



**Riverside**  
RESTORATIVE GROWTHPRINT

# CLIMATE ACTION PLAN

ADMIN DRAFT  
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# CHAPTER 1 INTRODUCTION

## PURPOSE

Over the past decade, the City of Riverside has progressively demonstrated its commitment to environmental quality, equity and opportunity, and economic prosperity for all. The Riverside Restorative Growthprint embodies the City of Riverside's commitment to be an engaged and responsible steward of its natural resources (both locally and regionally); reflects the City's dedication to address climate change by reducing greenhouse gas (GHG) emissions ; and defines the City's view that actions to reduce GHG emissions are opportunities to inspire economic development through investment in urban development, infrastructure, mobility systems, and entrepreneurship.

The Riverside Restorative Growthprint - Climate Action Plan (RRG-CAP) provides a roadmap for the City of Riverside to achieve deep GHG emissions through the year 2035 and establishes policies and priorities enabling the City to implement strategies that successfully fulfill the requirements of state initiatives, Assembly Bill [AB] 32 and Senate Bill [SB] 375. The RRG-CAP includes a baseline GHG inventory for local government operations and for the community as a whole, and establishes emission reduction targets consistent with state law. Through stakeholder engagement and cost-benefit analysis, the RRG-CAP resulted in strategies, measures, and actions for reducing emissions that align with the City's planning priorities and its vision of a future economy based on "clean, green businesses and business practices."

The Riverside Restorative Growthprint - Economic Prosperity Action Plan (RRG-EPAP) showcases opportunities where the community can reduce greenhouse gas emissions in a way that also advance economic growth and provide meaningful benefit to the residents, employees, investors or visitors to the City. While the RRG-CAP identifies GHG reduction measures and strategies, the RRG-EPAP identifies those measures and strategies that have the most potential to spur economic development and inspire entrepreneurship, which the RRG-EPAP illustrates through the "Top 10 Entrepreneurial Opportunity Areas" list. In summary, the RRG-CAP identifies strategies for reducing GHG emissions which, in turn, inspire entrepreneurial opportunities captured and promoted

through the EPAP. Furthermore, the EPAP identifies key implementation recommendations for the City to facilitate Smart Growth development and stimulate sustainable infrastructure investment.

In 2014 Riverside was one of twelve cities that collaborated with the Western Riverside Council of Governments (WRCOG) on a Subregional Climate Action Plan (CAP). The Subregional CAP sets forth a subregional emissions reduction target, emissions reduction measures, and action steps to assist each community in the region to demonstrate consistency with California's Global Warming Solutions Act of 2006 (AB 32). The City committed to reducing its GHG contribution by adopting 36 reduction measures from the Subregional CAP that would guide the City's GHG reduction efforts through 2020. The RRG-CAP expands upon the City's subregional commitments and provides a path for the City's GHG reduction goals through 2035.

AB 32 directs California to reduce statewide GHG emissions to 1990 levels by 2020. To achieve these reductions, the California Air Resources Board (CARB) recommends that local governments target their 2020 emissions at 15% below "current"<sup>1</sup> levels, consistent with the statewide commitment, to account for emissions growth that has occurred since 1990. Several initiatives at the state level will help the City reduce GHG emissions, but they alone will not be sufficient to meet the 2020 and 2035 targets. The RRG-CAP provides a roadmap for the City to reduce GHG emissions through local actions.

The release of GHGs into the atmosphere is the direct and indirect result of everyday activities as residents and businesses use energy in their homes and office, travel to work, generate waste, and use water. Local governments also emit GHGs as they perform essential services and operate buildings, vehicles, street lights, traffic signals, water systems, and wastewater plants. Strategies in this CAP to reduce such emissions include increasing energy efficiency in buildings and facilities, utilizing renewable energy sources, increasing vehicle fuel efficiency, supporting alternative modes of transportation, reducing waste generation, and reducing water consumption. In addition to addressing climate change, reducing GHG emissions often provides co-benefits such as reducing energy and transportation costs for residents, businesses, and local governments; creating green jobs and supporting advancement of green technologies and industries; improving air quality and the overall health of residents; and making the community a more attractive place to live and locate a business.

## CAP ORGANIZATION

The RRG-CAP expands upon the GHG reduction programs and policies that the City has already implemented, the Subregional CAP measures the City has already committed to, and best practices and innovative programs that have been successful in other cities, all of which creates a tailored suite of measures for the City of Riverside. The measures in the RRG-CAP were chosen not only for their GHG reduction potential, but also for their potential to spur local business opportunities and encourage local economic development. Other factors that contributed to the measure selection

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<sup>1</sup> "Current" is a term used by CARB in its Climate Change Scoping Plan of September 2008, but is undefined. It is generally taken to mean emissions for a year between 2005 and 2008, although other years have been used by local communities.

process include cost-benefit characteristics, funding availability, implementation feasibility and other co-benefits, such as public health.

The RRG-CAP is organized into five chapters:

- **Chapter 1, Introduction:** provides the framework for the RGG-CAP, places the CAP in the context of current climate change science and policy, describes existing regional and local sustainability efforts and accomplishments.
- **Chapter 2, Emissions Inventory, Projections, and Goals:** describes the emissions inventory process and results, forecasted business-as-usual emissions for the City, and the City's adopted emissions reduction target.
- **Chapter 3, Reduction Measures and Actions:** contains the anticipated state and federal emissions reductions, and the local reduction measures and actions that will be implemented to meet the City's reduction target.
- **Chapter 4, Adaptation and Resiliency:** identifies adaptation and resiliency strategies to address potential impacts on human and natural populations resulting from climate change.
- **Chapter 5, Implementation and Monitoring:** provides best practices and specific resources for implementing reduction and adaptation/resiliency measures, the role for measure-specific evaluations, periodic updates to the inventories, use of indicators to monitor the City's progress, and the need for future iterations of the CAP to incorporate new data and reduction and adaptation and resiliency measures as they become available.

## GREENHOUSE GAS EMISSIONS IMPACTS

Naturally occurring gases dispersed in the atmosphere determine the Earth's climate by trapping infrared radiation (heat). This phenomenon is known as the greenhouse effect and without it the Earth would be about -2°F. Overwhelming evidence shows that human activities are increasing the concentration of GHGs in the atmosphere, trapping more heat, and changing the global climate. The most significant contributor is the burning of fossil fuels for transportation, electricity generation, and other purposes, which introduces large amounts of carbon dioxide and other GHGs into the atmosphere. Collectively, these gases intensify the natural greenhouse effect, causing global average surface and lower atmospheric temperatures to rise, a phenomenon known as global climate change.

The most important GHGs to reduce are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), and nitrous oxide (N<sub>2</sub>O), which constitute over 98% of human-released GHGs in the U.S.<sup>2</sup> Other important GHGs include hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>). These gases are emitted through a variety of natural processes and human activities, including:

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<sup>2</sup> U.S. Environmental Protection Agency, 2011, <http://www.epa.gov/climatechange/ghgemissions/gases.html>

- Fossil fuel combustion (CO<sub>2</sub>, N<sub>2</sub>O, and CH<sub>4</sub>);
- Agricultural operations, such as fertilization of crops (N<sub>2</sub>O), livestock production, and rice cultivation (CH<sub>4</sub>);
- Anaerobic composting and landfill off-gassing (CH<sub>4</sub>);
- Refrigeration and cooling (HFCs); and
- Industrial manufacturing, including aluminum production (PFCs), semi-conductor manufacturing (SF<sub>6</sub>), and cement production (CO<sub>2</sub>).

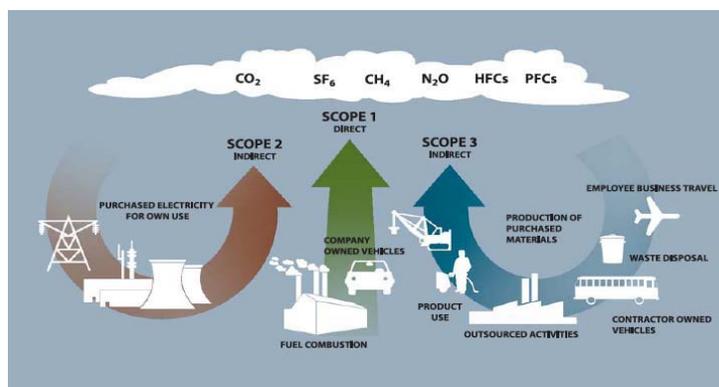
Global Warming Potential (GWP) is a quantitative measurement that expresses the relative warming potency of each GHG over a specific period of time. CO<sub>2</sub> is assigned a GWP value of 1 and the other GHGs are assigned GWPs relative to CO<sub>2</sub>. For GHG emission inventories, the amount of each gas emitted is multiplied by its GWP and presented in units of carbon dioxide equivalents (CO<sub>2</sub>e). **Table 1.1** lists the six primary GHGs as defined in AB 32, their chemical formula, the lifetime of the compound, and their GWPs relative to CO<sub>2</sub>. Although CO<sub>2</sub> has a lower GWP than other GHGs, it is the largest contributor to human-caused global warming, constituting about 84% of U.S. emissions.<sup>3</sup>

While the anticipated effects of climate change are likely to vary regionally, it is anticipated to have the following global effects<sup>4</sup>:

- Higher maximum temperatures and more hot days over most land areas;
- Higher minimum temperatures, fewer cold days, and frost days over most land areas;
- Reduced diurnal temperature range over most land areas;
- Increased heat index over land areas; and
- More intense precipitation events.

Many secondary effects are anticipated to result from climate change in California, including: loss in snow pack; sea level rise and inundation of coastal areas; increased flooding of low-lying areas; more extreme heat days per year; high ozone days; increased incidence of large forest fires; and more frequent and severe drought years.

**Figure 1-1: Greenhouse Gases Regulated Under AB 32**



<sup>3</sup> Ibid.

<sup>4</sup> IPCC Fourth Assessment Report: Climate Change 2007 (AR4). Available at: [http://www.ipcc.ch/publications\\_and\\_data/publications\\_ipcc\\_fourth\\_assessment\\_report\\_synthesis\\_report.htm](http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_synthesis_report.htm)

**Table 1.1 – Primary Greenhouse Gases, as defined by AB 32.**

GREENHOUSE GAS	CHEMICAL FORMULA	LIFETIME (YEARS)	GLOBAL WARMING POTENTIAL FOR 100-YEAR HORIZON
Carbon Dioxide	CO <sub>2</sub>	Variable	1
Methane	CH <sub>4</sub>	12	21
Nitrous Oxide	N <sub>2</sub> O	114	310
Sulfur Hexafluoride	SF <sub>6</sub>	3,200	23,900
Hydrofluorocarbons	HFCs	1.4 – 270	140 – 11,700
Perfluorocarbons	PFCs	1,000 – 50,000	6,500 – 9,200

**Source:** International Panel on Climate Change (IPCC) Second Assessment Report: Climate Change 1995 (SAR). Available at: [http://www.ipcc.ch/publications\\_and\\_data/publications\\_and\\_data\\_reports.shtml](http://www.ipcc.ch/publications_and_data/publications_and_data_reports.shtml)

**Note:** According to the Local Government Operations Protocol (LGO Protocol) and the U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions (Community Protocol), the GWP values in Table 1-2 were applied in this CAP. Since the SAR was published in 1995, the IPCC has published updated GWP values in its Third Assessment Report (TAR) and Fourth Assessment Report (AR4) that reflect new information on atmospheric lifetimes of GHGs and an improved calculation of the radiative forcing of CO<sub>2</sub>. However, GWP values from the SAR are still used by international convention to maintain consistency in GHG reporting. For GWP values that were not quantified in the SAR, GWP values from the TAR were used.

## REGULATORY CONTEXT

Many strategies for monitoring and addressing climate change have emerged at the international, national, and state levels. California remains a leader in the effort to reduce GHG emissions through mitigation and adaptation strategies. With AB 32, California is the first state in the U.S. to mandate GHG emissions reductions across its entire economy. To support AB 32, California has been developing policy and passing legislation that seeks to control emissions of gases that contribute to climate change. These have included regulatory approaches such as mandatory reporting for significant sources of GHG emissions and caps on emission levels, as well as market-based mechanisms, such as cap-and-trade. Voluntary local actions are also increasing, such as conducting emissions inventories, implementing practices to reduce emissions, and purchasing offsets and renewable energy certificates. While many local actions are currently voluntary, there is more emphasis being placed on monitoring and reporting emissions to demonstrate the effectiveness of policies and local consistency with state reduction goals. The following section highlights the primary state legislation and guidance related to the RRG-CAP.

## STATE LEGISLATION AND GUIDANCE

AB 32, also known as the Global Warming Solutions Act of 2006, directs public agencies in California to support the statewide goal of reducing GHG emissions to 1990 levels by 2020. Preparing a CAP supports AB 32 at the local level. The CAP provides a policy framework for how the City can do its part to reduce emissions. While compliance with AB 32 is not a requirement for local jurisdictions, demonstrating consistency with statewide reduction goals can significantly assist jurisdictions to qualify for incentives such as grant funding. Efforts to address climate change, reduce consumption of resources, and improve energy efficiency led by state legislation or programs are briefly described below and identified in **Figure 1-3**.

### Executive Order S-3-05

On June 1, 2005, Governor Arnold Schwarzenegger signed Executive Order (EO) S-3-05, which established the following GHG emission reduction targets:

- by 2010, California shall reduce GHG emissions to 2000 levels;
- by 2020, California shall reduce GHG emissions to 1990 levels; and
- by 2050, California shall reduce GHG emissions to 80 percent below 1990 levels.

EO-S-3-05 created the California Climate Action Team (CAT), which is tasked with the preparation of biennial science assessment reports on climate changes and adaptation options for California. The first CAT Report to the Governor and Legislature was published in 2006, and contains recommendations and strategies to help meet the targets in EO-S-3-05. These were expanded upon in the 2009 CAT Biennial Report to the Governor and Legislature. The new information includes revised climate and sea-level projections, and an evaluation of climate change within the context of broader social changes, such as land-use changes and demographic shifts<sup>5</sup>. The action items in the report focus on the preparation of the Climate Change Adaptation Strategy, required by EO-S-13-08.

### Assembly Bill 32 – California Global Warming Solutions Act of 2006

AB 32 was approved by the legislature and signed by Governor Schwarzenegger in 2006. The landmark legislation requires CARB to develop mechanisms that will reduce GHG emissions to 1990 levels by 2020. Mandatory actions under the legislation to be completed by CARB include:

- Identification of early action items that can be quickly implemented to achieve GHG reductions. These early action items were adopted by CARB in 2007 and include regulations affecting landfill operations, motor vehicle fuels, car refrigerants, and port operations, among other regulations. Development of a scoping plan<sup>6</sup> to identify the most technologically feasible and cost-effective measures to achieve the necessary emissions reductions to reach 1990 levels by

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<sup>5</sup> California EPA - Climate Action Team Report to Governor Schwarzenegger and the Legislature, March 2006. Available at: [http://www.climatechange.ca.gov/climate\\_action\\_team/reports/index.html](http://www.climatechange.ca.gov/climate_action_team/reports/index.html)

<sup>6</sup> CARB 2008 Scoping Plan. Available at <http://arb.ca.gov/cc/scopingplan/scopingplan.htm>

2020. The Scoping Plan identifies a variety of GHG reduction measures that include direct regulations, alternative compliance mechanisms, incentives, voluntary actions, and market-based cap-and-trade program. Key elements of the Climate Change Scoping Plan are:

- Expanding and strengthening existing energy efficiency programs;
- Achieving a statewide renewables energy mix of 33 percent for electricity generation;
- Developing a California cap-and-trade program affecting all GHG-emitting power plants in the state as well as companies that import power from other states for sale in California;
- Establishing targets for transportation-related GHGs for regions throughout California and pursuing policies and incentives to achieve those targets;
- Adopting measures pursuant to existing laws including clean car standards and low carbon fuel standards;
- Creating targeted fees on high global warming potential gases and a fee to fund the administrative costs of state's long term commitment to AB 32 implementation; and
- Adopting measures to increase commercial recycling.

The Plan identifies local governments and municipal owned utilities as strategic partners to achieving the state goal and translates the reduction goal to a 15% reduction of current emissions by 2020. AB 32 implementing activities directly affecting Riverside Public Utilities include expansion of energy efficiency programs, renewable portfolio standards and the cap-and-trade program.

- Creation and adoption of regulations to require the state's largest industrial emitters of GHGs to report and verify their emissions on an annual basis.

### **Senate Bill 97 – California Environmental Quality Act Guideline Amendments of 2007**

Senate Bill (SB) 97 was adopted in 2007 and directed the Governor's Office of Planning and Research (OPR) to amend the CEQA Guidelines to address GHG emissions. The CEQA Guidelines prepared by OPR were adopted in December 2009 and went into effect March 18, 2010. Local governments may use adopted plans consistent with the CEQA Guidelines to assess the cumulative impacts of projects on climate change, if the plan for the reduction of GHG emissions accomplishes the following:

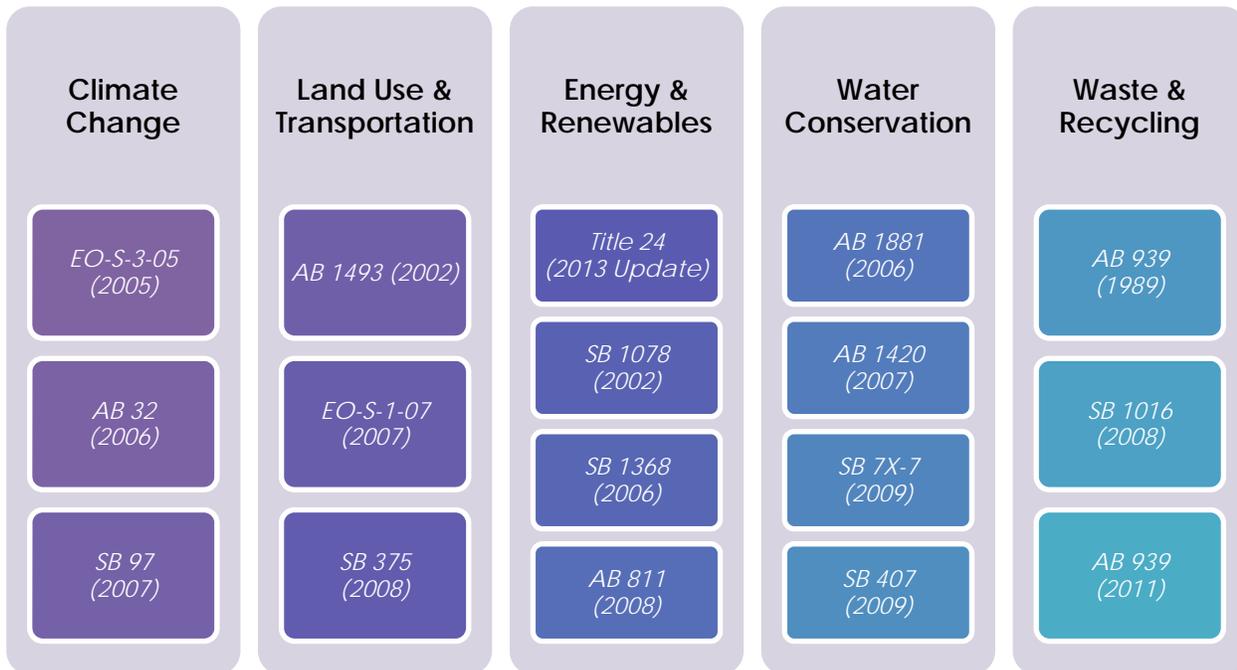
- Quantify GHG emissions, both existing and projected over a specified time period, resulting from activities within a defined geographic area.
- Establish a level, based on substantial evidence, below which the contribution to GHG emissions from activities covered by the plan would not be cumulatively considerable.
- Identify and analyze the GHG emissions resulting from specific actions or categories of actions anticipated within the geographic area.
- Specify measures or a group of measures, including performance standards, that substantial evidence demonstrates, if implemented on a project-by-project basis, would collectively achieve the specified emissions level.
- Establish a mechanism to monitor the plan's progress toward achieving the level and to require an amendment if the plan is not achieving specified levels.
- Be adopted in a public process following environmental review.

### SB 375 – Sustainable Communities and Climate Protection Act of 2008

SB 375, also known as the Sustainable Communities and Climate Protection Act of 2008, builds off of AB 32 and aims to reduce GHG emissions by linking transportation funding to land use planning. It requires the state’s metropolitan planning organizations (MPO) to create a sustainable communities strategy (SCS) in their regional transportation plans (RTP) for the purpose of reducing urban sprawl. Under SB 375, CARB established regional targets for GHG emissions reductions from passenger vehicle use for each MPO. The regional reduction targets for the Southern California Association of Governments (SCAG) region, which is the MPO with jurisdiction over the WRCOG subregion, are 8% per capita by 2020, and a conditional target of 13% per capita by 2035 from 2005 levels. In April 2012, SCAG adopted its first SCS, which demonstrates how the region will achieve the GHG emissions reduction targets set by CARB.

**Figure 1-2** categorizes the applicable state regulations that provide a policy framework for addressing climate change.

**Figure 1-2: Regulatory Framework for Climate Change**



## PLANNING CONTEXT

### REGIONAL PROGRAMS

The regional initiatives described below contribute to the development and success of this CAP. Many of these programs are administered by WRCOG and several are conducted by other regional entities in partnership with WRCOG.



## Southern California Association of Governments Regional Transportation Plan and Sustainable Communities Strategy

SCAG is the regional planning agency for Imperial, Los Angeles, Orange, Riverside, San Bernardino, and Ventura counties, and serves as a forum for regional issues relating to transportation, the economy, community development, and the environment. SCAG serves as the federally designated MPO for the Southern California region and is the largest MPO in the U.S. With respect to air quality planning, SCAG has prepared the *2012–2035 Regional Transportation Plan/Sustainable Communities Strategy (2012 RTP/SCS): Towards a Sustainable Future*, to fulfill federal planning requirements contained in the *Safe, Accountable, Flexible, Efficient, Transportation Equity Act: A Legacy for Users (SAFETEA-LU)*, which calls for regions to consider urban form and natural resources as part of the transportation planning process. Under SB 375, all of California’s MPOs must prepare an SCS as a component of their RTP. The RTP serves as a long-range transportation plan that is developed and updated by SCAG every four years. The RTP provides a vision for the development of transportation facilities throughout the region based on growth forecasts and economic trends projected over a 20-year period. The SCS expands upon transportation strategies in the RTP to analyze growth patterns and establish future land use strategies that aid the region in meeting its GHG reduction targets. The SCS does not mandate future land use policies for local jurisdictions, but rather provides a foundation of regional policy upon which local governments can build. WRCOG and its member jurisdictions partner with SCAG and are active members in the development and implementation of the RTP/SCS.



