# PART 4: Climate Action Plan Strategies and Actions

A Sustainable Vision for the City of Merced

# PART 4: CLIMATE ACTION PLAN STRATEGIES AND ACTIONS

PART 4 of the City of Merced Climate Action Plan is a catalog of greenhouse gas reduction strategies and actions that were reviewed and selected by the Climate Action Plan Ad-Hoc Committee. PART 4 includes the following sections:

PART 4 includes the following topics:

- Sources of Greenhouse Gas Emissions
- Climate Action Plan Values and Goals
- Catalog of Recommended Strategies and Actions

***"Let's set broad common goals and allow an individual's creativity and know-how to define the specific ways to achieve them."***

- Brett Baker, member of the City of Merced Climate Action Plan Advisory Ad-Hoc Committee.

# SOURCES OF GREENHOUSE GAS EMISSIONS

## Greenhouse Gas Reduction Sectors

This section describes those sectors of the community from which greenhouse gas reductions are most likely to occur, and includes buildings, mobility (transportation), waste reduction, water conservation, and land use planning. In one way or another, most greenhouse gas reduction measures align with these sectors. This section concludes with a discussion of GHG emission reductions in local government operations. Strategies and actions to reduce GHG emissions from local government facilities and operation are listed in Appendix E.


## Buildings

Emissions associated with building energy use come from power generation that provides the energy used to operate the building. Power is typically generated by remote fossil-fuel powered electricity generating plants, or onsite generation by fuel combustion. Broadly speaking, the use of fossil fuels for

generating energy (including electricity, heating, transportation, and other uses) is the single largest contributor to greenhouse gas emissions and climate change. Emissions from buildings can be reduced by lowering the amount of electricity and natural gas required for building operations. Buildings can be made more efficient by upgrading insulation and installing low emissive glass, using high-efficiency lighting with timers and sensors, installing cool roofs, and simply adjusting heating and cooling levels. Alternative energy sources can be developed, such as installation of solar collectors, or landfill gas to energy projects. Equipment that heats and cools buildings can be upgraded to the most efficient models, as can computers, telecommunications, and office equipment. Water-wise landscapes can be installed to reduce water pumping costs and urban forests can be planted to reduce building cooling costs during Merced's hot summer months.

### Residential Retrofit Programs

**Charleston, SC was selected as a pilot city by the Home Depot Foundation's Sustainable Cities Institute to connect green jobs, economic development, and energy efficiency through a residential retrofit program.** [23]

***Urban Forest***

Trees reduce atmospheric carbon dioxide ($CO_2$) through sequestration and reducing GHG emissions by conserving energy used for space heating and cooling (Figure 1). Carbon sequestration is the process by which $CO_2$ is absorbed into roots, branches, and leaves, and stored as carbon. Tree shade reduces summer air conditioning demand. Lowered air temperatures and wind speeds from increased tree cover can decrease both cooling and heating demand. Many scientific studies confirm that trees and vegetation are valuable resources for cooling our communities. [24]

## Mobility (Transportation)

Automobiles are a leading cause of global warming. Nationally, the transportation sector is one of the largest sources of U.S. emissions, representing nearly one-third of total emissions. It's hard to visualize, but every gallon of gasoline burned emits 20 pounds of CO2, the principal global warming pollutant. Besides emitting greenhouse gases, transportation fossil fuels also produce a host of criteria air pollutants when combusted, reducing local air quality and affecting our health. Many local governments are increasing their jurisdictions' fuel efficiency by making alternative forms of transportation more accessible to residents and employees. [24]

### Complete Streets

**Boulder, CO has been working to create a complete street network for some time, completing over 350 miles of dedicated bike facilities, paved shoulders and a comprehensive transit network. Between 1990 and 2003, fewer people in the city drove alone, more people bicycled, and transit trips grew by an amazing 500%. The reduction in car trips has cut $CO^2$ emissions in Boulder by an impressive half a million pounds per year.** [36]

Transportation emissions can be reduced by improving pedestrian and bicycle infrastructure, enhancing public transit service, discouraging single-occupancy vehicle use, and improving the City's vehicle fleet, or by reducing the vehicle miles traveled. Land use is closely linked to transportation because it is the orientation of destinations that require us to travel. The Land-Use Sector is closely aligned with the Transportation Sector, and focuses on ways to support pedestrian and transit-oriented development, discourage sprawl, and to encourage compact urban forms.

## Waste Reduction

There are three main stages of product life-cycles, all of which provide opportunities for GHG emissions. These stages are: raw material acquisition, manufacturing, and waste management.


All products use inputs of *raw materials*, such as metal ore, petroleum, trees, etc. Extracting and transporting these materials entails the combustion of fossil fuels for energy, which results in emissions of carbon dioxide. These fossil fuels must be extracted themselves, which requires additional energy use.

*Manufacturing processes* that transform raw or recycled materials into products require the combustion of fossil fuels for energy. Again, energy use produces GHG emissions both directly from the combustion of fossil fuels and from the upstream energy used to obtain and transport those fossil fuels. In addition, some manufacturing processes release other GHGs.

If a product is not recycled at the end of its useful life, it goes through one of three *waste management* options: composting, combustion, and landfilling. All three produce GHGs to varying degrees. [51]

Waste prevention and recycling are potent strategies for reducing greenhouse gas emissions most notably by:


- Reducing methane emissions from landfills. The most common waste management practice, results in the release of methane from the anaerobic decomposition of organic materials. Waste prevention and recycling (including composting) divert organic wastes from landfills, thereby reducing the methane released when these materials decompose. Methane is 21 times more potent a GHG than carbon dioxide.

- Reducing emissions from incinerators. Recycling and waste prevention allow some materials to be diverted from incinerators and thus reduce greenhouse gas emissions from the combustion of waste. Combustion releases both carbon dioxide and nitrous oxide (a GHG that is 310 times more potent than carbon dioxide).
- Reducing emissions from energy consumption. Recycling saves energy. Manufacturing goods from recycled materials typically requires less energy than producing goods from virgin materials. Waste prevention is even more effective at saving energy. When people reuse things or when products are made with less material, less energy is needed to extract, transport, and process raw materials and to manufacture products. The payoff? When energy demand decreases, fewer fossil fuels are burned and less carbon dioxide is emitted to the atmosphere.
- Increasing storage of carbon in trees. Trees absorb carbon dioxide from the atmosphere and store it in wood, in a process called "carbon sequestration." Waste prevention and recycling of paper products allow more trees to remain standing in the forest, where they can continue to remove carbon dioxide from the atmosphere.

## Water Conservation

Nationwide, drinking water and wastewater systems cost more than $4 billion a year in energy costs to pump, treat, deliver, collect, and clean water – and the majority of this cost is paid for by municipalities. The energy costs to run drinking water and wastewater systems can represent as much as one-third of a municipality's energy bill and this is often the single largest utility expenditure for a city. [24] Water-Related Opportunities include water conservation measures applicable to both indoor and outdoor water use.

The *City of Merced 2010 Urban Water Management Plan* recommends that in order for the City to achieve the projected water conservation target of 20% reduction in water use per capita by 2020, the City should prioritize its efforts towards implementing its water conservation programs. These will affect both indoor and outdoor water use.

***Outdoor***

Energy use associated with pumping, treating, and conveying water generates indirect GHG emissions. The amount of energy required depends on both the volume of water and energy intensity associated with the water source. For example, it generally takes less energy to pump and convey water from a local source than to transport water across long distances. As a result, the GHG emission factor associated with locally-sourced water will also be lower. Indirect GHG emissions associated with water use can be decreased by reducing the water demand and/or by using a less energy-intensive water source.

The volume of water required for landscaping will depend on the area extent of landscaping, the specific watering needs for the type of vegetation, and the water efficiency of the irrigation system. A reduction in outdoor water demand can be achieved by designing water-efficient landscapes that include plants with relatively low watering needs, minimize areas of water-intensive turf, and include smart irrigation systems to avoid excessive water use

### Open Space Storm Drainage

**The US EPA awarded Sacramento County a half-million dollar grant to expand the River Friendly Landscaping Program a collaboration by the County, nonprofits, and other local government agencies to promote landscaping that helps conserve water and protect rivers. The competitive grant program funds local initiatives aimed at combating greenhouse gases and improving the environment.** [37]

***Indoor***

Similar to outdoor water use, indirect GHG emissions from indoor water use can be reduced by decreasing water demand or using a less energy-intensive water source. A project can reduce its indoor water demand relative to the baseline scenario by installing low-flow and high-efficiency water fixtures and appliances such as toilets, showerheads, faucets, clothes washers, and dishwashers.

## Land Use

The distribution of different types of land uses, their design, their accessibility, and their intensity can have profound effects on energy use, water use, and vehicle miles of travel. Increasingly, many communities are designed in such a way that residents are living farther from places of work, school, and services. This growth pattern fosters an increasing dependence on motor vehicles. This community design, commonly known as sprawl, translates into higher air and global warming pollution associated with higher rates of car travel.

Some local governments have moved forward with creative planning that has revitalized the urban core zones in their areas with transit-oriented, mixed-use, high-density development of brownfield sites. The results are vibrant, livable, walkable communities where local residents work, shop, and play, and which attract visitors and bring economic vitality along with quality of life. Strategies and actions that result in such communities save green spaces and money by cutting fuel, utility and infrastructure, and service delivery costs. [24]

### Dwelling Energy Efficiency

**Other factors being equal, attached and multi-unit housing units tend to use significantly less energy for heating and cooling compared to detached houses - by 20% or more, according to some estimates. [22]**

The planning that local governments undertake, namely the General Plan, and any specific Area Plans or Climate Action Plans, can form the basis for thoughtful and effective actions to reduce GHG emissions from local activities. When this planning is undertaken in concert with broader regional planning, such as "Blueprint" planning, regional transportation planning, and air quality planning, the impact of GHG reduction efforts is multiplied many times. PART 2 of the CAP discusses the role of these planning efforts, and how they interrelate to effectively respond to the challenge of climate protection. [16]

## GHG Emission Reductions in Local Government Operations[16]

The buildings, equipment, and infrastructure of local government all use energy. In general, newer purchases and installations tend to be more energy efficient, but there are plenty of opportunities to enhance efficiency and cut energy use. There are five core areas of local government operations that are responsible for GHG emissions. These include: Energy Use, Waste and Recycling, water delivery and wastewater treatment, transportation, and the built environment.

***Energy Use:*** Local governments can change the emissions profile of the energy they purchase from their energy providers. Public infrastructure such as street lighting and traffic signals can be upgraded with state-of-the art technology. Lifecycle carbon costs of maintaining infrastructure as diverse as roads, bridges, and transit facilities can be evaluated so that the least carbon-intensive materials and procedures are used.

***Waste and Recycling:*** To reduce emissions from their own operational waste stream, jurisdictions can enhance employee access to recycling, create purchasing guidelines to emphasize recycled materials, less packaging, and to avoid products that release more potent GHGs. Local governments also may operate or exercise contractual control over waste handling programs, depending on how these services are structured and provided in their jurisdictions. Emissions from this portion of the waste stream can be reduced through methane recovery, recovery of potent GHG from foam and refrigerant systems, and other adjustments to collection systems.

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

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


***The Built Environment:*** Commitments to highly efficient construction in their own new facilities is one way local governments can reduce carbon emissions from the built environment. Many local governments are building or retrofitting their facilities to LEED certification standards. The siting of new facilities is also an opportunity to improve access by employees and the public and reduce transportation-related emissions. In addition, when it establishes the building codes for its jurisdiction, local government has the opportunity to significantly alter the energy used in constructing, maintaining, and using the built environment.

# CLIMATE ACTION PLAN VALUES AND GOALS

## Sustainability and GHG Emission Reductions

In the prior section, the various sectors of GHG emission sources were described and include buildings, mobility (transportation), waste reduction, water conservation and land use planning. As sources of emissions, these sectors are also the areas from which GHG reductions occur. Reducing emissions in these sectors provide other valuable benefits to the community.

As discussed in "Climate Action Plan Values," a section of PART 2 of the CAP, City Staff and the Committee recognized the importance of Climate Action Planning *Co-Benefits* and their relationship to greenhouse gas reduction. Co-Benefits include values such as water conservation, livable communities, and clean environments, among others.

## Plan Values and Goals

The Climate Action Plan Ad-Hoc Advisory Committee believed it was important to emphasize the "what" part of the Plan, that is, the over-arching values and goals of the Plan that give implementers the vision and ability to add and adjust the Plan's specific strategies and actions over time within a broad guiding framework. Four values were identified, each supported by a set of goals, under which strategies and actions are set. Note that the goals closely align with the GHG emission and reduction sectors.

| VALUES | GOALS |
|---|---|
| *Healthy Communities* | Enhance Mobility of all Transportation Modes (EM)<br>Sustainable Community Design (SC) |
| *Quality Natural Resources* | Water Conservation and Technology (WC)<br>Protect Air Resources (AR)<br>Waste Reduction (WR) |
| *Clean Energy Resources* | Increase the Use of Renewable Energy Resources (RE)<br>Building Energy Conservation (BE) |
| *Leaders and Partners* | Public Outreach and Involvement (PO) |

# CATALOG OF RECOMMENDED STRATEGIES AND ACTIONS

## Introduction

Given the large number of local communities engaged in Climate Action Planning, along with the numerous sources of GHG emission sources, the variety and scale of sample strategies and actions to reduce greenhouse gas emissions is tremendous. City Staff and interns assembled GHG reduction measures and actions from a variety of sources, including suggestions from the Merced Climate Action Plan Ad-hoc Advisory Committee, to create a warehouse of ideas for use by the Committee and its assessment teams.

Among other resources, the *Merced Vision 2030 General Plan* contributed heavily to the CAP's strategies and actions. This internal consistency with the City's General Plan gives the CAP several strengths including: 1) being firmly grounded on established community values and adopted policies; 2) being able to tier off the Environmental Impact Report of the General Plan; 3) assurance that potential strategies and actions are not overlooked; and, 4) and implementation of the CAP satisfying multiple goals of the City.

