of optimal multi-target reduction measures.

In general, public support and acceptance of GHG reduction efforts will be enhanced by the clear presentation of the co-benefits associated with these actions. This presents a significant opportunity to local decisionmakers to help improve public health and welfare in their local communities while simultaneously addressing the critical issue of climate change.

Worksheet for Evaluating Policies

Table 2 provides a worksheet for evaluating the expected impact of these policies, as well as factors that affect their implementation. The impacts will vary depending on a number of factors specific to each city and county. As stated previously, the effectiveness of many of these policies depends on how they are applied. For example, a number of the model land use policies are designed to support high-density development near the city center. Done properly, this strategy will result in a workforce that lives near the jobs it fills, and that relies on transit, biking, and walking to commute to work and school, and to reach a broad range of nearby services. If, for example, the housing is not in the proper price range for the workers who fill the local jobs, or if those jobs cannot be easily and safely reached using transit or other modes of transportation, the effect of the strategy

will be much less, and may even be negative. In the worst case, the housing could be purchased by people who work in remote areas and commute to their workplaces in single-occupancy vehicles, and this new housing could displace other housing that was in better balance with the local jobs, causing those workers to commute into the urban core. In the worksheet, each policy is referenced by number and name. For more detail on the policy, please refer to the text of the corresponding model policy, following in this chapter. The worksheet addresses the following factors:

- Implementation Examples: To the extent that CAPCOA has information, this information is already entered in the worksheet, to show the reader/practitioner examples of places this policy has been adopted or implemented in practice.

- Appropriate General Plan Element: This information is also already entered into the worksheet, to suggest (but not dictate) the most appropriate element or elements where the referenced model policy could be incorporated.

- Relative Effectiveness Reducing GHGs: We suggest ranking measures based on your estimate of their relative effectiveness, considering the local environment and constraints. This does not have to be quantitative; a rating of 1 to 3, or 1 to 5, could be used, or Low-Medium-High, for example. For more information on estimating effectiveness, consult the CAPCOA document on CEQA and Climate Change, the California Climate Action Registry, ICLEI[1], or the ARB Local Government Toolkit.

- Relative Difficulty to Implement: This is intended to be a measure of how prepared a jurisdiction is to implement a measure (do you have the necessary authority, knowledge, infrastructure, and resources, for example) as well as the expected political acceptability and the acceptance by the community.

- Relative Time for Reductions to Occur: This is not intended to be a precise measure, rather a qualitative one. We suggest "near term," "mid term," and "long term" for example, or another system for sorting and ranking measures based on when the return is expected to occur.

- Relative Cost: Measures could be rated qualitatively, for example as low, medium, or high costs, or between $ and $$$$$, with more dollar signs indicating a higher relative cost. Alternatively, a rough cost range could be used.

As cities and counties review these model policies and select the ones that are most appropriate for their jurisdictions, they should make clear and careful decisions about criteria that will properly target the policies to best achieve their intended result.

The model policies are provided in a form that begins, "The City/County will…" To reiterate, this is not meant to dictate what any city or county will do; rather, if a city or

[1] ICLEI is Local Governments for Sustainability

county wishes to incorporate a model policy, the policy has been written to allow the city or county to simply insert its name into the policy in place of "The City/County." As already stated, if other language or another format is preferred, the city or county has full discretion to make any such changes.

As previously noted, the California Air Resources Board has developed an online toolkit of measures for local governments to reduce global warming pollution, available at www.coolcalifornia.org. This toolkit contains emissions inventory utilities, case studies of local governments who have effectively reduced their global warming pollution, financial assistance available for conservation efforts, and other valuable information.

Greenhouse Gas Reduction Planning Policies

Goal: Reduce GHG emissions from all activities within the City/County boundaries to support the State's efforts under AB-32 and to mitigate the impact of climate change on the City/County, State, and world.

Objective GHG-1: By 2020, the City/County will reduce greenhouse gas emissions from within its boundaries to a level 30% less than the level that would otherwise occur if all activities continued under a "business as usual" scenario.

GHG-1.1 Emission Inventories: The City/County will establish GHG emissions inventories including emissions from all sectors within the City/County, using methods approved by, or consistent with guidance from, the ARB; the City/County will update inventories every 3 years to incorporate improved methods, better data, and more accurate tools and methods, and to assess progress.

1.1.1 The City/County will establish a baseline inventory of GHG emissions including municipal emissions, and emissions from all business sectors and the community.

1.1.2 The City/county will define a "business as usual" scenario of municipal, economic, and community activities, and prepare a projected inventory for 2020 based on that scenario.

GHG-1.2 Climate Action Plans: The City/County will establish plans to reduce or encourage reductions in GHG emissions from all sectors within the City/County.

1.2.1 The City/County will establish a Municipal Climate Action Plan which will include measures to reduce GHG emissions from municipal activities by at least 30% by 2020 compared to the "business as usual" municipal emissions (including any reductions required by ARB under AB 32).

1.2.2 The City/County will, in collaboration with the business community, establish a Business Climate Action Plan, which will include measures to reduce GHG emissions from business activities, and which will seek to reduce emissions by at least 30% by 2020 compared to "business as usual" business emissions.

1.2.3 The City/County will, in collaboration with the stakeholders from the community at large, establish a Community Climate Action Plan, which will include measures reduce GHG emissions from community activities, and which will seek to reduce emissions by

at least 30% by 2020 compared to "business as usual" community emissions.

1.2.4 Or: The City / County will, in collaboration with the stakeholders from the community at large, establish a CCAP, which will include measures to reduce GHG from community, municipal and business activities by at least 30% by 2020, compared to "business as usual".

GHG-1.1*A* **Emission Inventories:** *(Alternative form)* The City/County will establish GHG emissions inventories including emissions from all sectors within the City/County, using methods approved by, or consistent with guidance from, the ARB; the City/County will update inventories every 4 years to incorporate improved methods, better data, and more accurate tools and methods, and to assess progress.

1.1.1 The City/County will establish a baseline inventory of GHG emissions including municipal emissions, and emissions from all business sectors and the community.

GHG-1.2*A* **Climate Action Plans:** *(Alternative form)* The City/County will establish plans to reduce or encourage reductions in GHG emissions from all sectors within the City/County.

1.2.1 The City/County will establish a Municipal Climate Action Plan which will include measures to reduce GHG emissions from municipal activities by at least 15% by 2020 compared to the baseline municipal emissions inventory (including any reductions required by ARB under AB 32).

1.2.2 The City/County will, in collaboration with the business community, establish a Business Climate Action Plan, which will include measures to incentivize and support reductions in GHG emissions from business activities, and which will seek to reduce emissions by at least 15% by 2020 compared to the baseline business emissions inventory (including any reductions required by ARB under AB-32).

1.2.3 The City/County will, in collaboration with the stakeholders from the community at large, establish a Community Climate Action Plan, which will include measures to incentivize and support reductions in GHG emissions from community activities, and which will seek to reduce emissions by at least 15% by 2020 compared to the baseline community emissions inventory (including any reductions any reductions required by ARB under AB-32).

Objective GHG-2 The City/County will ensure that its local Climate Action, Land Use, Housing, and Transportation Plans are aligned with, support, and enhance any regional plans that have been developed consistent with state guidance to achieve reductions in GHG emissions.

GHG-2.1 Sustainable Communities Strategy/Regional Blueprint Planning: The City/County will participate in the Sustainable Communities Strategy/Regional Blueprint Planning effort and will ensure that local plans are consistent with the Regional Plan.

Land Use and Urban Design Policies

Goal: Promote land use strategies that decrease reliance on automobile use, increase the use of alternative modes of transportation, maximize efficiency of urban services provision and reduce emissions of GHGs.

Objective LU-1: The City/County will adopt and implement a development pattern that utilizes existing infrastructure; reduces the need for new roads, utilities and other public works in new growth areas; and enhances non-automobile transportation.

LU-1.1 Urban Growth Boundary: The City will establish an urban growth boundary (UBG) with related ordinances or programs to limit suburban sprawl; the City/County will restrict urban development beyond the UGB and streamline entitlement processes within the UGB for consistent projects.

1.1.1 Urban development should occur only where urban public facilities and services exist or can be reasonably made available.

1.1.2 The improvement and expansion of one urban public facility or service should not stimulate development that significantly precedes the City's, or other affected jurisdiction's, ability to provide all other necessary urban public facilities and services at adequate levels.

LU-1.2 Reserve Limits: The City/County will redirect new growth into existing city/urban reserve areas.

LU-1.3 Infill: The City/County will encourage high-density, mixed-use, infill development and creative reuse of brownfield, under-utilized and/or defunct properties within the urban core.

LU-1.4 Urban Service Lines: The City/County will maintain a one dwelling unit per 10 acre minimum lot size or lower density in areas outside designated urban service lines.

1.4.1 Adopt an urban-rural transition zone along the urban service line to ensure that land uses within the City / County are compatible with adjacent open space and agricultural uses.

LU-1.5 Density: The City/County will increase densities in urban core areas to support public transit.

1.5.1 Remove barriers to the development of accessory dwelling units in existing residential neighborhoods inside urban service lines.

LU-1.6 Road Width: The City/County will reduce required road width standards wherever feasible to calm traffic and encourage alternative modes of transportation.

LU-1.7 Parking Spaces: The City/County will reduce parking space requirements, unbundle parking from rents and charge for parking in new developments.

LU-1.8 Bicycle Facilities: The City/County will add bicycle facilities to city streets and public spaces.

LU-1.9 Levels of Service: The City/County will discourage the extension of urban levels of service for new development beyond existing urban service lines, and, if necessary, use zoning to assure that development occurs only if public services are adequate.

Objective LU-2: Promote infill, mixed-use, and higher density development, and provide incentives to support the creation of affordable housing in mixed use zones.

LU-2.1 Mixed-Use Development: The City/County will plan for and create incentives for mixed-use development.

2.1.1 The City/County will identify sites suitable for mixed-use development within an existing urban service line and will establish appropriate site-specific standards to accommodate the mixed uses. Site-specific standards could include:

2.1.1.1 Increasing allowable building height or allowing height limit bonuses;

2.1.1.2 Allowing flexibility in applying development standards (such as FAR[2] and lot coverage) based on the location, type, and size of the units, and the design of the development;

2.1.1.3 Allowing the residential component to be additive rather than within the established FAR for that zone, and eliminating maximum density requirements for residential uses in mixed use zones;

2.1.1.4 Allowing reduced and shared parking based on the use mix, and establishing parking maximums where sites are located within 0.25 miles of a public transit stop;

2.1.1.5 Allowing for tandem parking, shared parking and off-site parking leases;

[2] FAR is Floor Area Ratio

2.1.1.6 Requiring all property owners in mixed-use areas to unbundle parking from commercial and residential leases;

2.1.1.7 Creating parking benefit districts, which invest meter revenues in pedestrian infrastructure and other public amenities;

2.1.1.8 Establishing performance pricing of street parking, so that it is expensive enough to promote frequent turnover and keep 15 percent of spaces empty at all times.

2.1.2 The City/County will seek funding to prepare specific plans and related environmental documents to facilitate mixed-use development at selected sites, and to allow these areas to serve as receiver sites for transfer of development rights away from environmentally sensitive lands and rural areas outside established urban growth boundaries.

2.1.3 The City/County will enable prototype mixed-use structures for use in neighborhood center zones that can be adapted to new uses over time with minimal internal remodeling.

2.1.4 The City/County will identify and facilitate the inclusion of complementary land uses not already present in local zoning districts, such as supermarkets, parks and recreational fields, schools in neighborhoods, and residential uses in business districts, to reduce the vehicle miles traveled and promote bicycling and walking to these uses.

EMPHASIS OF DEVELOPMENT

USE	COMMERCIAL	OFFICE	RESIDENTIAL
Retail	50-70%	10-30%	10-30%
Office	0-20%	50-70%	0-30%
Residential	20-40%	0-30%	50-80%
Public	10-30%	10-30%	10-30%

2.1.5 The City/County will work with employers developing larger projects to ensure local housing opportunities for their employees, and engage employers to find ways to provide housing assistance as part of their employee benefits packages; major projects in mixed-use areas should include work-force housing where feasible.

2.1.6 The City/County will revise zoning ordinance(s) to allow local-serving businesses, such as childcare centers, restaurants, banks, family medical offices, drug stores, and other similar services near employment centers to minimize midday vehicle use.

2.1.7 The City / County will develop form-based community design standards to be applied to development projects and land use plans, using a comprehensive community outreach, for areas designated mixed-use

2.1.8 Mix affordable housing units with market rate units as opposed to building segregated affordable housing developments.

Objective LU-3: Promote greater linkage between land uses and transit, as well as other modes of transportation.

LU-3.1 Transit-Supportive Density: The City/County will implement a Housing Overlay Zone for transit centers and corridors. This shall include average minimum residential densities of 25 units per acre within one quarter mile of transit centers; average minimum densities of 15 units per acre within one quarter mile of transit corridors; and minimum FAR of 0.5:1 for non-residential uses within a quarter mile of transit centers or corridors.

LU-3.2 Transit-Oriented Development: The City/County will identify transit centers appropriate for mixed-use development, and will promote transit-oriented, mixed use development within these targeted areas, including:

3.2.1 Amending the Development Code to encourage mixed-use development within one-half mile of intermodal hubs and future rail stations; to offer flexible standards for affordable housing; and to establish minimum residential densities and non-residential FAR;

3.2.2 Rezoning commercial properties to residential and/or mixed-use where appropriate;

3.2.3 Providing expanded zoning for multi-family housing;

3.2.4 Providing maximum parking standards and flexible building height limitations;

3.2.5 Providing density bonus programs;

3.2.6 Establishing guidelines for private and public spaces;

3.2.7 Providing incentives for redevelopment of underutilized areas, such as surface parking lots;

3.2.8 Establishing a minimum pedestrian and bicycle connectivity standard;

3.2.9 Creating parking benefit districts, which invest meter revenues in pedestrian infrastructure and other public amenities;

3.2.10 Establishing performance pricing of street parking, so that it is expensive enough to promote frequent turnover and keep 15 percent of spaces empty at all times;

3.2.11 Discouraging auto-oriented development.

LU-3.3 **Transit-oriented Brownfield Development:** The City/County will promote the development of brownfield sites and other underused or defunct properties near existing public transportation.

LU-3.4 **Public Transit Development Focus:** The City/County will ensure new development is designed to make public transit a viable choice for residents, including:

3.4.1 Locating medium-high density development near activity centers that can be served efficiently by public transit and alternative transportation modes;

3.4.2 Locating medium-high density development near streets served by public transit whenever feasible;

3.4.3 Linking neighborhoods to bus stops by continuous sidewalks or pedestrian paths.

LU-3.5 **City-centered Corridors:** The City/County will establish city-centered corridors, directing development to existing transportation corridors.

LU-3.6 **Transit-oriented Development Design Standards:** The City / County will develop form-based community design standards to be applied to development projects and land use plans, using a comprehensive community outreach program, for areas designated mixed-use *(suggestion: check language with FBCI[3])*

LU-3.7 **Affordable Housing:** Affordable housing will be located in transit-oriented development whenever feasible.

Objective LU-4: Promote development and preservation of neighborhood characteristics that encourage walking and bicycle riding in lieu of automobile-based travel.

LU-4.1 **Pedestrian-oriented Character:** The City/County will create and preserve distinct, identifiable neighborhoods whose characteristics support pedestrian travel, especially within, but not limited to, mixed-use and transit-oriented development areas, including:

[3] FBCI is the Form-Based Codes Institute

4.1.1 Designing or maintaining neighborhoods where the neighborhood center can be reached in approximately five minutes of walking;

4.1.2 Increasing housing densities from the perimeter to the center of the neighborhood;

4.1.3 Directing retail, commercial, and office space to the center of the neighborhood;

4.1.4 Encouraging pedestrian-only streets and/or plazas within developments, and destinations that may be reached conveniently by public transportation, walking, or bicycling;

4.1.5 Allowing flexible parking strategies in neighborhood activity centers to foster a pedestrian-oriented streetscape;

4.1.6 Providing continuous sidewalks with shade trees and landscape strips to separate pedestrians from traffic;

4.1.7 Encouraging neighborhood parks and recreational centers near concentrations of residential areas (preferably within one quarter mile) and include pedestrian walkways and bicycle paths that encourage non-motorized travel.

LU-4.2 Pedestrian Access: The City/County will ensure pedestrian access to activities and services, especially within, but not limited to, mixed-use and transit-oriented development areas, including:

4.2.1 Ensuring new development that provides pedestrian connections in as many locations as possible to adjacent development, arterial streets, thoroughfares;

4.2.2 Ensuring a balanced mix of housing, workplaces, shopping, recreational opportunities, and institutional uses, including mixed-use structures;

4.2.3 Locating schools in neighborhoods, within safe and easy walking distances of residences served;

4.2.4 For new development, primary entrances shall be pedestrian entrances, with automobile entrances and parking located to the rear;

4.2.5 Support development where automobile access to buildings does not impede pedestrian access, by consolidating driveways between buildings or developing alley access;

4.2.6 Street parking provided shall be utilized as a buffer between sidewalk pedestrian traffic and the automobile portion of the roadway;

4.2.7 Establish pedestrian and bicycle connectivity standards for new development, with block sizes between 1 and 2 acres;

4.2.8 For existing areas that do not meet established connectivity standards, prioritize the physical development of pedestrian connectors;

4.2.9 Prioritizing grade-separated bicycle / pedestrian crossings where appropriate to enhance connectivity or overcome barriers such as freeways, railways and waterways.

Objective LU-5: Review fee structures and other opportunities to provide financial and administrative incentives to support desired land uses, development patterns, and alternative modes of transportation.

LU-5.1 Developer Fees: The City/County will promote desired land uses by scaling developer fees based on desired criteria, for example:

5.1.1 Increasing or reducing fees proportionally with distance from the city center or preferred transit sites;

5.1.2 Increasing or reducing fees based on the degree to which mixed uses are incorporated into the project;

5.1.3 Reducing fees for creative re-use of brownfield sites;

5.1.4 Increasing fees for the use of greenfield sites.

LU-5.2 Administrative Fees and Streamlining: The City/County will provide fast-track permitting and reductions in processing fees for desired projects. The City/County will research and implement a program of incentives for development projects that are fully consistent with the Sustainable Communities Strategy / Regional Plan.

LU-5.3 Incentives and Loans: The City/County will provide incentive funding and/or infrastructure loans to support desired projects.

LU-5.4 Infrastructure Preference: The City/County will give preference for infrastructure improvements that support or enhance desired land uses and projects.

Objective LU-6: The City/County will mitigate climate change by decreasing heat gain from pavement and other hard surfaces associated with infrastructure.

LU-6.1 Hardscape Heat Gain: The City/County will reduce heat gain from pavement and other hardscaping, including:

6.1.1 Reduce street rights-of-way and pavement widths to pre-World War II widths (typically 22 to 34 feet for local streets, and 30 to 35 feet for collector streets, curb to curb), unless landscape medians or parkway strips are allowed in the center of roadways;

6.1.2 Reinstate the use of parkway strips to allow shading of streets by trees;

6.1.3 Include shade trees on south- and west-facing sides of structures;

6.1.4 Include low-water landscaping in place of hardscaping around transportation infrastructure and in parking areas;

6.1.5 Install cool roofs, green roofs, and use cool paving for pathways, parking, and other roadway surfaces;

6.1.6 Establish standards that provide for pervious pavement options;

6.1.7 Remove obstacles to xeriscaping, edible landscaping and low-water landscaping.

Transportation Policies

Goal: Reduce GHG emissions by reducing vehicle miles traveled and by increasing or encouraging the use of alternative fuels and transportation technologies.

Objective TR-1: The City/County will reduce VMT-related emissions by encouraging the use of public transit through adoption of new development standards that will require improvements to the transit system and infrastructure, increase safety and accessibility, and provide other incentives.

TR-1.1 Transportation Planning: The City/County will ensure that new developments incorporate both local and regional transit measures into the project design that promote the use of alternative modes of transportation.

TR-1.1.1 Project Selection: The City / County shall give priority to transportation projects that will contribute to a reduction in vehicle miles traveled per capita, while maintaining economic vitality and sustainability.

TR-1.1.2 Equal Pedestrian Access: The City / County shall include sidewalks, separated sidewalks whenever possible, on both sides of all new street improvement projects, except where there are severe topographic or natural resource constraints.

TR-1.1.3 Public Involvement: Carry out a comprehensive public involvement and input process that provides information about transportation issues, projects, and processes to community members and other stakeholders, especially to those traditionally underserved by transportation services.

TR-1.2 System Interconnectivity: The City/County will create an interconnected transportation system that allows a shift in travel from private passenger vehicles to alternative modes, including public transit, ride sharing, car-sharing, bicycling and walking.

1.2.1 Ensure transportation centers are multi-modal to allow transportation modes to intersect;

1.2.2 Provide adequate and affordable public transportation choices, including expanded bus routes and service, as well as other transit choices such as shuttles, light rail, and rail;

1.2.3 To the extent feasible, extend service and hours of operation to underserved arterials and population centers or destinations such as colleges;

1.2.3A Focus transit resources on high-volume corridors and high-boarding destinations such as colleges, employment centers and regional destinations;

1.2.4 Coordinate schedules and routes across service lines with neighboring transit authorities;

1.2.5 Support programs to provide "station cars" for short trips to and from transit nodes (e.g., neighborhood electric vehicles);

1.2.6 Study the feasibility of providing free transit to areas with residential densities of 15 dwelling units per acre or more, including options such as removing service from less dense, underutilized areas to do so;

1.2.7 Employ transit-preferential measures, such as signal priority and bypass lanes. Where compatible with adjacent land use designations, right-of-way acquisition or parking removal may occur to accommodate transit-preferential measures or improve access to transit. The use of access management should be considered where needed to reduce conflicts between transit vehicles and other vehicles;

1.2.8 Provide safe and convenient access for pedestrians and bicyclists to, across, and along major transit priority streets;

1.2.9 Use park-and-ride facilities to access transit stations only at ends of regional transitways or where adequate feeder bus service is not feasible.

TR-1.3 Transit System Infrastructure: The City/County will upgrade and maintain transit system infrastructure to enhance public use, including:

1.3.1 Ensure transit stops and bus lanes are safe, convenient, clean and efficient;

1.3.2 Ensure transit stops have clearly marked street-level designation, and are accessible;

1.3.3 Ensure transit stops are safe, sheltered, benches are clean, and lighting is adequate;

1.3.4 Place transit stations along transit corridors within mixed-use or transit-oriented development areas at intervals of three to four blocks, or no less than one-half mile.

TR-1.4 Customer Service: The City/County will enhance customer service and system ease-of-use, including:

1.4.1 Develop a Regional Pass system to reduce the number of different passes and tickets required of system users;

1.4.2 Implement "Smart Bus" technology, using GPS and electronic displays at transit stops to provide customers with "real-time" arrival and departure time information (and to allow the system operator to respond more quickly and effectively to disruptions in service);

1.4.3 Investigate the feasibility of an on-line trip planning program.

TR-1.5 Transit Funding: The City/County will prioritize transportation funding to support a shift from private passenger vehicles to transit and other modes of transportation, including:

1.5.1 Give funding preference to improvements in public transit over other new infrastructure for private automobile traffic;

1.5.2 Before funding transportation improvements that increase roadway capacity and VMT, evaluate the feasibility and effectiveness of funding projects that support alternative modes of transportation and reduce VMT, including transit, and bicycle and pedestrian access.

TR-1.6 Transit and Multimodal Impact Fees: The City/County will assess transit and multimodal impact fees on new developments to fund public transportation infrastructure, bicycle infrastructure, pedestrian infrastructure and other multimodal accommodations.

Objective TR-2: The City/County will implement traffic and roadway management strategies to improve mobility and efficiency, and reduce associated emissions.

TR-2.1 System Monitoring: The City/County will monitor traffic and congestion to determine when and where the city needs new transportation facilities in order to increase access and efficiency.

TR-2.2 Arterial Traffic Management: The City/County will modify arterial roadways to allow more efficient bus operation, including bus lanes and signal priority/ preemption where necessary.

TR-2.3 Signal Synchronization: The City/County will expand signal timing programs where emissions reduction benefits can be demonstrated, including maintenance of the synchronization system, and will coordinate with adjoining jurisdictions as needed to optimize transit operation while maintaining a free flow of traffic.

TR-2.4 HOV Lanes: The City/County will encourage the construction of high-occupancy vehicle (HOV) lanes or similar mechanisms whenever necessary to relieve congestion and reduce emissions.

TR-2.5 Delivery Schedules: The City/County will establish ordinances or land use permit conditions limiting the hours when deliveries can be made to off-peak hours in high traffic areas.

Objective TR-3: The City/County will reduce VMT related-emissions by implementing and supporting trip reduction programs.

TR-3.1 Ride-Share Programs: The City/County will promote ride sharing programs, including:

3.1.1 Designate a certain percentage of parking spaces for ride-sharing vehicles;

3.1.2 Designate adequate passenger loading, unloading, and waiting areas for ride-sharing vehicles;

3.1.3 Provide a web site or message board for coordinating shared rides;

3.1.4 Encourage private, for-profit community car-sharing, including parking spaces for car share vehicles at convenient locations accessible by public transit;

3.1.5 Hire or designate a rideshare coordinator to develop and implement ridesharing programs.

TR-3.2 Employer-based Trip Reduction: The City/County will support voluntary, employer-based trip reduction programs, including:

3.2.1 Provide assistance to regional and local ridesharing organizations;

3.2.2 Advocate for legislation to maintain and expand incentives for employer ridesharing programs;

3.2.3 Require the development of Transportation Management Associations for large employers and commercial/ industrial complexes;

3.2.4 Provide public recognition of effective programs through awards, top ten lists, and other mechanisms.

TR-3.3 Ride Home Programs: The City/County will implement a city/county wide “guaranteed ride home” program for those who commute by public

transit, ride-sharing, or other modes of transportation, and encourage employers to subscribe to or support the program.

TR-3.4 Local Area Shuttles: The City/County will encourage and utilize shuttles to serve neighborhoods, employment centers and major destinations.

3.4.1 The City/County will create a free or low-cost local area shuttle system that includes a fixed route to popular tourist destinations or shopping and business centers;

3.4.2 The City/County will work with existing shuttle service providers to coordinate their services.

TR-3.5 Low- and No-Travel Employment Opportunities: The City/County will facilitate employment opportunities that minimize the need for private vehicle trips, including:

3.5.1 Amend zoning ordinances and the Development Code to include live/work sites and satellite work centers in appropriate locations;

3.5.2 Encourage telecommuting options with new and existing employers, through project review and incentives, as appropriate.

TR-3.6 Congestion Pricing: Advocate for a regional, market-based system to price or charge for auto trips during peak hours

Objective TR-4: The City/County will support bicycle use as a mode of transportation by enhancing infrastructure to accommodate bicycles and riders, and providing incentives.

TR-4.1 Development Standards for Bicycles: The City/County will establish standards for new development and redevelopment projects to support bicycle use, including:

4.1.1 Amending the Development Code to include standards for safe pedestrian and bicyclist accommodations, including:

4.1.1.1 "Complete Streets" policies that foster equal access by all users in the roadway design;

4.1.1.2 Bicycle and pedestrian access internally and in connection to other areas through easements;

4.1.1.3 Safe access to public transportation and other non-motorized uses through construction of dedicated paths;

4.1.1.4 Safe road crossings at major intersections, especially for school children and seniors;

4.1.1.5 Adequate, convenient and secure bike parking at public and private facilities and destinations in all urban areas;

4.1.1.6 Street standards will include provisions for bicycle parking within the public right of way;

4.1.2 Require new development and redevelopment projects to include bicycle facilities, as appropriate with the new land use, including:

4.1.2.1 Construction of weatherproof bicycle facilities where feasible, and at a minimum, bicycle racks or covered, secure parking near the building entrances;

4.1.2.2 Provision and maintenance of changing rooms, lockers, and showers at large employers or employment centers.

4.1.3 Prohibit projects that impede bicycle and pedestrian access, such as large parking areas that cannot be safely crossed by non-motorized vehicles, and developments that block through access on existing or potential bicycle and pedestrian routes;

4.1.4 Encourage the development of bicycle stations at intermodal hubs, with attended or "valet" bicycle parking, and other amenities such as bicycle rental and repair, and changing areas with lockers and showers;

4.1.5 Conduct a connectivity analysis of the existing bikeway network to identify gaps, and prioritize bikeway development where gaps exist.

TR-4.2 Bicycle and Pedestrian Trails: The City/County will establish a network of multi-use trails to facilitate safe and direct off-street bicycle and pedestrian travel, and will provide bike racks along these trails at secure, lighted locations.

TR-4.3 Bicycle Safety Program: The City/County will develop and implement a bicycle safety educational program to teach drivers and riders the laws, riding protocols, routes, safety tips, and emergency maneuvers.

TR-4.4 Bicycle and Pedestrian Project Funding: The City/County will pursue and provide enhanced funding for bicycle and pedestrian facilities and access projects, including, as appropriate:

4.4.1 Apply for regional, State, and federal grants for bicycle and pedestrian infrastructure projects;

4.4.2 Establish development exactions and impact fees to fund bicycle and pedestrian facilities;

4.4.3 Use existing revenues, such as state gas tax subventions, sales tax funds, and general fund monies for projects to enhance bicycle use and walking for transportation.

TR-4.5 Bicycle Parking: Adopt bicycle parking standards that ensure bicycle parking sufficient to accommodate 5 to 10% of projected use at all public and commercial facilities, and at a rate of at least one per residential unit in multiple-family developments *(suggestion: check language with League of American Bicyclists).*

Objective TR-5: The City/County will establish parking policies and requirements that capture the true cost of private vehicle use and support alternative modes of transportation.

TR-5.1 Parking Policy: The City/County will adopt a comprehensive parking policy to discourage private vehicle use and encourage the use of alternative transportation, including:

5.1.1 Reduce the available parking spaces for private vehicles while increasing parking spaces for shared vehicles, bicycles, and other alternative modes of transportation;

5.1.2 Eliminate or reduce minimum parking requirements for new buildings;

5.1.3 "Unbundle" parking (require that parking is paid for separately and is not included in the base rent for residential and commercial space);

5.1.4 Use parking pricing to discourage private vehicle use, especially at peak times;

5.1.5 Create parking benefit districts, which invest meter revenues in pedestrian infrastructure and other public amenities;

5.1.6 Establish performance pricing of street parking, so that it is expensive enough to promote frequent turnover and keep 15 percent of spaces empty at all times;

5.1.7 Encourage shared parking programs in mixed-use and transit-oriented development areas.

TR-5.2 Event Parking Policies: The City/County will establish policies and programs to reduce onsite parking demand and promote ride-sharing and public transit at large events, including:

5.2.1 Promote the use of peripheral parking by increasing on-site parking rates and offering reduced rates for peripheral parking;

5.2.2 Encourage special event center operators to advertise and offer discounted transit passes with event tickets;

5.2.3 Encourage special event center operators to advertise and offer discount parking incentives to carpooling patrons, with four or more persons per vehicle for on-site parking;

5.2.4 Promote the use of bicycles by providing space for the operation of valet bicycle parking service.

TR-5.3 Parking "Cash-out" Program: The City/County will require new office developments with more than 50 employees to offer a Parking "Cash-out" Program to discourage private vehicle use.

TR-5.4 Electric/Alternative Fuel Vehicle Parking: The City/County will require new commercial and retail developments to provide prioritized parking for electric vehicles and vehicles using alternative fuels.

Objective TR-6: The City/County will support and promote the use of low- and zero-emission vehicles, and alternative fuels, and other measures to directly reduce emissions from motor vehicles.

