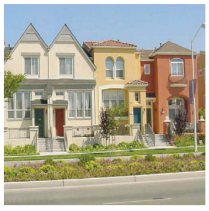
FEBRUARY 1, 2011



SUSTAINABILITY ACTION PLAN

CITY OF TRACY

CITY OF TRACY | DESIGN, COMMUNITY & ENVIRONMENT | TOWN GREEN

in consultation with: *ICF International* | *Fehr & Peers* | *Strategic Economics*

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1 INTRODUCTION

The City of Tracy recognizes that a healthy and prosperous community strategically balances economic, environmental, and social sectors of community planning. The Sustainability Action Plan is a detailed, long-range strategy to achieve sustainability in the sectors of greenhouse gas (GHG) emissions, energy, transportation and land use, solid waste, water, agriculture and open space, biological resources, air quality, public health, and economic development. Collectively, addressing community development through these lenses will strengthen Tracy as a place that is attractive, prosperous, and adaptive to social, political, and environmental changes.

Strategically planning for economic, environmental, and social sustainability is a challenge for many California communities. The Sustainability Action Plan provides Tracy with a guide to reduce GHG emissions, reduce consumption of non-renewable resources, improve public health, promote economic vitality, implement the General Plan, and engage residents. These efforts will also assist Tracy in balancing local economic development objectives with the State of California's required emission reduction targets and other environmental goals.

Through this strategy, Tracy positions itself to be economically attractive and competitive to like-minded entrepreneurs and companies. State regulations now require new development to account for its impact to the environment, specifically in terms of GHG emissions and impact on ecosystems. Mitigating impacts in these areas on a project by project basis is often difficult, costly, and time-consuming. The Sustainability Action Plan considers impacts of future development on a citywide level and provides a framework for addressing mitigation of such impacts. This strategy effectively streamlines the development process by relieving individual projects of the task to develop their own impacts analyses and mitigation measures.

Implementation of the Sustainability Action Plan places Tracy at a competitive advantage in attracting new job industries. The Sustainability Action Plan identifies opportunities for Tracy to be a destination of local employment centers and green jobs, an emerging field that diversifies Tracy's economic base and attracts complementary industries. Strengthening Tracy's employment base is likely to result in an increase of higher education opportunities and retail development.

The Sustainability Action Plan provides opportunities to strengthen Tracy's adaptability to emerging economic, environmental, and social climates without adding barriers or overregulation to successful growth and community development. The Sustainability Action Plan lays the foundation for a healthy, prosperous, and sustainable future for Tracy.

This Sustainability Action Plan establishes targets related to a variety of sustainability topics, and sets forth measures that will assist the City of Tracy in reaching those goals. This chapter provides background information about environmental challenges, existing sustainability efforts in Tracy, and public participation in the City's sustainability planning processes.

A. Environmental Regulations and Challenges

Although not unique to Tracy, the City of Tracy faces a number of environmental challenges. This section describes climate change and regulatory actions, as well as other environmental challenges related to sustainability in Tracy. The City of Tracy sees environmental regulatory compliance as responsible leadership and a wise business decision when considering the alternatives.

1. Regulatory Action on Climate Change

As climate change gains increasing attention, agencies and organizations from the international level to the local level are working to develop and implement solutions to control greenhouse gas (GHG) emissions and slow their effects on natural ecosystems. The major efforts are described in this section.

i. International Action

The United Nations Framework Convention on Climate Change (UNFCCC), an international treaty that has been ratified by 192 countries, leads international efforts to address the threats of climate change. The Convention encourages industrialized countries to reduce their GHG emissions.

The Kyoto Protocol, an addition to the treaty adopted in 2007, sets legally binding measures requiring countries to reduce emissions. The Kyoto Protocol sets binding emission reductions targets for 37 industrialized countries and Europe to reduce collective emissions about 5 percent below 1990 levels over the five year period between 2008 and 2012. The Kyoto Protocol has been ratified by 189 countries as of late 2009. Although the United States is responsible for a large potion of the emissions and signed the Protocol, Congress did not ratify it.

The Copenhagen Accord, adopted at the United Nations Climate Change Conference in Copenhagen in December 2009, is a non-binding agreement to keep maximum temperature rise to below 2 degrees Celsius (°C) and to raise funds to enable developing countries to take action on climate change.

ii. Federal Laws and Regulations

The United States does not have any federal regulations or policies related to GHG emissions. However, in December 2009, Environmental Protection Agency (EPA) Administrator Lisa Jackson signed findings that elevated concentrations of the six key GHGs in the atmosphere endanger public health and welfare of current and future generations, and that the combined emissions of GHGs from new motor vehicles contribute to the GHG air pollution that endangers public health and welfare.[1] While the final endangerment finding does not automatically impose any requirements, it allows EPA to finalize proposed GHG emission standards for light-duty vehicles, which were proposed in conjunction with the Department of Transportation's Corporate Average Fuel Economy (CAFE) standards earlier in 2009.[2]

iii. State Laws and Regulations

California has been a leader among states in passing legislation to reduce GHG emissions and slow climate change. Major laws and regulations are described below.

a) Energy Efficiency Standards (1978)

Title 24, Part 6 of the California Code of Regulations, Energy Efficiency Standards for Residential and Nonresidential Buildings, was established in 1978 to address a legislative mandate to reduce the State's energy consumption. The standards are updated roughly every three years to incorporate new energy efficiency goals, methods, and technologies. The

[1] U.S. Environmental Protection Agency website, "EPA's Endangerment Finding," http://www.epa.gov/climatechange/endangerment/downloads/EndangermentFinding_LegalBasis.pdf, accessed on January 13, 2010.

[2] U.S. Environmental Protection Agency website, http://epa.gov/climatechange/endangerment.html, accessed on January 14, 2010.

2008 standards went into effect on January 1, 2010, and require buildings to be 15 percent more energy efficient compared to the 2005 standards.

b) Clean Car Regulations (Assembly Bill 1493, 2002)

Assembly Bill (AB) 1493, Clean Car Regulations (commonly known as the "Pavley law"), directed the California Air Resources Board (CARB) to adopt regulations to decrease GHG emissions from new passenger vehicles and light duty trucks beginning with the 2009 model year. Implementation of these fuel efficiency standards, known as the "Pavley standards," was uncertain for years due to EPA's denial of California's request for a waiver of Clean Air Act Section 209(a), which was necessary to implement the Pavley standards. However, in June 2009, the EPA granted California the authority to implement the standards.[3] These standards are anticipated to reduce GHG emissions from California passenger vehicles by 30 percent by 2016, and are estimated to result in an 18 percent GHG emissions reduction across the passenger fleet.[4]

c) Executive Order S-3-05 (2005)

In 2005, Governor Schwarzenegger signed Executive Order S-3-05, which established the goals of reducing emissions to 2000 levels by 2010, to 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. The Executive Order identified the California Environmental Protection Agency (Cal/EPA) as the lead coordinating State agency for establishing climate change emission reduction targets in California, and designated a "Climate Action Team," a multi-agency group of State agencies, to implement Executive Order S-3-05. GHG emission reduction strategies and measures to reduce global warming were identified by the California Climate Action Team in 2006.

d) Global Warming Solutions Act (AB 32, 2006)

In 2006, California Governor Schwarzenegger signed AB 32, the Global Warming Solutions Act, into law. The Act requires that California cap its GHG emissions at 1990 levels by 2020. AB 32 also requires that CARB identify discrete early actions to reduce emissions that could be implemented immediately and develop a statewide scoping plan to identify how to meet the emissions reduction targets.

CARB identified a list of nine early actions, including landfill CH_4 capture, the Low Carbon Fuel Standard (LCFS) that is discussed further in the section below, and a tire pressure program. CARB's Climate Change Scoping Plan, adopted in December 2008, outlines regulations, market mechanisms, and other actions to achieve the maximum technologically-feasible and cost-effective reductions in GHG emissions by 2020.[5] The Scoping Plan recommends achieving a statewide energy mix with 33 percent from renewable energy sources, developing a California cap-and-trade program that will be part of a regional carbon market through the Western Climate Initiative, and expanding and strengthening existing energy efficiency programs and building and appliance standards.

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[3] California Air Resources Board website, www.arb.ca.gov, accessed on January 14, 2010.

[4] California Clean Cars Campaign, 2006, Factsheet: *California's Vehicle Global Warming Pollution Reduction Regulation: How it Works.* (http://www.calcleancars.org/factsheets/staffproposal.pdf).

[5] California Air Resources Board website, www.arb.ca.gov, accessed on January 14, 2010.

e) Executive Order S-01-07 (2007)

Executive Order S-01-07, signed by Governor Schwarzenegger in 2007, establishes a LCFS for transportation fuels sold in California. This standard will reduce the carbon content of passenger vehicle fuels in California by at least 10 percent by 2020.

f) Regional Transportation and Land Use Planning Efforts (SB 375, 2008)

In 2008, California enacted Senate Bill (SB) 375 to augment AB 32 by promoting efficient land use patterns and curbing sprawl. SB 375 establishes emissions-reduction goals for which regions can plan; encourages metropolitan planning organizations (MPOs) to integrate their housing, transportation, and regional land use plans with GHG reduction goals; and provides incentives for governments and developers to implement compact and efficient growth patterns. Under SB 375, the 18 MPOs in California must prepare a "sustainable communities strategy" to reduce the vehicle miles traveled (VMT) in their regions and demonstrate their ability to reach the CARB targets. SB 375 also includes incentives to create walkable and attractive communities and to revitalize existing communities. The legislation also allows developers to bypass certain environmental reviews under the California Environmental Quality Act (CEQA) if they build projects consistent with the new sustainable community strategies. SB 375 enhances CARB's ability to reach the AB 32 goals by directing the agency in developing regional GHG emission reduction targets to be achieved from the transportation sector for 2020 and 2035.

g) Heavy Duty Vehicle GHG Emissions Reduction Measure (2008)

In December 2008, CARB adopted the Heavy Duty Vehicle GHG Emission Reduction Measure, which requires long-haul truckers to retrofit their trailers with fuel efficient tires and aerodynamic devices. This requirement will improve the fuel economy of heavy duty vehicles, reducing GHG emissions.

iv. Regional and City Policies and Measures

The San Joaquin Valley Air Pollution Control District (Valley Air District) adopted the Climate Change Action Plan in August 2008. The Plan has been developed to assist local land use agencies and businesses to comply with State requirements.

In December 2009, the Valley Air District adopted standards that require projects to reduce their GHG emissions by at least 29 percent from business-as-usual levels, through application of best performance standards or through other measures, to achieve a less than cumulatively significant impact under CEQA.

2. Energy

Energy production is a major economic, security, and environmental challenge at the local, national, and global levels. The City of Tracy acknowledges the bottom-line benefits of the SAP because it lowers the community's demand and costs for fossil fuels. Although Tracy receives its energy from PG&E, which provides an energy mix that is much cleaner than what most other U.S. utilities provide, it still relies on fossil fuels – coal, oil, and natural gas – for about half of its energy.[6]

[6] Pacific Gas and Electric website, http://www.pge.com/myhome/environment/pge/cleanenergy/, accessed on March 1, 2010.

The U.S. imports approximately 60 percent of its petroleum and 15 percent of its natural gas from foreign countries, a dependence that makes the U.S.'s economy and security vulnerable to political and resource instability in other parts of the world.

The combustion of fossil fuels to produce heat or electricity, or to power internal combustion engines, is a main contributor to greenhouse gas emissions and other environmental problems. At the local level, fossil fuel combustion has been linked to poor air quality in the San Joaquin Valley, respiratory-related illnesses and negative impacts on crops. Because fossil fuels are found deep in the ground, they must be extracted and transported to provide energy. Surface and groundwater pollution can occur during extraction, storage, and transportation. Land subsidence can result when oil and gas are removed from below ground with nothing left to support the land above. There is also the potential for storage tank leakage and oil spills during transportation, causing widespread pollution and requiring costly cleanup efforts.[7]

There are numerous strategies to reduce fossil fuel dependence, which generally fall into three main categories:

- **Energy Conservation**. This is a quick and cost-effective strategy to reduce GHG emissions and decrease dependence on non-renewable sources of energy. Strategies include land use patterns that increase walking and bicycling, reducing electricity consumption, and efficient technologies such as ENERGY STAR products that use less electricity, natural gas, and water.
- **Renewable and Alternative Energy Sources**. These sources include solar, wind, geothermal, biomass, and alternative vehicle fuels, which are produced with minimal or no pollution. In recent years, increased research and development has been devoted to expanding the supply and increasing the deployment of these sources.
- **Carbon Capture and Storage**. Carbon capture and storage includes technological strategies to sequester carbon emissions from large pollution sources so that they don't enter the atmosphere.

3. Transportation and Land Use

Land use patterns and transportation systems in the last 60 years have consumed resources at unsustainable rates, creating a range of environmental and economic problems. Between 1950 and 1990, land in the U.S. urbanized 2.5 times faster than urban population increased. Compared to smart growth patterns, sprawl development consumes 45 percent more land, greatly reducing the land available for open space, agriculture, and habitat. Sprawl is also more expensive than compact growth, imposing costs that are 25 percent more for roads, 15 percent more for utilities, and 5 percent more for schools.[8]

With increases in urbanized land, VMT has grown dramatically. Between 1980 and 2005, Tracy's population increased by 85 percent, while VMT increased by 202 percent. Much of this increase is due to the way new communities are designed. Because this type of development generally results in segregated land uses with large distances between them, driving is often the only viable mode of transportation. Consequently, residents have fewer opportunities for physical

[7] Renewable Energy Trust website, http://www.masstech.org/cleanenergy/important/envother.htm, accessed on March 1, 2010.

[8] Burchell, Robert W. and David Listokin, 1995, *Land, Infrastructure, Housing Costs and Fiscal Impacts Associated With Growth: The literature on the Impacts of Sprawl v. Managed Growth,* Cambridge, Massachusetts: Lincoln Institute of Land Policy.

activity, and those who cannot drive, including children, seniors, and disabled people, can have trouble accessing services.

4. Solid Waste

The production and transport of consumer products creates large amounts of GHGs. A large percentage of these products are disposed of after only one use, requiring more raw materials to be extracted to replace these products. Making new products from raw materials generally requires more energy, uses more water, and creates more air and water pollution than reusing materials or making the same product from recycled materials, thereby increasing GHG emissions and contributing to climate change.

Once in the landfill, solid waste continues to emit GHGs, most notably methane (CH_4,) which is approximately 21 times more potent than carbon dioxide (CO_2) in terms of its global warming impacts.[9] Landfills also release harmful contaminants such as vinyl chloride and benzene. In addition, the combination of rainwater and other liquids with layers of solid waste at landfills produces leachate, a harmful substance that contains contaminants such as benzene and volatile halocarbons.[10] Leachate causes soil, surface water, and groundwater contamination. Poor management of solid waste operations can increase disease vectors and creates nuisances related to odor, litter, and dust.[11]

The GHG emissions and other environmental problems associated with solid waste can be reduced through increased diversion from landfills by reducing consumption and reusing or increasing recycling.

5. Water

The year 2009 marked the third consecutive year of drought in California, with the driest spring and summer on record, low water content in the Sierra snowpack, and a historic low in the State's reservoir levels. In 2008, the Sacramento and San Joaquin River systems that provide a large portion of the State's reservoir inflow were classified as Critically Dry. As of early 2009, the drought had damaged crops and prevented farmers from planting or replanting 100,000 acres of agricultural land, causing agricultural revenue losses of more than $300 million.[12] These drought conditions also threaten aquatic ecosystems, increase the risk of wildfires, increase food prices, and harm livelihoods dependent on agriculture, natural resources, and tourism. Responding to these wide-ranging impacts, Governor Arnold Schwarzenegger proclaimed a State of Emergency in February 2009. Governor Schwarzenegger called for an immediate 20 percent reduction in water use by urban water users and the use of efficient water management practices by agricultural users.[13]

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[9] U.S. Environmental Protection Agency website, http://www.epa.gov/outreach/scientific.html, accessed on March 1, 2010.

[10] U.S. Environmental Protection Agency website, http://www.epa.gov/waste/nonhaz/municipal/landfill/bioreactors.htm, accessed on March 1, 2010.

[11] City of San Diego Solid Waste Local Enforcement Agency website, http://www.sandiego.gov/development-services/leaconcerns.shtml, accessed on March 1, 2010.

[12] Office of the Governor, State of California, February 27, 2009, Press Release, "Gov. Schwarzenegger Takes Action to Address California's Water Shortage."

[13] Office of the Governor, State of California, February 27, 2009, Press Release, "Gov. Schwarzenegger Takes Action to Address California's Water Shortage."

Along with water shortages, water pollution is another major problem resulting from population growth and development. Inefficient development patterns increase impervious surfaces, reducing infiltration into the soil, causing erosion, and degrading water quality of streams, rivers, and wetlands.

In Tracy, water is supplied by a combination of surface and groundwater sources. Surface water generally comprises greater than 85 percent of Tracy's total water supply and is provided by the South San Joaquin Irrigation District (SSJID) and the United States Bureau of Reclamation (USBR). SSJID and the USBR act as water wholesalers to the City. Because the groundwater supply is a heavily mineralized source of water, the City would like to reduce daily use of groundwater and reserve its use for emergency situations and droughts. As a result, the City is trying to secure additional sources of surface water to meet its daily water demands.

6. Agriculture and Open Space

Located in San Joaquin Valley, one of the most productive agricultural regions in the world, Tracy is in a location with high quality farmland. Development pressures in Tracy and San Joaquin County, particularly over the past 20 years, have resulted in the loss of large amounts of Prime Farmland and Farmland of Statewide Importance, as defined by the State's Farmland Mapping and Monitoring Program.

In addition to consuming productive farmland, growth in Tracy and San Joaquin County has also occurred at a relatively low density. One impact of this land use pattern is the spread of ranchettes, which are residences on large rural parcels. Ranchettes can have negative impacts on agricultural production because they require agricultural practices to be modified to protect the health and security of neighboring residences. They also increase the market value for land above levels that are economically viable for commercial agriculture.[14]

The conversion of agricultural land to urban uses reduces agricultural production and has major repercussions for the regional and State economies. The San Joaquin Valley is responsible for 55 percent of the State's total agricultural sales.[15] In addition to agricultural productivity benefits, farmland and other forms of open space sequester vast amounts of CO_2 emitted through human activities; the conversion of land to agricultural and open space reduces these carbon "sinks."

7. Biological Resources

Natural habitats recharge aquifers, maintain water quality, and help to stabilize the climate. The disappearance of species from these systems alters and undermines the value of the habitat, causing related impacts to human health and the economy. As Tracy expands to accommodate additional population, biological resources are increasingly threatened.

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[14] American Farmland Trust, 2007, *Paving Paradise: A New Perspective on California Farmland Conservation*, pages 6-7. (http://www.farmland.org/programs/states/ca/Feature/Stories/documents/PavingParadise_AmericanFarmlandTrust_Nov07.pdf).

[15] American Farmland Trust, 2007, *Paving Paradise: A New Perspective on California Farmland Conservation*, pages 6-7. (http://www.farmland.org/programs/states/ca/Feature/Stories/documents/PavingParadise_AmericanFarmlandTrust_Nov07.pdf).

For an estimated 85 percent of imperiled plant and animal species in the U.S., the loss or degradation of their habitats is the main threat to their continued existence.[16] The development of green spaces into surburban and urban uses is the fastest-growing threat to vulnerable species in the U.S. By converting large undeveloped areas to roads, homes, offices, and stores, inefficient development patterns eliminate and fragment habitats, reducing the biological productivity and habitat value of the land. According to the report *Endangered by Sprawl: How Runaway Development Threatens America's Wildlife*, sprawl development could threaten the survival of nearly one out of every three threatened or endangered species in the U.S.[17] This risk is more severe in California, where growth rates and the number of threatened and endangered species are among the highest in the nation.

8. Air Quality

Air quality in the San Joaquin Valley is among the worst in the nation. The San Joaquin Valley Air Basin is particularly prone to air pollution due to its combination of geography, topography, and meteorology. High temperatures promote the formation of ground-level ozone (i.e. smog), and mountain ranges trap pollutants near the surface. During the summer, the potential for severe air pollution is particularly strong because of the combination of high temperatures, stable air, and intense sunshine. In winter, the low amount of rainfall, weak winds, and strong inversions allow emissions to build up to high levels.

Air pollution has major impacts on human health. Ozone and particulate matter, both fine and coarse, are among the pollutants with the most severe health implications.

Ozone is not emitted directly by specific sources, but is created through the reaction of sunlight on nitrogen oxide and volatile organic compound emissions, which are themselves emitted through a variety of sources. Ozone exposure is harmful for people with respiratory illnesses such as asthma, but also for healthy individuals. Prolonged exposure even at low concentrations can significantly reduce lung function and trigger respiratory inflammation in healthy individuals, causing symptoms such as nausea, coughing, chest pain, and pulmonary congestion.[18]

Particulate matter is emitted through many activities, including fuel combustion, crude oil refinement, and chemical manufacturing. Particulate matter is associated with respiratory illnesses, lung tissue damage, and premature death.

9. Public Health

As indicated in Section A.3, conventional development patterns in Tracy and surrounding areas have resulted in land development patterns that require most residents to rely on driving a vehicle in order to get to work, school, shopping, and services. As a result of these patterns that prioritize vehicle travel over other rather than more active forms of transportation like transit, walking, and bicycling, residents get less physical activity than they would in a more compact,

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[16] Ewing, Reid, and John Kostyack, 2005, *Endangered by Sprawl: How Runaway Development Threatens America's Wildlife*, National Wildlife Federation, Smart Growth America, and Nature Serve, page vii. (http://www.natureserve.org/publications/endangered_by_sprawl.pdf).

[17] Ewing, Reid, and John Kostyack, 2005, *Endangered by Sprawl: How Runaway Development Threatens America's Wildlife,* National Wildlife Federation, Smart Growth America, and Nature Serve, page vi. (http://www.natureserve.org/publications/endangered_by_sprawl.pdf).

[18] San Joaquin Valley Air Pollution Control District website, http://www.valleyair.org/newsed/pollutants.htm, accessed on February 26, 2010.

mixed-use urban setting. Physical inactivity is a major contributor to obesity, diabetes, hypertension, and cardiovascular diseases.

Limited access to healthy food is another key contributor to disease that is closely tied to development patterns. Many neighborhoods don't have grocery stores within a short walking or transit distance. Encouraging new grocery stores to be integrated into underserved neighborhoods is critical to addressing healthy food access. Providing opportunities for farmers' markets and community gardens can also help to fill the gap.

10. Economic Development

While Tracy provides a range of housing options at more affordable levels than other areas within Northern California, many Tracy residents commute long distances to surrounding communities with stronger office and industrial economic bases and higher wage jobs.

In addition, some of Tracy's residents shop, dine, or seek entertainment opportunities in other cities. A diverse local economy, with expanded high wage job opportunities, a complete array of shopping and dining options, and a range of entertainment venues would enhance residents' overall quality of life. This enhanced level of economic development, particularly with substantial attraction of higher wage jobs, would also better balance the jobs to housing ratio in Tracy and reduce VMT.

B. Existing Sustainability Efforts in Tracy

1. Tracy General Plan

The Tracy General Plan has a strong emphasis on sustainability. The Land Use Element emphasizes efficient growth patterns, the orderly expansion of new residential areas to maximize existing public services and infrastructure, and the balance of residential development with jobs, retail development, and provision of public services. The Community Character Element has policies to design neighborhoods to encourage pedestrian activity, and to emphasize the important role of the downtown by facilitating a mix of uses and the development of vibrant public spaces. The Circulation Element includes policies supporting street connectivity, extensive bicycle and pedestrian facilities, and a high degree of connectivity between all modes of transportation in Tracy. Policies in the Open Space and Conservation Element emphasize the preservation of agricultural lands, the development of a regional parkway system, resource conservation, and energy efficiency. The Public Facilities and Services Element includes policies to reduce the city's solid waste production and to increase the use of recycled water where possible. In the Air Quality Element, policies support land use patterns that reduce VMT, the development of a range of transportation choices to reduce reliance on single-occupancy vehicles, and local and regional air quality improvement efforts.

The General Plan was amended concurrently with the development of the Sustainability Action Plan in 2011 with many sustainability-oriented policies. Added in the Land Use Element were policies that encourage Downtown sites to be developed at the highest densities possible, consistent with environmental protection and land use compatibility goals, and require the creation of new specific plans to guide efficient and orderly development within Tracy's Secondary Residential Growth Areas. In the Community Character Element, policies were added to encourage the development of urban green spaces, promote the incorporation of pedestrian and bicycle access into site design, and discourage new strip commercial development. The Economic Development Element includes policies encouraging green businesses,

local procurement of green products, and employment opportunities that reduce the need for vehicle trips. The Circulation Element provides additional policies to encourage the use of non-motorized transportation, transit, and low-emission vehicles; to avoid disrupting sensitive environmental resources during transportation projects; and to use sustainable materials in road construction and repair projects. Policies have been added to the Open Space and Conservation Element to incorporate resource conservation through construction and development practices, expand the urban forest, and use water-efficient landscaping techniques. The City's Public Facilities Element incorporated policies that call for rehabilitating and reusing municipal buildings whenever feasible, and that require standards to reduce water and wastewater treatment demand in new development and redevelopment. In the Air Quality Element, policies have been added to develop a green building standard for new development, encourage solar panels on new development, encourage use of light emitting diodes (LED) for outdoor lighting, and reduce GHG emissions from municipal operations and new development.

2. Local Programs

In 2008, Tracy enrolled as one of two pilot cities in the Emerald Cities Pilot Program, a public-private partnership sponsored by the California Natural Resources Agency (CNRA) that was previously administered by the State Department of Conservation (DOC). Through this program, the City of Tracy worked closely with the DOC to accelerate progress toward the State's environmental goals, including those indicated in AB 32 and SB 375. In November 2008, the City Council adopted Resolution No. 2008-241, committing the City to pursue sustainable development practices to achieve specific goals identified by the State of California to be reflective of sustainable communities. The DOC was involved throughout the development of the Sustainability Action Plan. The City's activities under this program are presented on the Emerald Tracy website, www.emeraldtracy.org.

Tracy also has existing incentive programs that reduce energy consumption and GHG emissions. Through its Washing Machine Voucher Program, the City offers $50 rebates for ENERGY STAR-rated high-efficiency washing machines. Such washers use one-third less water and one-fourth less energy than conventional machines, which account for a considerable amount of water consumption in average households. This rebate can be used jointly with PG&E's rebate programs. The City has almost completed the installation of LED fixtures at all traffic signals in Tracy, which use significantly less energy and last far longer than conventional fixtures. The Tracy Wastewater Treatment Plant (WWTP) is installing variable-frequency drives for the Patterson Pass booster station that are expected to save the City 123,000 kilowatt hours (kWh) and $14,700 per year and to generate a rebate through PG&E of approximately $11,000. The WWTP has also initiated a CH_4 capture project for heating boilers. The City also retrofitted light fixtures (e.g. re-lamping, re-ballasting, and/or adding sensors) throughout City facilities. The annual energy savings from this project are approximately 190,800 kwh.

C. Public Outreach and Participation

The City has used online and in-person strategies to incorporate public participation in the development of the Sustainability Action Plan as described in this section.

1. Emerald Tracy Website

The City's Emerald Tracy website, www.emeraldtracy.org, provides information on the City's sustainability goals and targets, as well as the process it is undertaking to achieve them. The website invites visitors to submit feedback to shape

the Emerald Cities process through a survey. Survey respondents have submitted a range of ideas for how to reduce Tracy's environmental impacts, including following the strategies:

- Additional jobs in Tracy to reduce commuting.
- Improved transit connectivity.
- Water-conserving landscaping guidelines.
- Expanded recycling and composting.
- Incentives for energy-efficient retrofits.
- Expanded bicycle and pedestrian paths.

The survey also asks for feedback on the desired outcomes of the Emerald Tracy process. Desired outcomes submitted by respondents include clean air, cost savings for the City and residents, a more dynamic downtown, and Tracy becoming a model of sustainability for other cities. The feedback collected through the Emerald Tracy website has shaped the development of the measures included in the Sustainability Action Plan.

2. Community Workshop

The City held a Community Workshop on Wednesday, February 17, 2010 to discuss draft sustainability targets and measures for the Sustainability Action Plan as well as priorities for future funding opportunities.

During this workshop, participants brainstormed other projects and measures that could be included in the Sustainability Action Plan, or that the City could pursue through future funding opportunities. The workshop also featured an interactive exercise in which participants used dots to identify their preferred measures among the draft sustainability measures and the new measures that were suggested during the brainstorming session. The results of the brainstorming session and dot exercise are provided in Appendix A.

2 EXISTING CONDITIONS

This chapter summarizes existing sustainability conditions for the City of Tracy related to greenhouse gas (GHG) emissions, energy, transportation and land use, solid waste, water, agriculture and open space, biological resources, air quality, public health, and economic development. The GHG emissions, energy, transportation and land use, and solid waste sections below include quantified emission information. Quantified emissions data is not available for the water, agriculture and open space, biological resources, air quality, public health, and economic development sectors; these sections include a qualitative discussion of existing conditions and how they relate to sustainability. Information about the GHG emissions is based on the Emissions Inventory and Business As Usual (BAU) forecast for Tracy, which is provided as Appendix B.

A. Greenhouse Gas Emissions

Tracy's GHG inventory for the baseline year 2006 was compiled using the International Council for Local Environmental Initiatives' (ICLEI) Clean Air and Climate Protection (CACP) software, and is shown in Tables 2-1 and 2-2. GHG emissions in Tracy are a function of the energy, transportation and land use, solid waste, and water sectors, which are discussed in Sections B through E below. Additional information on these and other sources of GHG emissions is provided in Appendix B.

In 2006, Tracy's total GHG emissions were 1,350,321 metric tons of carbon dioxide equivalent (CO_2e). The GHG inventory includes a separate community-wide and municipal analysis. Tracy's 2006 community emissions were 1,338,872 metric tons CO2e from the residential, commercial, industrial, transportation, waste, and water sectors, as well as from fugitive and refrigerant emissions.

Tracy's municipal emissions inventory for 2006 was 11,449 metric tons of CO_2e, comprising less than 1 percent of the City's total emissions. The community and municipal inventories are discussed in greater detail below for each subsector.

TABLE 2-1 **COMMUNITY-WIDE EMISSIONS INVENTORY**

Sources	Metric Tons of CO_2e	Percentage of Total
Residential energy use	220,036	16.4%
Commercial and industrial energy use	160,740	12.0%
Fugitive emissions and refrigerants	90,233	6.7%
Transportation	849,673	63.5%
Waste	18,190	1.4%
Total	**1,338,872**	**100%**

Source: CACP model

TABLE 2-2 **MUNICIPAL EMISSIONS INVENTORY**

Sources	Metric Tons of CO_2e	Percentage of Total
Buildings and facilities	247	2.2%
Streetlights and traffic signals	1,798	15.7%
Fugitive emissions and refrigerants	323	2.8%
Vehicle and transit fleet	958	8.4%
Employee commute	3,650	31.9%
Airport facilities	28	.2%
Solid waste	2,211	19.3%
Wastewater	1,512	13.2%
Water delivery	722	6.3%
Total	**11,449**	**100%**

Source: CACP model.

In total, per capita GHG emissions in 2006 were 11.6 metric tons CO_2e.[1] This per capita emission rate is similar to many Bay Area cities, as indicated below; however, it should be noted that different jurisdictions use different methodologies, which makes comparison difficult.

- Menlo Park, with 16.5 metric tons CO_2e per capita.
- Martinez, with 14.5 metric tons CO_2e per capita.
- Palo Alto, with 13.9 metric tons CO_2e, per capita.
- Hayward, with 9.1 metric tons CO_2e per capita.
- San Mateo, with 6.9 metric tons CO_2e per capita.

B. Energy

1. Community Emissions Inventory

Community-wide stationary energy consumption includes electricity and natural gas use for residential, commercial, and industrial sectors. Community-wide energy consumption for 2006 was approximately 3,200,000 million metric British thermal units (MMBtu), resulting in 380,776 metric tons of CO_2e, or approximately 28 percent of total community-wide emissions.