## Final List of Greenhouse Gas Reduction Measures

Using this warehouse of ideas, City Staff prepared a draft set of greenhouse gas values, goals, strategies, and actions for Committee consideration. The selection was crafted using several tools including the *Context* and *Capacity* PARTS of this Plan, a consistency review with General Plan policies, and guiding comments made by the Climate Action Plan Ad-hoc Advisory Committee. The Committee provided comments through group discussion of concepts and specific measures, and assessment team workshops. In this later approach, the skill and knowledge base of the 18-member Committee was focused by creating small workgroups assigned to specific Goal Areas (Buildings and Energy, Transportation, Land Use, Waste Reduction, Green Initiatives, and Water Conservation), which correspond to GHG emission sectors of the City's 2008 Greenhouse Gas Emission Inventory.

Measures with small GHG emission reduction potentials were not rejected, because all actions to reduce GHG emissions will be necessary to achieve the City's target. Plan implementers should be aware of the GHG emission reduction potentials in balancing program objectives and resources.

## Overview of the Plan's Values, Goals, Strategies and Actions

This section contains a catalog of the Plan's strategies and actions. The Climate Action Plan includes detailed GHG reduction actions, which are cataloged under 4 Plan Values, 8 Goals, and 31 Strategies.


Among other resources, the *Merced Vision 2030 General Plan* contributed to forming the CAP's strategies and actions. This internal consistency with the City's General Plan enables the Climate Action Plan to tier off the Environmental Impact Report of the General Plan. The inclusion of the City's General Plan policies in this Plan also assures that potential strategies and actions are not overlooked, and efforts are not duplicated by City Staff resources.

### VALUES

Goals and General Plan policies that generally support efforts to attain these goals (Appendix F) are listed for each value. Other General Plan policies concerning these goals exist, but are more detailed and appear as strategies and actions.

### GOALS

For each goal, various strategies are listed along with a discussion of their relevance to Climate Action Planning.

### STRATEGIES AND ACTIONS

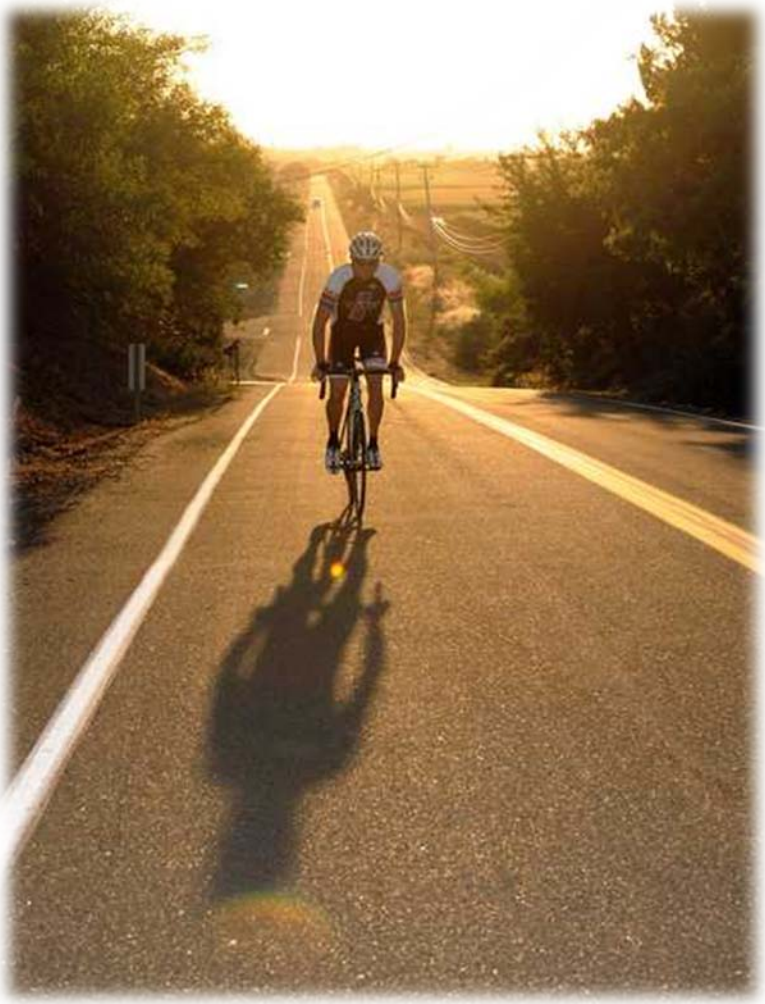
A listing of strategies and actions follow the introductory information about values and goals. Actions related to the review of development projects are not listed in this part of the Plan; they are grouped in Appendix E for convenient use by City Staff and the development community.

The numbering format of actions references an action's goal and strategy. For example, Action 4.3.1 is known as Action 1 of Strategy 3 of Goal 4.

## GHG Emission Reduction Targets by Goal

The Climate Action Plan Advisory Ad-Hoc Committee emphasized that the CAP should describe what success looks like through use of broad terms and descriptions. As one member put it, the Plan is about "what" more than "how." Such focus allows goals to be increased or reduced depending upon success of implementation, and it avoids a Plan that is too prescriptive, as future feasible actions are difficult to predict today. This approach also places higher value on incentive-based actions, enabling the diversity of community ideas and needs to form and implement actions without unrealistic outside pressures or directives.

In the Plan, this Committee guidance is expressed by use of high level values and goals. The goals are further emphasized in this section by matching them with supportive *Merced Vision 2030 General Plan* policies (Appendix F). The Plan's 31 strategies also describe what success looks like.



As an action plan, the CAP also includes numerous tangible actions that support the Plan's strategies, goals, and values, though it should be recognized that over time, actions will change and new ones will be added.

For each of the GHG reduction sectors (mobility/land-use, buildings, and waste reduction), the following GHG Emission reduction targets and associated amounts of CO2 equivalent apply to the Plan's eight goals.

# GHG REDUCTION TARGET – BY GOAL:

**HEALTHY COMMUNITIES**

***1.*** 21% of the GHG Emissions targeted for reduction will be accomplished through enhanced mobility programs and projects.

***2.*** 10% of the GHG Emissions targeted for reduction will be accomplished through sustainable land use designs and urban growth management.

**QUALITY NATURAL RESOURCES**

***3.*** 5% of the GHG Emissions targeted for reduction will be accomplished through water management practices.

***4.*** 10% of the GHG Emissions targeted for reduction will be accomplished through programs and actions that protect the quality of Merced's air resources.

***5.*** 1% of the GHG Emissions targeted for reduction will be accomplished through waste reduction programs.

**CLEAN ENERGY RESOURCES**

***6.*** 23% of the GHG Emissions targeted for reduction will be accomplished through utilization of renewable resources.

***7.*** 30% of the GHG Emissions targeted for reduction will be accomplished through energy conservation habits and equipment.

**LEADERS AND PARTNERS**

***8.*** The Public Outreach goal facilitates achievement of all targets and is not accounted separately.

## Continuing Public Involvement and Council Actions

After the CAP is adopted, specific actions will be developed by CAP leadership and presented for the City Council's consideration prior to actual implementation. The specific approach, partners, and funding sources will be detailed at that time. There is no evidence that either the voluntary or mandatory approach results in a better outcome. [25] This approach will allow for additional public involvement, refinement of ideas, and confirmation of support near the time the action would be implemented.

### IMPLEMENTATION DECISION-TREE

The Climate Action Plan is primarily a collection of existing City policy statements that foremost improve the community and secondarily, reduce greenhouse gas emissions. Implementation of the CAP's recommended actions is likely to involve citizens, elected and appointed officials. Adoption of the CAP does not automatically deploy actions for implementation.

The "Implementation Decision Tree" section found in PART 5 of the CAP, "Implementation," describes the process City Department heads and managers will use when taking steps to initiate implementation of the actions recommended in this plan. Please refer to that section for details.

# Value: Build Healthy Communities

**Goal 1**

**21% of the GHG Emissions targeted for reduction will be accomplished through enhanced mobility programs and projects.**

**Goal 2**

**10% of the GHG Emissions targeted for reduction will be accomplished through sustainable land use designs and urban growth management.**

# Goal 1: Enhance Transit, Pedestrian, and Bicycle Mobility (EM)

## Site Design Planning

Most developments are designed to provide the most direct and convenient access by car at the exclusion of other mode of transportation. It is possible to design sites in ways that encourage less polluting transportation modes and still support access by motor vehicle.

## Transit Planning

Cost effective, efficient public transportation is important in any effort to provide a level of service necessary to attract increasing public ridership. Through MCAG and the Merced County Consolidated Transit Agency, the City of Merced should continue to participate in planning efforts which promote improvements to the regional and local public transit systems.

The City is fortunate to have a central corridor, containing many of the major land use destinations within the urban area, aligned in general proximity to the length of "M" Street. These destinations would be convenient to a primary transit route on this roadway, and additional urban area destinations would be convenient to secondary or connecting routes on roads perpendicular to "M" Street. In addition, Bellevue Road/the Merced-Atwater Expressway and the Campus Parkway could provide connections to the "M" Street transitway, as well as a potential for future connections to regional facilities.

Just as the City's Downtown Transpo Center is a primary transfer station for public transit and private bus services, the area around any high speed rail station or other commuter rail system should accommodate all modes of public and private transit. The City will continue to work with the High Speed Rail Authority and Amtrak to create and expand such facilities.

Transit routes should serve industrial areas so that employees can reach their jobs by means other than the private automobile. The location of industrial areas and other major employment centers will be considered as transit routes are established.

## Bicycle Planning and Projects

Given Merced's attractive climate and flat terrain, bicycle transportation can be very effective. The City of Merced and Merced County have cooperated to develop an impressive regional bicycle system in the Merced/Lake Yosemite area. This has helped to place this area in a position to attract major cycling events. The bicycle system is also an important community and regional

### Bicycle Transportation

**In the City of Davis, 17% percent of all trips are taken on a bike. In San Francisco, the number of bike commuters doubled while the number of bike collisions declined.** [39]

recreational asset. Merced's bikeway and urban trail system has become a model for the region and an important element of the character of Merced. The system's use of the natural open space resources of the community has benefited the public and helped to preserve important open space lands. Bikeways and urban trails are an important element of the greenway system and provide linkages between other elements of the park system, public transportation, and residential and commercial areas throughout the City. The *2004 Park and Open Space Master Plan* and the City's *Bicycle Master Plan* address bikeway and trail systems.

## Pedestrian Planning

Providing a pleasant pedestrian environment can often be achieved with very little cost or effort. By making planning for pedestrian access an integral part of the circulation planning process, significant enhancements to pedestrian access within and around Merced's neighborhoods can be accomplished. Significant air quality benefits can be derived from promoting pedestrian-friendly environments. The City currently requires all streets to have sidewalks upon development. The City of Merced has also utilized safe routes to school funds to provide safety improvement around schools.

### Pedestrian Plans

**The City of Richmond cobbled together $350,000 of grant funds from a Caltrans Environmental Justice Grant and the Metropolitan Transportation Commission to get feedback from the community on how to shape the City's plan for greater safety and mobility for pedestrians and bicycle riders.** [38]

## STRATEGY EM 1.1: SITE DESIGN PLANNING

***STRATEGY:*** **Increase percentage of citizens that travel by walking, cycling, and by using transit services.**

ACTIONS FOR STRATEGY EM 1.1

**EM 1.1.1:** To be consistent with existing Air District requirements, encourage project designs which increase the convenience, safety and comfort of people using transit, walking, or cycling (General Plan Policy L-3.3 Implementing Action 3.3.a); adopt design guidelines.

**EM 1.1.2:** Encourage all subdivision street and lot designs, commercial site plans, and multi-family site plans to improve access by transit, bicycle, and walking (General Plan Policy L-3.3 Implementing Action 3.3.b); adopt design guidelines. Just a few examples of design options that could be recommended during design review include:

- Direct access to commercial centers from surrounding neighborhoods.
- Intra-development designs that incorporate integrated street patterns rather than designs which limit ingress and egress options to the development and restrict traffic to a limited number of arterials.
- Primary ground floor commercial building entrances should orient to plazas, parks, or pedestrian-oriented streets, not to interior blocks or parking lots as feasible.
- Promote the use of trees and plants in travel-way landscaping and residences.
- Building facades should be varied and articulated to provide visual interest to pedestrians.
- Street trees should be placed in planter strips or tree wells. Tree species should be selected to create a unified image for the street and provide an effective canopy.
- Sidewalks should provide an unobstructed path. Larger sidewalk dimensions are desirable in commercial areas where pedestrian activity will be greatest.
- Encourage the use of front porches, bay windows, and balconies which face onto the street to increase social interaction and provide heightened security for residential streets.
- Identify locations suitable for street furniture, and encourage its use.

### ACTION DESCRIPTIONS

***Site Design (EM 1.1.1):*** Create a user-friendly guide describing air quality friendly designs.

***Site Design Guidelines (EM 1.1.2):*** Review the City's development review procedures and modify, as appropriate, to include policies that accommodate access and internal circulation by alternative transportation modes. Develop design guidelines that illustrate preferred designs.

## STRATEGY EM 1.2: TRANSIT PLANNING

***STRATEGY:*** **Improve local transit service and ridership through proactive partnership with transit planners and providers.**

ACTIONS FOR STRATEGY EM 1.2

**EM 1.2.1:** Provide for and maintain a major transitway along "M" Street and possibly along the Bellevue Road/Merced-Atwater Expressway and Campus Parkway corridors (General Plan Policy T-2.1).

- Cooperate with Merced County and other interested agencies outside the City to maintain long-term flexibility to achieve an “M” Street Transitway (General Plan Policy T-2.1, Implementing Action 2.1.b).
- Cooperate with Merced County and other interested agencies outside the City to maintain a viable option for a Bellevue Road Transitway to provide regional public transit access to the University of California (UC) campus (General Plan Policy T-2.1, Implementing Action 2.1.d).
- Cooperate with Merced County and other interested agencies outside the City to evaluate the need to extend westward the Bellevue Road Transitway Corridor Concept (General Plan Policy T-2.1, Implementing Action 2.1.e).
- Plan for multi-modal transfer sites that incorporate auto parking areas, bike parking, transit, pedestrian and bicycle paths, and park and ride pick-up points (General Plan Policy T-2.2, Implementing Action 2.2.f).
- Encourage park and ride lots at suitable locations serving long distance and local commuters (General Plan Policy T-2.2, Implementing Action 2.2.g).