TR-6.1 Low and Zero Emission Vehicles: The City/County will support and promote the use of low- and zero-emission vehicles, including:

6.1.1 Develop the necessary infrastructure to encourage the use of zero-emission vehicles and clean alternative fuels, such as development of electric vehicle charging facilities and conveniently located alternative fueling stations;

6.1.2 Encourage new construction to include vehicle access to properly wired outdoor receptacles to accommodate ZEV and/or plug in electric hybrids (PHEV);

6.1.3 Encourage transportation fleet standards to achieve the lowest emissions possible, using a mix of alternate fuels, PZEV or better fleet mixes;

6.1.4 Establish incentives, as appropriate, to taxicab owners to use alternative fuel or gas-electric hybrid vehicles.

TR-6.2 Vehicle Idling: The City/County will enforce State idling laws for commercial vehicles, including delivery and construction vehicles.

Energy Efficiency Policies

Goal: Reduce emissions from the generation of electricity by reducing electricity use through increased efficiency.

Objective EE-1 The City/County will establish green building requirements and standards for new development and redevelopment projects, and will work to provide incentives for green building practices and remove barriers that impede their use.

EE-1.1 **Green Building Ordinance:** The City/County will adopt a Green Building Ordinance that requires new development and redevelopment projects for both residential and commercial buildings to incorporate sufficient green building methods and techniques to qualify for the equivalent of a current LEED Certified rating, GreenPoints, or equivalent rating system.

EE-1.2 **Green Building Flexibility:** The City/County will allow increased height limits and/or flexibility in other standards for projects that incorporate energy efficient green building practices.

EE-1.3 **Green Building Barriers:** The City/County will identify and remove regulatory or procedural barriers to implementing green building practices within its jurisdiction, such as updating codes, guidelines, and zoning, and will ensure that all plan review and building inspection staff are trained in green building materials, practices, and techniques.

EE-1.4 **Green Building Incentives:** The City/County will support the use of green building practices by:

1.4.1 Providing information, marketing, training, and technical assistance about green building practices;

1.4.2 Establishing guidelines for green building practices in residential and commercial development;

1.4.3 Providing financial incentives, including reduction in development fees, administrative fees, and expedited permit processing for projects that use green building practices.

Objective EE-2 The City/County will establish policies and standards to increase energy efficiency at new developments.

EE-2.1 **Improved Building Standards:** The City/County will adopt energy efficiency performance standards for buildings that achieve a greater reduction in energy and water use than otherwise required by state law, including:

2.1.1 Standards for the installation of "cool roofs";

2.1.2 Performance standards for heat transfer across the building envelope that result in increased insulation and the use of low-emissive windows;

2.1.3 Requirements to install high-efficiency plumbing fixtures and tankless water heaters;

2.1.4 Performance standards that specify high-efficiency space heating and cooling systems;

2.1.5 Requirements for improved overall efficiency of lighting systems;

2.1.6 Requirements for the use of Energy Star® appliances and fixtures in discretionary new development;

2.1.7 New lots shall be arranged and oriented to maximize effective use of passive solar energy.

EE-2.2 Affordable Housing Energy Efficiency: Affordable housing development shall incorporate energy efficient design and features to the maximum extent feasible.

2.2.1 The City/County will target local funds, including redevelopment and community development block grant resources, to assist affordable housing developers in meeting the energy efficiency requirements.

EE-2.3 Outdoor Lighting: The City/County will establish outdoor lighting standards in the Zoning Ordinance, including:

2.3.1 Requirements that all outdoor lighting fixtures be energy efficient, such as:

2.3.1.1 Full cut-off light fixtures at parking lots and on buildings;

2.3.1.2 Photocells or astronomical time switches on all permanently installed exterior lighting;

2.3.1.3 Directional and shielded LED lights for exterior lighting *(for example, see: www.nightwise.org)*, and install exterior and security lights with motion detectors.

2.3.2 Requirements that light levels in all new development, parking lots, and street lighting not exceed state standards;

2.3.3 Requirements that lighting at the urban-rural boundary be designed to provide one-half the light standard for urban areas;

2.3.4 Prohibition against continuous all-night outdoor lighting in sports stadiums, construction sites, and rural areas unless required for security reasons.

EE-2.4 Residential Wood Burning: The City/County will establish or enhance local ordinances that prohibit solid fuel wood-burning devices in mixed-use high-density development and restrict the installation of wood-burning appliances in new or redeveloped single family residential properties to those that burn pellets, natural gas, or propane, or at a minimum, EPA certified wood-burning units.

Objective EE-3: The City/County will establish policies and standards to reduce exterior heat gain and heat island effects.

EE-3.1 Exterior Heat Gain: The City/County will establish standards for new development and for large redevelopment or rehabilitation (for example, additions of more than 25,000 square feet commercial or 100,000 square feet industrial), to reduce exterior heat gain for 50% of non-roof impervious site landscape (roads, sidewalks, courtyards, parking lots, and driveways), including:

3.1.1 Achieving 50% paved surface shading with vegetation within 5 years, in consultation with city/county arborist;

3.1.2 Use of paving materials with a Solar Reflective Index (SRI) of at least 29, or open grid paving systems;

3.1.3 Covered parking (underground, beneath decking or roofs, or beneath a building), where any roof-covered parking uses roofing material with SRI of at least 29.

EE-3.2 Heat Island Mitigation: The City/County will adopt a Heat Island Mitigation Plan that requires cool roofs, cool pavements, and strategically placed shade trees, and will actively inspect and enforce state requirements for cool roofs on non-residential re-roofing projects.

Objective EE-4: The City/County will pursue policies and programs to improve energy efficiency of existing buildings.

EE-4.1 Energy Audits: The City/County will require the performance of energy audits for residential and commercial buildings prior to completion of sale, and that audit results and information about opportunities for energy efficiency improvements be presented to the buyer.

EE-4.2 Energy Efficiency Funding: The City/County will pursue incentives, grants, and creative financing for projects that improve energy efficiency, including, for example, the option for property owners to pay for such improvements through long-term assessments on their property tax bills.

EE-4.3 Community Energy Program: The City/County will implement an outreach and incentive program to promote energy efficiency and conservation in the community, including:

4.3.1 Launch an "energy efficiency challenge" campaign for community residents;

4.3.2 Implement a low-income weatherization assistance program;

4.3.3 Implement conservation campaigns specifically targeted to residents, and separately to businesses;

4.3.4 Promote the purchase of Energy Star® appliances, including, where feasible, incentive grants and vouchers;

4.3.5 Promote participation in the local "Green Business" program;

4.3.6 Distribute free CFL bulbs or other efficiency fixtures to community members;

4.3.7 Offer exchange programs for high-energy-use items, such as halogen torchiere lamps;

4.3.8 Adopt an ordinance requiring energy upgrades at time of property sale.

Alternative Energy Policies

Goal: The City/County will seek to reduce emissions associated with electrical generation by promoting and supporting the generation and use of alternative energy.

Objective AE-1: The City/County will establish policies and programs that facilitate the siting of new renewable energy generation.

AE-1.1 Site Designation: The City/County will identify possible sites for production of renewable energy (such as solar, wind, small hydro, and biogas), as compatible with surrounding uses, and will protect and promote that use, including:

1.1.1 Designate suitable sites to prioritize their development for renewable energy generation;

1.1.2 Evaluate potential land use, environmental, economic, and other constraints on that use, and mitigate such constraints, as feasible;

1.1.3 Adopt measures to protect the renewable energy use of the sites and their resources, such as utility easements, rights-of-way, and land set-asides.

AE-1.2 Removing Barriers: The City/County will identify and remove or otherwise address barriers to renewable energy production, including:

1.2.1 Review and revise building and development codes, design guidelines, and zoning ordinances to remove such barriers;

1.2.2 Work with related agencies, such as fire, water, health and others that may have policies or requirements that adversely impact the development or use of renewable energy technologies;

1.2.3 Develop protocols for safe storage of renewable and alternative energy products with the potential to leak, ignite or explode, such as biodiesel, hydrogen, and/or compressed air.

AE-1.3 Zoning Flexibility: The City/County will allow renewable energy projects in areas zoned for open space, where consistent with the Open Space element, and other uses and values.

Objective AE-2 The City/County will promote and require renewable energy generation, and co-generation projects where feasible and appropriate.

AE-2.1 On-site Renewable Energy Generation: The City/County will require that new office/retail/commercial or industrial development, or major rehabilitation (e.g., additions of 25,000 square feet commercial, or 100,000 square feet industrial) incorporate renewable energy generation either on- or off-site to provide 15% or more of the project's energy needs.

AE-2.2 Co-generation Projects: The City/County will promote and encourage co-generation projects for commercial and industrial facilities, provided they meet all applicable air quality standards and provide a net reduction in GHG emissions associated with energy production.

AE-2.3 Green Utilities: The City/County will promote and support green utilities, and will evaluate the creation of a locally or regionally owned green utility, perhaps in coordination with other regional strategies.

Objective AE-3: The City/County will promote, support, and require, as appropriate, the development of solar energy.

AE-3.1 Solar-ready Buildings: The City/County will require that, where feasible, all new buildings be constructed to allow for easy, cost-effective installation of solar energy systems in the future, using such "solar-ready" features as:

3.1.1 Designing the building to include optimal roof orientation (between 20 to 55 degrees from the horizontal), with sufficient south-sloped roof surface;

3.1.2 Clear access without obstructions (chimneys, heating and plumbing vents, etc.) on the south sloped roof;

3.1.3 Designing the roof framing to support the addition of solar panels;

3.1.4 Installation of electrical conduit to accept solar electric system wiring;

3.1.5 Installation of plumbing to support a solar hot water system and provision of space for a solar hot water storage tank.

AE-3.2 Solar Homes Partnership: The City/County will require that residential projects of 6 units or more participate in the California Energy Commission's New Solar Homes Partnership, which provides rebates to developers who offer solar power in at least 50% of new units, or a program with similar provisions.

AE-3.3 Passive Solar Design: The City/County will require that any building constructed in whole or in part with City/County funds incorporate passive solar design features, such as daylighting and passive solar heating, where feasible.

AE-3.4 Protection of Solar Elements: The City/County will protect active and passive solar design elements and systems from shading by neighboring structures and trees, as consistent with existing tree shading requirements.

Objective AE-4: The City/County will pursue and provide economic incentives and creative financing for renewable energy projects, as well as other support for community members or developers seeking funding for such projects.

AE-4.1 Renewable Energy Incentives: The City/County will provide, where possible, grants, rebates, and incentives for renewable energy projects, including reduced fees and expedited permit processing.

AE-4.2 Creative Financing: The City/County will provide, where feasible, creative financing for renewable energy projects, including subsidized or other low-interest loans, and the option to pay for system installation through long-term assessments on individual property tax bills.

AE-4.3 Partnerships: The City/County will pursue partnerships with other governmental entities and with private companies and utilities to establish incentive programs for renewable energy.

AE-4.4 Information and Support: The City/County will establish and maintain a clearinghouse of information on available funding alternatives for renewable energy projects, rates of return, and other information to support developers and community members interested in pursuing renewable energy projects.

Objective AE-5: The City/County will implement measures to support the purchase and use of renewable and alternative energy.

AE-5.1 Green Electricity Purchasing: The City/County will establish targets for the purchase of renewable energy, in excess of the state Renewable Portfolio Standards, using such mechanisms as green tags or renewable energy certificates.

AE-5.2 Community Choice Aggregation: The City/County will evaluate the feasibility and effectiveness of using Community Choice Aggregation as a model for providing renewable energy to meet the community's electricity needs, including potential partnerships with other jurisdictions.

Municipal Operations Policies

Goal: Reduce GHG emissions from municipal facilities and operations, and by purchasing goods and services that embody or create fewer GHG emissions.

Objective MO-1: The City/County will enhance the energy efficiency of its facilities.

MO-1.1 Energy Efficiency Plan: The City/County will prepare and implement a comprehensive plan to improve energy efficiency of municipal facilities, including:

1.1.1 Conduct energy audits for all municipal facilities;

1.1.2 Retrofit facilities for energy efficiency where feasible and when remodeling or replacing components, including increased insulation, installing green or reflective roofs and low-emissive window glass;

1.1.3 Implement an energy tracking and management system;

1.1.4 Install energy-efficient exit signs, street signs, and traffic lighting;

1.1.5 Install energy-efficient lighting retrofits and occupancy sensors, and institute a "lights out at night" policy;

1.1.6 Retrofit heating and cooling systems to optimize efficiency (e.g., replace chillers, boilers, fans, pumps, belts, etc.);

1.1.7 Install Energy Star® appliances and energy-efficient vending machines;

1.1.8 Improve efficiency of water pumping and use at municipal facilities, including a schedule to replace or retrofit system components with high-efficiency units (i.e., ultra-low-flow toilets, fixtures, etc.);

1.1.9 Provide chilled, filtered water at water fountains and taps in lieu of bottled water;

1.1.10 Install a central irrigation control system and time its operation for off-peak use;

1.1.11 Adopt an accelerated replacement schedule for energy inefficient systems and components.

MO-1.2 Efficiency Requirement for New Facilities: The City/County will require that any newly constructed, purchased, or leased municipal space meet minimum standards as appropriate, such as:

1.2.1 Requirements for new commercial buildings to meet LEED criteria established by the U.S. Green Building Council;

1.2.2 Requirements for new residential buildings to meet criteria of the Energy Star® New Homes Program established by U.S. EPA;

1.2.3 Incorporation of passive solar design features in new buildings, including daylighting and passive solar heating;

1.2.4 Retrofitting of existing buildings to meet standards under Title 24 of the California Building Energy Code, or to achieve a higher performance standard as established by the City/County;

1.2.5 Retrofitting of existing buildings to decrease heat gain from non-roof impervious surfaces with cool paving, landscaping, and other techniques.

MO-1.3 Training & Support: The City/County will ensure that staff receives appropriate training and support to implement objectives and policies to reduce GHG emissions, including:

1.3.1 Provide energy efficiency training to design, engineering, building operations, and maintenance staff;

1.3.2 Provide information on energy use and management, including data from the tracking and management system, to managers and others making decisions that influence energy use;

1.3.3 Provide energy design review services to departments undertaking new construction or renovation projects, to facilitate compliance with LEED standards.

Objective MO-2: The City/County will improve efficiency at municipal systems and reduce GHG emissions from vehicle and equipment engines.

MO-2.1 Wastewater System Efficiency: The City/County will maximize efficiency of wastewater treatment and pumping equipment.

MO-2.2 Drinking Water System Efficiency: The City/County will maximize efficiency at drinking water treatment, pumping, and distribution facilities, including development of off-peak demand schedules for heavy commercial and industrial users.

MO-2.3 Fleet Replacement: The City/County will establish a replacement policy and schedule to replace fleet vehicles and equipment with the most fuel-

efficient vehicles practical, including gasoline hybrid and alternative fuel or electric models.

MO-2.4 Small Tools and Equipment: Install outdoor electrical outlets on buildings to support the use of electric lawn and garden equipment, and other tools that would otherwise be run with small gas engines or portable generators.

Objective MO-3: The City/County will implement measures to reduce employee vehicle trips and to mitigate emissions impacts from municipal travel.

MO-3.1 Trip Reduction Program: The City/County will implement a program to reduce vehicle trips by employees, including:

3.1.1 Providing incentives and infrastructure for vanpooling and carpooling, such as pool vehicles, preferred parking, and a website or bulletin board to facilitate ride-sharing;

3.1.2 Providing subsidized passes for mass transit;

3.1.3 Offering compressed work hours, off-peak work hours, and telecommuting, where appropriate;

3.1.4 Offer a guaranteed ride home for employees who use alternative modes of transportation to commute.

MO-3.2 Bicycle Transportation Support: The City/County will promote and support the use of bicycles as transportation, including:

3.2.1 Providing bicycle stations with secure, covered parking, changing areas with storage lockers and showers, as well as a central facility where minor repairs can be made;

3.2.2 Providing bicycles, including electric bikes, for employees to use for short trips during business hours;

3.2.3 Implementing a police-on-bicycles program;

3.2.4 Providing a bicycle safety program, and information about safe routes to work.

MO-3.3 Municipal Parking Management: The City/County will implement a Parking Management Program to discourage private vehicle use, including:

3.3.1 Encouraging carpools and vanpools with preferential parking and a reduced parking fee;

3.3.2 Institute a parking cash-out program;

3.3.3 Renegotiate employee contracts, where possible, to eliminate parking subsidies;

3.3.4 Install on-street parking meters with fee structures designed to discourage private vehicle use;

3.3.5 Establish a parking fee for all single-occupant vehicles.

MO-3.4 Travel Mitigation: The City/County will mitigate business-related travel, especially air travel, through the annual purchase of verified carbon offsets.

MO-3.5 Transit Access to Municipal Facilities: Municipal employment and service facilities shall be located on major transit corridors, unless their use is plainly incompatible with other uses located along major transit corridors.

Objective MO-4: The City/County will enhance renewable energy generation, and implement programs for load management and demand response.

MO-4.1 Load Management and Demand Response: The City/County will design and implement peak load management and demand response programs for water pollution control, supply and treatment, and distribution, including interface with existing automated systems for building energy management and SCADA systems.

MO-4.2 Renewable Energy Installation: The City/County will install renewable energy systems at its facilities where feasible, including:

4.2.1 Solar collection systems on municipal roofs;

4.2.2 Solar water heating for municipal pools;

4.2.3 Waste-to-energy systems at waste handling operations.

Objective MO-5: The City/County will manage its stock of vegetation to reduce GHG emissions.

MO-5.1 Urban Tree Management: The City/County will conduct a comprehensive inventory and analysis of the urban forest, and coordinate tree maintenance responsibilities with all responsible departments, consistent with best management practices.

MO 5.2 Landscaping: The City/County will evaluate existing landscaping and options to convert reflective and impervious surfaces to landscaping, and will install or replace vegetation with drought-tolerant, low-maintenance

native species or edible landscaping that can also provide shade and reduce heat-island effects.

Objective MO-6: The City/County will use its purchasing power to promote reductions in GHG emissions by the suppliers of its goods and services.

MO-6.1 Purchasing Practices: The City/County will adopt purchasing practices and standards to support reductions in GHG emissions, including preferences for energy-efficient office equipment, and the use of recycled materials and manufacturers that have implemented green management practices.

MO-6.2 Contracting Practices: The City/County will establish bidding standards and contracting practices that encourage GHG emissions reductions, including preferences or points for the use of low or zero emission vehicles and equipment, recycled materials, and provider implementation of other green management practices.

Waste Reduction and Diversion Policies

Goal: Reduce GHG emissions waste through improved management of waste handling and reductions in waste generation.

Objective WRD-1: The City/County will improve emissions control at waste handling facilities.

WRD-1.1 Methane Recovery: The City/County will establish methane recovery at all wastewater and solid waste treatment facilities.

WRD-1.2 Waste to Energy: The City/County will implement waste-to-energy projects where characteristics meet criteria for effective energy generation.

WRD-1.3 Best Management Practices: The City/County will utilize best management practices at all waste handling facilities.

Objective WRD-2: The City/County will implement enhanced programs to divert solid waste from landfill operations.

WRD-2.1 Diversion Targets: The City/County will achieve a solid waste diversion of 75% of the waste stream by 2020.

WRD-2.2 Diversion Services: The City/County will expand jurisdiction-wide waste diversion services to include, for example, single stream curbside recycling, and curbside recycling of food and greenwaste.

WRD-2.3 Construction and Demolition Waste: The City/County will adopt a Construction and Demolition Waste Recovery Ordinance, requiring building projects to recycle or reuse a minimum percentage of unused or leftover building materials, including:

2.3.1 Require all new development and major rehabilitation projects (additions of 25,000 square feet commercial or 100,000 square feet industrial) to recycle or salvage XX% of non-hazardous construction and demolition debris (excluding excavated soil and land-clearing debris);

2.3.2 Require preparation of a construction waste management plan identifying materials to be diverted from disposal, and how material will be stored and handled;

2.3.3 Establish clear and consistent guidelines for calculation methods, recordkeeping, and reporting to document compliance with the plan;

2.3.4 Establish clear and consistent guidelines for how and when used construction materials can be used in new or remodel construction.

WRD-2.4 Reuse Center: The City/County will establish a reuse/recycling center where furniture, appliances, building materials, and other useful, non-hazardous items may be dropped off or purchased for a nominal fee.

WRD-2.5 Program Promotion: The City/County will promote and expand recycling programs, purchasing policies, and employee education to reduce the amount of waste produced.

Objective WRD-3: The City/County will enhance regional coordination on waste management.

WRD-3.1 Regional Coordination: The City/County will coordinate with other agencies in its region to develop and implement effective waste management strategies and waste-to-energy technologies.

Conservation and Open Space Policies

Goal: Conserve natural resources such as water and open space to minimize energy used and GHG emissions and to preserve and promote the ability of such resources to remove carbon from the atmosphere.

Objective COS-1: The City/County will adopt and implement a comprehensive strategy to increase water conservation and the use of recycled water.

COS-1.1 Water Consumption Reduction Target: The City/County will reduce per capita water consumption by X% by 2020.

COS-1.2 Water Conservation Plan: The City/County will establish a water conservation plan that may include such policies and actions as:

1.2.1 Tiered rate structures for water use;

1.2.2 Restrictions on time of use for landscape watering, and other demand management strategies;

1.2.3 Performance standards for irrigation equipment and water fixtures;

1.2.4 Requirements that increased demand from new construction be offset with reductions so that there is no net increase in water use.

COS-1.3 Recycled Water Use: The City/County will establish programs and policies to increase the use of recycled water, including:

1.3.1 Create an inventory of non-potable water uses within the jurisdiction that could be served with recycled water;

1.3.2 Produce and promote the use of recycled water for agricultural, industrial, and irrigation purposes, including grey water systems for residential irrigation;

1.3.3 Produce and promote the use of treated, recycled water for potable uses where GHG emissions from producing such water are lower than from other potable sources.

COS-1.4 Water Conservation Outreach: The City/County will implement a public education and outreach campaign to promote water conservation, and will highlight specific water-wasting activities to discourage, such as the watering of non-vegetated surfaces and using water to clean sidewalks and driveways.

Objective COS-2: The City/County will ensure that building standards and permit approval processes promote and support water conservation.

COS-2.1 Water-Efficient Design: The City/County will establish building design guidelines and criteria to promote water-efficient building design, including minimizing the amount of non-roof impervious surfaces around the building(s).

COS-2.2 Water-Efficient Infrastructure and Technology: The City/County will establish menus and check-lists for developers and contractors to ensure water-efficient infrastructure and technology are used in new construction, including low-flow toilets and shower heads, moisture-sensing irrigation, and other such advances.

COS-2.3 Gray Water System Standards: The City/County will establish criteria and standards to permit the safe and effective use of gray water (on-site water recycling), and will review and appropriately revise, without compromising health and safety, other building code requirements that might prevent the use of such systems.

Objective COS-3: The City/County will establish programs and policies to ensure landscaping and forests are installed and managed to optimize their climate benefits.

COS-3.1 Water-Efficient Landscapes: The City/County will install water-efficient landscapes and irrigation, including:

3.1.1 Planting drought-tolerant and native species, and covering exposed dirt with moisture-retaining mulch;

3.1.2 Installing water-efficient irrigation systems and devices, including advanced technology such as moisture-sensing irrigation controls;

3.1.3 Installing edible landscapes that provide local food.

COS-3.2 Shade Tree Planting: The City/County will promote the planting of shade trees and will establish shade tree guidelines and specifications, including:

3.2.1 Recommendations for tree planting based on the land use (residential, commercial, parking lots, etc.);

3.2.2 Recommendations for tree types based on species size, branching patterns, whether deciduous or evergreen, whether roots are invasive, etc.;

3.2.3 Recommendations for placement, including distance from structures, density of planting, and orientation relative to structures and the sun.

COS-3.3 Urban Forestry Management: The City/County will develop an Urban Forestry Program to consolidate policies and ordinances regarding tree planting, maintenance, and removal, including:

3.3.1 Establish a tree-planting target and schedule to support the goals of the California Climate Action Team to plant 5 million trees in urban areas by 2020;

3.3.2 Establish guidelines for tree planting, including criteria for selecting deciduous or evergreen trees low-VOC-producing trees, and emphasizing the use of drought-tolerant native trees and vegetation.

Objective COS-4: The City/County will establish policies and programs to develop and preserve conservation areas, including forested areas, agricultural lands, wildlife habitat and corridors, wetlands, watersheds, and groundwater recharge areas, that remove and sequester carbon from the atmosphere.

COS-4.1 Conservation Area Development: The City/County will establish programs and funding mechanisms to create protected conservation areas, including:

4.1.1 Imposing mitigation fees for development on lands that would otherwise be conservation areas, and use the funds generated to protect other areas from development;

4.1.2 Proposing for voter approval a small tax increment (e.g., a quarter cent sales tax, perhaps for a finite time period that could be renewed) to fund the purchase of development rights in conservation areas, or purchase of the land outright.

COS-4.2 Conservation Area Preservation: The City/County will establish policies to preserve existing conservation areas, and to discourage development in those areas.

Education and Outreach Policies

Goal: Increase public awareness of climate change and climate protection challenges, and support community reductions of GHG emissions through coordinated, creative public education and outreach, and recognition of achievements.

Objective EO-1: The City/County will establish a coordinated, creative public outreach campaign, including publicizing the importance of reducing GHG emissions and steps community members can take to reduce their individual impacts.

EO-1.1 **Outreach Methods:** The City/County will use a variety of media and methods to promote climate awareness and GHG reduction, including:

1.1.1 TV and radio spots with local celebrities and community leaders;

1.1.2 Advertising "Green Tips" in the local paper;

1.1.3 Collaborating with utilities, business associations, civic groups, and non-profits to place tips and articles in billing materials or newsletters;

1.1.4 Designing and maintaining an interactive Climate Protection website and collaborating with other organizations to link to the website.

EO-1.2 **Outreach Topics:** The City/County will coordinate with other agencies and outreach efforts to align messages on topics such as:

1.2.1 Energy efficiency and conservation, and green energy;

1.2.2 Trip reduction, public transit, carpooling, vanpooling, and alternative modes of transportation;

1.2.3 Green building and energy-efficient design;

1.2.4 Waste reduction, recycling, and composting;

1.2.5 Water conservation and water-efficient design and products;

1.2.6 The benefits of buying local, and information about locally grown, prepared, and manufactured goods and local services.

Objective EO-2: The City/County will work with local businesses and energy providers on specific, targeted outreach campaigns and incentive programs.

EO-2.1 **Energy Efficiency Campaigns:** The City/County will collaborate with local energy suppliers and distributors to establish energy conservation

programs, Energy Star® appliance change-out programs, rebates, vouchers, and other incentives to install energy-efficient technology and products and to cooperate on advertising.

EO-2.2 **Pedestrian and Bicycle Promotion:** The City/County will work with local community groups and downtown business associations to organize and publicize walking tours and bicycle events, and to encourage pedestrian and bicycle modes of transportation.

Objective EO-3: The City/County will organize events and workshops to promote GHG-reducing activities.

EO-3.1 **Waste Reduction:** The City/County will organize workshops on waste reduction activities for the home or business, such as backyard composting, or office paper recycling, and will schedule recycling dropoff events and neighborhood chipping/mulching days.

EO-3.2 **Water Conservation:** The City/County will organize workshops on water conservation activities, such as selecting and planting drought-tolerant, native plants in landscaping, and installing advanced irrigation systems.

EO-3.3 **Energy Efficiency:** The City/County will organize workshops on steps to increase energy efficiency in the home or business, such as weatherizing the home or building envelope, installing smart lighting systems, and how to conduct a self-audit for energy use and efficiency.

EO-3.4 **Climate Protection Summit/Fair:** The City/County will organize an annual Climate Protection Summit or Fair, to educate the public on current climate science, projected local impacts, and local efforts and opportunities to reduce GHG emissions, including exhibits of the latest technology and products for conservation and efficiency.

EO-3.5 **Schools Programs:** The City/County will develop and implement a program to present information to school children about climate change and ways to reduce GHG emissions, and will support school-based programs for GHG reduction, such as school based trip reduction and the importance of recycling.

Objective EO-4: The City/County will sponsor competitions and awards to encourage GHG reductions and recognize success.

EO-4.1 **Climate Champions Awards:** The City/County will establish a Climate Champions Awards program to acknowledge outstanding private and public efforts to reduce GHG emissions.

EO-4.2 **GHG Reduction / Climate Protection Competitions:** The City/County will sponsor competitions and contests with prizes for promoting climate protection and reducing GHG emissions, including such contests as:

4.2.1 Poster contests at schools, with winning entrants receiving scholarship grants and recognition at the Climate Protection Summit/Fair, and posters used in outreach campaigns or compiled in calendars;

4.2.2 Waste diversion contests between schools, businesses, civic organizations, and Scout troops or other groups, with prizes for the greatest percent waste diverted and recognition at the Climate Protection Summit/Fair, and similar contests for planting trees, reducing vehicle trips, or other desired behaviors;

4.2.3 Walkathons, relays, or other similar fundraising challenges, with funds raised to support community climate protection programs and activities.