[1] Based on the total population and employment in Tracy in 2006, which was approximately 116,500 residents and workers. From: Watten, Mackenzie and Mike Wallace. Fehr & Peers. Personal communication with Tanya Sundberg, DC&E. January 29, 2010.

Of this total, residential energy consumption is responsible for the largest share. Tracy residences consumed approximately 227 million kWh of electricity and 11 million therms of natural gas, resulting in the release of 220,036 metric tons of CO_2e. Major residential energy uses include refrigeration, lighting, and water heating. Commercial and industrial buildings consumed 168,310,545 kWh of electricity and 7,808,664 therms of natural gas, emitting 160,740 metric tons of CO_2e.

2. Municipal Operations Emissions Inventory

The energy sector of the municipal inventory includes electricity and natural gas use for the operations of municipal buildings and facilities, streetlights and traffic signals. Municipal operations consumed approximately 11 million kWh of electricity and 41,000 therms of natural gas, or approximately 42,000 MMBtu. Buildings and facilities were responsible for 247 metric tons of CO_2e, or 2 percent of municipal emissions, and streetlights and traffic signals accounted for 1,798 metric tons of CO_2e, or 16 percent of municipal emissions.

C. Transportation and Land Use

In 2006, the total daily VMT in Tracy was 3.3 million VMT. The transportation sector is responsible for the majority of GHG emission in Tracy.

1. Community Emissions Inventory

The "Citywide Travel Demand Model" used to analyze Tracy's transportation emissions from vehicle fuel combustion includes all of the VMT associated with trips completed within Tracy and half of the VMT generated by jobs and residences located in Tracy that result in travel to or from external destinations. The model does not include vehicles that pass through Tracy without either a point of origin or a destination within the city.

The community transportation sector includes travel on State highways, local roads, and the commuter train, as well as aviation and jet fuel from the Tracy Municipal Airport and off-road vehicles and equipment. These activities were responsible for 849,673 metric tons of CO_2e emissions in 2006, representing approximately 64 percent of Tracy's community-wide GHG emissions.

2. Municipal Operations Emissions Inventory

Transportation-related activities within the municipal inventory include commuting by City employees and the City's vehicle fleet. Commuting was responsible for 3,650 metric tons of CO_2e and 32 percent of municipal emissions. Tracy's fleet includes all vehicles owned and operated by the City, including Tracer, the public bus system, and contractor vehicles performing City functions. The vehicle and transit fleet emitted approximately 958 metric tons of CO_2e, or 8.75 percent of municipal emissions. Together, these activities are responsible for approximately 40 percent of the municipal inventory.

D. Solid Waste

Solid waste emits GHGs when placed in a landfill. Decomposition of organic materials in landfills produces methane, a GHG.

1. Community Emissions Inventory

Tracy sent approximately 92,202 tons of solid waste to the San Joaquin County Foothill Landfill, resulting in 18,190 metric tons of CO_2e, which represents 1 percent of total community-wide emissions.

2. Municipal Operations Emissions Inventory

In 2006, the City's solid waste facilities emitted 2,211 metric tons of CO_2e emissions.

Because Tracy Delta Solid Waste Management does not distinguish between municipal- and community-generated waste, the solid waste generated by municipal operations is included in the community-wide figure of 92,206 tons of waste sent to the landfill.

E. Water

According to the 2005 *City of Tracy Urban Water Management Plan*, Tracy's annual water demand in 2005 was 18,500 acre-feet.[2]

1. Community Emissions Inventory

The City manages water delivery for community consumption; therefore, emissions associated with water delivery are included in the municipal inventory, below. Emissions from water delivery are a negligible percentage of the community emissions inventory.

2. Municipal Operations Emissions Inventory

Water delivery generated 722 metric tons of CO_2e in 2006, accounting for 6 percent of Tracy's municipal inventory. Nearly all of the water supply is devoted to community water consumption; only 1 percent of the total water demand is from municipal uses. Emissions from water distribution result from energy use for facilities and pumping within Tracy's boundaries, as well as for transporting imported water from the Delta Mendota Canal and the Stanislaus River to Tracy.

F. Agriculture and Open Space

Agriculture is a major activity within the undeveloped portions of the Tracy area. Agricultural uses include: field crops, tree crops, nurseries, greenhouses, agricultural-related residences and structures, oil and gas exploration, livestock ranges, animal husbandry, public parks and recreation areas, farm employee residences, agricultural offices, truck farming, and roadside stands. There are approximately 4,000 acres of Prime Farmland, Farmland of Statewide Importance, and Farmland of Local Importance within the Tracy area. In addition, there are approximately 1,400 acres of land within the city that hold active Williamson Act contracts. These contracts preserve land in agricultural use for ten years and are adopted by land owners on a voluntary basis in exchange for tax benefits.

In addition, Tracy has 70 parks, totaling about 255 acres, which fall into three classifications:

[2] Erler & Kalinowski, Inc., 2005, *City of Tracy Urban Water Management Plan*, pages 13-15.

- **Mini-Parks.** Small parks, typically 1 to 3 acres in size that provide recreational activities for a specific neighborhood or subdivision. There are 48 mini parks in Tracy.
- **Neighborhood Parks.** Generally, parks 4 to 12 acres in size that provide basic recreational activities for a specific neighborhood area. Tracy has 15 neighborhood parks.
- **Community Parks.** Large parks, generally 12 to 50 acres or more, which include an equal mix of passive and active recreation areas that serve the entire city or a substantial portion of the city. Tracy has seven community parks.[3]

The City also operates approximately 14 acres of recreational corridors, mainly consisting of Class I bikeways. These facilities provide recreational and transportation amenities to Tracy residents.

G. Biological Resources

This section describes the vegetation, wildlife, special-status species, threatened and endangered species, and sensitive habitat found in Tracy and is based on information in the 2005 Draft Environmental Impact Report for the City of Tracy General Plan and the 1993 Final Environmental Impact Report for the City of Tracy Urban Management Plan/General Plan.

1. Vegetation and Wildlife Habitat

Tracy supports diverse native and non-native plant communities and wildlife habitat areas.

The Tracy area was historically dominated by perennial native grasslands, broad riparian zones and freshwater marsh wetlands, but these areas were largely converted to agriculture and grazing land during the 1800s. Remnant perennial grasslands continue to exist in outlying areas, primarily along the western slope of the Sierra Nevada Mountain Range and in isolated valleys in the Coast Range complex, where land use conversion pressures have been less severe.[4]

Historically, large grazing herbivores such as pronghorn antelope (*Antilocarpa americana*) and mule deer (*Odocoilues hemionus*) inhabited the northern San Joaquin Valley. The disappearance of large grazing herbivore populations coincided with the conversion of native habitat to agricultural and urban land uses. Populations of other mammalian and avian species also declined or disappeared with land use changes and were replaced by highly adaptive, opportunistic species.

Tracy's sensitive vegetation communities include non-native grasslands, riparian woodlands, seasonal wetlands, and farmed wetlands, which host a range of wildlife and plant species. These vegetation communities and habitat areas are described below.

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[3] Open Space and Conservation Element, City of Tracy General Plan Amendment proposed December 2010, Table 6-4. City of Tracy website, http://www.ci.tracy.ca.us/maps/parks/, accessed on February 22, 2010.

[4] City of Tracy, *Final Environmental Impact Report for the City of Tracy Urban Management Plan/General Plan*, July 19, 1993, page 101.

- **Non-Native Grasslands.** Non-native grasslands mainly occur in the southern portion of Tracy. This vegetation community supports a variety of birds and mammals and a small number of reptiles and amphibians. In addition, this community is identified as sensitive habitat for its value as a habitat area for the San Joaquin kit fox, a federally endangered and State threatened species.
- **Great Valley Riparian Woodland**. Riparian woodland communities occur in the northern area of Tracy along the Old River and Tom Paine Slough riparian zones, and along the Corral Hollow system, which flows northeast. The canopy and understory provide suitable habitat for birds and mammals. Riparian systems are also used by amphibians and reptiles. The Corral Hollow riparian area is identified as sensitive for its scenic value and habitat value. In addition, the great valley oak riparian woodland is identified as ecologically sensitive and as a desirable visual and recreational resource to San Joaquin County, and the great valley cottonwood riparian forest is identified as an important habitat area.
- **Desert Scrub Plant Community.** This community is identified as ecologically significant because it is the northernmost extension of this association in California. Desert scrub plant community is marked by sparse vegetation and bare soil between plants.
- **Seasonal Wetlands.** Seasonal wetlands occur throughout the Tracy area. These areas typically fill with water during the wet winter months and then drain enough to become ideal plant habitats throughout the spring and summer.
- **Farmed Wetlands.** Farmed wetlands are wetland areas that are currently in agricultural uses, and occur in the northern portion of the Tracy area.
- **Tidal Salt Ponds and Brackish Marsh.** Brackish marshes are areas affected by irregular tidal flooding with generally poor drainage and standing water. There are minimal occurrences along some of the larger river channels in the northern area of Tracy.
- **Old River, Paradise Cut and Tom Paine Slough.** The Old River, Paradise Cut and Tom Paine Slough are identified as sensitive for their scenic value and habitat value.

2. Protected Species

Numerous special-status animal species are known to be located in the Tracy area. Special-status species include plants and animals that are legally protected under State and federal Endangered Species Acts or other regulations, as well as species considered sufficiently rare by the scientific community to qualify for such listing. The following sensitive biological species are known to occur or potentially occur in the Tracy area:

- Mammals
  - San Joaquin kit fox
  - Riparian (San Joaquin Valley) woodrat
  - San Joaquin pocket mouse
  - Western mastiff bat
- Birds
  - Swainson's hawk
  - Burrowing owl

- Western yellow-billed cuckoo
- California horned lark

♦ Reptiles
- Coast (California) horned lizard
- San Joaquin whipsnake
- Silvery legless lizard
- Western pond turtle
- Giant garter snake
- Blunt-nosed leopard lizard

♦ Amphibians
- California red-legged frog
- California tiger salamander
- Western spadefoot

♦ Invertebrates
- Valley elderberry longhorn beetle

♦ Plants
- California tiger salamander
- Western spadefoot
- Delta button-celery
- Diamond-petaled California poppy
- Large-flowered fiddleneck
- Lemmon's jewelflower
- Mason's Lilaeopsis
- Rose-mallow
- Round-leaved filaree
- Showy madia

♦ Habitat Areas
- Great Valley Oak Riparian Forest
- Northern Calypan Vernal Pool

Several other threatened or endangered species may occur in the Tracy area, but they have not been definitively identified to occur in Tracy.

H. Air Quality

Tracy is located in the San Joaquin Valley air basin. Surrounded by mountain ranges, the air basin drains to the north, with an opening at the Carquinez Strait leading into San Francisco Bay and then the Pacific Ocean.

Wet winters and dry summers characterize the Tracy region's inland Mediterranean-type climate. Climate is temperate, with an average annual high of 75 degrees and an average low of 47 degrees. Rainfall totals can vary widely over a short

distance with windward mountain areas west of Tracy averaging over 24 inches of rain annually, and shadow areas, such as the city proper, averaging about 10 inches annually. During stormy periods, horizontal and vertical air movement ensures rapid pollutant dispersal. Rain also washes out particulate and other pollutants. Conversely, during calm periods, pollutant levels can build up to unhealthy levels.

Normally, air temperatures decrease with increasing elevations. This normal pattern is often inverted in the San Joaquin Valley, with warm air aloft, and cooler air trapped near the Earth's surface. This atmospheric condition occurs in all seasons. In summer, especially when wind speeds are very low, a strong inversion will trap air emissions near the surface, allowing high levels of ozone smog to develop. In winter, persistent inversions can trap emissions of particulate (e.g. woodsmoke) and carbon monoxide near the surface, resulting in unhealthy air quality.

Areas that do not violate ambient air quality standards set by federal and State agencies are considered to have attained the standard. Violations of ambient air quality standards are based on air pollutant monitoring data and are judged for each air pollutant. The San Joaquin Valley as a whole does not meet State or federal ambient air quality standards for ground level ozone and fine particulate matter. The region recently attained the federal coarse particulate matter standard, but still does not meet the State fine particulate matter standard.

I. Public Health

Public health is a primary measure of the overall quality of life for Tracy residents, and by extension, the sustainability of the city. The provision of open space, active modes of transportation, and access to healthy foods encourage healthy behaviors among residents and can also provide environmental benefits, for example, by reducing air pollution and GHG emissions.

The obesity epidemic is one of the most pressing public health challenges of the past decade. Nationwide, the proportion of the population nationwide that is overweight has doubled over the past 20 years. In California, one-third of children, one-quarter of adolescents, and over 60 percent of all adults are overweight or obese.[5]

In addition to reduced mobility and activity levels, obesity has serious health consequences, including an increased likelihood of diabetes, heart disease, stroke, and a number of different cancers. Obesity was estimated to cost California $28 billion during 2005 for medical care, worker's compensation, and lost productivity.[6]

J. Economic Development

This section provides a discussion of Tracy's current economic context, including an evaluation of the growth of the City's industrial and employment base and Tracy's role in the regional economy.

[5] California Department of Public Health website, http://www.cdph.ca.gov, accessed on February 24, 2010.
[6] California Center for Public Health Advocacy website, www.publichealthadvocacy.org, accessed on February 23, 2010.

Tracy's industries are related deeply to San Joaquin County – the city's transportation, warehousing, and food manufacturing sectors are reliant on the raw goods produced in the agricultural lands of the county and nearly half of the city's workforce lives in the county. However, Tracy's economy is also highly reliant on the Bay Area, where nearly half of the city's residents are employed, and from which much of the demand for Tracy's goods and services originates.

1. Employment Data and Distribution in Tracy

Tracy has experienced rapid job growth in the last decade. In fact, Tracy's employment base is growing at a significantly higher rate than that of San Joaquin County. Between 2002 and 2008, Tracy added 5,338 jobs, a growth rate of 24 percent, for a total of 27,829 jobs. The county's employment grew by less than 7 percent in that same time period. By 2008, Tracy represented a major employment center in San Joaquin County, with approximately 15 percent of the total jobs in the county.[7] These jobs came from within a variety of industrial sectors. In 2008, the top four sectors in Tracy were government, retail trade, transportation, and warehousing and manufacturing, which account for more than 16 percent, 13 percent, 11 percent, and 9 percent of the jobs in Tracy, respectively. Other key, growing sectors were the accommodation and food services sector and the wholesale trade sector.

In keeping with this industrial base, the largest employers in Tracy are those in the government and transportation and warehousing sectors. Manufacturing, especially of food products, is also represented by a large number of firms with at least 150 employees. The Safeway Distribution Center is the City's leading employer, with 2,000 jobs.

2. Commute Patterns of Workers

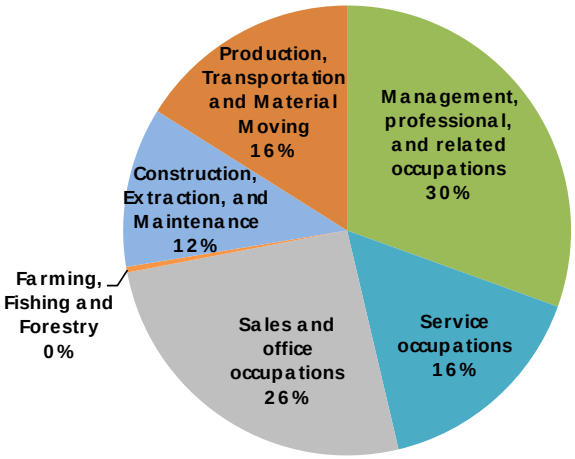
Although the labor shed for jobs in Tracy is expansive, a relatively high share of workers commute from within a short distance. Nearly 45 percent of workers based in Tracy are San Joaquin County residents, including 21 percent who are Tracy residents. Roughly 19 percent of workers travel from elsewhere in the Central Valley, while 25 percent are Bay Area residents making the reverse commute, suggesting a strong match between Tracy jobs and San Joaquin County residents.

3. Resident Workforce

From 2000 to 2008, Tracy's resident workforce grew by 50 percent, a faster growth rate than that of San Joaquin County. Despite this rapid growth, however, the occupations of new workers were similar in distribution to those of existing workers. In 2000, 61 percent of the resident workforce was employed in white collar occupations (i.e. management, professional and related occupations, and sales and office jobs); by 2008, this had only declined slightly to 57 percent. The share of residents in blue collar occupations (i.e. construction, extraction and maintenance, and production, transportation, and material moving jobs) was steady at 28 percent.

[7] California Economic Development Department, Labor Market Information Division, March 2009, "Monthly Labor Force Data for Cities and Census Designated Places (CDP) Annual Average 2008 – Revised." (http://www.labormarketinfo.edd.ca.gov/?pageid=133).

FIGURE 2-1 **OCCUPATIONS OF TRACY RESIDENTS, 2006-2008**



Source: 2006-2008 American Communities Survey, Strategic Economics 2009.

4. Commute Patterns of Residents

Only 35 percent of Tracy's resident workforce is employed in San Joaquin County, including 20 percent that work in Tracy. A far greater share of residents, 46 percent, commutes across the Altamont Pass to jobs in the Bay Area, including 27 percent that work in Alameda County. Only 9 percent of residents work elsewhere in the Central Valley.

5. Jobs-Housing Balance

Jobs-housing balance is often used as a metric of a city's sustainability. The rationale behind this is that if the number of housing units is roughly equivalent to the number of jobs, there will be less in- and out-commuting; to the extent that there is intercity travel, a strong balance will ensure bi-directional traffic flows, reducing rush-hour congestion in a single direction.

While the City of Tracy has experienced strong employment growth over the last several years, the city's population has grown at a faster pace than its employment. Much of this residential growth is attributable to households with workers employed in the Bay Area, especially Alameda County. Concomitantly, Tracy's housing prices are such that many of the predominantly low-wage workers of jobs based in Tracy must commute in from elsewhere in San Joaquin County and the Central Valley. The City's jobs-housing balance has declined in recent years such that in 2008, there were roughly 0.73 jobs for every employed resident. However, this ratio significantly understates the imbalance that currently exists for commute flows of residents and workers. As noted above, 20 percent Tracy's resident workforce is employed within the city, significantly less than the 73 percent that would be predicted if spatial match were the only factor determining where residents work. Some combination of job quality, accessibility, and occupation/skills requirements drives a higher proportion of Tracy workers to commute than would be necessary if the jobs located in Tracy were better matched to the skills and needs of residents.

3 FUTURE TRENDS

This chapter discusses future trends related to greenhouse gas (GHG) emissions, energy, transportation and land use, solid waste, water, agriculture and open space, biological resources, air quality, public health, and economic development. The future emissions forecast for GHG emissions is based on the Emissions Inventory and Business As Usual (BAU) forecast for Tracy, which is provided as Appendix B.

A. Greenhouse Gas Emissions

The community and municipal emissions inventories developed for the baseline year 2006 were used to project future emissions for the year 2020 under BAU conditions. The 2020 BAU forecast for community-wide emissions is 1,735,022 metric tons of carbon dioxide equivalent (CO_2e), an increase of approximately 30 percent over the 2006 baseline inventory. For municipal emissions, the 2020 BAU forecast is 13,948 metric tons of CO_2e, an increase of approximately 22 percent over the baseline. In total, Tracy's per capita GHG emissions in 2020 under BAU conditions are projected to be 11.5 metric tons CO_2e,[1] a slight decrease from the 2006 per capita emissions. These projections are based on the assumption that GHG emissions will increase as Tracy's population grows.

GHG emissions in Tracy are also a function of the energy, transportation and land use, solid waste, and water sectors, which are discussed in Sections B through E, respectively, below. Additional information on these and other sources of GHG emissions is provided in Appendix B.

B. Energy

1. Community-Wide Emissions Inventory

Community-wide energy consumption in 2020 includes electricity and natural gas consumption by residential buildings, commercial buildings, and industrial facilities. The forecast of residential energy use in 2020 was based on an average annual residential growth rate of 1.6 percent, which is consistent with the City's Growth Management Ordinance.[2] Residential energy consumption in 2020 is projected to be approximately 2.3 million MMBtu, which would produce 273,441 metric tons of CO_2e, an increase of approximately 24 percent above current conditions.

Energy use in 2020 by commercial and industrial facilities is projected to grow at a rate of approximately 1.8 percent per year. This growth rate reflects the projected growth in jobs in the area.[3] Commercial and industrial energy use in 2020 is projected to be approximately 1.7 million MMBtu, which would produce 206,228 metric tons of CO_2e, an increase of approximately 28 percent above current conditions.

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[1] Based on the total anticipated population and employment in Tracy in 2020, approximately 152,100 residents and workers. From: Watten, Mackenzie and Mike Wallace. Fehr & Peers. Personal communication with Tanya Sundberg, DC&E. January 29, 2010.

[2] The residential development allowed by the City's Growth Management Ordinance is described in Table 3-4 on page 3-37 of the April 2009 Draft EIR for the City of Tracy General Plan Amendment.

[3] The commercial and industrial development anticipated by the City's General Plan is described in Chapter 3, Section J.1 of the April 2009 Draft EIR for the City of Tracy General Plan Amendment.

These projections do not account for potential reductions in the carbon intensity of California electricity that may be achieved through the State's renewable portfolio standard, which is discussed further in Chapter 5 and Appendix C. These projections also do not account for improvements in energy efficiency of buildings that may result from changes to the building code, changes in behavior or advances in building materials that may reduce the energy consumed per square foot.

2. Municipal Operations Emissions Inventory

Because of data and modeling constraints, the BAU forecast does not include energy-related emissions from municipal operations. However, as indicated in Chapter 2, municipal emissions in 2006 accounted for less than 1 percent of the total emissions in Tracy. Therefore, the energy component of the municipal BAU forecast would not have a significant impact on the total BAU forecast.

C. Transportation and Land Use

As population and employment in Tracy grow, it is anticipated that VMT will also increase, which will contribute to GHG emissions in Tracy.

1. Community-Wide Emissions Inventory

The community-wide forecast for transportation emissions was based on projected city land use in 2020. The 2020 BAU forecast for transportation-related emissions is 1,118,705 metric tons of CO_2e, an increase of approximately 32 percent over 2006 emissions levels.

2. Municipal Operations Emissions Inventory

Because of data and modeling constraints, the BAU forecast does not include transportation-related emissions from municipal operations. However, as indicated in Chapter 2, municipal emissions in 2006 accounted for less than 1 percent of the total emissions in Tracy. Therefore, the transportation component of the municipal BAU forecast would not have a significant impact on the total BAU forecast.

D. Solid Waste

1. Community-Wide Emissions Inventory

Emissions associated with solid waste generation and subsequent burial in landfills are projected to grow in proportion to population, i.e. by 1.6 percent per year.[4] GHG emissions in the waste sector are forecast to be 41,939 metric tons CO_2e in 2020. This projection represents an increase of approximately 24 percent over existing conditions.

2. Municipal Operations Emissions Inventory

Tracy Delta Solid Waste Management provides service to the municipal buildings, as well as private residential and commercial buildings. Data aggregation did not allow for a unique estimate of the waste generated only by municipal

[4] Population growth is estimated based on the residential development allowed by the City's Growth Management Ordinance, which is described in Table 3-4 on page 3-37 of the April 2009 Draft EIR for the City of Tracy General Plan Amendment.

facilities. Therefore, the community forecast above includes future emissions due to waste generated through municipal operations of the City.

E. Water

1. Community-Wide Emissions Inventory

Water demand in the City of Tracy is estimated to be 23,900 acre-feet per year by 2020, according to Tracy's Urban Water Management Plan. The energy required for water pumping, treatment, and conveyance is projected to results in emissions of 1,012 metric tons of CO_2e in 2020. This forecast assumes that the energy intensity of City water remains constant in future years. The energy intensity is determined by several factors, including the relative percentages of locally-pumped to imported water and the energy mix in California. Water consumption due to municipal operations is estimated to comprise a small percentage of the community's total water use and is included in this forecast.

2. Municipal Operations Emissions Inventory

Water consumption due to municipal operations is included in the community forecast for emissions in this sector.

F. Agriculture and Open Space

The San Joaquin Valley is California's leading agricultural region, accounting for 55 percent of the State's total agricultural sales. Despite the importance of agriculture to the region, urbanization and population growth have resulted in the loss of substantial amounts of farmland, with the San Joaquin Valley losing approximately 70,000 acres of high quality farmland between 1990 and 2004.[5] Since 1990, urban development has consumed 1 acre of land for every eight people in the San Joaquin Valley.[6]

Loss of farmland has been particularly severe in San Joaquin County, where approximately 15,000 acres of high quality farmland – more than in any other county in California – were developed between 1990 and 2004. This loss of high quality farmland accounted for 76 percent of all the land urbanized in the county over the same period.[7]

In its report *Paving Paradise: A New Perspective on California Farmland Conversion*, the American Farmland Trust projected the amount of farmland that would be lost in future decades if current rates of urbanization continue. The San Joaquin Val-

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[5] American Farmland Trust, November 2007, *Paving Paradise: A New Perspective on California Farmland Conversion*, pages 6-7. (http://www.farmland.org/programs/states/ca/Feature%20Stories/documents/PavingParadise_AmericanFarmlandTrust_Nov07.pdf).

[6] Central Valley Farmland Trust website, http://www.valleyfarmland.org/archives/category/landowners/why-we-do-it, accessed on February 24, 2010.

[7] American Farmland Trust, November 2007, *Paving Paradise: A New Perspective on California Farmland Conversion*, pages 6-7. (http://www.farmland.org/programs/states/ca/Feature%20Stories/documents/PavingParadise_AmericanFarmlandTrust_Nov07.pdf).

ley is projected to lose approximately 218,500 additional acres of farmland in the period between 2004 and 2020 under current urbanization rates. San Joaquin County is projected to lose approximately an additional 40,800 acres by 2020.[8] Recognizing the problems of farmland conversion, the City of Tracy has an agriculture mitigation fee ordinance, which helps to fund farmland preservation through purchase and easements. Efforts are also underway at the regional level to counter this trend. The Central Valley Farmland Trust (CVFT) preserves productive farmland in Central Valley counties through land purchase, donation, and agricultural conservation easements from landowners. Through the San Joaquin Valley Blueprint process, policymakers have endorsed a preferred growth strategy through 2050 that would preserve approximately 118,000 acres of farmland in the San Joaquin Valley through efficient land use and transportation planning.

G. Biological Resources

As summarized in Chapter 2, Tracy is home to a range of wildlife and plant species that reflect the biological diversity of San Joaquin County and the larger San Joaquin Valley. These include seven threatened and endangered species and numerous special-status species, which are further threatened by inefficient development patterns. Development in and around Tracy will likely intensify pressures on these biological resources, and reduce the extent and diversity of Tracy's ecosystems.

In an effort to protect sensitive and threatened species throughout the county, the San Joaquin Council of Governments (SJCOG) has prepared the San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP), which the City of Tracy has adopted. The purpose of the SJMSCP is to provide a countywide strategy for preserving open space; provide for the long-term management of plant, fish, and wildlife species, especially those that are currently listed or may be listed in the future under the federal or California Endangered Species Act (ESA); and provide and maintain multiple-use open spaces that contribute to the quality of life of the residents of San Joaquin County.

H. Air Quality

Ambient air quality is affected by the rate and concentration of pollutant emissions and meteorological conditions. Factors such as wind speed, atmospheric stability, and mixing height all affect the atmosphere's ability to mix and disperse pollutants. Long-term variations in air quality typically result from changes in emissions, while short-term variations result from changes in atmospheric conditions. There are several continuous air monitoring stations operated by government agencies in the Tracy area. As indicated in Chapter 2, measured air pollutant data indicate that ground-level ozone and particulate matter are the air pollutants of greatest concern because concentrations in the area exceed health-based standards each year.

In general, air quality in San Joaquin County between 2003 and 2007 was better than in other parts of the San Joaquin Valley. During this time, the State one-hour ozone standard was exceeded three to sixteen times a year, and the federal

[8] American Farmland Trust, November 2007, *Paving Paradise: A New Perspective on California Farmland Conversion*, Statewide, Regional, and County datasets. (http://www.farmland.org/programs/states/ca/Feature%20Stories/PavingParadise.asp).

standard was not exceeded. The national eight-hour ozone standards were exceeded three to ten times a year. State coarse particulate matter standards are calculated to have been exceeded from 36 to 60 days a year. Federal fine particulate matter daily standards were exceeded from one to five times a year. Standards for all other criteria pollutants were not exceeded in the five-year period.

I. Public Health

The link between sustainability and public health has become more prominent in recent years due to dramatic increases in obesity rates and obesity-related illnesses.

Obesity not only affects one's comfort and mobility, but has serious health consequences, including an increased likelihood of diabetes, heart disease, stroke, and a number of different cancers. The rates of chronic disease and disability attributable to poor diet and inactivity, including heart disease, Type 2 diabetes, high blood pressure, stroke, depression, sleep disorders, and some cancers, continue to increase. In the United States, about 75 percent of overweight and obese children are likely to be obese as adults. Public health experts predict that if current trends continue, one-third of American children born in 2000 and one-half of all children from ethnic and racially diverse populations will suffer Type 2 diabetes during their lifetime. Public health experts also predict that this generation of children could become the first in modern history whose lifespan is shorter than that of their parents.[9]

Community planning can directly address these health problems through development patterns that: are more conducive to transit, walking, and bicycling; allow for wider access to sources of healthy food like grocery stores and farmers' markets; and provide parks and open space in every neighborhood. Research has shown that individuals living in neighborhoods that exhibit these characteristics are significantly less likely to be overweight or obese; significantly more likely to get the recommended levels of physical activity; and significantly more likely to walk, bicycle, or ride transit. Such benefits are particularly important in San Joaquin County where, similar to other California locations, coronary heart disease, lower respiratory disease, cancer, diabetes, and stroke are among the leading causes of death. Improving physical fitness and eating healthy foods can significantly reduce the risks for these diseases and conditions.

J. Economic Development

Despite Tracy's proximity to high-tech and research centers in the Silicon Valley and Alameda County, Tracy's basic economy is firmly rooted in "goods movement industries," including truck transportation, warehousing and storage, wholesale trade, and food manufacturing. Secondary strengths in Tracy's economy are industries that serve its growing residential population, including retail stores and restaurants. Recent employment growth and an advantageous geographic position near the Altamont Pass suggest that these industries will continue to be strong into the future.

[9] California Department of Public Health website, http://www.cdph.ca.gov, accessed on February 24, 2010.

1. Economic Competitiveness

A shift-share analysis was conducted to evaluate the sectors and industries that are likely to experience growth in the future. The analysis classified Tracy's industrial sectors into the five categories discussed below. The results of the shift-share analysis are presented in Table 3-1.

a. Competitive Advantage

Competitive Advantage sectors and industries are those that have grown in importance in San Joaquin County, adding employment at a faster rate than the economy overall. Further, growth in these industries has been even greater in Tracy than in the rest of the county. Consequently, sectors and industries in this category are those most likely to experience growth, as local advantages are buoyed by regional strength.

The Competitive Advantage sectors can be clustered in two groups. The first, which includes the wholesale trade sector, is driven by inter-regional demand, both from the Bay Area and from the rest of the world, accessed through the Bay Area's ports. This suggests that the demand for the products that are traded through the firms in this sector is increasing, and that Tracy's key geographic position, as the gateway to the Bay Area from the Central Valley, is an important factor for these firms. The second group, which includes the educational services, health care and social assistance, accommodation and food services, and administrative and support and waste management sectors, are driven by local and regional demand. That these sectors are growing more quickly in Tracy than in San Joaquin County is a reflection both of Tracy's rapidly-growing residential population and of Tracy's growing role as a regional services node.