## Sustainability Framework for Western Riverside County

WRCOG’s Sustainability Framework (Framework) is a subregional planning effort that establishes, implements, and continuously refines an overarching sustainability plan for the communities in Western Riverside County. The Framework aims to: initiate a dialogue about the importance of sustainability in the region; provide a vision and goals to guide local action and regional collaboration; define more immediate short-term goals that can contribute to the longer-term vision of the Framework; and define indicators, benchmarks, and targets that provide a measure of the effectiveness of Framework programs and policies. The Framework acts as a “living” document and contains goals and actions applying to economic development, education, public health, transportation, water and wastewater, energy, and the environment.



## Western Riverside County Clean Cities Coalition

The Western Riverside County Clean Cities Coalition (Coalition) is a voluntary local government and industry partnership that aims to reduce the consumption of petroleum fuels and improve air quality in the WRCOG subregion. The Coalition works to mobilize local stakeholders toward expanding the use of alternative fuel vehicles (AFV) and advanced technology vehicles, promoting local idle reduction measures, and strengthening local AFV fueling infrastructure. The governments of Western Riverside County have taken leadership roles in the Coalition, coordinating efforts between government and industry to recognize the value of partnership in achieving

air quality, energy efficiency, economic development, and transportation goals, while advancing the clean air and energy efficiency goals of the national Clean Cities program administered by the U.S. Department of Energy.



### Healthy Communities

WRCOG and its member jurisdictions are engaged in numerous efforts and initiatives to promote healthy communities, including participating in the Riverside County Health Coalition (RCHC). The RCHC is a collaboration of public and private sectors, school districts, community businesses, local and regional organizations and community members committed to policy development and advocacy, environmental change and community empowerment for healthy lifestyles in Riverside County. This initiative includes a focused partnership effort with local governments to integrate healthy communities into the local planning and policy-making process.



### Multiple Species Habitat Conservation Plan

The Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) is a comprehensive, multi-jurisdictional plan to conserve sensitive species and their associated habitats in the subregion. Created in 2004 by the Western Riverside County Regional Conservation Authority (RCA), the MSHCP provides subregional transportation and green infrastructure benefits to local agencies and allows WRCOG jurisdictions to make land use decisions and maintain a strong economy in a context that comprehensively addresses federal and state Endangered Species Acts (ESA and CESA) requirements.



### Transportation Uniform Mitigation Fee

WRCOG's Transportation Uniform Mitigation Fee (TUMF) was implemented in 2003 as one of the largest multi-jurisdictional fee programs in the nation. TUMF makes improvements to the regional transportation system and provides transportation demand management through funds from new development, ensuring that development mitigates for increases in traffic volumes. TUMF is a 32-year program that provides subregional transportation and infrastructure benefits to local agencies in Western Riverside County. The program is expected to raise \$4.2 billion, and 1.64% is allocated to the Riverside Transit Agency (RTA) for transit improvements. To mitigate the impacts of transportation construction projects, WRCOG allocates 1.59% of TUMF funds collected to the RCA to purchase habitat for the MSCHP.



### HERO Program

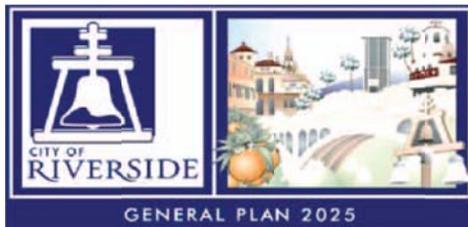
Established under the guidance of AB 811 (2008) and AB 474 (2009), WRCOG's HERO Program is a Property Assessed Clean Energy (PACE) program that provides financing to residential and commercial property owners for the installation of energy efficient, renewable energy, and water conservation improvements on existing properties. Financing provided through the HERO Program is repaid through an assessment on property tax bills over 5-, 10-, 15-, 20-, and 25-year terms, based on the useful life of the products, and upon sale of the property, the balance generally stays with the property.

## EXISTING SUBREGIONAL AND LOCAL ACCOMPLISHMENTS



### WRCOG Subregional Climate Action Plan

The Western Riverside Council of Governments (WRCOG) developed a Subregional Climate Action Plan (CAP) with the objectives of creating more livable, equitable, and economically vibrant communities. Twelve cities in the subregion, including Riverside, participated in the development of a Subregional CAP, which sets forth subregional emissions reduction targets, emissions reduction measures, and action steps to assist each community in demonstrating consistency with AB 32. The Subregional CAP includes feasible strategies that will help the WRCOG subregion advance toward GHG emissions reduction goals, while affording each community additional economic, public health and environmental benefits.



### General Plan 2025

The adoption of the City's General Plan 2025 Program in November of 2007 included the seven Elements mandated by state law, as well as several optional Elements. The Air Quality Element, which recognizes Riverside as a leader in clean air and a healthy environment, provides the scientific and regulatory context describing the importance of improving air quality and reducing greenhouse gas emissions. The Air Quality Element describes city programs and regional initiatives that had been implemented at the time the plan was adopted, and outlines programs and partnerships that the City would pursue in the future. Policies in the Air Quality Element help to set the framework for the air quality and climate change initiatives the City is pursuing today. As required by state law, as part of the General Plan 2025, the Implementation Plan includes tools, or action items, that address the Objectives and Policies of the Elements. In addition, there are Overarching Tools in the Implementation Plan that addressed the more significant Objectives and Policies of the General Plan 2025.

### Proposition R and Measure C

In addition to the City's General Plan, the City has two major voter approved initiatives to preserve the City's natural resources. With the passage of Proposition R in 1979 and Measure C in 1987, voters expressed serious community resolve to protect the Arlington Heights Greenbelt and Rancho La Sierra area's agricultural heritage and prevent urban sprawl thereby preserving them as community treasures. These measures serve to protect natural hillsides, arroyos and other important topographical features and ensure Riverside's greenbelt provides a buffer between urban and rural land uses.

### Green Action Plan

The 2012 Green Action Plan is a product of the City's Clean & Green Task Force, which was created to: build upon the policies of the City's General Plan 2025; ensure that the green design guidelines would be developed and followed; provide a framework for sustainability pilot projects; and initiate partnerships among regional agencies and

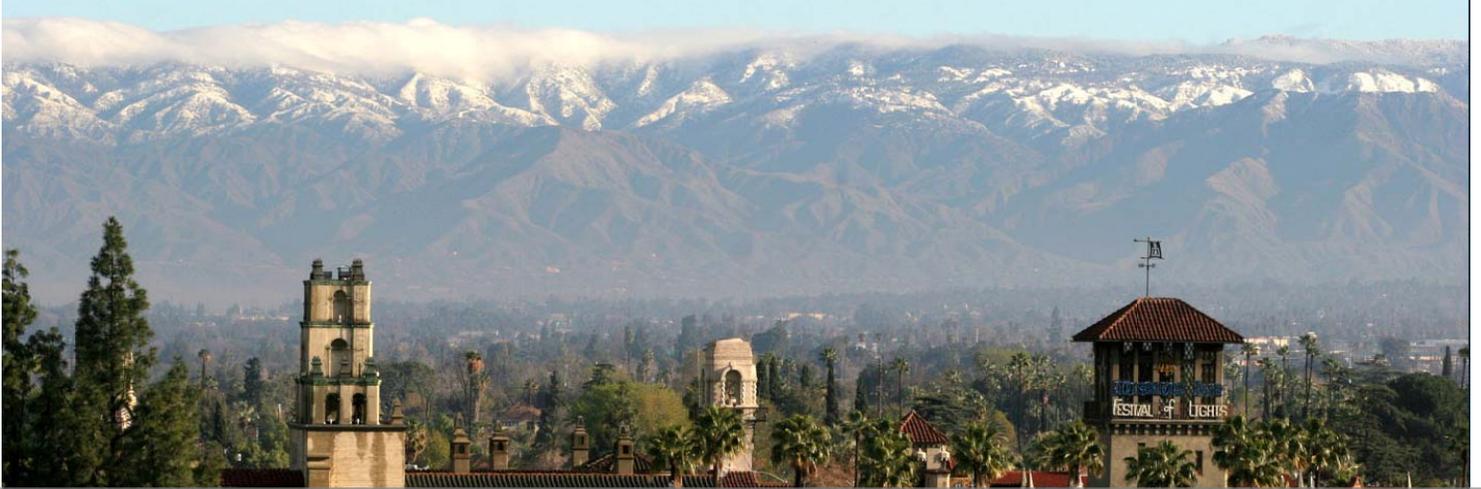
nearby cities. The Task Force first created the Sustainability Policy Statement (SPS), a document featuring eight main categories: Save Water, Keep it Clean, Make it Solar, Make it Shady, Clean the Air, Save Fuel, Make it Smart and Build Green. Once the SPS was adopted, the Green Action Plan was created to serve as a guidebook that would tie specific tasks to the policies of the SPS. The Green Action Plan focuses on seven key areas of city life: Energy, Greenhouse Gas Emissions, Waste, Urban Design, Urban Nature, Transportation and Water.

The City formed a Green Accountability Performance (GAP) Committee to carry out the tasks and within just two years nearly each of the plan's 38 tasks had been accomplished. The GAP Committee was reimaged to focus on healthy communities, and Riverside was awarded its designation by the United States Center for Disease Control and Prevention (CDC) as an Emerald City, an honor that has gained the City national acclaim. Healthy Communities is the GAP's eighth focus area, with 19 goals and over 50 additional tasks. The Healthy Communities strategies strengthen the Green Action Plan as setting a clear path to sustainability and serving as a living document that reflects the growth of the green movement, the progression of renewable energy, and the fresh ideas of the GAP Committee.



### **Riverside Public Utilities**

The City of Riverside Public Utilities (RPU) Department provides water and electric services to the residents and businesses of Riverside. Through **Green Riverside**, the City supports and implements the various tasks of the Green Action Plan and other sustainability initiatives, offering multiple energy efficiency programs that reduce consumption, while promoting the City's sustainability goals. **Blue Riverside** includes multiple water conservation programs that reduce water consumption.



# CHAPTER 2

## EMISSIONS INVENTORY

The City of Riverside (City) greenhouse gas (GHG) inventory serves multiple purposes. It quantifies the GHG emissions resulting from activities taking place throughout the City of Riverside, caused by the City's residents, businesses, and local government (i.e., the Community Inventory), as well as emissions attributed to local government operations (i.e., the Municipal Inventory). The inventory provides an understanding of where GHG emissions are originating, and creates an emissions baseline against which the City can set emissions reduction targets and measure future progress. The inventory further allows the City to develop effective policies, strategies, and programs to reduce emissions.

The Community Inventory encompasses the GHG emissions resulting from activities taking place within the City's boundaries, where the local government has jurisdictional authority, in addition to some activities taking place outside the City boundaries that support activities in the jurisdiction (for example, solid waste sent to landfill areas outside the City). The Community GHG Inventory includes emissions from the following sectors: residential energy, commercial/industrial energy, transportation, solid waste, and wastewater. The City's Municipal GHG Inventory includes emissions from municipal sources including buildings and facilities, fleet vehicles, streetlights, water conveyance, wastewater treatment, airport operations, solid waste disposal, employee commuting, and municipally-owned power generation.

The City has developed GHG inventories for the calendar years 2007 and 2010 that breakdown GHG emissions by sector, illustrating the GHG contribution of various sources in the community and from municipal operations. The City of Riverside Greenhouse Gas Inventories report issued in January 2014 (included as Appendix XX) presents the results of the 2007 and 2010 inventories, which were developed using ICLEI's Clean Air and Climate Protection (CACP) Software, and various emissions accounting protocols for assessing emissions from the community and municipal operations.

The City is a participant in the Western Riverside Council of Governments (WRCOG) Subregional Climate Action Plan (CAP) project, whereby Riverside and 11 additional local jurisdictions prepared baseline inventories to quantify GHG emissions from community contributors and government operations. 2010 was chosen as the inventory base year for 10 of the 12 participating jurisdictions within the WRCOG subregion, including the City of Riverside. This local Climate Action Plan, while consistent with the WRCOG subregional CAP, is customized to meet the specific needs of the City and designed to be integrated with the many planning projects that are currently underway in the City. In order to show a more comprehensive and locally-focused picture of the City's emissions profile, 2007 is used as the baseline emissions year for the local CAP. Selecting 2007 as the baseline year recognizes important accomplishments the City has already taken to reduce community-wide GHG emissions, most notably the shift from coal-generated electricity to renewable sources, and it ensures that those accomplishments are accounted for in assessing progress toward future goals.

Also influencing the selection of 2007 as the baseline year is the established set of standard elements required for a "qualified" climate action plan (or GHG reduction strategy) that can be used to streamline the analysis of GHG emissions under the streamlining provisions of California Environmental Quality Act (CEQA) Guidelines Section §15183.5. Those standard elements include a provision that the baseline inventory should include one complete calendar year of data for 2008 or earlier (see Section 2.7.2 of the CEQA Guidelines, under Standard Elements of a GHG Reduction Strategy for further guidance). Additional regulatory guidance from California Air Resources Board (CARB),<sup>1</sup> and the precedent set by dozens if not hundreds of communities across California, has established the years 2005 through 2008 as the most commonly used baseline years for community-wide climate action plans and as the basis for setting a significance threshold for CEQA.

This chapter also forecasts future GHG emissions using growth factors for population, households, motor vehicles, and job growth that are consistent with the Southern California Association of Governments (SCAG) 2016-2040 Draft Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS), which is currently being developed for the region. The City's GHG reduction targets for future years (2020 and 2035) are also established based on regulatory guidance and best practice established by other local jurisdictions across California, including those participating in the WRCOG Subregional CAP.

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<sup>1</sup> In its Climate Change Scoping Plan of September 2008, CARB recommends that local governments adopt a GHG reduction target consistent with the State's commitment to reach 1990 levels by 2020. This was identified as equivalent to 15% below "current" levels at the time of writing (2008), and is generally interpreted as including the years 2005 through 2008.

# COMMUNITYWIDE INVENTORY

The emission sources and activities chosen for inclusion in the City of Riverside Community Inventory are based on the local government reporting framework developed by ICLEI in their *U.S. Community Protocol for Accounting and Reporting of Greenhouse Gas Emissions*. As such, emissions in the Community Inventory are derived from sources located within the jurisdiction and from activities by community members for which the local government has significant influence to mitigate over time. This includes activities taking place within the City's geopolitical boundary where the local government has jurisdictional authority, as well as community-related activities taking place outside of City limits that are attributable to community activities (e.g., landfill waste from City residents).

Emissions from sources not subject to significant influence by the community were not included within the inventory, since the local government has limited means to influence material uses and consumption by the community.

The inventory estimates current emissions using the best available data and methods at the time the inventory was completed. As data collection and estimation methodologies evolve, future inventories may incorporate emission sources that were not captured previously, or may use newer approaches to estimating emissions.

## INVENTORY RESULTS

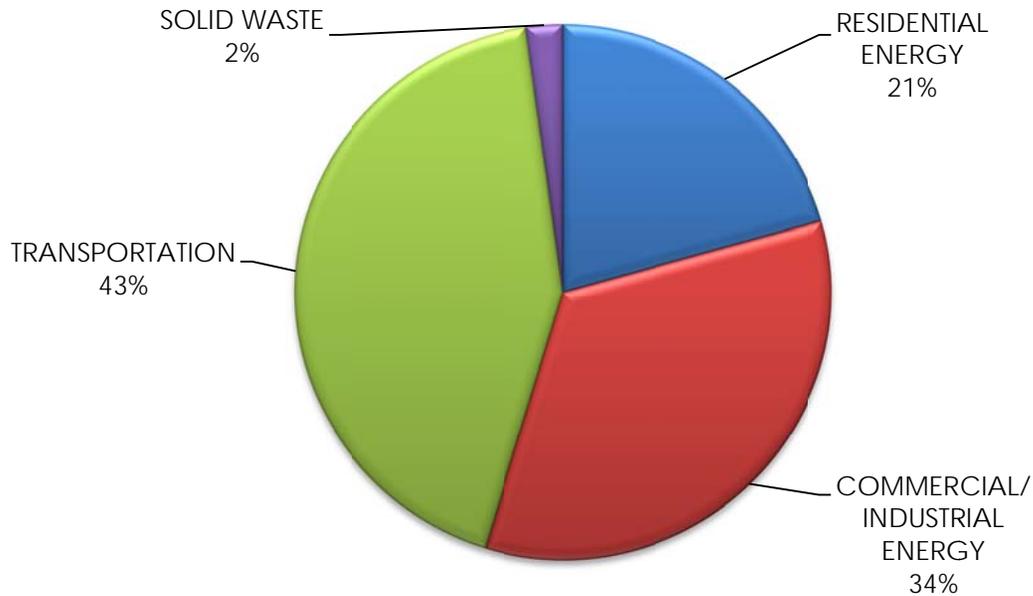
The Community Inventory includes emissions from residential, commercial, and industrial activities, as well as municipal operations, broken into 4 sectors: Residential, Commercial/Industrial, Transportation, and Solid Waste. Results are further broken down by energy source (e.g., electricity) and solid waste composition (e.g., paper products).

The results of the 2007 Baseline GHG Inventory are summarized in **Table 2.1** and **Figure 2-1**. Total community emissions in 2007 were 3,024,066 metric tons (MT) of carbon dioxide equivalent (CO<sub>2</sub>e<sup>2</sup>). Transportation is the biggest contributor to community emissions, followed by Commercial/Industrial operations, Residential activities, and Solid Waste disposal to landfill.

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<sup>2</sup> Carbon dioxide equivalent (CO<sub>2</sub>e) includes carbon dioxide, methane (CH<sub>4</sub> and/or nitrous oxide (N<sub>2</sub>O)).

**Figure 2-1: Communitywide Baseline Emissions (2007)**



**Table 2.1 – Communitywide Baseline Emissions (2007)**

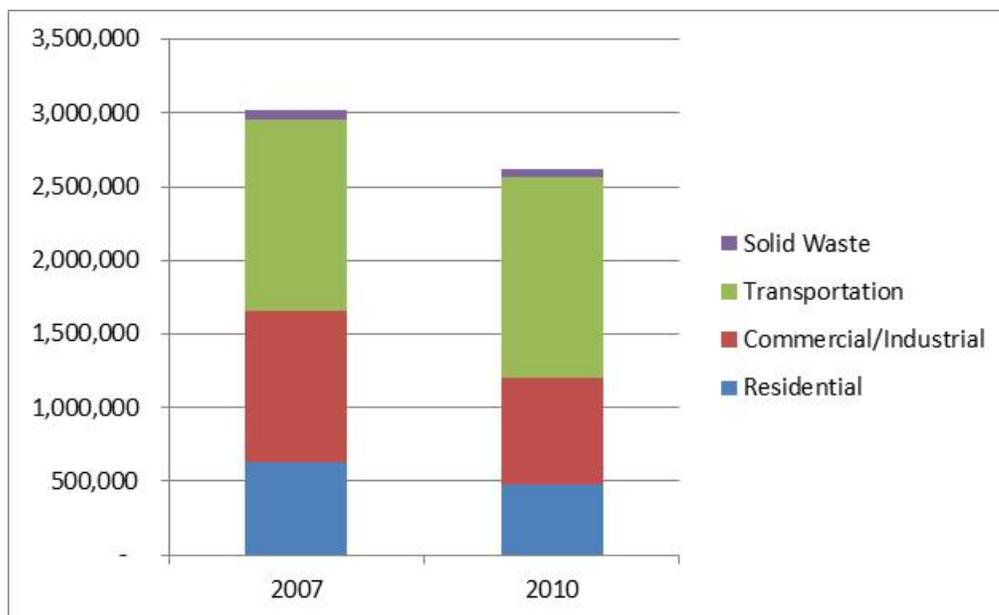
SECTOR	2007 (MT CO <sub>2</sub> e/yr)	Percent of Total
Residential Energy Use	626,136	20.7%
Commercial/ Industrial Energy Use	1,028,804	34.0%
Transportation	1,301,784	43.0%
Solid Waste Generation	67,342	2.2%
<b>Total Inventory</b>	<b>3,024,066</b>	<b>100%</b>

Figure 2-2 compares the 2010 emissions inventory (quantified for the WRCOG Subregional CAP) with the 2007 baseline. Communitywide emissions decreased by approximately 13.4 percent, with three of the four sectors experiencing a decrease; only transportation emissions increased. The primary reason for the large drop in Residential and Commercial/Industrial emissions from 2007 to 2010 was a reduction in the carbon intensity of the City’s electricity portfolio, as supplied by municipally-owned Riverside Public Utilities (RPU). The underlying reason for the significant decrease is described in more detail in the following section on the Municipal GHG Inventory. The

resulting impact on the wider community was a 23% reduction in Residential emissions and a 30% reduction in Commercial/Industrial emissions. Overall, community-wide emissions fell by 13% from 2007 to 2010.

Use of a 2007 baseline year in the City’s CAP captures these important reductions in GHG emissions that were the direct result of City policy and related actions. The City’s residential and commercial/industrial communities also used less energy over this period, likely the result of the economic downturn experienced over the period, along with the City’s ongoing energy efficiency and renewable energy programs. Solid waste emissions decreased slightly due to a higher percentage of the City’s waste being diverted from the landfill (i.e., increased recycling).