(page intentionally left blank)

Table 2: Worksheet for Model Policies Evaluation

Greenhouse Gas Reduction Planning Policies							
Goal: Reduce GHG emissions from all activities within the City/County boundaries to support the State's efforts under AB32 and to mitigate the impact of climate change on the City/County, State, and world.							
Objective: GHG-1 By 2020, the City/County will reduce greenhouse gas emissions from within its boundaries to a level 30% less than the level that would otherwise occur if all activities continued under a "business as usual" scenario, or to a level 15% less than the levels in 2009.							
Model Policy #	Policy Name/ Subject Area	Implementation Examples (click on link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
GHG-1.1	Emissions Inventories	Cal Poly Pomona GHG inventory	Conservation				
GHG-1.1.1	Baseline Inventory	San Carlos	Conservation				
GHG-1.1.2	Business As Usual Scenario	San Carlos	Conservation				
GHG-1.2	Climate Action Plan (CAP)		Conservation				
GHG-1.2.1	Municipal CAP	San Carlos City of Los Angeles City of Santa Monica – Sustainable City Progress City of Calabasas Issue Paper on GHG Reduction Strategies City of Santa Monica Sustainable Strategies Green County San Bernardino City of Huntington Beach	Conservation				
GHG-1.2.2	Business CAP	The Walt Disney Corporation	Conservation				
GHG-1.2.3	Community CAP	San Carlos	Conservation				
GHG-1.1A	Emissions Inventory Alternative		Conservation				
GHG-1.1	Baseline Inventory – alt		Conservation				
GHG-1.2A	Climate Action Plan (CAP) Alternative		Conservation				
GHG-1.2.1A	Municipal CAP - alt		Conservation				
GHG-1.2.2A	Business CAP - alt		Conservation				
GHG-1.2.3A	Community CAP - alt		Conservation				
Objective: GHG-2 The City/County will ensure that its local Climate Action, Land Use, Housing, and Transportation Plans are aligned with, support, and enhance any regional plans that have been developed consistent with state guidance to achieve reductions in GHG emissions.							
GHG-2.1	Sustainable Communities/ Regional Blueprint	Institute for Local Government Strategies	Land Use/ Circulation				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Land Use and Urban Design Policies							
Goal: Promote land use strategies that decrease reliance on automobile use, increase the use of alternative modes of transportation, and reduce emissions of GHGs.							
Objective: LU-1 The City/County will adopt and implement a development pattern that enhances non-automobile transportation.							
Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
LU-1.1	Urban Growth Boundary	County of Santa Clara Urban Growth Boundary Portland Metropolitan Area Petaluma 2025 General Plan Land Use GOAL 1-G-3: Maintain a well-defined boundary at the edge of urban development. Page 1-15 Land Use GOAL 1-G-4: Urban Growth Boundary Maintain a parcel-specific Urban Growth Boundary. Page 1-17	Land Use / Open Space				
LU-1.1.1	Location of Urban Development		Land Use / Open Space				
LU-1.1.2	Timing of Urban Development		Land Use / Open Space				
LU-1.2	Reserve Limits	Agricultural Land Reserve	Land Use				
LU-1.3	Infill	Smart Infill Greenbelt Alliance State of California Interim Hearing: Best Practices Successful Infill Development Marin Countywide Plan Goal CD-6 Page 3-30, Community Development, Built Environment Element	Land Use				
LU-1.4	Urban Service Lines	Santa Cruz County Urban Services Line	Land Use				
LU-1.4.1	Urban-Rural Transition Zone		Land Use				
LU-1.5	Density	City of Pasadena 2004 General Plan	Land Use				
LU-1.5.1	Barriers to Accessory Units		Land Use				
LU-1.6	Road Width		Circulation				
LU-1.7	Parking Spaces	Victoria Transport Policy Institute Parking Management Los Angeles Department of Transportation Parking and Smart Growth Study MTC Parking Best Practices see page 29 through fin MTC Parking Toolbox see page 29-33 Parking Policy Transit Oriented Development: Lessons for Cities Transit Agencies & Developers	Land Use				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
LU-1.8	Bicycle Facilities	San Francisco Municipal Transportation Authority Bicycle Parking San Francisco Bicycle Coalition Bike Parking at Work Alameda Bicycle	Circulation				
LU-1.9	Levels of Service	San Francisco Department of Public Health 1 / 2 San Francisco County Transportation Authority 1 / 2	Land Use				
Objective: LU-2 Promote infill, mixed use, and higher density development, and provide incentives to support the creation of affordable housing in mixed use zones.							
LU-2.1	Mixed-Use Development	Marin Countywide Plan Goal CD-8, Policy CD 8.7 Page 3-39, Community Development, Built Environment Element Goal DES-2, DES-3, Community Development, Built Environment Element Page 3-84	Land Use				
LU-2.1.1	Site-Specific Standards		Land Use				
LU-2.1.1.1	Allowable Building Height		Land Use				
LU-2.1.1.2	Flexible Development Standards		Land Use				
LU-2.1.1.3	Additive Residential Component/ Eliminate Density		Land Use				
LU-2.1.1.4	Reduced and Shared Parking		Land Use				
LU-2.1.1.5	Tandem and Offsite Parking		Land Use				
LU-2.1.1.6	Unbundle Parking from Leases		Land Use				
LU-2.1.1.7	Parking Benefit Districts		Land Use				
LU-2.1.1.8	Performance Pricing of Parking		Land Use				
LU-2.1.2	Supportive Pre-planning		Land Use				
LU-2.1.3	Prototype Adaptive Use Buildings		Land Use				
LU-2.1.4	Facilitate Complementary Uses		Land Use				
LU-2.1.5	Employer-Assisted Housing		Housing				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
LU-2.1.6	Services Near Employment Centers		Land Use				
LU-2.1.7	Form-based Standards		Land Use				
LU-2.1.8	Non-segregated Affordable Housing		Land Use				
Objective LU-3 Promote greater linkage between land uses and transit, as well as other modes of transportation.							
LU-3.1	Housing Overlay Zone	Marin Countywide Plan Goal CD-2, Policy CD-2.3; Page 3-15, Community Development, Built Environment Element	Land Use				
LU-3.2	Transit-oriented Mixed-use	US Federal Highway Administration: Fruitvale Transit Village Project Marin Countywide Plan Goal DES-2 Page 3-60, Community Design, Built Environment Element Smart Communities Network Transit Strategies	Land Use				
LU-3.2.1	Amend Code to Promote Transit-oriented Mixed-use		Land Use				
LU-3.2.2	Rezone to Allow Mixed Use		Land Use				
LU-3.2.3	Expand Zoning for Multi-Family Housing		Land Use				
LU-3.2.4	Flexible Parking & Bldg. Height		Land Use				
LU-3.2.5	Density Bonus Programs	County of San Diego Density Bonus Program	Land Use				
LU-3.2.6	Guidelines for Private/Public Spaces		Land Use				
LU-3.2.7	Incentives for Redevelopment	City of Knoxville Downtown Incentives	Land Use				
LU-3.2.8	Pedestrian/ Bicycle Connectivity		Land Use				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
LU-3.2.9	Parking Benefit Districts		Land Use				
LU-3.2.10	Performance Pricing for Parking		Land Use				
LU-3.2.11	Discourage Auto-oriented Development		Land Use				
LU-3.3	Transit-oriented Brownfield Development	Marin Countywide Plan Goal CD-6, Page 3-31, Community Development, Built Environment Element Multi Housing News Case Study Windsor, Ontario Brownfield's Strategy	Land Use				
LU-3.4	Public Transit Development Focus	Marin Countywide Plan Goal DES-2 Page 3-60, Community Design, Built Environment Element Victoria Transport Policy Institute 21 TOD Projects in California - Caltrans MTC - 10 Transit Oriented Development Profiles	Land Use				
LU-3.4.1	Density Near Activity Centers	City of Sacramento Smart Growth Strategy	Land Use				
LU-3.4.2	Density Near Transit Routes		Land Use				
LU-3.4.3	Links to Transit Stops		Land Use				
LU-3.5	City-centered Corridors	Map of Marin County	Land Use				
LU-3.6	Transit-oriented Development Design Standards		Land Use				
LU-3.7	Affordable Housing		Land Use				
Objective: LU-4 Promote development and preservation of neighborhood characteristics that encourage walking and bicycle riding in lieu of automobile-based travel.							
LU-4.1	Pedestrian-oriented Character	City of Los Angeles	Land Use				
LU-4.1.1	Design Short Walk to Center		Land Use				
LU-4.1.2	Increase Density Towards Center		Land Use				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
LU-4.1.3	Direct Business Space to Center		Land Use				
LU-4.1.4	Pedestrian Only Streets/Plazas	Urban Design International Santa Monica's Third Street Promenade Abstract	Circulation				
LU-4.1.5	Flexible Parking for Streetscape		Circulation				
LU-4.1.6	Continuous Separated Sidewalks		Circulation				
LU-4.1.7	Bike/Walk Paths to Parks		Circulation				
LU-4.2	Pedestrian Access	City of Los Angeles Marin Countywide Plan Goal TR-2 Page 3-159, Transportation, Built Environment Element	Circulation				
LU-4.2.1	Connectivity of Development		Land Use				
LU-4.2.2	Balanced Mix of Development	Petaluma 2025 General Plan Goal 1-G-1, page 1-14; Maintain a balanced land use program that meets the long-term residential, employment, retail, institutional, education, recreation, and open space needs of the community.	Land Use				
LU-4.2.3	Locate Schools w/ Safe Routes	Transportation Authority of Marin Safe Routes to Schools Transform Safe Routes to School	Land Use				
LU-4.2.4	Entrances to New Development		Land Use				
LU-4.2.5	Location of Driveways		Land Use				
LU-4.2.6	Street Parking as Buffer		Land Use				
LU-4.2.7	Pedestrian/ Bicycle Connectivity		Land Use				
LU-4.2.8	Develop Pedestrian Connectors		Land Use				
LU-4.2.9	Grade-separated Crossings		Land Use				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
Objective LU-5 Review fee structures and other opportunities to provide financial and administrative incentives to support desired land uses, development patterns, and alternative modes of transportation.							
LU-5.1	Developer Fees	ABAG memo to JPC PolicyLink Infill bonuses and Incentives Brownfields Smart Growth Incentives & Loans for Businesses – New Jersey	Land Use				
LU-5.1.1	Proportional to Distance from Center		Land Use				
LU-5.1.2	Incentivize Mixed Use		Land Use				
LU-5.1.3	Reduce fees for Brownfield Redevelopment		Land Use				
LU-5.1.4	Fees for Greenfield Development		Land Use				
LU-5.2	Admin. Fees & Streamlining		Land Use				
LU-5.3	Incentives & Loans		Land Use				
LU-5.4	Infrastructure Preference		Land Use				
Objective LU-6 The City/County will mitigate climate change by decreasing heat gain from pavement and other hard surfaces associated with infrastructure.							
LU-6.1	Hardscape Heat Gain	Cool Houston Plan	Land Use				
LU-6.1.1	Reduce Pavement Widths		Circulation				
LU-6.1.2	Include Parkway Strips		Circulation				
LU-6.1.3	Shade Trees on South and West		Land Use				
LU-6.1.4	Replace Hardscape with Low-Water Landscape		Land Use				
LU-6.1.5	Cool Roofs & Paving	Cool Houston Plan Cool Roof Rating Council	Land Use				
LU-6.1.6	Pervious Pavement Standards		Land Use				
LU-6.1.7	Xeriscaping		Land Use				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Transportation Policies							
Goal: Reduce GHG emissions by reducing vehicle miles traveled and by increasing or encouraging the use of alternative fuels and transportation technologies.							
Objective: TR-1 The City/County will reduce VMT-related emissions by encouraging the use of public transit through adoption of new development standards that will require improvements to the transit system and infrastructure, increase safety and accessibility, and provide other incentives.							
Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
TR-1.1	Transportation Planning	San Francisco Municipal Transportation Authority	Circulation				
TR-1.1.1	Project Selection						
TR-1.1.2	Equal Pedestrian Access		Circulation				
TR-1.1.3	Public Involvement		Circulation				
TR-1.2	System Interconnectivity	San Francisco Municipal Transportation Authority	Circulation				
TR-1.2.1	Multi-modal Transportation Ctrs.	RTD Fastracks	Circulation				
TR-1.2.2	Provide Transportation Options	City of Santa Monica Sustainable Transportation	Circulation				
TR-1.2.3	Extend Transit Service & Hours	King County Night Service	Circulation				
TR-1.2.3A	Focus Transit Resources		Circulation				
TR-1.2.4	Coordinate Across Service Lines	RTD Fastracks	Circulation				
TR-1.2.5	Support "Transit Cars"	King County Free Transit Area	Circulation				
TR-1.2.6	Free Transit Feasibility		Circulation				
TR-1.2.7	Transit Preference Measures		Circulation				
TR-1.2.8	Safe Access Along Major Streets		Circulation				
TR-1.2.9	Park-and-ride Locations		Circulation				
TR-1.3	System Infrastructure	RTD Fastracks	Circulation				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
TR-1.3.1	Efficient, Convenient Bus Stops		Circulation				
TR-1.3.2	Bus Stop Signage & Access		Circulation				
TR-1.3.3	Safe, Clean, Lighted Bus Stops		Circulation				
TR-1.3.4	Transit Station Locations		Circulation				
TR-1.4	Customer Service		Circulation				
TR-1.4.1	Develop Regional Pass System	Bay Area Translink	Circulation				
TR-1.4.2	Implement Smart Bus Technology	AC Transit	Circulation				
TR-1.4.3	Online Trip Planning		Circulation				
TR-1.5	Transit Funding		Circulation				
TR-1.5.1	Funding Preference for Transit		Circulation				
TR-1.5.2	Evaluate Feasible Alternatives		Circulation				
TR-1.6	Transportation Impact Fees	San Francisco County Transportation Authority Transportation Impact Fee	Circulation				
Objective: TR-2 The City/County will implement traffic and roadway management strategies to improve mobility and efficiency, and reduce associated emissions.							
TR-2.1	System Monitoring		Circulation				
TR-2.2	Arterial Traffic Mgt.		Circulation				
TR-2.3	Signal Synchronization		Circulation				
TR-2.4	HOV Lanes	MTC Riverside County Transportation Commission SANBAG HOV	Circulation				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
TR-2.5	Delivery Schedules		Circulation				
Objective: TR-3 The City/County will reduce VMT-related emissions by implementing and supporting trip reduction programs.							
TR-3.1	Ride-Share Programs	King County Ride Share Program UC Irvine Transportation Services	Circulation				
TR-3.1.1	Designated Ride-share Parking		Circulation				
TR-3.1.2	Provide Loading, Unloading, & Waiting Areas		Circulation				
TR-3.1.3	Ride Coordination Support	San Francisco Car and Van Pool	Circulation				
TR-3.1.4	Support Car-sharing Services	San Francisco Car Sharing	Circulation				
TR-3.1.5	Ride-share Coordinator	South Coast AQMD Rule 2202	Circulation				
TR-3.2	Employer-based Trip Reduction	San Francisco Transit Benefit Ordinance	Circulation				
TR-3.2.1	Support Ride-share Organizations	South Coast AQMD Rule 2202	Circulation				
TR-3.2.2	Support Ride-share Legislation		Circulation				
TR-3.2.3	Support Transp. Mgt. Assns.		Circulation				
TR-3.2.4	Recognize Effective Programs		Circulation				
TR-3.3	Ride Home Programs	San Francisco Emergency Ride Home Metro Transit Rider Programs	Circulation				
TR-3.4	Local Area Shuttles	City of Burlingame Public Transportation Caltrain Shuttle Services	Circulation				
TR-3.4.1	Reduced-cost Shuttle Service		Circulation				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
TR-3.4.2	Shuttle Service Coordination		Circulation				
TR-3.5	Low- and No-Travel Employment Opportunities		Circulation				
TR-3.5.1	Zoning & Codes for Live-Work		Land Use				
TR-3.5.2	Support Telecommuting	San Francisco Telecommuting Policy	Circulation				
TR-3.6	Congestion Pricing		Circulation				
Objective TR-4 The City/County will support bicycle use as a mode of transportation by enhancing infrastructure to accommodate bicycles and riders, and providing incentives.							
TR-4.1	Development Standards for Bicycles	San Francisco Municipal Transportation Authority Bicycle Plan	Circulation				
TR-4.1.1	Amend Code to Accommodate Bikes & Pedestrians	San Francisco Municipal Transportation Authority Livable Streets Caltrans Pedestrian & Bicycle Facilities in CA	Circulation				
TR-4.1.1.1	"Complete Streets" Policies	San Francisco Municipal Transportation Authority Livable Streets	Circulation				
TR-4.1.1.2	Include Access thru Easements		Circulation				
TR-4.1.1.3	Dedicated Bike/Pedestrian Paths	New York City Transportation City of Berkeley Transportation	Circulation				
TR-4.1.1.4	Safe Road Crossings	City of Berkeley Transportation	Circulation				
TR-4.1.1.5	Bicycle Parking	King County Bike Facilities City of Albuquerque Biking & Walking	Circulation				
TR-4.1.1.6	Street Standards for Bike Parking		Circulation				
TR-4.1.2	Bike Facilities in New Development	King County Bike Facilities	Circulation				
TR-4.1.2.1	Weather Protected Bike Parking		Circulation				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
TR-4.1.2.2	Changing Rooms, Showers, etc.		Circulation				
TR-4.1.3	Prohibit Projects that Impede Bicycle/ Pedestrian Transit		Circulation				
TR-4.1.4	Bicycle Support Services	San Francisco Municipal Transportation Authority Bicycle Plan	Circulation				
TR-4.1.5	Connectivity Analysis		Circulation				
TR-4.2	Bicycle and Pedestrian Trails	City of Berkeley Transportation City of Albuquerque Biking & Walking	Circulation				
TR-4.3	Bicycle Safety Program	City of Berkeley Transportation California DMV Bike Rules and Safety	Circulation				
TR-4.4	Bicycle and Pedestrian Project Funding		Circulation				
TR-4.5	Bicycle Parking		Circulation				
TR-4.4.1	Apply for Infrastructure Grants	City of Olympia Neighborhood Sustainability Grants	Circulation				
TR-4.4.2	Devel. Exactions & Impact Fees		Circulation				
TR-4.4.3	Redeploy Existing Revenues		Circulation				
Objective TR-5 The City/County will establish parking policies and requirements that capture the true cost of private vehicle use and support alternative modes of transportation.							
TR-5.1	Parking Policy	Redwood City Downtown Parking Management Plan MTC Parking Best Practices	Land Use				
TR-5.1.1	More Parking for Shared Vehicles		Land Use				
TR-5.1.2	Eliminate/ Reduce Parking Minimums	City of Alameda Memo Parking Management Strategy	Land Use				
TR-5.1.3	Require Unbundled Parking	City of Santa Monica Transportation Management	Land Use				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
TR-5.1.4	Increase Parking Rates	Redwood City	Land Use				
TR-5.1.5	Limit Parking Times		Circulation				
TR-5.1.6	Performance Pricing of Parking		Circulation				
TR-5.1.7	Shared Parking		Circulation				
TR-5.2	Event Parking Policies	San Francisco Municipal Transportation Agency Events Parking City of Berkeley Special Events Parking	Circulation				
TR-5.2.1	Promote Peripheral Parking		Circulation				
TR-5.2.2	Transit Discounts to Events		Circulation				
TR-5.2.3	Carpool Parking at Events		Circulation				
TR-5.2.4	Valet Bike Parking at Events	Secure Valet Bike Parking	Circulation				
TR-5.3	Parking Cash-out Program	City of Santa Monica Transportation Management	Circulation				
TR-5.4	Elec./Alt. Fuel Vehicle Policies	City of Albuquerque Alternative Fuels Program	Circulation				
Objective TR-6 The City/County will support and promote the use of low and zero emission vehicles, and alternative fuels, and other measures to directly reduce emissions from motor vehicles.							
TR-6.1	Low and Zero Emission Vehicles	City of Olympia Sustainability City of Columbus Green Fleet	Circulation				
TR-6.1.1	Electric & Alt. Fuel Infrastructure	San Francisco Municipal Transportation Agency Clean Air Initiatives	Circulation				
TR-6.1.2	Charging Access in New Development		Circulation				
TR-6.1.3	Fleet Standards	San Jose Green Fleet Policy	Circulation				
TR-6.1.4	Elec./Alt Fuel Taxicab Incentives		Circulation				
TR-6.2	Vehicle Idling	Minneapolis Anti Idling Ordinance	Circulation				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Energy Efficiency Policies							
Goal: Reduce emissions from the generation of electricity by reducing electricity use through increased efficiency.							
Objective: EE-1 The City/County will establish green building requirements and standards for new development and redevelopment projects, and will work to provide incentives for green building practices and remove barriers that impede their use.							
Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
EE-1.1	Green Building Ordinance	Berkeley Residential Energy Conservation Ordinance San Francisco Residential Energy Conservation Ordinance Rohnert Park Green Building Ordinance City of Los Angeles – Green Building	Conservation				
EE-1.2	Green Building Flexibility	Santa Monica	Conservation				
EE-1.3	Green Building Barriers		Conservation				
EE-1.4	Green Building Incentives	Arlington Green Building Incentives Matrix of Examples Build It Green Examples	Conservation				
EE-1.4.1	Information, Training, & Technical Assistance	Mothers of East LA Local group, environmental awareness, green business	Conservation				
EE-1.4.2	Guidelines for Green Building	Build It Green Guidelines and Checklist	Conservation				
EE-1.4.3	Financial Incentives		Conservation				
Objective: EE-2 The City/County will establish policies and standards to increase energy efficiency at new developments.							
EE-2.1	Improved Building Standards	City of Boulder Residential Building Guide	Conservation				
EE-2.1.1	"Cool Roofs" Standards	CA Title 24 2008 Update	Conservation				
EE-2.1.2	Building Envelope Heat Transfer		Conservation				
EE-2.1.3	High-Efficiency Plumbing	Alliance for Water Efficiency	Conservation				
EE-2.1.4	High-Efficiency Heating & Cooling	Solano County Green Building Ordinance	Conservation				
EE-2.1.5	Overall Lighting Efficiency	San Francisco Fluorescent Lighting Efficiency Ordinance Chittenden County, VT Lighting Program	Conservation				
EE-2.1.6	Energy Star® Appliances	Palm Desert Ord. 1124 Section 24.30.050	Conservation				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
EE-2.1.7	Orientation of New Lots		Conservation				
EE-2.2	Affordable Housing Energy Efficiency	The Chicago Housing Authority Energy Cost Savings Program City of Denver	Housing Conservation				
EE-2.2.1	Redevelopment Grants		Housing Conservation				
EE-2.3	Outdoor Lighting	Chittenden County, VT Lighting Program	Land Use Conservation*				
EE-2.3.1	Outdoor Lighting Efficiency Standards		Conservation See EE-2.3				
EE-2.3.1.1	Full Cut-off Fixtures		Conservation See EE-2.3				
EE-2.3.1.2	Photocells or Timed Switches		Conservation See EE-2.3				
EE-2.3.1.3	Directional/ Shielded LED Lights		Conservation See EE-2.3				
EE-2.3.2	Light Level Standards		Land Use Conservation				
EE-2.3.3	Urban/Rural Light Levels		Land Use Conservation				
EE-2.3.4	Prohibit Continuous Lighting		Land Use Conservation				
EE-2.4	Residential Wood Burning	Bay Area AQMD	Conservation*				
Objective: EE-3 The City/County will establish policies and standards to reduce exterior heat gain and heat island effects.							
EE-3.1	Exterior Heat Gain	Cool Houston Plan Page 5	Land Use Conservation*				
EE-3.1.1	50% Paved Surface Shading	City of Fresno Performance Standard for Parking Lot Shading	Land Use Conservation				
EE-3.1.2	Standards for Paving Materials	New Jersey Standard for Paving	Land Use Conservation				
EE-3.1.3	Standards for Roofing Materials	CA Title 24 2008 Update	Land Use Conservation				

* Best-judgment category, i.e. depending on city/county circumstances and scope of General Plan elements, policy could also be included in other mandatory element or in other optional element

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click on link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
EE-3.2	Heat Island Mitigation	Cool Houston Plan City of Chicago	Land Use Conservation				
Objective EE-4 The City/County will pursue policies and programs to improve energy efficiency of existing buildings.							
EE-4.1	Energy Audits	Austin Energy Audits	Energy*				
EE-4.2	Energy Efficiency Funding	City of Ann Arbor	Energy				
EE-4.3	Community Energy Program	Community Energy Services Corporation Portland Community Energy Project	Energy				
EE-4.3.1	"Energy Efficiency Challenge"		Energy				
EE-4.3.2	Low-income Weatherization Assistance	Portland Block by Block Weatherization Program	Energy, Housing				
EE-4.3.3	Conservation Campaigns	Ashland Conservation Program	Energy				
EE-4.3.4	Promote Energy Star®		Energy				
EE-4.3.5	Promote "Green Business"	Ashland Conservation Program San Francisco Green Business Program	Energy, Economic Development*				
EE-4.3.6	Distribute Free CFL Bulbs, etc.	Los Angeles Department of Water and Power	Energy				
EE-4.3.7	Exchange Programs for High-Energy Bulbs/Fixtures	Marin County (torchiere exchange), many cities, EPA Change A Light Campaign	Energy				
EE-4.3.8	Require Point of Sale Energy Upgrades	Berkeley RECO Berkely CECO San Francisco RECO	Energy				

* Best-judgment category, i.e. depending on city/county circumstances and scope of General Plan elements, policy could also be included in other mandatory element or in other optional element

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Alternative Energy Policies							
Goal: The City/County will seek to reduce emissions associated with electrical generation by promoting and supporting the generation and use of alternative energy.							
Objective: AE-1 The City/County will establish policies and programs that facilitate the siting of new renewable energy generation.							
Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
AE-1.1	Site Designation		Energy, Land Use				
AE-1.1.1	Renewable Energy Devel. Sites		Energy, Land Use				
AE-1.1.2	Evaluate & Mitigate Constraints		Energy, Land Use				
AE-1.1.3	Protect Renewable Energy Uses		Energy, Land Use				
AE-1.2	Removing Barriers	Ontario, Canada	Energy, Land Use				
AE-1.2.1	Revise Codes, Zoning, Guidance		Energy, Land Use				
AE-1.2.2	Work with Other Agencies		Energy				
AE-1.2.3	Develop Safety Protocols		Energy				
AE-1.3	Zoning Flexibility		Energy, Land Use				
Objective: AE-2 The City/County will promote and require renewable energy generation, and co-generation projects where feasible and appropriate.							
AE-2.1	On-site Renewable Energy Generation	US EPA Renewable Energy Generation Many examples, page 26	Energy				
AE-2.2	Co-Generation Projects	City of Boulder Co-Generation	Energy				
AE-2.3	Green Utilities	Austin Energy Green Riverside	Energy				
Objective AE-3 The City/County will promote, support, and require, as appropriate, the development of solar energy.							
AE-3.1	Solar-ready Buildings	Vancouver, Canada	Energy				
AE-3.1.1	Roof Orientation & Slope	Solar Santa Monica Santa Monica Community Energy Independence Initiative – part of the Solar Santa Monica program	Energy				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click on link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
AE-3.1.2	Clear Access on South Slope		Energy				
AE-3.1.3	Include Roof Framing Support		Energy				
AE-3.1.4	Include Electrical Conduit		Energy				
AE-3.1.5	Include Plumbing and Appliance Space		Energy				
AE-3.2	Solar Homes Partnership		Energy				
AE-3.3	Passive Solar Design	City of Santa Barbara	Energy				
AE-3.4	Protection of Solar Elements	San Jose Solar Access Design Guidelines	Energy, Land Use				
Objective AE-4 The City/County will pursue and provide economic incentives and creative financing for renewable energy projects, as well as other support for community members or developers seeking funding for such projects.							
AE-4.1	Renewable Energy Incentives	City of Santa Clara California Production Incentives for Renewable Energy					
AE-4.2	Creative Financing	City of Berkeley					
AE-4.3	Partnerships	Nevada Southwest Energy Partnership					
AE-4.4	Information & Support	City of Santa Monica page 49 San Diego Regional Energy Office Page 37					
Objective AE-5 The City/County will implement measures to support the purchase and use of renewable and alternative energy.							
AE-5.1	Green Electricity Purchasing	City of Santa Clara					
AE-5.2	Community Choice Aggregation	Marin County Clean Energy					

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Municipal Operations Policies							
Goal: Reduce GHG emissions from municipal facilities and operations, and by purchasing goods and services that embody or create fewer GHG emissions.							
Objective: MO-1 The City/County will enhance the energy efficiency of its facilities.							
Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
MO-1.1	Energy Efficiency Plan	California Energy Commission GHG Reporting Protocol	Energy*				
MO-1.1.1	Conduct Audits		Energy				
MO-1.1.2	Retrofit Facilities		Energy				
MO-1.1.3	Implement Tracking & Mgt.		Energy				
MO-1.1.4	Install Efficient Traffic Signs/ Lights		Energy				
MO-1.1.5	Retrofit Indoor Lighting		Energy				
MO-1.1.6	Retrofit Heating & Cooling Systems		Energy				
MO-1.1.7	Install Energy Star® Appliances		Energy				
MO-1.1.8	Increase Water Pumping Efficiency		Energy				
MO-1.1.9	Chilled, Filtered Water Fountains		Energy				
MO-1.1.10	Centralize, Optimize Irrigation		Energy				
MO-1.1.11	Accelerate Replacement Cycles		Energy				
MO-1.2	Efficiency Requirement for New Facilities		Energy				
MO-1.2.1	LEED Certify New Buildings		Energy				

* Best-judgment category, i.e. depending on city/county circumstances and scope of General Plan elements, policy could also be included in other mandatory element or in other optional element

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click on link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
MO-1.2.2	Energy Star® New Homes Program for Residential Units		Energy				
MO-1.2.3	Incorporate Passive Solar						
MO-1.2.4	Retrofit to Title 24 or Better		Energy				
MO-1.2.5	Decrease Heat Gain		Energy				
MO-1.3	Training & Support		Energy				
MO-1.3.1	Train Design, Engineering, Operations, Maintenance Staff		Energy				
MO-1.3.2	Provide Energy Use Data		Energy				
MO-1.3.3	Provide Energy Design Review		Energy				
Objective: MO-2 The City/County will improve efficiency at municipal systems and reduce GHG emissions from vehicle and equipment engines.							
MO-2.1	Wastewater System Efficiency		Energy*				
MO-2.2	Drinking Water System Efficiency		Energy				
MO-2.3	Fleet Replacement		Energy				
MO-2.4	Small Tools & Equipment		Energy				
Objective MO-3 The City/County will implement measures to reduce employee vehicle trips and to mitigate emissions impacts from municipal travel.							
MO-3.1	Trip Reduction Program		Circulation				
MO-3.1.1	Support Employee Van/ Carpools		Circulation				
MO-3.1.2	Subsidize Mass Transit for Staff		Circulation				

* Best-judgment category, i.e. depending on city/county circumstances and scope of General Plan elements, policy could also be included in other mandatory element or in other optional element

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click on link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
MO-3.1.3	Offer Alt. Work Schedules		Circulation				
MO-3.1.4	Offer Guaranteed Ride Home		Circulation				
MO-3.2	Bicycle Transportation Support		Circulation				
MO-3.2.1	Provide "Bicycle Stations"		Circulation				
MO-3.2.2	Provide Bicycles for Check-out		Circulation				
MO-3.2.3	Implement "Police on Bikes"		Circulation				
MO-3.2.4	Implement Bike Safety Program		Circulation				
MO-3.3	Municipal Parking Mgt.		Circulation				
MO-3.31	Parking for Van/Carpools		Circulation				
MO-3.3.2	Institute Parking Cash-out Program		Circulation				
MO-3.3.3	Eliminate Parking Subsidies		Circulation				
MO-3.3.4	Fees for Private Vehicle Parking		Circulation				
MO-3.3.5	Fees for Single Occ. Vehicles		Circulation				
MO-3.4	Travel Mitigation		Circulation				
MO-3.5	Transit Access to Municipal Facilities		Circulation				
Objective MO-4 The City/County will enhance renewable energy generation, and implement programs for load management and demand response.							
MO-4.1	Load Management & Demand Response		Energy				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
MO-4.2	Renewable Energy Installation		Energy				
MO-4.2.1	Solar Collections Systems		Energy				
MO-4.2.2	Solar Water Heating Systems		Energy				
MO-4.2.3	Waste-to-Energy Systems		Energy				
Objective MO-5 The City/County will manage its vegetation inventory to reduce GHG emissions.							
MO-5.1	Urban Tree Management	Million Trees Los Angeles (considered to be part of GHG program)	Land Use				
MO-5.2	Landscaping		Land Use				
Objective MO-6 The City/County will use its purchasing power to promote reductions in GHG emissions by the suppliers of its goods and services.							
MO-6.1	Purchasing Practices		Energy, Conservation, Municipal Ops*				
MO-6.2	Contracting Practices		See MO-6.1				

* Best-judgment category, i.e. depending on city/county circumstances and scope of General Plan elements, policy could also be included in other mandatory element or in other optional element