**EM 1.2.2:** Plan the area around new commuter, passenger, and mainline rail stations to provide convenient and safe pedestrian and bicycle access and connections to the transit system (General Plan Policy T-3.5, Implementing Action 3.5.c).

**EM 1.2.3:** Ensure that the Downtown is connected to the rest of the City through improved bus service, better bicycle and pedestrian connections, and enhanced connections between Downtown and Merced College and the UC campus (General Plan Policy L-2.8 - Implementing Action 2.8.c).

**EM 1.2.4:** Consideration should be given to provide attractive, efficient, and affordable means of mass transit between industrial areas and residential areas of the City (General Plan Policy L-2.4 - Implementing Action 2.4.c).

## STRATEGY EM 1.3: BICYCLE PLANNING AND PROJECTS

***STRATEGY:*** **Dramatically Increase the amount of facilities that support bicycle transportation throughout the City.**

ACTIONS FOR STRATEGY EM 1.3

**EM 1.3.1:** Utilize the urban stream system in the planning and design of bikeways and trails (General Plan Policy T-3.2, Implementing Action 3.2.a).

**EM 1.3.2:** Work with Merced County to establish connecting links to existing and planned inter-community bikeways. For example, provide a link between the City and County bikeway systems by establishing a connector to the Lake Road Bikeway Corridor out to Lake Yosemite (General Plan Policy T-3.2, Implementing Action 3.2.d).

**EM 1.3.3:** Develop an off-street bikeway and trail system in South Merced (General Plan Policy T-3.2, Implementing Action 3.2.e).

**EM 1.3.4:** Stripe 20 miles of bike lanes on existing City streets and 5 miles of Class I pathways by 2020.

**EM 1.3.5:** Implement the City of Merced Bike Plan, with particular focus on constructing safe, comfortable, continuous bike facilities that connect residential, workplace, commercial, school and recreation destinations.

**EM 1.3.6:** Update the *Bicycle Master Plan* to reflect the Climate Action Plan and to coordinate with Complete Streets and Safe Routes to School policies.

**EM 1.3.7:** Create an incentive-based program to encourage workplaces to provide destination amenities required by bicyclists, including: safe, secure, covered bicycle parking; and showers and lockers at workplaces.

**EM 1.3.8:** In addition to off-street Class I Bikeways and Class II Bike Lanes, explore designs and appropriate sites in Merced for bicycle use spaces to be located within street rights-of-way having limited exposure to vehicular traffic, such as sharrows, shared streets, and bike boulevards.

**EM 1.3.9:** Update the Official City Design Standards to be consistent with the Bicycle Master Plan, the *Merced Vision 2030 General Plan* and the *Climate Action Plan*, by inclusion of facilities such as: traffic signal sensors that detect bicycles, and signs beside and on the street that alert motor vehicle drivers to the presence and appropriateness of bicyclists on the street.

## STRATEGY EM 1.4: PEDESTRIAN PLANNING AND PROJECTS

***STRATEGY: Build Enticing Pedestrian Corridors***

ACTIONS FOR STRATEGY EM 1.4:

**EM 1.4.1:** **Healthy Community Pedestrian Master Plan / Development Guidelines.** Partner with the local health department to examine methods to assure and enhance walkability in new developments and in existing areas that could benefit from pedestrian-related improvements, and contribute this information to Action Item EM 1.1.2.

**EM 1.4.2:** **Merced Safe Routes to School Program.** In partnership with the local school districts and the local Building Healthy Communities organization, expand the City's Safe Routes to School Program to include the following elements:

- Maps for safe routes for all schools in the City limits;
- Host a walk to school day;
- Encourage regular walking to school through friendly competition;
- Produce and disseminate safe routes to school maps to parents;
- Partner in teaching how to drive a walking school bus; and,
- Track walking and biking to school. [45]

**EM 1.4.3:** **Shared Streets.** As part of a new pilot-program by the City to explore different ways to utilize right-of-way for multiple uses while saving money and creating livable communities, identify and construct a Shared Street.

**EM 1.4.4:** Provide drainage channels in transportation or canal easement areas to the extent feasible. Reflect the planned regional streets and open-space network to the degree possible when locating new future drainage facilities (General Plan Policy P-5.2, Implementing Action 5.2.a). **Green Streets.** Following the success of other communities, develop and implement a pilot program to create green streets.

**EM 1.4.5:** Adjust City Standards, where applicable, to assure construction of pedestrian-friendly neighborhoods and shopping districts (pedestrian amenities, street trees, transit facilities, etc.).

### ACTION DESCRIPTIONS

***Healthy Community Development Guidelines (EM 1.4.1):*** New data from the Centers for Disease Control (CDC) indicates that not only is the number of people with obesity, diabetes, and heart disease growing, the trends appear to be accelerating. UCLA Center for Health Policy Research estimates that 67% of Merced County adults are overweight or obese (ranking Merced County second in the State for obesity prevalence). To address this high rate of obesity, the Merced County Health Department may be interested in partnering with local planning departments to assure walkability in new development.

***Safe Routes to School Program (EM 1.4.2):*** Today only 13 percent of children walk or bicycle to school, as opposed to 66 percent in 1970. During the school year, much of the morning traffic can be attributed to parents driving their children to school. More parents drive their children as a result of increased congestion near schools, further aggravating the problem. These trends have serious implications for both childhood obesity and respiratory problems, which are both rising trends. Safe Routes to School programs promotes walking and biking to school in order to reduce pollution and promote children's health and community livability. For example, in Marin County, single student car trips dropped by 13 percent, saving over 4,250 one-way trips each day, since the program was instituted. [24]

***Shared Streets (EM 1.4.3):*** *Shared Streets* brings cars, bicycles, and pedestrians together to share the same space. Sidewalks and curbs are eliminated and vegetation and even art is extended into what is usually the domain of the automobile. Colored, patterned concrete is proposed to extend across intersections to emphasize the pedestrian character of the street. While these spaces are being created on alleys and other streets with light vehicular traffic, some cities, for example Sacramento, have created a shared street in the downtown that lines the convention center, two hotels, and several restaurants. [33]

***Green Streets (EM 1.4.4):*** Green Streets supports walking as a form of transportation and reduces urban runoff, the primary source of water pollution. For example, the City of Sacramento opened a five-block long project featured by a new storm-drain system that replaced the traditional curb-and-gutter whereby planter strips double as detention basins for storm-water runoff. In Portland, Oregon, green infrastructure has come out of the laboratory and into the mainstream as a legitimate and necessary strategy for controlling urban watersheds. Along with a diverse network of rain gardens, eco-roofs and strategically planted trees, Portland regards green streets as integral parts of its stormwater infrastructure. Through its pilot program, Portland has proved that street planters, curb extensions, and simple green strips in the medians along city streets can provide cost-effective peak flood reduction of 80+ percent, filtration of pollutants, groundwater recharge, soil rehabilitation, improved pedestrian safety, beautification of neighborhoods, and enough volume detention to increase home values and help alleviate the urban "heat island" effect. [34]

## STRATEGY EM 1.5: MOBILITY DEVELOPMENT REVIEW POLICIES

(Actions are listed in Appendix E)

## Goal 2. Sustainable Community Design (SC)

Many urban areas in the San Joaquin Valley are not conducive to walking, cycling, and transit use. Office developments have low employment densities and are often isolated from commercial services, forcing people to drive to eat lunch or to complete errands. High-density residential projects often have little if any commercial development nearby or discourage pedestrian access to commercial uses with block walls and large parking lots. The most common single-family lot size of 6,000 to 10,000 square feet leads to population densities too low to support frequent and direct transit service. The predominant suburban development patterns force all local trips for shopping, recreation, school, as well as commute trips onto the arterial street system. This leads to ever wider, more congested arterial streets which in turn discourage people from walking or cycling to even nearby destinations. To guide the City of Merced from these negative qualities, the City of Merced uses the Urban Village Concept, supported by General Plan goals, notably 1) create a compact urban form; 2) plan for and develop mixed-use projects; and, 3) maintain a high quality community appearance.

### COMPACT URBAN FORM / INFILL

Through the promotion of compact urban form, the City of Merced can achieve several important environmental and community planning goals. Through the concentration of urban development within the City's SUDP/SOI, impacts on surrounding agricultural resource lands can be reduced and important prime soils preserved. Additionally, through compact urban development, efficient public transit systems can operate to protect the region's air quality and pedestrian and bicycle use is encouraged. Compact urban development also reduces public infrastructure development and maintenance costs to the City and its residents, resulting in an efficient use of City resources.

#### Compact, Mixed-Use Communities Save Local Governments Money

**The Sacramento Area Council of Governments and Southern California Association of Governments have computer models that are capable of comparing the economic costs of current land use patterns to those planned under their adopted regional blueprint plans. They have employed this tool to calculate the cost of infrastructure under these scenarios. It is no small chunk of change! If their regional blueprints are implemented as planned, the 6-county Sacramento regions will save $16 billion by 2050. In the Los Angeles Region, the amount saved under blueprint is calculated to be $48 billion by 2050. Sprawling development patterns also cost more to serve, due to added fire and police services and infrastructure and street maintenance. One study by Burchell, et. Al. estimated these costs to be twice as much for low density sprawl as for compact development.** [46]

Multi-family developments are crucial to meeting the housing needs of Merced's growing population. They need to be located in appropriate areas where services are readily available to serve the needs of residents in an efficient manner.

## MIXED-USE / TRANSIT-ORIENTED DEVELOPMENT

The long term economic vitality of the City is enhanced by maintaining housing opportunities that accommodate a diversely skilled labor force. At the same time, residential development must have adequate and appropriate services which are accessible. The balance between job growth, housing opportunity, and services not only supports stable economic growth in Merced, it also reduces vehicle trips for work commutes and service, and enhances the overall quality of life for Merced residents. For example, by providing services adjacent to or within industrial areas so that employees do not have to leave the area to eat lunch or run errands, the number of noon hour auto trips may be reduced.

The fundamental building block of the Plan is the Urban Village, a compact, mixed-use district that will accommodate projected growth, maintain Merced's present quality of life and help ensure its continued economic vitality. Villages achieve these goals by encouraging pedestrian and transit travel, and by minimizing single-use, low density developments that generate traffic congestion, air pollution, a scarcity of affordable housing, monotonous landscapes and poor utilization of environmental and land resources. The City of Merced has established the "Urban Village" model (also known as "Transit Ready Development") as the basic design concept governing urban form in new growth areas. Its principles should be applied as much as feasible in new growth areas throughout the Merced urban area.

## GROWTH MANAGEMENT PLANNING

"Leap-frog development" tends to be cost-prohibitive in these times due to the high up-front costs of extending utility lines, streets, etc., across undeveloped properties to outlying areas. Such development should be discouraged in most cases because of the service inefficiencies it creates. Areas within the City's Area of Interest can be added to the City's SUDP/SOI in the future if the criteria described in GP Policy UE-1.6 have been satisfactorily addressed, however. The purpose of these criteria is to ensure that including additional land within the City's SUDP/SOI will not interfere with the timely development of lands that are currently within the City's growth boundary.

## COMMUNITY APPEARANCE

Over the years, the City of Merced has developed a unique physical character and civic flavor. The City's compact form, tree-shaded streets, well-kept neighborhoods and extensive open space areas have contributed to its charm and attractiveness. The Courthouse Square and re-energized downtown commercial center have maintained their human scale which enhances the small town flavor of Merced even though the City has grown significantly in recent years. To preserve and enhance this positive community appearance, the City has traditionally committed to a policy of civic improvement and beautification.

## STRATEGY SC 2.1: COMPACT URBAN FORM / INFILL

***STRATEGY:*** **Foster Compact and Efficient Development Patterns to Maintain a Compact Urban Form**

ACTIONS FOR STRATEGY SC 2.1:

**SC 2.1.1:** Encourage new development in downtown to capitalize on existing infrastructure, access to public transportation and local services and shopping, including new high-speed rail facilities.

**SC 2.1.2:** Encourage cleanup and development of "brownfields" and other unused or defunct properties near existing public transportation and jobs.

**SC 2.1.3:** Encourage development on infill sites by amending the Zoning and Subdivision Ordinances to better accommodate such requests (General Plan Policy UE-1.2. - Implementing Action 1.2.a).

**SC 2.1.4:** Work with Merced County to ensure that existing unincorporated Rural Residential Centers in the Merced area are not expanded and no new Rural Residential Centers are established (General Plan Policy UE-1.2. - Implementing Action 1.2.b).

**SC 2.1.5:** Rural Residential Center Annexations: Establish annexation policies and outreach program regarding the annexation of the existing Rural Residential Centers (existing development on one-acre lots) (General Plan Policy UE-1.5. - Implementing Action 1.5.d).

**SC 2.1.6:** Evaluate for Multi-Family Housing Development (General Plan Policy H-1.1. - Implementing Action 1.1.a).

**SC 2.1.7:** Conduct a survey of vacant lands through the Geographic Information System (GIS). Develop strategies and incentives for encouraging their development with appropriate uses, including expedited processing and reduced fees (General Plan Policy L-3.2. - Implementing Action 3.2.a).

### ACTION DESCRIPTIONS

***Higher Residential Densities (SC 2.1.1 and 2.1.2):*** The City will continue to promote the use of higher residential densities, especially small-lot single-family residential and multi-family residential, in order to make the most efficient use of land and maintain a compact urban form.

***Rural Residential Centers (SC 2.1.5):*** The City will establish policies and possibly an outreach program to address when Rural Residential Centers should be annexed and the level of services to be provided.

***Multi-Family Site Evaluation (SC 2.1.6):*** The City will complete an evaluation of vacant and underutilized parcels throughout the City to determine suitability and feasibility for potential multi-family development considering at least, but not limited to, location, size, circulation, and available

infrastructure. Staff will consider either an ordinance amendment to require development at a minimum density of at least 80 percent of permitted density or to encourage increased density through incentives such as reduced fees and priority processing. In addition, staff will work to educate the public and decision-makers about affordable housing, especially multi-family developments, to help alleviate "NIMBYism" when developments are proposed and to ensure decisions regarding developments are made based on adopted plans and policies.

## STRATEGY SC 2.2: MIXED-USE / TRANSIT-ORIENTED DEVELOPMENT

***STRATEGY:*** **Increase application of mixed-use land use and design concepts throughout the City.**

ACTIONS FOR STRATEGY SC 2.2:

**SC 2.2.1:** Encourage a diverse mix of commercial and service businesses that support the residents, and support the economic need of the community.