TABLE 3-1 **SUMMARY OF TRACY'S ECONOMIC STRENGTHS, 2002 – 2008**

Classification	Industries
Competitive Advantage	Wholesale Trade Educational Services Health Care and Social Assistance Accommodation and Food Services Administrative and Support and Waste Management
Local Advantage	Manufacturing Finance and Insurance Professional and Technical Services Management of Companies and Enterprises Arts, Entertainment, and Recreation Other Services (except Public Administration)
Emerging Opportunity	Transportation and Warehousing
Stable	Retail Trade
Declining	Agriculture, Forestry, Fishing, and Hunting Construction Real Estate and Rental and Leasing Mining Information

Source: California Economic Development Department, 2009; Strategic Economics, 2010.

b. Local Advantage

Local Advantage sectors and industries are those that have expanded their presence in Tracy, even as they have declined in importance in San Joaquin County as a whole, suggesting that Tracy has an advantage over the rest of San Joaquin County for drawing jobs in these industries. However, because these industries have a declining presence in San Joaquin County overall, they are potentially at risk for decline in Tracy. They should be considered for their unique role in differentiating Tracy's economy from the county's.

As with the Competitive Advantage sectors, much of this is related to Tracy's geographic position. Proximity to the Altamont Pass is likely a key factor in Tracy's growing manufacturing sector, as firms can make use of inputs from the Central Valley and quickly transport finished goods to consumers in the Bay Area. Other sectors in this category are more mixed in their reasons for locating in Tracy. For many firms in the finance and insurance, professional and technical services, and management of companies and enterprises sectors, location in Tracy may be mechanism to maintain proximity to Bay Area firms and clientele while economizing on rent and land prices. However, others are likely locating in Tracy to serve the growing residential population. Finally, the arts, entertainment, and recreation sector is primarily local- and county-serving, a reflection of population growth and Tracy's increasing economic importance to the region.

c. Emerging Opportunity

Emerging Opportunity sectors and industries are those that have increased their presence in San Joaquin County and have grown in Tracy, but at a slower rate than in the rest of the county. While this may be due to some inherent local disadvantage, these industries may also represent an opportunity to capture employment growth that is currently going elsewhere in the county.

The transportation and warehousing sector is the only industrial sector in the Emerging Opportunity category. However, in 2008, more than twice the share of Tracy's total employment was in this sector, compared to that of San Joaquin County. Consequently, the slow growth is likely a reflection of the dominance of larger, slow-growing establishments, such as the Safeway Distribution Center, rather than any local disadvantages. Reasons for locating in Tracy for firms in this sector are nearly identical to that of the wholesale trade sector.

d. Stable

Stable sectors and industries are those that have experienced local job growth, but have not gained in importance relative to other industries in Tracy or San Joaquin County.

Only one industrial sector, retail trade, can be classified as Stable. Currently, retail in Tracy is primarily local-serving and is growing, though at a slower pace than its overall economy.

e. Declining

Declining sectors and industries are those that have experienced a decline in the number of city jobs between 2002 and 2008.

With the exception of the information sector, the sectors in the Declining category are also related to housing construction and population growth, though with an opposite effect of those in the other categories. As housing construction has fallen precipitously from its peak in 2003, the construction and real estate sectors experienced contraction in em-

ployment. Employment in the agricultural and mining sectors has also fallen. The preservation of the remaining agricultural land and employment may be a key component of a sustainable economic development strategy. Finally, the information sector, which included only 44 jobs in 2008, has never been a significant component of Tracy's economy; its decline is largely a function of San Joaquin County's overall weakness in this sector.

2. Job Match Analysis

As discussed in Chapter 2, 20 percent of Tracy's resident workforce is employed within the city, significantly less than the 73 percent that would be predicted if Tracy's jobs-housing ratio were the only factor determining where residents work. One mechanism for reducing in- and out-commuting in the future is to foster a strong match between the skills of Tracy's residents and the training and educational requirements of Tracy's jobs. Highly trained or educated residents are unlikely to hold jobs for which they are overqualified, while residents with low levels of education are unlikely to be offered jobs with high training requirements. Consequently, the distribution of educational attainment of residents should closely resemble the occupational requirements of key industrial sectors for there to be a good skills-jobs match.

In general, the occupations in Tracy's key sectors do not have high training or educational requirements, with a majority requiring no post-secondary education. In comparison, in 2008, 55 percent of Tracy's resident workforce had some post-secondary education, including 20 percent that held bachelor's degrees or higher. This suggests that a potential source of mismatch between Tracy's jobs and residents is that the resident workforce may be "overqualified" for employment in the largest and most rapidly-growing sectors of the local economy.

4 SUSTAINABILITY TARGETS

This chapter presents the sustainability targets for Tracy for the year 2020. These targets were developed following a review of sustainability targets set by other entities, such as the State Department of Conservation and the Attorney General's Office, and have been refined iteratively and concurrently with the sustainability measures. Targets are presented for each sector of the Sustainability Action Plan.

A. Greenhouse Gas Emissions

This Sustainability Action Plan includes a community and municipal target for greenhouse gas (GHG) emissions by 2020, as listed below. In addition, the targets in each of the subsections below will support the overall reduction targets for GHG emissions. The GHG emission targets are as follows:

- Target #1: 15 percent reduction in per capita emissions from the 2006 baseline of 11.6 metric tons of carbon dioxide equivalent.

B. Energy

Within the energy sector, this Sustainability Action Plan aims to achieve the following:

- Target #2a: 25 percent of all community energy needs provided by renewable sources.
- Target #2b: 25 percent of all municipal energy needs provided by renewable sources.
- Target #3a: New residential and non-residential buildings powered by 10 percent using on-site solar panels.
- Target #3b: New municipal buildings powered by 10 percent using on-site solar panels.
- Target #4a: 15 percent reduction in community energy consumption from 2006 baseline levels.
- Target #4b: 10 percent reduction in the municipal peak electrical load from 2006 baseline levels.

C. Transportation and Land Use

Within the transportation and land use sector, this Sustainability Action Plan aims to achieve the following:

- Target #5a: 20 percent increase in the percentage of non-City employees who participate in travel demand management programs from 2006 baseline levels.
- Target #5b: 20 percent increase in the percentage of City employees who participate in travel demand management programs from 2006 baseline levels.
- Target #6a: 20 percent reduction in the community VMT per capita from current (2006) levels.
- Target #6b: 20 percent reduction in the municipal VMT from 2006 baseline levels.

D. Solid Waste

Within the solid waste sector, this Sustainability Action Plan aims to achieve the following:

- Target #7a: 75 percent of the community waste stream is diverted from landfills.
- Target #7b: 75 percent of the municipal waste stream is diverted from landfills.
- Target #8a: 50 percent of community construction waste is reused or recycled.
- Target #8b: 50 percent of municipal construction waste is reused or recycled.

E. Water

Within the water sector, this Sustainability Action Plan aims to achieve the following:

- Target #9a: 12 percent reduction in outdoor potable water use from 2010 levels.
- Target #9b: 20 percent reduction in per capita potable water use from Department of Water Resources Method 1 Ten Year Historical Average (1995-2004).
- Target #9c: 20 percent reduction in municipal water use from 2008 levels.

F. Agriculture and Open Space

Within the agriculture and open space sector, this Sustainability Action Plan aims to achieve the following:

- Target #10: No loss of Prime Farmland, Farmland of Statewide Significance or Unique Farmland outside of the City's Sphere of Influence (SOI).
- Target #11: Any loss of such farmland inside of the SOI is offset by mitigation fees to a qualified agriculture preservation trust, such as the Central Valley Farmland Trust, at a ratio related to every acre that is lost.

G. Biological Resources

Within the biological resources sector, this Sustainability Action Plan aims to achieve the following:

- Target #12: Any loss of critical habitat corridors is mitigated through the Habitat Conservation Plan or other appropriate mitigation.

H. Air Quality

This Sustainability Action Plan aims to achieve the following:

- Target #13: 25 percent reduction in the number of days exceeding National and California Ambient Air Quality Standards.

I. Public Health

Within the public health sector, this Sustainability Action Plan aims to achieve the following:

- Target #14a: 50 percent reduction in the percentage of obese adults in Tracy from 2006 baseline levels.
- Target #14b: 50 percent reduction in the percentage of obese children in Tracy from 2006 baseline levels.
- Target #15: 90 percent of households within ½ mile of a retail outlet selling fresh food and/or with a retail outlet selling fresh food as their closest food retailer.
- Target #16: 90 percent of households within ½ mile of a neighborhood or regional park or recreation facility.

J. Economic Development

Within the economic development sector, this Sustainability Action Plan aims to achieve the following:

- Target #17: Ratio of jobs to employed residents with matched skills between .90 and 1.10.
- Target #18: 10,000 square feet of neighborhood-serving retail within ¼ mile of 75 percent of all residents.
- Target #19: "Economic Diversity Index" score[1] equal to or better than the statewide average.
- Target #20: 10% of jobs are "green" by practice or product.

[1] The Economic Diversity Index is a score based on the economic diversity of the industries within a community. Communities with only one industry are inevitably impacted by shifts in the economy, and residents have few opportunities for alternative employment. Communities with a wider range of industries have more employment options for residents, and are expected to be more resilient to economic shifts.

5 SUSTAINABILITY MEASURES

This chapter presents the measures that the City of Tracy will implement in order to achieve its sustainability targets. These eighty-four measures were developed and refined through an iterative process that included community and stakeholder involvement. As discussed in Chapter 1, participants at the Community Workshop held in February 2010 provided ideas for additional sustainability measures to include in the Sustainability Action Plan. The City has determined that these measures would be complicated to implement at this time but will reconsider these measures when the Sustainability Action Plan is updated in the future.

The measures are described by sector in the sections below. Additional information on each measure is also provided in Tables 5-1 and 5-2, located at the end of this Chapter. Table 5-1 includes measures in the energy, transportation and land use, and solid waste sectors, , which all have a quantifiable GHG emission reduction benefit. For each measure, Table 5-1 provides the following information:

- How the measure is to be activated (e.g. by ordinance or program).
- The quantified reduction in carbon dioxide equivalent (CO_2e) emissions and the corresponding percentage of the total CO_2e reduction needed to reach the GHG target outlined in Chapter 4.
- Cost to the City per metric ton of CO_2e reduction.
- Secondary benefits of the measure (e.g. improving public health or increasing jobs).
- Anticipated new costs to the City to implement the measure.
- Anticipated costs to developers or residents.
- Projected cost savings and payback time.

Table 5-2 presents detailed information on the measures in the water, agriculture and open space, biological resources, public health, economic development, and public outreach and education sectors, which have not been quantified with a GHG emission reduction benefit. The table provides the following information for each measure:

- How the measure is to be activated.
- Primary and Secondary benefits of the measure.
- Anticipated new costs to the City to implement the measure.

A. Greenhouse Gas Emissions

The energy, transportation and land use, and solid waste sectors that are discussed below include measures that will reduce GHG emissions. In total, implementation of the Sustainability Action Plan will reduce GHG emissions by 378,461 to 482,154 metric tons of CO2 equivalent (CO2e). The assumptions that were used to quantify the GHG benefit are provided in Appendix C.

B. Energy

E-1: Green Building Ordinance

Develop an incentives-based Green Building Ordinance that promotes energy efficient design for new buildings. As part of this Ordinance:

a. Adopt the 2010 California Green Building Standards Code (Title 24, Part 11, CCR).

b. Encourage energy efficiency measures for new warehouses and warehousing in association with other commercial and industrial uses, including the use of reflective pavement and natural gas or electricity use for yard equipment.
c. Encourage the use of cement substitutes and recycled building materials for new construction.
d. Encourage the use of energy-efficient appliances that meet Energy Star standards when higher than Title 24 and the use of energy efficient lighting technologies that meet or exceed Title 24 standards.
e. Encourage all new buildings to be constructed to allow for the easy, cost-effective installation of future solar energy systems. "Solar ready" features should include: proper solar orientation (i.e. south facing roof area sloped at 20° to 55° from the horizontal); clear access on the south sloped roof (i.e. no chimneys, heating vents, plumbing vents, etc.); electrical conduit installed for solar electric system wiring; plumbing installed for solar hot water system; and space provided for a solar hot water storage tank.
f. Encourage any roof to have a Solar Reflectance Index (SRI) of at least 29.
g. Encourage that residential projects of 6 units or more participate in the California Energy Commission's New Solar Homes Partnership, which provides rebates to developers of 6 units or more who offer solar power in 50 percent of new units and is a component of the California Solar Initiative or a similar program with solar power requirements equal to or greater than those of the California Energy Commission's New Solar Homes Partnership.
h. Partner with Pacific Gas and Electric or other appropriate energy providers and the California Public Utilities Commission to develop an incentive program for solar installation on new and retrofitted warehouses. Consider a mandatory minimum solar requirement for new warehouse space.
i. Encourage that new or major rehabilitations of commercial, office, or industrial development greater than or equal to 25,000 square feet in size incorporate solar or other renewable energy generation to provide 15 percent or more of the project's energy needs. Major rehabilitations are defined as additions of 25,000 square feet of office/retail commercial or 100,000 square feet of industrial floor area.
j. In partnership with Pacific Gas and Electric and other appropriate energy providers, develop a program that provides incentives that meet or exceed those of AB 1470. AB 1470, the Solar Hot Water Energy Efficiency Act of 2007, directs the California Energy Commission to establish a ten-year, statewide incentive program to encourage the installation of 200,000 solar water heating systems to offset natural gas usage for water and space heating. The incentives would be funded by a utility company surcharge on certain natural gas customers up to $250 million over ten years.
k. Develop a public-private partnership to provide incentives for co-generation projects for commercial and industrial facilities using outside funds.
l. Encourage the development of alternative energy projects and conduct a review of City policies and ordinances to address alternative energy production. Develop protocols for alternative energy storage, such as biodiesel, hydrogen, and/or compressed air. Continue to research the location needs for alternative energy producers and send direct, targeted marketing pieces to alternative energy producers that are appropriate for Tracy. Identify possible City-owned sites for production of local renewable energy sources such as solar, wind, small hydro, and biogas.
m. Encourage the inclusion of alternative energy facilities that are a secondary use to another project. Identify the best means to avoid noise, aesthetic, and other potential land use compatibility conflicts for alternative energy facilities (e.g. installing tracking solar PV or angling fixed solar PV in a manner that reduces glare to surrounding land uses). Identify and remove regulatory or procedural barriers to producing renewable energy as a secondary use to another project, such as updating codes, guidelines, and zoning.
n. Encourage the use of locally-sourced, sustainable, salvaged and recycled-content materials and other materials that have low production energy costs for building materials, hard surfaces, and non-plant landscaping.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 2,485 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Conserve energy
- Increase renewable energy
- Reduce VMT
- Reduce waste
- Increase jobs

E-2: Energy Efficiency in Site Planning and Design

Amend the Zoning Ordinance, City Standards, or Subdivision Guidelines to do the following:

a. Establish measures that reduce energy use through solar orientation by taking advantage of landscaping and sun screens.
b. Allow increased height limits and greater development flexibility in exchange for incorporating energy-efficient green building practices. Provide permitting-related and other incentives for energy efficient building projects, for example by giving green projects priority in plan review, processing and field inspection services.
c. Establish guidelines for cool pavements and strategically placed shade trees.
d. Require all new development and major rehabilitation (i.e. additions of 25,000 square feet of office/retail commercial or 100,000 square feet of industrial floor area) projects to incorporate any combination of the following strategies to reduce heat gain for 50 percent of the non-roof impervious site landscape, which includes sidewalks, courtyards, parking lots, and driveways: shaded within five years of occupancy; use of paving materials with a Solar Reflectance Index (SRI) of at least 29; open grid pavement system; or locating parking spaces under deck, under roof, or under a building.
e. Require outdoor lighting fixtures to be energy-efficient. Require parking lot light fixtures and light fixtures on buildings to be on full cut-off fixtures, except emergency exit or safety lighting, and all permanently installed exterior lighting shall be controlled by adjustable timers. Prohibit continuous all night outdoor lighting in sports stadiums, construction sites, and rural areas unless they are required for security reasons.
f. Where feasible, increase solar access by requiring that new streets be designed so that the blocks have one axis within plus or minus 15 degrees of geographical east/west, and the east/west length of those blocks are at least as long, or longer, as the north/south length of the block. Areas with topological constraints, among others, may be excluded from this requirement.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 11,752 metric tons CO2e.

2. Secondary Benefits

As a secondary benefit, this measure would conserve energy.

E-3: Green Building and Energy Efficiency Design and Education

a. Amend the City of Tracy Design Goals and Standards to do the following:
   i. Integrate guidelines from the Green Building Ordinance.
   ii. Integrate guidelines related to cool pavements in the City Standards.
   iii. Balance tradeoffs between solar access and landscape tree shading.
b. Conduct the following public education and outreach campaigns:
   i. Provide information about green building, marketing, training, and technical assistance to property owners, development professionals, schools, and special districts.
   ii. Develop an "energy efficiency challenge" campaign for community residents or businesses.
   iii. Provide public education and publicity about renewable resources, energy efficiency and emissions reduction programs and incentives.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 10,781 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Conserve energy
- Increase renewable energy
- Reduce VMT
- Reduce waste
- Conserve water
- Foster public awareness of sustainability

E-4: Energy-Efficient Products and Retrofits

a. Partner with PG&E to do the following, using outside funds:
   i. Promote the use of energy-efficient appliances that meet Energy Star standards when higher than Title 24.
   ii. Distribute compact fluorescent light (CFL) bulbs and/or fixtures to community members.
   iii. Offer a halogen torchiere lamp exchange to community members.
   iv. Promote energy efficiency audits of existing buildings to check, repair, and readjust heating, ventilation, air conditioning, lighting, water heating equipment, insulation and weatherization.
   v. Encourage energy audits to be performed when residential and commercial buildings are sold. Energy audits will include information regarding the opportunities for energy efficiency improvements, and will be presented to the buyer. Commercial buildings are encouraged to be "benchmarked" using EPA's ENERGY STAR Portfolio Manager Tool.
   vi. Encourage individualized energy management planning and related services for large energy users.
   vii. Fund and schedule energy efficiency retrofits or "tune-ups" of existing buildings.
b. Support San Joaquin Valley Unified Air Pollution Control District's lawnmower exchange program for residents to exchange conventional gas-powered lawnmowers for electric and rechargeable battery-powered lawnmowers.
c. Encourage new development to provide exterior electrical outlets so that electric lawnmowers and other landscaping equipment can be sufficiently powered.
d. Encourage the installation of programmable thermostat timers.

e. Encourage the installation of energy efficient boilers.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 36,768 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Conserve energy
- Increase renewable energy
- Reduce VMT
- Reduce waste
- Increase jobs
- Foster public awareness of sustainability

E-5: Weatherization Assistance

Continue to fund weatherization projects for households that meet the income eligibility criteria by utilizing the Community Development Agency's Downtown Rehabilitation Loan and Grant programs.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 473 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Conserve energy
- Foster public awareness of sustainability
- Retain and increase amount of affordable housing

E-6: Financing for Energy Efficiency and Renewable Energy Projects

Develop a program under AB 811 to offer innovative, low-interest financing for energy efficiency and renewable energy projects for existing and new development, including heating, ventilation, air conditioning, lighting, water heating equipment, insulation, weatherization, and solar.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 8,789 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Conserve energy
- Increase renewable energy

E-7: Energy Efficient Retrofits for City Street Lights

Retrofit City street lights to LED or induction lighting.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 337 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Conserve energy
- Decrease City's facilities costs

E-8: Solar Panel Installations on Municipal Facilities

Install solar panels on municipal facilities.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 34 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Conserve energy
- Increase renewable energy
- Increase jobs
- Decrease City's facilities costs

E-9: Energy Efficiency Settings for City Desktop Computers

Change the settings for all City desktop computers to achieve the following:

a. All monitors shall go into sleep mode after 15 minutes of inactivity.
b. All computers shall go into sleep mode after 90 minutes of inactivity.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 5 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Conserve energy
- Decrease City's facilities costs

The GHG emissions reductions from the energy-related measures above account for the external, State-level measure regarding the energy efficiency. The California Green Building Initiative (Executive Order S-20-04) calls for modifica-

tions to Title 24 standards that will increase energy efficiency in new government and commercial buildings by 20 percent by 2015.[1]

External State Title 24 Standards

In 2008, the California Energy Commission adopted new Title 24 Energy Efficiency Standards, which require implementation of energy-efficient technologies that will reduce energy consumption in new residential, commercial, and industrial development. The largest percentage reduction from Title 24 Standards will occur in new residential sector energy consumption. Title 24 is estimated to reduce new residential electricity consumption by 22.7 percent and natural gas consumption by 10 percent.[2]

The new Title 24 Standards will cause a GHG benefit in Tracy that would occur regardless of whether this Sustainability Action Plan is implemented. Therefore, in quantifying the ability for the City to reach its GHG target by 2020, the GHG benefit from this external, State-level measure is provided separately in Table 5-1. As shown in the table, the Title 24 standards are projected to reduce GHG emissions in Tracy by 16,926 metric tons CO_2e.

External State Renewable Portfolio Standard

California Executive Order S-14-08 requires California electricity providers to expand their renewable energy portfolio to serve 33 percent of their load through renewable energy sources by 2020.[3] Since renewable energy sources generally do not generate GHG emissions, this Executive Order will cause a GHG benefit in Tracy that would occur regardless of whether this Sustainability Action Plan is implemented. Therefore, in quantifying the ability for the City to reach its GHG target by 2020, the GHG benefit from this external, State-level measure is provided separately in Table 5-1. As shown in the table, this renewable energy portfolio measure is projected to reduce GHG emissions in Tracy by 44,034 metric tons CO_2e.

C. Transportation and Land Use

T-1: Live-Work and Work-Live Uses

Amend the Zoning Ordinance to allow live-work and work-live uses in existing and future residential development and adopt more flexible home occupation requirements.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 292 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

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[1] California Energy Commission website, http://www.energy.ca.gov/greenbuilding, accessed on July 30, 2009.

[2] California Energy Commission, *2008, Update to the California Energy Efficiency Standards for Residential and Nonresidential Buildings.* (**http://www.energy.ca.gov/**title24/2008standards/index.html)

[3] California Executive Order S-14-08 was signed by Governor Arnold Schwarzenegger in November 2008. This mandate further accelerated a renewable energy portfolio standard implemented under Senate Bill 107 in 2006. California Energy Commission website, http://www.energy.ca.gov/renewables/index.html, accessed on August 3, 2009.

- Reduce VMT
- Improve air quality

T-2: Reduced Parking Requirements

Amend the Zoning Ordinance to allow a reduction in parking requirements under the following circumstances:

a. Multiple uses with staggered parking demand
b. Actual demand lower than as required in code as demonstrated by a parking study
c. Proximity to bus stop/transit
d. Mixed use project
e. In-lieu fee in Downtown

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 146 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce VMT
- Improve air quality

T-3: Support for Bicycling

Promote bicycle usage through the following:

a. Continue to require bicycle parking for non-residential and multi-family uses.
b. Amend the Zoning Ordinance to require shower facilities and dressing areas for significant new or redevelopment of non-residential uses.
c. Create a bicycle-sharing program.
d. Provide bicycle parking near transit.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 139 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce VMT
- Improve air quality
- Improve public health

T-4: Support for Transit

Promote transit ridership through the following:

a. Add to the Transportation Master Plan, where justified by ridership and funding availability, an increase transit route coverage to within ½ mile of all residents in the developed city and to within ¼ mile of 75 percent of residents within new development areas.

b. Continue to implement the City's program to provide covered and partially enclosed shelters that are adequate to buffer wind and rain and with at least one bench at each existing public transit stop and to provide local public transit information in transit shelters.
c. Provide information to city employees through the Human Resources Department and the City's Transit Coordinator on commute alternatives and incentives, including carpool/vanpool programs, transit service schedules, transit vouchers, alternative work week plans, telecommuting options, and incentives that can be used to increase employee use of alternative modes or work schedules.
d. Work with the San Joaquin Regional Rail Commission to study the feasibility of creating rail service in Tracy's downtown.
e. Continue to provide citywide door to door service for ADA customers and seniors on the City's Tracer service.
f. Continue to run Tracer along commuter routes during peak times, providing remaining service to all the middle and high schools and high employment areas, such as the West Valley Mall.
g. Encourage affordable housing to be located in transit-oriented development whenever feasible.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 1,248 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce VMT
- Improve air quality
- Foster public awareness of sustainability
- Attract and retain business

T-5: Smart Growth, Urban Design and Planning

Promote pedestrian safety, neighborhood connectivity and walkable neighborhoods through the following:

a. Create development standards for commercial, office, and retail zones to promote a principal functional entry that faces a public street. In the Zoning Code, evaluate more restrictive parking requirements to achieve greater pedestrian connections between streets and building entrances. Require all new buildings within the Corridor Overlay Zone and the Village Center (VC) Zone to be located an appropriate distance from the street to promote walkability, such as 10 feet. Within these zones, increase use of windows or storefronts with views into the building along a minimum of portion of the ground floor building walls fronting the primary street, depending on the building context.
b. Amend the Municipal Code or create subdivision design standards to require all new development within applicable areas to do the following:
    i. Include an interconnected grid of collectors and arterials within the developed city and connecting to and through new development areas with the goal of ¼-mile to ½-mile minimum spacing of two- and four-lane roadways and minimal reliance on six-lane arterials.
    ii. Include at least one through-street and/or non-motorized right-of-way (nonmotorized rights-of-way may count for no more than 10 percent of the total) intersecting the project boundary at least every 400 feet, or at existing abutting street intervals, whichever is less.
    iii. Have internal connectivity such that there are at least 200 intersections per square mile.

c. Amend the Zoning Ordinance to require adequate pedestrian access through all commercial, residential, and mixed-used development.
d. Amend the Zoning Ordinance or create new subdivision standards to require new projects to include a pedestrian or bicycle through-connection in any new cul-de-sacs, except where prohibited by topographical conditions.
e. Add to the Transportation Master Plan a program to close sidewalk gaps on key routes within the developed city, contingent on grant funding.
f. Establish a ½-mile walkability standard for residents to access goods, services, and recreational facilities.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 14,377 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce VMT
- Improve air quality
- Improve public health

T-6: Traffic Smoothing Through Congestion Management

Add to the Transportation Master Plan a program to implement traffic smoothing and congestion reduction at intersections along Eleventh Street, Grant Line Road, Schulte Road, Lammers Road, Tracy Boulevard, MacArthur Drive, and Chrisman Road corridors.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 77 metric tons CO2e.

2. Secondary Benefits

As a secondary benefit, this measure would improve air quality.

T-7: San Joaquin County Park and Ride Lot Master Plan Implementation

Implement the County's Park and Ride Lot Master Plan, which identifies key locations for park and ride lots in Tracy.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 226 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce VMT
- Improve air quality

T-8: Alternative Transportation Choices for Students

Promote alternative transportation choices for students through the following:

a. Continue to provide free or reduced bus passes for school students.

b. Work with school districts to expand "Safe Routes to Schools" programs.
c. Work with school districts to create ridesharing or "walking school bus" programs for students.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 529 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce VMT
- Improve air quality
- Improve public health

T-9: Comprehensive Signal Coordination Program

Continue to implement a comprehensive signal coordination program for key routes in the developed city, connecting to and through new development areas and to the Interstate-205 interchanges. Include Intelligent Transportation System (ITS) elements to maximize effectiveness, such as adaptive traffic control, synchronized signals, transit and emergency signal priority, and other traffic flow management techniques.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 675 metric tons CO2e.

2. Secondary Benefits

As a secondary benefit, this measure would improve air quality.

T-10: Ramp Metering on Interstate 205

Work with Caltrans and SJCOG to implement ramp metering on Interstate 205 to minimize congestion-related GHG emissions from both through trips and trips generated by Tracy that use Interstate 205.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 113 metric tons CO2e.

2. Secondary Benefits

As a secondary benefit, this measure would improve air quality.

T-11: Increased Transit to Bay Area Cities and San Joaquin Valley Employment Centers

Work with regional transit agencies to increase the frequency and capacity of inter-city buses connecting Tracy to Bay Area cities, Stockton, and other San Joaquin Valley employment centers.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 51 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce VMT
- Improve air quality

T-12: Altamont Route Approval and Transit-Oriented Development Around Rail

Work with ACE and the High Speed Rail Authority to approve the Altamont Route and achieve successful integration of rail transit into a transit-oriented development zone, including an intra-city feeder bus system.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 1,146 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce VMT
- Improve air quality

T-13: Reduce Commute Trips

Support regional efforts to reduce commute trips, including the following:

a. Support San Joaquin Valley Unified Air Pollution Control District requirements that large employers establish employee trip reduction programs such as Rule 9410.
b. Promote the San Joaquin Council of Governments Commute Connection program, which provides information about commute options and connects commuters for carpooling, ridesharing and other activities.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 26,993 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce VMT
- Improve air quality

T-14: Parking Cash-Out Programs for Employees

Encourage businesses to offer parking cash-out programs and offer incentives to employees for giving up their employee provided parking space.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 135 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce VMT

- Improve air quality

T-15: Reduced Commuting from Out of the Region

Develop a program that will do the following:

a. Encourage and support the development of satellite office space or "hoteling" space for use by employees of Bay Area firms who may be assigned to work temporarily in Tracy by offering development incentives to these types of projects. Incentives may include less restrictive height limit, setback, and parking requirements.
b. Conduct public education and outreach to promote telecommuting and/or offices/businesses from home.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 223 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce VMT
- Improve air quality

T-16: Transit Passes for Residents and Employees of New Developments

The City shall provide transit passes valid for at least one year to each resident or employee of new development projects for a period of at least the first three years of project occupancy.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 292 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce VMT
- Improve air quality

T-17: Increased Use of Low Carbon Fueled Vehicles

Conduct the following to promote the use of low carbon fueled vehicles:

a. Use the Zoning Ordinance to allow no/low carbon fueling stations as part of the "gas and service station" land use category.
b. Amend the Zoning Ordinance or City Standards to require new projects to provide parking spaces reserved for hybrid or electric vehicles (EVs), carpool, or car share vehicles.
c. Require dedicated parking spots for alternative fuel, hybrid, carpool, or car share vehicles in City parking lots and consider installing charging connections.
d. Encourage employers to create vanpool or shuttle programs for employees.
e. Encourage the use of hybrid and electric construction equipment and the use of alternative fuels for construction equipment.
f. Convert the municipal automotive fleet to cleaner fuels and lower emissions. Convert the municipal non-automotive fleet to cleaner fuels and lower emissions where technologically possible.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 3,832 metric tons CO2e.

2. Secondary Benefits

As a secondary benefit, this measure would improve air quality.

T-18: Carbon Sequestration on Municipal Property6

Develop a City program for maximizing carbon sequestration on municipal property through tree-planting.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 132 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Conserve energy
- Conserve biological resources

T-19: Mixed-Use and Traditional Residential Development

Continue City efforts to develop specific areas of the city as follows:

a. Redevelop the Bowtie area with mixed use development.
b. Where appropriate, develop new neighborhoods based on traditional residential development patterns and mixed use in a variety of densities with a pedestrian-friendly network of streets and parks.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 73 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce VMT
- Improve air quality
- Improve public health
- Retain and increase amount of affordable housing

T-20: Employment-Generating and High-Density Infill Projects

Promote smart growth in Tracy through the following:

a. Increase the development of employment-generating uses, in particular in West Tracy areas.
b. Require mixed use nodes surrounded by high density development that transition to lower density development.
c. In keeping with the City's Growth Management Ordinance Guidelines, prioritize high density infill projects within Redevelopment Areas and Village Centers that have a high level of vehicular and pedestrian connectivity both internally and externally to the project through the allocation of Residential Growth Allotments.

d. Develop each phase of Tracy Hills with an appropriate mix of density and uses consistent with the Tracy Hills Specific Plan.
e. Develop each phase of new development in Tracy as close to existing development as practical and maximize the density and range of uses for each phase of development in a manner consistent with the applicable General Plan and Zoning designations.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 4,800 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce VMT
- Improve air quality
- Retain and increase amount of affordable housing
- Improve public health
- Conserve or expand agricultural land

T-21: Compressed Natural Gas Buses for the City's Fleet

Continue to use compressed natural gas buses for the City's bus fleet and evaluate the conversion of the bus fleet to diesel-electric hybrid.

