CHAPTER

2 THE PLANNING PROCESS

STRATEGY

- The average carbon footprint for people in the United States is 20.4 metric tons
- The average for people in industrial nations is about 11 metric tons
- The average worldwide carbon footprint is about 4 metric tons
- The worldwide target to combat climate change is 2 metric tons

Source: Nature Conservancy, Carbon Footprint Calculator

The City of Citrus Heights is addressing the consequences of increased greenhouse gas (GHG) emissions related to both municipal and communitywide activities. In tandem with a focused update of the General Plan, the City will adopt a greenhouse gas reduction plan (GGRP) to reduce GHG emissions and meet the City's emission reduction target for 2020.

The City's approach to addressing GHG emission reductions within the General Plan is parallel to the climate change planning process being followed by more than 50 other California jurisdictions. This process includes:

- completing a baseline GHG emissions inventory and projecting future emissions;
- identifying a communitywide GHG reduction target;
- preparing a GHG reduction plan to identify strategies and measures to meet the reduction target;
- identifying targets and reduction strategies in the General Plan and evaluating the environmental impacts of the GGRP in the General Plan EIR; and
- monitoring effectiveness of reduction measures and adapting the plan to changing conditions.

GHG Baseline Inventory

The purpose of a GHG baseline inventory is to identify and categorize the major sources of GHG emissions produced by community residents and businesses and municipal (City) operations.

A GHG emissions inventory was conducted for each incorporated city in Sacramento County, including the City of Citrus Heights, and the unincorporated area of Sacramento County (County) for the year 2005. In 2009, the Citrus Heights GHG emissions inventory was further refined to revise emission levels related to on-road mobile sources, off-road mobile sources, wastewater treatment, and high Global Warming Potential (GWP) gases to adjust for emissions directly attributable and influenced by the City.

The baseline inventory identified a communitywide emissions total of 543,727 metric tons of carbon dioxide equivalent (MT CO_2e) emissions[1]. The baseline includes both communitywide emissions (i.e., those emissions attributable to all sources in the community) and municipal emissions (i.e., those emissions directly attributable to City government operations).

Table 2-1 and Figure 2-1 show the communitywide GHG baseline for 2005.

What is a ton of carbon?

A ton of carbon is released when you:

- Travel 5,000 miles in an airplane, (e.g., a roundtrip between Sacramento and New York).
- Drive 2,500 miles in a medium-sized car, (e.g., driving one-way from Sacramento to New York.)
- Cut down and burn a tree that was about one foot in diameter and 40 feet tall

Adapted from Nature Conservancy, Carbon Footprint Calculator

What is a metric ton of carbon dioxide equivalent?

Carbon Dioxide Equivalency is a conversion method used to express the global warming potential (GWP) of multiple GHGs using a consistent unit of measurement, metric tons of carbon dioxide equivalent (MT CO_2e). The measurement is expressed in terms of the amount of carbon dioxide (CO_2) that would have the same GWP as the mixture. For example, methane is twenty-five times more potent than carbon dioxide, giving it a GWP of 25.

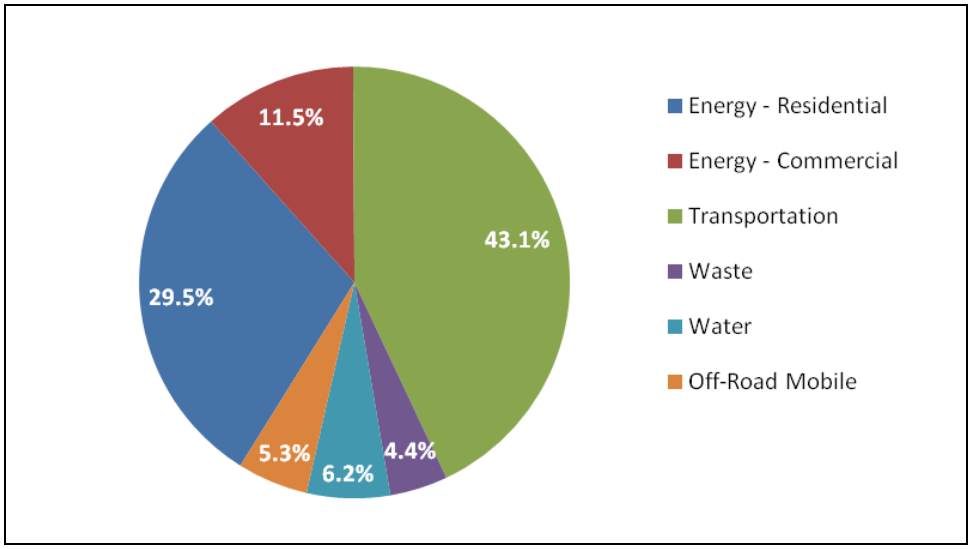
[1] The original emissions inventory identified a total of 578,134 MT CO_2e within the Citrus Heights Community.