**SC 2.2.2** Encourage a mixture of complementary retail uses to be located together to create activity nodes and serve adjacent neighborhoods and to draw visitors from other neighborhoods and from outside the area (e.g. sports facilities).

**SC 2.2.3** Help bring about an expansion and diversification of the employment base to provide quality jobs for Merced residents.

**SC 2.2.4** Prepare an industrial development workforce housing nexus study.

**SC 2.2.5** Create a work/live ordinance to provide opportunities for reduced work-related commutes.

**SC 2.2.6:** **Village Core Zoning*:*** Create a new zoning category to correspond with the "Village Core Residential" land use designation for mixed densities in residential areas within walking distance of neighborhood commercial centers (General Plan Policy L-1.2 - Implementing Action 1.2.f). This code amendment should also include village commercial-core areas.

**SC 2.2.7:** **Business Park Zone:** Establish a new zoning designation called "business park" which would allow a mix of heavy commercial, "back office," and light industrial uses (General Plan Policy L-2.4 - Implementing Action 2.4.a).

**SC 2.2.8:** **Mixed Use Industrial Zone**: Consideration should be given to making changes to the Zoning Ordinance which allow for some commercial and service activities in and/or convenient to industrial areas (General Plan Policy L-2.4 - Implementing Action 2.4.d).

**SC 2.2.9:** **Bellevue Corridor Community Plan**: Create the Bellevue Corridor Community Plan.

ACTION DESCRIPTIONS

***Encourage Mixed Use Development (SC 2.2.1):*** Expand the use of mixed-use residential/office/retail developments in the City's core downtown and other appropriate commercial centers to support both affordable housing and economic development goals through priority permit processing. The City will also amend the Zoning Ordinance to allow residential uses as a principally permitted use in deference to the Redevelopment Agency's Preferred Land Use Map and Downtown Strategy and when mixed with commercial uses. The City will promote development consistent with the "Downtown Strategy." In addition, the City will consider an ordinance amendment to reduce the parking requirements for residential developments within the downtown area. The use of other incentives such as reduced fees, density bonuses, and a streamlined development process will be reviewed.

***Village Core Residential (SC 2.2.6):*** The Urban Villages Concept calls for higher-density residential developments within walking distance of village commercial cores. A wide range of densities, including small-lot single-family, townhouses, and apartments, can be allowed in these "Village Core Residential" areas to achieve an overall average density of at least 10 units per acre. This residential development will help ensure greater support for transit and the economic viability of the commercial uses. These principles should be applied to most of the City's new growth areas and financial incentives explored for promoting their use.

### Transit Village Redevelopment

**The City of Sacramento's 65th Street/Transit Village redevelopment project provides a 20-25 year plan for mixed use, transit-oriented development in East Sacramento. The goal of this project is to improve pedestrian and bicycle circulation, increase residents', shoppers', and workers' access to the city's light rail system and strengthen this neighborhood's connection to the nearby California State University, Sacramento. The project was examined using six different scenarios of varying densities and mixed uses. In 2003, the residentially focused, transit-oriented model predicted that households would drive 2,000 miles less per year compared to the existing zoning and existing use scenarios. This reduces each household's emissions by one ton of $CO^2$ yearly.** [24]

***Village Core Commercial (SC 2.2.6):*** The Commercial Core of the Village plan provides the focus for service, employment, recreation, and entertainment within each Village area. It is vital that these core areas contain ample space to accommodate all necessary uses and activities and at the same time be highly accessible to surrounding residential areas by non-vehicular means. Core Commercial areas must be adjacent to a future transit stop. Street-level retail space should form a pedestrian-oriented "main street" that is accessible from the surrounding Village without using an arterial road. Shopping malls and centers should face shops onto streets that connect to the surrounding neighborhood without large intervening parking lots. The design of Core Commercial areas should encourage shopping enroute to the transit stop or by office workers during the day.

***Create a Business Park Zone (SC 2.2.7):*** The *Merced Vision 2015 General Plan* introduced a new land use designation, "Business Park." Planned Development zoning has been used on an interim basis, but a "business park" zone should be established which would allow a mix of heavy commercial, "back office," and light industrial uses. By allowing this mix of uses, the number of auto trips may be reduced within these areas. The provision for limited retail could also be explored during this effort.

***Code Amendment to Allow Mixed Use Industrial Zones (SC 2.2.8):*** Because of increasing air quality and traffic concerns, it is becoming desirable to provide commercial and service activities convenient to industrial activities for easier accessibility by industrial employees. If restaurants, health clubs, daycare centers, auto services, some offices, and limited retail activities that draw primarily from industrial areas could be located conveniently to such zones, it could have substantial traffic and air quality benefits to the community as well as making it easier for industrial employees to conduct business, run errands, etc. without having to drive across town. The City currently does not encourage or even allow in some cases these kinds of uses. Changes to the Zoning Ordinance will be necessary to achieve this objective.

***Bellevue Corridor Community Plan (SC 2.2.9):*** Recently, the City of Merced received a planning grant from the California Strategic Growth Council to establish a plan focused on establishing implementation tools of a variety of sustainability themes, including:

- Develop "Complete Streets" General Plan Policies;
- Develop Urban Village Form-Based Code Concepts;
- Create Bellevue ROW Standard Design Templates; and,
- Create "Transit Priority Project" Sites, (per SB 375, CEQA is waived).

The Bellevue Corridor Community Plan (BCCP) has the potential to foster development models resulting in less GHG emissions than traditional suburban development patterns. The boundary of the BCCP abuts UC Merced, who has agreed to partner with the City in developing the plan.

## STRATEGY SC 2.3: GROWTH MANAGEMENT PLANNING

***STRATEGY:*** **Create Practical Tools to Implement Growth Management-related Policies of the City's General Plan.**

ACTIONS FOR STRATEGY SC 2.3:

**SC 2.3.1:** **Public Facilities Financing Plan and Public Facilities Impact Fees**: Consider changes to the Public Facilities Financing Plan and Public Facilities Impact Fee program to reflect lower fees for "in-fill" development and new development within the 2015 SUDP vs. areas being added to the SUDP/SOI in the 2030 General Plan (General Plan Policy P-1.3 - Implementing Action 1.3.f).

**SC 2.3.2:** **Infrastructure Encouragement Zones**: Adopt guiding language, based on growth management policies, that define the circumstances and methods for reimbursement of developer installed public infrastructure.

**SC 2.3.3:** Explore and develop incentives for high performance design and construction in the private sector.

### ACTION DESCRIPTIONS

***Public Facilities Financing Plan and Public Facilities Impact Fees (SC 2.3.1)***: The City should consider whether lower impact fees should be offered to those developments that are closer to current City infrastructure and services, such as "in-fill" development within the existing City limits and within the existing 2015 SUDP. This would discourage "leapfrog" development within the SUDP/Sphere of Influence. This would also be in keeping with greenhouse gas reduction and agricultural preservation goals to discourage City development far from existing infrastructure.

## STRATEGY SC 2.4: COMMUNITY APPEARANCE

***STRATEGY:*** **Maintain and Enhance the Unique Community Appearance of Merced**

ACTIONS FOR STRATEGY SC 2.4:

**SC 2.4.1:** Encourage joint City and County cooperation in establishing land use and development standards along all major gateways to the City (General Plan Policy UD-2.2, Implementing Action 2.2.a).

**SC 2.4.2:** Expand the City's programs for undergrounding utility lines and require all new utility lines to be placed underground (General Plan Policy UD-2.2, Implementing Action 2.2.e).

**SC 2.4.3:** Support merchant groups that initiate improvement programs that make commercial centers more attractive and more efficient (General Plan Policy UD-2.2, Implementing Action 2.2.h).

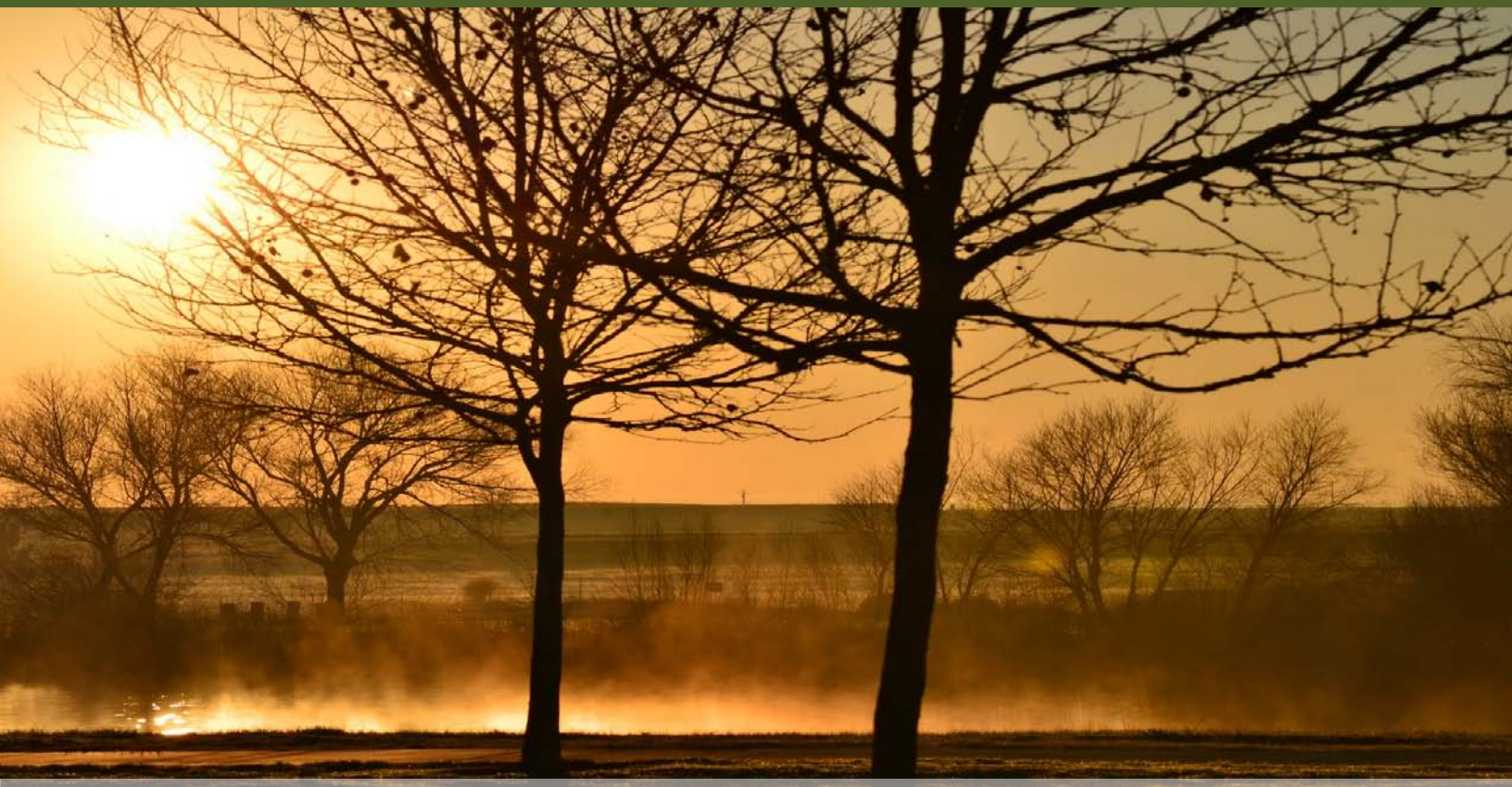
**SC 2.4.4:** Continue to support the long-term beautification and preservation of downtown commercial areas (General Plan Policy UD-2.2, Implementing Action 2.2.i).

**SC 2.4.5:** ***Revitalized Urban Villages:*** Use Urban Village Design Concepts in Neighborhood Revitalization Programs (General Plan Policy UD-2.1). Identify urban villages in older parts of Merced and revitalize them through application of Urban Village development concepts, by:

- Identify existing or potential neighborhood core areas that could serve as a Core Commercial area (General Plan Policy UD-2.1, Implementing Action 2.1.a).
- Evaluate public transit alternatives and service levels within existing neighborhoods (General Plan Policy UD-2.1, Implementing Action 2.1.b).
- Identify needed neighborhood level public and quasi-public service facilities within existing neighborhoods (General Plan Policy UD-2.1, Implementing Action 2.1.c).

## STRATEGY SC 2.5: COMMUNITY DESIGN DEVELOPMENT REVIEW POLICIES

(See Actions listed in Appendix E)



# Value: Quality Natural Resources

**Goal 3**

**5% of the GHG Emissions targeted for reduction will be accomplished through water management practices.**

**Goal 4**

**10% of the GHG Emissions targeted for reduction will be accomplished through programs and actions that protect the quality of Merced's air resources.**

**Goal 5**

**1% of the GHG Emissions targeted for reduction will be accomplished through waste reduction programs.**

## Goal 3. Water Conservation and Technology (WC)

The *City of Merced 2010 Urban Water Management Plan* recommends that in order for the City to achieve the projected water conservation target of 20% reduction in water use per capita by 2020, the City should prioritize its efforts towards implementing its water conservation programs. The CAP seeks to reduce water-related emissions from three activities: 1) water conservation and technology; 2) reduced pumping, and, 3) creating water efficient landscapes, all of which seek to sustain water supplies for use with successful businesses and attractive landscapes, while reducing maintenance costs and higher user fees due to higher demands on a shrinking water supply.

### Water Conservation and Technology

The *City of Merced 2010 Urban Water Management Plan* recommends that in order for the City to achieve the projected water conservation target of 20% reduction in water use per capita by 2020, the City should prioritize its efforts towards implementing its water conservation and technology programs.[8]

Conservation efforts focus on practices and habits, and achievements can backslide, whereas technology places infrastructure which, over time, does not reverse gains. Both approaches are recommended.