1. Primary Benefits

This measure, which is already in place, reduces GHG emissions in Tracy by 1,168 metric tons CO2e. Since this measure was in place at the time of the GHG inventory and is accounted for in the BAU forecast, the GHG benefit is not included in the calculation of the total CO2e reduction resulting from implementation of the Sustainability Action Plan.

2. Secondary Benefits

As a secondary benefit, this measure improves air quality.

External State Measures that Improve Fuel and Vehicle Efficiency

In addition to the transportation and land use measures listed above, the State has adopted fuel and vehicle efficiency standards that will reduce GHG emissions throughout the State and in Tracy, regardless of whether this Sustainability Action Plan is implemented. Therefore, in quantifying the ability for the City to reach its GHG target by 2020, the GHG benefit from these external, State-level measures are provided separately in Table 5-1.

As shown in the table, the fuel and vehicle efficiency standards are projected to reduce GHG emissions in Tracy by between 91,889 and 195,582 91,899 metric tons CO_2e. The range of benefits from these external State-level measures is based on different models. The lower range represents a conservative modeling approach; the upper range is based on a

method of modeling these fuel and vehicle efficiency standards by the Bay Area Air Quality Management District,[4] but adjusted for Tracy-specific data.

The fuel and vehicle efficiency standards are as follows:

- In April 2009, CARB adopted a Low Carbon Fuel Standard that will reduce GHG emissions from transportation fuels by 10 percent by 2020.[5] AB 118, the Alternative and Renewable Fuel and Vehicle Technology Program, will support this regulation by financing development and deployment of low-carbon fuels, such as plug-in hybrid, battery electric, fuel-cell, and fuels refined from organic waste.[6]
- AB 1493 directed CARB to adopt regulations that will decrease GHG emissions from new passenger vehicles through technical improvements, beginning with the 2009 model year. These regulations are expected to reduce emissions by 30 percent in new passenger vehicles by 2016, and are estimated to result in an 18 percent GHG emissions reduction across the passenger fleet.[7]

D. Solid Waste

SW-1: Diversion of Construction Waste from Landfills

Amend the Municipal Code to require at least 50 percent diversion (i.e. reuse or recycling) of non-hazardous construction waste from disposal.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 1,321 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce waste
- Increase jobs

SW-2: Increased Recycling and Waste Diversion

Increase recycling and waste diversion in Tracy by expanding marketing efforts to increase participation by residents and businesses. As part of this program, conduct public education and outreach about reuse and recycling, including the City and PG&E's programs for appliance disposal, yard debris collection and composting, waste to energy, and zero waste programs. Work with the local waste hauler to permit collection and composting of residential food waste. In addition, train a recycling coordinator for each City department.

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[4] Bay Area Air Quality Management District, October 2009, *California Environmental Quality Act Thresholds of Significance: Revised Draft Options and Justification Report*.

[5] CARB adopted Governor Schwarzenegger's Low Carbon Fuel Standard in April 2009. CARB website, http://www.arb.ca.gov/newsrel/nr042309b.htm, accessed on July 29, 2009.

[6] California Energy Commission website, http://www.energy.ca.gov/ab118/index.html, accessed on August 5, 2009.

[7] California Clean Cars Campaign, 2006, Factsheet: *California's Vehicle Global Warming Pollution Reduction Regulation: How it Works*. (http://www.calcleancars.org/factsheets/staffproposal.pdf)

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 73,746 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce waste
- Increase jobs
- Foster public awareness of sustainability

SW-3: Recycling Service for Multi-Family Housing

Assist multi-family housing projects with developing an on-site recycling program.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 23,544 metric tons CO2e.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce waste
- Increase jobs

SW-4: Municipal Recycling and Reuse

Require all City departments and facilities to reuse office supplies, furniture and computers before buying new materials. When buying new materials, require City departments and facilities purchase products that are made with high levels of post-consumer recycled content and have limited packaging.

1. Primary Benefits

This measure would reduce GHG emissions in Tracy by 78 metric tons CO2e.

2. Secondary Benefits

As a secondary benefit, this measure would reduce waste.

E. Water

The water sector includes measures that will conserve water and support other sustainability targets, as discussed below.

W-1: Potable Water Conservation through Development Standards, Public Education, and Municipal Waste-water Reuse

Adopt the following water conservation measures:

a. In compliance with SBX7-7, develop water use and efficiency standards in the City's Green Building Ordinance to reduce overall potable water consumption utilizing Method 1 established in the Department of Water Resources'

Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use for targets of 202 gallons per capita daily (gpcd) by 2015 and 180 gpcd by 2020. Include clear parameters for integrating water efficient infrastructure and technologies, including low-flush toilets, low-flush urinals and low-flow showerheads that are more stringent than the Energy Policy Act of 1992 fixture performance requirements.

b. Conduct the following:
    i. Promote water conservation and its benefits and provide education to reduce watering of non-vegetated surfaces and promote the use of pervious paving materials.
    ii. Using outside funds, promote water audit programs that offer free water audits to single family, multi-family, and commercial customers.
    iii. Using outside funds, enact conservation programs for commercial, industrial, and institutional accounts and create programs to install ultra-low-flush toilets in facilities.
c. Produce and promote the use of municipal wastewater (i.e. treated wastewater) for agricultural, industrial, and irrigation purposes consistent with the appropriate provisions of Title 22 and approval of the State Department of Public Health. As part of this measure, conduct the following:
    i. Inventory potential non-potable uses of water for potential substitution by recycled water.
    ii. Collaborate with responsible agencies to encourage the use of recycled water where cost and energy efficiencies for its production, distribution and use are favorable.
    iii. Plan for recycled water infrastructure in the Infrastructure Master Plans.
d. Promote the use of gray water systems for underground landscape irrigation in accordance with the incorporation of the new residential Graywater Standard into California Plumbing Code (Title 24, Part 5, Chapter 16A).
    i. Collaborate with other agencies to encourage the use of graywater systems where cost and energy efficiencies for its production, distribution and use are favorable.
e. Require through Ordinance or City standard that all new development and re-development install irrigation controllers in landscaping that shall be weather- or soil moisture-based controllers which automatically adjust irrigation in response to changes in plants' needs as weather conditions change in compliance with the City's water efficient landscape ordinance.
f. Require through Ordinance or City standard that all new development and re-development of buildings in excess of 50,000 square feet install separate submeters as follows:
    i. For each individual leased, rented or other tenant space within the building projected to consume more than 100 gal/day of potable water.
    ii. For spaces used for laundry or cleaners, restaurant or food service, medical or dental office, laboratory, or beauty salon or barber shop projected to consume more than 100 gal/day of potable water.
    iii. Any building within a project or space within a building that is projected to consume more than 1,000 gal/day of potable water.
g. Require through Ordinance or City standard that all plumbing fixtures using potable water (showerheads, toilets, faucets, urinals, etc.) be in compliance with Energy Policy Act of 1992 fixture performance requirements upon lease, resale, or remodel.
h. Develop incentives for property owners to replace high water use landscaping to more water efficient landscaping.

1. Primary Benefits

This measure would conserve water.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Conserve energy
- Reduce GHG emissions

W-2: Water Efficient Landscape Ordinance

Develop a water efficient landscape ordinance to be at least as effective as the State Department of Water Resources' (DWR) Model Water Efficient Landscape Ordinance (MWELO), which requires a 12% reduction of outdoor potable water use through irrigation efficiency, plant species, recycled wastewater and captured rainwater; and consistent with SBX7-7, utilizing Method 1 targets.

1. Primary Benefits

This measure would conserve water.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Conserve energy
- Reduce GHG emissions

W-3: Incentives for Water Efficiency Retrofits

Adopt water efficiency retrofit ordinances based on EPA's Water Sense Program that provide incentives for upgrades, including replacement of shower heads, faucets, urinals and toilets with more water efficient models, when conducting renovations or additions on residential and CII projects.

1. Primary Benefits

This measure would conserve water.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Conserve energy
- Reduce GHG emissions

W-4: Water Conservation Pricing

Adopt water conservation pricing, such as tiered rate structures, to encourage efficient water use for all user types. As part of this measure, conduct the following:

a. Provide notices in each billing to accounts with water use budgets showing the relationship between the budget and actual consumption.
b. Meter all new connections and retrofit existing connections. Implement sub-metering of multi-family residential and commercial customers.
c. To help monitor landscaping water use, create accounts with dedicated irrigation meters or develop and implement a strategy targeting and marketing large landscape water use surveys to commercial/industrial/ institutional accounts with mixed-use meters.

1. Primary Benefits
This measure would conserve water.

2. Secondary Benefits
This measure would provide the following secondary benefits:

- Conserve energy
- Reduce GHG emissions

In 2009, the Association of California Water Agencies (ACWA) adopted policy principles supporting comprehensive improvements in water use efficiency to achieve a goal of reducing water use statewide by 20 percent by 2020.[8] The State Water Resources Control Board in 2009 released a draft plan to achieve a 20 percent reduction in per capita water use statewide by 2020.[9] In addition to a 20 percent reduction in water use by 2020, a corresponding reduction in energy use for water conveyance is assumed.

F. Agriculture and Open Space

The agriculture and open space sector includes measures that will conserve and/or expand agricultural lands and support other sustainability targets, as discussed below.

AG-1: Agricultural Mitigation Fee Ordinance
Continue to implement the City's Agricultural Mitigation Fee Ordinance.

The primary benefit of this measure would be to conserve and/or expand agricultural lands.

AG-2: Farmland Preservation Around Tracy
Pursue funding from the California Farmland Conservancy Program to preserve farmland around the city in coordination with the Central Valley Farmland Trust and in conformance with the General Plan.

1. Primary Benefits
The primary benefit of this measure would be to conserve and/or expand agricultural lands.

2. Secondary Benefits
This measure allows for the potential of locally grown food and would provide the following secondary benefits:

[8] In March 2009, the Association of California Water Agencies (ACWA) adopted policies to reduce water consumption by 20 percent by 2020. ACWA is an organization of public agencies responsible for about 90 percent of the water delivered in California. ACWA website, http://wwn-online.com/articles/ 2009/04/03/calif-association-backs-20-water-use-reduction.aspx, accessed on August 4, 2009.

[9] Draft 20X2020 Water Conservation Plan was released on April 30, 2009. State Water Resources Control Board website, http://www.swrcb.ca.gov/water_issues/hot_topics/20x2020/docs/comment043009/202020_final_report_draft.pdf, accessed on January 12, 2010.

- Improve public health
- Reduce GHG emissions
- Reduce VMT

AG-3: Small-Scale and Pesticide-Free Food Production

Allow small-scale and pesticide-free food production through the Zoning Ordinance, with an emphasis on local food production.

1. Primary Benefits

The primary benefit of this measure would be to conserve and/or expand agricultural lands.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Conserve biological resources
- Improve public health
- Reduce GHG emissions
- Reduce VMT

AG-4: Increased Attendance at Weekly Farmers' Markets

Support an increase in attendance at weekly farmers' markets in appropriate places throughout the city.

1. Primary Benefits

The primary benefit of this measure would be to reduce GHG emissions.

2. Secondary Benefits

The secondary benefit of this measure would be to improve public health.

AG-5: Parkland Requirement Increase

Increase the City's parkland requirement from 4 acres per 1,000 residents to 5 acres per 1,000 residents.

1. Primary Benefits

The primary benefit of this measure would be to expand open space.

2. Secondary Benefits

The secondary benefit of this measure would be to improve public health.

AG-6: Natural Landscape and Minimal Turf in City Parks

Amend the Parks Master Plan to minimize turf in City parks and use a natural park landscape whenever possible.

1. Primary Benefits

The primary benefit of this measure would be to conserve water.

2. Secondary Benefits

The secondary benefit of this measure would be to conserve biological resources.

AG-7: Carbon Sequestration through Cultivation Practices

Consider, in collaboration with State and industry resources, the costs, benefits, grant funding opportunities, and constraints to developing a program for increasing carbon sequestration and/or cellulosic biofuel on private City parcels and public or private land in the county through the conversion of fallow, pasture and/or low value cropland and cultivation of:

a. Fruit and nut orchards or tree farms that sequester carbon for at least twenty years.
b. Cellulosic biofuel production from appropriate non-food, dedicated energy wood, grasses, or plants that meet Council on Sustainable Biomass Production (CSBP) Standards.

1. Primary Benefits

The primary benefit of this measure would be to reduce GHG emissions.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Conserve and/or expand agricultural land
- Increase renewable energy

G. Biological Resources

The biological resources sector includes measures that will conserve biological resources and support other sustainability targets, as discussed below.

BIO-1: Setbacks and Buffers Along Riparian and Critical Habitat Corridors

Require that new development provide setbacks and buffers along riparian and critical habitat corridors, unless the setback or buffer is already included in the riparian or critical habitat corridor. Where disturbance is unavoidable, provide on-site habitat mitigation or mitigation elsewhere in the county in accordance with SJCOG's Habitat Conservation Plan or other appropriate mitigation.

The primary benefit of this measure would be to conserve biological resources.

BIO-2: Consistency with Federal, State and Regional Regulations for Habitat and Species Protection

Continue to require that new development meet all federal, State and regional regulations for habitat and species protection.

The primary benefit of this measure would be to conserve biological resources.

BIO-3: Native Landscaping

Require that new development incorporate native vegetation into landscape plans, where appropriate, and reduce the use of invasive, non-native plant species.

1. Primary Benefits

The primary benefit of this measure would be to conserve water.

2. Secondary Benefits

The secondary benefit of this measure would be to conserve biological resources.

BIO-4: San Joaquin County Habitat Conservation Plan

Continue to participate in, implement and enforce the San Joaquin County Habitat Conservation Plan.

The primary benefit of this measure would be to conserve biological resources.

BIO-5: Stormwater Best Management Practices

Require best management practices for stormwater in all significant development projects in accordance with City Standards.

The primary benefit of this measure would be to conserve biological resources.

BIO-6: Joint Use of Retention and Detention Facilities

Require that retention and detention facilities be designed for joint use, such as recreation and environmental stewardship, where feasible.

1. Primary Benefits

The primary benefit of this measure would be to conserve biological resources.

2. Secondary Benefits

The secondary benefit of this measure would be to expand open space.

BIO-7: Sustainable Storm Drainage Design

Where feasible, require that storm drainage design be integral to the design of each project and mimic the undeveloped natural hydrologic conditions of the watershed while providing for flood protection and/or water quality control needs where feasible.

The primary benefit of this measure would be to conserve biological resources.

H. Air Quality

While many of the measures included in this Sustainability Action Plan have air quality benefits, they are not called out as separate air quality measures, since they are closely tied to the other sectors discussed above, such as Energy and

Transportation and Land Use. See Tables 5-1 and 5-2 for a list of measures within these other sectors that address air quality and Chapter 6 for a summary of the air quality benefits from this Sustainability Action Plan.

I. Public Health

The public health sector includes measures that will improve public health and support other sustainability targets, as discussed below.

PH-1: Public Education and Outreach on Healthy Eating and Exercise

Continue to conduct public education and outreach to promote healthy eating and exercise.

The primary benefit of this measure would be to improve public health.

PH-2: Healthy Practices at City Offices and City-Sponsored Events

Model healthy practices at City offices and City-sponsored events, for example by offering ample bicycle parking or offering healthy food choices or locally grown food that use fresh ingredients and minimize saturated fats and sugars.

1. Primary Benefits

The primary benefit of this measure would be to improve public health.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Reduce GHG emissions
- Reduce VMT

PH-3: Recreational Programs and Activities

Provide recreational programs and activities that are accessible and appealing to residents of all age groups, abilities, and income levels.

The primary benefit of this measure would be to improve public health.

PH-4: Joint-Use Agreements for Recreational Facilities

Pursue joint-use agreements to share recreational facilities with schools, particularly in areas that lack recreational facilities.

1. Primary Benefits

The primary benefit of this measure would be to improve public health.

2. Secondary Benefits

The secondary benefit of this measure would be to expand open space.

PH-5: Grants for Increased Park Capacity
Pursue grants to increase the capacity of parks.

1. Primary Benefits
The primary benefit of this measure would be to improve public health.

2. Secondary Benefits
The secondary benefit of this measure would be to expand open space.

PH-6: Active Recreation in Parks
Review proposed park designs to ensure they provide sufficient opportunities for active recreation, including walking, jogging, organized team sports, and informal group sports.

The primary benefit of this measure would be to improve public health.

PH-7: Goods, Services, and Recreation in Underserved Neighborhoods
Identify neighborhoods underserved by goods, services, and recreation, and amend the Zoning Ordinance if needed to allow for such uses in these neighborhoods.

The primary benefit of this measure would be to improve public health.

PH-8: Community Garden Inventory and Development
Identify and inventory potential community garden and urban farm sites on existing parks, public easements, right-of-ways, and schoolyards, and develop a program to establish community gardens in appropriate locations.

1. Primary Benefits
The primary benefit of this measure would be to improve public health.

2. Secondary Benefits
The secondary benefit of this measure would be to expand open space.

PH-9: Process for Community Garden Adoption By Neighborhoods
Establish a process through which a neighborhood can propose and adopt a site as a community garden.

1. Primary Benefits
The primary benefit of this measure would be to improve public health.

2. Secondary Benefits
The secondary benefit of this measure would be to expand open space.

PH-10: Public Food Benefits at Farmers' Markets
Encourage farmers' markets to accept food stamps and other public food benefits.

The primary benefit of this measure would be to improve public health.

PH-11: Municipal Integrated Pest Management (IPM) Program
Institute an Integrated Pest Management (IPM) program for pest control activities within City operations.

1. Primary Benefits
The primary benefit of this measure would be to improve public health.

2. Secondary Benefits
The secondary benefit of this measure would be to conserve biological resources.

PH-12: Non-Toxic Building Materials
Encourage new development to use non-toxic building materials.

1. Primary Benefits
The primary benefit of this measure would be to improve public health.

2. Secondary Benefits
The secondary benefit of this measure would be to improve air quality.

J. Economic Development

The economic development sector includes measures that will increase jobs, retain and increase amount of affordable housing, and support other sustainability targets, as discussed below.

ED-1: Job Training and Job Placement
Continue to utilize economic development staff to act as a liaison to local businesses to ascertain workforce needs. Continue to refer businesses with either hiring or workforce development needs to WorkNet to provide job placement and training services to job seekers.

The primary benefit of this measure would be to increase jobs.

ED-2: Opportunity Sites Inventory for Affordable Housing
Develop and maintain an inventory of opportunity sites for future affordable housing development.

The primary benefit of this measure would be to retain and increase amount of affordable housing.

ED-3: Shared and Public Parking
Allow for shared parking arrangements for new development citywide, and allow for public parking arrangements in the downtown area.

The primary benefit of this measure would be to conserve biological resources.

ED-4: Technical Assistance to Businesses

Continue to offer technical assistance to businesses regarding business credit and assist businesses in obtaining financing from available sources. Refer businesses to the Small Business Development Center and SCORE for further technical assistance options.

1. Primary Benefits

The primary benefit of this measure would be to increase jobs.

2. Secondary Benefits

The secondary benefit of this measure would be attract and retain business.

ED-5: Retention, Recruitment, and Support of Industry Clusters and High-Wage Jobs

Continue the City's economic development program to retain and recruit businesses that provide high-wage jobs and support existing and emerging industry clusters.

1. Primary Benefits

The primary benefit of this measure would be to increase jobs.

2. Secondary Benefits

This secondary benefit of this measure would be to attract and retain business.

ED-6: Work Groups with Industry Leaders

Continue to conduct on-going work groups with industry leaders.

1. Primary Benefits

The primary benefit of this measure would be to attract and retain business.

2. Secondary Benefits

The secondary benefit of this measure would be to increase jobs.

ED-7: Recruitment of Firms to Match Skills and Education Levels of Tracy Residents

Periodically study the skills and education levels of Tracy residents, and use the information as a guide for recruiting new firms to the city as a means of improving the city's jobs/housing match.

1. Primary Benefits

The primary benefit of this measure would be to increase jobs.

2. Secondary Benefits

The secondary benefit of this measure would be to attract and retain business.

ED-8: Local Hiring for Contracts and Services

Continue to offer local vendor preference for City contracts and services.

1. Primary Benefits

The primary benefit of this measure would be to increase jobs.

2. Secondary Benefits

The secondary benefit of this measure would be to reduce VMT.

ED-9: Child Care Services Near Jobs

Consult with child care advocates, employers, and developers to:

a. Address barriers that may be preventing the development of childcare supply near jobs.
b. Establish child care services in proximity to jobs.

1. Primary Benefits

The primary benefit of this measure would be to increase jobs.

2. Secondary Benefits

The secondary benefit of this measure would be to attract and retain business.

ED-10: Accessible Locations for Local Government and Civic Institutions

Concentrate the local government sector and civic institutions in accessible locations.

1. Primary Benefits

The primary benefit of this measure would be to reduce VMT.

2. Secondary Benefits

The secondary benefit of this measure would be to increase jobs.

ED-11: Warehousing, Transportation and Manufacturing Uses Along Rail Spurs in the Northeast Industrial Area

Zone land along rail spurs in the Northeast Industrial area for warehousing, transportation, and manufacturing uses.

1. Primary Benefits

The primary benefit of this measure would be to increase jobs.

2. Secondary Benefits

The secondary benefit of this measure would be to attract and retain business.

ED-12: Green Business Program

Establish a citywide green business recognition program.

1. Primary Benefits

The primary benefit of this measure would be to reduce GHG emissions.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Conserve energy
- Reduce VMT
- Reduce waste
- Conserve water
- Improve air quality
- Conserve biological resources

ED-13: Variable Frequency Drives in City Water Pumps

Continue to use variable frequency drives in all City water pumps.

The primary benefit of this measure would be to conserve water.

ED-14: Methane Recovery at Wastewater Treatment Facilities

Continue to provide for methane recovery at all wastewater treatment facilities.

The primary benefit of this measure would be to reduce GHG emissions.

K. Outreach and Education

The outreach and education sector includes measures that will foster public awareness of sustainability and support other sustainability targets, as discussed below.

OE-1: Sustainability Criteria in Evaluation of Proposals and Applications

When requesting proposals or applications for contracts, professional service agreements, or grants, request that proposals or applications include information about the sustainability practices of the organization, and use such information as a partial basis for proposal evaluations.

The primary benefit of this measure would be to foster public awareness of sustainability.

OE-2: Green Building Training for City staff

Train all plan review and building inspection staff to evaluate plans and improvements for compliance with green building requirements and practices.

1. Primary Benefits

The primary benefit of this measure would be to reduce GHG emissions.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Conserve energy
- Reduce VMT
- Reduce waste
- Conserve water
- Improve air quality
- Conserve biological resources

OE-3: Emerald Tracy Website

Continue to update and develop the Emerald Tracy website.

The primary benefit of this measure would be to foster public awareness of sustainability.

OE-4: Sustainable Communities Strategy

To the degree feasible for Tracy, implement the Sustainable Communities Strategy that will be released by the San Joaquin Council of Governments, and update relevant planning documents to ensure that they are consistent with the regional strategy.

1. Primary Benefits

The primary benefit of this measure would be to reduce GHG emissions.

2. Secondary Benefits

The secondary benefit of this measure would be to foster public awareness of sustainability.

OE-5: Coordination with Other Agencies for Green Building Policies and Programs

Work with interested agencies such as Build It Green to develop green building policies and programs in Tracy.

1. Primary Benefits

The primary benefit of this measure would be to reduce GHG emissions.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Conserve energy
- Reduce VMT
- Reduce waste
- Conserve water
- Improve air quality
- Conserve biological resources

OE-6: Public Education on Non-Petroleum Waste Oil Collection Locations

Conduct a public education and outreach campaign in coordination with the local waste hauler to publicize locations where non-petroleum waste oil is collected.

1. Primary Benefits

The primary benefit of this measure would be to reduce GHG emissions.

2. Secondary Benefits

This measure would provide the following secondary benefits:

- Improve air quality
- Reduce waste
- Conserve biological resources
- Foster public awareness of sustainability

Table 5-1 Quantified Sustainability Measures

	Actions	Activated By	Estimated Total CO2e Metric Tons Emissions Reductions	Percentage of Total Emissions Reductions	Cost Per Metric Ton of Reduced CO2e Emissions	Reduce GHG Emissions	Conserve Energy	Increase Renewable Energy	Reduce VMT	Improve Air Quality	Reduce Waste	Conserve Water	Increase Jobs	Conserve Biological Resources	Foster Public Awareness of Sustainability	Improve Public Health	Attract and Retain Business	Retain and Increase Amount of Affordable Housing	Decrease City Facilities Costs	Estimated New Costs to City	Developer/Resident Costs or Burden	Estimated Return On Investment
Energy																						
E-1	Green Building Ordinance	Ordinance	2,485	0.66% to 0.52%	$40.24	●	○	○	○		○		○							Ranges from $50,000 to $100,000 in consulting services.	N/A	Estimated savings = $295/home. Simple Payback = 17 years for residential or 3.2 years commercial
E-2	Energy Efficiency in Site Planning and Design	Ordinance and Program	11,752	3.11% to 2.44%	$0.00	●	○													Incidental costs; existing staff time.	$0.06/sqft	Annual cost savings estimated at $1,980,815. Payback is estimated at 0.1 year
E-3	Green Building and Energy Efficiency Design and Education	Program	10,781	2.85% to 2.24%	$1.86	●	○	○	○		○	○			○					Approximately $20,000 in consulting services.	$4.00/sqft	Annual cost savings estimated at $6.2 million dollars per year. Payback is estimated at 4.3 years
E-4	Energy-Efficient Products and Retrofits	Program	36,768	9.72% to 7.63%	$0.00	●	○	○	○		○		○		○					Incidental costs; existing staff time.	$1.50/sqft	Payback time estimated at 4.8 years
E-5	Weatherization for Low-Income Households	Program	473	0.12% to 0.10%	$0.00	●	○								○			○		Incidental costs; existing staff time (existing program).		Annual cost savings per home estimated at $491. Payback time = 14.3 years
E-6	Financing for Energy Efficiency and Renewable Energy Projects	Program	8,789	2.32% to 1.82%	$1.71	●	○	○												$15,000 for Tracy to join the California First Statewide 811 program.	N/A	N/A
E-7	LED Retrofits for City Street Lights	Program	337	0.09% to 0.07%	$6,252.23	●	○												○	$2,107,000 to convert 3,500 streetlights to LED, based on incremental cost of $602 per LED streetlight	N/A	Annual cost savings = $147,840. Payback time = 14.3 years
E-8	Solar Panel Installations on Municipal Facilities	Program	34	0.01% to 0.01%	$29,411.76	●	○	○					○						○	Between $350,000 and $1,000,000 to install 100 kW of solar panels, based on estimate of $3.50 to $10.00 per installed watt of solar power	N/A	Payback time estimated at 35 years, based on the current cost of solar panels
E-9	Energy Efficiency Settings for City Desktop Computers	Policy	5	0.00% to 0.00%	$0.00	●	○												○	Incidental costs; existing staff time	N/A	N/A
	External State Title 24 Standards		16,926	4.47% to 3.51%																		
	External State Renewable Portfolios Standard		44,034	11.64% to 9.13%																		
	Energy SUBTOTALS		**132,384**	**34.98% to 27.46%**																		
Transportation and Land Use																						
T-1	Live-Work and Work-Live Uses	Ordinance	292	0.08% to 0.06%	$0.00	●			○	○										Incidental costs; 40 hours of existing staff time.	N/A	Increased business/ sales tax
T-2	Reduced Parking Requirements	Ordinance	146	0.04% to 0.03%	$1,095.89	●			○	○										Incidental costs; existing staff time.	N/A	Decreased SF of impervious surface; reduced "heat island" load on AC
T-3	Support for Bicycling	Ordinance and Program	139	0.04% to 0.03%	$0.00	●			○	○						○				Incidental costs; 20 hours existing staff time for bicycle parking. For bicycle sharing program, $80,000 in capital costs, plus $40,000 annually in operating costs. Assumes fleet of 20 bikes and 3 docking stations located in downtown.	$300 per bike cost to install at time of construction	Potential for reduced parking. Bike sharing revenues and advertising can offset up to 80% operating costs.
T-4	Support for Transit	Ordinance, Program, and Infrastructure Master Plan	1,248	0.33% to 0.26%	$0.00	●			○	○					○		○			Incidental costs; 150 hours existing staff time (existing programs and outside transit funding)	$5,000 to $8,000 per shelter cost at time of construction	Potential for reduced parking. Increased business/sales tax. Transit funding dependent. Transit funding dependent.
T-5	Smart Growth, Urban Design and Planning	Ordinance, Program, and Infrastructure Master Plan	14,377	3.80% to 2.98%	$0.00	●			○	○						○				Incidental costs; 180 hours existing staff time.	$500 per cul-de-sac. $6 per square foot of new sidewalk.	Decreased SF of impervious surface; reduced "heat island" load on AC. potential for reduced parking.
T-6	Traffic Smoothing Through Congestion Management	Program and Infrastructure Master Plan	77	0.02% to 0.02%	$649.35	●				○										$50,000 for engineering; 40 hours existing staff time		
T-7	San Joaquin County Park and Ride Lot Master Plan Implementation	Program and Infrastructure Master Plan	226	0.06% to 0.05%	$0.00	●			○	○										Incidental costs (will use County or CMA funds); 160 hours existing staff time		Potential for parking fees
T-8	Alternative Transportation Choices for Students	Program	529	0.14% to 0.11%	$0.00	●			○	○						○				Incidental costs; existing staff time (existing program). Incidental costs; 80 hours existing staff time (outside funding)		Longer term reduction in school parking and bus transit
T-9	Comprehensive Signal Coordination Program	Program	675	0.18% to 0.14%	$0.00	●				○										Incidental costs; existing staff time (existing program).		
T-10	Ramp Metering on Interstate 205	Program	113	0.03% to 0.02%	$0.00	●				○										Incidental costs; existing staff time (Caltrans funding).		
T-11	Increased Transit to Bay Area Cities and San Joaquin Valley Employment Centers	Program	51	0.01% to 0.01%	$0.00	●			○	○										Incidental costs; existing staff time (transit funding).		