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
Waste Reduction and Diversion Policies							
Goal: Reduce GHG emissions from waste through improved management of waste handling and reductions in waste generation.							
Objective: WRD-1 The City/County will improve emissions control at waste handling facilities.							
WRD-1.1	Methane Recovery		Conservation				
WRD-1.2	Waste to Energy	California Energy Commission California Energy Commission Bioenergy Action Plan California Energy Commission Biomass White Paper See Policies, page 29	Conservation				
WRD-1.3	Best Management Practices		Conservation				
Objective: WRD-2 The City/County will implement enhanced programs to divert solid waste from landfill operations.							
WRD-2.1	Diversion Targets	City of San Francisco Zero Waste Targets	Conservation				
WRD-2.2	Diversion Services	Petaluma 2025 General Plan General Plan 4.4 Solid Waste, page 4-10 City of Albuquerque Recycling and Waste Reduction Programs Austin Recycling Ordinance Marin Countywide Plan GOAL PFS-4, Efficient Processing and Reduced Landfill Disposal of Solid Waste. page 3-206	Conservation				
WRD-2.3	Construction & Demolition Waste	San Francisco Construction and Demolition Debris Recovery Program 1 / 2	Conservation				
WRD-2.3.1	Recycle Targets for Large Projects		Conservation				
WRD-2.3.2	Construction Waste Mgt. Plan		Conservation				
WRD-2.3.3	Establish Compliance Methods & Guidelines		Conservation				
WRD-2.3.4	Establish Reuse Guidelines		Conservation				
WRD-2.4	Reuse Center		Conservation				
WRD-2.5	Program Promotion		Conservation				
Objective WRD-3 The City/County will enhance regional coordination on waste management.							
WRD-3.1	Regional Coordination		Conservation				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Conservation and Open Space Policies							
Goal: Conserve natural resources such as water and open space to minimize energy used and GHG emissions and to preserve and promote the ability of such resources to remove carbon from the atmosphere.							
Objective: COS-1 The City/County will adopt and implement a comprehensive strategy to increase water conservation and the use of recycled water.							
Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
COS-1.1	Water Consumption Reduction Target	City of Sacramento Urban Water Management Plan 1 / 2					
COS-1.2	Water Conservation Plan	Green County San Bernardino					
COS-1.2.1	Tiered Rate Structure						
COS-1.2.2	Time-of-use Restrictions						
COS-1.2.3	Performance Standards						
COS-1.2.4	Offset New Demand						
COS-1.3	Recycled Water Use	City of San Jose Water Conservation & Recycling Honolulu Ecology of Wastewater					
COS-1.3.1	Non-potable Use Inventory	City of Olympia					
COS-1.3.2	Promote Recycled Water Use	City of Olympia Reclaimed Water					
COS-1.3.3	Potable Recycled Water Use	City of Olympia					
COS-1.4	Water Conservation Outreach	Albuquerque Bernalillo County Water Utility Authority					
Objective: COS-2 The City/County will ensure that building standards and permit approval processes promote and support water conservation.							
COS-2.1	Water Efficient Design	City of Minneapolis Green Initiatives	Conservation				
COS-2.2	Water Efficient Infrastructure & Technology	City of Santa Barbara Water Conservation Sustainable Options	Conservation				
COS-2.3	Gray Water System Standards		Conservation				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
Objective COS-3 The City/County will establish programs and policies to ensure landscaping and forests are installed and managed to optimize their climate benefits.							
COS-3.1	Water-Efficient Landscapes	Stop Waste Model Ordinance Landscaping	Conservation				
COS-3.1.1	Drought Resistant Planting		Conservation				
COS-3.1.2	High-Efficiency Irrigation	City of Santa Barbara Water Conservation	Conservation				
COS-3.1.3	Installing Edible Landscapes		Conservation				
COS-3.2	Shade Tree Planting	City of Albuquerque Urban Forestry	Conservation				
COS-3.2.1	Recommend Plants by Land Use	City of Seattle Tree and Landscaping Regulations	Conservation				
COS-3.2.2	Consider Tree Characteristics	City of Albuquerque Tree Planting	Conservation				
COS-3.2.3	Recommend Placement		Conservation				
COS-3.3	Urban Forestry Management	City of Seattle Urban Forest Management Plan	Conservation, Open Space				
COS-3.3.1	Set Tree Planting Target	Raleigh Tree Planting Program	Conservation				
COS-3.3.2	Establish Planting Guidelines	City of Seattle Street Tree Planting Procedures	Conservation				
Objective COS-4 The City/County will establish policies and programs to develop and preserve conservation areas, including forested areas, agricultural lands, wildlife habitat and corridors, wetlands, watersheds, and groundwater recharge areas, that remove and sequester carbon from the atmosphere.							
COS-4.1	Conservation Area Development		Conservation, Open Space				
COS-4.1.1	Mitigation Fees on Development		Conservation, Open Space				
COS-4.1.2	Sales Tax for Conservation		Conservation, Open Space				
COS-4.2	Conservation Area Preservation	Honolulu Exceptional Tree Program	Conservation, Open Space				

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Education and Outreach Policies							
Goal: Increase public awareness of climate change and climate protection challenges, and support community reductions of GHG emissions through coordinated, creative public education and outreach, and recognition of achievements.							
Objective: EO-1 The City/County will establish a coordinated, creative public outreach campaign, including publicizing the importance of reducing GHG emissions and steps community members can take to reduce their individual impacts.							
Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
EO-1.1	Outreach Methods	City of San Mateo SMART Speakers	Climate Change or GHG, possibly Conservation				
EO-1.1.1	TV and Radio Spots	City of San Mateo SMART Media	See EO-1.1				
EO-1.1.2	"Green Tips" in Local Paper		See EO-1.1				
EO-1.1.3	Messages in Others' Newsletters, Billing Materials, etc.		See EO-1.1				
EO-1.1.4	Climate Protection Website	City of San Mateo SMART City of Palo Alto City of Minneapolis	See EO-1.1				
EO-1.2	Outreach Topics	City of San Mateo SMART Speakers	See EO-1.1				
EO-1.2.1	Energy Efficiency & Conservation	City of San Mateo SMART Carbon Counter	Energy, Conservation, GHG*				
EO-1.2.2	Trip Reduction & Alt. Modes	City of San Mateo SMART Carbon Counter City of Albuquerque Alternative Transportation	See EO-1.1				
EO-1.2.3	Green Building & Design	City of San Mateo Green Building	Conservation, Energy, Land Use				
EO-1.2.4	Waste Reduction, Recycling & Composting	San Francisco Composting Program City of San Mateo SMART Carbon Counter San Bernardino Reusable Bag Program	Conservation				
EO-1.2.5	Water Conservation & Efficient Design	Albuquerque Bernalillo County Water Utility Authority	Conservation, Land Use				

* Best-judgment category, i.e. depending on city/county circumstances and scope of General Plan elements, policy could also be included in other mandatory element or in other optional element

Table 2: Worksheet for Model Policies Evaluation (cont'd.)

Model Policy #	Policy Name/ Subject Area	Implementation Examples (click link to visit website)	Appropriate General Plan Element	Relative Effectiveness Reducing GHGs	Relative Difficulty to Implement	Relative Time for Reductions to Occur	Relative Cost
EO-1.2.6	Buying Local	San Francisco Farmers Market San Francisco Green Map City of Minneapolis Homegrown	See EO-1.1				
Objective: EO-2 The City/County will work with local businesses and energy providers on specific, targeted outreach campaigns and incentive programs.							
EO-2.1	Energy Efficiency Campaigns	City of Minneapolis Energy Challenge	Energy				
EO-2.2	Pedestrian and Bicycle Promotion	City of Berkeley Bike and Walking Maps 511 Bicycle Maps	Circulation				
Objective EO-3 The City/County will organize events and workshops to promote GHG-reducing activities.							
EO-3.1	Waste Reduction	Bay Area Green Business Program Shop Green City of Palo Alto Zero Waste Program	Conservation				
EO-3.2	Water Conservation	Bay Area Green Business Program Shop Green	Conservation				
EO-3.3	Energy Efficiency		Energy				
EO-3.4	Climate Protection Summit/Fair	Alameda County Downtown Menlo Park Goes Green Block Parties	Conservation, GHG				
EO-3.5	Schools Programs	City of Scottsdale EnviroKidsFest The Association for the Advancement of Sustainability in Higher Education	Energy, Conservation, GHG				
Objective EO-4 The City/County will sponsor competitions and awards to encourage GHG reductions and recognize success.							
EO-4-1	Climate Champions Awards	Climate All Stars Conference Columbus Green Spot	Conservation, Energy, GHG				
EO-4.2	GHG Reduction/ Climate Protection Competitions	Climate Protection Campaign Silicon Valley Leadership Group	See EO-4.2				
EO-4.2.1	Poster Contests at Schools, with Scholarships, Public Recognition	Climate Protection Campaign	See EO-4.2				
EO-4.2.2	Waste Diversion Contests between Schools or Other Groups	Waste Free Schools	See EO-4.2 (Especially Conservation)				
EO-4.2.3	Walkathons, Relays, & Other Challenges		See EO-4.2				

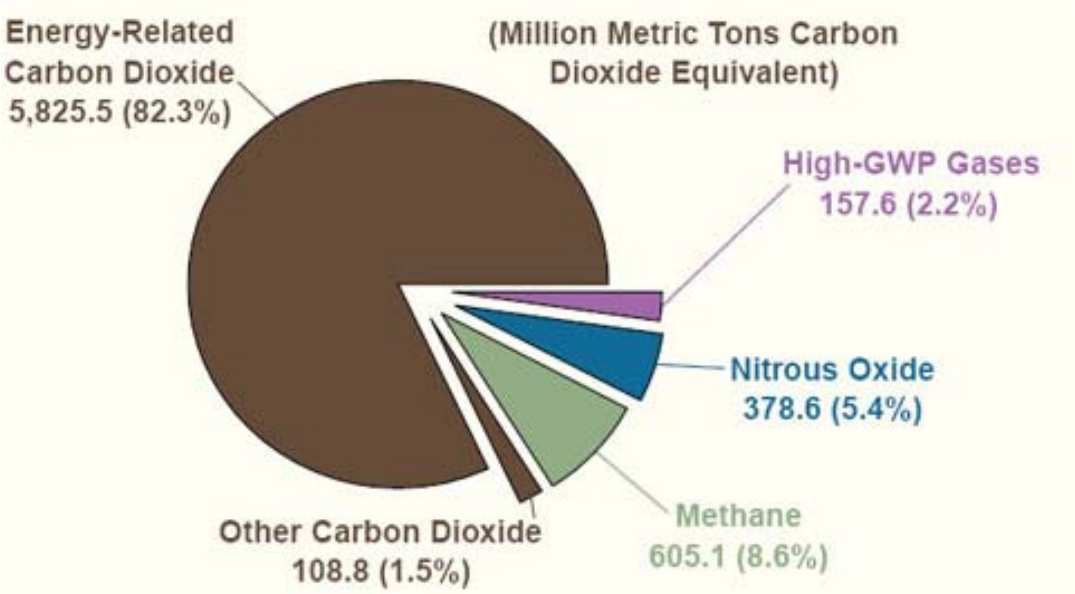
(This page intentionally left blank)

Appendix A

Greenhouse Gas Emissions in California

The characteristics, sources, and units used to quantify the six greenhouse gases (GHGs) listed in AB 32 are documented in this section in order of abundance in the atmosphere: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). (Water vapor, the most abundant GHG, is not included because natural concentrations and fluctuations far outweigh anthropogenic influences). Figure A-1 below shows U.S. emissions of these gases in 2006, with HFCs, PFCs and SF_6 collectively referred to as high-GWP (global warming potential) gases.

Figure A-1. U.S. Greenhouse Gas Emissions by Gas, 2006



Source: Energy Information Administration estimates,
http://www.eia.doe.gov/oiaf/1605/ggrpt/figure_1.html.
Note: High-GWP Gases include HFCs, PFCs, and SF_6.

In order to simplify reporting and analysis, methods have been set forth to describe emissions of GHGs in terms of a single gas. The most commonly accepted method to compare GHG emissions is the GWP methodology developed by the Intergovernmental Panel on Climate Change (IPCC). The IPCC defines the GWP of every GHG on a normalized scale of CO2e that compares the atmospheric heating potential of each GHG over a 100-year period to that of the same mass of CO2. (CO2 has a GWP of 1 by definition.) Generally, GHG emissions are quantified in terms of metric tons of CO2 equivalent (CO2e) emitted per year. For example, the IPCC finds that nitrous oxide has a GWP of 310 and methane has a GWP of 21. Thus, one ton of nitrous oxide emissions is represented as 310 tons of CO2e, and one ton of methane is 21 tons of CO2e. This allows for the summation of different GHG emissions into a single total.

Table A-1, below, lists the GWP of each GHG, its atmospheric life and concentration. Atmospheric concentration of a given compound is commonly described in units of parts

per million (ppm), parts per billion (ppb) or parts per trillion (ppt), referring to the number of molecules of the compound in a sampling of one million, one billion or one trillion molecules of air.

Table A-1: Global Warming Potentials, Lifetimes and Abundances of Several Significant GHGs

Gas	Global Warming Potential (100 years)	Atmospheric Life (years)	1998 Atmospheric Concentration (ppt[1])
CO_2	1	50–200	365,000,000
CH_4	21	9–15	1,745
N_2O	310	120	314
HFC-23	11,700	264	14
HFC-134a	1,300	14.6	7.5
HFC-152a	140	1.5	0.5
CF_4	6,500	50,000	80
C_2F_6	9,200	10,000	3
SF_6	23,900	3,200	4.2

[1] ppt is a mixing ratio unit indicating the concentration of a pollutant in parts per trillion by volume.
Source: IPCC 1996; IPCC 2001.

Table A-2, below, lists the anthropogenic (man-made) emissions of GHGs as CO2e equivalents. As shown, CO2 is by far the largest component of worldwide CO2e emissions, followed by CH4, N2O, and high-GWP gases.

Table A-2: Global Anthropogenic Greenhouse Gas Emissions (CO_2 e)

Gas	CO_2e Percentage
CO_2 (deforestation, decay of biomass, etc)	17.3%
CO_2 (other)	2.8%
CO_2 (fossil fuel use)	56.6%
CH_4	14.3%
N_2O	7.9%
High-GWP[1] Gases (includes HFCs, PFCs, and SF6)	1.1%

[1] GWP stands for Global Warming Potential. Source: Olivier et al., 2005, 2006 in IPCC 2007b.

CO_2

CO2 is the most important GHG and accounts for more than 75% of all anthropogenic GHG emissions. Its long atmospheric lifetime (on the order of decades to centuries) ensures that atmospheric concentrations of CO2 will remain elevated for decades after

GHG mitigation efforts to reduce GHG concentrations are implemented (Olivier et al. 2005, 2006 in IPCC 2007b).

Increasing concentrations of CO2 in the atmosphere are largely due to emissions from the burning of fossil fuels, gas flaring, cement production, and land use changes. Three quarters of anthropogenic CO2 emissions are the result of fossil burning (and to a very small extent, cement production and gas flaring); the remainder results from land-use changes (IPCC 2007a).

Anthropogenic emissions of CO2 have increased concentrations in the atmosphere most notably since the industrial revolution; the concentration of CO2 has increased from about 280 ppm to 379 ppm over the last 250 years (IPCC 2001). IPCC estimates that the present atmospheric concentration of CO2 has not been exceeded in the last 650,000 years and is likely to be the highest ambient concentration in the last 20 million years (IPCC 2007a; IPCC 2001).

CH_4

CH4 , the main component of natural gas, is the second largest contributor to anthropogenic GHG emissions and has a GWP of 21 (Association of Environmental Professionals 2007; IPCC 1996). Anthropogenic emissions of methane primarily result from growing rice, raising cattle, combusting natural gas, and coal mining (National Oceanic and Atmospheric Administration 2005). Atmospheric methane has increased from a pre-industrial concentration of 715 parts per billion to 1,775 parts per billion in 2005 (IPCC 2001). Though it is unclear why, atmospheric concentrations of CH4 have not risen as quickly as anticipated (National Oceanic and Atmospheric Administration 2005).

N_2O

N2O is a powerful GHG, with a GWP of 310 (IPCC 1996). Anthropogenic sources of N2O include agricultural processes, nylon production, fuel-fired power plants, nitric acid production and vehicle emissions. Nitrous oxide is also used in rocket engines, racecars, and as an aerosol spray propellant. Agricultural processes which result in anthropogenic N2O emissions are fertilizer use and microbial processes in soil and water (Association of Environmental Professionals 2007). N2O concentrations in the atmosphere have increased from pre-industrial levels of 270 parts per billion to 319 parts per billion in 2005 (IPCC 2001).

HFCs

HFCs are man-made chemicals used in commercial, industrial and consumer products and have high GWPs (EPA 2006a). HFCs are generally used as substitutes for ozone depleting substances (ODS) in automobile air conditioners and refrigerants. As seen in Table A-1, the most abundant HFCs, in order from most abundant to least, are HFC-134a (35 parts per trillion), HFC-23 (17.5 parts per trillion), and HFC-152a (3.9 parts per

trillion). Concentrations of HFCs have risen from zero to current levels. Because these chemicals are man-made, they do not exist naturally in ambient conditions.

PFCs

The most abundant PFCs include CF4 (PFC-14) and C2F6 (PFC-116). These man-made chemicals are emitted largely from aluminum production and semiconductor manufacturing processes. PFCs are extremely stable compounds that are only destroyed by very high-energy ultraviolet rays, which result in the very long lifetimes of these chemicals, as shown in Table A-1 (Environmental Protection Agency 2006). PFCs have large GWPs and have risen from zero to the current concentration levels shown in Table A-1.

SF_6

SF6, another man-made chemical, is used as an electrical insulating fluid for power distribution equipment, in the magnesium industry, in semiconductor manufacturing and also as a trace chemical for study of oceanic and atmospheric processes (Environmental Protection Agency 2006a). In 1998, atmospheric concentrations of sulfur hexafluoride were 4.2 parts per trillion, and steadily increasing in the atmosphere. SF6 is the most powerful of all GHGs listed in IPCC studies with a GWP of 23,900 (IPCC 1996).

Appendix B

AB 32 Programs

California's major law for reducing greenhouse gas (GHG) emissions is stipulated in Assembly Bill 32 (AB 32, Nunez) approved by Governor Schwarzenegger in 2006. The goals in AB 32 aim at reducing GHG emissions to 1990 levels by 2020 - a reduction of approximately 30 percent. The main strategies for making these reductions are outlined in the Scoping Plan adopted by the California Air Resources Board (ARB) in December 2008 and in the Discrete Early Action measures identified by ARB in 2007. The following are summaries of AB 32 Programs for reducing GHG emissions.

Discrete Early Action Measures

AB 32 established a statewide target for GHG reductions by 2020. AB 32 further required the ARB to adopt a plan and individual measures to achieve the maximum technologically feasible and cost-effective reductions in GHG emissions. AB 32 required ARB to identify a list of Discrete Early Action measures for implementation by January 1, 2010. ARB identified in 2007 nine Discrete Early Action measures, including potential regulations affecting landfills, motor vehicle fuels, refrigerants in cars, port operations and other sources. Refer to the ARB website at http://www.arb.ca.gov/cc/ccea/ccea.htm for detailed information about each measure and the timeline for implementation. Short descriptions of the Discrete Early measures follows.

Low Carbon Fuel Standard (LCFS)

The LCFS requires fuel providers to ensure that the mix of fuel they sell into the California market meets, on average, a declining standard for carbon intensity. By 2020, the LCFS will produce a 10 percent reduction in the carbon content of all passenger vehicle fuels sold in California. This is expected to replace 20 percent of on-road gasoline consumption with lower-carbon fuels, more than triple the size of the state's renewable fuels market, and place more than 7 million alternative fuel or hybrid vehicles on California's roads. The LCFS will use market-based mechanisms that allow providers to choose how they reduce emissions while responding to consumer demand. For example, providers may purchase and blend more low-carbon ethanol into gasoline products, purchase credits from electric utilities supplying low-carbon electrons (i.e., low carbon fuels used in the generation of electricity) to electric passenger vehicles, or diversify into low-carbon hydrogen as a product. In addition, new strategies yet to be developed will be included.

Landfill Methane Capture

This control measure will reduce methane emissions from municipal solid waste landfills by requiring gas collection and control systems on landfills where these systems are not currently required and will establish statewide performance standards to maximize methane capture efficiencies. Additionally, as part of this process, ARB and California Integrated Waste Management Board (CIWMB) staff will explore opportunities to increase energy recovery from landfill methane gas.

Reductions from Mobile Air Conditioning

These measures will control HFC release from do-it-yourself motor vehicle air conditioning (MVAC) servicing; require addition of leak tightness testing and repair during Smog Checks; enforce federal regulations on banning HFC release from MVAC servicing and dismantling; and require the use of low global warming potential (GWP) refrigerants for new MVAC.

Semiconductor Reduction

This measure proposes to reduce perfluorocarbon (PFC) and fluorinated gas from the semiconductor industry. The regulation will be designed to achieve the maximum reductions in PFC fluorinated gas emissions that are technically feasible and cost-effective.

SF_6 Reductions

SF6 is a potent GHG with a GWP of 23,900, one of the highest GWPs currently identified. SF6 is a versatile gas used in a multitude of sectors including the electric utility and semiconductor industries. (Utility and semiconductor industry-related emissions will be addressed under separate strategies.) This early action focuses on the non-utility and semiconductor-related emissions of SF6. Specifically, the strategy reduction measures will consider a potential ban on the use of SF6 where technologically feasible and cost-effective alternatives are available. The main uses of SF6 in California that are not directly related to utilities or semiconductor manufacturing include: magnesium casting operations; consumer products (tennis balls); medical uses (ultrasounds, eye surgery); tracer gas in leak testing (including fume hood testing), research and bioterrorism studies; insulator for particle accelerators; and etchant for flat panel display units.

High-GWP Consumer Products

Measures under this Discrete Early Action focus on reducing the use of compounds with high GWP in consumer products. This will be done by adding and modifying product category definitions in the existing consumer products regulation and establishing new or lower volatile organic compound (VOC) limits for multiple categories. The measures would also reduce the use of compounds with high GWP in pressurized gas duster products. A number of other modifications or clarifications are also proposed, including prohibiting the use of specified toxic air contaminants in carpet and upholstery cleaners, fabric protectants, multi-purpose lubricants, penetrants, sealant or caulking compounds, and spot removers. The consumer products measure is estimated to reduce CO2 equivalent emissions by 250,000 metric tons per year.

Heavy Duty Vehicle Measures

Under this Early Action measure, new and existing on-road tractors and trailers operating on California highways would need to be equipped with technologies to improve fuel efficiency. It is based on the U.S. EPA's SmartWay Program, which approves technologies, such as aerodynamic equipment and low-rolling resistance tires, and certifies tractors and trailers that incorporate these technologies. The proposed regulation would provide GHG and NOx emission reductions throughout California. Tractors and trailers that comply with the proposed regulation by proper use of aerodynamic equipment and low-rolling resistance tires are expected to achieve a fuel efficiency improvement ranging from 7 to 10 percent and provide GHG and oxides of nitrogen (NOx) emission reductions throughout California.

Tire Pressure Program

Maintaining proper tire pressure on vehicles improves fuel economy, and therefore reduces GHG emissions. This measure would place requirements on the automotive service industry regarding tire pressure checks and inflation pressure retention. While current federal law requires auto manufactures to install tire pressure monitoring systems in all new vehicles beginning September 1, 2007, owners of older vehicles lack this important tool.

Shore Power

Port electrification was identified as a Discrete Early Action measure. The proposed regulation, while reducing diesel PM and NOx emissions, would also result in significant reductions of CO2 emissions as a co-benefit of requiring cleaner grid supplied electrical generation for ocean-going vessels while docked. Auxiliary engines typically power lighting, ventilation, pumps, communication, and other onboard equipment while a ship is docked at a berth. The proposed regulations would require some vessels to turn off their auxiliary engines; it is expected, but not required, that many of those vessels would then receive their electrical power from shore while at berth.

AB 32 Scoping Plan

The Scoping Plan outlines a variety of measures and programs to reduce GHG emissions to 1990 levels by 2020. The plan includes development of a California cap-and-trade program that will be integrated with a broader regional market to maximize cost-effective opportunities to achieve GHG emissions reductions. The plan also includes transformational measures designed to help pave the path toward California’s clean energy future. The following are summaries of the proposed AB 32 measures and programs.

California Cap-and-Trade Program

A cap-and-trade program sets the total amount of GHG emissions allowable for facilities under the cap and allows covered sources, including producers and consumers of energy, to determine the least expensive strategies to comply. The emissions allowed under the cap will be denominated in metric tons of CO2e. The currency will be in the form of allowances which the State will issue based upon the total emissions allowed under the cap during any specific compliance period. Emission allowances can be banked for future use, encouraging early reductions and reducing market volatility. The ability to trade allows facilities to adjust to changing conditions and take advantage of reduction opportunities when those opportunities are less expensive than buying additional emissions allowances. California is working closely with other states and provinces in the Western Climate Initiative (WCI) to design a regional cap-and-trade program that can deliver reductions of GHG throughout the region. ARB will develop a cap-and-trade program for California that will link with the programs in the other WCI Partner jurisdictions to create a regional cap-and-trade program. In addition, a federal cap-and-trade program is being contemplated, and legislation (the Waxman-Markey Bill) is being developed. If the federal program is enacted, the development and implementation of the program will need to be closely coordinated with California. Federal preemption is a possibility.

California Light-Duty Vehicle GHG Standards

There are a number of programs identified under AB 32 that reduce GHGs by the way of light-duty vehicle emission standards. These programs include the AB 1493 (Pavley) GHG vehicle standards, zero-emission vehicle (ZEV) program, and the AB 118 (Nunez) Air Quality Improvement Program/Alternative and Renewable Fuel and Vehicle Technology Program.

AB 1493 directed ARB to adopt vehicle standards that lowered GHG emissions to the maximum extent technologically feasible, beginning with the 2009 model year. ARB adopted regulations in 2004 and applied to the U.S. EPA in 2005 for a waiver under the federal Clean Air Act to implement the regulation. The Pavley regulations incorporate both performance standards and market-based compliance mechanisms. To obtain additional reductions from the light-duty fleet, ARB plans to adopt a second, more stringent, phase of the Pavley regulations. U.S. EPA however, denied the California waiver in 2008 the issues entered litigation. As of February 2009, EPA began reconsidering the waiver request.

The ZEV program will play an important role in helping California meet its 2020 and 2050 GHG emissions reduction requirements. Through 2012, the program requires placement of hundreds of ZEVs (including hydrogen fuel cell and battery electric vehicles) and thousands of near-zero emission vehicles (including plug-in hybrids, conventional hybrids, compressed natural gas vehicles). In the mid-term (2012-2015), the program will require placement of increasing numbers of ZEVs and near-zero emission vehicles in California. In 2009, the Board will review the ZEV program to ensure it is

optimally designed to help the State meet its 2020 target and put us on the path to meeting our 2050 target of an 80 percent reduction in GHG emissions from 1990 levels.

Under AB 118 (Núñez, Chapter 750, Statutes of 2007), ARB is administering the Air Quality Improvement Program, which provides approximately $50 million per year for grants to fund clean vehicle/equipment projects and research on the air quality impacts of alternative fuels and advanced technology vehicles. AB 118 also created the Alternative and Renewable Fuel and Vehicle Technology Program and authorized CEC to spend up to $120 million per year over seven years (2008-2015) to develop, demonstrate, and deploy innovative technologies to transform California's fuel and vehicle types.

Energy Efficiency Programs

The Scoping Plan relies heavily on energy efficiency to reach its GHG emissions reduction goals. Programs include the California Long Term Energy Efficiency Strategic Plan and the Solar Hot Water and Efficiency Act of 2007.

Renewables Portfolio Standard

California's current Renewables Portfolio Standard (RPS) is intended to increase procurement from eligible renewable energy resources to reach 20 percent by 2010. Increased use of renewables will decrease California's reliance on fossil fuels, thus reducing emissions of GHGs from the electricity sector. Based on Governor Schwarzenegger's call for a statewide 33 percent RPS, the Scoping Plan anticipates that California will have 33 percent of its electricity provided by renewable resources by 2020, and includes the reduction of GHG emissions based on this level. Achieving the 33 percent goal will require broad-based participation from many parties and the removal of certain barriers. The CEC, CPUC, California Independent System Operator (CAISO), and ARB are working with California utilities and other stakeholders to formally establish and meet this goal.

Regional Transportation-Related GHG Targets

On September 30, 2008, Governor Arnold Schwarzenegger signed SB 375 (Steinberg) which establishes mechanisms for the development of regional targets for reducing passenger vehicle GHG emissions. Through the SB 375 process, regions will work to integrate development patterns and the transportation network in a way that achieves the reduction of GHG emissions while meeting housing needs and other regional planning objectives. This new law reflects the importance of achieving significant additional reductions of GHG emissions from changed land use patterns and improved transportation to help achieve the goals of AB 32. SB 375 requires ARB to develop, in consultation with metropolitan planning organizations (MPOs), passenger vehicle GHG emissions reduction targets for 2020 and 2035 by September 30, 2010. It sets forth a collaborative process to establish these targets, including the appointment by ARB of a Regional Targets Advisory Committee (RTAC) to recommend factors to be considered and methodologies for setting GHG emissions reduction targets. RTAC members were

appointed in January 2009. An explanation of SB 375 from bill author Darrell Steinberg can be found at the Institute for Local Government website at http://www.ca-ilg.org/sb375 .

Million Solar Roofs Program

The Million Solar Roofs Program is a ratepayer-financed incentive program aimed at transforming the market for rooftop solar systems by driving down costs over time. Created under Senate Bill 1, the Million Solar Roofs Program includes CPUC's California Solar Initiative and CEC's New Solar Homes Partnership, and requires publicly-owned utilities (POUs) to adopt, implement and finance a solar incentive program. This measure would offset electricity from the grid, thereby reducing GHG emissions.

Industrial Emissions

These measures would be implemented through a regulation requiring each facility to conduct an energy efficiency audit of individual combustion and other direct sources of GHGs within the facility to determine the potential reduction opportunities, including criteria air pollutants and toxic air contaminants. The audit would include an assessment of the impacts of replacing or upgrading older, less-efficient units such as boilers and heaters, or replacing units with combined heat and power units. In addition, ARB has identified four specific measures for development and implementation, two for oil and gas recovery operations and gas transmission, and two for refineries.

High-Speed Rail

The Safe, Reliable High-Speed Passenger Train Bond Act for the 21st Century was approved by California voters in 2008. A high-speed rail (HSR) system is part of the statewide strategy to provide more mobility choice and reduce GHG emissions. This measure supports implementation of plans to construct and operate an HSR system between northern and southern California. As planned, the HSR is a 700-mile-long rail system capable of speeds in excess of 200 miles per hour on dedicated, fully-grade separated tracks with state-of-the-art safety, signaling and automated rail control systems. The system would serve the major metropolitan centers of California in 2030 and is projected to displace between 86 and 117 million riders from other travel modes in 2030.

Green Building Strategy

A Green Building strategy offers a comprehensive approach to reducing direct and upstream GHG emissions that cross-cut multiple sectors including Electricity/Natural Gas, Water, Recycling/Waste, and Transportation. Green buildings are designed, constructed, renovated, operated, and maintained using an integrated approach that reduces GHG emissions by maximizing energy and resource efficiency. Employing a whole-building design approach can create synergies that result in multiple benefits at

little or no net cost, allowing for efficiencies that would never be possible on an incremental basis.

Recycling and Waste

ARB will work with the California Integrated Waste Management Board (CIWMB) to develop and implement programs to reduce waste and materials at the source of generation and increase recycling which will result in the reduction of GHG emissions and other co-benefits. ARB will also work with the California Department of Food and Agriculture, the Department of Transportation, and others to provide direct incentives for the use of compost in agriculture and landscaping. Further, CIWMB will explore the use of incentives for all recycling and waste management measures, including commercial recycling, and for local jurisdictions to encourage the collection of residentially and commercially generated food scraps for composting and in-vessel anaerobic digestion.

Sustainable Forests

The 2020 Scoping Plan target for California's forest sector is to maintain the current 5 MMTCO2e of sequestration through sustainable management practices, including reducing the risk of catastrophic wildfire, and the avoidance or mitigation of land use changes that reduce carbon storage. California's Board of Forestry and Fire Protection has the existing authority to provide for sustainable management practices, and will, at a minimum, work to maintain current carbon sequestration levels. The Resources Agency and its departments will also have an important role to play in implementing this measure.

Water

Six GHG emission reduction measures are proposed for the water sector: water use efficiency; water recycling; water system energy efficiency; reuse urban runoff; increased renewable energy production; and public goods charge. Three of the measures target reducing energy requirements associated with providing reliable water supplies and two measures are aimed at reducing the amount of non-renewable electricity associated with conveying and treating water. The final measure focuses on providing sustainable funding for implementing these actions.

Agriculture

The Scoping Plan encourages the capture of methane (CH_4) through use of manure digester systems at dairies to provide emission reductions on a voluntary basis. This measure is also a renewable energy strategy to promote the use of captured gas for fuels or power production. Nitrogen fertilizer, which produces N2O emissions, is the other significant source of GHGs in the agricultural sector. ARB has begun a research program to better understand the variables affecting fertilizer N2O emissions, and based on the findings, will explore opportunities for emission reductions.