Table 2-1:
2005 Communitywide Greenhouse Gas Emissions Baseline

Communitywide Emissions Sector	2005 Baseline Emissions	
	MT CO_2e	Percent
Residential Energy Use	160,429	29.5%
Commercial Energy Use	62,553	11.5%
On-road Mobile sources (Transportation)	234,231	43.1%
Off-road Mobile sources	28,877	5.3%
Solid Waste	23,679	4.4%
Wastewater Treatment	30,433	5.6%
Water Use-related	3,525	0.6%
Total	**543,727**	**100%**

Notes: CO_2e = carbon dioxide equivalent; MT= metric tons.
Off-road mobile-source emissions are related to emissions from off-road motor vehicles such as boats, agricultural equipment, off-highway vehicles, lawn and garden equipment, and rail.
Source: Data compiled by AECOM from the City of Citrus Heights Greenhouse Gas Emissions Inventory 2009.

2005 Communitywide Greenhouse Gas Emissions Baseline **Figure 2-1**



Note: Water and wastewater emissions are reported together within the water sector
Source: Sacramento County 2009, AECOM 2010.

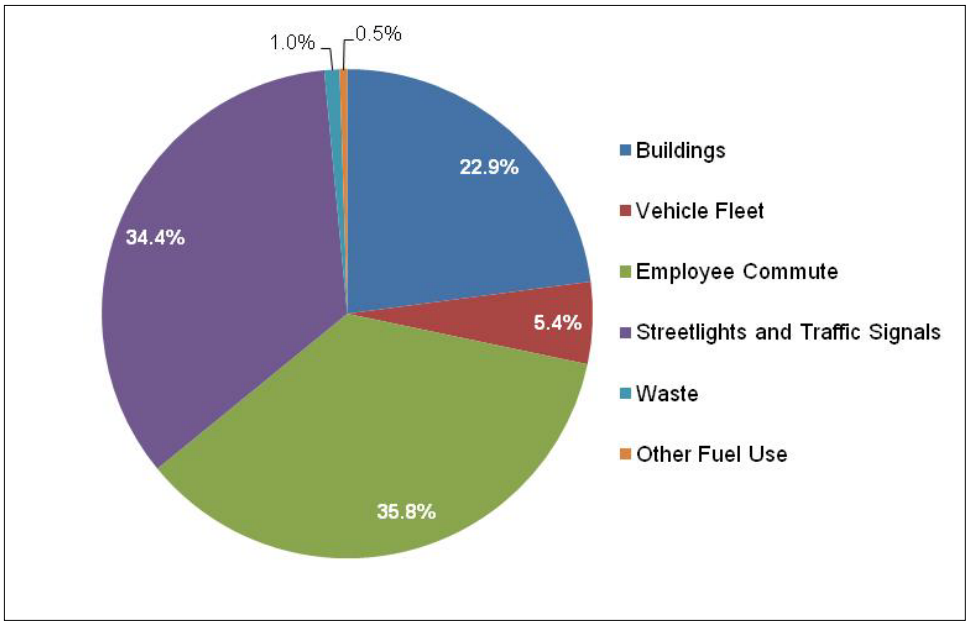
Table 2-2 and Figure 2-2 show the municipal operations GHG baseline for 2007. The municipal inventory divides emissions among government buildings, streetlights and traffic signals, vehicle fleet, employee commutes, and methane emissions from waste generated by government operations and placed in landfills.GHG emissions from municipal operations are considered a subset of total communitywide emissions.