Table 5-1 Quantified Sustainability Measures

	Actions	Activated By	Estimated Total CO2e Metric Tons Emissions Reductions	Percentage of Total Emissions Reductions	Cost Per Metric Ton of Reduced CO2e Emissions	Reduce GHG Emissions	Conserve Energy	Increase Renewable Energy	Reduce VMT	Improve Air Quality	Reduce Waste	Conserve Water	Increase Jobs	Conserve Biological Resources	Foster Public Awareness of Sustainability	Improve Public Health	Attract and Retain Business	Retain and Increase Amount of Affordable Housing	Decrease City Facilities Costs	Estimated New Costs to City	Developer/Resident Costs or Burden	Estimated Return On Investment
T-12	Altamont Route Approval and Transit-Oriented Development Around Rail	Program	1,146	0.30% to 0.24%	$0.00	●			○	○										Incidental costs; existing staff time (transit funding).		Increased real estate investment; long term reduction in highway infra-structure
T-13	Reduce Commute Trips	Program	26,993	7.13% to 5.60%	$0.00	●			○	○										Incidental costs; existing staff time		Potential for reduced parking
T-14	Parking Cash-Out Programs for Employees	Program	135	0.04% to 0.03%	$0.00	●			○	○										Incidental costs; 60 hours existing staff time		Potential for reduced parking
T-15	Reduced Commuting from Out of the Region	Program	223	0.06% to 0.05%	$0.00	●			○	○										Incidental costs; 120 hours existing staff time		Increased business and sales tax
T-16	Transit Passes for Residents And Employees of New Developments	Ordinance	292	0.08% to 0.06%	$0.00	●			○	○										Incidental costs; existing staff time.		
T-17	Increased Use of Low Carbon Fueled Vehicles	Ordinance, Program, and Policy	3,832	1.01% to 0.79%	$1,826.72	●				○										Approximately $7 million		Cost/benefit increases as oil prices rise,
T-18	Carbon Sequestration on Municipal Property	Program	132	0.03% to 0.03%	$3,000.00 (excluding maintenance costs)	●	○							○						$396,000 in capital costs; assumes 33 acres of tree planting.		1-10 years
T-19	Mixed-Use and Traditional Residential Development	Policy	73	0.02% to 0.02%	$0.00	●			○	○						○		○		Incidental costs; existing staff time		Increased real estate investment; increased business/ sales tax
T-20	Employment-Generating and High-Density Infill Projects	Program, Policy, and Ordinance	4,800	1.27% to 1.00%	$0.00	●			○	○				○		○		○		Incidental costs; existing staff time		Increased real estate investment; increased business/ sales tax
T-21[a]	Compressed Natural Gas Buses for the City's Fleet[a]	Program	1,168	0.31% to 0.24%	$0.00	●				○										Incidental costs; existing staff time (existing program)		Depends on fuel prices
	External State Measures That Improve Fuel and Vehicle Efficiency[b]		91,889 to 195,582	24.28% to 40.56%	0.12																	
	Transportation SUBTOTALS		**147,388 to 251,081**	**38.94% to 52.07%**																		
	Solid Waste																					
SW-1	Diversion of Construction Waste from Landfills	Ordinance	1,321	0.35% to 0.27%	$0.00	●					○		○							Incidental costs; existing staff time	Costs uncertain but related to construct debris hauling services and/or increased distances for waste removal	unknown
SW-2	Increased Recycling	Program	73,746	19.49% to 15.30%	$0.04	●					○		○		○					Incidental costs; existing staff time (Tracy Delta Solid Waste Management program), plus $3,000 to train existing employees		unknown
SW-3	Recycling Service for Multi-Family Housing	Program	23,544	6.22% to 4.88%	$0.00	●					○		○							Incidental costs; existing staff time (Tracy Delta Solid Waste Management program)		
SW-4	Municipal Recycling and Reuse	Policy	78	0.02% to 0.02%	$0.00	●					○									Incidental costs; existing staff time		
	Solid Waste SUBTOTALS		**98,689**	**26.08% to 20.47%**																		
	GRAND TOTAL		**378,461 to 482,154**																			

● **Primary Benefit** ○ **Secondary Benefit**

Footnotes

[a]The GHG emissions reduction for this measure has already accounted for in the 2006 emissions inventory, and is therefore not included in the total emissions reduction calculation in the SAP.

[b]Modeling results provided a range for the benefits of these external State measures; see Chapter 5 of the Sustainability Action Plan for more information.

Note: Gray-shaded rows are State-level external measures that will happen regardless of the City's Sustainability Action Plan. These State-level measures will contribute to the GHG emission reduction in Tracy.

Table 5-2 Non-Quantified Sustainability Measures

	Actions	Activated By	Reduce GHG Emissions	Conserve Energy	Increase Renewable Energy	Reduce VMT	Improve Air Quality	Conserve and/or Expand Agricultural Lands	Expand Open Space	Reduce Waste	Conserve Water	Increase Jobs	Conserve Biological Resources	Foster Public Awareness of Sustainability	Improve Public Health	Attract and Retain Business	Retain and Increase Amount of Affordable Housing	Cost to the City
Water																		
W-1	Potable Water Conservation through Development Standards, Public Education, and Municipal Wastewater Reuse	Ordinance, Program, and Infrastructure Master Plan	○	○							●							Incidental costs; existing staff time
W-2	Water Efficient Landscape Ordinance	Ordinance and Program	○	○							●							Incidental costs; existing staff time.
W-3	Incentives for Water Efficiency Retrofits	Ordinance	○	○							●							Incidental costs; existing staff time
W-4	Water Conservation Pricing	Program	○	○							●							Incidental costs; existing staff time
Agriculture and Open Space																		
AG-1	Agricultural Mitigation Fee Ordinance	Ordinance						●										Incidental costs; existing staff time.
AG-2	Farmland Preservation Around Tracy	Program	○			○		●							○			Incidental costs; existing staff time.
AG-3	Small-Scale and Pesticide-Free Food Production	Ordinance	○			○		●					○		○			Incidental costs; existing staff time.
AG-4	Increased Attendance at Weekly Farmers' Markets	Policy and Program	●												○			Incidental costs; existing staff time.
AG-5	Parkland Requirement Increase	Policy and Infrastructure Master Plan							●						○			Incidental costs; existing staff time.
AG-6	Natural Landscape and Minimal Turf in City Parks	Policy and Infrastructure Master Plan									●		○					Incidental costs; existing staff time.
AG-7	Carbon Sequestration through Cultivation Practices	Program	●		○			○										Incidental costs; existing staff time.
Biological Resources																		
BIO-1	Setbacks and Buffers Along Riparian and Critical Habitat Corridors	Policy and Ordinance											●					Incidental costs; existing staff time.
BIO-2	Consistency with Federal, State and Regional Regulations for Habitat and Species Protection	Policy											●					Incidental costs; existing staff time.
BIO-3	Native Landscaping	Policy and Ordinance									●		○					Incidental costs; existing staff time.
BIO-4	San Joaquin County Habitat Conservation Plan	Program											●					Incidental costs; existing staff time.
BIO-5	Stormwater Best Management Practices	Policy and Ordinance											●					Incidental costs; existing staff time.
BIO-6	Joint Use of Retention and Detention Facilities	Policy, Ordinance, and Infrastructure Master Plan							○				●					Incidental costs; existing staff time.
BIO-7	Sustainable Storm Drainage Design	Policy, Ordinance, Infrastructure Master Plan											●					Incidental costs; existing staff time.
Public Health																		
PH-1	Public Education and Outreach on Healthy Eating and Exercise	Program													●			Incidental costs; existing staff time.
PH-2	Healthy Practices at City Offices and City-Sponsored Events	Program	○			○									●			Incidental costs; existing staff time.
PH-3	Recreational Programs and Activities	Policy													●			Incidental costs; existing staff time.
PH-4	Joint-Use Agreements for Recreational Facilities	Program							○						●			Incidental costs; existing staff time.
PH-5	Grants for Increased Park Capacity	Program							○						●			Incidental costs; existing staff time.
PH-6	Active Recreation in Parks	Policy and Ordinance													●			Incidental costs; existing staff time.

Table 5-2 Non-Quantified Sustainability Measures

	Actions	Activated By	Reduce GHG Emissions	Conserve Energy	Increase Renewable Energy	Reduce VMT	Improve Air Quality	Conserve and/or Expand Agricultural Lands	Expand Open Space	Reduce Waste	Conserve Water	Increase Jobs	Conserve Biological Resources	Foster Public Awareness of Sustainability	Improve Public Health	Attract and Retain Business	Retain and Increase Amount of Affordable Housing	Cost to the City
PH-7	Goods, Services, and Recreation in Underserved Neighborhoods	Program and Ordinance													●			Incidental costs; existing staff time.
PH-8	Community Garden Inventory and Development	Program							○						●			Incidental costs; existing staff time.
PH-9	Process for Community Garden Adoption By Neighborhoods	Ordinance							○						●			Incidental costs; existing staff time.
PH-10	Public Food Benefits at Farmers' Markets	Policy and Program													●			Incidental costs; existing staff time.
PH-11	Municipal Integrated Pest Management (IPM) Program	Program											○		●			Incidental costs; existing staff time.
PH-12	Non-Toxic Building Materials	Policy and Ordinance					○								●			Incidental costs; existing staff time.
Economic Development and Fiscal Health																		
ED-1	Job Training and Job Placement	Program										●						Incidental costs; existing staff time.
ED-2	Opportunity Sites Inventory for Affordable Housing	Program															●	Incidental costs; existing staff time.
ED-3	Shared and Public Parking	Ordinance											●					Incidental costs; existing staff time.
ED-4	Technical Assistance to Businesses	Program										●				○		Incidental costs; existing staff time.
ED-5	Retention, Recruitment, and Support of Industry Clusters and High-Wage Jobs	Program										●						Incidental costs; existing staff time.
ED-6	Work Groups with Industry Leaders	Program										○				●		Incidental costs; existing staff time.
ED-7	Recruitment of Firms to Match Skills and Education Levels of Tracy Residents	Program										●				○		Incidental costs; existing staff time.
ED-8	Local Hiring for Contracts and Services	Policy				○						●						Incidental costs; existing staff time.
ED-9	Child Care Services Near Jobs	Program										●				○		Incidental costs; existing staff time.
ED-10	Accessible Locations for Local Government and Civic Institutions	Policy				●						○						Incidental costs; existing staff time.
ED-11	Warehousing, Transportation and Manufacturing Uses Along Rail Spurs in the Northeast Industrial Area	Ordinance and Policy										●				○		Incidental costs; existing staff time.
ED-12	Green Business Program	Program	●	○		○	○			○	○		○					$20,000 to develop and launch, plus $20,000 per year to administer
ED-13	Variable Frequency Drives in City Water Pumps	Program									●							Incidental costs; existing staff time (existing program).
ED-14	Methane Recovery at Wastewater Treatment Facilities	Program	●															Incidental costs; existing staff time (existing program).
Public Outreach and Education																		
OE-1	Sustainability Criteria in Evaluation of Proposals and Applications	Policy												●				Incidental costs; existing staff time.
OE-2	Green Building Training for City staff	Program	●	○		○	○			○	○		○					Incidental costs; existing staff time.
OE-3	Emerald Tracy Website	Program												●				Incidental costs; existing staff time.
OE-4	Sustainable Communities Strategy	Program	●											○				Incidental costs; existing staff time.
OE-5	Coordination with Other Agencies for Green Building Policies and Programs	Program	●	○		○	○			○	○		○					Incidental costs; existing staff time.
OE-6	Public Education on Non-Petroleum Waste Oil Collection Locations	Program	●				○			○			○	○				Incidental costs; existing staff time.

● **Primary Benefit** ○ **Secondary Benefit**

6 SUMMARY OF BENEFITS

As described in detail in Chapter 5, this Sustainability Action Plan will provide a number of benefits in Tracy, some of which can be quantified, and some of which are qualitative. This chapter summarizes the benefits of the Sustainability Action Plan in its entirety. The assumptions that were used for the quantified benefits are provided in Appendix C.

A. Greenhouse Gas Emissions

In combination with the external State measures discussed in Chapter 5, implementation of this Sustainability Action Plan is projected to reduce greenhouse gas (GHG) emissions in Tracy by between 378,461 to 482,154 metric tons of carbon dioxide equivalent (CO_2e). This translates into a projection of 1,266,816 to 1,370,509 total metric tons CO_2e in year 2020, or 8.3 to 9.0 metric tons CO_2e per person in 2020.[1] This GHG emissions reduction exceeds the target that is identified in Chapter 4, which is a 15 percent reduction in per capita emissions from the 2006 baseline. As stated in Chapter 2, the 2006 per capita emissions were 11.6 metric tons CO_2e. The target is therefore a reduction of 1.7 metric tons CO_2e per capita, or a result of 9.9 metric tons CO_2e per person in 2020. The Sustainability Action Plan, in combination with the external State measures, will achieve and exceed this target.

This Sustainability Action Plan provides other GHG-related benefits. Under the Sustainability Action Plan, the traffic model shows that the percentage of jobs in Tracy that are filled by residents of Tracy aims to be 72 percent in 2020, a 32 percent increase from the conditions in 2000.[2] This increase in worker capture would significantly decrease commute trips for Tracy residents, a major component of Tracy's GHG emissions inventory.

As part of the process to develop this Sustainability Action Plan, many potential measures were considered. Some of the potential measures were not included in the Sustainability Action Plan for a variety of reasons, such as a lack of data or examples. However, City staff will maintain a list of these other potential measures for additional investigation and consideration. As discussed in Chapter 7, the City will undertake a comprehensive implementation and monitoring plan to ensure that the implementation of the measures in this Sustainability Action Plan achieve the modeled GHG emission reductions. If, based on this monitoring, the City finds that adjustments to the Sustainability Action Plan measures are needed, the City will revisit the measures that were not included in the Plan at this time.

B. Energy

Implementation of this Sustainability Action Plan will reduce energy consumption and consumer costs in Tracy. The measures described in Chapter 5 are projected to reduce electricity consumption in Tracy by approximately 293 million kWh per year and natural gas consumption by approximately 5 million therms per year, or a total of approximately 1.5 million MMBtu per year. As stated in Chapter 3, energy consumption in 2020 under BAU conditions is projected to be approximately 4.1 million MMBtu. Therefore, with implementation of the Sustainability Action Plan, energy consump-

[1] Based on the total anticipated population and employment in Tracy in 2020, approximately 152,100 residents and workers. From: Watten, Mackenzie and Mike Wallace. Fehr & Peers. Personal communication with Tanya Sundberg, DC&E. January 29, 2010.

[2] Based on data from the US Census, the percentage of jobs in Tracy that were filled by residents of Tracy was 40 percent in 2000.

tion in Tracy is projected be approximately 2.6 million MMBtu, a 40 percent decrease from BAU conditions and a 20 percent decrease from 2006 conditions (3.2 million MMBtu).

This reduction in energy use will achieve the related energy target identified in Chapter 4, which is a 15 percent reduction in per capita emissions from the 2006 baseline of 11.6 metric tons CO_2 equivalent.[3]

Many of the measures in this Sustainability Action Plan will address the other energy-related targets by conserving energy and increasing renewable energy. In total, 17 measures will assist the City in reaching its energy conservation targets and six measures will assist the City in reaching its renewable energy targets.

C. Transportation and Land Use

This Sustainability Action Plan includes a number of measures that will reduce VMT compared to BAU conditions. In total, 26 of the measures in this Sustainability Action Plan will reduce VMT. As indicated in Section A of this chapter, the measures in this Sustainability Action Plan will increase the percentage of jobs in Tracy that are filled by residents of Tracy to 72 percent, an increase of 32 percent from the conditions in 2000.[4] This increase in worker capture will significantly decrease commute trips and thus decrease VMT, for Tracy residents. In addition, as population continues to grow into the future beyond the 10-year time period modeled in this document, these measures will provide an even greater reduction in per capita VMT.

D. Solid Waste

As indicated in Chapter 4, there are two solid waste targets related to waste diversion. In total, 11 of the measures in this Sustainability Action Plan will reduce waste. Although the specific volume of waste that would be diverted due to implementation of the Sustainability Action Plan was not forecast due to modeling constraints, these 11 measures will assist the City in reaching its waste diversion targets.

E. Water

As indicated in Chapter 4, this Sustainability Action Plan aims to reduce water consumption. Reduced water consumption better enables the City to accommodate growth with existing water supplies, and defers and/or eliminates the need for future water supplies. In total, 11 of the measures in this Sustainability Action Plan will conserve water. Although the specific volume of water that would be conserved due to implementation of the Sustainability Action Plan was not forecast due to modeling constraints, these 11 measures will assist the City in reaching its water conservation targets.

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[3] Because 2020 forecast energy data were not available for municipal operations, this analysis only considers the energy target for community emissions.

[4] Based on data from the US Census, the percentage of jobs in Tracy that were filled by residents of Tracy was 40 percent in 2000.

F. Agriculture and Open Space

There are two targets related to the conservation of agricultural lands. In total, three of the measures in this Sustainability Action Plan will conserve and/or expand agricultural land, and six measures will expand open space. Although the specific amount of agricultural land that would be conserved due to implementation of the Sustainability Action Plan was not forecast due to modeling constraints, these nine measures will assist the City in reaching its targets related to the conservation of agricultural lands.

G. Biological Resources

This Sustainability Action Plan aims to mitigate any loss of critical habitat corridors through the Habitat Conservation Plan. In total, 17 of the measures in this Sustainability Action Plan will conserve biological resources. Although the biological resource benefits of the Sustainability Action Plan were not forecast due to modeling constraints, these 17 measures will assist the City in reaching its biological resource target.

H. Air Quality

This Sustainability Action Plan aims to reduce the number of days exceeding air quality standards. In total, 25 of the measures in this Sustainability Action Plan will improve air quality. Although the air quality benefits of the Sustainability Action Plan were not forecast due to modeling constraints, these 26 measures will assist the City in reaching its air quality target.

I. Public Health

This Sustainability Action Plan includes targets to reduce obesity, improve access to healthy food, and improve access to opportunities for physical activity. In total, 21 of the measures in this Sustainability Action Plan will improve public health. Although the public health benefits of the Sustainability Action Plan were not forecast due to modeling constraints, these 21 measures will assist the City in reaching its public health targets.

J. Economic Development

As indicated in Chapter 4, there are five targets related to economic development. As indicated in Tables 5-1 and 5-2, the measures contained in this Sustainability Action Plan will support economic development targets as follows:

- Fifteen measures will increase jobs.
- Six measures will attract and retain business.
- Four measures will retain and increase amount of affordable housing.

Although the economic development benefits of the Sustainability Action Plan were not forecast due to modeling constraints, these measures will assist the City in reaching its economic development targets.

7 IMPLEMENTATION AND MONITORING PLAN

This chapter presents the implementation and monitoring plan for this Sustainability Action Plan. The benefits of the Sustainability Action Plan measures shown in Chapters 5 and 6 are based on models that predict the greenhouse gas (GHG) emissions reductions associated with each measure. The GHG emission reduction model is based on a set of metrics that are discussed further in this chapter. In addition to the measures that achieve a quantified GHG emission reduction benefit, this chapter presents a monitoring plan for measuring reduction in water use. This implementation and monitoring plan includes periodic reviews of these metrics, as well as an update to the GHG emissions inventory and release of a progress report in approximately 2015 to measure the actual GHG emissions in Tracy and demonstrate the status of implementation at the halfway point to the Sustainability Action Plan's target year.

Based on the periodic reviews and the comprehensive GHG inventory update, if the City finds that it is not on track to meet the GHG emission reductions predicted by the model, the City will make adjustments to the measures and their implementation in order to achieve the needed reductions.

A. Implementation Schedule

Following adoption of the Sustainability Action Plan, the City will create Work Plans for the implementation of the sustainability measures. Each Work Plan will identify sustainability measures that will be implemented within a performance period of two consecutive fiscal years. The contents of the Work Plan are anticipated to be as follows:

Objective:	Identifies the measure that will be implemented during the performance period of the Work Plan
Action:	Steps that need to be taken to achieve implementation of the measure identified in the objective
Due Date:	The anticipated date of completion of each action
Lead Staff:	The Department, Division, Strategic Team, or Staff person responsible for completing each action by their due dates

Prior to the beginning of each Work Plan performance period, the City will determine the measures that are to be implemented, using criteria such as cost, return on investment, availability of funding and resources, City Council direction, and community interest to identify those measures. The City recognizes that not all metrics will be achieved in a linear progression. Some measures will be implemented early on, while others will not be fully implemented until 2020 or as funding and necessary resources become available.

B. Periodic Reviews

As the sustainability measures are implemented, the City will measure the effectiveness of the Sustainability Action Plan on an ongoing basis. The City will conduct periodic reviews that will include data gathering related to a series of metrics and checking the City's progress in meeting the values that were assumed in the GHG model for the Sustainability Action Plan. The metrics that were used in the GHG model, source of data for each metric, and relevant Sustainability Action Plan measures are listed in Table 7-1 and discussed further in the sections below.

1. Energy Use

Energy use in Tracy will be determined from the Pacific Gas & Electric Company (PG&E). The GHG model for the Sustainability Action Plan assumes that energy use in Tracy will decrease by 20 percent from 2006 levels by 2020.

TABLE 7-1 **GHG MODEL METRIC SOURCES**

Metric	Data Source	Relevant Measures
Energy Use	Pacific Gas & Electric Company	E-1 through E-9
VMT	California Department of Motor Vehicles	T-1 through T-5 T-7 through T-8 T-11 through T-16 T-19 and T-20
Tailpipe Emissions	Floating car surveys	T-6; T-9; T-10
Municipal Vehicle Fleet	Tracy Public Works Department	T-17
Municipal Tree Planting	Tracy Public Works Department	T-18
Solid Waste	Tracy Delta Disposal Service, Inc.	SW-1 through SW-4
Water Use	Tracy Public Works Department	W-1 through W-4

In 2006, energy use in Tracy was approximately 3,200,000 million metric British thermal units (MMBtu), and the GHG model predicted that the Sustainability Action Plan measures would reduce energy use to 2.6 million MMBtu in 2020. Based on the energy use data provided by PG&E, the City will evaluate whether the actual energy use reflects the reductions anticipated by the GHG model.

2. Vehicle Miles Traveled

Vehicle miles traveled (VMT) in Tracy will be determined from odometer readings aggregated by zip code from the California Department of Motor Vehicles (DMV).[1] The GHG model for the Sustainability Action Plan, in addition to accounting for reductions based on the Plan, also accounts for increases in population and changes in land use. This model assumes that VMT in Tracy in 2020 will be 57 percent greater than it was in 2006.

VMT estimates that were used in the GHG model were based on a traffic model. Because the VMT measured in the periodic reviews will be based on a different data source, the 2006 VMT baseline using the DMV data will first be determined. The periodic reviews will then evaluate whether the actual VMT in Tracy reflects the change in VMT anticipated by the GHG model.

3. Tailpipe Emissions

Tailpipe emissions will be determined using floating car surveys conducted by the City. Floating car surveys measure tailpipe emissions through sensors as the vehicle drives through the areas where congestion-relief measures were implemented. The GHG model for the Sustainability Action Plan assumes that tailpipe emissions will decrease by 6.2 percent in the AM peak hour and 2.7 percent in the PM peak hour after the measures are implemented.

[1] The odometer readings are based on smog check station reporting to the DMV.

In order to provide a baseline, the City will conduct floating car surveys before any of the congestion-relief measures (i.e. Measures T-6, T-9, and T-10) are implemented. The periodic reviews will evaluate whether the actual tailpipe emissions reflect the reductions anticipated by the GHG model.

4. Municipal Vehicle Fleet

The entire benefit of Measure T-17, Increased Use of Low Carbon Fueled Vehicles, is based on conversion of the City's automotive fleet to low carbon fueled vehicles by 2020. For the periodic reviews, the City's Public Works Department will provide data on vehicular fleet conversion.

5. Municipal Tree Planting

The benefit of Measure T-18, Carbon Sequestration on Municipal Property, is based on an assumption that the City will plant 33 acres of healthy trees by 2020, with each acre consisting of 35 to 40 trees. For the periodic reviews, the City's Public Works Department will provide information on the progress of the program to evaluate whether the City is on track to meet this target. As part of this review, the City will consider both the amount and health of the trees that are planted.

6. Solid Waste

Solid waste reduction efforts in Tracy will be determined from data provided by the Tracy Delta Disposal Service, Inc. The GHG model for the Sustainability Action Plan assumes that solid waste in Tracy will be reduced as follows:

- 25 percent reduction in recycling and yard waste sent to landfills compared to 2006.
- 50 percent reduction in food waste sent to landfills compared to 2006.
- 50 percent diversion of all construction waste (assuming 4 pounds of construction waste per square foot of construction).

Based on the information provided by Tracy Delta Disposal Service, Inc., the periodic reviews will evaluate whether the actual solid waste in Tracy reflects the reductions anticipated by the GHG model.

7. Water Use

Although GHG emission reduction benefit from water conservation efforts were not quantified, reduction in water use can be easily tracked. Water use in Tracy will be determined through Water Usage Data (WUDS) and monthly production wells data provided by the Tracy Public Works Department. As of 2010, metered landscape irrigation accounted for 13 percent of total gallons per capita per day (gpcd), or 29 gpcd. The Sustainability Action Plan assumes that water use in Tracy will be reduced by 2020 as follows:

a) 12 percent reduction in outdoor potable water use from 2010 baseline data. This equates to 26 gpcd by 2020.

b) 20 percent reduction in per capita potable water use utilizing State Department of Water Resources' (DWR) Method 1 historical average.[2] Total gpcd less metered landscape irrigation gpcd equates to total potable water use reduction to 180 gpcd by 2020.

c) 20 percent reduction in municipal potable water use compared to 2008 baseline data.

Based on the information provided by the Public Works Department, the periodic reviews will evaluate whether the actual water use in Tracy reflects the reductions anticipated by the GHG Model.

C. Progress Report and Greenhouse Gas Inventory Update

Approximately every five years following the adoption of the Sustainability Action Plan, or as funding is available, the City will conduct a comprehensive update to the baseline 2006 GHG inventory and release a progress report. The GHG inventory and progress report will demonstrate the effectiveness of the Sustainability Action Plan. The progress report will list the measures that have been implemented to date and summarize the results of periodic reviews that have been conducted. The inventory update will measure actual GHG emissions in Tracy at the halfway point to the 2020 target year for this Sustainability Action Plan. The GHG model for the Sustainability Action Plan assumes that GHG emissions in Tracy will be reduced by 378,461 to 482,154 metric tons carbon dioxide equivalent (CO_2e) in 2020. Based on the comprehensive updates to the GHG inventory, the City will evaluate whether the actual GHG emissions in Tracy reflect the reductions anticipated by the model. If target reductions are not met at the halfway point, the City will re-evaluate and adjust the measures and overall targets to reach the established 2020 targets.

[2] DWR requires the use of one of four methods to determine the 2020 goal. Method 1 states: A 20 percent reduction from historical baseline per capita water use based on a 10-year average per capita water use ending between December 31, 2004 and December 31, 2010. Utilizing this method and historical data from 1995-2004, the City will need to achieve 202 gpcd by 2015 and 180 gpcd by 2020.

APPENDIX A

COMMUNITY WORKSHOP INPUT

APPENDIX A

The City held a Community Workshop on Wednesday, February 17, 2010 to discuss draft sustainability targets and measures for the Sustainability Action Plan, as well as priorities for future funding opportunities.

During this workshop, participants brainstormed other projects and measures that could be included in the Sustainability Action Plan or that the City could pursue through future funding opportunities. These suggestions include:

- Nuclear fusion and nuclear energy.
- Nuclear laser to manage garbage.
- Light rail from Tracy to Stockton.
- Desktop manufacturing.
- Small-scale biodiesel plant.
- Food conspiracy/cooperative.
- Enhanced Building Code enforcement.
- Continuation of allowing secondary (in-law) units.
- Enhanced City-School District collaboration, including multi-use of school campuses for social events and exchanges.
- Rewards for residents who identify energy cost savings.
- Support for home composting.
- Encouraging green manufacturing.
- Rainwater harvesting.
- Converting methane at wastewater treatment plant to energy.
- Graywater capture at individual homes.
- Time of sale energy retrofit requirements.

The workshop also featured an interactive exercise in which participants used dots to identify their preferred measures among the draft sustainability measures and the new measures that were suggested during the brainstorming session. The following measures, which are discussed further in Chapter 5, were the most popular measures that received the most dots:

- E-6, Financing for Energy Efficiency and Renewable Energy Projects (17 dots)
- T-12, Increased Transit to Bay Area Cities and San Joaquin Valley Employment Centers (13 dots)
- SW-2, Increased Recycling (13 dots)

- E-8, Solar Panel Installations on Municipal Facilities *and* Energy Target #2a, New municipal buildings powered by 10% using on-site solar panels (13 dots)
- AG-2, Farmland Preservation Around Tracy *and* Agricultural Lands Target #1, No loss of Prime Farmland, Farmland of Statewide Significance, or Unique Farmland outside of the City's Sphere of Influence (13 dots)
- T-5, Smart Growth, Urban Design and Planning (10 dots)
- SW-3, Recycling Service for Multi-Family Housing (9 dots)
- E-3, Green Building and Energy Efficiency Design and Education (8 dots)
- T-3, Support for Bicycling (8 dots)
- ED-12: Green Business Program (8 dots)

APPENDIX B

BASELINE GREENHOUSE GAS INVENTORY AND BUSINESS AS USUAL FORECAST

City of Tracy

Baseline Greenhouse Gas Emissions Inventory Report

December 2009

Conducted by Town-Green in Partnership with the City of Tracy

City of Tracy Baseline Greenhouse Gas Emissions Inventory

Table of Contents

Acknowledgements

This Greenhouse Gas Emissions Inventory Report was a collaborative effort between the staff members from the City of Tracy, local business representatives, and regional transportation organizations. We would like to thank staff members from ICLEI and ICF/Jones & Stokes and Fehr & Peers for their assistance, and the City of Tracy staff for their help in researching and compiling data for the analysis. City staff provided invaluable input and assistance in locating key data resources in the City. We would also like to thank Pacific Gas & Electric Company (PG&E) for its cooperation in providing data.

I. Introduction

It is widely known in the scientific community that as the world's population increases, we are globally releasing more greenhouse gases than can be absorbed back into nature. While there are some greenhouse gases that are produced naturally, the principal greenhouse gas emissions, which are a result of human activities, are: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and Fluorinated Gases. Known as the greenhouse effect or global climate change, models show that this phenomenon will lead to a 2^oF to 10^oF temperature increase over the next 100 years. Already the Intergovernmental Panel on Climate Change warns that most of the warming observed over the last 50 years is attributable to human activities.

Changes in the earth's temperature will have impacts for residents of Tracy, California. These impacts could include:

- Increase in severe weather events
- Increase in annual rainfall of 20 to 30 percent leading to more serious storm events
- Rising sea levels that will threaten ecosystems and water supplies
- Decrease in the Sierra snow pack which will effect fresh water availability
- Increase in insect-borne diseases

It is essential that each city understand its own contribution to the cumulative effects of climate change. By understanding the major sources of the greenhouse gas emissions, cities may make informed changes to land use and transportation planning, waste management, and energy usage that impact emissions.

A. Baseline Emissions Inventory Report: Purpose

This report, conducted by Town-Green, presents the levels of greenhouse gas (GHG) emissions that the City of Tracy emitted in its base year, 2006, on a municipal level and a community-wide level. The emission forecast represents a business-as-usual (BAU) prediction of how GHG emissions may change the City of Tracy over time if no emissions reduction programs are implemented. This information will inform the city about the sources and severity of emissions as potential targets for reductions. The inventory will help the City tailor its emissions reduction strategies towards significant sources and meet specific State and community environmental and energy goals.

B. California Emerald Cities Program

The City of Tracy is the second participant in the Emerald Cities Pilot Program. Emerald Cities (EC) consists of a program to help transform California cities and counties, especially those underserved or at risk, into more environmentally, economically, and socially sustainable places. Under the general direction of the State Department of Conservation, with assistance from the non-profit National Charrette Institute (NCI) and the California Sustainability Alliance, Town-Green leads the Tracy pilot in collaboration with State and private technical consultants in the appropriate fields of sustainability.

EC is intended to significantly:

- Assist jurisdictions in meeting or exceeding local and state statutory requirements such as California's Assembly Bill 32 (AB32) and Senate Bill 375 (SB375);
- Help communities reduce their carbon footprint, preserve renewable resources, and decrease reliance on fossil fuels;
- Improve the community's ability to prepare for and adapt to economic (e.g., jobs, food, and utility costs), environmental (e.g., climate, air quality), and energy (e.g., power, fuels, reduce auto dependency) changes; and
- Help forge a community-supported policy, regulatory, programmatic, and implementation framework to achieve these desired outcomes

II. Emissions Inventory

A. Reasoning, Methodology & Model

The GHG inventory provides local governments with a baseline or benchmark for quantifying changes in their greenhouse gas emissions. By identifying stationary and mobile sources of CO_2 emissions, local governments may methodically focus on targeting the most significant emissions from energy use, transportation, and waste related activities at the community-wide scale and those resulting directly from municipal operations.

Once completed, these inventories offer a baseline to forecast BAU emissions. These forecasts inform the local government by estimating future emissions resulting from continued limited or inaction, and provide an incentive for setting reduction targets; the targets help policy-makers design and implement the corresponding greenhouse gas emission reduction measures.

1. Emissions Analysis Software

Town-Green employed International Council for Local Environmental Initiatives' (ICLEI) Clean Air and Climate Protection (CACP) software to calculate the emissions derived from energy consumption, transportation, and waste generation within Tracy. The methodology assumes that electricity and natural gas use, transportation, and solid waste generation will increase over time in proportion to population, number and type of jobs, and housing availability. It also assumes that fuel economy and the percentage of electricity generated from renewable sources remains constant throughout the forecast period.