**Figure 2-2: 2007 and 2010 Communitywide GHG Emissions by Sector (MT CO2e)**



## GOVERNMENT OPERATIONS INVENTORY

Emissions from Riverside municipal operations are included in the Community Inventory, but a separate Municipal Inventory is included to provide the City with the detail needed to target reductions in emissions associated with municipal operations. The emission sources and activities included in the City of Riverside Municipal Inventory are consistent with the Local Government Operations Protocol (LGOP), which was developed by the California Air Resources Board (CARB), the California Climate Action Registry (CCAR), and Local Governments for Sustainability (ICLEI) in collaboration with The Climate Registry. The LGOP provides a standardized set of guidelines and methodologies to assist local governments with quantifying and reporting GHG emissions associated with their operations. ICLEI’s CACP Software was used to generate

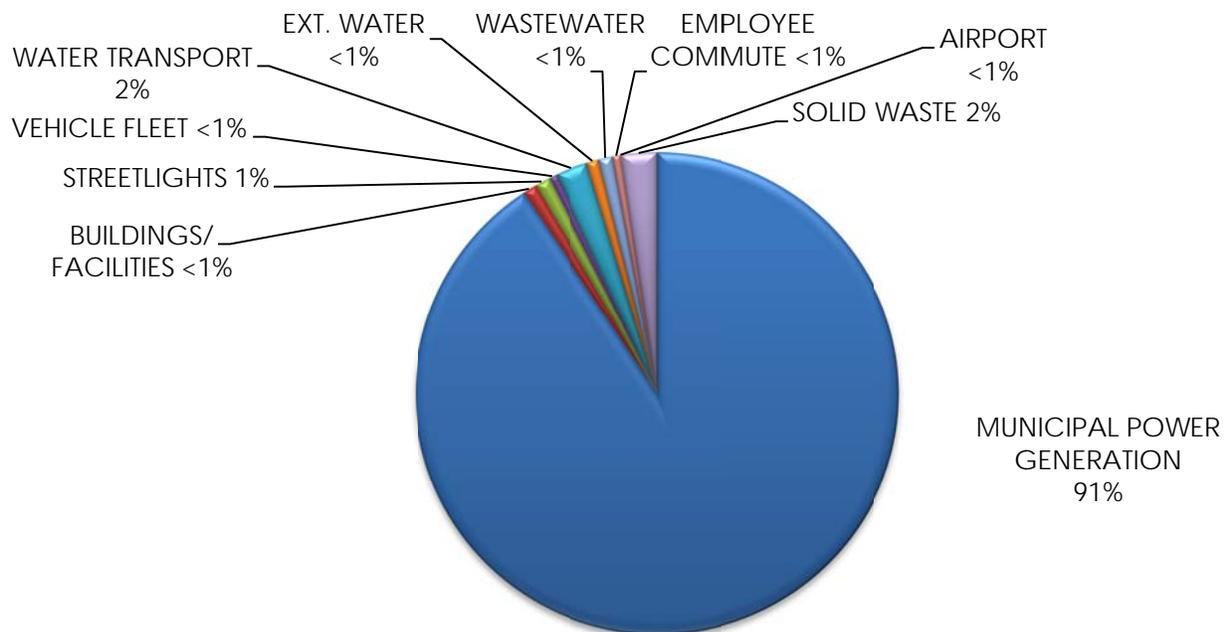
GHG emissions estimates based on conversion factors for electricity and natural gas consumption, as well as conversion factors for liquid fuel consumption and modeling of emissions from solid waste disposed in landfills.

The Municipal Inventory includes emissions from all GHG sources under the direct control of the City, including buildings and facilities, streetlights, fleet vehicles, water conveyance (both within the City boundary and upstream of the City), wastewater treatment, the City-operated airport, government-generated solid waste, employee commuting, and most significantly, emissions from municipal power generation by Riverside Public Utilities (RPU), which is a city-owned local electric utility and water utility with more than 107,000 metered electric customers and 64,000 metered water customers.

## INVENTORY RESULTS

As shown in **Table 2.2**, municipal operations were responsible for approximately 1,362,587 MT CO<sub>2e</sub> in 2007. Indirect GHG emissions associated with RPU operations have an outsized impact on the Municipal Inventory, representing approximately 91% of the 2007 inventory. **Figure 2-3** shows graphically how much influence RPU has on municipal emissions. The primary sources constituting the rest of the inventory are government-generated Solid Waste and Water Transport (both within the City and upstream of the City from original sources), followed by roughly equal contributions from Buildings and Facilities, Streetlights, and Employee Commuting, Vehicle Fleet, and Wastewater Treatment. Airport facilities provide a relatively small contribution to GHG emissions.

**Figure 2-3: Government Operations Baseline Emissions (2007)**

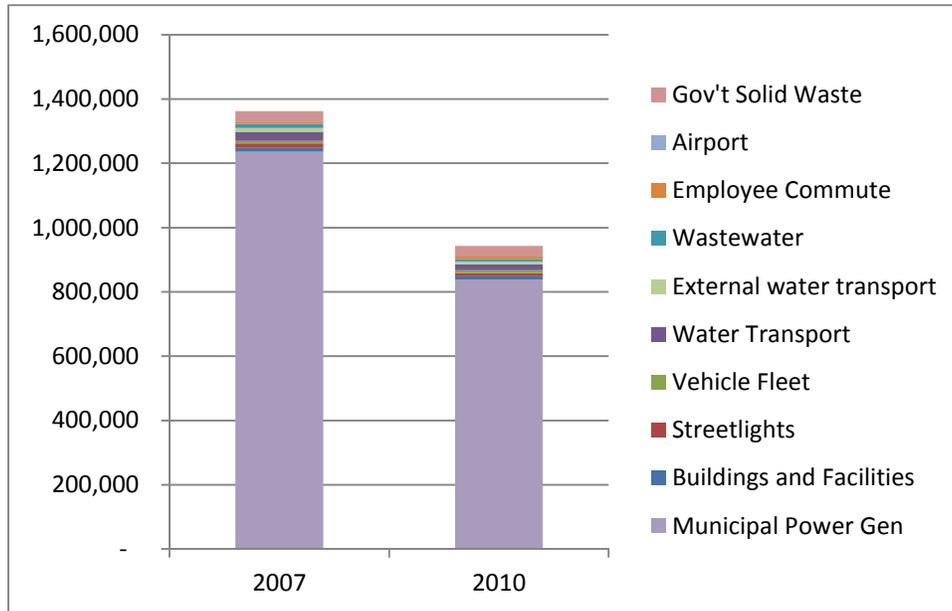


**Table 2.2 – Government Operations Baseline Emissions (2007)**

SECTOR	2007 (MT CO <sub>2</sub> e/yr)	Percent of Total
Buildings and Facilities	12,734	0.9%
Streetlights	13,523	1.0%
Vehicle Fleet	7,700	0.6%
Water Transport (within City)	29,167	2.1%
External Water Transport (upstream of City)	11,227	0.8%
Wastewater	12,717	0.9%
Employee Commute	7,413	0.5%
Airport	304	0.0%
Municipal Solid Waste	32,465	2.4%
Municipal Power Generation	1,235,337	90.7%
<b>Total Inventory</b>	<b>1,362,587</b>	<b>100.0%</b>

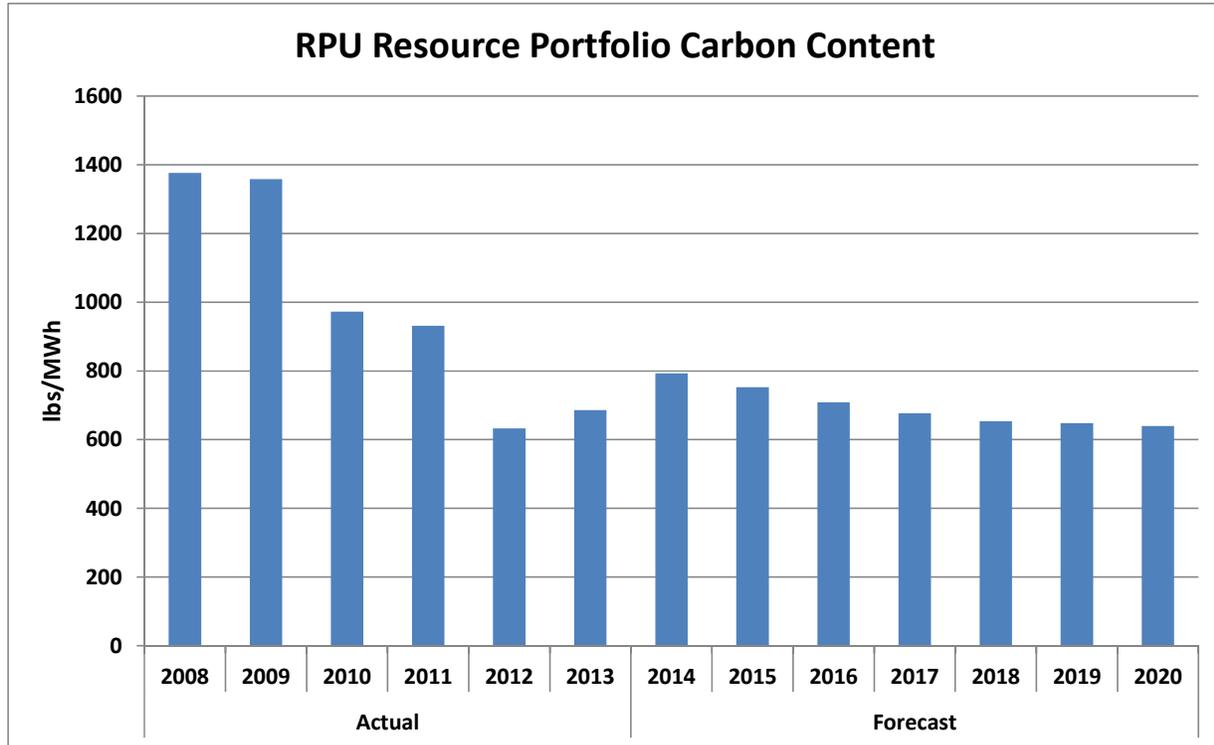
**Figure 2-4** compares the 2010 municipal operations inventory (quantified for the WRCOG Subregional CAP) with the 2007 baseline. During the period, emissions associated with RPU fell by more than 32%, primarily due to a shift from purchasing coal-produced electricity to more low-carbon electricity sources over that time period.

**Figure 2-4: 2007 and 2010 Municipal Operations GHG Emissions by Sector (MT CO<sub>2</sub>e)**



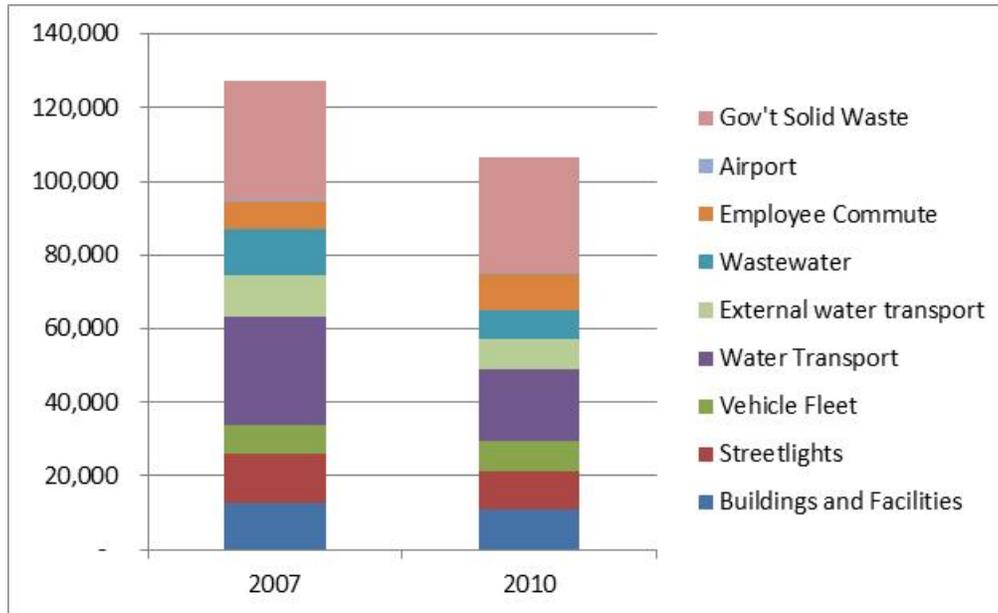
**Figure 2-5** shows how the carbon content of RPU’s electricity decreased between 2007 and 2010. Although not shown in the figure, the carbon content continued to decrease through 2012. Prior to 2007, RPU began positioning itself to achieve significant reductions in GHG emissions associated with its electricity portfolio by shifting its resource mix from carbon intensive sources to renewable sources. In 2003, RPU was one of the first electric utilities in California to voluntarily procure renewable resources (the Salton Sea geothermal resource in Imperial Valley and the Wintec wind resource in Palm Springs) to meet a portion of Riverside’s electric power needs. This commitment accelerated in 2005 when RPU amended its contract with Salton Sea geothermal resource to more than double its procurement of renewable energy. To further its commitment to clean power, RPU terminated its power purchase agreement with Deseret Generation and Transmission Cooperative for Hunter and Bonanza coal generating plants in Utah at the end of 2009. The impact of these changes in the City’s electricity portfolio, which occurred primarily in the 2009-2010 timeframe, is clearly observed in Figure 2-5. These changes in Riverside’s electricity portfolio are also the primary reason that community-wide emissions fell by more than 13% from 2007 to 2010, as illustrated in Figure 2-2.

Figure 2-5: City of Riverside Public Utilities – Portfolio Carbon Content Over Time



Since emissions associated with the electricity provided by RPU represent such a large percentage of emissions from municipal operations, it is useful to analyze the Municipal Operations Inventory excluding the RPU-related emissions, to provide a clearer picture of the relative contributions from other municipal sectors. **Figure 2-6** shows the 2007 and 2010 Municipal Inventories without the RPU-related emissions. Over this period, the emissions reductions associated with Water Transport, Buildings and Facilities, Streetlights, and Wastewater Treatment, and Airport facilities are largely the result of the lower carbon intensity of the City’s electricity supply.

Figure 2-6: Municipal GHG Emissions by Sector (MT CO<sub>2</sub>e), Excluding RPU



## EMISSIONS FORECASTS

GHG emissions forecasts for 2020 and 2035 were developed under a business-as-usual (BAU) scenario (i.e., a scenario that does not include regulatory actions or GHG reduction measures that were not in place by the 2007 base year), and then adjusted for the expected impact of state-wide emissions reduction measures, such as updates to building energy standards, and implementation of state-wide programs to decrease emissions from on-road vehicles.

### BUSINESS-AS-USUAL SCENARIO

BAU GHG emissions forecasts for 2020 and 2035 were developed using growth factors that are consistent with the 2016 RTP/SCS being developed for the SCAG region. Anticipated growth rates for population, households, and employment in the City of Riverside were used to derive emissions growth factors for the Residential, Commercial/Industrial, Transportation, and Solid Waste sectors of the Community Inventory, to forecast emissions in 2020 and 2035. These factors differ slightly from those used for the WRCOG Subregional CAP, with the primary difference being relatively slower residential and commercial growth forecasts by the RTP/SCS through 2020.

## COMMUNITY-WIDE FORECASTS

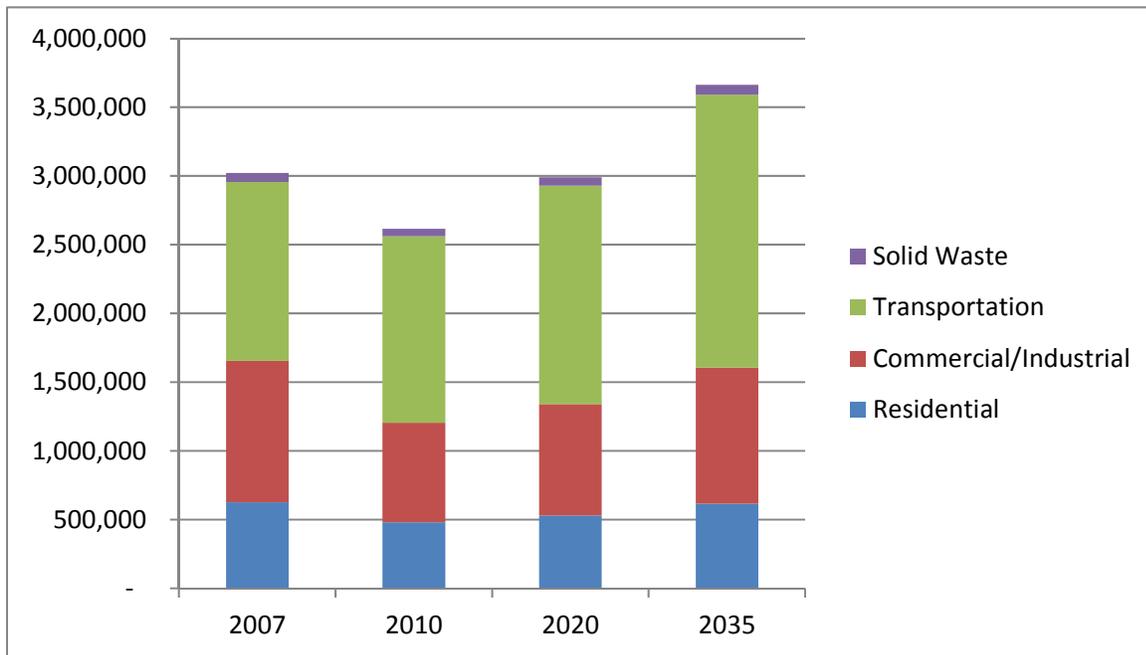
**Table 2.3** provides a summary of emissions forecasts for the four community sectors. For purposes of comparison, Table 2.3 also includes the results from the 2010 inventory. Household numbers were used as a growth proxy for Residential emissions; Commercial employment was used to represent Commercial/Industrial emissions growth; Transportation (vehicle miles traveled and associated emissions) growth was taken directly from the modeling results using the County traffic model (known as RIVTAM); Service population (residents plus numbers employed) was used as a proxy for Solid Waste emissions.

**Figure 2-7** shows how community emissions are projected to increase by 2020 and 2035 using the BAU forecasts. Looking forward from the latest inventory (2010), total community-wide GHG emissions are expected to grow 14.3% by 2020, and 40.4% by 2035.

**Table 2.3 – Communitywide Business-As-Usual Emissions Forecast**

SECTOR	2007 Baseline (MT CO <sub>2</sub> e/yr)	2010 Baseline (MT CO <sub>2</sub> e/yr)	2020 Forecast (MT CO <sub>2</sub> e/yr)	Growth Rate 2007-2020	2035 Forecast (MT CO <sub>2</sub> e/yr)	Growth Rate 2007-2035
Residential Energy Use	626,136	481,903	543,134	10.1%	617,156	28.1%
Commercial/ Industrial Energy Use	1,028,804	722,321	809,594	12.1%	989,264	37.0%
Transportation	1,301,784	1,358,647	1,590,544	17.1%	1,985,260	47.0%
Solid Waste Generation	67,342	54,669	60,939	11.5%	71,525	30.8%
<b>TOTAL INVENTORY</b>	<b>3,024,066</b>	<b>2,617,540</b>	<b>3,004,212</b>	<b>14.3%</b>	<b>3,663,205</b>	<b>40.4%</b>

**Figure 2-7: Communitywide Business-As-Usual Emissions Forecast**



## MUNICIPAL FORECASTS

For projecting municipal emissions, it was assumed that emissions from municipal power generation, water transport, streetlights, and wastewater treatment will grow commensurate with the City’s service population (residents plus numbers employed locally), whereas other municipal operations sectors would grow in proportion to municipal employment trends. Municipal employment is anticipated to grow at a slower rate than the City population from 2010 to 2020 and 2035. **Table 4.4** provides a summary of emissions forecasts for the ten local government sectors. **Figure 2-8** shows how emissions from municipal operations are projected to increase by 2020 and 2035 using the BAU forecasts.

From 2010 onwards, total GHG emissions from municipal operations are expected to grow 10.8% by 2020, and 29.1% by 2035. Excluding emission from RPU electricity, GHG emissions from municipal operations are expected to grow 5.6% by 2020, and 15.3% by 2035. **Figure 2-9** shows municipal emissions forecasts that exclude the RPU-related emissions, to provide a clearer picture of how the other sectors influence the inventory and forecasts over time.