Table 2-2
2007 Municipal Greenhouse Gas Emissions

Municipal Operations	MT CO_2e	Percent
Buildings	603	22.9%
Vehicle Fleet	143	5.4%
Employee Commute	945	35.8%
Streetlights and Traffic Signals	908	34.4%
Waste	25	1.0%
Other Fuel Use	14	0.5%
Total	**2,638**	**100%**

Notes: CO_2e = carbon dioxide equivalent; MT= metric tons.
Source: Data compiled by AECOM from the City of Citrus Heights' Greenhouse Gas Emissions Inventory prepared by Sacramento County 2009.

2007 Municipal Greenhouse Gas Emissions Baseline **Figure 2-2**



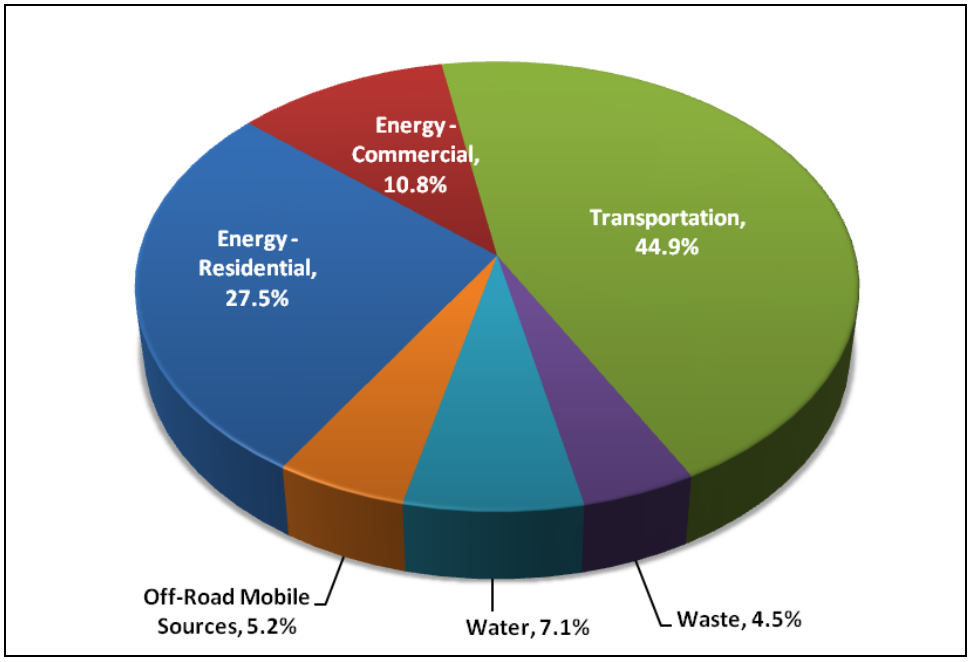
Source: Sacramento County 2009, AECOM 2010.

Business-as-Usual GHG Projection Scenario

Under a forecasted business-as-usual scenario, the communitywide emission levels will increase by approximately 2% between 2005 and 2020. Therefore, by 2020 the communitywide emissions will be 556,396 MT CO_2e to accommodate the General Plan's 2020 population of 92,949. Assuming that current practices continue, the community's GHG projection is made up of primarily transportation and energy-related emissions. GHG emissions from driving in the community and energy use in residential and commercial buildings add up to approximately 83% of the total projected emissions. The rest of the projected growth in GHG emissions comes from off-road mobile sources, waste, water and wastewater sectors.

Figure 2-3 illustrates the 2020 business-as-usual GHG projection for the various sectors identified in the community inventory.

2020 Business-as-usual GHG projections **Figure 2-3**



Note: Water and wastewater emissions are reported together within the water sector
Source: AECOM 2010.