(page intentionally left blank)

Appendix C

Other Programs to Reduce GHG Emissions

There are many programs already underway in California at the state, regional and local levels to reduce GHG emissions. These programs seek new and innovative ways to require or promote reductions in GHG emissions through new standards and incentives designed to increase energy efficiencies and renewable energy production, advance green technologies and cleaner fuels, and improve our land use development patterns and waste management, among others. Such programs are occurring worldwide. Appendix C focuses only on the major GHG emission reduction programs in California.

State of California

Assembly Bill 118(Nunez) - Alternative and Renewable Fuel and Vehicle Technology Funding

This program is intended to increase the use of alternative and renewable fuels and innovative technologies that will transform California's fuel and vehicle types to help attain the state's climate change policies. Upon appropriation by the State, approximately $120 million will be allocated annually as incentives to public agencies, vehicle and technology consortia, businesses, public-private partnerships, workforce training partnerships and collaboratives, fleet owners, consumers, recreational boaters, and academic institutions, for projects that:

Develop and improve alternative and renewable low-carbon fuels;

- Optimize alternative and renewable fuels for existing and developing engine technologies;
- Produce alternative and renewable low-carbon fuels in California;
- Decrease the overall impact of an alternative and renewable fuel's life-cycle carbon footprint and increase sustainability;
- Expand fuel infrastructure, fueling stations, and equipment;
- Improve light-, medium-, and heavy-duty vehicle technologies;
- Retrofit medium and heavy-duty on-road and non-road vehicle fleets;
- Expand infrastructure connected with existing fleets, public transit, and transportation corridors; and
- Establish workforce training programs, conduct public education and promotion, and create technology centers.

Senate Bill 1368 (Peralta) - GHG Emissions Performance Standards

The law limits long-term investments in baseload generation by the state's utilities to power plants that meet an emissions performance standard (EPS) jointly established by the California Energy Commission (CEC) and the California Public Utilities Commission (PUC).

The CEC has designed regulations that:

- Establish a standard for baseload generation owned by, or under long-term contract to, publicly owned utilities, of 1,100 lbs CO2 per megawatt-hour (MWh). This will encourage the development of power plants that meet California's growing energy needs while minimizing their emissions of GHGs;

- Require posting of notices of public deliberations by publicly owned utilities on long-term investments on the CEC website. This will facilitate public awareness of utility efforts to meet customer needs for energy over the long term while meeting the State's standards for environmental impact, and;

- Establish a public process for determining the compliance of proposed investments with the EPS.

California Solar Initiative

The California Solar Initiative a collaborative effort between the PUC and CEC initiated in 2006, has a statewide goal to install 3,000 MW of new solar electricity capacity by 2016 - moving the state toward a cleaner energy future and helping lower the cost of solar systems for consumers. The initiative has a statewide budget of $3.3 billion over 10 years. The California Solar Initiative provides solar incentives to customers in investor-owned utility territories of Pacific Gas & Electric, Southern California Edison, and San Diego Gas & Electric. These three utilities represent about 75-80% of California's electricity use. The California Solar Initiative provides cash back for solar for existing homes, and existing and new commercial, industrial, government, non-profit, and agricultural properties.

Executive Order S-14-08

On November 17, 2008 Governor Schwarzenegger signed Executive Order (EO) S-14-08 directing all state agencies to work toward a 33% RPS by 2020. A 33% renewable energy target would further California’s efforts to address climate change and lead the nation in clean energy policy. Specifically, the Executive Order stated the following:

- The EO calls for a new, more aggressive renewable energy target, increasing the current goal of obtaining 20% of California’s energy from clean, renewable resources by 2010 to 33% by 2020.

- The EO directs a restructuring of the process for developing specific renewable energy sites. The EO has a goal of reducing permitting process times for developing renewable energy sites by 50 percent.

- The Governor will propose legislation that will codify the new higher standards and reform the renewable pricing structure at the PUC to make them competitive and get projects built sooner.

Landfill Methane Capture Strategies

The California Integrated Waste Management Board (CIWMB) has identified strategies for increasing landfill methane capture to reduce methane emissions by 2020. The Landfill Methane Capture Strategy includes three core components:

- Install New Methane Control Systems at Landfills Currently Without Control Systems. The control measure will reduce methane emissions from landfills by requiring gas collection and control systems on landfills generating significant methane where these systems are not currently required; it will also establish statewide performance standards to maximize methane capture efficiencies.

- Maximize Landfill Methane Capture Efficiencies. The CIWMB is developing a guidance document to help landfill operators and regulators evaluate potential actions to achieve additional GHG emission reductions from landfills beyond what are currently occurring with existing landfill practices. The study is based on an evaluation of existing state-of-the-practice technologies, as reflected in published literature, reports to regulatory agencies, and the project team's familiarity and experience with specific landfill and landfill gas practices and projects.

- Increase Recovery of Landfill Gas as a Biomass Renewable Energy Source. The CIWMB is providing technical assistance and incentives, and further developing options, in consultation with ARB, CEC, and PUC, to increase recovery of landfill gas. The CIWMB awarded two grants totaling $1 million to demonstrate commercial scale production of liquefied natural gas (LNG) vehicle fuel from landfill gas. The CIWMB is also providing matching funding to demonstrate an innovative anaerobic composting design and process sited at a landfill to increase recovery of biogas for energy and recover a residual compost product from yard wastes otherwise used as landfill alternative daily cover.

California Adaptation Strategy

The California Resources Agency is currently developing a California Adaptation Strategy. The strategy will be developed by collecting, synthesizing, and communicating to the greatest extent possible, how sea level rise, temperature rise and duration, and precipitation changes due to climate change will exacerbate existing fire, flood, water quality, air quality, habitat loss, human health and drought. The Strategy will also

examine how risks associated with these changes will impact the state's economy, infrastructure, human populations, and environment. In addition, it will also outline those solutions which can be implemented that promote resiliency to climate change impacts posing the greatest risks to California and consider key economic, health, and environmental issues.

Caltrans Climate Action Program

The California Department of Transportation (Caltrans) Office of Policy Analysis and Research (OPAR) Climate Action Program coordinates the department's effort in response to AB 32, the Climate Action Team (CAT), the Governor's executive orders, Administration policies, and related legislative rulings. OPAR works with the CAT, ARB, regional agencies, and other stakeholders on cross-agency policy framework and research focusing on GHG emissions reduction and energy-efficiency measures. The program's functional responsibilities include:

- Coordinating and monitoring climate activities and strategies across departmental programs, including planning functions statewide;
- Serving as a primary point of contact for issues related to climate change and transportation energy; and
- Working to mainstream GHG emissions reduction and energy-efficiency measures into transportation planning and project development.

California Water Plan

The California Department of Water Resources (DWR) addresses climate change in its California Water Plan, which is updated every five years. The plan provides a framework for water managers, legislators, and the public to consider options and make decisions regarding California's water future. In addition, DWR in October 2008 released its report *Managing an Uncertain Future; Climate Change Adaptation Strategies for California's Water* which focuses discussion on the need for California's water managers to adapt to impacts of climate change. The report proposes 10 adaptation strategies in four categories which may be incorporated into the California Water Plan

Air Districts

Air Pollution Control Districts and Air Quality Management Districts throughout the state have implemented a variety of climate protection programs over the past several years. The following is a small sampling of some air district programs.

Bay Area Air Quality Management District

In 2005, the Bay Area Air Quality Management District (BAAQMD) initiated a Climate Protection Program that acknowledges the link between climate protection and programs to reduce air pollution in the greater San Francisco Bay Area. The Board of Directors also formed a standing Committee on Climate Protection to provide direction on BAAQMD climate protection activities. BAAQMD is continually seeking ways to integrate climate protection into current District functions, including grant programs, CEQA commenting, regulations, inventory development, and outreach. In addition, the District's climate protection program emphasizes collaboration with ongoing climate protection efforts at the local and State level, public education and outreach and technical assistance to cities and counties. The following are some of BAAQMD's Climate Protection Programs:

- *Climate Protection Grant Program:* In 2007 the BAAQMD awarded $3 million to fund 53 local projects that will significantly reduce the Bay Area's carbon footprint. This $3 million represents the largest single source of funding available for climate protection projects in the Bay Area, and makes the District one of the top funders of climate protection activities in the country.

  - *4th and 5th Grade Curriculum: Protect Your Climate* is a climate protection curriculum targeted at 4th and 5th graders. The curriculum's 16 lessons investigate the science and causes of climate change and how students can take action to protect our climate. Through hands-on activities, students learn ways to reduce GHG emissions from energy, waste, and transportation. Lessons are connected to the California state content standards. After successfully completing a pilot year in 2007-2008, the curriculum program was expanded to include 40 classrooms in the 2008-2009 school year. The participating teachers and approximately 1,000 students in the program are learning how to take action for climate protection in their classrooms, homes, and communities

  - *GHG Regional Inventory*: In 2006 the BAAQMD published *Source Inventory of Bay Area GHG Emissions*, the Bay Area Regional GHG Emission Inventory for base year 2002. The District is developing an updated regional GHG emission inventory which will reflect Bay Area emissions from the year 2005.

  - *ICLEI-BAAQMD Workshop Series:* The BAAQMD has an ongoing partnership with ICLEI-Local Governments for Sustainability to host a series of local government workshops on developing GHG emission inventories and selecting climate protection strategies. Workshops have been hosted for local governments in San Mateo, Santa Clara, and Marin counties. The District and partners ICLEI, PG&E and MTC have provided workshop participants with city-specific data sets and hands-on training. Over 30 local government staff have participated and developed GHG emission inventories for their communities.

- *GHG Fee for Stationary Sources Adopted:* On May 21, 2008, BAAQMD's Board of Directors approved a new fee on air pollution sources in the region to help defray the costs of the District's climate protection work. Industrial facilities and businesses that are currently required to submit an air quality permit to operate will have the modest fee of 4.4 cents per metric ton of GHG emissions added to their permit bill. The fee will apply to Climate Protection Program activities related to stationary sources.

Sacramento Metropolitan Air Quality Management District

The Sacramento Metropolitan Air Quality Management District (SMAQMD) has started a formal program to address climate change. Elements include GHG inventory, work practices, commute incentives, building retrofits and education. Currently SMAQMD is researching and developing enhancements to the District's Climate Protection Program. Those enhancements include: 1) the creation of a GHG emissions "bank," 2) the creation of a program which would facilitate GHG mitigation for CEQA purposes, 3) an enhanced reporting system and; 4) assurances that climate protection measures do not cause increases in criteria pollutants. In addition, SMAQMD has done the following in regards to the Climate Protection Program.

- *California Climate Action Registry (CCAR) and The Climate Registry* The SMAQMD joined the CCAR in March of 2006 and is a founding member of The Climate Registry. The Climate Registry consists of organizations that are voluntarily taking actions to reduce their GHGs. Among the required actions are annually tracking and reporting their GHGs and having them certified by an independent auditer. The District has completed its emissions inventory for 2005, 2006 and 2007 and all three years of data have been certified.

- *Greenergy® member* The SMAQMD subscribes to this Sacramento Metropolitan Utility District program which matches electricity use with renewable electricity sources.

- *Clean Vehicles* Most of the SMAQMD vehicles are hybrids. Employees regularly use these vehicles to conduct air quality inspections at the sites. (Currently, of the District's 23 vehicles, 19 are 2005 Toyota Priuses. When their lease ends in February 2011, the District will look to replace the Priuses with even greener vehicles.)

- *Alternate Transportation Policies* The SMAQMD provides incentives to employees to commute using public transit, car or van pools, and bicycles or by walking. Over 60% of the District's employee work trips are made by alternate modes instead of driving alone.

- *Building Retrofits* The SMAQMD has already implemented several measures at its main office building to improve energy efficiency and reduce its carbon footprint, including: 1) replacing light bulbs with more energy-efficient bulbs, 2)

installing motion sensors on the majority of its light switches and placing other lights on timers and 3) installing a new digitally-based HVAC control system. The District is pursuing LEED EB (Existing Building) certification (level still TBD) for its building and a next step is to have a LEED EB Gap Analysis performed to determine what steps remain to achieve LEED EB certification.

San Joaquin Valley Unified Air Pollution Control District

In August 2008 the San Joaquin Valley Air Pollution (SJVAPCD) Control District's Governing Board adopted a Climate Change Action Plan (CCAP). The CCAP directed the Air Pollution Control Officer to develop guidance documents to assist land use and other permitting agencies in addressing GHG emissions as part of the CEQA process; investigate the development of a GHG banking program; enhance the existing emissions inventory process to include GHG emissions reporting consistent with new state requirements; and administer voluntary GHG emission reduction agreements. These items would then be brought before the District's Governing Board for their consideration in late summer 2009. The goals of the CCAP are to assist local land use agencies comply with CEQA for projects with GHG emissions, assist Valley businesses in complying with state law related to GHGs, and to ensure that collateral emissions from GHG emission reduction projects do not adversely impact public health or environmental justice communities in the Valley. The following are potential programs considered within the CCAP: (1) GHG guidance for CEQA; (2) carbon exchange program; (3) GHG emissions reporting; and (4) voluntary GHG mitigation agreements. The implementation of these actions, if determined to be warranted and feasible, will be determined with extensive stakeholder input.

South Coast Air Quality Management District

The South Coast Air Quality Management District (SCAQMD) is actively engaged in Climate Change activities to maximize the synergies between strategies to reduce criteria pollutants, toxics, and greenhouse gases (GHG). The following highlights selected SCAQMD efforts:

- *Climate Change Committee*: In Spring 2008, the SCAQMD established a Board-level Climate Change Committee to oversee SCAQMD's efforts related to implementation of AB 32 and provide enhanced guidance to local governments regarding climate change issues.

- *Climate Change Policy*: In September 2008, the SCAQMD Board approved a formal Climate Change Policy. It states: *"It is the policy of the South Coast Air Quality Management District (SCAQMD) to actively seek opportunities to reduce emissions of criteria, toxic, and climate change pollutants and maximize synergistic effects of strategies that reduce emissions in more than one of these categories. It is the policy of the SCAQMD to assist businesses and local governments implementing climate change measures, decrease the agency's*

carbon footprint and provide information regarding climate change to the public. If greenhouse gas reduction strategies have potential negative impacts or slow progress in reducing criteria or toxic pollutants, the impacts must be carefully evaluated and disclosed. In these instances, public health protection should prevail in the majority of circumstances. This policy provides additional direction to staff relative to future actions related to greenhouse gas emission reductions and climate change."

The Policy includes 8 specific action areas to implement the above policy.

- *Inventory*: To show its support for efforts to inventory and reduce GHG emissions, SCAQMD has voluntarily prepared a GHG inventory. The SCAQMD has also reported voluntarily to the California Climate Action Registry (CCAR) for the last several years.

- *SoCal Climate Solutions Exchange*: The objective of the SoCal Climate Solutions Exchange is to ensure real, surplus, verifiable GHG reductions from voluntary, early actions. This provides incentives for local investments and assists local businesses in capturing voluntary early GHG reductions. Added benefits are the retention of co-pollutant benefits and stimulus for the local economy. Three rules were adopted in late 2008 and early 2009 to implement this program – Rule 2700 – General; Rule 2701 – SoCal Climate Solutions Exchange; and Rule 2702 – GHG Reduction Program. SCAQMD staff serves as the verifiers for emission reductions that follow pre-approved protocols.

- *California Environmental Quality Act (CEQA)*: To provide guidance to local lead agencies on determining significance for GHG emissions in their CEQA documents, the SCAQMD convened a GHG CEQA Significance Threshold Working Group. Members of the working group include government agencies implementing CEQA and representatives from various stakeholder groups that will provide input to the SCAQMD staff on developing GHG CEQA significance thresholds. On December 5, 2008, the SCAQMD Governing Board adopted an interim GHG significance threshold for projects where the SCAQMD is lead agency. Work is underway regarding recommendations for a GHG threshold for other applications.

- *Technology Advancement Assistance:* SCAQMD oversees a comprehensive program to co-sponsor public-private demonstration and deployment projects for lower-emission fuels, vehicles, and technologies in local fleets. Co-funded fleet acquisitions include low-emission natural gas school & transit buses, clean heavy-duty vehicles, plug-in hybrid electric conversions, and other advanced propulsion vehicles & equipment.

- *Technical and Policy Forums*: The SCAQMD periodically holds clean-energy forums and roundtables to bring together experts on a variety of topics, including GHG reduction strategies. Archived event materials can be viewed at the

SCAQMD website: visit aqmd.gov, click on upper tab "Technology," then select "Technology Forums" from the drop-down menu.

- *Leading by Example*: The SCAQMD headquarters facility is considered a "green building" because of its unique design and state-of-the art features such as fuel cells, 60-kilowatt micro turbines, high efficiency chillers, and energy efficient lighting. The building's exterior design includes windows of a high-efficiency glass which allows light in, but keeps heat out. The building roof is a reflective material which aids in reducing air conditioning load during sunny days. The SCAQMD maintains one of the largest alternatively-fueled fleets in the country, with vehicles running on electricity, compressed natural gas, gasoline, hydrogen or other hybrid combinations.

San Luis Obispo County Air Pollution Control District

In November 2005, the SLOAPCD Board adopted its Climate Protection Plan. Implementation of the plan has been given a high priority and resulted in the following activities and accomplishments:

- *Community Outreach:* A comprehensive outreach program for climate protection was developed, with a countywide survey conducted to determine the level of public knowledge and action on the issue. Presentations have been made to every city council and the county as well as at various public forums regarding the impacts of climate change and how to reduce greenhouse gas emissions locally. A community stakeholder group has been formed with representatives from all local jurisdictions meeting regularly to discuss development of GHG inventories and action plans.

- *GHG Inventory Development:* Municipal and communitywide GHG inventories are being compiled for all local jurisdictions in the region, with a regional emissions report and action plan to be developed based on the inventories.

- *Grant Funding for GHG Reduction Programs:* The District has allocated $440,000 in grant funds for climate protection to provide incentive grants for reducing GHGs in the county; a third of those funds will be used as seed money for implementation of community climate action plans initiated by local jurisdictions.

- *Evaluation of Existing District Programs:* District staff have completed a review of existing regulations and programs to determine the level of GHG reductions already achieved by those programs and what changes can be made to enhance those reductions.

- *Regional Planning:* The District is working with the Council of Governments, LAFCO and the County to develop a preliminary Sustainable Communities

Strategy to include in the 2010 update of the Regional Transportation Plan.

- *Community Partnerships and Programs:* The District is a founding member or on the steering committee for several community groups working to reduce energy consumption and GHG emissions, including the following: The Strategic Energy Alliance for Change (SEAChange) which sponsors public forums and outreach on renewable energy and clean fuels; the Central Coast Clean Cities Coalition, which fosters the advancement and use of clean fuels; the 2030 Challenge Task Force, whose mission is to promote the achievement of carbon free, zero energy buildings by 2030; and SLO Car Free, whose goal is to promote car-free tourism throughout the County.

Ventura County APCD

- *Air – the search for one clean breath***:** a 41-minute award-winning high-definition film produced by the District and funded primarily by a U.S. Environmental Protection Agency grant, features information on climate change via a visit to the British Antarctic Core Survey Program at Cambridge, England, to interview Dr. Robert Mulvaney, an international ice core expert. DVD copies were given to every air district in the country, and the film is being screened throughout the United States and internationally. Teacher lessons for the film will be available online this summer at www.airthefilm.org. They will be aligned with the California State content standards for science, history, and social science. Several of the lessons will concentrate on global climate change.

- *Climate Change Presentations:* The District markets a 20-minute PowerPoint presentation on Global Climate Change to service organizations, senior groups, schools and other organizations. Since its inception in 2008, the program has been presented to over 600 individuals.

- *District Legislative Platform*: The District has amended its legislative platform to allow for the support legislation that implements cost-effective measure to reduce greenhouse gases.

- *Green Urban Fleets*: The District is providing funding to support low-carbon alternative fuel fleets operating in urban environments.

Northern Sonoma County APCD

The Northern Sonoma County Air Pollution Control District participates in climate protection programs on its own as an air district and through CAPCOA. Most District efforts, however, are undertaken in partnership with the County of Sonoma, its nine cities, the Sonoma County Water Agency, and the Agriculture and Open Space Preservation District. Key District efforts include:

- Offering small grants for projects that reduce GHG emissions through its "Sustainability and Trip Reduction Program," approved by the District's Board in 2008.

- Working with local high schools and the Sonoma County Climate Protection Campaign to incorporate climate change awareness and analysis of student travel patterns into the curriculum, and to support campaigns to reduce VMT associated with commute to school.

- Participation in the steering committee overseeing the efforts to achieve the commitment made by Sonoma County and all of its nine cities to reduce GHG emissions by 25% by 2015.

- Participation in the county-wide effort to deploy a vehicle charging network to support electric vehicle technology.

- Participation in the partnership with Nissan to deploy 1,000 electric vehicles in Sonoma County by 2011.

Regional GHG Reduction Programs

The Western Climate Initiative (WCI)

The WCI is a cooperative effort of seven U.S. states and four Canadian provinces that are collaborating to identify, evaluate, and implement policies to reduce GHG emissions, including the design and implementation of a regional cap-and-trade program. The Initiative began in February 2007 with the governors of Arizona, California, New Mexico, Oregon, and Washington, who have since been joined by the premiers of British Columbia, Manitoba, Ontario, and Quebec, and the governors of Montana and Utah. Participation in the WCI reflects each partner's strong commitment to identify, evaluate, and implement collective and cooperative actions addressing climate change. In addition, WCI was created to focus on a market-based cap-and-trade system.

(page intentionally left blank)

Appendix D

Projected Climate Change Impacts to California

In California and throughout western North America, signs of a changing climate are evident. During the last 50 years, winter and spring temperatures have been warmer, spring snow levels in lower- and mid-elevation mountains have dropped, snowpack has been melting one to four weeks earlier, and flowers are blooming one to two weeks earlier. These regional changes are consistent with global trends. If left unchecked, by the end of the century CO2 concentrations could reach levels at which climate change impacts would severely impact our public health, economy, and environment.

State of the art climate modeling was performed for the California Energy Commission (CEC) to determine potential future impacts of climate change in California under three different scenarios: a low emissions scenario that assumes aggressive action is taken to reduce GHG emissions, a medium emissions scenario assuming moderate level GHG reductions, and a high emissions scenario that assumes little action is taken to reduce emissions. The range of potential impacts modeled was summarized in a 2006 CEC document called: "Our Changing Climate: Assessing the Risks to California." The document details the growing severity of consequences predicted statewide as temperature rises, and also identifies those impacts that may be unavoidable and for which we will need to develop coping and adaptation strategies. That information is summarized below to aid jurisdictions in determining the scope and focus of the policies needed to address climate change through the General Plan process.

Increase in the Number of Extreme Heat Days

Current models predict that extreme heat events in California will worsen in both frequency and intensity over the next several decades. Heat waves that once lasted days could last for weeks or even most of an entire season. Heat waves are especially dangerous to vulnerable groups, such as infants, the elderly and those with pre-existing health conditions.

The impacts of heat waves tend to be greater in urban areas because of the "heat island" effect and higher levels of air pollution from transportation. The heat island effect occurs when urban areas replace natural land cover with darker man-made materials such as pavement for parking lots and roads. These materials tend to collect and retain heat at a higher rate than a natural landscape, which causes the urban areas to be hotter than nearby open spaces. Heat island area impacts are expected to increase the frequency, duration, and intensity of conditions conducive to air pollution formation. Health impacts may be influenced by the timing and characteristics of heat waves. Extreme heat events that happen early in the summer tend to result in more deaths than those that occur later in the summer, as people have not yet acclimatized to warmer weather. Moreover, nighttime minimum temperatures are increasing more rapidly than daytime maximum temperatures, which can further increase temperature stress to the elderly and people with pre-existing health conditions, such as circulatory, respiratory and nervous system problems. Furthermore, extreme heat related illnesses place stress on health infrastructure and can lead to significant economic costs.

Increased electricity demand is an additional concern associated with extreme heat days, as the heavy demand to operate air conditioning raises the risk of power shortages. Heavy electricity usage, which is often generated using fossil fuels, means more pollutant emissions, including GHGs.

Increase in the Number and Intensity of Wildfires

Wildfires can have a severe impact on California's air quality and public health. In the coming years, wildfires are expected to increase in intensity and frequency due to climate change, producing more extreme bad air days and longer fire seasons. This negatively impacts the health of the population and results in higher economic costs to California.

Smoke is made up of a mixture of gases and fine particles produced when wood and other organic matter burn. Fine particulate matter (PM) from smoke can cause a variety of adverse health effects ranging from eye and respiratory tract irritation to serious illness, such as reduced lung function, bronchitis, aggravation of asthma, and premature death. aggravation of pre-existing respiratory and cardiovascular disease and increased mortality. PM can also affect the body's immune system and make it more difficult to remove inhaled foreign materials from the lungs, such as pollen and bacteria.

Wildfires also have major economic impacts, costing California hundreds of millions of dollars in firefighting and medical costs; damage to property, natural areas and agricultural lands; loss in tourism, other businesses and employment; increased insurance rates; and a host of other impacts.

Rise in Sea Level and Increased Risk of Flooding

California sea levels have risen about 7 inches over the past 150 years and are projected to rise an additional 4 to 28 inches over the next century as a result of climate change. As sea levels rise, California can expect species and habitat shifts, changes in intensity and frequency of rainfall and coastal storms, increased flooding and changes in runoff patterns. A rise in coastal water temperatures is also anticipated, which will affect water quality and conditions for all marine life that depend on oxygen.

California coastal areas are especially vulnerable to rising sea levels. Increasingly severe winter storms, high tides, and rising mean sea levels are expected to cause more frequent and severe erosion, flooding, and damage to coastal structures. California coastal areas are at risk for the following:

- Erosion of beaches and bay shores;
- Inundation of low-lying uplands;
- Increased flooding and erosion of marshes, wetlands and tidal flats;
- Increased flooding and storm damage in low-lying coastal areas;

- Vulnerable to episodic storm surges and destructive waves that penetrate further inland; and
- Increased salinity in estuaries, marshes, coastal rivers, and coastal aquifers.

Water supplies are also at risk. Rising sea levels would aggravate saltwater intrusion which would degrade California's estuaries, coastal aquifers, wetlands, and groundwater aquifers, and threaten the quality and reliability of the Sacramento-San Joaquin River Delta water transfer system. Higher tide levels caused by higher sea levels could also pose problems to the Delta levee systems with a risk of more inland inundation and the corresponding threat to water quality.

Decrease in Snowpack and Early Run-Off: Effects on Water Supply

Water is already a scarce resource in California and is likely to become more scarce in the coming decade. Water demand is expected to increase because of rising temperatures and increasing population; at the same time, water supply is expected to decrease. California's water supply system relies on a network of dams, reservoirs and canals which are dependent upon water supplied by the snowpack in the Sierra Nevada Mountains. The Sierra Nevada snowpack provides natural water storage, storing winter precipitation in the form of snow and releasing it in the spring and early summer as the snow melts. This system is estimated to hold about half the storage capacity of California's major reservoirs.

Recent studies show that if heat-trapping GHG emissions continue unabated, more precipitation will fall as rain instead of snow, and the snow that does fall will melt earlier, reducing the Sierra Nevada spring snowpack by as much as 70 to 90 percent by the end of this century. Decreasing snowmelt and spring stream flows coupled with increasing demand for water could lead to increasing water shortages, which could exacerbate drought conditions and increase the diversion of rivers in California. The Central Valley relies heavily on Sierra Nevada snowmelt in the summer for drinking water and agriculture. As river flows decrease, competition for scarce water resources increases. California Energy Commission reports project a 15% to 30% reduction in surface water supply to California's cities and farms over this century as a result of climate change.

Increase in the Intensity of Severe Storms

The IPCC predicts changes in precipitation due to increasing global surface temperatures. Rising global surface temperatures are expected to increase the activity of the world's hydrologic cycle and increase the moisture content of the atmosphere. In addition, rising temperatures are expected to increase water vapor in the atmosphere which is a GHG and will likely provide a positive feedback mechanism for climate warming. Global average precipitation is expected to increase during this century; however, it will not be

distributed evenly. Certain areas are expected to receive extra precipitation while others, including California and the southwestern deserts, are expected to receive less.

Research indicates that climate change can cause hurricanes and tropical storms to become more intense, last longer, and have stronger winds. Scientists hypothesize that higher water temperatures are one of the causes of longer and stronger storms, since hurricanes and tropical storms get their energy from warm water. As sea surface temperatures rise, developing storms will contain more energy. Weather patterns have also become more variable, causing longer and drier droughts and longer winter and spring flooding. In recent years, due to high-intensity storms, water flows on many California rivers have been the largest on record. Levees, dams, and flood bypasses are forced to manage flows for which they weren't designed.

Specifically to California, the Sacramento-San Joaquin River Delta is susceptible to flooding. The Delta is composed of 70 islands and tracts and has land surfaces at or below mean sea level. Some Delta Islands are now 25 feet below mean sea level as a result of farming and soil erosion. Levee failure is a significant threat and could result in potential loss of human life, damage to property, and agricultural crops, significant harm to the Delta's fragile ecosystem, disruption of utilities and highways, and water supply disruption due to levee failure and changes in salinity levels.

Effects on Human Health Due to Climate Change

Summer temperatures in California under some climate models are projected to increase by 2°C to 7°C (3.6°F to 12.6°F) by the end of this decade. These temperature increases are expected to affect human health in a number of ways including negative effects on air pollution, heat-related mortality, effects on various infectious diseases, and increase in wildfires.

Higher temperatures are expected to increase the frequency, duration, and intensity of conditions conducive to ozone formation, a pervasive air pollution problem in California causing a wide range of respiratory and cardiovascular problems, particularly for the elderly and very young. Considerable improvement in ozone levels has been achieved over the past three decades as a result of California's aggressive anti-pollution programs. However, under a moderate warming scenario, climate models predict a potential increase of 75 to 85 percent more days with weather conducive to ozone formation in Los Angeles and the San Joaquin Valley, relative to today's conditions.

Likewise, if temperatures rise to the higher warming range, by 2100 there could be up to 100 more days per year with temperatures above 90°F in Los Angeles and above 95°F in Sacramento. Extremely high temperatures increase the number of people who die on a given day by causing the cardiovascular system to work harder to keep the body cool, aggravating existing heart problems; increasing respiratory distress; and causing heat exhaustion. This is predicted to result in two to three times more heat-related deaths than occur today.

Climate change may also increase the risk of some infectious diseases, particularly those that thrive in warm areas. Diseases often associated with hot weather, including the West Nile virus, cholera, and Lyme disease are spreading rapidly throughout North America and Europe because increased temperatures in these areas allow disease carriers such as mosquitoes, ticks, and mice to thrive.

(page intentionally left blank)

Appendix E

Top 10 Actions by Local Governments and Communities

Top Ten Actions by Local Governments and Communities

The most effective and efficient greenhouse gas reductions within the control of local governments will depend on the particular greenhouse gas (GHG) profile within each community, the status of GHG reduction planning to date, and the economic conditions relative to different strategies. Not all strategies will work equally within the diversity of cities and counties in California. However, the following ten strategies are widely applicable throughout California in varying degrees and are the recommended initial local government focus for future General Plan policies, Climate Action Plan development, and Blueprint Planning:

1) promotion of smart growth, jobs/housing balance, transit-oriented development, and infill development through land use designations, zoning, and public-private partnerships;

2) support for and funding of transit, bicycle, and pedestrian connections through transit and trail planning and regional cooperation;

3) promotion of energy- and water-efficient buildings (e.g., LEED buildings) through green building ordinances, project timing prioritization, and other implementing tools;

4) promotion of green procurement and alternative fuel vehicle use through municipal mandates and voluntary bid incentives;

5) support for alternative fuel facilities and infrastructure through land use designations, zoning, and public-private partnerships;

6) support for renewable energy generation (utility and residential) through feasibility evaluations, land use designations, and zoning;

7) promotion of waste diversion, recycling, energy efficiency and energy recovery in cooperation with public services districts and private entities;

8) support for urban and rural forestry through tree planting requirements and programs;

9) community outreach and education to foster community involvement, input, and support for GHG reduction planning and implementation; and

10) regional cooperation to find cross-regional efficiencies in GHG reduction investments and to plan for regional transit, energy generation, and waste recovery facilities.