**Table 2.3 – Municipal Business-As-Usual Emissions Forecast**

SECTOR	2007 Baseline (MT CO <sub>2</sub> e/yr)	2010 Baseline (MT CO <sub>2</sub> e/yr)	2020 Forecast (MT CO <sub>2</sub> e/yr)	Growth Rate 2007-2020	2035 Forecast (MT CO <sub>2</sub> e/yr)	Growth Rate 2007-2035
Buildings and Facilities	12,734	10,939	11,065	1.2%	11,324	3.5%
Streetlights	13,523	10,155	11,320	11.5%	13,286	30.8%
Vehicle Fleet	7,700	8,402	8,499	1.2%	8,698	3.5%
Water Transport	29,167	19,471	21,704	11.5%	25,475	30.8%
External water transport	11,227	8,164	9,100	11.5%	10,681	30.8%
Wastewater	12,717	7,927	8,836	11.5%	10,371	30.8%
Employee Commute	7,413	10,045	10,161	1.2%	10,399	3.5%
Airport	304	293	296	1.2%	303	3.5%
Municipal Solid Waste	32,465	30,900	31,256	1.2%	31,988	3.5%
Municipal Power Gen	1,235,337	837,170	933,190	11.5%	1,095,295	30.8%
<b>TOTAL INVENTORY</b>	<b>1,362,587</b>	<b>943,466</b>	<b>1,045,427</b>	<b>10.8%</b>	<b>1,217,821</b>	<b>29.1%</b>
Excluding Power Gen	127,250	106,296	112,237	5.6%	122,525	15.3%

Figure 2-8: Municipal Business-As-Usual Emissions Forecast

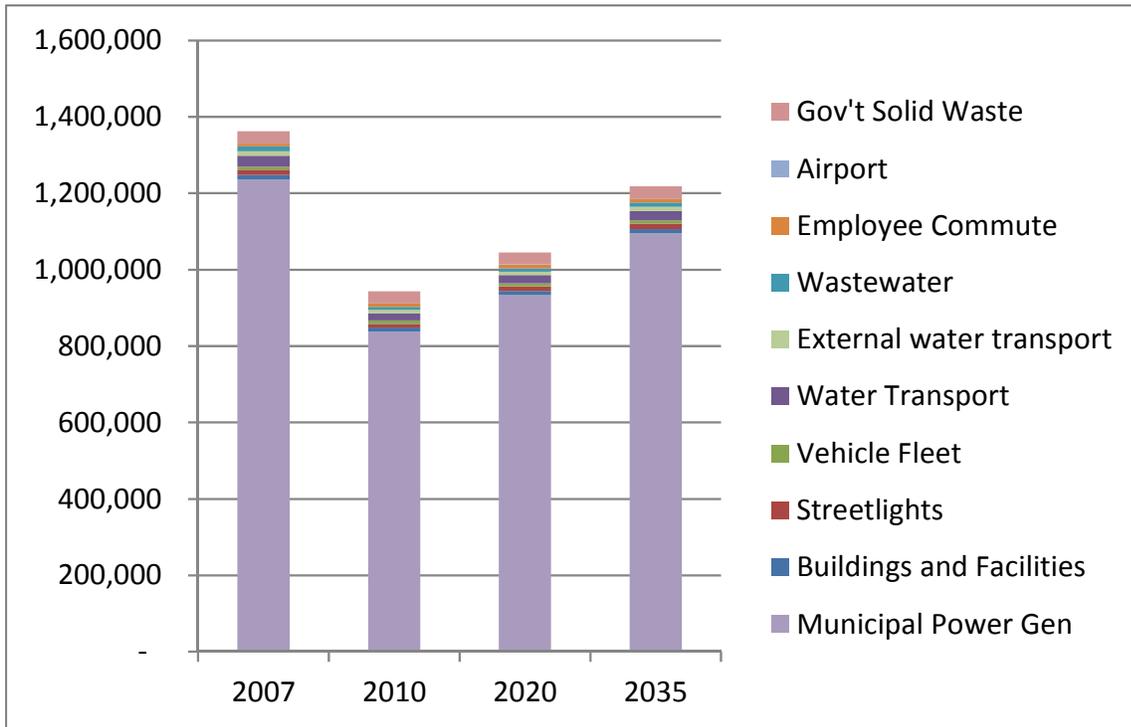


Figure 2-9: Municipal Business-As-Usual Emissions Forecast, Excluding RPU

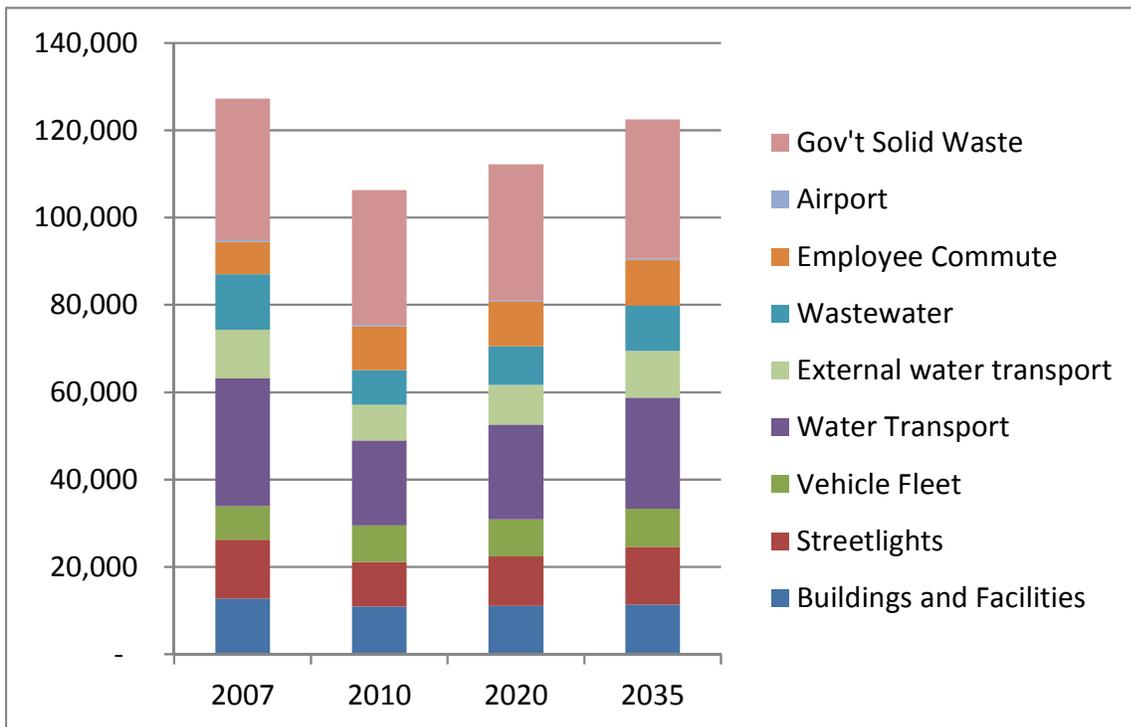
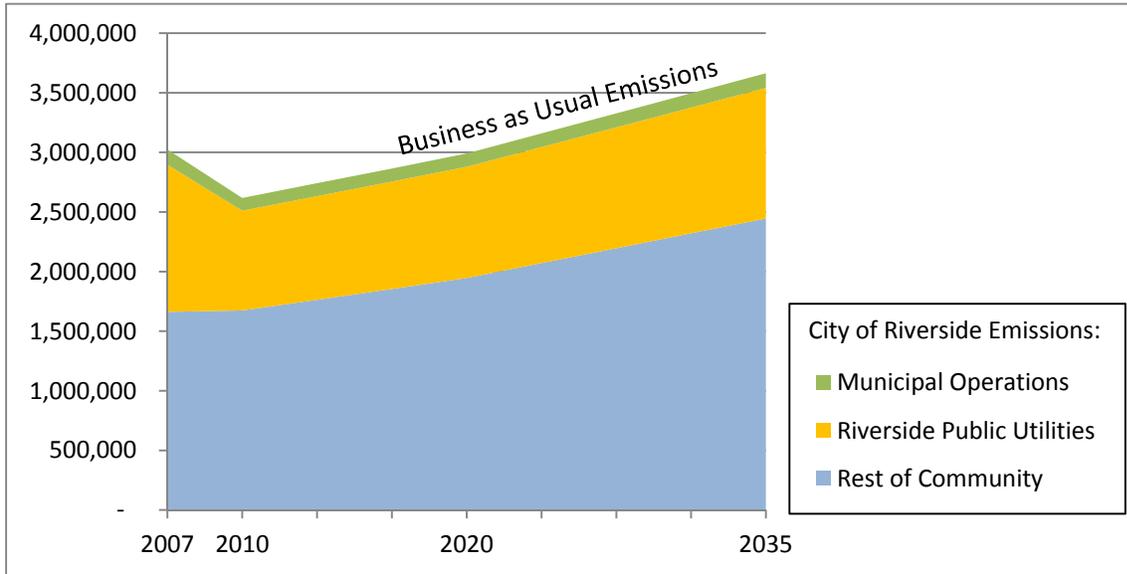


Figure 2-10 shows the contribution to overall emissions from municipal operations, from RPU electricity, and from the rest of the community, starting in 2007, continuing through 2010 and forecasted out to 2035 using business-as-usual assumption.

**Figure 2-10: City of Riverside GHG Emissions Forecast through 2035**  
(values in metric tons CO<sub>2</sub>e)



## EMISSIONS REDUCTION TARGETS

Through participation in the WRCOG Subregional CAP, the City of Riverside has adopted a 2020 community-wide emissions target of 2,224,908 MT CO<sub>2</sub>e, representing a 15 percent reduction from the City’s 2010 emissions inventory. A 15 percent reduction target is deemed by CARB and the California Attorney General to be consistent with the state-wide AB 32 goal of reducing emissions to 1990 levels,<sup>3</sup> and is in line with current best practice for climate action plans developed for numerous California cities. The Subregional CAP does not establish a reduction target for 2035 or future years; however the Subregional CAP identifies a reduction goal of 49 percent below baseline emissions levels to set the WRCOG subregion on a trajectory to meet targets identified in SB 375 and Executive Order (EO) S-3-05, recognizing that information, methodologies, and data availability may change between now and 2035.

<sup>3</sup> In its Climate Change Scoping Plan of September 2008, CARB recommends that local governments adopt a GHG reduction target consistent with the State’s commitment to reach 1990 levels by 2020. This is identified as equivalent to 15% below “current” levels at the time of writing (2008).

## COMMUNITY EMISSIONS

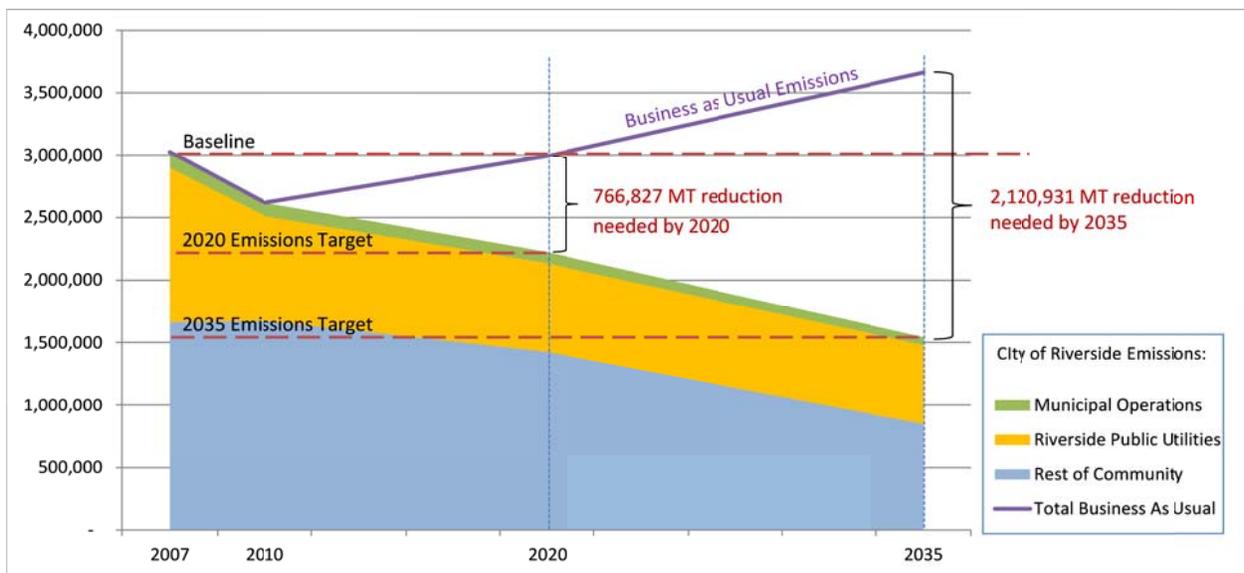
### 2020 Target

The City is committed to the 2020 target for City of Riverside in the WRCOG Subregional CAP. This Climate Action Plan will remain consistent with that target of 2,224,908 MT CO<sub>2</sub>e per year, which is 26.4% below the City’s 2007 baseline and 15% below 2010 emissions. This represents a reduction of 779,304 MT CO<sub>2</sub>e from the 2020 BAU forecast. The communitywide emissions reduction target for 2020 is depicted graphically in **Figure 2.11**, which depicts what community emissions would look like through the year 2035 if sufficient reductions were achieved at the same percentage across all sectors.

### 2035 Target

The Subregional CAP suggests a goal for 2035 equivalent to 49 percent below baseline emissions. This is derived from a straight-line interpolation of the state-wide AB 32 goal and Executive Order (EO) S-3-05, which aims for 80% below 1990 levels by 2050.<sup>4</sup> Using this approach, the City of Riverside is setting its 2035 GHG emissions goal to 49% below the 2007 baseline, which is equivalent to 1,542,274 MT CO<sub>2</sub>e per year. This represents a reduction of 2,120,931 MT CO<sub>2</sub>e from the 2035 BAU forecast. The community-wide emissions reduction target for 2035 is depicted graphically in **Figure 2-11**.

**Figure 2-11: City of Riverside GHG Reduction Targets for 2020 and 2035**  
(values in metric tons CO<sub>2</sub>e)



<sup>4</sup> 2035 is the midpoint between 2020 and 2050. The 49% reduction is equivalent to 40% below 1990 levels (an additional 40% below 1990 levels =  $0.6 \times (0.85 \times \text{baseline}) = 51\%$  of baseline, equivalent to a 49% reduction)

## MUNICIPAL OPERATIONS EMISSIONS

Though the City of Riverside municipal operations emissions are a subset of the emissions from the overall community, a reduction target for municipal operations is appropriate because many of the measures included in the Climate Action Plan apply to facilities or operations under the direct control of the City, and because the City will continue to lead by example in meeting the state's GHG emissions goals. The municipal emissions targets below do not include emissions from the RPU, since those emissions are included in the communitywide target, and they far outweigh emissions from other sources in the Municipal Inventory affected by the policies and operations of City departments that control those sources.<sup>5</sup>

### **2020 Target**

Applying the 15 percent reduction criteria to the City's 2007 baseline emissions from municipal operations (excluding RPU) results in a 2020 target of 108,163 MT CO<sub>2</sub>e, representing a reduction of 4,075 MT CO<sub>2</sub>e from the 2020 BAU forecast.

### **2035 Target**

Applying the 49 percent reduction criteria to the City's 2007 baseline emissions from municipal operations (excluding RPU) results in a 2035 target of 64,898 MT CO<sub>2</sub>e, representing a reduction of 57,628 MT CO<sub>2</sub>e from the 2020 BAU forecast.

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<sup>5</sup> Note: The Subregional Climate Action Plan does not set targets for municipal operations emissions.

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# CHAPTER 3

## REDUCTION MEASURES

The emissions forecasts described in Chapter 2 illustrate the need for the City to implement strategies to reduce greenhouse gas (GHG) emissions by 2020 and beyond. This chapter discusses how the City will achieve its 2020 and 2035 reduction targets, through anticipated reductions from State and Federal legislation, measures the City has committed to in the WRCOG Subregional Climate Action Plan (CAP), and additional local measures that the City will implement.

### PROCESS AND OVERVIEW

The RRG-CAP expands upon the efforts of the WRCOG Subregional CAP, employing local measures to help the City achieve its GHG reduction target for 2035. The process of developing the WRCOG Subregional CAP included ongoing coordination and information sharing among participating jurisdictions. The WRCOG Planning Directors' Technical Advisory Committee (PD TAC) served as the primary technical working group. The PD TAC met regularly over the course of three years to discuss the Subregional CAP and provide feedback. Perspectives from jurisdictions participating in the Subregional CAP and those in the subregion who had already prepared a local CAP were shared. In addition, WRCOG staff met individually with each participating jurisdiction to review emissions inventories, discuss potential emissions reduction measures and participation levels, and review the Draft Subregional CAP. Regular presentations were made to the WRCOG Public Works Committee, Technical Advisory Committee, and Executive Committee (all committees include representatives from the City of Riverside) to keep jurisdictional staff, management officials, and elected leaders informed.

To further develop local GHG reduction measures for the RRG-CAP, the City conducted a more detailed assessment of local strategies and actions related to the measures in the Subregional CAP, expanding the discussion and analysis with respect to implementation (for post-2020 in particular), costs and funding, performance metrics, and local co-benefits. Some new measures were added, many of which support the subregional measures. In addition, the discussions identify local economic opportunities

that represent points of integration with the forthcoming Riverside Restorative Growthprint Economic Prosperity Action Plan (RRG-EPAP), which will support local, regional, and global GHG reductions through local entrepreneurship and green enterprise zones.

## CEQA TIERING

As described in Chapter 1, the RRG-CAP provides a mechanism for streamlining the CEQA analysis of projects that are consistent with its assumptions and locally-implemented GHG reduction measures (CEQA Guidelines, Section 15183.5). The RRG-CAP includes GHG reduction measures that, when fully implemented, will exceed the 2020 emissions reduction target that is consistent with and supports the state-mandated reduction target embodied in AB 32. Through its participation in WRCOG's Subregional CAP, the City of Riverside is committed to reaching that 2020 target, and is already implementing all of the local measures that are critical to succeeding on that front.

The RRG-CAP also anticipates a post-2020 threshold for CEQA tiering, based on the reduction trajectory needed to meet the 2050 target established by the Governor's Executive Order S-3-05 (see Chapter 1). With a planning horizon of 2035, the RRG-CAP sets an interim GHG reduction target midway between the AB 32 target for 2020 and E.O. S-3-05 target for 2050. The 2035 target is also consistent with SB 375, which calls for a per-capita reduction in transportation-related emissions of 13% by 2035. Though planning for the year 2035 is necessarily subject to a wide range of uncertainties, the RRG-CAP lays out a path for achieving deep reductions in GHG emissions, to allow the City to continue using the RRG-CAP as a CEQA tiering document.

## COORDINATION WITH THE EPAP

The City recognizes that achieving the deep GHG reductions needed to reach its 2035 GHG reduction target will depend on market transformations that value clean energy and low-carbon solutions to meeting the everyday needs of its residents and businesses. The companion document to the RRG-CAP, the Riverside Restorative Growthprint - Economic Prosperity Action Plan (RRG-EPAP), is intended to accelerate market penetration of new technologies and service solutions that reduce energy demand, electrify vehicle fleets, and decarbonize electricity and fuel supplies. This directly supports state policy, as expressed by the AB 32 Scoping Plan and the Governor's Office of Planning and Research (OPR) *Environmental Goals and Policy Report*, which calls for commitments to support innovation and entrepreneurial business enterprises that can greatly reduce GHG emissions at the state and local levels. The RRG-EPAP represents a plan to steer investment and promote local entrepreneurial activity to achieve deep GHG reductions locally, but also to the development of technologies that can be exported to the rest of the state throughout the world to reduce GHG emissions globally.

# SUMMARY OF REDUCTIONS

## STATE AND FEDERAL REDUCTIONS

In addition to local measures that City of Riverside will implement within the city, significant emissions reductions are achieved through the efforts of federal, state, and regional programs. State and federal emissions reductions are primarily achieved through regulations, such as efficiency standards for passenger vehicles (e.g., Pavley I standards), reduction in carbon content of transportation fuels (e.g., the Low Carbon Fuel Standard), and minimum renewable energy supply requirements for utilities (e.g., the Renewables Portfolio Standard). Measures regulated and implemented by the state and federal government achieve reductions without additional action by the city. That is, even if vehicle miles traveled (VMT) within the city remain constant over time, resulting GHG emissions would decrease because as new vehicles are purchased, they would in general be more GHG-efficient than those they replace.

Some state and federal programs also require local action within communities. The California Green Building Standards Code (CALGreen) requires, at a minimum, that new buildings and renovations throughout California meet certain design standards. New residential and commercial buildings must meet certain baseline efficiency and sustainability standards. Additional voluntary building code provisions, known as Tier 1 and Tier 2 requirements, can be adopted locally, providing even greater energy savings and emissions reductions.

The Water Conservation Act of 2009, known as SB X7-7, requires the State to reduce urban per capita water use 20% by 2020. Regional Urban Water Management Plans provide strategies and create incentives to achieve these targets, but regional and local implementation strategies vary, and consumer participation is necessary to realize water use reductions. Local implementation strategies typically include tiered pricing or water budget-based (i.e., pricing water according to the amount consumed); water-efficient landscape requirements for water and irrigation management, planting location, and plant materials; and incentives where a regional or local utility pays for turf grass removal and replacement with efficiently-irrigated landscaping.

## REGIONAL REDUCTIONS

Regional programs are those developed or administered at a level of government above the local jurisdiction but below the state. These programs often are more responsive to local context than statewide programs. They require local participation but do not require local administration to achieve GHG reductions.

The WRCOG HERO Program, described in Chapter 1, is a regionally-administered program that offers financing options for home and business owners to retrofit or install energy-efficient, water conservation, and/or renewable energy generating products. This program is voluntary and therefore also up to individuals to implement, but regional

administration lowers the burden to local governments and has already led to demonstrable reductions in the subregion since the HERO Program's inception in 2011.

WRCOG also administers the TUMF Program. The TUMF Program establishes a funding source to mitigate the cumulative regional transportation impacts of new development on regional arterials. TUMF fees are collected locally, and WRCOG works with its member agencies to identify priority projects to fund using fee revenues in order to reduce subregional transportation impacts caused by development. Facilitating movement on roads, by encouraging non-motorized transportation, increasing access to transit, or easing congestion on critical roadways may lead to GHG reductions. Therefore, TUMF can fund projects that meet this objective. Because the project relies on locally-collected fees, available funding depends on the economic vitality and development opportunities in the region.

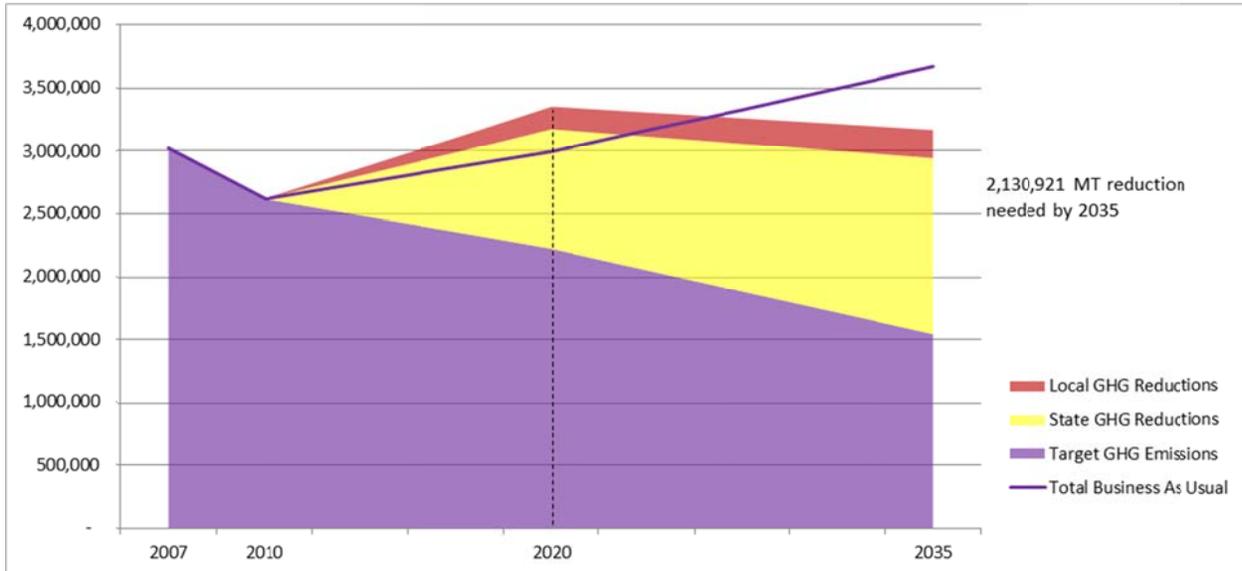
A number of other transportation-related programs and projects under the primary control of the Riverside Transit Agency (RTA), Riverside County Transportation Commission (RCTC), California Department of Transportation (Caltrans), and other transportation entities are being implemented to reduce GHG emissions. The long-term planning of major transportation infrastructure is not under the City of Riverside's direct control; however, the City participates in transportation planning decisions in a way that benefits the subregion. The City of Riverside is in direct control of land uses, which can dictate how future transit is shaped. Individuals also play an important role in how they choose to move throughout the subregion; therefore, while the City does not implement these programs, local input is critical to their success. Additional projects anticipated to reduce the City's GHG emissions include California High Speed Rail, Metrolink expansion, express lanes, congestion pricing, goods movement measures, high frequency transit service, and electric vehicle infrastructure implementation.