The CACP software determines emissions using coefficients according to the type of fuel consumed. Emissions from different types of fuel consumption are converted into equivalent measures of carbon dioxide units, or CO_2e, in order to be able to compare different greenhouse gases more easily.

The methodologies that the CACP software uses to calculate current and predict future greenhouse emissions follow the same national and international standards established by national and international inventory standards established by the Intergovernmental Panel on Climate Change (1996 Revised IPCC Guidelines for the Preparation of National GHG Emissions Inventories), the U.S. Voluntary Greenhouse Gas Reporting Guidelines (EIA for 1605), and, for emissions generated from solid waste, the U.S. EPA's Waste Reduction Model (WARM).

While the CACP software has been successfully used across the U.S. to calculate greenhouse gas emissions, it is important to note that the ICLEI software model and available community-wide field data on fuel consumption is limited. Therefore, some of the data requires assumptions to be made about the conditions of community-wide fuel consumption. While the numbers generated by this software are very close approximations, the computations may not reflect exact values. Forecasted information about both community emissions and municipal emissions are projected using a different methodology, as the CACP software was insufficient for accurate analysis. The community-wide forecast was calculated using a separate ICLEI spreadsheet that bases its forecast on population and employment growth. The municipal forecast calculated by Town-Green was based on municipal parks, infrastructure, and water and wastewater facility growth estimates provided by City of Tracy staff.

2. Inventory Sources and Data Collection Process

To conduct the greenhouse gas emissions inventory, Town-Green used 2006 as the designated year to collect information from several sources and energy sectors. PG&E provided data on electricity and natural gas consumption for the community and local government. Fehr & Peers provided fuel

consumption data for community travel, and Altamont Commuter Express (ACE) and the City's transit provider, Tracer, provided data on emissions from the regional passenger train and public transportation. Solid waste data was gathered from the Tracy Delta Solid Waste Management. City staff coordinated the City's overall municipal data collection process.

Town-Green aggregated this 2006 data to create a community emissions inventory and a municipal operations emissions inventory. The community inventory represents all the energy and transportation-related fuels used, and waste produced by non-government owned and operated establishments within the City of Tracy and its contribution to greenhouse gas emissions. The municipal inventory includes emissions derived from internal government operations and local government employee commute.

It is important to calculate community and municipal GHG emission inventories separately. This allows the local government to analyze its own impacts on climate change, and helps them to lead by example, demonstrating how it will exert control over its own reduction efforts. The City of Tracy will play a critical role in inspiring community members to change their energy consumption patterns and set an example for other local governments to address their greenhouse gas emissions and reduce their environmental impacts.

Tracy's community emissions inventory includes all electricity and natural gas consumption energy within the city limits, excluding energy consumption from County-owned facilities. This means that, even though the electricity used by Tracy's residents is produced elsewhere, the energy and emissions associated with it appears in Tracy's inventory. By calculating emissions to include the impacts of the source of their energy consumption, a community will look at their energy consumption more holistically and not limited by the city's political boundaries.

B. Inventory Results

The results below represent the City of Tracy's completion of the greenhouse gas inventory. The community-wide analysis will be discussed first and the municipal analysis will follow.

1. Community Emissions Inventory

In the base year 2006, the City of Tracy emitted approximately 1,338,872 tons of CO_2e from residential, commercial, industrial, transportation and waste sectors, as well as fugitive and refrigerant emissions. Fugitive emissions result as a byproduct of industrial processes. These are emissions of gases from pressurized equipment, generally from leaks and irregular releases of gases.

Burning fossil fuels in motor vehicles and for energy use in buildings and facilities represent the major contributor to Tracy's greenhouse gas emissions. This single largest source of emissions consists of fuel consumption in the transportation sector, contributing 63% of total emissions. Table (1) and Figure (a) below show Tracy's total greenhouse gas emissions from all major sources for the year 2006. The residential, commercial, and industrial sectors represent emissions that result from electricity and natural gas used in both private and public sector buildings and facilities. The transportation sector includes emissions from private and commercial vehicles driven within the City's geographical boundaries, commuter traffic, off-road emissions, as well as the emissions from trips taken by Tracy residents on ACE, the regional passenger train.

The Tracy "Citywide Travel Demand Model" covers all of the vehicle miles traveled (VMT) associated with trips completed within Tracy and half of the VMT generated by jobs and residences located within Tracy but that resulting in travel to/from external destinations. The model does not account for vehicles that pass through Tracy without either a point of origin or a destination within the city. Tracy assumes

emissions accountability for the VMT that occurs outside of the city borders only if is directly related to Tracy residents.

The emissions from transit vehicles and the city-owned fleet, Tracer, are included in the municipal emission summary.

Table (1): Tracy Community Emissions Summary

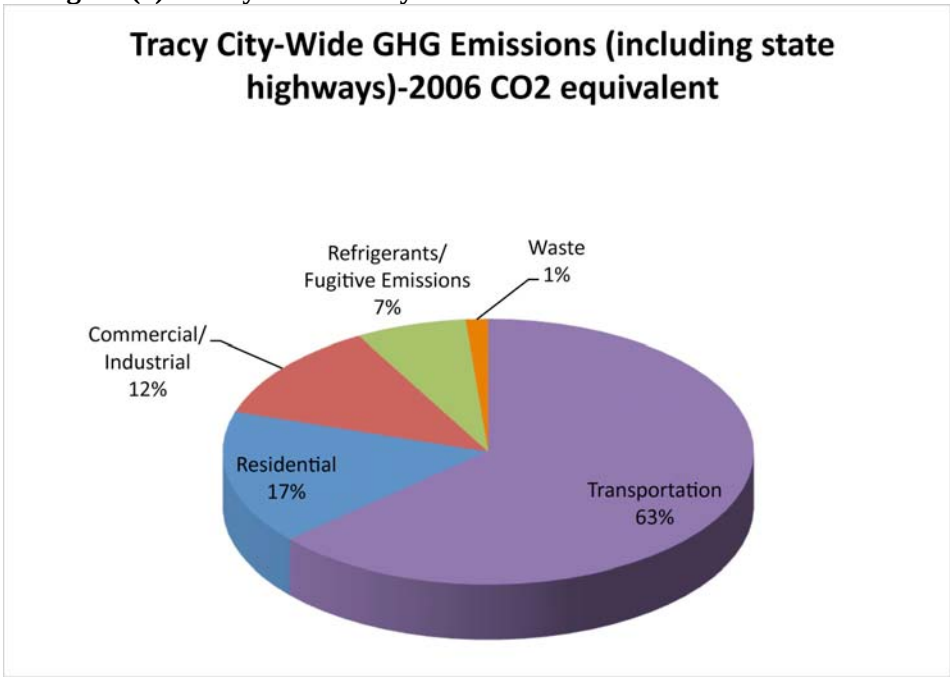
Potential Sources	**Equiv CO_2e (metric tons)***	**Energy (MMBtu)****
Residential	220,036	1,856,775
Commercial/Industrial	160,740	1,355,305
Transportation	849,673	10,816,752
Waste	18,190	0
Fugitive Emissions/Refrigerant	90,233	0
TOTAL	**1,338,872**	**14,028,832**

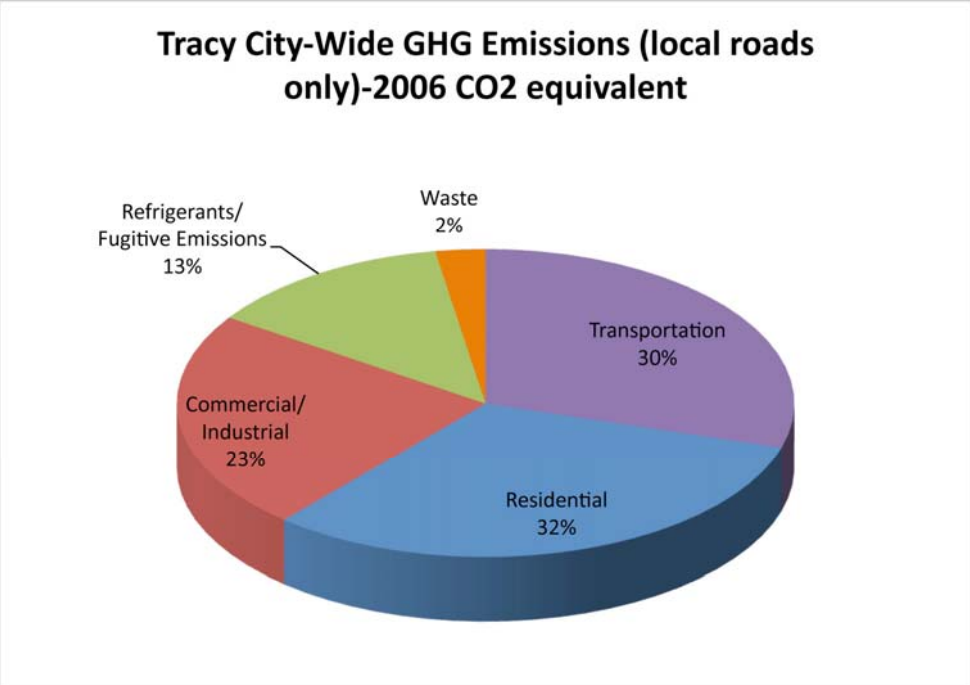
Source: CACP Model output

*Equiv CO_2e refers to equivalent carbon dioxide. It is standard international practice to convert other greenhouse gasses into CO_2e so that their impacts can be directly compared.

**Energy is measured in British Thermal Units. MMBtu represents one million BTUs.

Figure (a): Tracy Community Greenhouse Gas Emissions - Year 2006





Source: CACP Model output

Energy / Stationary Source Emissions

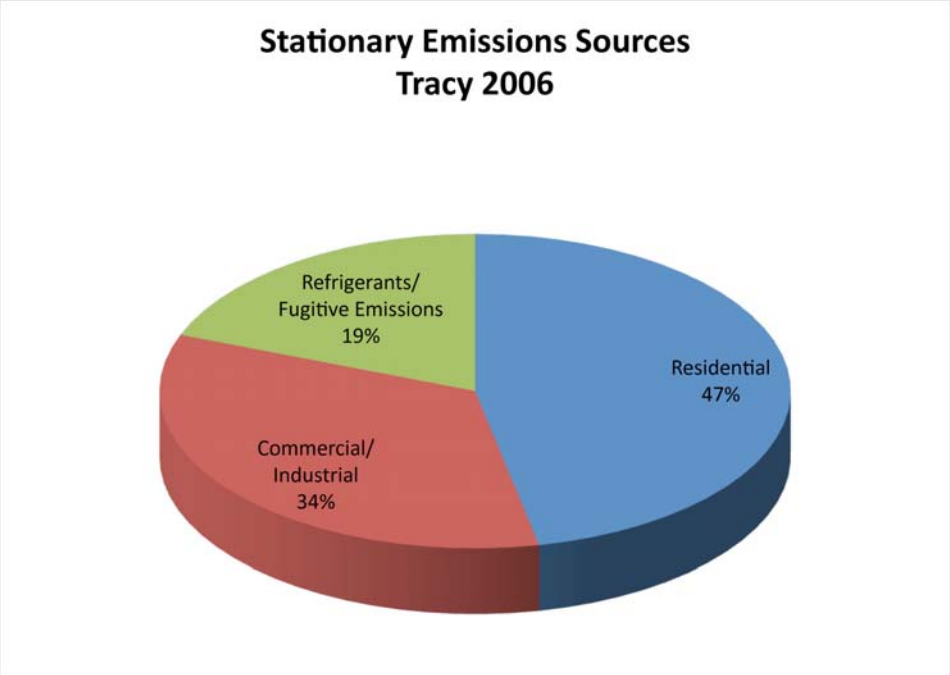
In 2006, Tracy's total stationary energy consumption was about 395,669,635 kWh of electricity and 18,616,718 therms of natural gas. Stationary energy use by all sectors (residential, commercial, industrial activities, and refrigerants/fugitive emissions) accounts for 35.21% of total greenhouse gas emissions in Tracy. These emissions are a result of the combustion of fossil fuel, but do not include fugitive emissions

or refrigerants. Tracy's stationary energy use resulted in a total of approximately 470,670 tons of CO_2e emissions in 2006.

The City of Tracy receives its electricity from Pacific Gas & Electric Company (PG&E). The 2006 emissions coefficients for electricity provided by PG&E are included in the notes in Appendix A (Data Summary Reports and Inventory Detailed Reports). The types of power sources that make up a utility's electricity generation mix have a significant impact on a city's greenhouse gas emissions. A coal fired power plant, for example, releases 1.3 tons of CO_2e per megawatt-hour of electricity generated versus 0.7 tons for gas turbines and 0 tons for renewable sources such as solar, wind, or hydroelectric power.

Figure (b) shows the breakdown of greenhouse gas emissions by sector for both electricity and natural gas combined. Of the total 470,670 tons of CO_2e emitted due to stationary energy use, 46.75% was from residential building, 34.08% was from commercial/industrial buildings, and 19.17% was from refrigerants and fugitive emissions.

Figure (b): Tracy Community Greenhouse Gas Emissions Breakdown (Residential and Commercial/Industrial) - Year 2006



Source: CACP Model output

Residential

In 2006, Tracy's 80,308 residents consumed 227,359,090 kWh of electricity, or about 9,103 kWh per household, and 10,808,054 therms of natural gas, or about 433 therms per household. This consumption resulted in a release of 220,036 tons of CO_2e. Major residential energy uses include refrigeration, lighting, and water heating.

Commercial/Industrial

In 2006, Tracy's commercial/industrial sector buildings consumed 168,310,545 kWh of electricity and 7,808,664 therms of natural gas. This consumption resulted in a release of 160,740 tons of CO_2e into the atmosphere.

While industrial establishments are located in Tracy, separating the emissions attributed to industrial facilities from those from commercial facilities is not possible. Calculating separate Commercial and Industrial energy consumption is constrained because PG&E is not permitted by the California Public Utilities Commission to release that aggregate data, under the '15-15 rule.' If any single private industrial customer makes up more than 15% of the total industrial usage or there are fewer than 15 total industrial customers, PG&E is required to "roll-up" or combine the industrial data into the commercial sector to prevent a 15-15 confidentiality violation.

Fugitive Emissions/Refrigerants

In 2006, Tracy's residential and commercial/industrial sectors use of refrigerants and leaking pressurized equipment resulted in a release of 90,233 tons of CO_2e. These emissions were measured at a 1.1 $MTCO_2e$ per capita rate based on data from the California Air Resources Board. The estimate is included in the inventory as refrigerants, but is defined broadly to include CFCs and HCFCs, and the emissions are considered "High Global Warming Potential GHGs." For more information regarding the methodology of how this was calculated, please refer to Appendix A. At the time this report was written, the City of Tracy did not have a standardized method of recording fugitive emissions and refrigerants emitted by the residential, commercial, or industrial sectors.

Stationary Sources

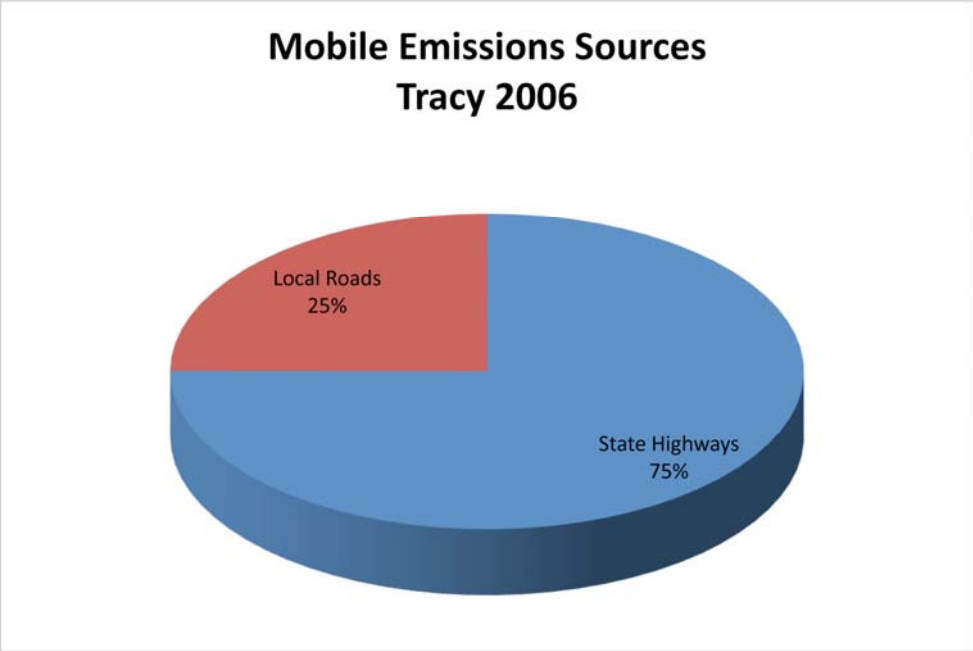
Commercial and industrial facilities consume both electricity and natural gas, and may consume other types of fuel onsite for operation of their equipment or vehicles. Information regarding propane and kerosene used by private entities was not tracked by the City of Tracy, and at the time of this inventory, was not available. However, the off-road emissions inventory from the Air Resources Board (ARB) show that construction, agricultural, recreational, and industrial equipment and vehicles consumed 1,852,417 gallons of diesel, 255,700 gallons of gas, and emitted 23,949 tons of CO_2e. Including aviation gas and jet fuel, the off-road emissions were responsible for emitting 24,873 tons of CO_2e. These off-road emissions are accounted for in the transportation emissions section.

Transportation Emissions

The community transportation sector, including travel on state highways, local roads, and the commuter train, as well as all off-road emissions, is responsible for approximately 63.43% of Tracy's greenhouse gas emissions. Motor vehicles driven within the City's geographical boundaries on both local and state roads emitted approximately 823,136 tons of CO_2e in 2006. The regional commuter train, ACE, plus aviation and jet fuel from the Tracy Municipal Airport contribute another 1,664 tons of CO_2e, or 0.2% of the transportation emissions. Off-road vehicles and equipment emitted approximately 24,873 tons of CO_2e in 2006, accounting for 2.9% of the transportation emissions. The VMT model used to help calculate the motor vehicle emissions does not account for travel passing through Tracy without either a point of origin or a destination within the city.

Figure (c) shows the breakdown of greenhouse gas emissions by vehicle miles traveled (VMT) from local roads and VMT from state highways. Of the total 849,673 tons of CO_2e emitted from transportation on all roads, 25% was from local roads and 75% was from state highways. This percentage does not include off-road emissions.

Figure (c): Tracy Community Greenhouse Gas Emissions Breakdown (Local Roads and State Roads) - Year 2006



Calculations for transportation emissions are based on figures for total VMT in the City of Tracy. Fehr and Peers supplied the necessary VMT data, the breakdown of vehicle types, and the percentage of vehicles in each speed-bin.

Solid Waste Emissions

In 2006, Tracy sent approximately 92,202 tons of solid waste to the San Joaquin County Foothill Landfill, resulting in 18,190 tons of CO_2 e emissions. Of this total landfilled waste, 66,600 tons were hauled by Tracy Delta Waste Management and passed through the Tracy Delta Facility. 25,602 tons of waste was hauled by individuals, landscapers, and construction companies. Tracy employs recycling measures to reduce the amount of waste sent to landfills.

Greenhouse gases are generated by landfilling the waste, and by the decomposition of the organic fraction, which produces methane. Methane is a greenhouse gas 21 times more potent than carbon dioxide. Table (2) shows the approximate breakdown of the materials Tracy sent to landfills in 2006. The WARM model estimates the CO_2e emissions released from the landfill based on the percentages of waste from a 2003 study for Cascadia, California. At the time this inventory was written, San Joaquin County had not conducted a more current waste characterization study.

Table (2): Tracy Waste Composition

Waste Type	Waste Share
Paper Products	21%
Food Waste	15 %
Plant Debris	14 %
Wood/Textiles	23 %
All Other Waste	27 %
TOTAL	**100 %**

Source: Tracy Delta Solid Waste Management

The U.S. EPA's Waste Reduction Model (WARM) model is used to estimate the greenhouse gas impacts of landfilling Tracy's waste. The WARM model makes the following assumptions in the analysis: 75% of landfill gas, methane, is collected and flared, so that only 25% escapes to the atmosphere. The flaring of methane converts it back into CO_2. The calculation does not account for any sequestration at the site. The landfill is 20 miles from the transfer station, so the model accounts for the energy used in the transfer of waste to the landfill.

The CACP software calculates waste disposal emissions using a model based on the WARM model and is therefore consistent with national standards.

However, the CACP software does not fully account for or reflect the emission reductions in the energy use from recycling and composting programs. This is important because recycling and composting programs can have a significant impact on reducing GHG emissions. Tracy Delta Solid Waste Management calculated that Tracy's recycling programs helped avoid 24,266 metric tons of CO_2e in calendar year 2006. Recycling also avoids GHG emissions by returning materials back into the production stream to replace the use of virgin materials that require additional energy use in the production of goods, and by recycling paper products that avoid cutting down forests.

2. Municipal Operations Emissions Inventory

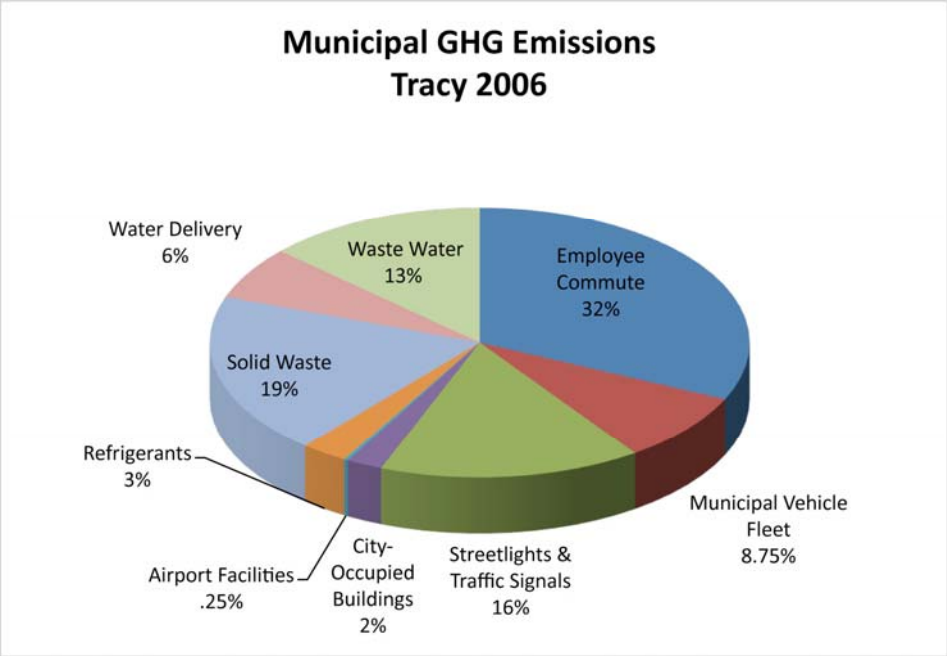
In the base year of 2006, Tracy's municipal operations generated 11,449 tons of CO_2e. As Table (3) and Figure (d) show, the emissions from City's employee commute accounted for the plurality of emissions at 32%.

Table (3): Tracy Municipal Emissions Summary

Potential Sources	Equiv CO_2e (tons)	Energy (MMBtu)
Buildings/Facilities	247	4,191
Vehicle/Transit Fleet	958	12,230
Employee Commute	3,650	46,671
Streetlights/Traffic Signals	1,798	26,696
Water Delivery	722	10,720
Wastewater	1,512	23,799
Solid Waste	2,211	5,009
Fugitive Emissions/Refrigerants	323	0
Airport Facilities	28	406
TOTAL	**11,449**	**129,722**

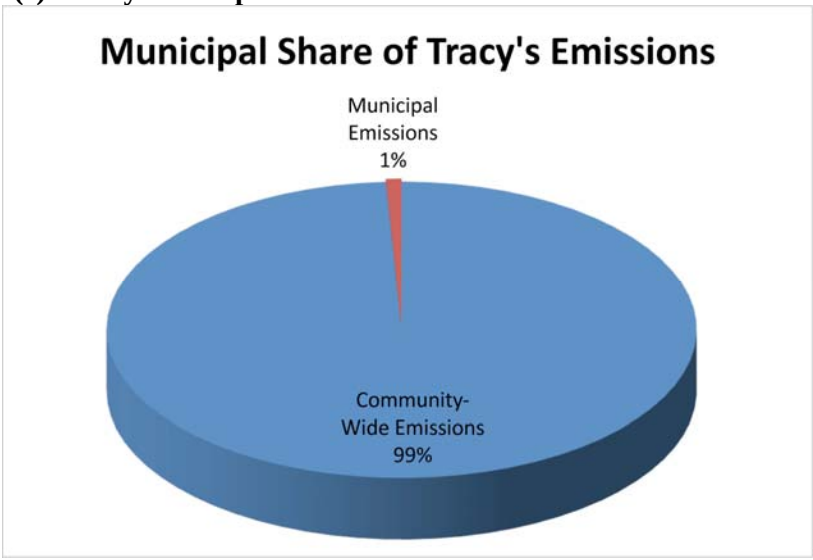
Source: CACP Model output

Figure (d): Tracy Municipal Greenhouse Gas Emissions – Year 2006



Source: CACP Model output

Figure (e): Tracy Municipal Share of Greenhouse Gas Emissions – Year 2006



Source: CACP Model output

Municipal emissions in Tracy constitute less than 1% of Tracy's total emissions. Local government emissions typically fall between one and five percent of overall community emissions. Appendix B shows the results of the CACP analysis. As a minor contributor to total emissions, actions to reduce municipal energy use may have a small impact on Tracy's overall community emissions levels. However, municipal action can help reduce operation costs and has symbolic value demonstrating leadership that extends beyond the magnitude of emissions actually reduced.

Energy/Stationary Source Emissions

In 2006, Tracy municipal buildings, facilities, streetlights, and water distribution consumed 11,115,896 kWh of electricity and 40,743 therms of natural gas, which resulted in a release of 2,795 tons of CO_2e emissions into the atmosphere.

Although the City manages the distribution of water supply, almost all water goes towards community water consumption. Only 1.3% of total water demand within the City is from institutional users. In 2006, imported and local water distribution consumed 3,140,931 KWh of electricity, which used 10,720 MMBtu and released 722 tons of CO_2e. No natural gas is used for water distribution. It should be noted that energy emissions from water distribution accounts for facilities and pumping within Tracy's boundaries, as well as from imported water from the Delta Mendota Canal and the Stanislaus River. According to Tracy's 2005 Urban Water Management Plan, surface water has historically comprised between 50 to 60% of the City's total water supply. All of the City's surface water is imported, and its ground water is taken from inside Tracy's boundaries. As groundwater supplies decrease and water demand increases, Tracy intends to increase its imported surface water supply, thus increasing the City's electricity consumption.

Transportation Emissions

The City's vehicle and transit fleet consumed 97,605 gallons of fuel and emitted about 958 tons of CO_2e. The municipal vehicle fleet includes all vehicles owned and operated by the City of Tracy plus some contractor vehicles performing City functions. The transit fleet includes Tracer, the public bus system.

Waste Emissions

The City of Tracy's wastewater and solid waste facilities consumed 4,647,311 kWh of electricity and 107,948 therms of natural gas. This consumption emitted 3,803 CO_2e emissions into the atmosphere. The Tracy Wastewater Treatment Plant processes approximately 8 million gallons of wastewater per day and releases approximately 375 tons of methane per year. This methane is not released into the atmosphere, but is used for heat generation in the two solid waste digesters.

Tracy Delta Solid Waste Management does not distinguish between municipal waste and community waste, therefore municipal solid waste production is rolled into the 92,206 tons of waste sent to the landfill. (See Waste section in the Community Analysis.) The City of Tracy has recycling programs that help to reduce waste stream and CO_2e emissions.

III. Forecast for Greenhouse Gas Emissions

Town-Green used Tracy's community and municipal operations emissions inventories developed for the base year 2006 to forecast future emissions for the year 2020 and 2050. The emission forecast represents a business-as-usual (BAU) prediction of how greenhouse gas (GHG) emissions may change in the City of Tracy over time.

Community Forecast

Projections of greenhouse gas emissions are based on the assumption that energy consumption will grow as population increases. For the community analysis, the forecast was conducted by applying population growth factors to Tracy's base year residential, commercial/industrial, and transportation data. Between 2006 and 2020, the forecast reported a 31.1% growth in emissions based on a BAU scenario. For the municipal operations analysis, the City's Public Works Department forecasts a 20% growth in emissions.

Transportation emission forecasts

The community forecast for transportation emissions were based on projected City land use for 2020 and 2050. For 2020, Fehr & Peers estimated the release of 1,118,705 tons of CO_2e, a 31.7% growth in emissions from 2006.

Refrigerant emissions forecast

Refrigerant emission numbers were based on the ARB's statewide growth in per capita emission estimates. The refrigerant emissions include ozone depleting substances (ODS) and HFC. The ARB used 2007 as their baseline for the per capita emissions, and assumes that the 2007 emissions are similar to the 2006 emissions. The ARB forecasts that in 2020, the metric tons of CO_2e will increase by 26.9%, from 90,233 metric tons of CO_2e in 2007 to 114,477 metric tons of CO_2e in 2020. Between 2007 and 2050, emissions will decrease by 9.1%, to 190, 264 metric tons of CO_2e. The 2050 estimate takes into account trends between 1990 and the present, and takes into account the Montreal Protocol phase-out of CFCs and HCFCs. It assumes that these refrigerants will be replaced by reduced-CO2e gases such as HFO-1234yf that have a very low global warming potential (GWP). See Appendix C for the methodology for this estimate.

Please note that the BAU scenario for Tracy's community-wide emission forecast assumes that the City's Growth Management Ordinance (GMO) remains constant over time. The City of Tracy adopted a GMO in 1987 and amended it in 2000. The GMO aims to help Tracy achieve a steady and orderly growth rate that allows for the adequate provision of services and community facilities, and includes a balance of housing opportunities. The GMO limits the number of Residential Growth Allotment (RGAs) and building permits to an average of 600 housing units per year for market rate housing, with a maximum of 750 units in any single year, although there are exceptions for affordable housing. This means that the estimated rate of fuel consumption for residential, commercial, industrial, and municipal facilities may be lower than the calculations predicted by the ICLEI model.

Municipal forecast

The municipal forecast was based on the growth expectations for buildings and facilities, parks, and infrastructure. Information available regarding the expected increase in square footage for municipal operations was very limited, and PG&E was unable to provide a forecast of energy consumption. City staff was able to provide the square footage and future construction plans for Tracy's fire facilities, the square footage of existing and planned park space, and the planned increases in the water and wastewater treatment plants' capacities. Public Works staff estimated that the wastewater treatment plant's capacity might increase by 33% by 2020, and by 78% by 2050. Assuming that the CO_2 emissions per KWh stay constant between 2006 and 2020, CO_2 emissions will increase by almost 40% in 2020, and 116% by 2050. However, when staff averaged these growth rates of CO_2 emissions with the growth rate of parks, the water treatment plant, and the firehouse facilities, a 20% increase in energy consumption and CO_2 emissions was estimated. The raw data considered in this estimate is included in Appendix D.

Water Supply emission forecasts

The ICLEI software forecast does not calculate the increased rate of GHG emissions from an increase in imported water from outside of Tracy's political boundaries. Based on the City of Tracy's 2005 Urban Water Management Plan, Tracy will consume 23,900 acre-feet in 2020, resulting in the consumption of 4,402,830 KWh, and the release of 1,012 metric tons of CO_2e. This represents a 2.87% increase from 2006 levels. The UWMP assumes a 9.21% increase in water consumption every five years from 2005-2020; this same growth rate was used to project a water demand of 40,537 acre-feet in 2050. This will result in the consumption of 7,467,679 KWh, and the release of 1,717 metric tons of CO_2e, representing a 3.13% increase from 2006 levels. These calculations do not factor in special energy conserving technology for water distribution that may be implemented in the future.