(page intentionally left blank)

Appendix F

Agency Responsibilities for Programs on Climate and GHGs

Appendix F provides information on California State agencies and how they are addressing climate change and GHG reductions in their policies and programs. The following are thumbnail summaries of State programs for reducing GHG emissions. Links are provided at the end of each summary where additional information can be found.

Climate Action Team (CAT)

Established by Governor Schwarzenegger under an Executive Order S-05-05 on June 1, 2005, the CAT coordinates state-level actions relating to Climate Change. The Team is led by the Secretary of the California Environmental Protection Agency and includes the Secretary of the Business, Transportation and Housing Agency, Secretary of the Department of Food and Agriculture, Secretary of the Resources Agency, Chairperson of the Air Resources Board, Chairperson of the Energy Commission and President of the Public Utilities Commission. The CAT is charged with implementing global warming emission reduction programs and reporting on the progress made toward meeting the statewide GHG reduction targets that were established in the Executive Order. The CAT is divided into 11 subgroups which are focused on supporting the Scoping Plan--the roadmap to meet the state's GHG reduction goals. The CAT members will play a key role in developing and implementing the reduction measures adopted in the Scoping Plan. Furthermore, the Executive Order mandated the preparation of a biennial assessment on climate change science, impacts, and adaptation. The CAT has released the draft Climate Action Team Biennial Report for 2009. The draft report can be found at this link: http://www.energy.ca.gov/2009publications/CAT-1000-2009-003/CAT-1000-2009-003-D.PDF . The draft report addresses four climate change topics which include: impacts of climate change on California's public health, infrastructure and natural resources; economic impacts of climate change on California; climate change research in California; and state efforts to adapt to current and future effects of climate change.
http://www.climatechange.ca.gov/climate_action_team/index.html

California Air Resources Board (CARB)

CARB is tasked to oversee California's major initiatives for reducing climate change or GHG emissions as outlined in AB 32, and 2005 Executive Order S-3-05. These efforts aim at reducing GHG emissions to 1990 levels by 2020 - a reduction of approximately 30 percent, and then an 80 percent reduction below 1990 levels by 2050. The main strategies for making these reductions are outlined in the Scoping Plan which was adopted by the Board in December 2008.

The Scoping Plan provides an outline for actions to reduce California's GHG emissions. The Scoping Plan now requires the CARB and other state agencies to adopt regulations and other initiatives reducing GHGs. Many of these measures will be developed in 2009 and 2010 and go into effect in 2012. The following are some of the regulations and activities that CARB will be implementing: energy efficiency/co-benefits audits of large stationary sources; refinery flare recovery; SF6 emission reduction from the electrical

sector and particle accelerators; landfill methane control measures; stationary equipment refrigerant management program; and foam recovery and destruction program. For a complete list of regulations and measures that CARB is considering, please see the Scoping Plan at:
http://www.arb.ca.gov/cc/scopingplan/scopingplan.htm .

In addition to AB 32, CARB is involved with other state climate change programs which include SB 375 and Clean Car Standards (AB 1493—Pavley). As described in Chapter 2, SB 375 is a state law that requires CARB to set regional targets to reduce greenhouse gas emissions from passenger vehicles for 2020 and 2035. If regions develop integrated land use, housing and transportation plans that meet the SB 375 targets, new projects in these regions can be relieved of certain review requirements under CEQA. The targets apply to the regions in the State covered by the 18 metropolitan planning organizations (MPOs).

Under AB 1493, CARB adopted regulations that achieve the maximum feasible and cost-effective reduction in greenhouse gas emissions from motor vehicles. The regulations would reduce GHG emissions from California passenger vehicles by about 22 percent by 2012 and about 30 percent by 2016. For these regulations, however, the Federal Clean Air Act requires a waiver from the U.S. EPA. Initially, the request was denied, but the U.S. EPA as of February 2009 is currently reconsidering rehearing of the waiver request.
http://www.arb.ca.gov/cc/cc.htm

Board of Forestry

The Board of Forestry (BOF) has been involved in the development of forest protocols and how the Forest Practices Act could better address climate mitigation and adaptation policies. BOF has worked with Cal Fire to update the 2003 Assessment of Forests and Rangelands to provide more discussions and analysis on climate change; BOF also helps develop the State's Fire Management Plan which provides policy direction for the state on combating fires. In developing this plan, BOF will consider climate change in its considerations. Furthermore, CARB's Scoping Plan states that the forest sector must achieve a "no net loss" target, which means it must achieve reductions in CO2 equivalent to the current statewide forest carbon budget. BOF has further been tasked by CARB to implement approaches to reach this target. BOF plans to use a combination of regulatory, statutory and incentive-based approaches to meet these goals.
http://www.fire.ca.gov/resource_mgt/resource_mgt_EPRP_Climate/climate_change_board.php

California Coastal Commission

The California Coastal Commission is developing a planning manual for how stakeholders should address climate change within the California Coastal Act (CCA). The Coastal Commission is planning to develop a document and website that will help stakeholders interpret and implement projects under the CCA. In addition the Commission completed the following in connection with its climate change activities: a

workshop on climate change for the Commission Board; establishment of an internal climate change task force to better understand the relationship between climate change and the CCA; addressing how to incorporate GHG mitigation requests into permit conditions within large projects before the Commission; and participation on the Coastal States Organization Climate Change Work Group, which developed a report, "The Role of Coastal Zone Management Programs in Adaptation to Climate Change."
http://www.coastal.ca.gov/climate/climatechange.html

California Coastal Conservancy

The California Coastal Conservancy has taken the following actions in regards to climate change: developing Climate Change Grant Assessment Criteria for project design; reduction of the Conservancy's overall carbon footprint; and improved planning for future climate impacts to land and water management efforts. The Conservancy is also interested in the "permanent protection or restoration of important habitat corridors affecting significant populations of various species" as an important measure of success. The Conservancy will assess both land and freshwater species as pertaining to climate change impacts.
http://www.scc.ca.gov/index.php?cat=26

California Conservation Corps (CCC)

The CCC has taken the following actions in regards to climate change: implementing a number of programs to reduce its carbon footprint; promoting a more environmentally-friendly labor force by increasing spikes (work from mobile camps) to project work sites to reduce vehicle mileage and maximize time on tasks; increasing fleet vehicle use; developing demonstration projects that sequester carbon and reduce energy and water use; engaging in additional urban and wildland forestry projects, such as tree planting and fuel reduction activities and; participating in climate education that furthers climate action awareness through highly visible project work and public education strategies.
http://www.ccc.ca.gov/#

California Department of Food and Agriculture (CDFA)

The CDFA is addressing the issues of global warming through development of carbon sequestration strategies and GHG reduction strategies for agriculture, promotion of energy and water use efficiency in agriculture, biological control measures, and support for biofuels development. Some specific programs administered include the Rice Straw Utilization Program, which ties into carbon sequestration and biofuels production. Other projects in the Minor Crops Block Grant Program address carbon sequestration and energy efficiency in agriculture. The CDFA is also seeking to reduce the use of petrochemical-based pesticides and fertilizers, which release GHG to the atmosphere, through the Biological Control Program, which substitutes biological organisms for pesticides, and the Fertilizer Research and Education Program, which reduces fertilizer use and promotes carbon sequestration. The Drainage Water Reduction Program and

Reuse and Salt Utilization Program result in more efficient use of irrigation water, resulting in less energy used for water pumping. The CDFA promotes the California production and use of bioethanol and biodiesel as renewable fuels. The Dairy Digester Cost Share Program expands the use of dairy digesters, which convert dairy manure and the methane gas derived from it into electricity, process heat, compost, and carbon dioxide. The conversion of dairy methane to carbon dioxide reduces the global warming potential by about 90% while providing energy.
http://www.cdfa.ca.gov/AHFSS/Emergency_Preparedness/Climate_Change.html

California Department of Forestry and Fire Protection (Cal Fire)

Cal Fire has taken the following actions in regards to climate change: reducing Cal Fire's carbon footprint; participating as an active member of the CAT Forest and Land-Use Sector Groups; assisting in the development of the original forest carbon protocols that were recently adopted by CARB; actively developing new protocols on public lands, urban forestry, and working forests; developing the climate strategy for the Forestry CAT that included detailed descriptions on Reforestation/Afforestation, Forest Conservation, Forest Management, Urban Forestry, and Fuels Reduction/Biomass Production; and participating in several current programs that improve the ability of our forests to adapt to the projected impacts of climate change in California. These programs include the California Forest Improvement Program, the Vegetation Management Program, the Nursery and Seed Bank Program, the Urban Forestry Program, the Forest Legacy Program, and Fuel Hazard Reduction.
http://www.fire.ca.gov/index.php

California Energy Commission (CEC)

The CEC has played an important role in coordinating and implementing state activities addressing climate change. These activities include the following: involvement in a number of activities supporting implementation of AB 32 and other climate activities such as reductions in GHG emissions through energy efficiency, renewable energy and alternative transportation fuel programs; serving on the CAT and leading the Land Use Subgroup of the Climate Action Team (LUSCAT); participating on 11 CAT subgroups responsible for developing action items that will result in quantifiable greenhouse gas emission reductions; conducting a joint proceeding with the CPUC on AB 32 implementation in the electric sector and making joint recommendation to the ARB in February 2008; conducting scientific research on climate change through the Public Interest Energy Research Program (PIER) and the California Climate Change Center; developing climate research and a Development, Demonstration and Deployment Road Map with the ARB and other state agencies to achieve GHG emission reduction and adaptation goals; providing technical support to the California Climate Action Registry in developing greenhouse gas emission protocols; qualifying third-party organizations to provide technical assistance and certification of emissions baselines and inventories; supporting CARB's statewide greenhouse gas emissions inventory for updates and

accuracy; participating in the working groups of the Western Climate Initiative to identify, evaluate and implement collective and cooperative ways to reduce GHGs in the West; and providing policy guidance and monitoring international, national and regional developments and activities impacting clean energy and climate change issues.

Furthermore, the CEC's PIER Program supports research to produce environmentally sound, safe, reliable and affordable energy services and products. In conjunction with other state agencies, PIER is addressing climate change by leading the development of a long-term climate change research plan for California. Under PIER, energy efficiency and generation technologies are under development that could significantly contribute to the decline of in-state greenhouse gas emissions. In addition, PIER is seeking to improve understanding of the implications of climate change by supporting research on potential costs and impacts was well as possible adaptation and mitigation measures. http://www.energy.ca.gov/climatechange/index.html

California Environmental Protection Agency (Cal/EPA)

Under existing law, the CARB, CEC, and the California Climate Action Registry all have responsibilities with respect to control of greenhouse gas emissions. New legislation requires the Secretary for Environmental Protection to coordinate greenhouse gas emission reductions and climate change activity in state government. Cal/EPA is addressing climate change through its assessment of environmental indicators in the Environmental Protection Indicators for California (EPIC) project. EPIC was created to develop scientifically based measures that convey complex information on environmental status and trends in an easily understandable format. EPIC supports Cal/EPA's commitment to using measurable results in judging the effectiveness of the state's efforts directed at environmental protection. In its first year, EPIC developed a framework in which to select indicators that are important in tracking the state of California's environment. For climate change, the indicators selected were carbon dioxide emissions, air temperature, Sierra Nevada snowmelt runoff, and sea level rise in California. In the future, EPIC will investigate other greenhouse gas emissions, such as methane and nitrous oxides, and correlate different data sets that show increasing climate patterns in California. Cal/EPA will continue to evaluate, improve, and expand on the EPIC project to ensure that it provides meaningful information for understanding the state of the California environment for planning and decision making.
http://www.climatechange.ca.gov/

California Integrated Waste Management Board (CIWMB)

The CIWMB is addressing climate change issues through recycling programs, which avoid emissions from the energy-intensive processing of virgin raw materials; through sustainable building activities, which emphasize energy, water, and materials efficiency thereby reducing emissions from their production and transport; and through landfill gas collection, which directly uses landfill greenhouse gas emissions for fuel. The CIWMB is implementing the State Agency Buy Recycled Campaign (SABRC) program which,

under state law, requires all state agencies to use recycled products when available and increase acceptance and awareness of recycled-content product use in the private sector as well as state and local government. CIWMB runs the one of the largest recycled-content databases on the web, including construction and demolition recycling databases. The CIWMB has played a key role in the Sustainable Buildings Task Force, and is currently developing the Sustainable Building Training Program. In an interagency study, the CIWMB will develop a methodology to incorporate life-cycle costing into the state's capital outlay design. CIWMB participated in the Collaborative for High Performance Schools to assist in building energy and resource-efficient California schools and runs a program to promote efficient landscape design and maintenance practices among landscaping professionals. CIWMB also has been instrumental in the U.S. Green Building Council's Green Building Rating System. The CIWMB is pursing conversion technologies such as gasification and hydrolysis of solid waste to produce alternative fuels such as ethanol, thereby offsetting greenhouse gas emissions from fossil fuel sources. The conversion of solid waste destined for landfills to useful products such as ethanol reduces the organic fraction going into landfills. It is the organic fraction which generates landfill gas, a significant source of greenhouse gas emissions. The CIWMB also directly benefits greenhouse gas reduction by ensuring compliance with state minimum standards for landfill gas monitoring, collection, and control.
http://www.ciwmb.ca.gov/climate/

California Ocean Protection Council (OPC)

OPC has taken the following actions in regards to climate change: coordinating ocean impacts; establishing policies that will guide those agencies responsible for ocean protection; and helping to coordinate the state's efforts to adapt to the ocean impacts of climate change. OPC is working on determining potential impacts along the coast due to sea level rise, including impacts to public infrastructure.
http://www.opc.ca.gov/

California Public Utilities Commission (CPUC)

The CPUC is responsible for a number of energy-related policies and initiatives that benefit consumers and the economy, and have corresponding reductions in GHGs. Some of these policies and initiatives are described as follows:

- Energy Efficiency - The CPUC launched an energy efficiency and conservation campaign in which the agency allocated almost $3 billion in funding for energy efficiency programs in 2006-2008.

- Renewable Energy - California has the most ambitious goals in the nation for renewable energy. The State’s Renewable Portfolio Standard requires utilities to obtain 20% of their power from renewable resources by 2010, as mandated under SB 107 (Simitian). The CPUC oversees utility progress toward this goal and identifies steps toward meeting the Governor’s target of 33% by 2020.

- Emissions Performance - The CPUC instituted a new GHG emissions performance standard to regulate contracts with electricity generation facilities. Mandated by SB 1368 (Perata), the standard, known as EPS, ensures that any long-term power commitments to meet California's energy needs are at least as clean as California's existing energy portfolio.

- Emerging Technologies - The CPUC approved $11 million per year in funding support for emerging energy efficiency technologies from 2006 through 2008.

- Advanced Metering - The CPUC has authorized distribution tariffs since 2001 to fund utility incentives for customer-owned clean generation such as fuel cells and solar energy. This is a part of a plan for replacing conventional customer electric meters with an Advanced Metering Infrastructure (AMI), giving customer new access to information and greater control over their energy use and bills. http://www.cpuc.ca.gov/PUC/energy/climate+change/

California Resources Agency

The California Resources Agency is providing leadership in promoting and implementing climate policies across the state through its 25 departments, commissions, boards and conservancies, through the Governor's Climate Action Team efforts, and through engagement in national and international climate policy dialogues. These efforts range from working to reduce the Resource Agency's overall carbon footprint, to setting state climate policy direction through the development of a state climate adaptation strategy, to representing California in the recent U.N. Framework Convention on Climate Change Convention in Indonesia. The Resources Agency has been active in developing a climate adaptation strategy (CAS) for the state that begins to address how California can and should prepare for short-, medium-, and long-term risks from expected climate impacts. Mitigating carbon emissions has and should be a central focus of California climate policies, but helping California adapt to known climate impacts will need to be on equal footing to address climate risks to the state's resources. In addition, the Resources Agency is:

- In the process of accounting for all Resources-wide GHG emissions. At the same time, the Agency is working with all of its departments, commissions, boards, and conservancies to reduce its overall carbon footprint in internal operations, project activities, and amongst its grantees and contractors when possible;

- Leading the Forestry Climate Action Team Scoping Group. The Resources Agency has been Chairing the Forestry Climate Action Team (FCAT) sector group that has focused on developing a forest sector strategy for the Scoping Plan, revising the state's greenhouse gas inventory for the forests, developing new forest protocols, discussing offsets, and the climate adaptation strategy for the forest sector;

- Revising CEQA Guidelines to address greenhouse gas mitigation and adaptation. Under SB 97 (Dutton), the Resources Agency is working with the Governor's Office of Planning and Research to develop Technical Guidelines for how GHGs should be considered in the California Environmental Quality Act (CEQA). It is planned that this effort will be completed by 2010;

- Providing Climate Policy Coordination and Leadership within the Agency. Monthly "Climate Leaders" meetings with the Lead Climate person within each Resources organization are held to discuss recent happenings on climate-related topics;

- Revising bond-money grant guidelines to incorporate climate change. The Resources Agency is developing climate change grant criteria for several programs within its organization to begin to track the carbon emissions and sequestration from Resources programs;

- Initiating a forestry sub-group as part of the Western Climate Initiative, with Washington and Oregon;

- Partnering with the Coastal States Organization (CSO). The Resources Agency chairs the CSO where the Chair's Initiative proposes that coastal climate change be one of the three top priorities of the CSO. The organization has adopted the Adaptation to Climate Change Policy to better coordinate state and national efforts. The Coastal States Stewardship Foundation, in collaboration with the Coastal States Organization, is creating the Coastal States Campaign to Adapt to Climate Change;

- Involved with the West Coast Governors' Agreement on Ocean Health. Part of the recommendations from the West Coast Governors Agreement on Ocean Health Action Plan will be to address climate change adaptation by conducting a west-coast-wide assessment of anticipated impacts of climate change over the next several decades and setting a plan for how to adapt to such changes. http://resources.ca.gov/energy_and_climate_change.html

California Department of Transportation (Caltrans)

Caltrans is addressing climate change by reducing emissions through energy efficiency measures and use of alternative technologies to lessen the emissions from the state transportation system, vehicle fleet, and reduction of time spent in cars and in traffic. In fiscal year 2001/2002 Caltrans surpassed energy efficiency goals by saving $7.5 million, primarily due to the statewide Light Emitting Diode (LED) Traffic Signal upgrade project. This achievement has led to significant emissions reductions in energy generation, and is being expanded through implementation of non-vehicular energy conservation activities, such as reducing the energy to traffic signals, roadway and sign lighting, facility operations and procedures, and bridge and tunnel operations. Caltrans' Greening the Fleet Initiative uses viable, emerging technologies to reduce mobile source

emissions. So far, nineteen hybrids and 758-gas/propane bi-fuel trucks were purchased. Low emission trucks have replaced 54 diesel-powered trucks, and zero emission static inverters have replaced generators on 34 trucks. Solar panels have replaced fossil fuel-powered accessories. These efforts will continue with the goal of making significant emissions reductions and leading California fleet operators. Caltrans will also reduce mobile source emissions through its transportation energy efficiency program, the Smart Transportation and Livable Community Initiative, with the goal of reduced fuel consumption and vehicle miles traveled, and increased transit ridership and vehicle occupancy. The Transportation System Management and Congestion Relief programs seek to reduce emissions by minimizing travel demand and congestion while maximizing traffic efficiency. Applications include electronic toll collection on bridges, traffic signals, ramp meters, and many more. The New Technology Program will continue to research, demonstrate, and deploy new technologies to increase travel efficiency.
http://www.dot.ca.gov/hq/tpp/offices/opar/climate.html

Department of Conservation (DOC)

The DOC is addressing climate change issues and GHG reductions through a number of actions and programs which include the following:

- The DOC is working with The Climate Registry and several of its members in devising documentation procedures for several emission sources, such as work travel in personal vehicles and rental cars that are currently not required but strongly encouraged.

- Both the Division of Recycling and the Division of Land Resource Protection have revised their grant programs to include GHG reduction as a means to encourage and support lower-emitting projects.

- DOC participates on the following CAT subcommittees: Land Use, Recycling and Waste, Agriculture, Water, Energy and Economic.

- DOC's Division of Oil, Gas and Geothermal Resources is working with the California Energy Commission and other state and federal agencies, as mandated by AB 1925 (Blakesee). DOC is helping to assess the technical and economic feasibility of carbon sequestration in California.

- DOC established a department-wide Climate Action Team (CoolCATS) consisting of representatives from each Division. This team will measure DOC's carbon footprint and identify meaningful and feasible strategies to reduce that footprint.

- Each division within DOC is systematically educating their staff on the principles of sustainability. http://www.conservation.ca.gov/Index/Pages/Index.aspx

Delta Protection Committee (DPC)

The DPC has identified sea level rise as a central threat facing the Delta in the DPC 2006-2011 Strategic Plan. The DPC has initiated a process to update its 1995 Land Use and Resource Management Plan for the Primary Zone of the Delta and will include findings on climate change policies and recommendations for action that local and state government can take to address the impacts of climate change on the Delta.
http://www.delta.ca.gov/

Department of Fish and Game (DFG)

The DFG is addressing climate change issues and GHG reductions through a number of actions and programs which include the following:

- Implementing California's Wildlife Action Plan which identifies climate change as one of DFG's four primary stressors affecting wildlife (along with growth and development, water management conflicts, and invasive species) and makes recommendations to incorporate climate change science in restoration work.

- Providing climate leadership through personnel additions.

- Taking a lead among the state fish and wildlife agencies to begin to address the uncertainty associated with a changing climate through landscape scale efforts that support managing robust populations and healthy habitats. The Department also has many targeted efforts underway focused at climate change research, monitoring and other more specific actions.

- Creating a task force to provide the leadership to reduce or mitigate the production of greenhouse gases by the Department, and to prepare for the current and future harmful impacts of climate change on California's natural resources through policy and meaningful action.

- Convening stakeholders and partners from the NGO community, academia, state and federal agencies. This stakeholder group will provide direct input to the Director's Task Force as well as maintaining and increasing communication and collaboration among stakeholders and Department of Fish and Game.

- Developing a website that will serve as both a resource to Department employees as well as a message to the public and partners about the Department of Fish and Game's commitment to addressing the challenges of a changing climate in all of its endeavors.

- Evaluating the carbon impact of all departmental operations as part of the Climate Change Registry and as a Resources Agency-wide effort.

- Participating with the Resources Agency on the forestry, land-use and water, energy and transportation CAT subgroups, and advising the state on factors relating to adaptation and mitigation for climate change effects on wildlife and natural resources.

- Working with State Parks, Cal Fire and other Resources Agency departments and the Biodiversity Council to build a comprehensive library of published literature, popular articles, and other information on climate change effects that will be made available to the public. DFG has also developed complementary data and enhanced close collaboration with sister state agencies to help inform decisions ranging from levee placement to park management to highway interchange placement.

- Representing wildlife interests on the climate action working group of the Western Governors Association and the Climate Change subcommittee for the Association of Fish and Wildlife Agencies. http://www.dfg.ca.gov/climatechange/

Department of General Services (DGS)

The DGS is addressing climate change issues and GHG reduction through a number of actions and programs which include the following:

- Developing and implementing energy savings strategies such as the Better Buildings Program, ensuring energy savings in state building projects and schools.

- Assisting, through the Office of Fleet Administration's (OFA) Alternative Fuel Vehicle (AFV) Program, state agencies in meeting federal AFV purchasing requirements, which helps reduce dependence on foreign oil and help reduce GHG emissions.

- Establishing a vehicle purchase policy which requires gasoline vehicles purchased for the state fleet to meet the Air Resources Board’s ultra low-emission vehicle standard.

- Promoting the use of recycled products in the construction and maintenance of state buildings

- Monitoring in real time the energy use in state facilities to foster conservation efforts. http://www.green.ca.gov/default.htm

Department of Toxic Substances Control (DTSC)

The DTSC is addressing climate change issues through its Pollution Prevention and Technology Development Program. Hazardous waste reduction and recycling activities reduce impacts on the environment as well as the impacts from transportation, management and disposal. As one example, the development of water-based cleaning systems in lieu of solvent-based systems reduces resource consumption and promotes sustainability. Through the incorporation of life-cycle thinking, DTSC's pollution prevention activities take a holistic, multi-media approach, incorporating energy and materials efficiency as well as air, land and water emissions reductions.
http://www.dtsc.ca.gov/

Department of Water Resources (DWR)

The DWR is addressing climate change issues through a number of actions and programs which include the following:

- Developing a DWR Renewable Resources Policy that would meet the intent of the State's Renewable Portfolio Standards by establishment of a goal under which a percentage of load would be met by use of renewable resources.
- Refurbishing generating and pumping units to increase their efficiency as part of the State Water Project Energy Efficiency Improvements.
- Promoting combined-cycle plants and renewable resources at its facilities.
- Developing an adaptation plan for the state's water resources within the State Water Plan effort.
- Serving as a co-leader and actively participating in the CAT Water and Energy Scoping Group.
- Actively pursuing projects and research that promote carbon sequestration on DWR lands. www.water.ca.gov/climatechange/

Office of Planning and Research (OPR)

OPR is addressing climate change through education about using renewable energy sources, and through Smart Growth, and Vital Communities Initiatives. Innovative Clean Air Technologies (ICAT), GIS State Energy Map, Energy Educational Forum, and Stationary Fuel Cell Collaborative are among the initiatives led by the office. OPR held renewable energy forums from May through November of 2001 in an effort to meet the Governor's goal to increase renewable sources to supply twenty percent of all California's energy needs by 2010. The forums focused on biomass, wind, geothermal, solar, and fuel cell energy, which lead to significant reductions in greenhouse gas emissions as

compared to fossil fuel generated energy. OPR led an Interagency Task Force on Green Accounting that revised the 1987 Standard Practices Manual (2001) which provided finance and accounting procedures for using life-cycle analysis for state projects. The same Task Force is worked on a Comprehensive Energy Efficiency and Renewable Plan for the State On-Site State Buildings and a "Renewable Grid Connected Generation Plan" which supports the financial potential of the Governor's Renewable Portfolio Standard. Furthermore, addressing climate change and GHGs in CEQA projects has emerged as a major issue. Pursuant to Senate Bill 97 (Dutton)(Chapter 185, 2007) OPR is in the process of developing CEQA guidelines "for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions." OPR is required to "prepare, develop, and transmit" the guidelines to the Resources Agency on or before July 1, 2009. As part of its continuing service to professional planners, land use officials, and CEQA practitioners, OPR, in collaboration with the California Resources Agency, Cal/EPA, and ARB, has published a technical advisory containing informal guidance for public agencies as they address the issue of climate change in their CEQA documents.
http://opr.ca.gov/index.php?a=ceqa/index.html

State and Consumer Services Agency (SCSA)

SCSA which also houses the Department of General Services (DGS) and the Department of Consumer Affairs, has used the emissions reductions of energy savings programs such as the Building Better Buildings program, energy conservation awareness programs such as the Flex Your Power campaign, as well as emissions reduced from mobile sources in the "Green Fleet" program to address climate change in California. Along with the CIWMB, the SCSA has ensured significant energy and resource savings in major state building projects which amount to over $1 billion, substantially cutting emissions from energy generation. An example of this is the Capitol Area East End project. DGS, as property managers for numerous state government buildings, is cutting energy use through building electricity metering, energy control systems, and extensive recycling. Through the DGS, the Alternative Fuel Vehicle Program is creating a government fleet that produces less greenhouse gas emissions than standard gasoline powered cars by relying on Ultra Low Emission and Super Ultra Low Emission vehicles. The program is also working to deploy fuel cell vehicles as part of the state fleet and to promote the use of electric vehicles. SCSA also promotes energy conservation and efficiency in homes and schools through education and awareness programs. An example is the Flex Your Power campaign implemented by the Department of Consumer Affairs.
http://www.scsa.ca.gov/

State Lands Commission

The State Lands Commission is addressing climate change issues through a number of actions and programs which include the following:

- Inclusion of GHG emissions from leases in environmental impact reports (EIRs). The Commission is requiring greenhouse gas reports for leases involving major

projects. For projects that completed their EIRs before AB 32, the Commission is requiring a supplemental report on greenhouse gases. For example, a supplemental greenhouse gas report was produced for the Poseidon desalination project since the EIR was completed before passage of AB 32.

- Sea Level Rise Planning. The Commission is requiring that oil terminals be modified so that they can accommodate anticipated sea level rise over the life of the terminal. The Commission is beginning to consider the effects rising sea levels will have on the mean high tide line and, consequently, State Lands' jurisdiction. http://www.slc.ca.gov/

State Parks

The State Parks is addressing climate change issues and GHG reductions through a number of actions and programs which include the following:

- Planning a reduction strategy by using solar power systems, installing better insulation, and by buying lower-emission vehicles. In addition, the buildings Parks hopes to build (e.g., restrooms, visitor centers, etc., using bond funds) will have to meet high energy-efficiency standards by Executive Order of the Governor.

- Promoting carbon sequestration in State Park projects. Because forests and other plants absorb and store carbon dioxide from the atmosphere, Parks is trying to reduce its total amount of GHGs affecting our climate through Parks land stewardship and land acquisition strategies.

- Working with universities to monitor the success of different species at different altitudes in the face of climate change. And, consistent with Parks' educational mission, the entire project will be interpreted to visitors as a working example of climate change adaptation and mitigation.

- Modifying its land stewardship priorities to help species adapt to the effects of climate change. The available science suggests Parks need to be purchasing and protecting habitat corridors that move up in elevation so species have somewhere to migrate as the temperatures increase. State Parks also have to consider how an increase in sea level could affect our properties, in particular coastal properties. Sea level rise may require relocating our coastal infrastructure.

- Hosting a seminar with UC Berkeley's California Center for Environmental Law and Policy and the Resources Legacy Fund that brought together public land managers, non-profits and significant donors (who collectively will be spending hundreds of millions of dollars in the coming several years) together with scientists, academics and other experts to develop new acquisition priorities and restoration practices.

- Engaging the public in a meaningful way to help them understand the issue of climate change and to inspire them to constructive action. Parks can teach visitors about the impacts of climate change on parks and inspire them to adapt to climate change by making positive lifestyle changes. Parks can become models of climate-change best practices showcasing both what is at risk and what can be done about it. Parks is beginning to consider how climate change fits into existing planning efforts. http://www.parks.ca.gov/?page_id=21491

State Water Resources Control Board (SWRCB)

The SWRCB is addressing adaptation to climate change with increased environmental data collection and information management that assist in determining correlation between climate change, water supply changes and water quality effects. Through the Surface Water Ambient Monitoring Program (SWAMP), water quality monitoring has increased the gathering of data about overall surface water conditions. SWRCB is also implementing the System for Water Information Management (SWIM) that will increase the availability of such information to researchers, the public, and other interests. The SWRCB is working through the Joint Agency Climate Team and other forums, to identify and coordinate water quality related issues. Increased climate variability and warming has the potential to significantly affect water quality in the state, therefore this data collection and management system will assist in the planning of adaptations to meet water quality objectives.
http://www.waterboards.ca.gov/water_issues/programs/climate/

(page intentionally left blank)

Appendix G

Examples and Resources

(intentionally left blank)

Appendix G: Examples and Resources

Appendix G provides an example of a General Plan approach from Marin County. A link has been provided at the end of the Marin County excerpt for readers who wish to view the Marin County General Plan in its entirety. In addition there are several additional reference links for General Plans and Climate Action Plans. The intent is to augment the guidance in the main body of this report with real-world examples of what others have done.