Federal, state and regional measures in the RRG CAP are organized into four major sectors, similar to the emissions inventory:

- Energy – including electricity and natural gas consumption
- Transportation and Land Use
- Water
- Solid Waste

Through federal, state, and regional measures implemented at the subregional level, the City of Riverside anticipates reductions of 949,571 MTCO<sub>2e</sub> and 1,398,918 MTCO<sub>2e</sub> from the City's 2020 and 2035 BAU emissions forecasts, respectively, as illustrated in **Figure 3-1**.

**Figure 3-1: City of Riverside GHG Reductions Achieved through State, Regional, and Local Measures**



## LOCAL REDUCTIONS

While federal, state, and regional measures are critical to meet emission reduction goals, local government programs and policies, as well as choices made by the City’s local residents and business owners, will determine the City’s ability to achieve the overall emissions reduction targets for 2020 and 2035. Through outreach campaigns, incentives, zoning changes, ordinances, and changes in local government operations, the City will achieve the additional local reductions identified in the RRG-CAP.

Local reduction measures in the RRG-CAP are organized into four major sectors, similar to the emissions inventory:

- Energy – including electricity and natural gas consumption
- Transportation and Land Use
- Water
- Solid Waste

Through locally-implemented measures, the City of Riverside anticipates reductions of 156,439 MTCO<sub>2</sub>e and 235,273 MTCO<sub>2</sub>e from the City’s 2020 and 2035 BAU emissions forecasts, respectively, as illustrated in **Figure 3-1**. This is more than enough to reach the City’s 2020 target, but falls short of the 2035 target by approximately 486,700 MTCO<sub>2</sub>e.

## MEASURE DESCRIPTION AND ANALYSIS

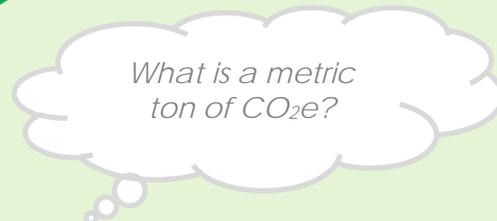
Individual measures were evaluated to identify the greatest opportunities for GHG reduction that can be achieved with minimum cost. For each measure included in the RRG-CAP, a general description is provided, along with a timeframe and specific actions that the City is taking (or intends to take) to implement the measure.

For those measures included in the WRCOG Subregional CAP, the City of Riverside's participation level is referenced (e.g., Silver, Gold, or Platinum), and the 2020 annual GHG reduction estimates in the RRG-CAP are consistent with those in the Subregional CAP.

Estimates of the 2035 reductions for each measure are an added component of the RRG-CAP. Recognizing that the RRG-EPAP is an essential component of achieving the deep reductions needed to reach the 2035 emissions target, the description of each local measure assesses its synergy with the RRG-EPAP, and provides a general discussion of how implementation can boost local economic activity.

Each local measure was evaluated using the following criteria:

- GHG Reduction Potential (MT CO<sub>2</sub>e/year): This is quantified for each measure in terms of metric tons of carbon dioxide equivalents achieved annually by the target year.
- Synergy with RRG-EPAP (high, medium, low): Assessment of the opportunities linked to clean technologies, new business concepts and infrastructure project that hold the most promise for entrepreneurship in Riverside.
- Relative Cost Effectiveness (high, medium, low): Assesses the potential GHG reduction versus the relative upfront costs to the City and ongoing staff resources needed for implementation. Also, whether the measure represents a good use of public funds.
- Ease of Implementation (high, medium, low): Considers consistency with other City planning efforts and ease of implementation with respect to current City operating patterns/paradigms; whether the



GHG emissions are reported as metric tons (MT) of CO<sub>2</sub>e. Emitting 1 MT CO<sub>2</sub>e is equal to the following:

- 102 gallons of gasoline
- 41 propane cylinders used for home barbecues
- One month's worth of energy used in a house

In contrast, reducing 1 MT CO<sub>2</sub>e would require:

- Growing 25 tree seedlings for 10 years
- Recycling 600 pounds of waste instead of throwing it away

Note: Equivalencies are approximate and are adapted from:  
<http://www.epa.gov/cleanenergy/energy-resources/calculator.html>

measures can be incorporated into the way the City and the private sector does business without major negative impacts; whether there are technological, regulatory and/or legal and regulatory barriers to implementation.

## GHG REDUCTIONS

The GHG reduction potential of each measure is quantified based on the assumption that past trends will continue into the future (e.g., energy consumption, VMT) and standard methods and assumptions recommended by the State (e.g., CAPCOA 2010). For voluntary programs, the level of participation anticipated was developed using case studies and evidence of success with similar programs.

## PROGRESS METRICS

For locally implemented measures in particular, monitoring emissions and reporting reductions will be necessary to validate the success of the measures or to identify measures that are not achieving anticipated reductions. Metrics for monitoring progress are provided for individual measures, although periodic re-inventorying of local government and community-wide emissions will be needed to validate progress.



## LOCAL ECONOMY AND OTHER COMMUNITY BENEFITS

CAP measures often have benefits that go beyond reducing GHG emissions. The Riverside CAP is designed to integrate with the RRG-EPAP, which will help entrepreneurs and investors bring innovative GHG-reducing products, services, and technologies to market that will benefit the City, the region, and the world at large. For CAP measures that support the EPAP, a discussion is provided on how the measure offers opportunity to local businesses and entrepreneurs and investors.

Many measures offer financial co-benefits such as providing development and retrofitting incentives, or reducing energy use and lowering utility bills; others improve public health by encouraging walking and biking or reducing air pollution. Some measures preserve natural resources by consuming and wasting less; while others increase mobility through alternative transportation measures. The following icons are used to identify co-benefits that the City can achieve by implementing local GHG reduction measures.



Energy



Health



Economy



Resources



Mobility

## STATE AND REGIONAL MEASURES

**Table 3.2** lists the state and regional measures included in the Subregional CAP and provides a breakdown of the GHG reduction potential for these measures, for the City of Riverside and for the WRCOG subregion.

**Table 3.2 – 2020 and 2035 Reductions from State and Regional Measures**

State and Regional Measures by Sector		2020 WRCOG (MT CO <sub>2</sub> e/yr)	2020 Riverside (MT CO <sub>2</sub> e/yr)	2035 Riverside (MT CO <sub>2</sub> e/yr)
SR-1	Renewables Portfolio Standard	479,211	363,096	372,020
SR-2	2013 California Building Energy Efficiency Standards (Title 24, Part 6)	44,926	19,156	62,927
SR-3	HERO Residential Program	79,335	38,681	64,964
SR-4	HERO Commercial Program	12,333	6,618	86,276
<b><i>Energy Subtotal</i></b>		<b><i>603,472</i></b>	<b><i>427,551</i></b>	<b><i>586,187</i></b>
SR-6	Pavley & Low Carbon Fuel Standard	1,095,555	429,447	694,841
SR-7	Metrolink Expansions	23,074	9,045	11,289
SR-8	Express Lanes	60,864	23,858	29,779
SR-9	Congestion Pricing	3,246	1,272	1,588
SR-10	Telecommuting	40,576	15,905	19,853
SR-11	Goods Movement	22,688	8,893	10,811
SR-12	Electric Vehicle Plan and Infrastructure	81,152	31,811	39,705
<b><i>Transportation Subtotal</i></b>		<b><i>1,327,155</i></b>	<b><i>520,231</i></b>	<b><i>807,866</i></b>
SR-13	Construction and Demolition Waste Diversion	3,574	1,789	4,865
<b><i>Solid Waste Subtotal</i></b>		<b><i>3,574</i></b>	<b><i>1,789</i></b>	<b><i>4,865</i></b>
<b>TOTAL REDUCTIONS from State and Regional Measures</b>		<b>1,934,201</b>	<b>949,571</b>	<b>1,398,918</b>

**Note:** Total may not add up due to rounding.

## STATE AND REGIONAL ENERGY MEASURES

The following are state and regional measures that are expected to reduce GHG emissions associated with the energy sector.



### Measure SR-1: Renewables Portfolio Standard

*Utilities must secure 33% of their power from renewable sources by 2020.*

**2020 GHG Reduction Potential: 363,096 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 372,020 MT CO<sub>2</sub>e/yr**

Through a series of increasingly stringent bills first enacted in 2002, California has placed requirements on electric utilities to procure a portion of their energy from renewable sources. The standard, known as the Renewables Portfolio Standard (RPS), applies to investor-owned utilities, publicly-owned utilities, electricity service providers, and community choice aggregators. Therefore, Riverside Public Utilities (RPU) must meet these targets:

- 20% of retail sales from renewables by 2013
- 25% of retail sales from renewables by 2016
- 33% of retail sales from renewables by 2020
- 40% of retail sales from renewables by 2035<sup>1</sup>

RPU exceeded the 2013 target, achieving 23% of retail sales by qualifying renewables, and is well on its way to meeting these targets. Prior to 2007, RPU began positioning itself to achieve significant reductions in GHG emissions associated with its electricity portfolio by shifting its resource mix from carbon intensive sources to renewable sources. In 2003, RPU was one of the first electric utilities in California to voluntarily procure renewable resources (the Salton Sea geothermal resource in Imperial Valley and the Wintec wind resource in Palm Springs) to meet a portion of Riverside's electric power needs. This commitment accelerated in 2005 when RPU amended its contract with Salton Sea geothermal resource to more than double its procurement of renewable energy. To further its commitment to clean power, RPU terminated its power purchase agreement with Deseret Generation and Transmission Cooperative

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<sup>1</sup> There is currently no RPS requirement for a percentage increase beyond the 2020 target.

for Hunter and Bonanza coal generating plants in Utah at the end of 2009. These changes in the City's electricity portfolio, which occurred primarily in the 2009-2010 timeframe, led to a reduction in communitywide emissions of more than 13% from 2007 to 2010, and additional reductions through the year 2012. While not mandated at this time, the City intends to continue to reduce its carbon portfolio beyond 2020 to include 40% renewables by 2035.



## Local Economic Opportunities

The RPS is generating business opportunity by ensuring a growing market for low-carbon energy. Qualifying renewable energy sources applicable to Riverside include solar thermal electric, photovoltaics, wind, biomass, geothermal electric, municipal solid waste, energy storage, anaerobic digestion, small hydroelectric, biodiesel, and fuel cells using renewable fuels.

A local opportunity for RPU includes arranging power purchase agreements (PPA) and financing photovoltaics (PV) on private property. A PPA is a financial arrangement in which a third-party developer (i.e., RPU) owns, operates, and maintains the PV system, and a host customer (i.e., local property owner) agrees to site the system on its roof or elsewhere on its property and purchases the system's electric output from the solar services provider for a predetermined period. This financial arrangement allows the host customer to receive stable, and sometimes lower cost electricity, while the solar services provider acquires valuable financial benefits such as tax credits and income generated from the sale of electricity to the host customer. PPA arrangements enable the host customer to avoid the high up-front capital costs; system performance risk; and complex design and permitting processes and can be cash flow positive from the day the system is commissioned.

Local renewables research and development opportunities exist in partnership with the University of California Riverside (UCR). UCR has a recently adopted mandate to achieve carbon neutrality by 2025, which poses an even greater need for utilizing renewables for its energy needs.

## Other Community Co-Benefits





## Measure SR-2: 2013 California Building Energy Efficiency Standards (Title 24, Part 6)

*Mandatory energy efficiency standards for buildings.*

**2020 GHG Reduction Potential: 19,156 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 62,927 MT CO<sub>2</sub>e/yr**

Building energy efficiency standards are designed to ensure new and existing buildings achieve energy efficiency and preserve outdoor and indoor environmental quality. The 2013 California Building Energy Efficiency Standards (Title 24, Part 6) are listed in the California Code of Regulations. These standards began in 1978 and are updated every 5 years. The 2013 standards differ from the 2008 standards by requiring usage of less energy for lighting, heating, cooling, ventilation, and water heating. Buildings are also required to be solar-ready, allowing for easier and less expensive installation of photovoltaic or solar thermal panels in the future. The California Energy Commission estimates that the 2013 standards will result in residential construction that is 25% more efficient and nonresidential construction that is 30% more efficient than the 2008 standards. The new standards went into effect on July 1, 2014.

The California Energy Efficiency Strategic Plan (CEESP), published in 2008, established a goal that all new residential buildings will be zero net energy (ZNE) by 2020, and all new commercial buildings will be ZNE by 2030. Renewable energy is likely to play a major part in meeting that those goals, but Title 24 will continue to impose more rigorous energy efficiency requirements over time. Measure SR-2 conservatively assumes that Title 24 will require a 30% improvement in energy efficiency over the current (2013) standard by 2035; it does not account for the renewable energy contribution toward ZNE, as that is accounted for by other RRG-CAP measures. Note that the state has not yet established the rules or defined how renewable energy sources are accounted for in determining ZNE status of a building or a set of buildings.



### Local Economic Opportunities

Requirements for more energy efficiency buildings creates business opportunities for new or existing contractors specializing in green building practices related to energy efficiency. Additional opportunities may exist for local businesses that specialize in energy efficient lighting, heating, cooling, ventilation, and water heating solutions and/or equipment.

## Other Community Co-Benefits





## Measure SR-3: HERO Residential Program

*Financing for homeowners to make energy efficient, renewable energy, and water conservation improvements.*

**2020 GHG Reduction Potential: 38,681 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 64,964 MT CO<sub>2</sub>e/yr**

The HERO Program is a public-private partnership administered by WRCOG, offering financing to homeowners in the subregion for the installation of energy efficient, renewable energy, and water conservation improvements. This property assessed clean energy (PACE) financing program offers a continually expanding list of eligible products for financing and an ever-growing cadre of trained contractors who can assist property owners with selecting and installing eligible products. The HERO program is helping Riverside Public Utilities (RPU) meet its obligation under California's Assembly Bill 2021, which requires public energy utilities (including RPU) to reduce energy use by its customers by 10% over 10 years (to 2020). It also supports RPU's commitment to expanding solar installations in the City as an administrator of Senate Bill 1 (SB 1) that funds Governor Schwarzenegger's Million Solar Roofs initiative, with statewide goals to install 3,000 megawatts of solar energy systems, and establish solar energy systems as a viable mainstream option for residential buildings.

Products eligible for HERO Financing include, but are not limited to:

- Energy audits
- Insulation of attics, floors, walls, and home perimeter
- Lighting upgrades
- Drip and weather-based irrigation systems
- Rainwater catchment systems
- Pool pumps and heaters
- Energy-efficient windows
- Solar PV panels
- Air sealing and weatherization
- Cool roof system
- Cool wall coatings

This award-winning program is offered to eligible home owners in the City of Riverside who wish to participate.

WRCOG's Residential Program partner, Renovate America, collects data regarding participation, energy savings, renewable energy installation, job creation, and

economic development by jurisdiction in the subregion. Since program inception in 2011, more than 3,400 Riverside homeowners have been approved to fund over \$123 million in eligible renewable energy, energy efficiency and water efficiency projects. Nearly 2,000 projects, totaling approximately \$33 million, have been completed for Riverside homeowners through the WRCOG HERO Program.

WRCOG will continue to partner with Renovate America to track ongoing participation and energy savings on a monthly and annual basis. Emissions reduction estimates for this CAP were calculated based on program participation assumptions developed by Renovate America. Since its inception in 2011, the HERO program has funded more than \$175 million worth of eligible projects, and created more than 1,300 jobs. The program’s growth has led to energy savings, GHG reductions, water conservation, and local job creation in each of its participating communities. The HERO program has also been an award-winning model for other PACE programs, earning recognition from various industry organizations including the Southern California Association of Governments, the U.S. Green Building Council, the Urban Land Institute, and the Governor of California.



### Local Economic Opportunities

The HERO Program provides business opportunities to Riverside contractors. As of July 2014, 230 contractors in the City of Riverside were registered with the HERO Program and eligible to install solar, HVAC, windows and doors, roofing, water and other projects to HERO customers. The products installed have saved local residential customers over \$1.8 million. Since its inception in 2011, the HERO Program has created 359 local jobs in the City of Riverside resulting in over a \$73 million economic impact to the community including indirect, direct and induced economic benefit.

Local research and development opportunities exist to develop and add to the more than 900,000 home energy, water efficient, and renewable energy systems products eligible for HERO financing.

### Other Community Co-Benefits





## Measure SR-4: HERO Commercial Program

*Financing for business owners to make energy efficient, renewable energy, and water conservation improvements.*

**2020 GHG Reduction Potential: 6,618 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 86,276 MT CO<sub>2</sub>e/yr**

The HERO Program is a public-private partnership administered by WRCOG, offering financing to business owners in the subregion for the installation of energy efficient, renewable energy, and water conservation improvements. This PACE financing program offers a continually expanding list of eligible products for financing and an ever-growing cadre of trained contractors who can assist property owners with selecting and installing eligible products. The HERO program is helping Riverside Public Utilities (RPU) meet its obligation under California's Assembly Bill 2021, which requires public energy utilities (including RPU) to reduce energy use by its customers by 10% over 10 years (to 2020). It also supports RPU's commitment to expanding solar installations in the City as an administrator of Senate Bill 1 (SB 1) that funds Governor Schwarzenegger's Million Solar Roofs initiative, with a statewide goal to install 3,000 megawatts of solar energy systems, and establish solar energy systems as a viable mainstream option for commercial buildings.

Products eligible for HERO Financing include, but are not limited to:

- Energy audits
- Insulation of attics, floors, walls, and home perimeter
- Lighting upgrades
- Drip and weather-based irrigation systems
- Rainwater catchment systems
- Pool pumps and heaters
- Energy-efficient windows
- Solar PV panels
- Air sealing and weatherization
- Cool roof system
- Cool wall coatings

This award-winning program is offered to eligible property owners in the WRCOG subregion who wish to participate.

WRCOG's Commercial Program partner, Samas Capital, collects data regarding participation, energy savings, renewable energy installation, job creation, and economic development by jurisdiction in the subregion.



## Local Economic Opportunities

The HERO Program provides business opportunity to local Riverside contractors. As of July 2014, 230 contractors in the City of Riverside were registered with the HERO Program and eligible to install solar, HVAC, windows and doors, roofing, water and other projects to HERO customers.

Local research and development opportunities exist to develop and add to the more than 900,000 home energy, water efficient, and renewable energy systems products eligible for HERO financing.

## Other Community Co-Benefits



## STATE AND REGIONAL TRANSPORTATION MEASURES

The following are state and regional measures that are expected to reduce GHG emissions associated with the transportation sector.



### Measure SR-6: Pavley and Low Carbon Fuel Standard

*Requirements for vehicles to use cleaner fuels.*

**2020 GHG Reduction Potential: 429,447 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 694,841 MT CO<sub>2</sub>e/yr**

In 2002, California adopted AB 1493, referred to as “Pavley I”, which directed CARB to develop fuel-efficiency standards for passenger vehicles in California by 2005. Through a series of rulings, CARB and the federal government agreed on federal standards that began in 2009 and increase through 2016. CARB and the federal government are currently finalizing fuel-efficiency standards that continue to become increasingly-stringent from 2017 through 2025. Building from Pavley 1, Executive Order S-1-07, known as the Low Carbon Fuel Standard (LCFS), requires the carbon-intensity of California’s transportation fuel to be reduced by at least 10% by 2020.



### Local Economic Opportunities

The opportunities created by this measure occur in the development of new technology for vehicles and fueling facilities. Meeting the LCFS and Pavley goals will require the testing and deployment technologies such as improved batteries for electric cars, more efficient gasoline engines, and fuel cells. These vehicles will also require charging stations or fueling stations. The research facilities at UCR can participate in the development and testing of these technologies. Additionally, entrepreneurs wanting to research and develop components associated with these technologies will likely want to locate near UCR to take advantage of their faculty and student body, leading to synergies between the research and implementation. There is the potential to create a clean-tech hub proximate to UCR to facilitate further progress in the area.

### Other Community Co-Benefits





## Measure SR-7: Metrolink Expansion

*Additional Metrolink transit service provided to Western Riverside County.*

**2020 GHG Reduction Potential: 9,045 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 11,289 MT CO<sub>2</sub>e/yr**

Identified in SCAG's 2012 RTP/SCS, the Metrolink Perris Valley Line will be extended from Riverside to Perris in Western Riverside County, allowing for alternative transportation, reducing VMT and GHG emissions in Western Riverside County. Service along this route is expected to begin in 2015.

The Perris Valley Line is anticipated to have four stations, with the first station to be located near Columbia Avenue within the Hunter Park industrial area in the northern portion of the City of Riverside. According to the Riverside County Transportation Commission (RCTC), this station location would provide access to the Hunter Park, Highgrove, and Grand Terrace areas. Additionally, the Hunter Park area is home to the UC Riverside College of Engineering, Center for Environmental Research and Technology (CE-CERT).



### Local Economic Opportunities

Local economic opportunities associated with this measure include development or redevelopment opportunities associated with the Metrolink station. The current land uses around the station are primarily commercial and light industrial. Rail stations can be catalysts for higher density development such as higher density office. Occupants of these projects often tend to prioritize access to transit stations when deciding on locations. Another opportunity is related to the marketing of future development projects or businesses such as CE-CERT. Proximity to the train station could be used to attract businesses with younger workers, who may prefer to commute via transit instead of driving. Marketing collateral for buildings that are adjacent to transit stations tends to promote the proximity as a selling point for buyers and renters.