GHG Emission Reduction Target

Adopting an emission reduction target is an important step in assessing the effectiveness of the GGRP. In comparison to many other California jurisdictions, Citrus Heights is nearly built out, and a significant number of residents work in adjacent cities. However, approximately 60% of Citrus Heights' residential units and much of its commercial building stock were built prior to implementation of California's Title 24 Energy Efficiency Standards. Understanding this context, the City's baseline inventory, and business-as-usual projections led to establishment of a reduction target. On February 17, 2010, the Citrus Heights City Council recommended a communitywide reduction target of 10% to 15% below 2005 baseline emission levels by 2020.

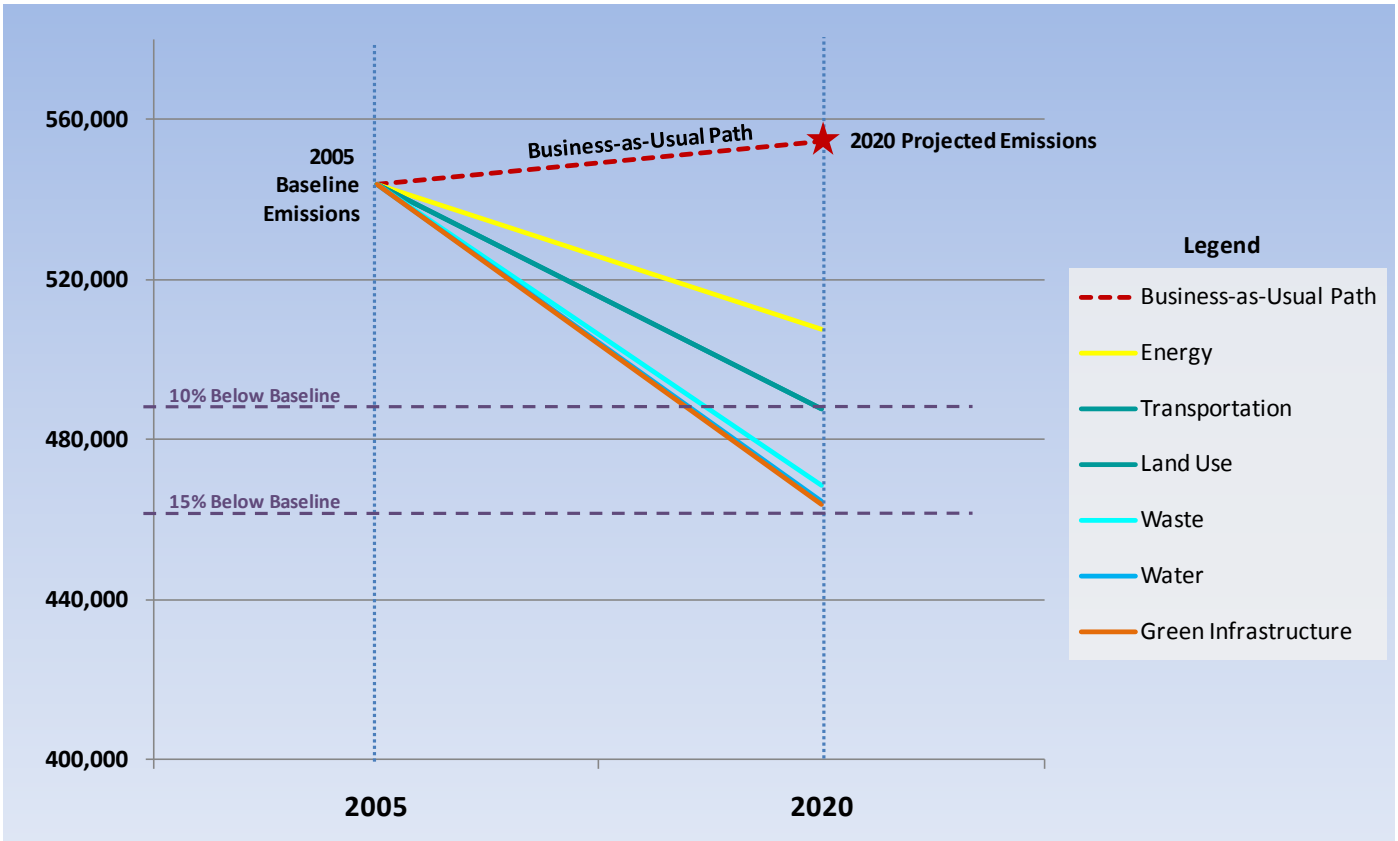
Together, the adopted measures within the GGRP have the potential to reduce approximately 87,267 MT CO_2e emissions per year (equivalent to a 13.7% reduction below 2005 levels) and achieve the City's adopted emission reduction target of 10% to 15% below 2005 baseline emissions level by 2020. Figure 2-4 demonstrates how the reduction potential of various strategies cumulatively helps to achieve the target.