(intentionally left blank)

© Chris Bramham

2.7 Atmosphere and Climate

Background

Although air quality in Marin County is generally very good, emissions from within the county may contribute to pollution problems elsewhere in the region and climate changes that are occurring on a global scale. In some parts of the Bay Area, ozone levels exceed National Ambient Air Quality Standards and particulate concentrations exceed State standards (Figures 2-9 and 2-13). Vehicle traffic produces most of the emissions leading to increased ozone levels, while construction activities, wood burning, off-road travel, and agriculture generate some measured particulate matter.

The Bay Area Air Quality Management District (BAAQMD) encourages local jurisdictions to implement policies that will help improve regional air quality, and to especially recognize sensitive receptors. This Section of the Countywide Plan provides a regulatory framework for articulating air quality objectives consistent with regional air quality programs. The Transportation, Energy and Green Building, Public Facilities and Services, and Community Development sections of the Built Environment Element also include policies and programs intended to reduce the impact of future development on air quality and global warming.

On a global scale, data indicate an increase in mean surface air temperatures over historic levels and climate models predict this warming will continue. Scientists expect that the average global surface temperature could rise 1°F to 4.5°F in the next 50 years, and 2.2° to 10°F in the next century. A rise of this magnitude is significant: For example, the difference in temperature between 1995 and the temperature during the ice ages was 5°F to 8°F. Mounting scientific evidence suggests that the discharge by human activities of gases that trap heat in the atmosphere is largely responsible for this trend. A major consequence of global warming is melting glaciers and warmer waters, which cause the oceans to expand and rise. Sea level rise and higher evaporation rates are expected to increase storm frequency and severity. The resulting economic loss from increased storm activity will be equally dramatic: It has already increased tenfold over the past 40 years. Climate change will amplify existing environmental problems, such as erosion, storm-surge floods, and landslide risk, and changes to the water cycle will further stress domestic water supply as well as indigenous plant and animal populations. Further complicating the issue of climate change is the high level of complexity and uncertainty associated with modeling and predicting climate behavior. While it is clear that damage resulting from weather-related events is already on the rise, it is not known whether future changes will be gradual or abrupt. Nor is it clearly understood what the full spectrum of impacts will be. Given the global risks to economic, environmental, and social stability, it is imperative that climate change be addressed at all levels of government.

> *"Everybody talks about the weather, but nobody does anything about it."*
>
> — Mark Twain

Fortunately, local governments can play a meaningful role in addressing climate change, by instituting measures that reduce the vulnerability and increase the adaptability of Marin's physical infrastructure, economic activities, and natural systems. Furthermore, steps taken to address climate change will yield positive benefits in local efforts to improve air quality, as vehicle traffic and energy generation are major contributors to both greenhouse gases and air pollution. For example, construction of a modern world class transportation system in Marin County will contribute to further reducing greenhouse gas emissions and improving air quality.

The issue of climate change is ultimately part of the larger challenge of fostering sustainable communities. Climate change goals are more effectively accomplished when efforts are focused on integrating principles of sustainability within sectors such as transportation, buildings, ecosystems, and water systems. While the aim of this Section is to provide a framework for addressing atmosphere and

climate change, the detailed policies and programs that address climate protection are located throughout the Countywide Plan and are referenced here in this section.

Key Trends and Issues

How clean is the air in Marin?

Air quality indicators show improvement. Marin has experienced a drop both in the total number of days exceeding State Ambient Air Quality Standards and in the number of days exceeding safe levels of ozone since 1996. Marin also has had a reduction in the number of days that safe levels of particulate matter have been exceeded in the county since 1996 (Figure 2-9). Ozone precursor pollutants have decreased locally, and are expected to continue to decline.

Figure 2-9 Summary of Measured Air Quality Exceedances

Pollutant	Standard	Monitoring Station	Days Exceeding Standard				
			2000	2001	2002	2003	2004
Ozone (O_3)	NAAQS 1-hr	San Rafael	0	0	0	0	0
		BAY AREA	3	1	2	1	0
	NAAQS 8-hr	San Rafael	0	0	0	0	0
		BAY AREA	4	7	7	7	0
	CAAQS 1-hr	San Rafael	0	0	0	0	0
		BAY AREA	12	15	16	19	7
Fine Particulate Matter (PM_{10})	NAAQS 24-hr	San Rafael	0	0	0	0	0
		BAY AREA	0	0	0	0	0
	CAAQS 24-hr	San Rafael	0	2	2	0	1
		BAY AREA	7	10	6	6	7
Fine Particulate Matter ($PM_{2.5}$)	NAAQS 24-hr	San Rafael	0	--	--	--	--
		BAY AREA	1	5	7	0	1
All Other (CO, NO_2, Lead, SO_2)	All Other	San Rafael	0	0	0	0	0
		BAY AREA	0	0	0	0	0

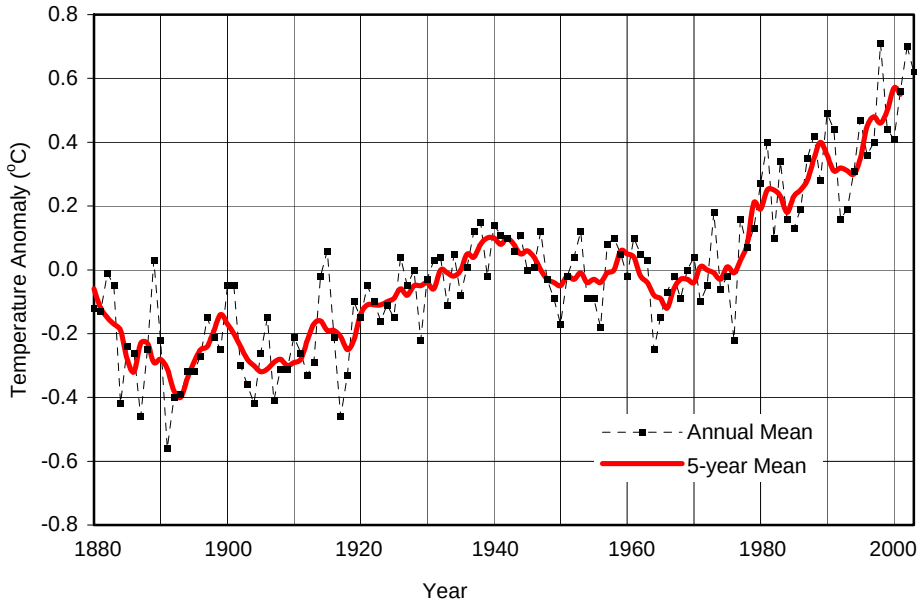
Source: 2000-2004 Bay Area Air Quality Management District.

Pollution levels can be reduced. Most particulate matter comes from areawide sources, such as combustion of wood and other nonclean fuels, and from homes and businesses without emission-control devices. Simple measures such as requiring clean-burning stoves can achieve improvements in air quality. Reducing motor vehicle use can result in significantly cleaner air.

Are temperatures rising globally?

The 10 warmest years of the 20th century all occurred after 1985, with 1998 the warmest year on record. The average of all global climate models suggests about a 3°F to 10°F rise in global temperature over the next 50 to 100 years. Global surface temperatures have increased about 1°F over the 20th century, with approximately 70% (or 0.7°F) of that change occurring in the last 25 years. The following graph illustrates the increasing rate and magnitude of global surface air temperatures.

Figure 2-10 Global Temperature



Source: NASA Goddard Institute for Space Studies.

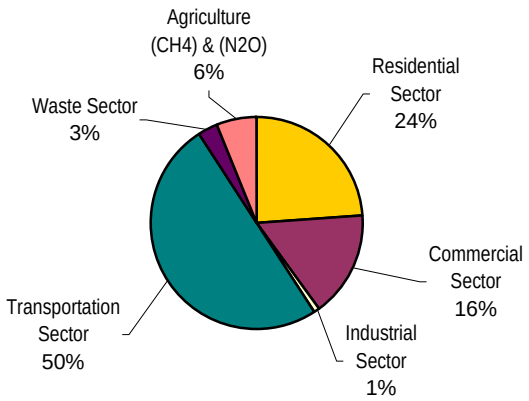
Is sea level rising?

Globally, sea level has risen 4 to 8 inches over the past century. The Intergovernmental Panel on Climate Change (IPCC) notes it is very likely that the 20th-century warming has contributed significantly to rising sea levels, through thermal expansion of seawater and loss of land ice. The EPA estimates that sea level is likely to rise 1.8 feet along most of the West Coast by 2100. By comparison, the San Francisco Bay level has increased about 4 inches since 1850. Given a 1-foot rise in sea level, the current 100-year high in the storm surge felt on the levee system of inland San Francisco Bay and Delta would become the 10-year high. In other words, the frequency of a 100-year event would increase tenfold.

What activities are contributing to the greenhouse gases in Marin?

Marin emits nearly 3 million tons of carbon dioxide every year. Vehicle traffic accounts for 50% of the total emissions, and energy use by buildings (residential, commercial and industrial combined) accounts for 41%.

Figure 2-11 Countywide Emissions Analysis



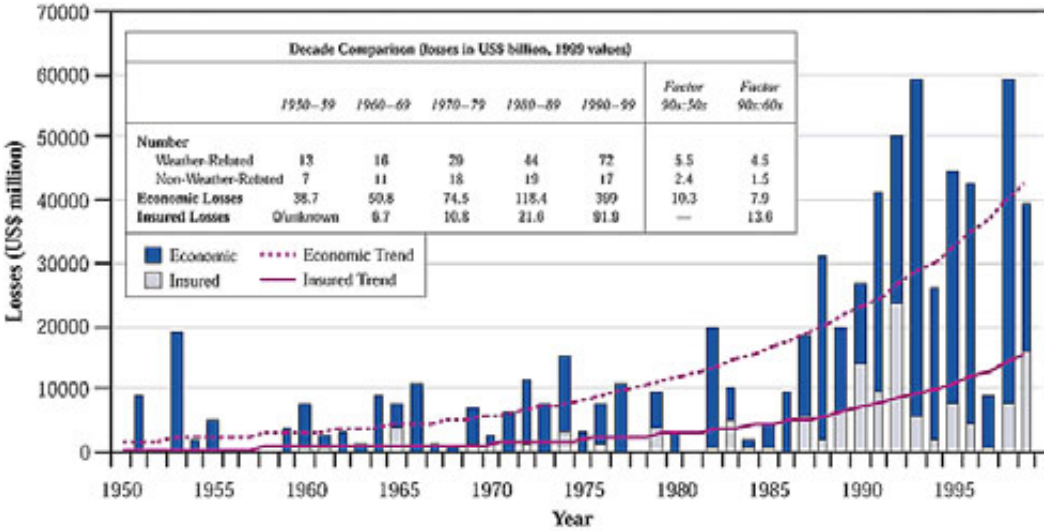
Source: Community Development Agency,
Greenhouse Gas Emissions Analysis Report 2000.

Has climate change affected the global economy?

Challenges resulting from weather- and climate-related events include changes to world food production and supply, migration, and access to clean water and energy. As indicated in the table below, costs have increased substantially since 1980.

> *"The climate system is being pushed hard enough that change will become obvious to the man in the street in the next decade."*
>
> – James E. Hansen, director of NASA's Goddard Institute for Space Studies, quoted in *Newsweek*, January 22, 1996

Figure 2-12
Cost to Society of Insurable, Weather-Related Damages from 1950 through 1999



Source: International Panel on Climate Change, 2001.

What Are the Desired Outcomes?

GOAL AIR-1

Improved Regional Air Quality. Promote planning and programs that result in the reduction of airborne pollutants measured within the county and the Bay Area.

Policies

AIR-1.1 Coordinate Planning and Evaluation Efforts. Coordinate air quality planning efforts with local, regional, and State agencies, and evaluate the air quality impacts of proposed plans and development projects.

AIR-1.2 **Meet Air Quality Standards.** Seek to attain or exceed the more stringent of federal or State Ambient Air Quality Standards for each measured pollutant (Figure 2-13).

AIR-1.3 **Require Mitigation of Air Quality Impacts.** Require projects that generate potentially significant levels of air pollutants, such as quarry, landfill operations, or large construction projects, to incorporate best available air quality mitigation in the project design.

Why is this important?

It is essential to use a regional approach to improving air quality, since polluted air flows from one place to another.

Environment: Cleaner air and water mean healthier marine and terrestrial ecosystems.

Economy: Poor air quality is linked to a higher incidence of public health costs associated with respiratory illnesses. The California Air Resources Board (CARB) suggests that the annual health impacts of exceeding state health-based standards for ozone and particulate matter include 6,500 premature deaths, 4,000 hospital admissions for respiratory disease, and 350,000 asthma attacks. The loss of productive workdays also affects the local economy. The American Lung Association (ALA) states that asthma accounts for an estimated three million lost workdays for adults nationally.

Equity: Poor air quality is linked to a higher incidence of respiratory illnesses. Asthma, which can be triggered and/or caused by poor air quality, currently affects 2.3 million Californians. In Marin, there were 17,083 cases of asthma in 2004, which translates to an impact on 7% of the population.

How will results be achieved?

Implementing Programs

AIR-1.a ***Inform Local and Regional Agencies.*** Notify local and regional jurisdictions of proposed projects in unincorporated areas that may affect regional air quality, as identified by project type and size thresholds in the *BAAQMD CEQA Guidelines, Assessing the Air Quality Impacts of Projects and Plans* (Figure 2-14).

AIR-1.b ***Evaluate Air Quality Impacts of Proposed Projects and Plans.*** As part of the Environmental Review Process, use the current BAAQMD CEQA Guidelines to evaluate the significance of air quality impacts from projects or plans, and to establish appropriate minimum submittal and mitigation requirements necessary for project or plan approval.

AIR-1.c ***Take Part in Regional Programs.*** Continue to participate in the Cities for Climate Protection and Spare the Air programs.

AIR-1.d ***Cooperate to Enforce Air Quality Standards.*** Cooperate with the U.S. Environmental Protection Agency (EPA), the California Air Resources Board, and the BAAQMD to measure air quality at emission sources (including transportation corridors) and to enforce the provisions of the Clean Air Act and State as well as regional policies and established standards for air quality.

Figure 2-13 California and National Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards	NATIONAL STANDARDS [a]	
			Primary [b,c]	Secondary [b,d]
Ozone	8-hour	0.07 ppm (154 μg/m^3)	0.08 ppm (176 μg/m^3)	—
	1-hour	0.09 ppm (180 μg/m^3)	— [e]	Same as primary
Carbon Monoxide	8-hour	9 ppm (10 μg/m^3)	9 ppm (10 μg/m^3)	—
	1-hour	20 ppm (23 μg/m^3)	35 ppm (40 μg/m^3)	—
Nitrogen Dioxide	Annual	—	0.053 ppm (100 μg/m^3)	Same as primary
	1-hour	0.25 ppm (470 μg/m^3)	—	—
Sulfur Dioxide	Annual	—	0.03 ppm (80 μg/m^3)	—
	24-hour	0.04 ppm (105 μg/m^3)	0.14 ppm (365 μg/m^3)	—
	3-hour	—	—	0.5 ppm (1,300 μg/m^3)
	1-hour	0.25 ppm (655 μg/m^3)	—	—
PM_{10}	Annual	20 μg/m^3	50 μg/m^3	Same as primary
	24-hour	50 μg/m^3	150 μg/m^3	Same as primary
$PM_{2.5}$	Annual	12 μg/m^3	15 μg/m^3	—
	24-hour	—	65 μg/m^3	—
Lead	Calendar quarter	—	1.5 μg/m^3	Same as primary
	30-day average	1.56 μg/m^3	—	—

Notes: (a) Standards, other than four ozone and those based on annual averages, are not to be exceeded more than once a year. The ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one.
(b) Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parenthesis.
(c) Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the EPA.
(d) Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
(e) The national one-hour ozone standard was revoked by U.S. EPA on June 15, 2005.

Source: 2004 Bay Area Air Quality Management District.

Figure 2-14
Projects with Potentially Significant Emissions

Land Use Category	Trip Generation Rate	Size of Project Likely to Generate 80 lb/day NOx
Housing		
Single Family	9.4/d.u.	320 units
Apartments	5.9/d.u.	510 units
Retail		
Discount Store	48.3/1000 sq.ft.	87,000 sq.ft.
Regional Shopping Center	96.2/1000 sq.ft.	44,000 sq.ft.
Supermarket	178/1000 sq.ft.	24,000 sq.ft.
Office		
General Office	10.9/1000 sq.ft.	280,000 sq.ft.
Government Office	68.9/1000 sq.ft.	55,000 sq.ft.
Office Park	12.8/1000 sq.ft.	210,000 sq.ft.
Medical Office	37.1/1000 sq.ft.	110,000 sq.ft.
Other		
Hospital	13.8/1000 sq.ft.	240,000 sq.ft.
Hotel	8.7/room	460 rooms

Note: Trip rates for many land uses will vary depending upon size of project. See latest edition of Trip Generation, Institute of Transportation Engineers.

Source: 1999 Bay Area Air Quality Management District.

AIR-1.e ***Conduct Public Education Program.*** Educate regarding the reason for requiring using best management practices to improve air quality.

AIR-1.f ***Limit Residential Wood Burning.*** Continue to implement the ordinance that phases out the use of older, polluting wood-burning appliances and limits the installation of wood-burning devices in new or renovated homes to pellet stoves, EPA-certified woodstoves and fireplace inserts, or natural gas or propane appliances.

AIR-1.g ***Require Control Measures for Construction and Agricultural Activity.*** Require reasonable and feasible measures to control particulate emissions (PM-10 and PM-2.5) at construction sites and during agricultural tilling activity, pursuant to the recommendations in the BAAQMD CEQA Guidelines, which may include the following:

- Watering active construction or agricultural tilling areas.
- Covering hauled materials.
- Paving or watering vehicle access roads.
- Sweeping paved and staging areas.

What Are the Desired Outcomes?

GOAL AIR-2

Protection from Emissions. Minimize the potential impacts from land uses that may emit pollution and/or odors on residential and other land uses sensitive to such emissions (see Map 2-16, Sensitive Receptor Sites in Unincorporated Marin County).

Policy

AIR-2.1 Buffer Emission Sources and Sensitive Land Uses. Consider potential air pollution and odor impacts from land uses that may emit pollution and/or odors when locating (a) air pollution sources, and (b) residential and other pollution-sensitive land uses in the vicinity of air pollution sources (which may include freeways, manufacturing, extraction, hazardous materials storage, landfill, food processing, wastewater treatment, and other similar uses).

Why is this important?

People and sensitive plants and animals need to be protected from sources of air pollution.

Environment: Air pollution creates stress on fragile and sensitive ecosystems by reducing reproductive capacity and food sources.

Economy: Lowering pollutants from area-wide and point sources would lower public health costs associated with respiratory illnesses and lead to fewer sick days at the workplace.

Equity: Children, people who are ill, and elderly people are particularly sensitive to air pollution. Places where they congregate need protection from polluted air.

How will results be achieved?

Implementing Programs

AIR-2.a *Require Separation Between Air Pollution Sources and Other Land Uses.* Only allow (a) emission sources or (b) other uses in the vicinity of air pollution or odor sources if the minimum screening distances between sources and receptors established in the BAAQMD CEQA Guidelines can be met, unless detailed project-specific studies demonstrate compatibility with adjacent uses despite separations that do not meet the screening distance requirements.

AIR-2.b *Protect Sensitive Receptors Near High-Volume Roadways.* Amend the Development Code to require mitigation measures such as increased indoor air filtration to ensure the protection of sensitive receptors (facilities where individuals are highly susceptible to the adverse effects of air pollutants, such as housing, child care centers, retirement

homes, schools, and hospitals) near freeways, arterials, and other major transportation corridors.

AIR-2.c *Health Risk Analysis for Sensitive Receptors.* Require that projects involving sensitive receptors proposed within 150 feet of freeways shall include an analysis of the potential health risks. Mitigation measures that comply with adopted standards of the BAAQMD for control of odor/toxics for sensitive receptors shall be identified in order to reduce these risks to acceptable levels.

What Are the Desired Outcomes?

GOAL AIR-3

Reduction of Vehicle-Generated Pollutants. Reduce vehicle trips and emissions, and improve vehicle efficiency, as means of limiting the volume of pollutants generated by traffic.

Policy

AIR-3.1 **Institute Transportation Control Measures.** Support a transportation program that reduces vehicle trips, increases ridesharing, and meets or exceeds the Transportation Control Measures recommended by BAAQMD in the most recent Clean Air Plan to reduce pollutants generated by vehicle use.

Why is this important?

Vehicle emissions are a major source of air pollution, and reduction of vehicle trips will improve air quality.

Environment: Vehicle travel is responsible for 54% of nitrogen oxides, 73% of carbon monoxide, and 79% of the particulate matter released in Marin. These pollutants create stress on Marin's marine and terrestrial ecosystems through a loss of species diversity and reproduction capacity.

Economy: In addition to alleviating the economic burden of public health costs, a reduction in vehicle trips will reduce traffic congestion. In 2006, over 9,400 productive hours were lost each weekday as a result of traffic congestion and delay.

Equity: Based on EPA's most current data, vehicle generated sources are responsible for 91% of the air-related cancer risk in Marin County. Furthermore, lower income neighborhoods tend to be nearest to major transportation routes; thus, these residents are exposed to higher levels of mobile source pollutants. One study finds that in the Bay Area, prevalence of asthma and bronchitis symptoms is about 7% higher for children in neighborhoods with higher levels of traffic pollutants compared with other children in the study.

How will results be achieved?

Implementing Programs

AIR-3.a *Support Voluntary Employer-Based Trip Reduction.* Provide assistance to regional and local ridesharing organizations, and advocate legislation to maintain and expand employer ridesharing incentives, such as tax deductions or credits.

AIR-3.b *Utilize Clean Vehicle Technology.* Promote new technologies and other incentives, such as allowing zero or partial zero emission vehicles rated at 45 miles or more per gallon in Marin County carpool lanes, and replacing fleet vehicles with these and similar clean vehicles.

> *"Adding lanes to solve traffic congestion is like loosening your belt to solve obesity."*
>
> — Glen Hemistra

AIR-3.c *Consider Model Clean Vehicle Requirements.* Research and consider adoption of an ordinance or standards that provide a set of voluntary measures to incorporate clean vehicles in fleets and promote the use of clean alternative fuels.

AIR-3.d *Reduce Peak-Hour Congestion.* Implement recommended Bay Area Air Quality Management District (BAAQMD) Transportation Control Measures in the Clean Air Plan to reduce vehicle emissions and congestion during peak commute periods.

AIR-3.e *Improve Arterial Traffic Management.* Modify arterial roadways to allow more-efficient bus operation, including possible signal preemption, and expand signal-timing programs where air quality benefits can be demonstrated.

What Are the Desired Outcomes?

GOAL AIR-4

Minimization of Contributions to Greenhouse Gases. Prepare policies that promote efficient management and use of resources in order to minimize greenhouse gas emissions. Incorporate sea level rise and more extreme weather information into the planning process.

Policies

AIR-4.1 **Reduce Greenhouse Gas Emissions.** Adopt practices that promote improved efficiency and energy management technologies; shift to low-carbon and renewable fuels and zero emission technologies.

AIR-4.2 **Foster the Absorption of Greenhouse Gases.** Foster and restore forests and other terrestrial ecosystems that offer significant carbon mitigation potential.

Why is this important?

Major contributors to greenhouse gas emissions, such as vehicle traffic and building energy use, can be reduced on a local level through the implementation of sustainable development policies.

Environment: Increased greenhouse gas emissions lead to climate change, which could include increases in temperature and shifting amounts of rainfall. Changes in temperature and water availability affect terrestrial and marine ecosystems. Furthermore, higher temperatures lead to higher evaporation rates, as well as reductions in stream flow and an increased frequency of droughts. Droughts are a problem in Marin, where 80% of our water comes from rainfall.

Economy: Mitigation measures that reduce emissions can result in substantial savings. The Tellus Institute estimates that California can save 1.9 billion dollars annually by 2020 through adoption of more stringent building codes and standards, efficiency programs, and increased supply of energy from renewable sources.

Equity: Access to clean water, energy, and mineral resources, and availability of productive arable land are all threatened by changes in climate. Weather- and temperature-related issues will add strain to an already overburdened public health system. Furthermore, low income families will be disproportionately impacted as they will be the least able to adapt to the effects of climate change.

How will results be achieved?

Implementing Programs

AIR-4.a ***Reduce Greenhouse Gas Emissions Resulting from Energy Use in Buildings.*** Implement energy efficiency programs and use of renewable energy. (Also see EN-1, EN-2, PFS-2, and TR-4.)

Carbon Dioxide

The Ecological Footprint shows that the single largest human demand on ecosystems comes from carbon dioxide emissions. The land area required to absorb this waste product makes up over half the Ecological Footprint of the average Marin resident. If Marin County reduced its carbon dioxide emissions by 20%, it could reduce its total footprint by an area equal to almost the entire size of Marin County.

Changing Scientific Understanding of Human Influences on Climate Change

1990: "Our judgment is that global mean surface air temperature has increased [though] the unequivocal detection of the enhanced greenhouse effect is not likely for a decade or more."

1995: "The balance of evidence suggests a discernible human influence on global climate."

2001: "The Earth's climate system has demonstrably changed on both global and regional scales. There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities."

AIR-4.b ***Reduce Greenhouse Gas Emissions Resulting from Transportation.*** Increase clean-fuel use, promote transit-oriented development and alternative modes of transportation, and reduce travel demand. (Also see TR-4, AIR-3, DES-2, HS-2, HS-3, CD-2, CD-3, and EC-1.)

AIR-4.c ***Reduce Methane Emissions Released from Waste Disposal.*** Encourage recycling, decrease waste sent to landfills, require landfill methane recovery, and promote methane recovery for energy production from other sources. (See PFS-3.)

Cities for Climate Protection Milestones

In August 2002, the Board of Supervisors partnered with the Cities for Climate Protection Campaign to address climate change through five actions:

1. Analyze baseline greenhouse gas emissions.
2. Set a target for reducing emissions.
3. Develop a local action plan for pursuing emissions reductions measures.
4. Implement local action plan.
5. Monitor progress.

Source: www.iclei.org.

"New analyses suggest that 15%–37% of a sample of 1,103 land plants and animals would eventually become extinct as a result of climate changes expected by 2050."

— *Nature Medicine*, 2004

AIR-4.d ***Reduce Greenhouse Gas Emissions from Agriculture.*** Compile an inventory of agricultural greenhouse gas emissions. Partner with AgStar, the U.S. Department of Agriculture, and the U.S. Department of Energy to encourage the use of methane recovery technologies and determine potential use in energy production.

AIR-4.e ***Reduce County Government Contributions to Greenhouse Gas Emissions.*** Where feasible, replace fleet vehicles with hybrid fuel and other viable alternative fuel vehicles, increase energy efficiency of County-maintained facilities, increase renewable energy use at County-maintained facilities, adopt purchasing practices that promote emissions reductions, and increase recycling at County-maintained facilities. (Also see EN-1, EN-2, PFS-3, TR-4, EC-1 and PH-1.)

AIR-4.f ***Establish a Climate Change Planning Process.*** Continue implementation of the approved Marin County Greenhouse Gas Reduction Plan. Integrate this plan into long-range and current planning functions of other related agencies. Establish and maintain a process to implement, measure, evaluate, and modify implementing programs, using the Cities for Climate Protection Campaign as a model (see the sidebar).

AIR-4.g ***Work with Bay Area Governments to Address Regional Climate Change Concerns.*** Play a leading role to encourage other local governments to commit to addressing climate change. Participate in programs such as the Cities for Climate Protection Campaign to address local and regional climate change concerns.

AIR-4.h *Evaluate the Carbon Emissions Impacts of Proposed Developments.* Incorporate a carbon emissions assessment into land use plans and the environmental impact report for proposed projects.

AIR-4.i *Work with Appropriate Agencies to Determine Carbon Uptake and Storage Potential of Natural Systems.* Study Marin's wetlands, forests, baylands, and agricultural lands to determine the potential to sequester carbon over time. Determine their value as carbon sinks.

AIR-4.j *Acquire and Restore Natural Resource Systems.* Take and require all technically feasible measures to avoid or minimize potential impacts on existing natural resource systems that serve as carbon sinks. (Also see CD-1, BIO-2, BIO-3, BIO-4, BIO-5, OS-1, and OS-2.)

AIR-4.k *Encourage the Planting of Trees.* Adopt urban forestry practices that encourage re-forestation as a means of storing carbon dioxide. (Also see BIO-1, DES-3.)

AIR-4.l *Preserve Agricultural Lands.* Protect agricultural lands and soils that serve as carbon sinks. (Also see AG-1.)

AIR-4.m *Focus Development in Urban Corridors.* Build in urban corridors and limit development in natural resource areas. Encourage green spaces that serve as carbon sinks in urban corridors. (Also see CD-1, CD-2, and DES-3.)

AIR-4.n *Monitor for Carbon Storage Research.* Monitor federal and international research on technological approaches to carbon storage.

AIR-4.o *Implement Proposed State Programs to Reduce Greenhouse Gas Emissions.* Implement proposed State programs to reduce greenhouse gas emissions, including the Renewable Portfolio Standards, California Fuel Efficiency (CAFE) standards, and carbon cap and trade programs.

What Are the Desired Outcomes?

GOAL AIR-5

Adaptation to Climate Change. Adopt policies and programs that promote resilient human and natural systems in order to ease the impacts of climate change.

Policies

AIR-5.1 **Determine Marin-Specific Climate Change.** Participate in research that examines the effects of climate change on human and natural systems in Marin.

AIR-5.2 **Prepare Response Strategies for Impacts.** Prepare appropriate response strategies that aid systems in adapting to climate change based on sound scientific understanding of the potential impacts.

Why is this important?

Adapting to climate change will require accurate scientific understanding as well as an institutionalized policy framework.

Environment. Wildlife distributions, population size, population density, and behavior are directly affected by changes in climate and indirectly through changes in vegetation. As wildlife tries to adapt to changes in the environment caused by shifting temperature and precipitation patterns, the already high number of threatened and endangered species could see a marked increase. New analyses suggest that 15% to 37% of a sample of 1,103 land plants and animals would eventually become extinct as a result of climate changes expected by 2050.

> *"My interest is in the future, because I am going to spend the rest of my life there."*
>
> — Charles Kettering

Economy. Aquaculture products brought $2.4 million into Marin's economy, representing 5.4% of Marin's entire agriculture industry. Warmer ocean waters and saltwater inundation due to climate change may impact coastal ecosystems by speeding the decline in fish populations and marine ecosystems already stressed from habitat loss and reduced freshwater flows. A report sponsored by the United Nations stated that worldwide economic losses could soar to $150 billion a year within the next 10 years.

Equity. Adopting and fostering resilience within the natural and built environments will save significant resources, speed recovery, and protect public health and safety for people of all income levels.

How will results be achieved?

Implementing Programs

AIR-5.a ***Coordinate with Local and Regional Agencies.*** Coordinate with the U.S. Geological Survey, Bay Conservation and Development Commission, California Coastal Commission and other monitoring agencies to study near-term and long-term high-probability climate change effects. Explore funding and collaborations with Bay Area partners in the Cities for Climate Protection Campaign in order to share resources, achieve economies of scale, and develop plans and programs that are optimized to address climate change on a regional scale.

AIR-5.b ***Study the Effect of Climate Change.*** Determine how climate change will affect the following:

Natural Systems: Changes in water availability, shifting fog regimes (and the effect on coastal redwoods and fire ecology), temperature changes, and shifting seasons.