### Other Community Co-Benefits





## Measure SR-8: Express Lanes

*Additional express lanes added along major freeways in Western Riverside County.*

**2020 GHG Reduction Potential: 23,858 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 29,779 MT CO<sub>2</sub>e/yr**

SCAG's analysis of critical corridors found inter-county trips account for over 50% of all trips. Ongoing congestion issues—and therefore increased idle time and GHG emissions—have led to SCAG proposing increasing the network of express lanes that connect counties, including Riverside County. Extension of express lanes along State Route-91 (SR-91) and Interstate-15 (I-15) would be operational by 2017 and 2020 respectively, and would lead to reduced congestion according to regional transportation modeling. The SR-91 extension project is currently under construction. The I-15 Toll Express Lanes from State Route-60 (SR-60) to Cajalco Road has entered the preliminary engineering phase, and the anticipated opening year is 2020.

The primary effect of these express lanes would be to reduce the travel time to the City of Riverside along the SR-91, which may make areas within the City more attractive for those currently commuting via the SR-91 to Orange and Los Angeles Counties. These express lanes may also reduce the travel time for those commuting into the City of Riverside from areas west of the City such as Corona and locations in Orange County.



### Local Economic Opportunities

The primary local economic benefit of the express lanes would be as an incentive for additional development in Riverside, particularly along SR-91 because of a reduction in travel time between work and housing locations. The City could look for opportunities to intensify development/redevelopment along the SR-91 Corridor to accommodate additional housing and employment locations. These express lanes could also be used to market specific sites which are adjacent to the freeway because of this reduced travel time.

### Other Community Co-Benefits





## Measure SR-9: Congestion Pricing

*Expansion of the toll lanes along the SR-91.*

**2020 GHG Reduction Potential: 1,272 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 1,588 MT CO<sub>2</sub>e/yr**

Transportation demand management (TDM) consists of methods used to encourage transportation other than single-occupancy vehicle travel at peak traffic times. TDM strategies are generally categorized as “soft” or “hard” strategies. Soft mechanisms are incentive-based and include measures like preferential parking for carpoolers, while hard mechanisms are associated with pricing or an enforceable policy or ordinance.

Congestion pricing is a hard TDM strategy examined by SCAG through its Express Travel Choices Study. Pricing mechanisms may include toll lanes/roads or mileage-based user fees, which discourage automobile traveling by increasing travel costs. Currently an expansion of the toll lanes on SR-91 is planned to continue these toll lanes through Corona and into Riverside.

The effectiveness of congestion pricing reflects the regional share of VMT reduction associated with this strategy, in addition to local actions. This approach accounts for the high degree of out-commuting that currently occurs in Western Riverside County as residents travel to jobs in Los Angeles, San Bernardino, and Orange Counties.

This measure would have limited application to the City of Riverside given the regional nature of its effectiveness.



### Local Economic Opportunities

There are no specific economic opportunities associated with this measure given its regional application.

### Other Community Co-Benefits





## Measure SR-10: Telecommuting

*Work arrangement in which employees do not commute to a central place of work.*

**2020 GHG Reduction Potential: 15,905 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 19,853 MT CO<sub>2</sub>e/yr**

Telecommuting is a soft TDM mechanism that has increased considerably over the past decade. According to SCAG, telecommuting could increase even more by 2020 (to 5% of workers in the region) and 2035 (to 10% of workers), from the current 2.6% that currently telecommute. By telecommuting, GHG emissions associated with vehicles no longer on the road are reduced, as are idling or congestion-related emissions from vehicles remaining on the road. Similar to Measure SR-9: Congestion Pricing, this strategy reflects the regional share of TDM strategies that may be implemented on a regional level given the high degree of out-commuting that occurs in Western Riverside County.

Telecommuting would be applicable to the City of Riverside, particularly for large employers such as UC Riverside, AT&T and The Press Enterprise. The City could encourage telecommuting by providing informational material to large employers, describing the advantages of telecommuting.

Additional TDM strategies implemented by local employers are accounted for in the RRG-CAP local measures.



### Local Economic Opportunities

There are two main opportunities presented by telecommuting as it relates to the City of Riverside. First, major regional employers may consider if there are opportunities to set up satellite offices or locations where workers can telecommute in a collaborative environment. These facilities would be similar to executive suite office buildings, of which there are several already in the City of Riverside. Second, the City may want to expand the coverage of any publicly provided wireless internet system (Wi Fi or equivalent), given that a significant percentage of telecommuting occurs spontaneously in café's, coffee shops, and public gathering places. For example, the City could provide high quality internet access in the downtown, where people already gather. These people may then choose to patronize adjacent shops and restaurants during their time.

### Other Community Co-Benefits





## Measure SR-11: Goods Movement

*Efficient movement of goods through inland Southern California.*

**2020 GHG Reduction Potential: 8,893 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 10,811 MT CO<sub>2</sub>e/yr**

Southern California is a major hub for importing and exporting goods. SCAG estimates that over \$2 trillion in cargo was moved across the region in 2010 alone, much of which travels through inland Southern California, including Western Riverside County. However, the many warehouses and distribution facilities employ non-passenger vehicles that contribute to GHG emissions. At the state level, more standards are being implemented to increase vehicle efficiencies and the 2012 RTP/SCS and AQMD are supporting greater penetration of low-emission trucks in the region. While goods will continue to be moved to support local and regional economies, electrification and other low-emission technologies installed in vehicles can reduce the GHG emissions of goods movement. The GHG reductions estimated here account for the region's "share" of SCAG and AQMD's anticipated investments and the effect of the investment on GHG emissions. These investments include both policies as well as physical improvements such as "truck climbing" lanes on State Route-60 (SR-60), funded by RCTC.



### Local Economic Opportunities

A primary local economic opportunity of efficient goods movement is the research and development of new technologies which would reduce GHG emissions from freight vehicles. This research could be conducted by entrepreneurs in conjunction with faculty and staff at UC Riverside at facilities such as CE-CERT. This topic, along with innovative vehicle and fuel technologies identified in SR-6 and SR-12, could be facilitated by encouraging businesses to locate in areas proximate to CE-CERT by providing various incentives.

### Other Community Co-Benefits





## Measure SR-12: Electric Vehicle Plan and Infrastructure

*Facilitate electric vehicle use by providing necessary infrastructure.*

**2020 GHG Reduction Potential: 31,811 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 39,705 MT CO<sub>2</sub>e/yr**

SCAG has developed a regional plug-in electric vehicle (PEV) readiness plan, and WRCOG has a similar subregional plan for PEV readiness. Together, these plans identify viable locations for charging stations, changes to development codes, and other strategies to encourage the purchase and use of electric vehicles. PEV chargers are already being installed in the WRCOG subregion. Through these plans and outreach efforts, alternative-fuel vehicles will be promoted as one strategy to reduce GHG emissions associated with passenger vehicles. This measure is anticipated to reduce nearly 82,000 MT CO<sub>2</sub>e in participating jurisdictions by 2020.

For the City of Riverside, this measure would be implemented by providing both public and private charging facilities and also by updating development codes to encourage or facilitate charging stations.



### Local Economic Opportunities

Similar to other regional measures, UC Riverside could be a focus for research into new vehicle and fuel technologies, as discussed in SR-6 and SR-11. In addition, the need to install charging facilities at locations throughout the City will create a demand for service businesses and persons with the requisite skills. There may be benefit to developing facilities for training persons in the installation and maintenance of these charging stations (similar to training facilities for solar installation).

### Other Community Benefits



## STATE SOLID WASTE MEASURES

The following state measure is expected to reduce GHG emissions associated with the solid waste sector.



### Measure SR-13: Construction & Demolition Waste Diversion

*Meet mandatory requirement to divert 50% of C&D waste from landfills by 2020 and exceed requirement by diverting 75% of C&D waste from landfills by 2035.*

**2020 GHG Reduction Potential: 1,789 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 4,865 MT CO<sub>2</sub>e/yr**

Recycling construction and demolition materials reduces GHG emissions by removing material from landfills that would otherwise generate methane. Construction and demolition (C&D) debris can include lumber, drywall, metals, masonry, carpet, plastic, and other materials. Buildings that are deconstructed, as opposed to demolished, are carefully disassembled and component parts are recycled or locally repurposed and reused. C&D waste recycling is a component of green building construction as it reduces the need to harvest and transport new raw construction materials in addition to reducing landfill methane emissions from the decomposition of organic components.

Effective July 1, 2014, CALGreen, the state's Green Building Standards Code, requires jurisdictions to divert a minimum of 50% of their nonhazardous C&D waste from landfills. Reductions for the year 2020 assume that 100% of new construction and applicable retrofit projects meet the minimum diversion rates established by the State. For 2035, this measure assumes that C&D waste diversion would increase to 90% for new construction and retrofit projects. This increase is in line with GAP Goal 6.A which aims to develop measures to encourage that a minimum of 90% of recoverable waste from all construction sites be recycled throughout Riverside by 2015, beginning with 40% in 2010 and increasing by 10% each year thereafter.



### Local Economic Opportunities

Increased C&D waste diversion presents opportunities and resources for local businesses that specialize in materials reuse and upcycling. In addition, increased diversion targets would create additional business for new or existing contractors specializing in building deconstruction and other green building practices related to waste management.

## Other Community Co-Benefits



## LOCAL REDUCTION MEASURES

Table 3.3 lists the Subregional CAP measures and local measures, providing a breakdown of the GHG reduction potential for each measure.

**Table 3.3: 2020 and 2035 Reductions from Local Measures**

Local Measures by Sector		2020 Reductions (MT CO <sub>2</sub> e/yr)	2035 Reductions (MT CO <sub>2</sub> e/yr)
E-1	Traffic and Street Lights	549	4,153
E-2	Shade Trees	96	841
E-3	Local Utility Programs – Electricity	32,197	43,491
E-4	Renewable Energy Production on Public Property	Supporting	Supporting
E-5	UC Riverside Carbon Neutral Program	Supporting	Supporting
<b>Energy Subtotal</b>		<b>32,842</b>	<b>48,485</b>
T-1	Bicycle Infrastructure Improvements	15,905	20,839
T-2	Bicycle Parking	2,168	2,889
T-3	End of Trip Facilities	1,119	1,491
T-4	Promotional Transportation Demand Management	909	1,212
T-5	Traffic Signal Coordination	51,693	68,754
T-6	Density	1,259	1,887
T-7	Mixed-Use Development	769	1,153
T-8	Pedestrian Only Areas	1,399	1,824
T-9	Limited Parking Requirements for New Development	17,482	24,757
T-10	Bus Rapid Transit Services	1,399	2,330
T-11	Voluntary Transportation Demand Management	2,185	3,095
T-12	Accelerated Bike Plan Implementation	3,496	4,951

Local Measures by Sector		2020 Reductions (MT CO <sub>2</sub> e/yr)	2035 Reductions (MT CO <sub>2</sub> e/yr)
T-13	Fixed Guideway Transit	-	13,981
T-14	Neighborhood Electric Vehicle Programs	3,496	4,660
T-15	Subsidized Transit	3,496	4,951
T-16	Bike Share Program	210	280
T-17	Car Share Program	2,797	3,728
T-18	SB 743 as Alternative to LOS	2,028	2,703
<b><i>Transportation Subtotal</i></b>		<b><i>111,810</i></b>	<b><i>165,485</i></b>
W-1	Water Conservation and Efficiency	10,748	10,748
<b><i>Water Subtotal</i></b>		<b><i>10,748</i></b>	<b><i>10,748</i></b>
SW-1	Yard Waste Collection	468	1,238
SW-2	Food Scrap and Paper Diversion	571	9,317
<b><i>Solid Waste Subtotal</i></b>		<b><i>1,039</i></b>	<b><i>10,555</i></b>
<b>TOTAL LOCAL ACTION REDUCTIONS</b>		<b>156,439</b>	<b>235,273</b>

## LOCAL ENERGY MEASURES

The following are local measures that can be implemented to reduce GHG emissions associated with the energy sector.



### Measure E-1: Traffic and Street Lights

*Replace traffic and street lights with high-efficiency bulbs.*

**2020 GHG Reduction Potential: 549 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 4,153 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Platinum
Implementation Status:	In progress
Synergy with RRG-EPAP:	Medium
Relative Cost Effectiveness:	Medium (Requires grant funding or assistance from RPU, City staff time and promotional materials)
Ease of Implementation:	High
Responsibility:	Public Works Department, in conjunction with RPU
Objectives:	By 2020: Convert 50% of traffic lights and 1% of street lights to high-efficiency bulbs By 2035: Convert 100% of traffic lights and street lights to high-efficiency bulbs
Progress Indicators and Metrics:	By 2035: Expect 1.26 million kWh/year in savings from Streetlights and Traffic Signals/Controllers subsector of Local Government GHG Inventory
Local Co- Benefits:	Lower energy bills; reduced maintenance costs; generates work for local contractors (green jobs)
Alignment with Other City Efforts:	Supports all of the City's energy efficiency goals by reducing energy consumption

Similar to many household light fixtures, traffic lights are typically illuminated with inefficient incandescent bulbs. Street lights commonly use high-pressure sodium (HPS) bulbs, which also produce light inefficiently. Newer lighting technology, such as light-emitting diodes (LEDs), last significantly longer than traditional incandescent or HPS bulbs, and use much less energy to perform the same task. The City of Riverside will have replaced 50% of their traffic signals and 1% of their street light fixtures with LEDs or other high-efficiency bulbs by 2020. By 2035 the City estimates that 100% percent of both traffic lights and street lights will have been converted to high-efficiency bulbs. Upgrading these fixtures would both lower municipal utility costs and reduce maintenance costs associated with bulb replacement.



### **Local Economic Opportunities**

The City can contract with local installers to complete the full retrofit of all fixtures. The City may include a preference in their contract for products of more local manufacturing companies, if available. In addition, the City may consider partnering with UC Riverside to replace outdoor lighting on campus roads and in campus parking lots.

The City may partner with UC Riverside or local green technology firms that are researching and developing new traffic and streetlight technology, and potentially develop a pilot program to be implemented in the potential green enterprise zone, as further discussed in the Economic Prosperity Action Plan.

### **Other Community Co-Benefits**





## Measure E-2: Shade Trees

*Strategically plant trees at new residential developments to reduce the urban heat island effect.*

**2020 GHG Reduction Potential: 96 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 841 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Gold
Implementation Status:	In progress
Synergy with RRG-EPAP	Low
Relative Cost Effectiveness:	Medium (City staff time and promotional materials)
Ease of Implementation:	High
Responsibility:	Community Development and Public Works Departments in conjunction with RPU
Objectives:	By 2020: 6,000 new shade trees shall be planted By 2035: 18,800 additional new shade trees shall be planted
Progress Indicators and Metrics:	By 2020: 12,200 new shade trees planted By 2035: 18,800 new shade trees shall be planted representing one tree for every new residential unit built
Local Co-Benefits:	Lower energy bills; generates work for local contractors (green jobs)
Alignment with Other City Efforts:	GAP Goal 12b to plant at least 3,000 shade trees on private property annually

Planting additional trees in urban environments has a number of benefits, including lowering peak-load energy demands during the hottest months, enhancing the visual aesthetic of a community, and naturally sequestering carbon dioxide. Properly selected and located shade trees can help keep indoor temperatures low, thereby reducing air conditioner demands and utility costs. Trees can also provide shade for parking lots and other paved areas, reducing the urban heat island effect

communitywide. As part of the City's Urban Forestry Program, the Free Shade Tree program offers RPU customers a coupon for the purchase of a qualifying shade tree that can be redeemed at one of four local nurseries in Riverside. In addition to lower energy costs, RPU customers can also receive a rebate on their energy bill for planting up to five shade trees in a year. As a participant in the WRCOG Subregional CAP, the City has committed to planting one shade tree per new residential unit.



### **Local Business Opportunities**

The City could expand the Free Tree program to partner with additional local nurseries. The City could leverage its nursery partnerships to increase shade tree education and program promotion from within each nursery.

RPU could share data on energy use with researchers studying the impacts of shade trees on building energy and the urban heat island effect.

### **Other Community Co-Benefits**





## Measure E-3: Local Utility Programs -Electricity

*Financing and incentives for business and home owners to make energy efficient, renewable energy, and water conservation improvements.*

**2020 GHG Reduction Potential: 32,197 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 43,491 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Subregional
Implementation Status:	In progress
Synergy with RRG-EPAP	High
Relative Cost Effectiveness:	Medium (City staff time and promotional materials)
Ease of Implementation:	Medium
Responsibility:	Community Development in conjunction with RPU
Objectives:	By 2020: RPU saves 87.2 million kWh/yr By 2035: RPU saves 131.5 million kWh/yr
Progress Indicators and Metrics:	Continued implementation of existing RPU programs
Local Co-Benefits:	Lower energy and water bills; generates work for local contractors (green jobs)
Alignment with Other City Efforts:	Supports state legislative efforts, including SB 1037, AB 2021, and SB 1

This measure quantifies the beneficial impacts of the various energy savings programs that Riverside Public Utilities (RPU) provides to its customers. These programs are required as part of SB 1037, but also help RPU achieve its 1% per year reduction by 2020 as required by AB 2021, and support the state’s SB1 solar energy commitments. This measure assumes that RPU continues to reduce its energy use by 1% per year through 2035. RPU offers a selection of rebates and other incentives to assist property owners (residential and commercial) with the installation of energy- and water-saving products. The following list provides a sample of RPU programs currently offered:

- Domestic Time-of-Use Tiered Rate Plan: Offers special rates for customers who

- manage their energy use by switching some uses to off-peak hours.
- Whole House Rebate Program: Rebate increase for customers participating in two or more energy and/or water efficiency programs; up to 250% of listed rebate for maximum participation.
- ENERGY STAR™ Appliances and Devices: Rebates for purchasing Energy Star refrigerators, AC units, dishwashers, clothes washer, ceiling fans, and televisions.
- Residential Photovoltaic Rebate Program: Provides financial incentives to RPU electric customers who purchase and install photovoltaic systems.
- Tree Power Rebates: Credited towards utility bill for planting up to five trees per year.
- Weatherization: Rebates are available for attic and exterior wall insulation, whole house fans, attic fans (solar and electric), duct insulation and sealing, window film, and Cool Roof coatings or products.
- Pool & Spa Pump Rebate: Installing qualifying multi-flow or variable-speed pool pumps with appropriate controllers (two speed pumps do not qualify) on in-ground pools or spas.
- Pool Pump Billing Credit: Five dollar (\$5) credit towards bill for using pool pump during off-peak hours.
- Air Conditioning Incentives: Rebates to residential customers for installation of new high energy-efficient air conditioning systems or heat pumps, or replace old units.
- Energy Audit Tool: Online audit tool for residential or commercial RPU customers.
- Lighting Retrofit Outreach: Promotes installation of high efficiency light bulbs.
- Green Power Premium: Helps RPU purchase renewable energy.
- Direct Install: Helps small business customers lower their utility bills by installing energy and water efficiency upgrades at low or no cost.
- Lighting Rebate: Incentives for commercial customers who replace older, inefficient lighting with the most energy-efficient fixtures; includes daylighting and occupancy sensors, along with solar tubes and sky lighting

RPU has entered into a Master Inter-Utility Agreement (Agreement) with the Southern California Gas Company to jointly undertake various programs aimed at reducing natural gas, water, and electricity usage by customers who use both utilities' services. The Agreement provides a method for a collective approach to energy efficiency and resource savings and allows for more effective and efficient program implementation. Under the Agreement, new programs may arise for customers in the joint service territory that would increase energy savings while dividing and reducing the cost of program implementation and marketing for both utilities.



## **Local Economic Opportunities**

The programs offered by RPU generate business for local retailers and contractors who supply and install the various energy efficient fixtures that are covered under RPU's rebates. Several of the rebates offered by RPU can only be redeemed at local businesses. The City can leverage relationships with local contractors to promote program participation. As more efficient technologies continue to develop, RPU can create new programs to incentivize their installation.

## Other Community Co-Benefits





## Measure E-4: Renewable Energy Production on Public Property

*Large scale renewable energy installation on publicly owned property and in public rights of way.*

**2020 GHG Reduction Potential: Supporting Measure**

**2035 GHG Reduction Potential: Supporting Measure**

WRCOG Participation Level:	NA
Implementation Status:	Within 2-3 years
Synergy with RRG-EPAP:	High
Relative Cost Effectiveness:	Medium
Ease of Implementation:	Medium
Responsibility:	Public Works and RPU
Objectives:	By 2020: Complete feasibility study By 2035: Install priority projects identified in feasibility study
Progress Indicators and Metrics:	Number of feasibility/pilot studies and projects implemented per year
Local Co-Benefits:	Increase public health; creates research and development and local business opportunities
Alignment with Other City Efforts:	Supports GAP Goal 1 to increase use of clean energy to 50% by 2020 and Goal 3 to install at least 20 MW solar PV by 2020

This measure encourages the City to seek opportunities to install renewable energy projects on public property, public facilities and in public rights of way. Projects could include solar photovoltaic projects, wind energy, and other emerging energy generation technologies. These projects could include large scale installations on land that the City owns that cannot be used for other purposes, or small scale (and even temporary) installations, such as solar powered trash cans, solar powered lighting, and small scale wind turbines.

The City should work with RPU to complete a feasibility study that identifies opportunities to install both large and small scale renewable energy projects on public property, public facilities and in the public right of way. The study should also identify partners in the community that are developing more advanced large and small scale renewable energy systems that could be installed as a pilot project. The Study should identify priority projects that the City could implement by 2020, and additional projects to implement by 2050, that would contribute to the City's GHG reduction.



### **Local Economic Opportunities**

The City could partner with UC Riverside or green technology firms seeking to research and develop new renewable energy generating technologies. The City could partner on various pilot projects and focus efforts in the proposed Green Enterprise Zone, where installed technologies could be accompanied by informational signs to explain the technology and its benefits to those interested.