Current programs include:

***School Education Program:*** The *Water Conservation School Education Program* requires water suppliers to implement a school education program that includes providing educational materials and instructional assistance. The City's school education program consists of speaking engagements at the City's grade schools and presence at Career Days at local middle schools, high schools, and colleges. The City also supplies local schools and colleges with materials illustrating water conservation tips and techniques. The City has committed to its public information program as an ongoing effort. [8]

***Water Waste Prohibition Program:*** The City implemented a *Water Waste Prohibition Program* (Ordinance 1842) on January 18, 1993, which prohibited the waste of water through prohibition of the following activities: (a) Washing of sidewalks, driveways, and other outdoor surfaces; (b) Washing of external building or trailer walls; (c) Non-recirculating fountains; and, (d) use of water from the City's distribution system for non-domestic purposes when another adequate source of water is available. The ordinance also includes mandatory conservation strategies, including replacement of broken plumbing fixtures and sprinklers, limited irrigation hours, and restriction of outdoor irrigation by day of week (based on odd and even street address). The ordinance also included a prohibition on waste of water for reasons not stated without reasonable purpose. Violators of the water conservation prohibitions can be penalized through disconnection or metering at the violator's expense.[8]

***Public Information Program:*** The *Water Conservation Public Information Program* consists of distributing information to the public through a variety of methods including brochures included with utility bills, press releases via radio and newspaper, school curriculum, educational flyers, commercials on television and in theatres, water conservation suggestions and videos on its webpage, and providing economical water conservation kits, low-flow shower heads or faucet aerators, toilet tank banks (water displacement devices), shower timers, and leak detection tablets. [8] The water outreach and education program involves participation and education at local community events, such as the County Fair, the weekly Summerfest, Earth Day Celebration, and Dia del Nino. [9] The City has committed to its public information program as an ongoing effort.

***Leak Detection and Repair Program:*** The water distribution system consists of approximately 280 miles of pipe. The City's program involves leak detection and repair focusing primarily on areas with a high probability for leakage. The City repairs approximately 100 leaks per year, although this number was as high as 800 leaks per year while the City transitioned from polybutylene service lines to copper. Since the 2005 UWMP, the City has completed a program to replace all polybutylene service connections with copper connections. As part of the replacement program, pipelines nearby to the failing polybutylene service connections were also surveyed and repaired as needed. Leaks are repaired in a timely manner, whether they are service line or main-line leaks. The City's distribution system also contains some sand-cast water mains which City operations staff plan for replacement in coordination with street upgrades. [8]

***Water Metering Program***: Since 1992, the City has required meters on all new service connections to allow billing by volume of use. All commercial businesses are on water meters, and almost all multifamily residential dwelling units and public parks are metered. Approximately half of the 20,000 residential customers are on a water meter, while the other half is receiving water at a flat rate. As of 2009, the City maintained approximately 9,787 water meters, which represents approximately half of the total connections in the service area. The City classified these meters into the following categories: 6,797 single family residential, 1,519 multi-family residential, 1,144 commercial/institutional, 34 industrial, and 293 landscape irrigation. [8] The State of California mandates that by 2025, all residential dwellings be metered; the City's goal is to make that happen by 2015. [9]

***Residential Plumbing Retrofit Program:*** The *Residential Plumbing Retrofit Program* consists of installing physical devices to reduce the amount of water used or to limit the amount of water that can be served to the customer. In accordance with State law, low-flow fixtures have been required on all new construction since 1978. In addition, State legislation enacted in 1990 requires all new buildings after January 1, 1992, to install Ultra-Low-Flush Toilets (ULFT). Several studies suggest that water use savings resulting from miscellaneous interior retrofit fixtures can range between 25 and 65 gpd per housing unit. The studies also suggest that installation of retrofit fixtures in older single-family homes tend to produce more savings, while newer multi-family homes tend to produce fewer saving per housing unit. The City offers free low-flow shower heads and other types of low flow retrofit kits to customers at public outreach events and at the Finance and Public Works counters upon request. [8]

## Reduce Groundwater Pumping

Groundwater pumping costs and emissions can be reduced by using other water sources and by retaining pumped water otherwise lost to leaks.


By using surface-water for uses such as landscape maintenance, the City can reduce its demand on regional groundwater supplies and reduce associated GHG emissions to run water pumps. The existence of the MID irrigation system agricultural water use system in the expanding urban area provides a significant future opportunity for the City to develop innovative means of landscape maintenance in addition to meeting some of the area's groundwater recharge needs.

The development of expanded wastewater treatment systems should incorporate beneficial use of treated wastewater.

## STRATEGY WC 3.1: WATER CONSERVATION AND TECHNOLOGY

***STRATEGY:*** **Reduce per capita water use by 20% by 2020, in part, through Water Conservation Efforts.**

ACTIONS FOR STRATEGY WC 3.1:

**WC 3.1.1:** Continue implementation and enforcement of the City's Water Shortage Regulations (General Plan Policy OS-5.1, Implementing Action 5.1.a).

**WC 3.1.2:** Implement a voluntary *Residential Water Audit Program* to all customers within the City of Merced.

**WC 3.1.3:** Enhance the existing *Residential Plumbing Retrofit Program* through increased retrofits and rebate efforts to all customers within the City of Merced.

**WC 3.1.4:** Implement a voluntary *High Efficiency Washing Machine Rebate Program* to all customers within the City of Merced.

**WC 3.1.5:** Implement a voluntary *Conservation Program for Commercial, Institutional, and Industrial (CII) Accounts* to all customers within the City of Merced.

**WC 3.1.6:** Consider a tiered water rate structure within the City of Merced.

**WC 3.1.7:** Implement a voluntary *Residential Ultra-Low-Flush Toilet Replacement Program* to all customers within the City of Merced.

**WC 3.1.8:** Implement the *Large Landscape Conservation Program* for city-owned properties.

**WC 3.1.9:** Enhance the existing *Water Metering Program* through incentives and/or ordinance for all City of Merced customers who are not currently connected to a water meter.

### ACTION DESCRIPTIONS

***Water Audit Program (WC 3.1.2):*** This program consists of offering water audits to single-family and multi-family residential customers. Audits include reviewing water usage history with the customer, identifying leaks inside and outside the home, and recommending improvements. [8]

***High Efficiency Washing Machine Rebate Program (WC 3.1.4):*** This program provides financial incentives, typically in the form of rebate offers, to qualifying customers who install high-efficiency washing machines in their homes. Merced Irrigation District (MID), within whose service area the City's service area falls, operates a high efficiency washing machine rebate program for their electricity customers. The program offers a $75 rebate for purchase of an energy saving clothes washing machine or dishwasher. While the program is a part of MID's energy conservation rebate program, MID estimates the washing machines provide a water conservations savings of 40 percent when compared to conventional clothes washing machines. In addition, PG&E offers a similar rebate to its customers in the

area. The program offers a $50 rebate for purchasing a high efficiency clothes washer, and up to $125 on qualifying clothes washers. All clothes washers much meet specific PG&E efficiency requirements. [8]

***Conservation Program for Commercial, Institutional, and Industrial (CII) Accounts (WC 3.1.5):*** This program consists of ultra low flush toilet (ULFT) replacements in commercial, institutional, and industrial (CII) facilities and either surveys of water use for CII accounts or performance targets for CII accounts. Additional CII related conservation programs may involve turf fields, smart irrigation timers, and industrial process water use reductions. [8]

***Tiered Water-Rate Structure (WC 3.1.6):*** While the City implements commodity metering for all commercial, industrial, and multifamily customers, the City's rate structure does not currently implement a tiered rate structure. The City plans to consider a tiered rate structure during its upcoming rate study.[8]

***Residential Ultra-Low-Flush Toilet Replacement Program (WC 3.1.7):*** This program will provide incentives for voluntary replacement of existing toilets with ULFTs. State legislation requires the installation of efficient plumbing in new construction and, effective in 1994, required that only ultra low flow toilets (ULFTs) be sold in California.[8]

***Water Metering Program (WC 3.1.9):*** This enhanced program applies to retrofitting any existing unmetered connections. Most of the City's unmetered connections are to single family residential (SFR) homes. Prior to implementing this Strategy, the City will evaluate two options for retrofitting existing unmetered connections. The first option is a program to replace all unmetered connections and the second is an ordinance to require retrofit upon title transfer.[8]

## STRATEGY WC 3.2: REDUCE GROUNDWATER PUMPING

***STRATEGY:*** **Reduce per capita water use by 20% by 2020, in part, through increased use of water from non-groundwater sources to reduce the need for groundwater pumping.**

ACTIONS FOR STRATEGY WC 3.2

**WC 3.2.1:** Pursue innovative programs to reduce the demand for potable ("drinkable") water (General Plan Policy P-3.1, Implementing Action 3.1.a).

**WC 3.2.2:** Perform a *System Water Audit* when all customers are connected to meters.

**WC 3.2.3:** Reach a long-water term transfer agreement with the Merced Irrigation District for the exchange of tertiary treated wastewater effluent for canal surface water.

**WC 3.2.4:** Work cooperatively with MID to preserve and enhance its surface water delivery system (General Plan Policy P-3.2, Implementing Action 3.2.b).

**WC 3.2.5:** Explore the use of MID water resources for applications that do not require treated water to reduce demand on the regional groundwater supplies and reduce costs of water treatment (General Plan Policy P-3.2, Implementing Action 3.1.c).

**WC 3.2.6:** Consider the Use of Reclaimed Water to Reduce Non-Potable Water Demands Whenever Practical (General Plan Policy P-4.2).

- Consider conducting a reclaimed water market study to identify potential users (General Plan Policy P-4.2, Implementing Action 4.2.b).
- Consider preparing a plan for the use of reclaimed water which evaluates the facilities and costs required to serve potential users, determines required capacities of facilities, and presents an implementation plan (General Plan Policy P-4.2, Implementing Action 4.2.c).
- Explore the use of distributed reclaimed water improvements for local industrial, commercial, and residential buildings, such as the collection of rainwater and use of gray-water, as well as state regulations that would support or hinder subsequent efforts by the City to implement such improvements.

**WC 3.2.7:** Increase water storage capacity to allow for off-peak pumping of water.

**WC 3.2.8:** Examine the benefits of energy efficiency of water delivery and treatment systems by: 1) Upgrade the mechanical and electrical systems at water and wastewater facilities; and, 2) Participate in local energy efficiency incentive programs to upgrade pump efficiency.

### ACTION DESCRIPTIONS

A ***System Water Audit (WC 3.2.2)*** is a process of accounting for water use throughout the municipal water system in order to quantify the unaccounted-for water. Unaccounted-for water is the difference between metered production and metered usage on a system-wide basis. As the City is not fully metered, a system-wide audit has not yet been performed, and the City has no knowledge of when the last system-wide water audit was conducted.[8]

***Water Transfer Agreement (WC 3.2.3):-*** The City of Merced and the Merced Irrigation District (MID) are considering a long-term transfer agreement for the exchange of tertiary treated wastewater effluent for MID canal water (surface water). Under this scenario, the City would use surface water from the Merced River to irrigate City parks. The potential transfers or exchanges provide the benefit of reduced groundwater pumping, which could help the City achieve its greenhouse gas and water conservation targets. MID is currently charging $1,000 per acre to connect parks and schools to MID canal water.[8]

## STRATEGY WC 3.3: WATER EFFICIENT LANDSCAPES

***STRATEGY:*** **Reduce per capita water use by 20% by 2020, in part, through water efficient landscapes.**

ACTIONS FOR STRATEGY WC 3.3:

**WC 3.3.1:** Consider value in performing landscape audits for large commercial customers.

**WC 3.3.2:** Examine the costs and benefits in reduced demand for potable water by converting industrial and irrigation demands to recycled water wherever practical and cost-effective.

### ACTION DESCRIPTION

The ***Large Landscape Conservation Program (WC 3.3.1)*** consists of assigning reference evapotranspiration (ETo) - based water budgets to accounts with dedicated irrigation meters and providing water-use audits to accounts with mixed-use meters. The City has placed an irrigation control system in the "G" Street Railroad Undercrossing Project that considers weather and ETo conditions to reduce water consumption. This technique can also be applied to large landscaped areas such as parks and landscaped medians.[8]

## STRATEGY WC 3.4: WATER CONSERVATION DEVELOPMENT REVIEW POLICIES

(Actions are listed in Appendix E)

# Goal 4. Protect Air Resources (AR)

## Reduced Vehicle Trips

In addition to the bike, pedestrian, and transit actions listed under the *Building Healthy Communities* value, there are multiple ways to reduce the number of vehicle trips in a community. For example, the shipping of food is energy intensive; increased demand and production of locally sourced foods can reduce shipping needs, support the local farm economy, and help to conserve local farmland.

## Clean Trips - Clean Vehicles


For those trips that cannot be reduced or replaced by less polluting methods, the emissions from these trips can be reduced, for example, by improved traffic flow and by limiting idling.

The City of Merced aspires to be a leader among cities when it comes to a Green Fleet. This City project will reduce the City's carbon footprint, conserve energy, and minimize expenses to the City's citizens as well as create higher-quality jobs.

The City's green fleet program includes staff development and purchase of electric and/or hybrid vehicles. The City will also purchase equipment for vehicle maintenance and will provide necessary maintenance and repair training for fleet staff. The City has taken delivery of 3 Ford Hybrid Escape vehicles as well as the delivery of 3 alternate fuel Garbage trucks in which the cost differential versus the purchase of gasoline-powered vehicles has been offset by EECBG grant funds. Eventually, forty seven diesel-powered trucks will be replaced by CNG or CNG hydraulic assist hybrids, and CMAQ funds through MCAG will purchase an additional 18 hybrid vehicles, all of which will be small SUVs or sedans. In addition, a portion of funds would go towards: 1) providing mechanic training of alternative power-fleet vehicles; and, 2) planning, policy change, and monitoring, for example, identifying ways to minimize emissions from vehicles that cannot be immediately replaced.

Merced is home to numerous truck routes and industrial parks that are utilized by heavy-duty trucks. While an early-action item of AB 32 seeks to reduce GHG emissions from these vehicles, local efforts can supplement state efforts.