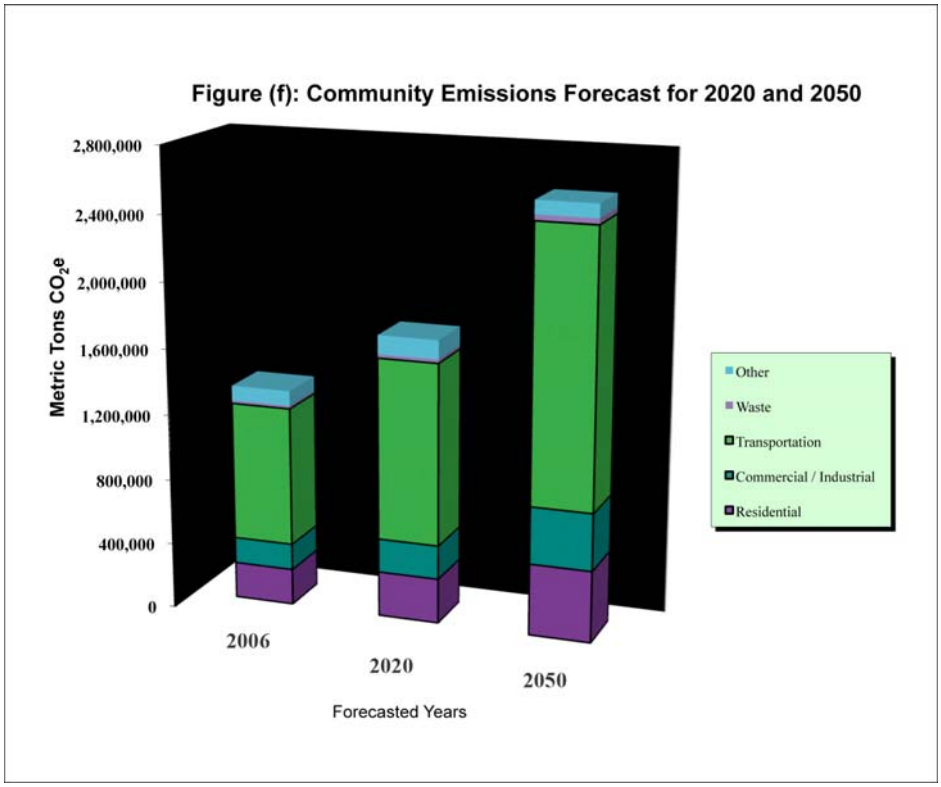
Table (4) provides an emissions summary for Tracy's base year and forecast year.

Table (4): Tracy's Emissions Summary

Tracy's Emissions Summary		
	Community Analysis	**Municipal Operations Analysis**
Base year	**2006**	**2006**
Indicators used to generate forecast	1.99 % (Annual population growth rate based on the April 2009 Draft Supplemental EIR for the General Plan Amendment)	1.42% (Annual rate based on increase in municipal operations)
Quantity of CO_2e emissions in base year (metric tons)	1,336,869	11,449
Forecast year	**2020**	**2020**
Business-as-usual projection of CO_2e emissions in *2020* (metric tons)	1,735,022; 29.6% increase over baseline	13,948; 21.8% increase over baseline
Forecast year	**2050**	**2050**
Business-as-usual projection of CO_2e emissions in *2050* (metric tons)	2,568,068; 92.1% increase over baseline*	21,291; 86% increase over baseline

Source: CACP Model Output

*Fehr & Peers will be providing the 2050 forecast for mobile transportation vehicles. The revised 2050 transportation forecast should be added to the Tracy Forecast Builder worksheet in order to calculate the 2050 community analysis' BAU projection.



Source: CACP Model output

Conducting an emissions forecast is essential for setting an emissions reduction target, since the amount of GHG emissions Tracy pledges to reduce will be derived from projected emissions. Appendix C provides the results of the CACP analysis.

IV. Conclusion

This greenhouse gas emissions inventory report represents a profile of the greenhouse gases that the City of Tracy emitted in its base year, 2006, from community and municipal sources. The report also estimates the greenhouse gases that the City will emit in the year 2020 and 2050, if the community and municipality continue to emit business-as-usual GHG emissions, without additional emission reduction actions or a growth management ordinance.

This inventory is a crucial tool for the City as it develops a climate action plan with new policies, regulations, programs, and practices to meet its emission reduction targets. The inventory serves to direct the City towards the major sources of greenhouse gas emissions. For example, the community inventory for the City of Tracy reveals that the transportation sector is responsible for 63% of total emissions. In response, the city might implement actions that reduce the frequency and length of motor vehicle trips, decrease fossil fuel consumption, and reduce the toxicity of tailpipe emissions. Potential action items may include improving the connectivity to and diversity of destinations for pedestrians and cyclists and increasing public transportation frequency and convenience.

The inventory demonstrates that the municipal government emissions comprise a minimal percentage of community emissions, less than one percent. However, the City of Tracy has the opportunity to exhibit strong and visible leadership role in addressing climate change by reducing its own emissions.

Appendix A – CACP Reports by Sector, Data Sources, Assumptions and Notes for the Community Inventory

See PDF files: Appendix A_Tracy Community-Wide CACP Reports.pdf, Appendix A_Fehr and Peers Community-Wide Transportation Report.pdf, Appendix A_Solid Waste Stream Worksheet.pdf, Appendix A_ARB Refrigerant Emissions Worksheet.pdf

Assumptions

The greenhouse gas inventory calculates emissions based on many assumptions.

- The population and job growth did not account for the recent economic depression. This data assumes that the population and job growth rate will be consistent with past trends. The BAU forecasts do take into account the Growth Management Ordinance that limits the residential growth allotment and building permits per year. This inventory assumes the Ordinance will not be significantly modified in the near future.
- Fugitive emissions and refrigerants from non-municipal or municipal operations are not documented in the City of Tracy. This data was extrapolated from California Air Resources Board's refrigerant calculations on a per capita basis. It was assumed that the consumption per capita rate of emissions is the same throughout California.
- The BAU forecast uses 2030 emissions factors which reflect projected improvements in vehicle efficiency but since it is based on the baseline General Plan land use plan, it does not reflect reductions in VMT due to progressive land use and transportation planning.
- Forecasts are based on "business-as-usual" projections. This does not take into account federal and/or state regulations which address energy consumption and greenhouse gas emissions, such as the Low Carbon Fuel Standard adopted by CARB or the vehicle efficiency requirements directed by AB 1493.
- BAU forecasts also do not consider any change in the electricity grid emission factor. The emission factor will likely change in the future as utilities use more renewable energy and as power plants become more efficient. Lastly, it also doesn't consider adjustments to the per capita energy use; these may increase or decrease according to a mix of technology and behavior changes.
- Forecasts for 2050 use the same the growth rate as that which was used for the period of 2006 – 2020. This is using the BAU assumptions, and assumes that the Growth Management Ordinance will continue to be enforced.

Community Analysis Methodology

The data entered into the ICLEI software came from numerous sources of information.

- The residential, commercial and industrial electricity and natural gas data came directly from PG&E.
- Industrial establishments: No energy information is available for industrial establishments under rule 15-15. If any one private industrial customer makes up more than 15% of the total industrial usage or there are fewer than 15 total industrial customers, PG&E is not permitted by the California Public Utilities Commission to release that aggregate data.
- Transportation: Transportation data came from a combination of sources: Fehr & Peers wrote a VMT report, ACE provided data on Tracy ridership and train fuel consumption, and the Tracy airport facilities provided data on aviation and jet fuel for the private airplanes and jets. The off-road emissions were calculated with the ARB's Off-Road Emission model. The model calculated off-road emissions for San Joaquin County. Approximately 0.2% of San Joaquin County's agriculture is in Tracy, therefore, 0.2% of the off-road agricultural equipment was assumed originate in Tracy. Based on data from the San Joaquin Council of Governments, 16% of

construction in San Joaquin County is in Tracy, and 5.49% of industrial off-road equipment is in Tracy. Tracy's population is 12% of San Joaquin County; this number was used as an approximation to calculate Tracy's consumption of fuel from recreation, and small utility vehicles.

- Solid Waste: Solid waste data was provided by Tracy Delta Waste Management. An additional analysis, provided by consultants Edgar and Associates, explains the amount of CO_2e emissions avoided by the City's recycling program. This information is explained in the appendix below.
- Refrigerants: Refrigerant information, under "other" category, was provided by the Air Resources Board (ARB), which calculated a detailed analysis of refrigerants per capita in Tracy, and also broke those emissions down into community and municipal use. The 1.1 $MTCO_2e$ per capita measurement includes CFCs and HCFCs. For more information, please refer to the detailed methodology below.
- Water**:** Emissions from water distribution and treatment are reported in the government analysis section because water is a city managed resource. However, only 1.3% of total water demand within the City is from institutional users.[1]

Waste Methodology

There is a discrepancy between the ICLEI software and the WARM model:

WARM calculates the methane generation potential of the landfilled waste and allocates that amount of methane generation in the year that the waste is placed, even though the landfill gas will be generated over many years. This is different than most landfill gas generation models, which use a first order decay equation to allocate the potential methane generation over future years in accordance with a decay constant for the waste.

Edgar & Associates produced a report detailing the waste stream handled by Tracy Delta Waste Management Company, and describing the CO_2 emissions avoided by the recycling and composting program. Their final number is slightly different than the number calculated through the ICLEI software, possibly because of the different calculation methods. Edgar & Associates report that the "net" result, which is emissions generated less carbon storage, is -12,258. The carbon storage amount is -33,595, so the actual emissions generated are 24,747 $MTCO_2e$. See PDF file, Appendix A_GHG Landfilling Transfer Tonnages.pdf

San Joaquin County has done no waste characterization studies since the state-wide study in 2003, so the Cascadia study was the best information available for waste stream information.

The percentages in the Cascadia study were applied to the 66,600 tons of waste that is landfilled, so that an assumed waste characterization embedded in the WARM model that is based on national averages isn't be relied on.

There is a difference between the tonnages reported by Tracy Delta for recyclables and landfilled waste and those that the city reported to the CIWMB as far as disposal and diversion.

In addition, the WARM model accounts for the energy used in the transfer of waste from the transfer station to the landfill, a distance of 20 miles. Due to modeling limitations, these trips are also counted in the transportation section.

[1] 2005 Tracy Urban Water Management Plan, page 13

Disposal Tonnages

Tracy Delta tracks the origin of all waste that passes through their facility. In 2006, total tons of outbound waste to the landfill was 104,885 and the amount originating in the City was 66,600 tons, meaning that 38,285 tons of landfilled waste managed by Tracy Delta originated outside of the City. The City of Tracy reported to the State that 92,202 tons were disposed in 2006, which is 25,602 tons greater than the 66,600. However, there is also waste that originates in the City that doesn't pass through the Tracy Delta facility and isn't hauled by Tracy Delta. For instance, individuals, landscapers, and construction companies may haul waste directly to the landfill themselves and those tonnages would not be known by Tracy Delta.

There is a State Disposal Reporting System that requires haulers and disposal facilities to report the tonnage of waste back to the jurisdiction of origin, so the City should have records of disposed waste by Tracy Delta and any other haulers. At the time this inventory was written, the City was not able to track down this information.

Recyclables

Tracy Delta collects garbage, recyclables and green waste in 3 separate containers. The weight of recyclables was 20,136 tons and green waste was 3,772 tons. For purposes of calculating greenhouse gas impacts, the green waste was assumed to lose half of its mass during composting.

Fugitive Emissions/Refrigerants Methodology

The ARB's source of data is the U.S. EPA Vintaging Model estimates for CFC, HCFC, HFC, Halon, and PFC emissions (attached). The national estimates to California's 12.5% share of population was scaled down. It was assumed that the per capita emissions in 2010 (estimated) would be about the same as those for 2006 or 2007.

For the large commercial refrigeration and AC systems (greater than 50 pounds charge of refrigerant), ARB's own methodology was used, as described in detail in Appendix B of the Initial Statement of Reasons of ARB's Refrigerant Management Plan (rule and appendices available on our website at: http://www.arb.ca.gov/cc/reftrack/reftrack.htm (go to "What's New"; click on that link, and scroll down to Appendix B "California Facilities and Greenhouse Gas Emissions Inventory".)

There was a discrepancy between the ICF estimates and ARB estimates of the fugitive emissions/refrigerants for the community analysis. This can be explained as followed:

ARB's per capita emissions included all sources of CFC, HCFC, HFC, Halon, and PFC emissions in California. ICF may be looking at HFC emissions only; as CFC and HCFC emissions are often not counted towards GHG inventories (CFC and HCFC are ODSs are supposed to be gradually eliminated through the Montreal Protocol, and therefore, are generally not counted towards GHG reduction goals). On the attached Vintaging Model spreadsheet, it is shown the HFC-only per capita emissions to be about 0.45 $MTCO_2e$ per Californian, which is closer to the ICF estimate of 0.36 $MTCO_2e$/person. When Refrigerant HFC emissions only are looked at, it is estimated to be 0.38 $MTCO_2e$/person, which is very close to the ICF estimate.

The methodology for estimating refrigerant emissions from large commercial refrigeration and AC systems is spelled out in great detail in Appendix B Initial Statement of Reasons for the Refrigerant Management Plan CARB will put forth for Board adoption December 9, 2009. All other sources (residential AC and appliances, insulating foam, consumer products, etc.) have been scaled down from national estimates based on the U.S. EPA Vintaging Model (data source: VM IO

File_V4_3.25.08.xls) A description of the methodology used in the U.S. EPA Vintaging Model can be found in EPA document 430-R-05-003 "Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2003". It's in Section 3.8, page 158 (available on US EPA website at http://epa.gov/climatechange/emissions/usgginv_archive.html.

If the methodology of the GHG inventory report calls for only HFCs from refrigerants, the most accurate per capita emissions to use are 0.36 to 0.38 MTCO2e/person (California average). To show HFC emissions from all sources (refrigerant plus non-refrigerant), use the estimate of 0.45 MTCO2e/person.

Appendix B – CACP Reports by Sector, Data Sources, Assumptions and Notes for the Municipal Inventory

See PDF file, Appendix B_Tracy Government Operations CACP Reports.pdf

Municipal Assumptions

- The population and job growth did not account for the recent economic depression. This data assumes that the population and job growth rate will be consistent with past trends. The BAU forecasts do take into account the Growth Management Ordinance that limits the residential growth allotment and building permits per year. This inventory assumes the Ordinance will not be significantly modified in the near future.
- Fugitive emissions and refrigerants from non-municipal or municipal operations are not documented in the City of Tracy. This data was extrapolated from California Air Resources Board's refrigerant calculations on a per capita basis. It was assumed that the consumption per capita rate of emissions is the same throughout California.
- The City of Tracy's 2005 Urban Water Management Plan (UWMP) states that future water contracts with other water districts and retailers are possible. New energy emissions will need to be calculated for future sources of imported water.
- Forecasts are based on "business-as-usual" projections. This does not take into account future changes in federal and/or state regulations which address energy consumption and greenhouse gas emissions
- BAU forecasts also do not consider any change in the electricity grid emission factor. The emission factor will likely change in the future as utilities use more renewable energy and as power plants become more efficient. Lastly, it also doesn't consider adjustments to the per capita energy use; these may increase or decrease according to a mix of technology and behavior changes.

Municipal Analysis Methodology

All of the data for the municipal analysis was collected from the individual departments related to each sector. Town-Green spoke with employees in the Public Works dept, Planning dept, Public Utilities, Airport, Solid Waste, Economic Development, and Tracer (the public bus system). All of these departments supplied us with information regarding fuel consumption. Much of this data had to be calculated further in order to isolate the information demanded by the CACP software. Should ICF or DC&E have questions regarding how specific numbers were arrived at, please contact Town-Green.

Methodology for calculating Embodied Emissions from Imported Water

In addition to the groundwater that is drawn from within the City boundaries, currently there are 2 sources of imported water: Mendota Canal (Central Valley Project), and the South San Joaquin Irrigation District. All water distribution uses electrical energy.

Delta Mendota Canal (DMC)
Approximately 7,500 ac-ft of water per year moves from the Shasta Dam, which produces electricity, to the WAPA power plant, which is directed by the *Bureau of Reclamation*. The water delivery to WAPA and to the Tracy Processing Plant is via gravity and uses minimal electricity. At the processing plant, there is one 250-foot lift, which uses a significant amount of electricity. This treatment plant's energy consumption is accounted for in Tracy's municipal PG&E bill.

South San Joaquin Irrigation District (SSJID)
The water for SSJID originates from 3 dams, all which generate energy. The water flows by gravity to the Woodward Reservoir and then to the Nick deGroot water treatment plant. Here, there is electricity consumption. 2006 electricity data was not available, therefore, 2007 data was used for SSJID imported water. In 2007, Tracy was responsible for 1,958,581 KWh being used. The water pump in Lathrop, which sends water to Tracy, used 3,313 KWh. Tracy was responsible for 1,961,894 KWh from SSJID water distribution.

Waste Water
The Tracy Waste Water Treatment Plant processes approximately 8 million gallons/day of wastewater. The WWTP emits between 90-116,000 cubic feet/day of CH4

Methane emission Calculations:
1 million cu. ft. of natural gas = 18.91 tons liquid

Therefore the methane content of digester gas is 60% of natural gas so then 1 Mcuft = 0.6 x 18.91 = 11.4 tons liquid

In one year the Tracy WWTP generates 90,000 cu. ft. x 365 days = 32,850,000 cu. ft. or 32.85 Mcuft or 375 tons liquid. The methane is not released into the air, but is used to generate heat for the 2 digesters.

Appendix C –Summary Report for the Community Emissions Forecast

See PDF file, Appendix C_2020 Tracy VMT Forecast Report.pdf, Appendix C_Tracy Refrigerant Forecast Worksheet.pdf, Appendix C_Tracy Forecast Builder.xls

Community Forecast
ICLEI recommended that we use their in-house forecast builder, rather than the forecast in the ICLEI software. The ICLEI software is limited in its prediction capabilities because PG&E does not predict the mix of energy types that will be used in the future, and therefore 2006 data was used in the forecasts. Please refer to the excel spreadsheet for the details of the Community Forecast for 2020 and 2050.

The data which Town-Green was required to input in the excel sheet is highlighted in red.

- The CO_2e numbers for 2006 came from the CACP software summary reports.
- The population calculation for 2006, 2020, and 2050 came from the General Plan.
- The job count for 2006 came from the April 2009 Draft Supplemental EIR for the General Plan Amendment. Data from the General Plan was used to calculate the annual growth rate, and this growth rate was used to calculate the projection for 2020 and 2050.

Transportation emission forecast
Fehr & Peers calculated the forecast for 2020 and 2050 using the baseline data for 2006. Please refer to PDF file, Appendix C_2020 Tracy VMT Forecast Report.pdf

Refrigerant emission forecast
Glenn Gallagher from the Air Resources Board estimated the forecast for 2020 and 2050 based on the ARB's statewide per capita emission estimates. Please refer to PDF file, Appendix C_Tracy Refrigerant Forecast Worksheet.xls

The summary table breaks out emissions by ODS versus HFC. They are measured in metric tons of CO_2e.

California Per Capita CFC, HCFC, and HFC emissions (and HFO-1234yf substitute in 2050):

Year	per capita total GHG emissions CFC, HCFC, HFC (MTCO2e) in CA	per capita HFC (Kyoto gas) MTCO2e only	per capita ODS (CFC + HCFC) MTCO2e	Note
2007	1.121	0.413	0.707	
2020	1.147	0.891	0.256	BAU
2050	1.175	1.009	0.165	BAU
2050	0.330	0.168	0.162	With HFC phase-out

ARB used a one percent per year growth rate for pounds of material used and a 1.56% annual population growth rate. The 2020 proportion of materials used is from the US EPA Vintaging Model estimates.

The 2050 proportion of materials used is a little more hypothetical, even assuming business-as-usual. CFCs, HCFCs, and even HFC usage will largely go away, to be replaced by new refrigerants such as HFO-1234yf, which has a global warming potential of 4. It was assumed that in 2050, 80 % of refrigerant usage is HFO-1234yf, or a similar very low GWP refrigerant; and 20 % is still HFC-134a. Although it is not for certain that HFC usage will be limited after 2020, all signs point to HFC usage being severely limited after 2020 either through a US climate bill or HFC's inclusion as a Montreal Protocol refrigerant with a timetable for its gradual elimination.

Appendix D – Summary Report for the Municipal Emissions Forecast

See PDF file: Appendix D_City Facilities Sq Ft 2009.pdf

Municipal Forecast

For reasons similar to the community analysis, the CACP software was not sufficient to forecast municipal CO_2e emissions. ICLEI did not have a forecast builder for municipal operations, therefore Town-Green has been working with the City of Tracy and PG&E to predict energy emissions for 2020 and 2050. This information is pending while PG&E looks for requested data. Although it will be helpful for the City of Tracy to know the forecasted growth of municipal operations, this data will not make up a huge portion of Tracy's overall future emissions. The municipal operations account for less than 1% of Tracy's emissions, so the BAU forecasts most crucial to understand will be from the Community sectors.

Water Delivery Emission Forecast

The following calculations were based off of the 2005 UWMP's water forecasts for 2020. Year 2050 was calculated using a 9.21% increase every 5 years, as was seen in the forecast for 2020-2050.

Year	Water Demand ac-ft/Year	Total KWh consumed	Total metric tons of CO_2e emitted	Percent Increase from Base Year
2020	23,900	4,402,830	1,012	2.87%
2050	40,537	7,467,679	1,717	3.13%

Water Demand forecasts:
Year 2020: 23,900 af-ft/year
Year 2050: 40,537.18 af-ft/year
KWh per ac-ft/year= 2005 total KWh (3,140,931 KWh: imported and local)/Total water for 2005 (17,050 ac-ft/yr) = 184.22 KWh/ac-ft per year.

2020 KWh=184.22 KWh/ac-ft*23,900 ac-ft=4,402,830 KWh
2020 BTUs=15,027
CO2e=1,012 metric tons
2050 KWH=184.22 KWh/ac-ft*40,537 ac-ft=7,467,679 KWh
2050 MBTUs=25,487
CO2e=1,717 metric tons

APPENDIX C

ASSUMPTIONS FOR EMISSIONS REDUCTIONS

Appendix C: Assumptions for Emissions Reductions

	Measure	Methodology	Assumptions	Cost Assumption Notes	Citations/ Sources	Estimated Years to Activate
			Energy			
E-1	Green Building Ordinance		The Solar Benefits modeled for Measures E-1g, E-1h, and E-1i (1,087 MTCO2e) are based on an assumption that these measures would result in the installation of 3,172 kW of solar PV before 2020. Approximately 2/3 of the benefit is related to warehouse installations. This quantification is separate from the benefits from installations on municipal facilities, which were modeled in Measure E-8. Other benefits from this measure are from Measures E-1d (1,138 MTCO2e) and E-1j (260 MTCO2e). Benefits from Title 24 standards are provided separately.			1-2 years
E-2	Energy-Efficiency in Site Planning and Design		This value is the sum of all components of the measure. The majority of these reductions come from bullet (e). For (e), we used the CAPPA "Lights Out at Night" measure and assumed the measure would apply to the following land use types with varying levels of penetration: hotel, commercial, medical, park, public, school, place of worship, and industrial. The quantification represents a scenario where 50% of this land us area is targeted with a 20% adoption rate. For bullet (d), we assumed that 10% of the existing commercial space will be retrofit with a 5% gain in efficiency associated with the non-roof buildings components listed in the measure. This bullet is focused on specific types of retrofits and thus the penetration rate is somewhat less than that assumed for other submeasures. Additional benefits from the Subdivision and Zoning Ordinances were also included under this meaure. If the measure were voluntary, estimated emissions reduction would be 3,150 metric tons CO2e, and estimated percentatge emissions reduction of all measures would be .53 percent.			1-2 years
E-3	Green Building and Energy Efficiency Design and Education		This measure is a more stringent variant of E-1(a). Its reductions benefits are not strictly additive with E-1(a) and depend highly on assumptions about penetration and applicability of both measures. We used the CAPPA measure "Green Building" and assumed that 25% of all new residential and commercial construction (6.7 million square feet) would fall under the code. No penetration rate was assumed. The reductions listed represent an upper limit.			1-2 years
E-4	Energy-Efficient Products and Retrofits		This value is the sum of all components of this measure. The majority of these reductions come from bullets (f) and (g) and depend primarily on the total sqft of buildings that are retrofitted. The quantification represents a scenario with 40% of the residential and commercial building stock being retrofit and 20% of the industrial. Used CAPPA Retrofit measure. If the both the submeasures were voluntary, estimated emissions reduction would be 10,376 metric tons CO2e, and estimated percentage emissions reduction of all measures would be 1.39 percent. The voluntary scenario assumes 20% of the existing residential and commercial stock being retrofit and 5% of the industrial stock.			2 years
E-5	Weatherization for Low-Income Households		This measure assumes that 6,520 homes are eligible for the program and that 5% of these homes are weatherized. Used CAPPA weatherization measure.	Estimated that weatherization projects cost approximately $7,000 per home; however, this is an existing City program, so there is no new cost to the City		2 years
E-6	Financing for Energy Efficiency and Renewable Energy Projects		Assumes a 10% increase in the number of residential and commercial energy retrofits due to this program. Economic analysis performed by the Center for Climate Protection (CCP) suggests that this is an aggressive but not unrealistic target. This measure essentially "boosts" the penetration rate of E-5(f) by 10%.			2 years
E-7	LED Retrofits for City Street Lights		Based on information provided by PG&E: 4,266 streetlights would be retrofit by 2020; annual kW saved = 1,613,716; GHG emissions factor = 0.00020858.	Cost assumes $602 per fixture.		3-4 years
E-8	Solar Panel Installations on Municipal Facilities		Assumes the installation of 100kW of solar power on municipal facilities by 2020.	Assumes cost range of $3.50 - $10.00 per watt of installed solar power (depending on materials, rebates and discretional installer costs). An average residential solar installation in California is on the order of 3-4 kW. An installation on a municipal building could potentially be larger than this.	CAPPA Model	3-4 years
E-9	Energy Efficiency Settings for City Desktop Computers		Assumes that all computers are on at night, so 250 machines go into sleep mode that would otherwise be on, and that these machines are active all day (no additional sleep mode time during the day).			1 year
			Transportation and Land Use			
T-1	Live-Work and Work-Live Uses	1. Total New SF Residential Units 2020: 5,160 DU @ Average 2,000 SF; 2. Total New Retail SF 2020: 3,000,000 SF; 3. Total New SF Office 2020: 1,500,000 SF; 4. Percentage of Retail Captured by LW/WL 2020: 4% or 120,000 SF; 5. Percentage of Office Captured by by LW/WL 2020: 6% or 90,000 SF; 6. Total Percentage of Retail and Office Captured by by LW/WL 2020: 210,000 SF; 7. Average Live-Work/Work-Live SF Non-Residential Space: 500 SF; 8. Total Estimated Live-Work and Work-Live Units 2020: 210,000/500 = 420. 9. Total Percentage of New Residential Units 2020: 420/5,160 = 8% 10. Reduction in Total Daily Trip Generation: 420. Daily Commute VMT: 904,730 VMT [Internal- External/Day] x 35% [commute] = 316,555 VMT/Day, or . Daily trip reduction: 420 trips @ 21 VMT per capita = 8,820 VMT reduction or 4.8 CO2e/per day	Live-work is somewhat location efficient, but typically 80 percent of household trip making is for non-work purposes; having a grocery store nearby makes a world of difference, as do other amenities. "The median square footage of newly built homes SF 2,065 square feet in the first three months of this year, compared with the same period last year, according to the U.S. Census Bureau". [Les Christie, CNNmoney.com staff writer Last Updated: August 11, 2009]. We assume commute trips account for about 35% of the total external travel, and about 40% of total external VMT. Assume only new live-work/work-live units, no conversions. Estimates for conversions are anecdotal and cannot be quantified at this time. Development Types Affected: New; Residential; Trip Purposes Affected: Work; Areas Affected: All Tracy		1. Land use changes depend on policy changes. 2. Todd Litman, Victoria Transport Policy Institute research <http://www.vtpi.org/sgcp.pdf> suggests that while many consumers want to live in more compact, mixed communities, there is no way to project how much cities will respond to this demand, and will vary from one jurisdiction to another. 3. Scott Bernstein, Center for Neighborhood Technology: Refer to maps at htaindex.cnt.org, the Affordability Index website. "Based on 2000 Census, within regions, as you move to areas of greater density and accessibility, you can see how VMT drops; if you click on Greenhouse Gas Emissions at the top, it's all pre-calculated (metric tons of CO2 per HH per year from driving) at the Census Block Group level; just click on the map and you'll get a pop-up window with the score for any of the variables. Live-work is somewhat location efficient, but typically 80 percent of household trip making is for non-work purposes."	1 year
T-2	Reduced Parking Requirements		Development Types Affected: All; Residential/Non-Residential; Trip Purposes Affected: All; Areas Affected: Downtown Tracy	60 to 120 hours staff time; $5,000 to $8,000 parking study; $50,000 to $150,000 for a TDM program	Moving Cooler	1 to 3 years
T-3	Support for Bicycling		Development Types Affected: New; Residential/Non-Residential; Trip Purposes Affected: Work; Areas Affected: New development within 3 miles of Tracy	$3,000 to $4,000 per bike, including cost of docking stations, computer software, licensing, bikes, and other capital expenditures. Operating costs range from $1,000 to $2,000 per bike annually, although some business plans purport that 80 to 100% of operating costs can be re-captured through subscriptions and rental and user fees. Cell phone activated systems have lower capital costs ($500 to 1500 per bike).	TDM Encyclopedia	1 to 5 years
T-4	Support for Transit		Development Types Affected: New; Residential/Non-Residential		TCRP Web Document 12	1 year
T-5	Smart Growth, Urban Design and Planning	Index 4D Method	Development Types Affected: All; Residential/Non-Residential; Trip Purposes Affected: All; Areas Affected: All Tracy.			1 to 10 years
T-6	Traffic Smoothing Through Congestion Management		GHG reduction strategies such as transportation system management (e.g. bottleneck removal, ramp metering) may also have the potential fo inducing travel. For such strategies, if the estimated improvement exceeds 10% benefit in travel time reduction, we recommend conducting project specific analysis on induced travel prior to establishing GHG reduction benefits. The conditions may vary considerably over time and the extent of induced travel depends on a variety of factors, and may also vary over time as these factors change. Development Types Affected: New; Residential/Non-Residential			2-10 years
T-7	San Joaquin County Park and Ride Lot Master Plan Implementation		Development Types Affected: All; Residential; Trip Purposes Affected: Work; Areas Affected: Trips out of Tracy		WSDOT	1-10 years