### **Other Community Co-Benefits**





## Measure E-5: UCR Carbon Neutrality

*Collaborate with UCR to achieve a carbon neutral campus.*

**2020 GHG Reduction Potential: Supporting Measure**

**2035 GHG Reduction Potential: Supporting Measure**

WRCOG Participation Level:	NA
Implementation Status:	In progress
Synergy with RRG-EPAP:	High
Relative Cost Effectiveness:	Medium
Ease of Implementation:	Medium
Responsibility:	UCR and RPU
Objectives:	By 2025: Achieve a carbon neutral campus By 2035: Maintain a carbon neutral campus
Progress Indicators and Metrics:	Number of feasibility/pilot studies and projects implemented since 2007
Local Co-Benefits:	Increase public health; improve air quality; lowers energy bills; creates research and development and local business opportunities
Alignment with Other City Efforts:	Supports GAP Goal 1 to increase use of clean energy to 50% by 2020 and Goal 3 to install at least 20 MW solar PV by 2020

In 2007, the Chancellor of UCSF signed the American College and University President’s Climate Commitment (ACUPCC) to complete an emissions inventory, set target dates and interim milestones for becoming climate-neutral, take steps to reduce GHG emissions, and prepare public progress reports. As an intermediate target, UCOP established the goals of reducing GHG emissions to 2000 levels by 2014; 1990 levels by 2020; and achieving climate neutrality as soon as possible after reaching the 2014 and 2020 reduction targets. More recently, UCR committed to achieving climate neutrality by the year 2025. These goals pertain to Scope 1 and Scope 2 emissions of the six Kyoto greenhouse gases originating from sources specified in the ACUPCC, as well as Scope 3 emissions from business airline travel and

commuting by UCSF staff and students. The Regents' policy specifies that these goals will be pursued while maintaining the primary research and education mission of the University.

This measure encourages RPU and the City of Riverside to collaborate with UCR to achieve their carbon neutrality goals. RPU and UCR are partnering on a number of projects to advance clean energy technology and low-carbon solutions including polymer-zeolite nanocomposite high-temperature proton-exchange-membrane (PEM) for Fuel Cells; the control of NOx (nitrogen oxides), Sox (sulfur oxides), and particulate matter in biological filters; Southern California –Research Institute for Solar Energy; and clean automated electric power, heating and cooling from urban waste.

This is considered a supporting measure until the University's carbon neutrality goals can be more specifically defined with respect to energy savings.



### **Local Economic Opportunities**

The City can partner with UC Riverside to achieve carbon neutrality, by implementing new technologies as pilot studies and showcasing successes to other institutions and businesses interested in reducing their carbon footprint. Possible joint activities identified at the Green Leadership Conference in February 2014 include the creation of an eco-development zone or green enterprise zone adjacent to the UCR campus; mobile solar on vacant city lands (see Measure E-4); waste to energy for converting organic waste into biogas; pilot on-site water retention and treatment at UCR; and simply continuing to partner and host innovative conferences and seminars.

### **Other Community Co-Benefits**



## LOCAL TRANSPORTATION MEASURES

The following are local measures that can be implemented to reduce GHG emissions associated with the transportation sector.



### Measure T-1: Bicycle Infrastructure Improvements

*Expand on-street and off-street bicycle infrastructure, including bicycle lanes and bicycle trails.*

**2020 GHG Reduction Potential: 15,905 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 20,839 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Platinum
Implementation Status:	In progress
Synergy with RRG-EPAP:	Medium
Relative Cost Effectiveness:	Medium (\$200,000 at 2020 for maintaining additional bicycle facilities. Total capital cost for the full completion of the City's Bicycle Master Plan is approximately \$30M. Pro-rata share of City's Bicycle Master Plan would therefore be \$15M)
Ease of Implementation:	Medium
Responsibility:	Community Development and Public Works Departments
Objectives:	By 2020: Achieve a 50% increase in bicycle lane mileage from baseline levels. By 2035: Achieve a 75% increase in bicycle lane mileage from baseline levels.
Progress Indicators and Metrics:	Percent increase in bicycle lane mileage from 2010 baseline
Local Co-Benefits:	Health, recreation and mobility benefits; improved air quality; generates work for local contractors
Alignment with Other City Efforts:	Bicycle Master Plan; Draft city-wide bicycle design guideline (to be adopted in 2014)

By providing more bicycle lanes and better connections between existing bicycle lanes, Riverside can increase the viability of bicycling as an emission-free commute option. Several WRCOG jurisdictions have adopted or are preparing bicycle master plans. Implementing these plans will increase alternative transportation options in the sub-region and can reduce vehicle miles traveled and congestion for vehicles. Community health benefits from increased bicycling include improved air quality and exercise.

The City of Riverside completed a Bicycle Master Plan in 2007 and has been implementing the Plan's recommendations. As an example, City recently completed a "green" or painted bike lane in the Downtown area. Given the City's terrain and climate, there are significant opportunities to encourage cycling by residents, visitors, and employees.



### **Local Economic Opportunities**

One significant opportunity in the City would be the creation of a bike friendly district, such as was done in the City of Long Beach. This bike friendly district would have extensive bicycle facilities, bike shops, and business which support cycling. For example, businesses could specifically advertise that they allow for bicycles to park at the business. This bike friendly district would also create additional foot traffic, which would be conducive to more having more patrons at restaurants, café's, and shops. One likely application would be in the Downtown, where a nexus of bicycle facilities and supportive land uses could be easily achieved.

### **Other Community Co-Benefits**





## Measure T-2: Bicycle Parking

*Provide additional options for bicycle parking.*

**2020 GHG Reduction Potential: 2,168 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 2,889 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Platinum
Implementation Status:	In progress
Synergy with RRG-EPAP:	Low
Relative Cost Effectiveness:	High (Cost for bicycle parking facilities assumed to be associated with private development that would install the bicycle parking is sites develop or redevelop)
Ease of Implementation:	High
Responsibility:	Community Development Department, Planning Division
Objectives:	By 2020: Amend zoning to require provision of bike parking for all multi-family or mixed-use projects consisting of a mix of residential, retail, and office space.
Progress Indicators and Metrics:	Number of new bike parking spaces added since 2010.
Local Co-Benefits:	Health, recreation, and mobility benefits; improved air quality
Alignment with Other City Efforts:	GAP Goal 14 to decrease VMT; Draft city-wide bicycle design guideline (to be adopted in 2014)

Safe and convenient bicycle parking is a relatively low-cost action that leads to a demonstrated shift from automobile use to bicycle use. Helping business owners understand the potential benefits of bicycle parking and requiring new development projects to include bike racks as a condition of approval can facilitate implementation of this measure.

The City is current developing Citywide Bicycle Design Guidelines, which will address bicycle parking as sites develop and redevelop.



### **Local Economic Opportunities**

Bicycle parking would provide many of the same benefits as with T-1. Ample bike parking allow bicyclists to park their bikes in public area, providing them with opportunities to patronize nearby businesses.

### **Other Community Co-Benefits**





## Measure T-3: End of Trip Facilities

*Encourage use of non-motorized transportation modes by providing appropriate facilities and amenities for commuters.*

**2020 GHG Reduction Potential: 1,119 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 1,491 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Platinum
Implementation Status:	In progress
Relative Cost Effectiveness:	High (limited cost to the City since any incremental costs associated with these facilities would be related to the development or redevelopment of individual sites)
Synergy with RRG-EPAP:	Low
Ease of Implementation:	High
Responsibility:	Public Works Department; Community Development Department, Planning Division
Objectives:	By 2020: Amend zoning code to require installation of end-of-trip facilities for new commercial buildings greater than 50,000 square feet.
Progress Indicators and Metrics:	Number of development projects installing end-of-trip facilities since 2010
Local Co-Benefits:	Health, recreation, and mobility benefits; improved air quality; generates work for local contractors
Alignment with Other City Efforts:	GAP Goal 14 to decrease VMT; Draft city-wide bicycle design guideline (to be adopted in 2014)

End-of-trip commuter facilities further incentivize alternative transportation modes, such as walking and biking. Within the City of Riverside, this measure would require larger commercial buildings (new construction only) to provide end of trip facilities including showers, changing areas and bicycle storage, which will encourage persons to walk and bike to their employment locations.



### **Local Economic Opportunities**

This measure may generate work for local contractors who would be required to install these facilities into new commercial buildings and local businesses who want to manufacture such products.

### **Other Community Co-Benefits**





## Measure T-4: Promotional Transportation Demand Management

*Encourage Transportation Demand Management strategies.*

**2020 GHG Reduction Potential: 909 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 1,212 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Silver
Implementation Status:	In Progress
Relative Cost Effectiveness:	High (\$35,000 based on the likelihood that an existing staff member would be assigned this task in lieu of existing duties. This cost may also cover some additional costs to the City related to publications, materials, and other promotional activities. Approximately \$25,000 would reflect offsetting staff costs and another \$10,000 would be for promotional materials)
Synergy with RRG-EPAP:	Low
Ease of Implementation:	High
Responsibility:	Community Development Department, Planning Division and Public Works
Objective:	By 2020: Train an existing staff person to promote TDM strategies to existing businesses.
Progress Indicators and Metrics:	Number of jurisdictions with full-time or part-time staff promoting TDM programs to be established through an annual survey conducted by WRCOG.
Local Co-Benefits:	Health, recreation, and mobility benefits; improved air quality
Alignment with Other City Efforts:	GAP Goal 14 to decrease VMT

Transportation demand management (TDM) describes strategies to reduce demand for roadway travel, particularly in single-occupancy vehicles. TDM strategies can include both “carrot” and “stick” approaches to change travel behavior patterns. Specific examples include preferential parking for carpoolers and parking pricing.

While SCAG offers regional approaches such as high-occupancy vehicle lanes, this measure focuses on efforts by individual existing business owners in the WRCOG sub-region to develop TDM strategies, such as parking “cash out” programs and allowing telecommuting. Several TDM strategies can be offered; often, multiple programs can enhance one another rather than being redundant. In addition to reducing GHG emissions, TDM strategies often ease congestion and improve air quality.

Although TDM strategies have application within the larger region, this measure would focus on City actions needed to support TDM within private businesses. Chapter 19.880 of the City’s Municipal Code includes regulations for TDM. Trip reduction plans to reduce work-related vehicle trips by six and one-half percent from the number of trips related to the project are required for all new developments or businesses generating one hundred or more employees. A combination of strategies may be included in the plan to achieve the required vehicle reduction targets including but not limited to, alternative work schedules/flex-time; preferential parking for carpool vehicles; rideshare vehicle loading areas; vanpool vehicle accessibility; bus stop improvements; on-site child care facilities; and on-site amenities such as cafeterias, restaurants, automated teller machines and other services that would eliminate the need for additional trips, etc. The City would designate and train a staff person to proactively market these TDM strategies and ensure enforcement of the Municipal Code, particularly at larger businesses where these strategies are the most effective. There would be limited applicability of this measure to employment centers such as UC Riverside where TDM measures are already applied.



### Local Business Opportunities

There are limited local business opportunities related to this measure.

### Community Benefits





## Measure T-5: Traffic Signal Coordination

*Incorporate technology to synchronize and coordinate traffic signals along local arterials.*

**2020 GHG Reduction Potential: 51,693 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 68,754 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Platinum
Implementation Status:	In progress
Relative Cost Effectiveness:	Medium (Annual cost to the City may be as much as \$1M per year. City 2011-2015/2016 CIP has allocated approximately \$600,000 for traffic signal coordination and maintenance. With additional signals coordinated throughout the City, there will be a greater need to maintain the system)
Synergy with RRG-EPAP:	Low
Ease of Implementation:	Medium
Responsibility:	Public Works Department
Objective(s):	By 2020: Achieve a 75% increase in arterials roads that have coordinated traffic signals.  By 2035: Achieve a 90% increase in arterials roads that have coordinated traffic signals.
Progress Indicators and Metrics:	Percentage of arterial roads with signal coordination from 2010 baseline.
Local Co-Benefits:	Increased mobility; improved air quality
Alignment with Other City Efforts:	NA

Traffic signal coordination describes a method of timing groups of traffic signals along an arterial to provide smooth movement of traffic with minimal stops. This technique reduces motorist stops and delays, lowers the amount of fuel need to move a certain distance, and reduces GHG emissions. Signal coordination also lessens congestion and resulting tail pipe emissions, which reduces GHG emissions and improves air quality.

The City of Riverside has an extensive traffic management system which includes coordination along major corridors, video cameras, and an integrated traffic management center in City Hall.



### **Local Economic Opportunities**

As the City extends traffic signal coordination to additional roadways, there are significant opportunities for local contractors, particularly those who are experienced in these types of projects. Retrofitting an existing corridor to accommodate signal coordination can sometimes require excavating work, installing conduit, repairing sidewalks as necessary, and installing items like cameras and traffic signal controllers. Given the work required, large scale signal coordination projects often have budgets in the hundreds of thousands or even millions of dollars. Local contractors could bid on these projects, which would benefit the City economy and its residents directly.

### **Other Community Co-Benefits**





## Measure T-6: Density

*Improve jobs-housing balance and reduce vehicle miles traveled by increasing household and employment densities.*

**2020 GHG Reduction Potential: 1,259 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 1,887 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Gold
Implementation Status:	2015
Relative Cost Effectiveness:	High (Cost to the City would only accrue when supporting documents such as the General Plan, Development Code, etc.) are updated or modified)
Synergy with RRG-EPAP:	Low
Ease of Implementation:	High
Responsibility:	Community Development Department, Planning Division; Economic Development Department
Objective(s):	By 2020: Achieve a 10% increase in community-wide household and employment density over baseline conditions.  By 2035: Achieve a 15% increase in community-wide household and employment density over baseline conditions.
Progress Indicators and Metrics:	Percentage change in community-wide household and employment density from 2010 baseline.
Local Co-benefits:	Increased health and mobility; improved air quality
Alignment with other City efforts:	GAP Goal10A to apply urban planning principles that encourage high density, mixed-use, walkable/bikeable neighborhoods; GAP Goal 14 to decrease VMT; General Plan 2025; Riverside SmartCode Specific Plan

Density describes the number of people, jobs, or housing units in a given area. Increasing density generally results in shorter distances between locations, making transit and non-motorized transportation options such as walking and biking more viable. GHG emissions associated with vehicle miles traveled (VMT) are reduced as more individuals choose alternative transportation modes. Increases in density must generally fit within assumptions of a jurisdiction's General Plan, although amendments can be made to increase density in certain areas.

The City is pursuing the development of a Smart Code Specific Plan project with the goal of re-envisioning much of the commercial, office and industrial zoned properties throughout the City that encompasses nearly 20% of the City area. As part of this effort, the City may create incentives for higher-density development, particularly along major transit corridors.



### Local Economic Opportunities

There may be opportunities for local contractors, who would be involved in the higher density development that may be envisioned as part of the Smart Code Specific Plan; though these contractors would likely be involved in new construction regardless of this measure.

### Other Community Co-Benefits





## Measure T-7: Mixed-Use Development

*Provide for a variety of development types and uses.*

**2020 GHG Reduction Potential: 769 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 1,153 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Silver
Implementation Status:	In progress
Relative Cost Effectiveness	High (Cost to the City would only accrue when supporting documents such as the General Plan, Development Code, etc. are updated or modified)
Synergy with RRG-EPAP:	Low
Ease of Implementation:	High
Responsibility:	Community Development Department, Planning Division
Objectives:	By 2020: Achieve a 5% improvement in the jobs/housing ratio over baseline conditions.  By 2035: Achieve a 10% improvement in the jobs/housing ratio over baseline conditions.
Progress Indicators and Metrics:	Percentage change in jobs/housing ratio within new development areas from 2010 baseline.
Local Co-Benefits:	Increased health and mobility; improved air quality
Alignment with Other City Efforts:	GAP Goal 14 to decrease VMT; GAP Goal 10A encourage high density, mixed-use, walkable/bikeable neighborhoods; General Plan 2025; Riverside SmartCode Specific Plan

Development can occur in many forms, ranging from single-family homes on large plots of land to multi-family housing with high vertical construction for residential areas, and single-use to multi-use zoning for commercial properties. While land development choices are typically made at the household or business level, recent studies show that individuals are more frequently demanding higher-density, multi-use

regions that are more walkable. Most WRCOG jurisdictions have identified portions of their communities where future higher-density development is desirable. Such development reduces both VMT and GHGs, as individuals can accomplish many tasks in a single mixed-use area. This also can improve community health by encouraging bicycling and walking, improve air quality by reducing tailpipe emissions, and increase the community's sense of place.

For the WRCOG subregion, mixed-use development is classified as having at least three of the following features either on-site or within ¼ mile:

- Residential development;
- Retail development;
- Park;
- Open space; or
- Office.

Within the City of Riverside, there are significant opportunities for mixed-use, particularly within the Downtown Core area. There is already a mix of retail, housing, and office within the Downtown and additional mixed-use development will only improve the current mix of uses.



### **Local Economic Opportunities**

There may be opportunities for local contractors, who would be involved in the construction of these buildings; though these contractors would likely be involved in new construction regardless of this measure.

### **Other Community Co-Benefits**





## Measure T-8: Pedestrian-Only Areas

*Encourage walking by providing pedestrian-only community areas.*

**2020 GHG Reduction Potential: 1,399 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 1,824 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Platinum
Implementation Status:	In progress
Relative Cost Effectiveness	Low (Cost associated with this measure would be for any additional maintenance and other services (police, cleaning, etc.)
Synergy with RRG-EPAP:	Medium
Ease of Implementation:	High
Responsibility:	Community Development Department, Planning Division
Objectives:	By 2020: Designate one additional major activity center as permanent pedestrian-only area.  By 2035: Designate one additional major activity center as permanent pedestrian-only area
Progress Indicators and Metrics:	Change in the number of temporary or permanent pedestrian-only zones from 2010 baseline.
Local Co-Benefits:	Increased health, recreational, and mobility; improved air quality
Alignment with Other City Efforts:	GAP Goal 14 to decrease VMT; General Plan 2025; Riverside SmartCode

Also referred to as an urban non-motorized zone, a pedestrian-only area restricts certain portions of a central business district or major activity center to non-motorized transportation.

There is one current pedestrian only zone in the City, which is located in the Downtown. The City could choose to expand this area or designate another area in the City to operate as a pedestrian only area.



## Local Economic Opportunities

An additional or expanded pedestrian only area could create opportunities for local businesses who provide food, drink, and shopping. The current pedestrian only area in the Downtown is next to numerous restaurants and shops which are heavily patronized by the employees, visitors, and residents. Pedestrian only areas could be prioritized within the proposed green enterprise zone.

## Other Community Co-Benefits





## Measure T-9: Limit Parking Requirements for New Development

*Reduce requirements for vehicle parking in new development projects.*

**2020 GHG Reduction Potential: 17,482 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 24,757 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Platinum
Implementation Status:	In Progress
Relative Cost Effectiveness:	High (Cost to the City would only accrue when parking code requirements in the Municipal Code are updated. Absent cost associated with this update, no incremental cost would accrue to the City)
Synergy with RRG-EPAP:	Low
Ease of Implementation:	High
Responsibility:	Community Development Department, Planning Division
Objectives:	By 2020: Amend zoning to reduce parking requirements by 25% for non-residential development.  By 2035: Amend zoning to reduce parking requirements by 33% for non-residential development.
Progress Indicators and Metrics:	Change in the number of WRCOG jurisdictions who have amended their parking requirements to reduce parking spaces required within new development or redevelopment areas from 2010 baseline.
Local Co-Benefits:	Increased health and mobility; improved air quality
Alignment with Other City Efforts:	GAP Goal 14 to decrease VMT; Riverside SmartCode

Limiting parking requirements for new development in certain areas may encourage alternative individual transportation choices, but caution should be taken to minimize the resulting incentive to travel to more distant locations with plenty of parking. This can be accomplished by:

- Eliminating (or reducing) minimum parking requirements;
- Creating maximum parking requirements; and
- Implementing shared parking.

Limiting parking requirements would encourage modes of transportation other than single-occupancy vehicles, thereby reducing VMT and GHG emissions. If these alternative transportation modes include walking and biking, mobility and health benefits would also be realized.

The City's current Zoning Code authorizes a reduction in the number of required parking spaces for mixed-use development and/or stand-alone uses in mixed-use zones subject to the approval of a shared parking arrangement. In addition, the Zoning Administrator may grant a mixed-use parking reduction credit of up to 15 percent of the total required number of spaces where there are multiple uses in a complex with different operating characteristics, such as day time office and nighttime commercial entertainment oriented uses. Another factor in favor of granting a credit is proximity to a transit stop.

The Riverside Smart Code Specific Plan (referenced in Measure T-8) will provide an opportunity for the City to comprehensively review its parking requirements and further incorporate state of the art techniques such as shared parking, parking cash out, and other specific strategies.



## Local Economic Opportunities

Reducing parking requirements, particularly if it is tailored to specific areas within the City, has the potential to incentivize certain types or forms of development within sub-areas of the City. For example, this strategy is likely to be most effective in the more dense areas of the City such as the Downtown Core. Local land owners and developers within these areas could benefit as a reduction in parking requirements will reduce cost of development by reducing the need to provide parking areas on site. Additionally, land may be freed up for buildings as the City reduces parking requirements.

## Other Community Co-Benefits





## Measure T-10: High Frequency Transit Service

*Implement bus rapid transit service in the subregion to provide alternative transportation options.*

**2020 GHG Reduction Potential: 1,399 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 2,330 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Gold
Implementation Status:	2016
Relative Cost Effectiveness:	N/A- Any incremental cost associated with this measure would accrue to RTA as the transit operator.
Synergy with RRG-EPAP:	High
Ease of Implementation:	High
Responsibility:	Public Works Department in conjunction with RTA
Objectives:	By 2020: Work with RTA to offer high frequency transit service within one (1) corridor.  By 2035: Work with RTA to offer high frequency transit service within two (2) corridors.
Progress Indicators and Metrics:	Number of corridors in which high frequency transit service has been implemented since 2010 baseline.
Local Co-Benefits:	Increased mobility and improved air quality
Alignment with Other City Efforts:	GAP Goal 14 to decrease VMT; GAP Goal 14 to decrease VMT; General Plan 2025; Riverside SmartCode Specific Plan

The WRCOG subregion is one of the fastest growing areas in California. As more residents and employees occupy the area, there will be increased need to move people efficiently in and out of the area. A high frequency transit system such as bus rapid transit (BRT) would provide an alternative to constructing more roadways and allow commuters and residents additional transportation options. Jurisdictions participating in this measure have an objective to work with RTA to identify corridors

where BRT service would provide an effective and logical transportation option.