## STRATEGY AR 4.1: REDUCED VEHICLE TRIPS

***STRATEGY:*** **Reduce per capita Vehicle Miles Travelled by 5% by 2020.**

ACTIONS FOR STRATEGY AR 4.1:

**AR 4.1.1:** Continue to support, encourage, and implement to the extent feasible, innovative employer-based trip reduction programs for their employees (General Plan Policy SD-1.5, Implementing Action 1.5.a). As a first step, by example, implement a Travel Demand Management program applicable to the City of Merced, using the City's participation in "eTRIP" (Employer Trip Reduction Implementation Plan) as a guide, and which should include:

- Support the use of teleconferencing and internet-based training opportunities in lieu of employee travel to conferences and meetings when feasible (General Plan Policy SD-1.5, Implementing Action 1.5.c).
- Make use of telecommuting programs as part of their trip reduction strategies (General Plan Policy SD-1.5, Implementing Action 1.5.d).
- Employee Incentives to take transit and carpool.
- Preferred parking for carpools.

**AR 4.1.2:** Encourage the development of state of the art communication infrastructure linked to the rest of the world (General Plan Policy SD-1.5, Implementing Action 1.5.e), for example, the Development Services Department's "Electronic Plan Check Project."

**AR 4.1.3:** Implementing "Complete Streets" policies to ensure the Needs of Bicyclists, Pedestrians, and the Disabled are considered in the transportation element of any new capital improvement or development project.

**AR 4.1.4:** Coordinate the different modes of travel to enable users to transfer easily from one mode to another.

**AR 4.1.5:** Increasing the use of ridesharing as an alternative to single occupancy driving.

**AR 4.1.6:** Complete the City's network of bicycle and pedestrian transportation routes and allow for new forms of non-motorized transportation (General Plan Policy T-2.9, Implementing Action 2.9.d).

**AR 4.1.7:** Explore the feasibility of establishing a local car-share program.

**AR 4.1.8:** Examine opportunities to reduce standard-design City rights-of-way and to receive the benefits made available by use of narrow streets.

**AR 4.1.9:** Work with MCAG to construct park-and-ride lots in the City and elsewhere to reduce vehicle trips.

**AR 4.1.10:** Encourage healthy food choices through the encouragement of farmers markets and community garden. (General Plan Policy SD-4.2, Implementing Action 4.2.b). Develop programs and policies to encourage community based farms and gardens, including demonstration projects

ACTION DESCRIPTIONS

***Employer Trip Reduction Implementation Plan*** ( eTRIP ) ***(AR 4.1.1)*** is a set of strategies an employer chooses that will encourage employees at worksites to use alternative transportation and ridesharing for their morning and evening commutes. Each eTRIP Strategy has a point value, and an employer's eTRIP needs to meet the point targets specified in the rule. The eTRIP is phased in over a period of three years. Phase 1 includes "Marketing" and "Program Support" strategies to increase program awareness to make ridesharing and alternative transportation easier for employees. The Phase 2 "Services and Facilities" strategy includes strategies deployed in the workplace so that employees are less likely to need to travel offsite for personal business during the workday. Phase 3, "Transportation, Alternative Schedules, and Incentives," includes a wide range of options such as comprehensive carpool and vanpool programs, monetary incentives for ridesharing, subsidized transit passes, and telecommuting.


Employers will submit Commute Verification results and eTRIP revisions by March 31, starting in 2015. As of July 2011, the following employers in the City of Merced have eTRIP programs: City of Merced Public Works; Golden Valley Health Center; McLane Pacific; City of Merced Civic Center; Merced County Human Services; Merced County Public Health; Merced County Administration; Merced Service Center + IS; AT&T; Malibu Boats, LLC *; and Fineline Ind. * (*have less than 100 employees).

***Development Services Department's Electronic Plan Check Project (AR 4.1.2):*** This project will develop, purchase, and administer an electronic plan review and document storage/retrieval system, to be integrated into the City of Merced's Inspection Service Division that will allow for all construction plans, building permits, requests for information, change orders, and other documents large or small to be submitted, reviewed for Building Code compliance, and returned electronically, alleviating the need for vehicle usage for pickup and delivery. Plan archival and retrieval, being stored electronically, would further reduce vehicle usage, thereby reducing emissions as well as providing various other energy efficiency savings and benefits.

***Carshare Programs (AR 4.1.7):*** Why buy, insure, and hassle storage and repair of a car when all you want to do is drive? For a vehicle use fee, these costs and activities can be managed by others, and allow you to enjoy the use of a car when you need it. For example, the City of Philadelphia and PhillyCarShare instituted a novel car sharing system that includes both local residents and government employees. The program replaced 330 municipal vehicles and saved the City $2 million each year. In the community, 1,200 citizen vehicles were replaced saving residents $5.5 million in costs and reducing vehicle travel by 8.2 million fewer miles per year. [24] Although Merced's population is low, there may be partnership opportunities to make a carshare program viable.

***Narrower Streets (AR 4.1.8):*** Research contracted by the LGC in the late 1990s demonstrated that in a hot summer climate, the temperature in a neighborhood with wide, unshaded streets can be ten degrees higher than in a similar neighborhood with narrow, tree-shaded streets. A lower ambient temperature can reduce or even eliminate the need for air conditioning. Other studies show how wide streets encourage speeding and increase pedestrian fatalities. In the Institute of Transportation Engineers (ITE) Journal in December 2002, a study entitled "Low Speed Design Criteria for Residential Streets" demonstrated how residential streets wider than 32 feet tend to increase speeds of motorists by three to four miles per hours per foot of additional width, and influence motorist to drive 30 to 40 mph in residential areas – a speed that could prove fatal to pedestrians if hit by a car. [32]

## STRATEGY AR 4.2: CLEAN TRIPS – CLEAN VEHICLES

***STRATEGY:*** **Deploy a Comprehensive Program to Reduce Vehicle Emissions**

ACTIONS FOR STRATEGY AR 4.2:

**AR 4.2.1:** **Green Fleet:** Fleet vehicle operators should evaluate alternatives which include replacing or converting conventional fuel vehicles with clean fuel vehicles as rapidly as feasible within the financial constraints of the City (General Plan Policy SD-1.5, Implementing Action 1.5.b), for example, the City's "Build a Green Fleet Program."

**AR 4.2.2:** Adopt a City-fleet fuel-efficiency standard and seek to meet standard by 2020.

**AR 4.2.3:** ***Traffic Signalization***: Particular effort should be placed on further improvement of traffic signalization to reduce stop-and-go traffic, which causes excess vehicle emissions from excessive idling.

**AR 4.2.4:** **Reduce Idling:** Identify actions that result in win-win outcomes for the community and community members, and implement through feasible and reasonable means, which may or may not include an ordinance amendment.

**AR 4.2.5:** Establish City Design Standards for traffic roundabouts sited on local and collector street intersections.

**AR 4.2.6:** Consider establishment of a policy of purchasing fuel efficient new City alternative-fuel vehicles.

**AR 4.2.7:** Retire or sell old and underutilized vehicles.

**AR 4.2.8:** Explore the use of "light vehicle" networks, such as neighborhood electric vehicle (NEV) systems.

**AR 4.2.9:** Explore methods, and implement where appropriate, actions to reduce heavy-duty diesel emissions. For example, support clean heavy-duty fleets by facilitating the conversion of heavy-duty trucks to clean fuels while also encouraging the provision of alternative fuel infrastructure and operational requirements.

ACTION DESCRIPTION

***Traffic Signalization (AR 4.2.3):*** Particular effort should be placed on further improvement of traffic signalization to reduce stop-and-go traffic, which causes excess vehicle emissions from excessive idling, such as signal synchronization. This program requires various strategies and equipment, including optimized signal timing, interconnected and coordinated signals, traffic-actuated signals, computer-based controls, channelized intersections, and additional turn lanes. These efforts will allow traffic to pass more efficiently through congested areas.

***Reduce Idling (AR 4.2.4):*** Consider various methods to reduce vehicle idling in the following sectors: commercial vehicles, delivery vehicles, construction vehicles, road design and operations. For example, the "G" Street Undercrossing Project significantly reduced idling from all sources.

## STRATEGY AR 4.3: REDUCE NON-VEHICULAR EMISSIONS

***STRATEGY:*** **Promote Opportunities for Residents to Benefit from Small-Engine Retrofit Programs**

ACTIONS FOR STRATEGY AR 4.3:

**AR 4.3.1:** Promote and participate in the Clean Green Yard Machine (CGYM) Program

ACTION DESCRIPTION

***CGYM Program (AR 4.3.1):*** The CGYM Program is a San Joaquin Valley Air Pollution Control District incentive program for San Joaquin Valley residents to trade in their existing, functional gasoline-powered lawnmower for a new cordless, electric lawnmower. In Fall 2010, the District distributed discount vouchers to residents in every Valley county to replace over 2,100 gas-powered mowers with new cordless, electric models at substantially reduced prices. In Spring 2011, the Board accepted $183,661 from the California Air Resources Board for the District's Clean Green Yard Machine program, bringing the total for the next phase of this successful lawnmower replacement program to $783,661 to provide more vouchers.

## STRATEGY AR 4.4: AIR RESOURCE DEVELOPMENT REVIEW POLICIES

(Actions are listed in Appendix E)

# Goal 5: Waste Reduction

## Reduce, Reuse, and Recycle


State law mandates that the waste stream be reduced significantly and that local governments implement programs and activities to accomplish this objective. The City of Merced deems that it is in the City's long term interest to support efforts to reduce the amount of solid waste deposited in the Merced County Regional Waste Management Authority's landfill sites and support private and public recycling efforts.

### Recycling Ordinance

**Since January 2005, by law, the City of Seattle has prohibited the disposal of certain recyclables from residential, commercial, and self-haul garbage. The recycling ordinance is aimed at eliminating recyclable or compostable paper, cardboard, aluminum cans, plastic bottles, and yard debris that had constituted approximately 25 percent of the city's garbage. The city hopes the ordinance will save residents and businesses as much as $2 million per year and keep future garbage costs low, as well as help to reverse the recent decline in Seattle's recycling rates. The Strategy is projected to achieve an annual reduction of 260,000 tons of eCO2. [24]**

## STRATEGY WR 5.1: REDUCE, REUSE, AND RECYCLE

***STRATEGY:*** **Continue Efforts to Increase the City's Waste Diversion Rate, and Aim to achieve a 65% Diversion Rate by 2020.**

ACTIONS FOR STRATEGY WR 5.1:

**WR 5.1.1:** Support the private sector, wherever possible, to develop methods for the reuse of inert materials (concrete, asphalt, and other building materials waste) which currently use valuable landfill space and increasing resource and material recovery from solid wastes (General Plan Policy P-6.1, Implementing Action 6.1.a). For example, establish "Building Materials Reuse Warehouse" for community construction and demolition use.

**WR 5.1.2:** If needed, find a location(s) for a local recycling drop-off center and household hazardous waste facility. Support community drop-off, buy-back, and collection.

**WR 5.1.3:** Develop a volunteer "Master Recycler" program open to the public, with field work, field trips, projects, and speaker series. Volunteers would promote conservation and recycling throughout the community by example and through outreach projects.

**WR 5.1.4:** Establish a reuse campaign for both businesses and residents establishing partnerships with and promoting thrift shops and reuse stores. Establish and/or promote materials exchange programs and include a program to divert bulky items from landfills.

**WR 5.1.5:** Implement the commercial recycling requirements of the Scoping Plan of AB 32.

**WR 5.1.6:** Implement the Green Code Construction and Demolition requirement to recycle construction materials. Support efforts to increase recycling rates as markets for these goods improve. Assist contractors and builders in locating C&D materials recovery facilities (MRFs), materials exchange opportunities, and other reuse and recycling sources.

**WR 5.1.7:** Develop a recycling program to provide recycling opportunities at special events; the City should implement such program at City sponsored or hosted events.

**WR 5.1.8:** Form a partnership with local schools and business that encourages waste reduction, recycling, composting, and food garden programs.

**WR 5.1.9:** Develop and implement a waste audit program.

**WR 5.1.10:** Within a reasonable period of time from adoption of General Plan, the City shall consider establishing incentives to foster increased participation in residential recycling and green waste diversion.

**WR 5.1.11:** Within a reasonable period of time from adoption of General Plan, the City shall consider instituting a program to evaluate major waste generators and to recommend recycling opportunities for their facilities and operations.

**WR 5.1.12:** The City shall continue to partner with the California Department of Recycling Resources and Recovery (CalRecycle) to participate in waste diversion and recycling programs such as the tire collection and recycling program, and community recycling education.

**WR 5.1.13:** Within a reasonable period of time from adoption of General Plan, the City shall consider instituting residential, restaurant, and institutional food waste segregation and recycling incentive-based program, to reduce the amount of organic material sent to landfills.

## STRATEGY WR 5.2: WASTE REDUCTION DEVELOPMENT REVIEW POLICIES

(See Actions in Appendix E)

# Value: Clean Energy Resources

## Goal 6

**23% of the GHG Emissions targeted for reduction will be accomplished through utilization of renewable resources.**

## Goal 7

**30% of the GHG Emissions targeted for reduction will be accomplished through energy conservation habits and equipment.**

# Goal 6: Increase the Use of Renewable Energy Sources (RE)

## Renewable Energy Systems

In the United States, heating, ventilation, and air conditioning (HVAC) systems account for over 25 percent of the energy used in commercial buildings and nearly half of the energy used in residential buildings. Solar heating, cooling, and ventilation technologies can be used to offset a portion of this energy.

Electricity generated from renewable energy sources is often referred to as "green power." Unlike fossil fuel-based power, these sources of energy emit no or low global warming pollutants. Green power can include electricity generated exclusively from renewable resources including wind, hydro-electric, or solar power - or electricity produced from a combination of fossil and renewable resources. Cities can source renewable energy through utilities offering green power programs, through the purchase of renewable energy certificates called Green Tags or by installing on-site renewable technologies, such as solar panels. [24]

The California Energy Commission's New Solar Homes Partnership (NSHP) is helping cities in their quest to use solar power with a new online toolkit that encourages local home buildings to install solar electric photovoltaic (PV) systems on new energy efficient homes, and includes case studies that document how cities have used the toolkit strategies successfully. For example, the NSHP recommends the use of an energy finance district authorized by AB 811, otherwise known as the PACE program, to fund solar energy projects. Local governments that establish AB 811 programs make low-interest loans to property owners for energy upgrades, then collect payments through property taxes. Because AB 811 programs are voluntary, property taxes remain unchanged for property owners that don't participate. [43]

## STRATEGY RE 6.1: RENEWABLE ENERGY SYSTEMS

***STRATEGY:*** **Increase Reliance on Local Renewable Energy Sources and Reduce Emissions by 50,000 $CO_2$ Equivalent Tons through this Strategy by 2020.**

SOLAR-RELATED ACTIONS FOR STRATEGY RE 6.1:

**RE 6.1.1:** Consider to develop a renewable energy strategy for residential, commercial, and industrial uses that encourages installation of solar energy systems (thermal and photovoltaic) through streamlined permit procedures, optional CALGreen Tier 1 measures, adoption of incentives, or a municipal finance district program that provides a low-risk option for property owners to invest in on-site renewable energy installations.