Biological Resources: Changes in species distribution and abundance in estuary ecosystems resulting from salinity changes and flooding. For marine ecosystems, determine changes in distribution and abundance resulting from warmer waters, rising sea level, and changes in ocean currents and freshwater inflows.

Environmental Hazards: Runoff, fire hazards, floods, landslides and soil erosion, and the impact on coastal and urban infrastructure.

Built Environment: Effect of flooding and rising sea level on sewage systems, property, and infrastructure.

Water Resources: Runoff, changes in precipitation, increases and decreases in drought, salinity changes, sea level rise, and shifting seasons.

Agricultural and Food Systems: Food supply, economic impacts, and effect on grazing lands.

Public Health: Temperature-related health effects, air quality impacts, extreme weather events, and vector-, rodent-, water-, and food-borne diseases.

AIR-5.c ***Prepare Response Strategies.*** In coordination with the California Coastal Commission, the Bay Conservation and Development Commission, water districts, wildlife agencies, and flood control districts, prepare response strategies for Marin's human and natural systems. Current response strategies include the following:

Water Resources: Improve drainage systems, harvesting flows, and recharge designs in order to direct runoff to landscaped areas where the water can percolate into the soil. (See WR-1.)

Biological Resources: Limit development such that coastal wetlands are able to migrate inland in response to sea level rise, wildlife corridors and ecotones are protected, and development impacts are minimized. Promote the restoration of wetlands and riparian areas to provide capacity for high water and flood flows. (Also see BIO-2, BIO-4, BIO-5, OS-2, DES-1, and DES-5.)

Public Health: General strengthening of public health infrastructure and health-oriented environmental management, such as with air and water quality, and community and housing design.

Built Environment: Assess development located in coastal areas that are subject to sea level rise and increased flooding, and develop a response strategy, such as a planned retreat program, for the relocation of facilities in low-lying areas. Work with the County flood control and water districts to prepare a plan for responding to a potential rise in the sea level, consider developing flood control projects, and amend County Code Chapters 11, 22, 23, and 24 to include construction standards for areas potentially subject to increased flooding from a rise in sea level.

Environmental Hazards: Develop response strategies that cope with increasing storm events, flooding, fire, landslides, and soil erosion. Establish surveillance systems. With the development of advanced (spatial) surveillance technology, it is conceivable that such systems will be expanded to address forest health and productivity, monitoring biotic vectors and natural elements, as well as tree and storm responses. (Also see EH-3, EH-4, BIO-1, and PH-1.)

"The causes and effects of climate change occur around the world. Individuals, communities, and nations must work together cooperatively to stop global climate change."

— The Environmental Justice and Climate Change Initiative

AIR-5.d ***Monitor Local Climate Change.*** Encourage appropriate local and regional agencies to track the following environmental indicators of climate change:

- Sea level (also see EH-3)
- Minimum and maximum temperature
- Precipitation
- Timing and volume of river flow
- River temperatures
- Sea surface temperatures
- Diversity and abundance of fish stocks and sea birds

AIR-5.e ***Seek Resources for Response Strategies.*** Explore funding and collaborative opportunities that share resources, to develop plans and programs that are optimized on a regional scale.

AIR-5.f ***Protect and Enhance Native Habitats and Biodiversity.*** Effectively manage and enhance native habitat, maintain viable native plant and animal populations, and provide for improved biodiversity throughout Marin. Require identification of sensitive biological resources and commitment to adequate protection and mitigation. (Also see BIO-1 and BIO-2.)

"It is not the strongest of the species that survive, nor the most intelligent, but the one most responsive to change."

— Charles Darwin

AIR-5.g ***Conduct Public Outreach and Education.*** Increase public awareness about climate change, and encourage Marin residents and businesses to become involved in activities and lifestyle changes that will aid in reducing greenhouse gas emissions.

AIR-5.h ***Implement Floodplain Ordinances.*** Continue to implement ordinances that regulate floodplain development to ensure that project-related and cumulative flooding impacts are minimized or avoided through conditions of project approval as required by the ordinances.

AIR-5.i ***Modify Construction Standards.*** Amend the Marin County Code to include construction standards for areas threatened by future sea level rise.

Figure 2-15 Relationships of Goals to Guiding Principles

This figure illustrates the relationships of each goal in this Section to the Guiding Principles.

Goals / Guiding Principles	1. Link equity, economy, and the environment locally, regionally, and globally.	2. Minimize the use of finite resources and use all resources efficiently and effectively.	3. Reduce the use and minimize the release of hazardous materials.	4. Reduce greenhouse gas emissions that contribute to global warming.	5. Preserve our natural assets.	6. Protect our agricultural assets.	7. Provide efficient and effective transportation.	8. Supply housing affordable to the full range of our workforce and diverse community.	9. Foster businesses that create economic, environmental, and social benefits.	10. Educate and prepare our workforce and residents.	11. Cultivate ethnic, cultural, and socioeconomic diversity.	12. Support public health, safety, and social justice.
AIR-1 Improved Regional Air Quality	●		●	●	●							●
AIR-2 Protection from Emissions	●		●	●	●							●
AIR-3 Reduction of Vehicle-Generated Pollutants	●		●	●	●		●					●
AIR-4 Minimization of Contributions to Greenhouse Gases	●	●	●	●		●	●		●			●
AIR-5 Adaptation to Climate Change					●	●				●		●

How Will Success Be Measured?

Indicator Monitoring

Nonbinding indicators, benchmarks, and targets[1] will help to measure and evaluate progress. This process will also provide a context in which to consider the need for new or revised implementation measures.

Indicators	Benchmarks	Targets
Number of days of poor air quality.	No exceedences in 2000.	No increase through 2015.
Amount of greenhouse gas emissions countywide.	2,849,000 tons CO_2 in 1990.	Reduce 15% by 2015.
Amount of greenhouse gas emissions from County government sources.	15,200 tons CO_2 in 1990.	Reduce 15% – 20% by 2015.

[1]Many factors beyond Marin County government control, including adequate funding and staff resources, may affect the estimated time frame for achieving targets and program implementation.

Program Implementation

The following table summarizes responsibilities, potential funding priorities, and estimated time frames for proposed implementation programs. Program implementation within the estimated time frame[1] will be dependent upon the availability of adequate funding and staff resources.

Figure 2-16
Atmosphere and Climate Program Implementation

Programs	Responsibility	Potential Funding	Priority	Time Frame
AIR-1.a – Inform Local and Regional Agencies.	CDA	Existing budget	High	Ongoing
AIR-1.b – Evaluate Air Quality Impacts of Proposed Projects and Plans.	CDA	Existing budget	High	Ongoing
AIR-1.c – Take Part in Regional Programs.	CDA	Existing budget	High	Ongoing
AIR-1.d – Cooperate to Enforce Air Quality Standards.	CDA, EPA, CA Air Resources Board, BAAQMD	Existing budget, State and federal funds	High	Ongoing
AIR-1.e – Conduct Public Education Program	CDA, BAAQMD	Existing budget and may require additional grants or revenue[2]	High	Ongoing
AIR-1.f – Limit Residential Wood Burning.	CDA	Existing budget, Tobacco Settlement Funds	Medium	Ongoing
AIR-1.g – Require Control Measures for Construction and Agricultural Activity.	CDA, Agricultural Commissioner	Existing budget	High	Ongoing
AIR-2.a – Require Separation Between Air Pollution Sources and Other Land Uses.	CDA, BAAQMD	Existing budget	High	Ongoing
AIR-2.b – Protect Sensitive Receptors Near High-Volume Roadways.	CDA	Existing budget	Medium	Long term
AIR-2.c – Health Risk Analysis for Sensitive Receptors.	CDA	Existing budget	Medium	Short term

[1]Time frames include: Immediate (0–1 years); Short term (1–4 years); Med. term (4–10 years); Long term (10–20 years); and Ongoing.

[2]Completion of this task is dependent on acquiring additional funding. Consequently, funding availability could lengthen or shorten the time frame and ultimate implementation of this program.

Programs	Responsibility	Potential Funding	Priority	Time Frame
AIR-3.a – Support Voluntary Employer-Based Trip Reduction.	DPW, Transportation Authority of Marin (TAM), CDA	Existing Budget, will require additional grants or other revenue[2]	Medium	Med. Term
AIR-3.b – Utilize Clean Vehicle Technology.	1. CDA/CalTrans-carpool lanes, 2. DPW- County fleet	1. Existing budget, 2. Will require additional grants or other revenue[2]	1. Medium, 2. Medium	1. Ongoing, 2. Long term
AIR-3.c – Consider Model Clean Vehicle Requirements.	DPW	Will require additional grants or other revenue[2]	Medium	Long term
AIR-3.d – Reduce Peak-Hour Congestion.	TAM	TFCA	Medium	Ongoing
AIR-3.e – Improve Arterial Traffic Management.	DPW, TAM	Grants, traffic mitigation fees, transportation sales tax[2]	Medium	Ongoing
AIR-4.a – Reduce Greenhouse Gas Emissions Resulting from Energy Use in Buildings.	CDA	Existing budget and may require additional grants or revenue[2]	Medium	Med. Term
AIR-4.b – Reduce Greenhouse Gas Emissions Resulting from Transportation.	1. TAM, CDA, 2. DPW	General Fund, TAM budget, TLC/HIP Grants, and will require additional grants or other revenue[2]	1. Medium, 2. Medium	1. Ongoing, 2. Long term
AIR-4.c – Reduce Methane Emissions Released from Waste Disposal.	DPW	Will require additional grants or other revenue[2]	Medium	Long term
AIR-4.d – Reduce Greenhouse Gas Emissions from Agriculture.	Agricultural Commissioner, CDA, USDA, USDOE	Grants, existing budget	Medium	Ongoing
AIR-4.e – Reduce County Government Contributions to Greenhouse Gas Emissions.	DPW	Will require additional grants or other revenue[2]	High	Pending
AIR-4.f – Establish a Climate Change Planning Process.	CDA	Existing budget and may require additional grants or revenue[2]	High	Immediate
AIR-4.g – Work with Bay Area Governments to Address Regional Climate Change Concerns.	CDA, ABAG, International Council for Local Environmental Initiatives (ICLEI)	Existing budget and may require additional grants or revenue[2]	High	Ongoing
AIR-4.h – Evaluate the Carbon Emissions Impacts of Proposed Developments.	CDA	Existing budget and may require additional grants or revenue[2]	High	Ongoing

Programs	Responsibility	Potential Funding	Priority	Time Frame
AIR-4.i – Work with Appropriate Agencies to Determine Carbon Uptake and Storage Potential of Natural Systems.	CDA, California Energy Commission (CEC), BAAQMD, other municipalities	Will require additional grants or revenue[2]	Low	Long term
AIR-4.j – Acquire and Restore Natural Resource Systems.	MCOSD	Will require additional grants or revenue[2]	High	Ongoing
AIR-4.k – Encourage the Planting of Trees.	CDA, NGO's, CBO's	Will require additional grants or revenue[2]	Medium	Ongoing
AIR-4.l – Preserve Agricultural Lands.	CDA, MALT, CBO's	Will require additional grants or revenue[2]	High	Ongoing
AIR-4.m – Focus Development in Urban Corridors.	CDA	Existing budget	High	Ongoing
AIR-4.n – Monitor for Carbon Storage Research.	CDA, ICLEI	Existing budget and may require additional grants or revenue[2]	Medium	Ongoing
AIR-4.o – Implement Proposed State Programs to Reduce Greenhouse Gas Emissions.	CDA	Existing budget and may require additional grants or revenue[2]	Medium	Ongoing
AIR-5.a – Coordinate with Local and Regional Agencies.	CDA, Bay Conservation and Development Commission (BCDC), CCC, BAAQMD, USGS, ICLEI	Existing budget and may require additional grants or revenue[2]	High	Ongoing
AIR-5.b – Study the Effect of Climate Change.	CDA, BCDC, CCC, BAAQMD, USGS, ICLEI	Will require additional grants or revenue[2]	Medium	Ongoing
AIR-5.c – Prepare Response Strategies.	CDA, CCC, BCDC, Water Districts, Resource Protection Agencies, ICLEI	Existing budget, will require additional grants or revenue[2]	High	Ongoing
AIR-5.d – Monitor Local Climate Change.	CDA, CCC, BCDC, Water Districts, Resource Protection Agencies, ICLEI	Existing budget and may require additional grants or revenue[2]	Medium	Ongoing
AIR-5.e – Seek Resources for Response Strategies.	CDA, CCC, BCDC, Water Districts, Resource Protection Agencies, ICLEI	Existing budget and may require additional grants or revenue[2]	Medium	Ongoing

Programs	Responsibility	Potential Funding	Priority	Time Frame
AIR-5.f – Protect and Enhance Native Habitats and Biodiversity.	Parks & Open Space, CDA, CBO's	Existing budget and may require additional grants or revenue[2]	High	Ongoing
AIR-5.g – Conduct Public Outreach and Education.	CDA, CBO's, ICLEI	Existing budget and may require additional grants or revenue[2]	Medium	Ongoing
AIR-5.h – Implement Floodplain Ordinances.	CDA/DPW	Existing budget	High	Ongoing
AIR-5.i – Modify Construction Standards.	CDA/DPW	Existing budget and may require additional grants or revenue[2]	Medium	Long term

(Note: This is an extract of the Marin County General Plan that highlights the applicability to air quality and greenhouse gases. The entire Marin County General Plan 2020 can be found at:
(http://www.co.marin.ca.us/depts/cd/main/fm/cwpdocs/CWP_CD2.pdf)

Additional Links to General Plans and Climate Action Plans:

The following examples of general plans and climate action plans were reviewed and were also found to be good resources. These examples have addressed climate change and have provided good goals, objectives, policies, standards and/or implementations measures for their jurisdiction and environment. These goals, objectives, policies, standards and implementation measures have been addressed in a stand-alone document as in the San Francisco Climate Action Plan, Sonoma County Climate Action Plan, and the City of Riverside General Plan; or the goals, objectives, policies, standards and implementation measures have been incorporated into the existing general plan elements as in the City of Beverly Hills Draft General Plan, City of Sacramento General Plan and Sonoma County General Plan.

City of Beverly Hills Draft General Plan can be found at:
http://www.ci.beverly-hills.ca.us/services/planning/plan/draft_general_plan.asp

City of Riverside General Plan can be found at:
http://www.riversideca.gov/planning/2008-0909/GP/13_Air_Quality_Element.pdf

City of Sacramento General Plan can be found at:
http://www.sacgp.org/

San Francisco Climate Action Plan can be found at:
http://www.sfenvironment.org/downloads/library/climateactionplan.pdf

Sonoma County General Plan can be found at:
http://www.sonoma-county.org/prmd/gp2020/adopted/index.htm

Sonoma County Community Climate Action Plan can be found at:
http://www.coolplan.org/

(This page intentionally left blank.)

Appendix H

California Attorney General Guidance on General Plans

(intentionally left blank)

Appendix H: California Attorney General Guidance on General Plans

The California Attorney General's Office has compiled a list of General Plan, CEQA-related Frequently Asked Questions and their answers to assist cities and counties in their General Plan updates. The following is the Attorney General Office's document entitled *'Climate Change, the California Environmental Quality Act, and General Plan Updates: Straightforward Answers to Some Frequently Asked Questions.'*

(intentionally left blank)

Climate Change, the California Environmental Quality Act, and General Plan Updates: Straightforward Answers to Some Frequently Asked Questions California Attorney General's Office

At any given time in this State, well over one hundred California cities and counties are updating their general plans. These are complex, comprehensive, long-term planning documents that can be years in the making. Their preparation requires local governments to balance diverse and sometimes competing interests and, at the same time, comply with the Planning and Zoning Law and the California Environmental Quality Act (CEQA).

Local governments have decades of experience in applying state planning law and excellent resources to assist them – such as the "General Plan Guidelines" issued by The Governor's Office of Planning and Research (OPR).[1] They are also practiced in assessing whether general plans may have significant localized environmental effects, such as degradation of air quality, reductions in the water supply, or growth inducing impacts. The impact of climate change, however, has only fairly recently shown up on the CEQA radar.

The fact that climate change presents a new challenge under CEQA has not stopped local governments from taking action. A substantial number of cities and counties already are addressing climate change in their general plan updates and accompanying CEQA documents. These agencies understand the substantial environmental and administrative benefits of a programmatic approach to climate change. Addressing the problem at the programmatic level allows local governments to consider the "big picture" and – provided it's done right – allows for the streamlined review of individual projects.[2]

Guidance addressing CEQA, climate change, and general planning is emerging, for example, in the pending CEQA Guideline amendments,[3] comments and settlements by the Attorney General, and in the public discourse, for example, the 2008 series on CEQA and Global Warming organized by the Local Government Commission and sponsored by the Attorney General. In addition, the Attorney General's staff has met informally with officials and planners from numerous jurisdictions to discuss CEQA requirements and to learn from those who are leading the fight against global warming at the local level.

Still, local governments and their planners have questions. In this document, we attempt to answer some of the most frequently asked of those questions. We hope this document will be useful, and we encourage cities and counties to contact us with any additional questions, concerns, or comments.

- **Can a lead agency find that a general plan update's climate change-related impacts are too speculative, and therefore avoid determining whether the project's impacts are significant?**

  No. There is nothing speculative about climate change. It's well understood that (1) greenhouse gas (GHG) emissions increase atmospheric concentrations of GHGs; (2) increased GHG concentrations in the atmosphere exacerbate global warming; (3) a project that adds to the atmospheric load of GHGs adds to the problem.

  Making the significance determination plays a critical role in the CEQA process.[4] Where a project may have a significant effect on the environment, the lead agency must prepare an Environmental Impact Report (EIR).[5] Moreover, a finding of significance triggers the obligation to consider alternatives and to impose feasible mitigation.[6] For any project under CEQA, including a general plan update, a lead agency therefore has a fundamental obligation to determine whether the environmental effects of the project, including the project's contribution to global warming, are significant.

- **In determining the significance of a general plan's climate change-related effects, must a lead agency estimate GHG emissions?**

  Yes. As OPR's Technical Advisory states:

  > Lead agencies should make a good-faith effort, based on available information, to calculate, model, or estimate the amount of CO2 and other GHG emissions from a project, including the emissions associated with vehicular traffic, energy consumption, water usage and construction activities.[7]

  In the context of a general plan update, relevant emissions include those from government operations, as well as from the local community as a whole. Emissions sources include, for example, transportation, industrial facilities and equipment, residential and commercial development, agriculture, and land conversion.

  There are a number of resources available to assist local agencies in estimating their current and projected GHG emissions. For example, the California Air Resources Board (ARB) recently issued protocols for estimating emissions from local government operations, and the agency's protocol for estimating community-wide emissions is forthcoming.[8] OPR's Technical Advisory contains a list of modeling tools to estimate GHG emissions. Other sources of helpful information include the white paper issued by the California Air Pollution Control Officers Association (CAPCOA), "CEQA and Climate Change"[9] and the Attorney General's website,[10] both of which provide information on currently available models for calculating emissions. In addition, many cities and counties are working with the International Council for Local Environmental Initiatives (ICLEI)[11] and tapping into the expertise of this State's many colleges and universities.[12]

- **For climate change, what are the relevant "existing environmental conditions"?**

  The CEQA Guidelines define a significant effect on the environment as "a substantial adverse change in the physical conditions which exist in the area affected by the proposed project."[13]

  For local or regional air pollutants, existing physical conditions are often described in terms of air quality (how much pollutant is in the ambient air averaged over a given period of time), which is fairly directly tied to current emission levels in the relevant "area affected." The "area affected," in turn, often is defined by natural features that hold or trap the pollutant until it escapes or breaks down. So, for example, for particulate matter, a lead agency may describe existing physical conditions by discussing annual average PM10 levels, and high PM10 levels averaged over a 24-hour period, detected at various points in the air basin in the preceding years.

  With GHGs, we're dealing with a global pollutant. The "area affected" is both the atmosphere and every place that is affected by climate change, including not just the area immediately around the project, but the region and the State (and indeed the planet). The existing "physical conditions" that we care about are the current atmospheric concentrations of GHGs and the existing climate that reflects those concentrations.

  Unlike more localized, ambient air pollutants which dissipate or break down over a relatively short period of time (hours, days or weeks), GHGs accumulate in the atmosphere, persisting for decades and in some cases millennia. The overwhelming scientific consensus is that in order to avoid disruptive and potentially catastrophic climate change, then it's not enough simply to stabilize our annual GHG emissions. The science tells us that we must <u>immediately and substantially reduce</u> these emissions.

- **If a lead agency agrees to comply with AB 32 regulations when they become operative (in 2012), can the agency determine that the GHG-related impacts of its general plan will be less than significant?**

  <u>No.</u> CEQA is not a mechanism merely to ensure compliance with other laws, and, in addition, it does not allow agencies to defer mitigation to a later date. CEQA requires lead agencies to consider the significant environmental effects of their actions and to mitigate them today, if feasible.

  The decisions that we make today do matter. Putting off the problem will only increase the costs of any solution. Moreover, delay may put a solution out of reach at any price. The experts tell us that the later we put off taking real action to reduce our GHG emissions, the less likely we will be able to stabilize atmospheric concentrations at a level that will avoid dangerous climate change.

- **Since climate change is a global phenomenon, how can a lead agency determine whether the GHG emissions associated with its general plan are significant?**

  The question for the lead agency is whether the GHG emissions from the project – the general plan update – are considerable when viewed in connection with the GHG emissions from past projects, other current projects, and probable future projects.[14] The effects of GHG emissions from past projects and from current projects to date are reflected in current atmospheric concentrations of GHGs and current climate, and the effects of future emissions of GHGs, whether from current projects or existing projects, can be predicted based on models showing future atmospheric GHG concentrations under different emissions scenarios, and different resulting climate effects.

  A single local agency can't, of course, solve the climate problem. But that agency can do its fair share, making sure that the GHG emissions from projects in its jurisdiction and subject to its general plan are on an emissions trajectory that, if adopted on a larger scale, is consistent with avoiding dangerous climate change.

  Governor Schwarzenegger's Executive Order S-3-05, which commits California to reducing its GHG emissions to 1990 levels by 2020 and to eighty percent below 1990 levels by 2050, is grounded in the science that tells us what we must do to achieve our long-term climate stabilization objective. The Global Warming Solutions Act of 2006 (AB 32), which codifies the 2020 target and tasks ARB with developing a plan to achieve this target, is a necessary step toward stabilization.[15] Accordingly, the targets set in AB 32 and Executive Order S-3-05 can inform the CEQA analysis .

  One reasonable option for the lead agency is to create community-wide GHG emissions targets for the years governed by the general plan. The community-wide targets should align with an emissions trajectory that reflects aggressive GHG mitigation in the near term and California's interim (2020) [16] and long-term (2050) GHG emissions limits set forth in AB 32 and the Executive Order.

  To illustrate, we can imagine a hypothetical city that has grown in a manner roughly proportional to the state and is updating its general plan through 2035. The city had emissions of 1,000,000 million metric tons (MMT) in 1990 and 1,150,000 MMT in 2008. The city could set an emission reduction target for 2014 of 1,075,000 MMT, for 2020 of 1,000,000 MMT, and for 2035 of 600,000 MMT, with appropriate emission benchmarks in between. Under these circumstances, the city could in its discretion determine that an alternative that achieves these targets would have less than significant climate change impacts.

- **Is a lead agency required to disclose and analyze the full development allowed under the general plan?**

  Yes. The lead agency must disclose and analyze the full extent of the development allowed by the proposed amended general plan,[17] including associated GHG emissions.

This doesn't mean that the lead agency shouldn't discuss the range of development that is likely to occur as a practical matter, noting, for example, the probable effect of market forces. But the lead agency can't rely on the fact that full build out may not occur, or that its timing is uncertain, to avoid its obligation to disclose the impacts of the development that the general plan would permit. Any other approach would seriously underestimate the potential impact of the general plan update and is inconsistent with CEQA's purposes.

- **What types of alternatives should the lead agency consider?**

  A city or county should, if feasible, evaluate at least one alternative that would ensure that the community contributes to a lower-carbon future. Such an alternative might include one or more of the following options:

  - higher density development that focuses growth within existing urban areas;
  - policies and programs to facilitate and increase biking, walking, and public transportation and reduce vehicle miles traveled;
  - the creation of "complete neighborhoods" where local services, schools, and parks are within walking distance of residences;
  - incentives for mixed-use development;
  - in rural communities, creation of regional service centers to reduce vehicle miles traveled;
  - energy efficiency and renewable energy financing (see, e.g., AB 811)[18]
  - policies for preservation of agricultural and forested land serving as carbon sinks;
  - requirements and ordinances that mandate energy and water conservation and green building practices; and
  - requirements for carbon and nitrogen-efficient agricultural practices.

  Each local government must use its own good judgment to select the suite of measures that best serves that community.

- **Can a lead agency rely on policies and measures that simply "encourage" GHG efficiency and emissions reductions?**

  No. Mitigation measures must be "fully enforceable."[19] Adequate mitigation does not, for example, merely "encourage" or "support" carpools and transit options, green building practices, and development in urban centers. While a menu of hortatory GHG policies is positive, it does not count as adequate mitigation because there is no certainty that the policies will be implemented.

  There are many concrete mitigation measures appropriate for inclusion in a general plan and EIR that can be enforced as conditions of approval or through ordinances. Examples are described in a variety of sources, including the CAPCOA's white paper,[20] OPR's Technical Advisory,[21] and the mitigation list on the Attorney General's website.[22] Lead agencies should also consider consulting with other cities and counties that have recently completed general plan updates or are working on Climate Action Plans.[23]

- **Is a "Climate Action Plan" reasonable mitigation?**

  Yes. To allow for streamlined review of subsequent individual projects, we recommend that the Climate Action Plan include the following elements: an emissions inventory (to assist in developing appropriate emission targets and mitigation measures); emission targets that apply at reasonable intervals through the life of the plan; enforceable GHG control measures; monitoring and reporting (to ensure that targets are met); and mechanisms to allow for the revision of the plan, if necessary, to stay on target.[24]

  If a city or county intends to rely on a Climate Action Plan as a centerpiece of its mitigation strategy, it should prepare the Climate Action Plan at the same time as its general plan update and EIR. This is consistent with CEQA's mandate that a lead agency must conduct environmental review at the earliest stages in the planning process and that it not defer mitigation. In addition, we strongly urge agencies to incorporate any Climate Action Plans into their general plans to ensure that their provisions are applied to every relevant project.

- **Is a lead agency also required to analyze how future climate change may affect development under the general plan?**

  Yes. CEQA requires a lead agency to consider the effects of bringing people and development into an area that may present hazards. The CEQA Guidelines note the very relevant example that "an EIR on a subdivision astride an active fault line should identify as a significant effect the seismic hazard to future occupants of the subdivision."[25]

  Lead agencies should disclose any areas governed by the general plan that may be particularly affected by global warming, e.g.: coastal areas that may be subject to increased erosion, sea level rise, or flooding; areas adjacent to forested lands that may be at increased risk from wildfire; or communities that may suffer public health impacts caused or exacerbated by projected extreme heat events and increased temperatures. General plan policies should reflect these risks and minimize the hazards for current and future development.

Endnotes

[1]For a discussion of requirements under general planning law, see OPR's General Plan Guidelines (2003). OPR is in the process of updating these Guidelines. For more information, visit OPR's website at http://www.opr.ca.gov/index.php?a=planning/gpg.html.

[2]OPR has noted the environmental and administrative advantages of addressing GHG emissions at the plan level, rather than leaving the analysis to be done project-by-project. See OPR, Preliminary Draft CEQA Guideline Amendments, Introduction at p. 2

(Jan. 8, 2009), available at http://opr.ca.gov/download.php?dl=Workshop_Announcement.pdf.

[3] OPR issued its Preliminary Draft CEQA Guidelines Amendments on January 8, 2009. Pursuant to Health and Safety Code, § 21083.05 (SB 97), OPR must prepare its final proposed guidelines by July 1, 2009, and the Resources Agency must certify and adopt those guidelines by January 1, 2010.

[4]Cal. Code Regs., tit. 14 (hereinafter "CEQA Guidelines"), § 15064, subd. (a).

[5]CEQA Guidelines, § 15064, subd. (f)(1).

[6]CEQA Guidelines, § 15021, subd. (a).

[7]OPR, CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review (June 2008), available at http://opr.ca.gov/ceqa/pdfs/june08-ceqa.pdf.

[8] ARB's protocols for estimating the emissions from local government operations are available at http://www.arb.ca.gov/cc/protocols/localgov/localgov.htm.

[9] CAPCOA, CEQA and Climate Change, Evaluating and Addressing Greenhouse Gas Emissions from Projects Subject to the California Environmental Quality Act (January 2008) (hereinafter, "CAPCOA white paper"), available at http://www.capcoa.org/.

[10] http://ag.ca.gov/globalwarming/ceqa/modeling_tools.php

[11] http://www.iclei-usa.org

[12] For example, U.C. Davis has made its modeling tool, UPlan, available at http://ice.ucdavis.edu/doc/uplan; San Diego School of Law's Energy Policy Initiatives Center has prepared a GHG emissions inventory report for San Diego County http://www.sandiego.edu/EPIC/news/frontnews.php?id=31; and Cal Poly, San Luis Obispo City and Regional Planning Department is in the process of preparing a Climate Action Plan for the City of Benicia, see http://www.beniciaclimateactionplan.com/files/about.html.

[13]CEQA Guidelines, § 15002, subd. (g).

[14] CEQA Guidelines, § 15064(h)(1).

[15]See ARB, Scoping Plan at pp. 117-120, available at http://www.arb.ca.gov/cc/scopingplan/document/psp.pdf. (ARB approved the Proposed Scoping Plan on December 11, 2008.)

[16]In the Scoping Plan, ARB encourages local governments to adopt emissions reduction goals for 2020 "that parallel the State commitment to reduce greenhouse gas emissions by approximately 15 percent from current levels . . . ." Scoping Plan at p. 27; see *id.* at Appendix C, p. C-50. For the State, 15 percent below current levels is approximately equivalent to 1990 levels. *Id.* at p. ES-1. Where a city or county has grown roughly at

the same rate as the State, its own 1990 emissions may be an appropriate 2020 benchmark. Moreover, since AB 32's 2020 target represents the State's *maximum* GHG emissions for 2020 (see Health & Safety Code, § 38505, subd. (n)), and since the 2050 target will require substantial changes in our carbon efficiency, local governments may consider whether they can set an even more aggressive target for 2020. See Scoping Plan, Appendix C, p. C-50 [noting that local governments that "meet or exceed" the equivalent of a 15 percent reduction in GHG emissions by 2020 should be recognized].

[17] *Christward Ministry v. Superior Court* (1986) 184 Cal.App.3d 180, 194 [EIR must consider future development permitted by general plan amendment]; see also CEQA Guidelines, §§ 15126 [impact from all phases of the project], 15358, subd. (a) [direct and indirect impacts].

[18] See the City of Palm Desert's Energy Independence Loan Program at http://www.ab811.org.

[19] Pub. Res. Code, § 21081.6, subd. (b); CEQA Guidelines, § 15091, subd. (d); see also *Federation of Hillside and Canyon Assocs.* (2000) 83 Cal.App.4th 1252, 1261 [general plan EIR defective where there was no substantial evidence that mitigation measures would "actually be implemented"].

[20]CAPCOA white paper at pp. 79-87 and Appendix B-1.

[21]OPR Technical Advisory, Attachment 3.

[22]See http://ag.ca.gov/globalwarming/pdf/GW_mitigation_measures.pdf [mitigation list];http://ag.ca.gov/globalwarming/pdf/green_building.pdf [list of local green building ordinances].

[23]See http://opr.ca.gov/ceqa/pdfs/City_and_County_Plans_Addressing_Climate_Change.pdf.

[24]See Scoping Plan, Appendix C, at p. C-49.

[25]CEQA Guidelines, § 15126.2, subd. (a).