The City of Riverside has several corridors where BRT service could be implemented including University Avenue and Magnolia Avenue. As these corridors may be prioritized for the proposed Streetcar, BRT could represent either an interim solution prior to the construction of the Streetcar or as a complement to the Streetcar.



### **Local Economic Opportunities**

The implementation of BRT along selected corridors within the City could serve as a way to direct future development to areas which have higher densities and supporting non-motorized facilities (sidewalks and bike lanes). Landowners along these corridors may see an increase in value and there may be opportunities for developers to redevelop parcels to transit supportive uses such as offices and multi-family housing.

### **Other Community Co-Benefits**





## Measure T-11: Voluntary Transportation Demand Management

*Encourage employers to create TDM programs for their employees.*

**2020 GHG Reduction Potential: 2,185 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 3,095 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Gold
Implementation Status:	Ongoing
Relative Cost Effectiveness:	N/A - Any additional costs associated with this measure would accrue to building owners, building operators, and other private parties
Synergy with RRG-EPAP:	Low
Ease of Implementation:	High
Responsibility:	Community Development Department, Planning Division
Objectives:	By 2020: 25% of employees within the City participate in voluntary TDM programs. By 2035: 33% of employees within the City participate in voluntary TDM programs.
Progress Indicators and Metrics:	Percent change in the number of employees participating in voluntary TDM programs since 2010.
Local Co-Benefits:	Increased health and mobility; improved air quality
Alignment with Other City Efforts:	GAP Goal 14 to decrease VMT

TDM describes strategies to reduce demand for roadway travel, particularly in single-occupancy vehicles. TDM strategies can include both “carrot” and “stick” approaches to change travel behavior patterns. Specific examples include preferential parking for carpoolers and parking pricing.

While SCAG offers regional approaches such as high-occupancy vehicle lanes, this measure focuses on efforts by individual existing business owners in the WRCOG subregion to develop TDM strategies, such as parking “cash out” programs and

allowing telecommuting. Several TDM strategies can be offered; often, multiple programs can enhance one other rather than being redundant. In addition to reducing GHG emissions, TDM strategies often ease congestion and improve air quality.

Within the City of Riverside, these strategies would be applied by individual employers in conjunction with Measure T-4 (Promotional TDM). Larger employers would be encouraged to offer TDM programs to their employees. The City would act as a resource for local businesses who may need technical assistance, example programs, and other related items.



### **Local Economic Opportunities**

There limited local business opportunities related to this measure.

### **Other Community Co-Benefits**





## Measure T-12: Accelerated Bike Plan Implementation

*Accelerate the implementation of all or specified components of a jurisdiction's adopted bike plan.*

**2020 GHG Reduction Potential: 3,496 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 4,951 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Platinum
Implementation Status:	In progress
Relative Cost Effectiveness:	Medium - \$100,000 at 2020 for maintaining additional bicycle facilities beyond Measure T-1. Total capital cost for the full completion of the City's Bicycle Master Plan is approximately \$30M. Pro-rata share of City's Bicycle Master Plan would therefore be \$7.5M.
Synergy with RRG-EPAP:	Low
Ease of Implementation:	Medium
Responsibility:	Community Development and Public Works Departments
Objectives:	By 2020: 75% of all bike facility miles identified in the City's Bike Plan shall be installed  By 2035: 100% of all bike facility miles identified in the City's Bike Plan shall be installed
Progress Indicators and Metrics:	Percent change in the number of bicycle facility miles installed since 2010.
Local Co-Benefits:	Increased health, recreation and mobility; improved air quality
Alignment with Other City Efforts:	GAP Goal 14 to decrease VMT; Bicycle Master Plan; Draft city-wide bike design guidelines (to be adopted in 2014)

Several jurisdictions within WRCOG are currently implementing existing Bicycle Master Plans and/or Trails Plans. These plans outline a series of on-street and off-street facilities to increase bicycle use within the community. This measure addresses accelerated implementation of these Master Plans to provide additional facilities by 2020 beyond those identified in Measure T-1.

The City is currently implementing their bicycle plan, as described in Measure T-1. One recent implementation action was to designate “green” bicycle lanes along Brockton Avenue in the Downtown.



### **Local Economic Opportunities**

The primary economic benefit would occur through the creation of a Bicycle Friendly District as noted in T-1.

### **Other Community Co-Benefits**





## Measure T-13: Fixed Guideway Transit

*By 2020, complete feasibility study and by 2025 Introduce a fixed-route transit service in the jurisdiction.*

**2020 GHG Reduction Potential: 0 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 13,981 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Platinum
Implementation Status:	In progress
Relative Cost Effectiveness:	Low - Feasibility study assumed to be complete by 2020. No additional expenses assumed until fixed-guideway system is operational.
Synergy with RRG-EPAP:	High
Ease of Implementation:	Low
Responsibility:	Community Development and Public Works Departments
Objectives:	By 2020: Complete feasibility study for a fixed-guideway system. By 2035: Implement a fixed-guideway transit system
Progress Indicators and Metrics:	Annual community-wide fixed guideway transit ridership.
Local Co-Benefits:	Increased health and mobility; economic opportunities
Alignment with Other City Efforts:	Riverside Reconnects Streetcar Feasibility Study; GAP Goal 14 to decrease VMT

This measure applies specifically to the City of Riverside’s efforts on the “Riverside Reconnects” Streetcar feasibility study that would determine the economic feasibility of a future Streetcar alignment. This Streetcar would provide fixed-route transit service through the City of Riverside, providing access to major destinations such as the University of California, Riverside, Downtown Riverside, and other major destinations throughout the city. The City would plan, design, construct, and operate the streetcar.



## Local Economic Opportunities

There are significant local business opportunities related to the Streetcar. Streetcars have a demonstrated history of increasing land values along parcels adjacent to the lines. That increase in value often occurs concurrent with additional development and redevelopment, as with other communities where Streetcars have implemented. Similar to other measures, the Streetcar provides the ability for the City to direct growth to areas of the City with existing infrastructure.

## Other Community Co-Benefits





## Measure T-14: Neighborhood Electric Vehicle Programs

*Implement development requirements to accommodate Neighborhood Electric Vehicles and supporting infrastructure.*

**2020 GHG Reduction Potential: 3,496 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 4,660 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Gold
Implementation Status	In progress
Relative Cost Effectiveness:	Medium (\$100,000- Based on cost for additional signage and education program, which might require additional staff resources or retasking of existing staff)
Synergy with RRG-EPAP:	High
Ease of Implementation:	Medium
Responsibility:	Community Development and Public Works Departments
Objectives:	By 2020: Adopt a comprehensive NEV program including signage for NEVs and an educational program related to NEV use.  By 2035: Adopt a comprehensive NEV program including signage for NEVs and an educational program related to NEV use.
Progress Indicators and Metrics:	Implementation of NEV program
Local Co-Benefits:	Increased mobility and improved air quality
Alignment with Other City Efforts:	Four City Electric Vehicle Plan; GAP Goal 14 to decrease VMT

Neighborhood electric vehicles (NEVs) emit fewer GHGs than traditional passenger vehicles and reduce local air pollution. NEVs generally are used in areas with speed

limits of 35 miles per hour or less for relatively short (less than 30 miles) trips. This measure introduces development requirements for signage and educational programs related to the use of NEVs consistent with state regulations.

Within the City of Riverside, NEV's can address short-distance trips, which may be difficult to complete by walking or biking. Therefore, NEV's would be a complement to the Streetcar, the BRT, or other strategies which additional connectivity is required and the use of a personal automobile would be problematic or otherwise undesirable.



### **Local Economic Opportunities**

The local business opportunity associated with this measure would likely occur at facilities where NEV's may park or otherwise congregate. For example, if the City were to install NEV charging stations or parking lots, those facilities could attract a high level of foot traffic. This level of foot traffic could then support restaurants, cafes, and shops similar to other strategies such as T-1.

### **Other Community Co-Benefits**





## Measure T-15: Subsidized Transit

*Increase access to transit by providing free or reduced passes.*

**2020 GHG Reduction Potential: 3,496 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 4,951 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Platinum
Implementation Status:	In Progress
Relative Cost Effectiveness:	Low (\$1M per year, assuming expansion of passes beyond those already offered to students at locations such as UCR)
Synergy with RRG-EPAP:	Low
Ease of Implementation:	High
Responsibility:	RTA, UCR and City
Objectives:	<p>By 2020: Provide subsidized or discounted transit passes to 2% of residents, students, and employees living, working or going to school in the community.</p> <p>By 2035: Provide subsidized or discounted transit passes to 2.5% of residents, students, and employees living, working or going to school in the community</p>
Progress Indicators and Metrics:	Change in the number of discounted transit passes provided per total residents, students and employees living, working, or going to school in Riverside since 2010.
Local Co-Benefits:	Increased mobility and improved air quality
Alignment with other City efforts:	Riverside Go-Transit Bus Pass Subsidy Program; City-Pass Program; GAP Goal 14 to decrease VMT

One approach to increase transit use within a jurisdiction is lowering the cost of using transit. Within Western Riverside County, the typical approach has been to provide reduced cost transit passes such as those provided by several universities. This approach is generally targeted at groups such as students or seniors who may lack access to vehicles.

Within the City of Riverside, the primary recipients of discounted transit passes currently are students and staff at UC Riverside, who are able to ride RTA buses to and from campus for free.



### **Local Economic Opportunities**

There limited local business opportunities related to this measure.

### **Other Community Co-Benefits**





## Measure T-16: Bike Share Program

*Create nodes offering bike sharing at key locations throughout the City.*

**2020 GHG Reduction Potential: 210 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 280 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	N/A
Implementation Status:	2014/2015
Relative Cost Effectiveness:	Medium (Based on assumption that private vendor operates bike share as turnkey operation, as is done with other larger cities currently)
Synergy with RRG-EPAP:	High
Ease of Implementation:	Low
Responsibility:	Community Development Department, Planning Division
Objectives:	2020: Complete pilot study for bike sharing and install four bike sharing station in the City of Riverside  2035: Install bike sharing in eight or more locations in the City of Riverside
Progress Indicators and Metrics:	Number of bike sharing stations in the City of Riverside
Local Co-benefits:	Increased health and mobility; improved air quality
Alignment with other City efforts:	GAP Goal 14 to decrease VMT; Air Quality Improvement Fund

Bike sharing allows users to rent bicycles for a nominal fee, use them on a temporary basis, and then return the bicycle to either the same location or another designated location. Bike sharing allows a person to use a bicycle on a temporary basis, removing the need to purchase and own a bicycle. Bike sharing is becoming increasingly common in larger Cities such as Chicago and New York, where they serve as a usual adjunct to transit. Bike sharing is most often run by third-party vendors, who are responsible for maintaining and operating the system. These vendors typically set up stations where bikes are rented and returned. The number of

stations would vary based on the size of the system.

In the City of Riverside, bike sharing would most likely be implemented in either the Downtown, transit stations, or in areas with high density and mix of uses such as along University Avenue. The City of Riverside is currently conducting a pilot study on bike sharing, using grant funding. This pilot study will explore implementing bike sharing at one or more locations in the City.

In June 2014, the City Council approved a Bike Share project that will provide four bicycle stations at key destinations linking Downtown to the Metrolink Station and the University of California, Riverside to promote bicycle usage. The estimated cost including design is \$303,000. The City was approved for \$240,000 in grant funds if the City will provide a \$63,000 match.



### **Local Economic Opportunities**

Business opportunities related to bike sharing would generally revolve around those locations in which bike sharing stations are implemented. Those stations often generate a certain level of economic activity such as small restaurants, cafes, shops, and other similar uses.

### **Other Community Co-Benefits**





## Measure T-17: Car Share Program

*Offer Riverside residents the opportunity to use car sharing to satisfy short-term mobility needs.*

**2020 GHG Reduction Potential: 2,797 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 3,728MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	N/A
Implementation Status:	In progress at UC Riverside
Relative Cost Effectiveness:	High (Based on assumption that car share program is operated privately by vendor. Car share program would therefore be a turnkey operation with no cost or revenue accruing to City)
Synergy with RRG-EPAP:	High
Ease of Implementation:	High
Responsibility:	Community Development Department, Planning Division and Public Works
Objectives:	2020: Install one location in the City of Riverside where car sharing is available.  2035: Develop two locations in the City of Riverside where car sharing is available.
Progress Indicators and Metrics:	Number of car sharing stations in the City of Riverside
Local Co-Benefits:	Improve air quality and mobility
Alignment with Other City Efforts:	GAP Goal 14 to decrease VMT; Air Quality Improvement Fund

Similar to bike sharing, car sharing allows persons to rent cars for short periods of time. Unlike traditional rental cars, car sharing may be used only for one trip or one day instead of multi-day periods. Also, car sharing often requires less effort than traditional rental cars. Obtaining a car at a location might require only the use of a smart phone app unlike the more extensive rental car process. Car sharing stations are also much smaller than traditional rental car locations, in which only 4-5 cars might be available at one time. Similar to bike sharing, car sharing also typically occurs through a third

party vendor who will operate and maintain the facility.

There is an existing car sharing station at UC Riverside. This strategy would involve the deployment of car sharing to additional locations in the City. Potential locations could include the three Metrolink Stations in the City (two existing plus one proposed) and the Downtown.



### **Local Economic Opportunities**

Business opportunities related to car sharing would generally revolve around those locations in which car sharing stations are implemented. Those stations often generate a certain level of economic activity such as small restaurants, cafes, shops, and other similar uses. Car sharing is often co-located with transit, bike sharing, and other similar uses.

### **Other Community Co-Benefits**





## Measure T-18: SB 743- Alternative to LOS

*Use SB 743 to incentivize development in the downtown and other areas served by transit.*

**2020 GHG Reduction Potential: 2,028 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 2,703 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	N/A
Implementation Status:	In Progress
Relative Cost Effectiveness:	High (No additional cost to City unless supporting documentation such as traffic study guidelines are updated during this time frame)
Synergy with RRG-EPAP:	High
Ease of Implementation:	High
Responsibility:	Community Development Department, Planning Division & Public Works Department, Traffic Engineering Division
Objectives:	2020: Develop guidelines to direct development to Downtown and other desired locations  2035: Develop guidelines to direct development to Downtown and other desired locations
Progress Indicators and Metrics:	Development of new City guidelines for traffic studies and CEQA which encourage development in high priority areas such as Downtown and those areas served by transit.
Local Co-Benefits:	Increased health and mobility; improved air quality
Alignment with Other City Efforts:	Complies with SB 743

SB 743 removes Level of Service (LOS) as an analysis metric under CEQA. Instead, the Vehicle Miles Traveled (VMT) is used as the primary evaluation criteria to determine traffic impacts. The primary purpose of this effort is to avoid penalizing in-fill

development, which often generates LOS impacts in urbanized areas with limited opportunities where such impacts are not easily mitigated.

For the City of Riverside, the primary benefits of SB 743 will occur as development and redevelopment occurs in areas such as the Downtown, where a traditional traffic analysis would likely generate a long list of intersection and roadway impacts based on the application of LOS criteria. As such, the use of VMT instead of LOS could reduce traffic impacts for projects in the Downtown. The City could potentially apply the provisions of SB 743 to streamline or incentivize development in the Downtown. This streamlining will change how the City evaluates traffic impacts under CEQA.



### **Local Economic Opportunities**

The local business opportunity associated with this measure would be associated with new development. Land owners in areas could benefit from additional development, leading to higher land prices. Contractors could also benefit as they are hired to build new buildings and redevelop existing buildings. The economic benefits for this strategy would likely be similar to T-8 and T-9.

### **Other Community Co-Benefits**



## LOCAL WATER MEASURES

The following local measure is expected to reduce GHG emissions associated with the water sector.



### Measure W-1: Water Conservation and Efficiency

*Reduce per capita water use by 20% by 2020.*

**2020 GHG Reduction Potential: 10,748 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 10,748 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	N/A
Implementation Status:	In progress
Relative Cost Effectiveness:	High
Synergy with RRG-EPAP:	Low
Ease of Implementation:	High
Responsibility:	RPU in conjunction with Community Development Department, Planning Division
Objectives:	Prior to 2020: Reduce per capita water use by 10% from baseline level by 2015 2020: Reduce per capita water use by 20%
Progress Indicators and Metrics:	NA
Local Co-Benefits:	NA
Alignment with Other City Efforts:	Complies with SBX7-7

SB X7-7 is part of a California legislative package passed in 2009 that requires urban retail water suppliers to reduce per-capita water use by 10% from a baseline level by 2015, and to reduce per-capita water use by 20% by 2020. GAP Goal 16 directly aligns with SB X7-7. In Southern California, energy costs and GHG emissions associated with the transport, treatment, and delivery of water from outlying regions are high. Therefore, the region has extra incentive to reduce water consumption. While this is considered a state measure, it will be up to the local water retailers, jurisdictions, and

water users to meet these targets. A number of policies have been established at the local level within the subregion requiring more efficient use of water, including landscape ordinances that require native or low-irrigation landscaping. Water retailers also offer resources that incentivize purchase of high-efficiency appliances and provide information on best management practices, landscaping, and the use of recycled and gray water systems.

While emissions reductions associated with water conservation efforts are likely, the emissions inventories conducted for the WRCOG Subregional CAP did not include a water emissions sector. To be conservative in estimating the RRG-CAP's emissions reduction potential, reductions associated with this measure are not quantified here. Future WRCOG and City of Riverside emissions inventory updates may include a separate water emissions sector, in which case it would be appropriate to estimate the reduction potential of water conservation efforts.

Current efforts by the City that aid in implementing this measure include adoption of the City's Water Efficient Landscape Ordinance (Riverside Municipal Code Chapter 19.570) in compliance with AB 1881 in 2009 and pending Draft Water Efficient Landscape Design Guidelines to be adopted 2014/2015. Other related Ordinances include Recycled Water Ordinance (RMC Chapter 14.28) and Water Conservation Ordinance (RMC Chapter 14.22). All of these efforts and more are outlined in the City's Urban Water Management Plan.



## Local Economic Opportunities

There is a wide array of products on the market that aim to enhance water use efficiency for households and businesses. RPU offers incentives for the installation of products that reduce water use, including low-flow shower heads, high efficiency toilets, and drip irrigation systems. RPU also offers incentives for installing water efficient landscaping, such as drought tolerant native plants, and for replacing grass areas with artificial turf. The City can partner with local vendors and installers to increase promotion of its incentive programs, while also increasing local business.

There are endless opportunities in the research and development of new water savings technologies, and the promotion of existing but less common technologies, as water scarcity and security continue to be a primary concern for California.

## Other Community Co-Benefits



## LOCAL SOLID WASTE MEASURES

The following are local measures that can be implemented to reduce GHG emissions associated with the solid waste sector.



### Measure SW-1: Yard Waste Collection

*Provide green waste collection bins community-wide.*

**2020 GHG Reduction Potential: 468 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 1,238 MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Gold
Implementation Status:	In progress
Relative Cost Effectiveness:	Low (Coordination with contracted waste hauler)
Synergy with RRG-EPAP:	Low
Ease of Implementation:	High
Responsibility:	Public Works
Objectives:	By 2020: Provide residential green waste bins for collection and transport to an organic waste processing facility. By 2035: Continue to provide yard waste collection services.
Progress Indicators and Metrics:	Achievement of 95% diversion of residential yard waste from landfill waste stream by 2020.
Local Co-Benefits:	Public health benefits, increase life of landfill
Alignment with Other City Efforts:	Aligns with GAP Goal 6 to implement programs to reduce waste by 75% by 2020.

The City will continue to offer green waste collection bins for residential yard waste. Diverting yard waste from landfills helps to extend the life of the City's contracted landfills. In addition, grass clippings and leaves can be composted into nutrient-rich topsoil amendments, and branches can be chipped into mulch for reuse in

landscaping. Removing beneficial organic materials from landfills also helps avoid the creation of landfill methane, a potent GHG.



### **Local Economic Opportunities**

This measure represents a continuation of current services. Opportunities for local composting and mulching services may exist for local service providers.

### **Other Community Co-Benefits**





## Measure SW-2: Food Scrap and Compostable Paper Diversion

*Divert food and paper waste from landfills by implementing commercial and residential collection program.*

**2020 GHG Reduction Potential: 571 MT CO<sub>2</sub>e/yr**

**2035 GHG Reduction Potential: 9,317MT CO<sub>2</sub>e/yr**

WRCOG Participation Level:	Gold
Implementation Status:	Implement targeted commercial composting program through 2020. Accept residential food scraps in waste bins by 2020. Implement mandatory commercial composting by 2020.
Relative Cost Effectiveness:	Low
Synergy with RRG-EPAP:	Medium
Ease of Implementation:	High
Responsibility:	Public Works
Objective(s):	Prior to 2020: 20% of businesses divert 90% of compostable waste from landfills By 2035: Accept residential food scraps in waste bins so that 90% of residents and businesses divert 75% of compostable waste.
Progress Indicators and Metrics:	20% of businesses divert 90% by 2020 90% of residents and businesses divert 75% by 2035
Local Co-benefits:	Public health benefits, increase life of landfills
Alignment with other City efforts:	Aligns with GAP Goal 6 to implement programs to reduce waste by 75% by 2020.

Food scraps are unwanted cooking preparation and table scraps, such as banana peels, apple cores, vegetable trimmings, bones, egg shells, meat, and pizza crusts. Compostable paper, sometimes called food-soiled paper, usually comes from the kitchen and is not appropriate for paper recycling due to contamination. Materials such as stained pizza boxes, uncoated paper cups and plates, used coffee filters, paper food cartons, napkins, and paper towels are all compostable paper. Food scraps alone represent nearly 20% of total landfilled solid waste statewide. Diverting these organic items from landfills helps to reduce landfill methane gas generation, and can help prolong the lifespan of area landfills.

The City would work with its waste hauler to accept food scraps and organic waste in residential green waste bins by 2020. The City would also implement a pilot food scrap and organic waste composting program to be implemented by businesses in special focus areas that could include Green Enterprise Zone(s), and other businesses throughout Riverside that are interested in participating. By 2035 the City would extend the commercial composting program to all businesses in Riverside.



### **Local Economic Opportunities**

The measure could create opportunities for businesses specializing in composting, and training companies to reduce their landfill waste by diverting compostable waste.

### **Other Community Co-Benefits**