**RE 6.1.2:** Develop and implement solar hot water and space heating incentive program, consistent with recently-enacted Assembly Bill AB1470 and the California Solar Initiative solar water heating pilot program. Target 500 residential systems equivalent, with estimated savings of 500 metric tons per year.

**RE 6.1.3:** Explore methods to encourage new commercial and industrial land uses greater than a certain size to utilize on-site renewable energy systems to offset a minimum percentage of the projected building energy use. Renewable energy systems may include energy generated by solar, wind, geothermal, water, or bio-based energy capture systems.

**RE 6.1.4:** Work with MID, PG&E, and local solar businesses to offer incentives to install solar hot water systems for new pool installations or renovations.

BIO-FUEL-RELATED ACTIONS

**RE 6.1.5:** Install methane-powered electric generators at the City's WWTP when feasible. Take interim steps necessary to achieve this goal.

**RE 6.1.6:** Work toward enabling B20 Biodiesel to fuel parts of the City's Vehicle Fleet.

OTHER-RELATED ACTIONS

**RE 6.1.7:** Adopt zoning allowances for renewable energy generators, for example, residential wind power and solar panels.

**RE 6.1.8:** Encourage community partners to finance and install renewable systems on large-scale private facilities.

**RE 6.1.9:** Establish energy financing districts (AB 811); offer renewable energy system financing to small commercial properties.

**RE 6.1.10:** Explore options to allow a revolving loan fund for community investment in renewable energy.

**RE 6.1.11:** Examine possible regulations on construction of new peaker plants.

**RE 6.1.12:** Support geothermal and grey-water plumbing options for development projects.

ACTION DESCRIPTION

**Methane-Powered Electric Generators *(RE 6.1.5):*** The City of Merced performed a feasibility study to determine the potential uses of methane at the City's wastewater treatment plant (WWTP). Although methane-powered electric generators could not be constructed due to the configuration of the WWTP, it was feasible to install natural gas/methane-fired boilers, which was accomplished. The City of Merced aims to install a grease receiving station, but first needs to determine if adequate amounts of grease can be collected to make that goal feasible. If the grease receiving station is possible, then the City could reconsider fuel cells and microturbines using methane from the digesters.

### On-Site Energy Generation

**The energy savings incurred by the City of San Diego's Metropolitan Wastewater Department help maintain lower sewer rates for citizens while providing renewable electric energy to the region. Eight "digesters" at the Point Loma Wastewater Treatment Plant use heat and bacteria to break down the organic solids removed from the community's wastewater. One of the by-products of this biological process is methane gas, which is collected from the digesters and piped to the on-site Gas Utilization Facility. The methane powers two continuously running generators that can each produce up to 2.25 megawatts of electricity.** [24]

***Community Energy Investments (RE 6.1.1):*** The City's Public Financing and Economic Development Authority (PFEDA), though use of EECBG grant funds is providing a long term low interest loan to finance the purchase and installation of a Photo Voltaic (Solar) System for a new multifamily affordable housing construction project.

***Peaker Plants (RE 6.1.11):*** Peaker plants powered by fossil fuel-based power sources would emit GHGs to Merced's airshed. Achievements in GHG emission reductions through implementation of the CAP could be degraded by use of such plants, and some form of regulation should be explored. Some peaker plants are powered by renewable resources, however, which should be considered in any such regulation.

**B20 Biodiesel Fuel *(RE 6.1.6):*** Although the City's older fire trucks may not be capable of handling the biodiesel, and the City's fuel vendors don't yet provide B20 biodiesel fuel, the City's Fleet Manager states that the use of this alternative fuel is worth pursuing in the future.

### B20 biodiesel

**From fire engines to snowplows, all 77 of the vehicles in the City of Keene, New Hampshire's Public Works Department are running smoothly on B20 biodiesel. The fleet is fueled onsite at the department's pump. The biodiesel performs well in cold temperatures and has improved the air quality inside the fleet maintenance facility. The City has burned more than 4,400 gallons of biodiesel since 2002, which prevents an estimated 12 tons of CO2 from entering the atmosphere annually.** [24]

## STRATEGY RE 6.2: RENEWABLE ENERGY DEVELOPMENT REVIEW POLICIES

(Actions are listed in Appendix E)

# Goal 7. Building Energy Conservation (BE)

## GREEN CITY FACILITIES AND INFRASTRUCTURE

The City has an opportunity to lead by example and to partner with other local leaders, such as UC Merced, in this endeavor.

## ENERGY EFFICIENCY IN NEW DEVELOPMENT

*Merced Vision 2030 General Plan* Policy SD-3.2 encourages new residential, commercial, and industrial development to reduce air quality impacts from area sources and from energy consumption. This can initially be accomplished through incentive programs, through setting an example on public facilities, and required audits.

## COMMERCIAL AND INDUSTRIAL ENERGY PERFORMANCE

The building sector is the major consumer of energy in the U.S., using over one-third of all energy and two-thirds of electricity. Yet, it can be cost-effective to fix up almost any existing building to use dramatically less energy. New buildings can be ten-times more efficient than an ordinary building, existing ones, three-fold more efficient. Many businesses own their own building, but the majority rent space in someone else's building. Programs to reduce the carbon footprint of buildings should address both owner-occupied spaces and rental space, and match upgrade improvements with third-party funding sources and rebates. [54]

## Urban Forestry / Heat Island Effect

Early in the development of Merced, trees were planted to provide shelter from wind and summer heat. The City requires street and parking lot trees to be planted for all new developments. As a result, the City has a large number of mature trees along its streets, in public places and in private yards, and has been designated a "Tree City USA" for over 30 years. The City's urban forest provides valuable wildlife habitat and creates an attractive atmosphere for residents and visitors alike. Additionally, the City's trees substantially reduce summer heat and glare around paved areas, thereby helping the City maintain a cooler summer average temperature and reduce energy usage global warming pollution. [24]

## STRATEGY BE 7.1: GREEN CITY FACILITIES AND INFRASTRUCTURE

***STRATEGY:*** **Facilitate green building construction, renovations, operation, and maintenance at local government owned/operated facilities.**

ACTIONS FOR STRATEGY BE 7.1

**BE 7.1.1:** Complete Phase I of the Energy Retrofit Project of City Facilities and Assets (Siemens Project).

**BE 7.1.2:** For all new City buildings, perform a cost-benefit analysis to determine value in exceeding Title 24 (California Energy Efficiency Standards), and implement where appropriate.

**BE 7.1.3:** Consider use of renewable energy systems on City-owned facilities, providing assessment and options for City Council review and discussion.

**BE 7.1.4:** Consider use of daylight janitorial services.

**BE 7.1.5:** Implement an energy efficient standard procurement policy.

**BE 7.1.6:** Improve energy efficiency when replacing equipment, renovating, or constructing.

**BE 7.1.7:** Lighten colors of City building rooftops and street paving to reduce the "heat island" effect.

**BE 7.1.8:** Recover food waste in cafeterias and kitchens of local government buildings for composting or other use.

### ACTION DESCRIPTION

***Green Facilities Project (BE 7.1.1):*** The City, as an organization, is one of Merced's largest employers and provides a full array of community services. The City maintains a large inventory of assets, including buildings, parks, airport, water wells, wastewater treatment plant, and various pump systems. Recently, the City contracted with a performance-based contractor to audit energy consumption and retrofit City facilities, including building, water and sewer systems, and other assets.

The scope of the Green Facilities project is very broad, and is expected to result in construction/retrofit strategies worth well over $5 million. Using the performance-based contracting model, the project will be largely self-funded, with energy savings financing the construction and retrofit. The Project will result in energy efficiencies and reduction of greenhouse gas emissions through numerous upgrades:

1. Interior and Exterior Lighting Retrofits
2. Retrofit Approximately 5,644 Street Lighting with Induction Lamps
3. Software Controls Upgrades
4. Retrofit Heating, Ventilation, and Air Conditioning Mechanical Units

5. Retrofit Water Fixtures
6. Install Civic Center Window Film
7. Install Vending Misers
8. Retrofit Airfield Lighting Fixtures
9. Upgrade to Weather-Based Irrigation Controllers

The City's Green Facilities Project, which reduces emissions primarily from electrical sources, is estimated to result in a savings of approximately 3,474,790 kWh/year, or 825.9 tons/year of $CO^2$ equivalent. This equates to 162 cars removed from the road or 21,177 tree seedlings grown for 10 years. The above calculations do not account for reductions from natural gas, but it makes a minimal impact (~2% of overall lbs $CO^2$) according to the contracted energy engineer.

***Energy–Efficiency in New City Facilities (BE 7.1.2):*** This program seeks to raise the energy efficiency bar by constructing new City buildings to exceed Title 24 (California Energy Efficiency Standards), when economically feasible.

## STRATEGY BE 7.2: ENERGY EFFICIENCY IN NEW DEVELOPMENT

***STRATEGY:*** **Encourage new development to reduce significant GHG emission impacts through energy efficient building designs and siting.**

ACTIONS FOR STRATEGY BE 7.2:

**BE 7.2.1:** Implement the minimum CALGreen standards for energy efficiency, contained in 2008 Title 24 standards, effective January 1, 2010.

**BE 7.2.2:** Cooperate with the local building industry, utilities, and the SJVAPCD to promote enhanced energy conservation standards for new construction (General Plan Policy SD-3.2, Implementing Action 3.2.b), and to promote designs which greatly reduce the need for cooling.

**BE 7.2.3:** Update the City's Public Infrastructure Design Standards for new development to include energy-efficient equipment, for example, use of Light Emitting Diodes (LED) traffic lights.

**BE 7.2.4:** **Energy Efficiency Performance Code:** Consider establishment of an incentive-based development code (for example, increased dwelling-unit densities) in exchange for performance-based energy-efficiency measures, which may include the following and other methods:

- Automated control system for heating/air conditioning and energy efficient appliances;
- Utilize lighting controls and energy efficient lighting in buildings;

- Use light colored roof materials to reflect heat;
- Take advantage of shade (save healthy existing trees when feasible), prevailing winds, landscaping, and sun screens to reduce energy use;
- Install solar panels on carports and over parking areas;
- Increase building energy efficiency percent beyond Title 24 requirements. In addition implement other green building design (i.e., natural day-lighting and on-site renewable, electricity generation); and,
- Require that projects use efficient lighting.

ACTION DESCRIPTION

***City Design Standards (BE 7.2.3):*** City infrastructure uses electricity, usually related to lighting surfaces on roads, bridges, or bike paths, but also includes water pumps. This action would update the City's official Standard Designs to require energy efficient equipment, and thereby keep utility costs low for users of such infrastructure.

**Energy Efficiency Performance Code *(BE 7.2.4):*** This voluntary program would allow increased densities in specified areas of the City in exchange for performance-based energy-efficiency projects allowing the developers, architects, or contractor to decide how to meet the target.

## STRATEGY BE 7.3: RESIDENTIAL ENERGY EFFICIENCY

***STRATEGY:*** **Encourage retrofitting existing residential buildings and homes to achieve an overall 20% reduction in overall energy use by 2020.**

ACTIONS FOR STRATEGY BE 7.3:

**BE 7.3.1:** "Energy Independence Program": Explore use of an assessment district bond financing program to fund installation of renewable energy system and other efficiency upgrades.

**BE 7.3.2:** Provide Public Information on Preventative Maintenance and Energy Conservation (General Plan Policy H-2.1, Implementing Action 2.1.d).

**BE 7.3.3:** Energy Conservation: The City shall assist low-income homeowners and renters in securing energy audits through local utility companies (General Plan Policy H-2.1, Implementing Action 2.1.f).

**BE 7.3.4:** Energy Conservation and Weatherization: Through funding obtained from the Federal Stimulus Program or other funding sources, the City will initiate a program for low/moderate income families to provide weatherization materials such as weather stripping, outlet covers, and water heater insulating blankets (General Plan Policy H-2.1, Implementing Action 2.1.g).

**BE 7.3.5:** Work with the local real estate community to promote the benefit of point-of-sale residential energy efficiency audit and retrofits.

**BE 7.3.6:** Encourage energy efficiency audits for residences during major remodeling.

**BE 7.3.7:** Explore financing vehicle to residential sector for energy retrofits (investigate PACE and other options).

**BE 7.3.8:** Increase residential uptake of utility incentives for energy efficiency. Promote and utilize the statewide framework of Energy Upgrade California to centralize energy efficiency resources and financing for the community.

**BE 7.3.9:** Develop and launch program to incentivize renter-occupied and multi-family residential properties to implement energy efficiency strategies.

ACTION DESCRIPTION

***Energy Independence Program (BE 7.3.1):*** Despite rising state and national unemployment in 2009, construction-related jobs in Sonoma County increased 8.4 percent between January and September 2009. The surprising increase was achieved through a local program that allows property owners to finance energy efficiency, water efficiency, and renewable energy improvements through a voluntary assessment attached to the property, paid back through the property tax system over time, otherwise known as *Property Assessed Clean Energy Financing* (PACE).[41] The City of Merced's Energy Independence Program will likewise seek to create more jobs and lower utility bills for its residents.

***Energy Information Program (BE 7.3.2):*** Utilize Public Service Announcements (PSAs) and other information dissemination programs such as the City's website and monthly newsletter to educate the public on low-cost preventative maintenance, as well as energy conservation strategies they can take to prolong the life and quality of their home and reduce their long-term utility and maintenance costs. Continue provision and distribution of City's "Homeowner Preventative Maintenance" brochures and referral to local lender counseling programs.

***Energy Conservation Program (BE 7.3.3):*** Informational flyers will be provided at City offices and other public buildings to advertise funding sources to low-income homeowners and renters for making any necessary changes such as energy conservation fixtures and devices.