To attain a target of 10% to 15% below 2005 GHG emissions while accommodating projected growth through 2020, the Citrus Heights community needs to reduce total GHG emissions by 65,225 to 92,812 MT CO_2e.

This is approximately equivalent to:

- Taking about 13,300 to 18,600 cars off the road for a year (assuming that an average car emits 11,000 lbs of carbon per year, and one pound of carbon is released every mile)

Greenhouse Gas Reduction Potential **Figure 2-4**



Statewide Greenhouse Gas Reductions

Statewide reductions from implementation of Assembly Bill 1493, Low Carbon Fuel Standards (LCFS) and the Renewable Energy Portfolio Standard (RPS) were also considered during the development of the GHG emission reduction target. The California Air Resources Board (ARB) estimates that implementation of GHG emission reduction standards for new passenger cars, pickup trucks and sport utility vehicles as described in AB 1493 will achieve a 15.76% increase in vehicle performance and therefore reduce the overall GHG emissions from on-road mobile sources by 2020 (Source: ARB Scoping Plan). This increase in statewide vehicle efficiency standards was considered while evaluating achievement of the GHG reduction target for the Citrus Heights community. Upgraded vehicle standards can effectively reduce GHG emissions in the transportation sector by 39,240 MT CO_2e/year.

The City recognizes that statewide reductions will also occur from implementation of LCFS. Based on current available data, LCFS standards are projected to reduce overall statewide GHG emissions attributable to vehicle fuels by about 10%. Therefore, this increase in statewide vehicle-fuel efficiency can effectively reduce GHG emissions in the transportation sector by another 20,970 MT CO_2e/ year.

Sacramento Metropolitan Utility District (SMUD) emission factors incorporate the mandated requirements of RPS, which require 33% of SMUD's electricity production to be from renewable sources. These factors were used to estimate the GHG emissions attributable to the energy sector within the 2020 projections, and to calculate the reduction potential of electric energy-related GGRP measures. Since these GHG reductions are already distributed within the 2020 energy projection and reduction measures, they have not been accounted for individually within statewide reductions to avoid double-counting.

The City's actions, together with the effects of AB 1493, LCFS and the RPS in Citrus Heights would enable a combined reduction of 145,677 MT CO_2e/ year, or about 24.5% below 2005 levels. While statewide reductions alone are nearly sufficient to achieve the City's target, their effects are not certain, and implementing them is an action beyond the City's control. The City accepts that it has a fair share responsibility to implement GHG reduction measures addressing communitywide emissions within its control, above and beyond statewide reductions. Thus, the recommended GGRP measures outline a path to achieving the GHG reduction target without relying on statewide reductions.

IMPLEMENTATION APPROACH

Selecting Emission Reduction Strategies and Measures

Seven emission reduction strategies have been identified for the City of Citrus Heights GGRP. These are grounded in actions directly influenced by the City and reliant on community participation. Each strategy is then sub-divided into a series of recommended measures to reduce GHG emissions within the particular strategy.

The GHG reduction measures were developed by (a) evaluating existing community conditions, (b) identifying emissions reduction opportunities within the City, (c) reviewing best practices from other jurisdictions and organizations, and (d) incorporating state and regional laws, guidelines, and recommendations. After considering a wide range of potential measures, recommended measures were selected based on the following criteria:

- What is the cost of implementation to City along with private costs and savings?
- Is it technically possible to implement the measure?
- Would the community support and adopt the measure?
- Does the measure create any additional community benefits (e.g., quality of life, jobs, improved health) beyond reducing GHG emissions?

Implementation Flexibility

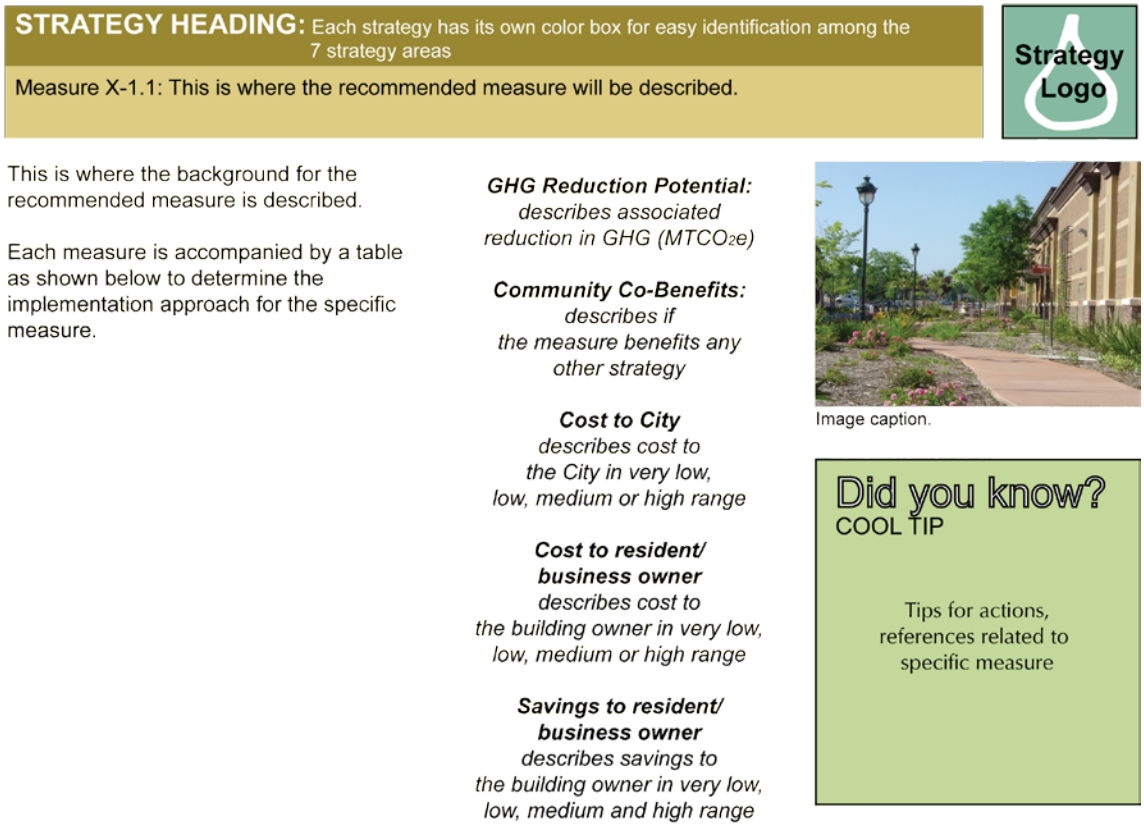
The City of Citrus Heights GGRP represents the City's best attempt at responding to the need to reduce GHG emissions through municipal operations and community activity. However, federal and State policies and requirements regarding climate change are continually evolving to meet the challenges of a rapidly changing climate and its effects. Over the next decade, new GHG reduction technology and ways to measure GHG reduction are also likely to develop. To remain effective, the GGRP must evolve accordingly. To ensure consistency and usefulness, the recommended measures should be considered within the City's annual budget process, and updated periodically to reflect newly available technologies and legal requirements.

To monitor successful implementation of the GGRP and track its progress toward the 2020 target, a new GHG inventory should be completed and the GGRP should be updated approximately every 3 years. During these updates the City may also investigate new measures that have not been recommended currently due to financial or technical constraints to determine their applicability in the future.

Layout Guide

Figure 2-5 explains the layout that describes GGRP measures presented in Chapter 3. Each measure is described on a single page.

GHG Reduction Measures Layout **Figure 2-5**



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