***Energy Conservation and Weatherization Program (BE 7.3.4):*** As part of the City's Energy Conservation and Weatherization Program, staff will arrange needed installation assistance for seniors and/or disabled individuals through local community groups, churches, the senior center, or service organization(s).

## STRATEGY BE 7.4: COMMERCIAL AND INDUSTRIAL ENERGY PERFORMANCE

***STRATEGY:*** **Retrofit existing commercial and industrial buildings to achieve an overall 20% reduction in overall energy use by 2020.**

ACTIONS FOR STRATEGY BE 7.4:

**BE 7.4.1:** Implement a "Green Building" Incentive Program.

**BE 7.4.2:** Implement a "Free Resource and Energy Business Evaluation" Program.

**BE 7.4.3:** Partner with local utility companies to ensure commercial properties maximize use of energy efficiency rebate programs.

**BE 7.4.4:** Establish PACE (AB 811) program and for commercial energy efficiency retrofit projects.

**BE 7.4.5:** Establish revolving loan fund for industrial energy efficiency project financing.

**BE 7.4.6:** Consider amending the Merced Municipal Code to include green building standards for substantially expanded and remodeled buildings.

ACTION DESCRIPTION

***"Green Building" Incentive Programs (BE 7.4.1):*** Buildings that use little or no non-renewable energy can be comfortable and affordable. Cities can encourage developers to build using energy efficiency standards, even if no regulations are in place. Many incentives to encourage developers to use best practices require little investment for the City. For example, cities can offer priority permit processing for building/developers who propose low-carbon projects, and advertising and recognition for developers who use energy efficient, or renewable energy technologies.

***Free Resource and Energy Business Evaluation (BE 7.4.2):*** Following the City of Chula Vista model, adopt an ordinance to encourage and assist local businesses to reduce their energy consumption and utility bills.

## Free Resource and Energy Business Evaluation

**The City of Chula Vista adopted an ordinance to encourage and assist local businesses to reduce their energy consumption and utility bills. The ordinance requires business to participate in an energy and water evaluation of their premises. It helps them identify energy efficiency and water conservation opportunities and take advantage of rebate, incentive, and financial programs for improvements solely at the business's discretion. For example, the State of California's, Energy Upgrade California Program (EUC), provides energy and water efficiency and renewable energy retrofits. The evaluations, which are offered at no cost, apply to licensed businesses with a physical storefront and/or office location. Businesses are encouraged, but are not required, to perform efficiency retrofits or improvements indentified through the on-site evaluation. In December 2009, 993 businesses received notices about the evaluations during calendar year 2010. By September 1st, 84% had scheduled or completed an on-site evaluation. Two-thirds of evaluated businesses reported that they are likely or very likely to make a change based on the free evaluation, and over 95% would recommend the program to another business.** [42]

## STRATEGY BE 7.5: URBAN FORESTRY / HEAT ISLAND EFFECT

***STRATEGY:*** **Improve and Expand the City's Urban Forest** (General Plan Policy OS-1.4)**.**

ACTIONS FOR STRATEGY BE 7.5:

**BE 7.5.1:** Work with local non-profit agencies, service clubs, and other voluntary organizations to plant trees and shrubs in appropriate areas throughout the City (General Plan Policy OS-1.4, Implementing Action 1.4.c).

**BE 7.5.2:** Consider amendments to City policies and ordinances where appropriate to implement the following actions of the Climate Action Plan:

- Large canopy trees should be carefully selected and located to protect the building(s) from energy consuming environmental conditions, and to shade 50% of paved areas within 15 years. Trees near structures act as insulators from weather thereby decreasing energy requirements. Trees also store carbon.
- Create guidelines that address the "urban heat island" effect by, e.g. requiring light-colored and reflective roofing materials and paint; light-colored roads and parking lots; shade trees in parking lots and shade trees on the south and west sides of new or renovated buildings.

**BE 7.5.3:** Develop and Implement a Merced Tree Planting Initiative for streets and parks to significantly increase the carbon storage potential of trees and other vegetation in the community. Plant at least 10,000 trees in Merced by 2020.

**BE 7.5.4:** Support the preservation and creation of conservation areas that provide carbon sequestration benefits, such as those with tree cover.

**BE 7.5.5:** Continue to enforce policies and programs that regulate the removal and replacement of trees.

### ACTION DESCRIPTIONS

***Tree Planting Initiative (BE 7.5.3):*** In order to rejuvenate some areas of the City that lack tree resources, funding should be sought to pursue a tree planting initiative to plant trees in strategic areas to employ the trees' energy efficiency and air pollution reduction benefits.

## STRATEGY BE 7.6: BUILDING ENERGY CONSERVATION DEVELOPMENT REVIEW POLICIES

(Actions are listed in Appendix E)

# Value: Leaders and Partners

## Goal 8

**The Public Outreach goal facilitates achievement of all targets and is not accounted separately.**

# Goal 8: Public Outreach and Involvement (PO)

## Community Resource

In addition to implementing programs to reduce its own carbon emissions, local government has an important role to play in bringing others to the table and helping them to reduce their GHG emissions. Local governments can develop public education and outreach programs, can establish public-private partnerships and programs to publicly recognize achievements, and offer incentives for actions that reduce GHG emissions.

Education and outreach programs would include events such as conferences, workshops, fairs, featured speakers, public service announcements, print messages, and online information or interactive sites. Ideally, topics will span a broad range, including the fundamentals of climate change and how our actions contribute to it, down to specific actions or projects, such as a "lights out" campaign, a "green tip of the day" or a how-to workshop on gardening with drought-tolerant, native plants.

## Support a Green Economy

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

Suggestions include supporting the local chamber of commerce, business associations, or business-focused civic groups to establish a forum to share efforts and results, such as newsletters or a monthly breakfast meeting or luncheon. Local government can also help establish demonstration projects, and can publicly recognize local leaders with awards or in public service messages. Incentives are another important tool to encourage actions that reduce GHG emissions in the near term. For example, public recognition can be a powerful motivator as can express permitting of projects on a "green project" list. [16]

## STRATEGY PO 8.1: COMMUNITY RESOURCE

***STRATEGY*: Engage Community Groups and Resources in Sustainability Programs**

ACTIONS FOR STRATEGY PO 8.1:

**PO 8.1.1:** Work with the local energy providers on voluntary incentive-based programs to encourage the use of energy efficient designs and equipment (General Plan Policy SD-3.2, Implementing Action 3.2.a). Form a local government partnership with local energy utilities to promote community-wide energy efficiency, similar to the VIEW Partnership that operates in Tulare County.

**PO 8.1.2:** Continue to coordinate implementation and planning of the Merced Bicycle Master Plan with the County of Merced and the University of California (General Plan Policy T-2.6, Implementing Action 2.6.a).

**PO 8.1.3:** Participate in resource and material recovery studies. Support Merced County Regional Waste Management Authority efforts to study the region's waste stream and develop recovery methodologies that will facilitate and promote enhanced recycling efforts and further reduce the volume of waste material deposited in landfill sites (General Plan Policy T-6.1, Implementing Action 6.1.c).

**PO 8.1.4:** Design and Implement an Energy Program Website for the City of Merced.

**PO 8.1.5:** Modeled after the "DoRight Leadership Corps", work with local education-based community partners to establish a youth program and a sustainability education curriculum that mobilizes youth action to create a sustainable future through education, business partnerships, legislative action, and public relations.

**PO 8.1.6:** Work with Merced County Community Action Agency to promote building insulation and weatherization.

**PO 8.1.7:** Launch a community-based "Cool Roofs and Pavement" campaign for private and public buildings and sites.

**PO 8.1.8:** Continue to support and facilitate implementation of the San Joaquin Valley Blueprint.

### ACTION DESCRIPTIONS

***DoRight Leadership Corps Sustainability Assessment (PO 8.1.5):*** The "DoRight Leadership Corps" was created in 2005 by educator Scott Beall. Working with middle and high school age youth, the DLC is both a youth program and a sustainability education curriculum that mobilizes youth action to create a sustainable future through education, business partnerships, legislative action, and public relations. One aspect of the DLC program is DoRight Enterprises – a youth run consulting firm that can conduct sustainability and energy efficiency audits. The City of Merced, in coordination with UC Merced and local school districts will pursue the formation of a local "DoRight Leadership Corps." [47]

***Cool Roofs (PO 8.1.7): -*** In warm climates, cool roofs can absorb less solar energy and quickly release any heat that they store. Simply replacing black or metal roofs with a lighter colored surface can reduce the need for air conditioning and produce huge annual cost and energy savings while decreasing global warming pollution at the same time. [24]

## STRATEGY PO 8.2: SUPPORT A GREEN ECONOMY

***STRATEGY*: Encourage and support GHG Reductions in the Business Community**

ACTIONS FOR STRATEGY PO 8.2:

**PO 8.2.1:** Work with local chamber of commerce offices to create a Green Business Challenge.

**PO 8.2.2:** Where appropriate, continue to encourage the efforts of the Greater Merced Chamber of Commerce REACON team.

**PO 8.2.3:** Seek to establish partnerships with area employers to work together to help meet the communitywide sustainability and related emission goals.

**PO 8.2.4:** Seek to implement a Green Business Program. Encourage local businesses and industries to benefit from local utilities energy-efficiency programs.

### ACTION DESCRIPTION

***Green Business Challenge (PO 8.2.1):*** The Challenge is a friendly competition to engage commercial property managers, office tenants, and others in the business sector to seek energy-related cost savings and energy efficiency, conserve water, reduce waste, and involve their employees in improving the environmental performance of their buildings and operations.[23]

***REACON Team (PO 8.2.2):*** The Greater Merced Chamber of Commerce recently created a REACON (Recycling, Energy, Air, Conservation) Team, modeled after the original REACON Team of the Greater Stockton Chamber of Commerce. The REACON Team (Recycling, Energy, Air Conservation) is a collaboration between the Greater Merced Chamber, private businesses, municipal and public agencies, economic development professionals, and the communities of Merced County. The REACON Team offers a free business-to-business service, which is an overall assessment of how a chamber member can implement cost-saving strategies on disposal services, energy usage, indoor air quality, and other services.

***Climate Partnerships* (*PO 8.2.3)*** are voluntary pacts among employers to take action to reduce their own emissions, and to work together to help meet the communitywide goal. Employers commit to take actions that will reduce their global warming pollution emissions while at the same time cutting costs, improving the work environment for their employees, and improving their record of corporate responsibility.

***Green Business Programs (PO 8.2.4)*** are partnerships of environmental agencies, utilities, and nonprofit organizations that assist, recognize, and promote businesses and government agencies that volunteer to operate in a more environmentally responsible way. To be certified "green," participants must be in compliance with all regulations and meet program standards for conserving resources, preventing pollution, and minimizing waste. The "Monterey Bay Area Green Business Program," is a local model that Merced may wish to utilize.

## STRATEGY PO 8.3: SUPPORT SUSTAINABLE NEIGHBORHOODS

***STRATEGY*: Garner the efforts of local neighborhood groups to initiate energy efficiency actions.**

ACTIONS FOR STRATEGY PO 8.3

**PO 8.3.1:** **LEED Neighborhood Planning:** Consider various options for establishing a neighborhood planning process by which the concerns of specific neighborhoods can be addressed through neighborhood plans (General Plan Policy L-1.8, Implementing Action 1.8.c).

**PO 8.3.2:** Create a Community-Climate Action Challenge Program or Campaign.

**PO 8.3.3:** Development of the Sustainable Community Strategy (SCS) by the *Merced County Association of Governments* provides an opportunity for community collaboration and planning as to how to reach the state-imposed target of reaching a 5% per capita reduction of GHG emissions through reduction of vehicle miles travelled by 2020. This effort is significant because communities that do not meet the state threshold may experience loss of transportation funding.

**PO 8.3.4:** **Revitalized Urban Villages*:*** Seek opportunities, such as the Martin Luther King Jr. Way Revitalization Plan Project, to use the urban village to rejuvenate existing neighborhoods.

ACTION DESCRIPTION

***LEED Neighborhood Planning (PO 8.3.1):*** When staffing levels allow, the City's long-standing desire to establish a neighborhood planning program, should strive for a high-level of public participation at the neighborhood level, and should be founded on discussions of LEED Neighborhood Planning concepts in order to focus the discussion and results toward sustainable planning, including energy efficiency.

***Community-Climate Action Challenge Programs or Campaigns (PO 8.3.2)*** are voluntary and aim to raise public awareness about climate change and to encourage households and businesses to reduce their emissions pollution. The process is about taking small steps to reduce energy use, at home and on the road, to help create sustainable communities. For example, the City of Burlingame's "Community 10 percent Challenge Program" is achieving an estimated annual reduction of 1,500 tons of CO2 in the residential sector alone. [24] Another example is the *One Day Campaign* in Vancouver, British Columbia, which has established partnerships with youth, community groups, and business leaders. [24]

***Sustainable Community Strategy (PO 8.3.3):*** As it applies to SB 375, the California Air Resources Board adopted "placeholder" GHG emission reduction targets of 5% from 1990 levels by 2020 and a 10% reduction by 2035 for the San Joaquin Valley, and that this amount of emissions would primarily come from reducing vehicle miles traveled. NOTE: These targets may change in Fall 2012. During the Plan project period (2012-2020), the Merced County Association of Governments, with input from the City of Merced, will prepare a *Sustainable Community Strategy* (SCS) as part of the update to the Merced County Regional Transportation Plan (RTP). The SCS will define in greater detail how trips will be reduced countywide.

## Public Outreach

**"Greening Greenfield," a citizen group working with the town of Greenfield, MA reached its goal of signing more than 900 households up for its 10% Challenge Campaign, which asks residents to commit to making small changes to save energy and money in their homes, businesses, and transportation choices. As a result, average household energy use in Greenfield has decreased from 3.1 percent to 12.8 percent over the past four years, depending on the type of fuel used.** [23]

***Revitalized Urban Villages (PO 8.3.4):*** Urban Village development policies and principles can result in improved neighborhood environments, reduced traffic congestion, and better and more cost effective service delivery systems. Although some existing neighborhoods in Merced contain certain elements of the Urban Village, some service and infrastructure improvements could enhance these "Villages." Through the use of the Specific Plans, existing neighborhoods could be revitalized utilizing modified Urban Village policies, programs, and standards.