Appendix C: Assumptions for Emissions Reductions

	Measure	Methodology	Assumptions	Cost Assumption Notes	Citations/ Sources	Estimated Years to Activate
T-8	Alternative Transportation Choices for Students		Development Types Affected: New; Residential; Trip Purposes Affected: School; Areas Affected: Tracy Trips to Schools within 1 mile		WSDOT	1 to 10 years
T-9	Comprehensive Signal Coordination Program		Areas Affected: 11th St., Grant Line, Schulte, Lammers, Tracy, MacArthur, and Chrisman corridors		Barth Curves by Matthew Barth, University of California at Riverside	1-10 years
T-10	Ramp Metering on Interstate 205		GHG reduction strategies such as transportation system management (e.g. bottleneck removal, ramp metering) may also have the potential fo inducing travel. For such strategies, if the estimated improvement exceeds 10% benefit in travel time reduction, we recommend conducting project specific analysis on induced travel prior to establishing GHG reduction benefits. The conditions may vary considerably over time and the extent of induced travel depends on a variety of factors, and may also vary over time as these factors change. Development Types Affected: New; Residential/Non-Residential			2-10 years
T-11	Increased Transit to Bay Area Cities and San Joaquin Valley Employment Centers		Development Types Affected: All; Residential/Non-Residential; Trip Purposes Affected: Work; Areas Affected: Trips with one end in Tracy		Moving Cooler	2 years
T-12	Altamont Route Approval and Transit-Oriented Development Around Rail		Development Types Affected: All; Residential/Non-Residential; Trip Purposes Affected: Work; Areas Affected: Trips to/from Santa Clara and Alameda		High Speed Rail Ridership, TCRP-95	2 years
T-13	Reduce Commute Trips		This measure requires large employers to reduce vehicle trips by at least 20 percent, without defining ways to go about achieving that 20 percent. The other sustainability measures listed above did affect large employers, but not to the 20 percent desired by this measure. The planning areas identified as large new employer sites are Gateway, Cordes Ranch, Catellus, Filios, I-205 Expansion, West Side Industria and Chrisman Road. Development Types Affected: New; Residential/Non-Residential.			2-10 years
T-14	Parking Cash-Out Programs for Employees		Development Types Affected: New; Non-Residential; Trip Purposes Affected: Work; Areas Affected: 30% of new developments in Tracy		Moving Cooler	2 years
T-15	Reduced Commuting from Out of the Region		Development Types Affected: All; Residential/Residential; Trip Purposes Affected: School; Areas Affected: All Tracy			2-5 years
T-16	Transit Passes for Residents And Employees of New Developments		Development Types Affected: New; Non-Residential; Trip Purposes Affected: Work; Areas Affected: All Tracy		Santa Monica	1 year
T-17	Increased Use of Low Carbon Fueled Vehicles	To create cost effective program, focus on biodiesel conversions of conventional diesels, including multiple axle and vehicles above 18,000 GVW. Cost projections should consist of increasing percentage of annual new and replacement purchase budget such as 10% increase per year [10%, 20% 30%, 40% to 100% by 2020 or sooner.] Total average GHG emission per fleet vehicle = 4.96 CO2eMT. Total annual municipal fleet emissions: 958 CO2e MT x 50% emission reduction = 479 x 8 years [implementation 2012] = 3,832 total CO2eMT and total reduction.	Development Types Affected: New; Residential/Non-Residential. AB 118 (Chapter 750, Statues of 2007) can offset purchase costs. The total number of vehicles in the City's fleet currently: 68 sedans and 125 light trucks. We assume that all of the existing fleet will convert to suc vehicles by 2020, and that each vehicle will require replacement within 10 years with an emission reduction of 50% of 2006 levels. Emissions reductions benefits derive from the conversion of the City's fleet to cleaner fuels; the other components of the measure support the use of alternative fuel vehicles but do not reduce emissions.	Assumes Tracy will replace entire automotive fleet by 2020. Assumes a 10 percent increase each year in number of vehicles in fleet being replaced. Assumes all sedans in fleet have diesel engines, with an average tank size of 17 gallons. Diesel engine vehicles in the fleet are ready to run on biodiesel, but there are no retailers in the Tracy area; assume that biodiesel B99-B100 blend will be available and that prices will correspond roughly to average West Coast biodiesel fuel prices. Cost estimate does not include potential cost offsets for purchases of hybrids under the Enhanced Fleet Modernization Program of AB 118.	Jeff Long at CARB: "With respect to greenhouse gases there currently is not much of a change in the newer model years. That is, the fuel economy assumptions are assumed to not change. In the next update or outside of the model we will likely be applying Pavley [Fran Pavly is a CA Assemblywoman] adjustments but we have not done so yet...As we go into the future what can change is the mix of cars and trucks. This process is complex in that we use future VMT projections from local transportation planning agencies to get future growth. Using survival rates we determine how many vehicles fall out of the fleet as you roll into the future. we then deduce what the growth in new vehicles needs to be to maintain that VMT. Because cars and trucks have different mileage accrual rates there can be a modest shift towards cars or trucks depending on the default splits of an individual region. With respect to criteria pollutants there is no longer much difference between light cars and trucks, but for greenhouse gases obviously light trucks get lower fuel economy than passenger cars. With into the future is the mix of the LEV [low emissions vehicles] fleet changes (more PZEV and SULEV)."	2-10 years
T-18	Carbon Sequestration on Municipal Property	Total sequestration of carbon in CO2e in metric tons: Number of mature, healthy trees [age, health] x 13 lbs. CO2e = 0.005896 CO2eMT [http://www.metric-conversions.org/weight/pounds-to-metric-tons.htm] or acres of mature, healthy trees [age, health] x 3.5 = CO2e MT	Trees "sequester" carbon, by removing it from the atmosphere and storing it in their wood and in the soil. A single mature tree can absorb carbon dioxide at a rate of about 48 lbs./year; a healthy tree stores [sequesters] about 13 pounds of carbon annually or 2.6 tons per acre each year, all depending on species, condition, and location. Trees tend to have a low albedo. Deciduous trees have an albedo value of about 0.1 to 0.18 while coniferous trees have a value of about 0.09 to 0.15.	Assumes $250-$300/ tree, plus $15-$40 in maintenance/tree/year; 35-40 trees/acre; 33 acres of tree planting.	Studies by the Hadley Centre have investigated the relative (generally warming) effect of albedo change and (cooling) effect of carbon sequestration on planting forests. They found that new forests in tropical and mid-latitude areas tended to cool; new forests in high latitudes (e.g. Siberia) were neutral or perhaps warming	through 2020
T-19	Mixed-Use and Traditional Residential Development	Index 4D Method	Development Types Affected: New; Residential/Non-Residential; Trip Purposes Affected: All; Areas Affected: Bowtie, Ellis.			2-10 years
T-20	Employment-Generating and High-Density Infill Projects	Index 4D Method	Development Types Affected: New; Residential/Non-Residential; Trip Purposes Affected: All; Areas Affected: Cordes Ranch, West Tracy, Tracy Hills, other new development.			1-10 years
T-21	Compressed Natural Gas Buses for the City's Fleet	228,935 Total average annual miles; CNG=8 miles/ gallon=28,616.8 Annual Gallons=155 Tonnes CO2; Diesel=10 miles/ gallon=22,893.5 Annual Gallons=238.4 Tonnes CO2= A difference of 83.4 Annual Tonnes of CO2			City-supplied inventory.	Continuous
	Solid Waste					
SW-1	Diversion of Construction Waste from Landfills		A significant portion of the reductions achieved through implementation of this measure are life-cycle emissions and do not correspond with emissions counted in the inventory. Assumed CAPPA default value for waste generation of 4lbs/sqft of construction. Assumed that the measure applies to total new construction for year 2020, only. A single year snapshot was used to match the methodology for waste related emissions calculated in the inventory. However, ICF is uncertain of the extent that C&D waste related emissions were captured in the inventory.			1-2 years
SW-2	Increased Recycling		The following CAPPA measures were used to estimate GHG reductions associated with this measure: Curb Recycle, Yard Composting, and Kitchen Composting. Assumed the City would set a goal to capture an additional 25% of the recyclable materials that are currently going to landfills by expanding the current program. Assumed the City would set a goal to capture an additional 25% of yard waste that is currently going to landfills by expanding the current program. Assumed the City would set a goal to capture 50% of the food waste that is currently going to landfills by establishing a new program. A majority of the emissions reductions achieved are life cycle emissions related to energy saved in the production of new materials. These reductions do not correspond to emissions counted in the inventory.			1-2 years and ongoing
SW-3	Recycling Service for Multi-Family Housing		Assumed that the same diversion rate that was set as the target for single-family homes (SW-5) would also be achieved by multi-family home but at a ratio consistent with national patterns for recycling in single vs multi family homes as measured by the EPA. Single family homes recycle more waste at a ratio of 1.6/1.0.			1-2 years
SW-4	Municipal Recycling and Reuse		A portion of the reductions achieved through implementation of this measure are life-cycle related. Quantification of this measure should be considered highly uncertain. Used CAPPA measure "Reuse" and assumed 527 City employees and that this measure would result in a diversion or avoidance of 40 lbs/person of waste annually.			1-2 years

Transportation GHG Emissions Assumptions:
Tracy's greenhouse gas inventory is defined as the total amount of VMT generated by Tracy land use. This includes:
a) all of the VMT associated with trips made completely internally within Tracy;
b) half of the VMT generated by jobs and residences located within Tracy but that travels to/from external destinations (this is consistent with the recent SB 375 Regional Targets Advisory Committee (RTAC) decision that the two generators of an inter-jurisdictional trip should each be assigned half of the responsibility for the trip and its VMT);
c) none of the responsibility for travel passing completely through the City with neither an origin point or a destination within the city (also consistent with RTAC decision).

Index 4D Method:
US EPA, October 2001, *Index 4D Method: A Quick-Response Method of Estimating Travel Impacts from Land-Use Changes.*

Carbon Content Values
1. Assuming a carbon content of fuel consistent with the values from EMFAC, about 91 gallons of fuel per metric ton of CO2.
2. Commute trips account for about 35% of the total external travel, and about 40% of total external VMT

Appendix C: Assumptions for Emissions Reductions

Presumed Emission Reduction Factors

The 2020 emissions forecast is based on the assumption that GHG generation in Tracy, San Joaquin County, California, and the nation will change due to various factors through 2020, including increased technological efficiencies and stricter regulatory controls. This model incorporates the following emissions reduction assumptions in the 2020 emissions forecast:

• In 2008, the California Energy Commission adopted new Title 24 Energy Efficiency Standards, which require implementation of energy-efficient technologies that will reduce energy consumption in new residential, commercial, and industrial development. The largest percentage reduction from Title 24 Standards will occur in new residential sector energy consumption. Title 24 is estimated to reduce new residential electricity consumption by 22.7 percent and natural gas consumption by 10 percen

• The California Green Building Initiative (Executive Order S-20-04) calls for further modifications to Title 24 standards that will increase energy efficiency in new government and commercial buildings by 20 percent by 2015.

• California Executive Order S-14-08 requires California electricity providers to expand their renewable energy portfolio to serve 33 percent of their load through renewable energy sources by 2020. Renewable energy sources generally do not generate GHG emissions.

• In April 2009, CARB adopted a Low Carbon Fuel Standard that will reduce GHG emissions from transportation fuels by ten percent by 2020. AB 118, the Alternative and Renewable Fuel and Vehicle Technology Program, will support this regulation by financing development and deployment of low-carbon fuels such as plug-in hybrid, battery electric, fuel-cell, and fuels refined from organic waste.

• AB 1493 directed CARB to adopt regulations that will decrease GHG emissions from new passenger vehicles through technical improvements, beginning with the 2009 model year. These regulations are expected to reduce emissions by 30 percent in new passenger vehicles by 2016, and are estimated to result in an 18 percent GHG emissions reduction across the passenger fleet.

Carbon Sequestration Values

Type	Amount	Unit	Mean Annual Seq. CO2e Metric Tpns/acre/year
Vineyard/Orchard		Acres	.59 to 1.68[2]
Oak woodlands		Acres	3.71[2]
Coniferous forest		Acres	8.89[2]
Grasslands & Shrub[1]		Acres	Unknown
Urban		Acres	Per Tree
Water/Roads		Acres	0

1 - Not Quantified (no factor) and offset by some grazing emissions.
2 - Source: Kroodsma and Field (2006) for the Vineyard factor
Source: Baldacci et al. (unpublished) for the Oak Woodlands factor.

EROEI (Energy Return on Energy Invested) for Various Fuels, Apr 12 2006

	Fuel Potency (1)	Energy Return on Energy Invested
1	**Biodiesel**	3:1
2	**Coal**	1:1 to 10:1
3	**Ethanol**	1.2:1
4	**Natural Gas**	1:1 to 10:1
5	**Hydropower**	10:1
6	**Hydrogen**	0.5:1
7	**Nuclear**	4:1
8	**Oil**	1:1 to 100:1
9	**Oil Sands**	2:1
10	**Solar PV***	1:1 to 10:
11	**Wind***	3:1 to 20:1

*Wind and solar power have the potential to offer respectable EROEI ratios and should be very helpful in our energy transition. They cannot though help us out of the near-term challenges we face of having agricultural and transport systems that require very large amounts of petroleum, the global production of which is soon to peak, and then decrease annually

APPENDIX D

BACKGROUND ECONOMIC ANALYSIS

STRATEGICECONOMICS

MEMORANDUM

Date: February 10, 2010

To: Tanya Sundberg

From: Mason Austin and Sujata Srivastava, Strategic Economics

Project: Tracy Sustainability Action Plan (Strategic Economics Project No. 0916)

Subject: Background Economic Analysis for Tracy Sustainability Action Plan

This memo is a supplement to the overall measures and benchmarks provided as a part of the Sustainability Action Plan. Whereas that plan focuses on goals and policies that Tracy can adopt to grow in a more sustainable manner, this memo provides an assessment of the economic context wherein that growth will take place. Specifically, what follows is an analysis of the industrial and employment base of the City of Tracy, including an evaluation of the growth and competitiveness these industries. These economic factors are assessed in the context of Tracy's role in the regional economy and related back to the potential for increasing the number of "green" jobs in the city.

There are a variety of metrics by which one can measure a sustainable economy. These include diversity of industries and occupations; stability/robustness of employment growth; the share of industries that are engaged in the green economy; fiscal resilience; efficient use of natural resources; a minimal amount of in- or out-commuting; the minimization of auto-based trips; and many others. The analysis below is intended to guide the formulation and implementation of measures that advance the sustainability of Tracy's economy.

Tracy's industries are related deeply to San Joaquin County- the city's transportation, warehousing, and food manufacturing sectors are reliant on the raw goods produced in the agricultural lands of the County and nearly half of the city's workforce lives in the County. However, Tracy's economy is also highly reliant on the Bay Area, where nearly half of the city's residents are employed, and from which much of the demand for Tracy's goods and services originates. The employment growth relative to peer-locations in San Joaquin County will help to highlight opportunities for, as well as limitations on, the expansion of individual industries. This, in turn, will help to guide recommendations for crafting policy that helps to ensure the skills of local residents are matched to those required by local employers, allowing for shorter commutes for residents and a smaller environmental footprint.

The following analysis begins with a brief discussion of the defining "green" businesses. It next focuses on major trends and features of Tracy's economy. This is followed by a comparison of these trends to those in San Joaquin County as a whole, allowing for an identification of industrial sectors in which the city is particularly competitive and key subsectors which are likely to host the bulk of Tracy's future employment growth. Finally, the memo evaluates the city's jobs-housing balance, assessing the compatibly of the skill-base of residents to the requirements of jobs in key industrial subsectors.

A TAXONOMY OF GREEN BUSINESSES/JOBS

The "greening" of employment uses in Tracy is an important component of the Sustainability Action Plan. Any discussion of such a goal, however, must first recognize that the "green economy" encompasses a broad range of definitions for "green jobs" and "green business." For the purposes of this memo, we make use of the following taxonomy of businesses that may be considered to be "green":

Green by Product/Service: Businesses in this category are those whose products or services are explicitly designed to reduce energy consumption, pollution, or carbon release. Firms that are green by product would include such firms alternative fuels producers, photovoltaic panel manufacturers, or organic farms; firms that are green by service would include such businesses as energy-related R&D firms, environmental remediation consultants, or construction firms that specialize in retrofitting buildings for energy-efficiency.

Green by Process: Businesses in this category may not offer services or products that inherently "green," but do help to improve the environment by virtue of their business practices. In manufacturing sectors, this might include making use of recycled materials, sourcing inputs locally, or limiting/reusing waste products. In offices, this might include employing recycling and composting programs or retrofitting a building for higher energy efficiency.

Green by Location: Businesses in this category have a reduced environmental impact by virtue of their location relative to that of their suppliers, costumers, and employees. If a firm is in a location that permits it to source its inputs or deliver its goods within a short distance or via rail or boat, it will be able to limit its energy consumption and carbon footprint; similarly, if a firm is located close to its employees or close to a regional transit node, workers will be able to reduce the distance and number of their automobile-based trips.

While a given firm may be in more than one of these categories, this distinction is important for generating policies that foster green jobs. Policies that augment the number of Green by Product/Service firms would include those aimed at either at attracting larger firms from outside of the city or at fostering the growth of smaller start-ups in the city that are already "green." Policies that increase the number of firms that are Green by Process could instead be directed at mature firms already operating in the city; these are likely to include the provision of incentives (either in the form of direct fees or subsidies or in the form of enhanced public awareness) that encourage firms to change their practices. Finally, the generation of more firms that are Green by Location is best accomplished through land use policies that mandate energy efficient locations for new or existing firms.

These definitions of "green businesses," which include a wide variety of industries, also encompass a full array of "green jobs." In many cases, the occupations that serve a green business are identical to those in a non-green business. In others, green businesses provide jobs (such as energy-efficiency

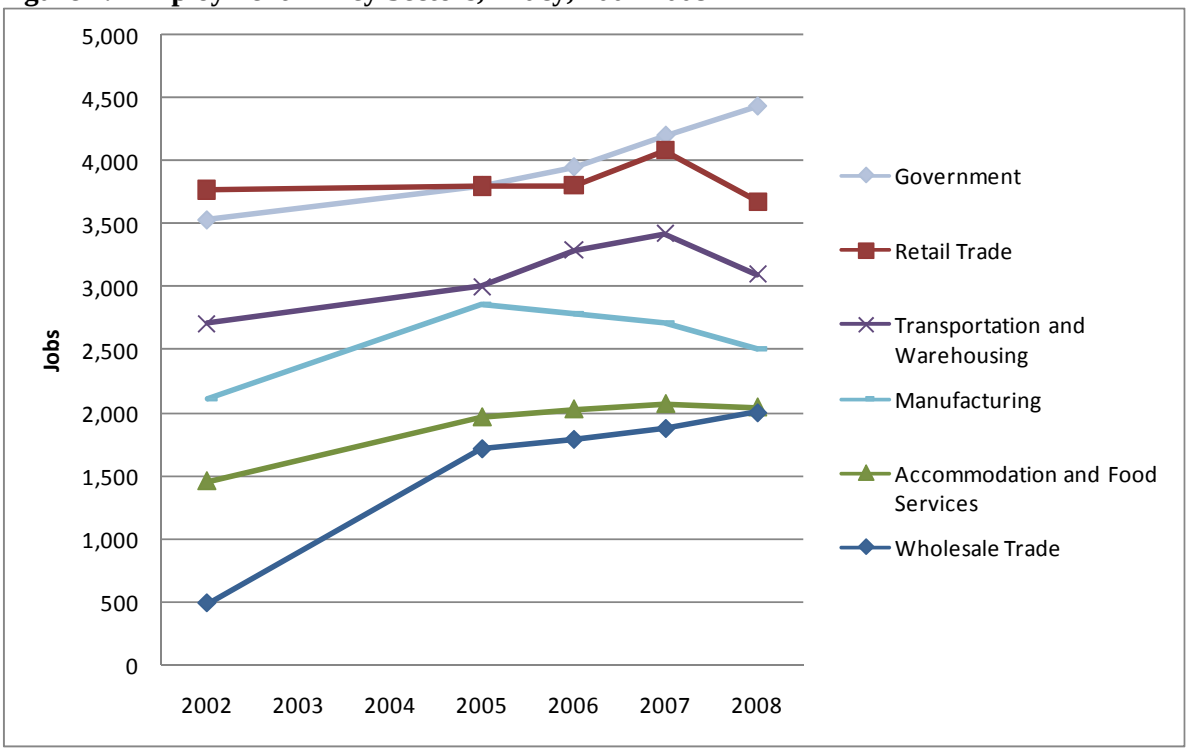
monitors or landscape architects) are distinct to the green economy. Finally, many green jobs are similar to existing occupations, but require some amount of training to adjust to new practices and processes. The provision of training programs that can help employees and employers to make these process changes is one set of policy measures than may be taken without the need of any change in industrial composition. While the process of greening the economy may not result in a dramatic increase in total employment, preparing the workforce to adapt to green practices will enhance the sustainability of the environment and the resilience of the local economy.

PROFILE OF EMPLOYMENT IN THE CITY OF TRACY

Employment Data and Distribution in the City of Tracy

Though the rapid expansion of housing construction in Tracy has been the focus of many policymakers, the last decade has also brought considerable job growth in the city. In fact, Tracy's employment base is growing at a significantly higher rate than the San Joaquin County. Between 2002 and 2008, the number of jobs in Tracy grew by about 24 percent, adding 5,338 jobs for a total of 27,829. The County's employment grew by less than seven percent in that same time period. By 2008, Tracy represented a major employment center in San Joaquin County, with approximately 15 percent of the total jobs in the County.[1]

Figure 1: Employment in Key Sectors, Tracy, 2002-2008



Source: California Economic Development Department 2009, Strategic Economics 2010

As shown in Figure 1, these jobs came from within a variety of industrial sectors. In 2008, the top four sectors in Tracy were Government, Retail Trade, Transportation and Warehousing, and Manufacturing, which account for more than 16 percent, 13 percent, 11 percent, and 9 percent of the

[1] California Economic Development Department

jobs in Tracy, respectively. Other key, growing sectors were Accommodation and Food Services and Wholesale Trade.

Commute Patterns of Workers

Although the labor shed for jobs in Tracy is expansive, a relatively high share of workers commutes from within a short distance. Nearly 45 percent of workers based in Tracy are San Joaquin County residents, including 21 percent that are Tracy residents. Roughly 19 percent of workers travel from elsewhere in the Central Valley, while 25 percent are Bay Area residents making the reverse commute. This suggests that there is a strong match between Tracy jobs and San Joaquin county residents. Strengthening this match can help to reduce the environmental footprint of Tracy industries. This issue of job-resident match is discussed in greater depth later in this document.

Major Employers

Major employers in the City of Tracy sphere of influence are shown in Table 1. In keeping with the industrial base described above, the largest employers are those in Government or Transportation and Warehousing. Manufacturing, especially of food products, is also represented by a large number of firms with at least 150 employees. The Safeway Distribution Center is the City's leading employer, with 2,000 jobs.

Table 1: Twenty Largest Employers in Tracy

Employer Name	# Employees	Type of Agency
Distribution		
Safeway Distribution Center	2000	Distribution Perishable
Orchard Supply Hardware	340	Distribution Hardware
Costco Wholesale Co.	329	Distribution Grocery
Yellow Freight	250	Freight
Food Processing		
Pacific Pre-Cut Produce	400	Food Processing
Leprino Foods	308	Mozzarella Cheese
Musco Olive Products	230	Ripe Olive Processing
Costco Meats	182	Wholesale Meat Process
Government		
Tracy Unified School District	1600	Education
Defense Depot San Joaquin	1375	Government Agency
Deuel Vocational Institute	1300	State Prison Facility
City of Tracy	630	Municipal Services
CA Department of Water Resources	140	State Agency
Health Care		
Sutter Tracy Community Hospital	568	Medical Care
Manufacturing		
Owens-Illinois of NA	400	Glass Container Manufacturer
Barbosa Cabinets	275	Cabinet Builders
Inland Paperboard & Packaging	200	Corrugated Containers
Ameron International WTG-NCD	192	Concrete Pipe
Pacific Medical	150	Rehabilitation Products
Other		
Adesa Golden Gate	360	Wholesale Auto Auction

Source: City of Tracy

Resident Workforce

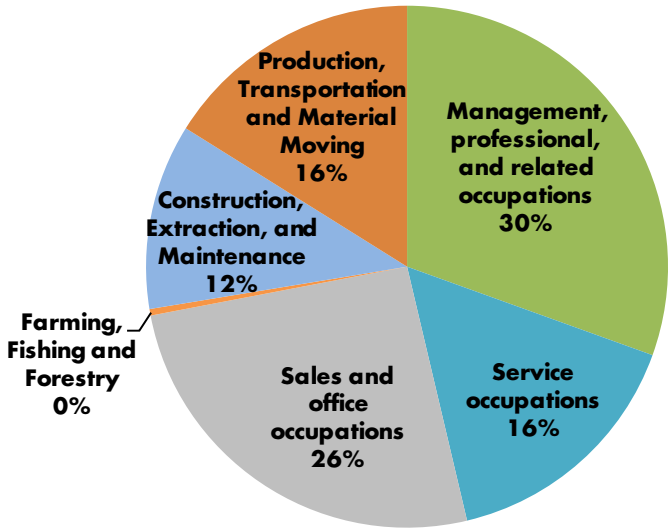
From 2000 to 2008, Tracy's resident workforce grew by 50 percent, a significantly greater rate than that of San Joaquin County (Table 2). Despite this rapid growth, however, the occupations of new workers were similar in distribution to those of existing workers. In 2000, 61 percent of the resident workforce was employed in white collar occupations (management, professional and related occupations and sales and office jobs); by 2008, this had only declined slightly to 57 percent. The share of residents in blue collar occupations (construction, extraction and maintenance and production, transportation, and material moving jobs) was steady at 28 percent (Figure 2).

Table 2: Occupations for Tracy and San Joaquin County Residents, 2000 - 2008

	City of Tracy				San Joaquin County			
	2000		2006-2008		2000		2006-2008	
	#	%	#	%	#	%	#	%
Management, professional, and related occupations	7,825	31%	11,686	31%	59,397	27%	76,668	28%
Service occupations	3,085	12%	6,061	16%	31,921	15%	45,811	17%
Sales and office occupations	7,579	30%	9,835	26%	59,341	27%	70,904	26%
Farming, Fishing and Forestry	209	1%	172	0%	9,044	4%	10,073	4%
Construction, Extraction, and Maintenance	2,782	11%	4,390	12%	22,439	10%	29,741	11%
Production, Transportation, and Material Moving	4,012	16%	6,148	16%	36,858	17%	44,951	16%
Total Workers	*25,492*	*100%*	*38,292*	*100%*	*219,000*	*100%*	*278,148*	*100%*

Source: 2000 Census, 2006-2008 American Communities Survey, Strategic Economics 2009

Figure 2: Occupations of Tracy Residents, 2006-2008



Source: 2006-2008 American Communities Survey, Strategic Economics 2009

Commute Patterns of Residents

Only 35 percent of Tracy's resident workforce is employed in San Joaquin County, including 20 percent that work in Tracy. A far greater share of residents (46 percent) commutes across the Altamont Pass to jobs in the Bay Area, including 27 percent that work in Alameda County. Only 9 percent of residents work elsewhere in the Central Valley.

ASSESSMENT OF ECONOMIC COMPETITIVENESS

Strategic Economics completed a statistical measure known as a "shift-share analysis" in order to assess the future competitiveness of local sectors and industries. The shift-share analysis helps us

break down employment trends to understand different factors that might influence local employment growth. By identifying these factors, we can determine which industries are likely to experience future growth, and understand the dynamics of this growth. The shift-share analysis also allows for the classification of industrial sectors into the following major categories:

Competitive advantage- These sectors and industries have grown in importance in San Joaquin County, adding employment at a faster rate than the economy overall. Further, growth in these industries has been even greater in Tracy than in the rest of the county. Consequently, sectors and industries in this category are those most likely to experience growth, as local advantages are buoyed by regional strength.

Local advantage- These sectors and industries have expanded their presence in Tracy, even as they have declined in importance in San Joaquin County as a whole. It is likely that the Tracy has an advantage over the rest of San Joaquin County for drawing jobs in these industries. However, because these industries have a declining presence in San Joaquin County overall, they are potentially at risk for decline in the Tracy. They should be considered for their unique role in differentiating the city's economy from the County's.

Emerging opportunity- These sectors and industries have increased their presence in San Joaquin County and grown in absolute numbers in Tracy, but at a slower rate than in the rest of the County. While this may be due to some inherent local disadvantage, these industries may also represent an opportunity to capture employment growth that is currently going elsewhere in the county.

Stable- These sectors and industries have experienced local job growth, but have not gained in importance in the City of Tracy or San Joaquin County. These industries are maintaining a healthy presence in the economy but have not gained strength over other industries.

Declining- These sectors and industries have experienced a decline in the number of city jobs between 2002 and 2008.

Sectors

The results of this shift-share analysis on Tracy's industrial sectors are as follows:

Figure 3: Summary of Economic Strengths of the City of Tracy, 2002-2008

		Growth in SJ County > Growth In Overall Employment	
		+	-
Growth in Tracy > SJ County	+	**Competitive Advantage** Wholesale Trade Educational Services Health Care and Social Assistance Accommodation and Food Services Administrative and Support and Waste Management	**Local Advantage** Manufacturing Finance and Insurance Professional and Technical Services Management of Companies and Enterprises Arts, Entertainment, and Recreation Other Services (except Public Administration)
	-	**Emerging Opportunity** Transportation and Warehousing	**Stable** Retail Trade
Job Loss in Tracy		**Declining** Agriculture, Forestry, Fishing and Hunting Construction Real Estate and Rental and Leasing	 Mining Information

Source: California Economic Development Department 2009, Strategic Economics 2010

The Competitive Advantage sectors can be clustered in two groups. The first, which includes Wholesale Trade is driven by inter-regional demand, both from the San Francisco Bay Area and from the rest of the world, accessed through the Bay Area's ports. That these sectors are growing more quickly in Tracy than in the rest of San Joaquin County suggests, not only that the demand for the products that are traded through the firms in this sector is increasing, but also that Tracy's key geographic position, as the gateway to the Bay Area from the Central Valley, is an important factor for these firms. The second group, which includes Educational Services, Health Care and Social Assistance, Accommodation and Food Services, and Administrative and Support and Waste Management, are driven by local and regional demand. That these sectors are growing more quickly in Tracy than in San Joaquin County is a reflection both of Tracy's rapidly-growing residential population and of Tracy's growing role as a regional services node.

Whereas Competitive Advantage sectors are those wherein Tracy has captured a disproportionate amount of San Joaquin County's growth, the Local Advantage sectors are those that have grown in Tracy despite a decline in San Joaquin County as a whole. As with the Competitive Advantage sectors, much of this is related to Tracy's geographic position. Proximity to the Altamont Pass is likely a key factor in Tracy's growing manufacturing sector, as firms can make use of inputs from the Central Valley and quickly transport finished goods to consumers in the Bay Area. Other sectors in this category are more mixed in their reasons for locating in Tracy. For many firms in the Finance and Insurance, Professional and Technical Services, and Management of Companies and Enterprises, location in Tracy may be mechanism maintain proximity to Bay Area firms and clientele while economizing on rent and land prices. However, others are likely locating in Tracy to serve the growing residential population. Finally, the Arts, Entertainment, and Recreation sector is primarily local- and county-serving, a reflection of population growth and Tracy's increasing economic importance to the region.

Transportation and Warehousing is the only industrial sector in the Emerging Opportunity category. However, in 2008, more than twice the share of Tracy's total employment was in this sector, compared to that of San Joaquin County. Consequently, the slow growth is likely a reflection of the dominance of larger, slow-growing establishments (such as the Safeway Distribution Center), rather

than any local disadvantages. Reasons for locating in Tracy for firms in this sector are nearly identical to that of Wholesale Trade.

Only one industrial sector, Retail Trade, can be classified as Stable. Currently, retail in Tracy is primarily local-serving and is growing, though at a slower pace than its overall economy.

For sectors in these four categories, the distinction between local serving and interregional-serving is critical, as each represents a different set of strategies for fostering economic development and generating green jobs. In sectors for which demand is generated locally, the City of Tracy may have a greater ability to influence the existing businesses through programs that incentivize sustainable practices and through marketing programs encouraging local patronage of green businesses. In sectors where practices are more dependent on demand from customers outside of Tracy, the City should instead focus on attracting green firms and influencing the location preferences of these firms, through incentives, zoning, and other land use policies.

With the exception of Information, the sectors in the Declining category are also related to housing construction and population growth, though with an opposite effect of those in the other categories. As housing construction has fallen precipitously from its peak in 2003, the Construction and Real Estate sectors experienced contraction in employment. Employment in Agricultural and Mining sectors has also fallen as land has been converted from the production/extraction of natural resources to residential use- the preservation of the remaining agricultural land and employment may be a key component of a sustainable economic development strategy. Finally, Information, which included only 44 jobs in 2008 has never been a significant component of Tracy's economy; its decline is largely a function of San Joaquin County's overall weakness in this sector.

Key Subsectors

Performing a similar shift-share analysis on subsectors leads to the emergence of the following key industry groups:

Figure 4: Key Subsectors the City of Tracy, 2002-2008, (total employment in parentheses)

		Growth in SJ County > Growth In Overall Employment	
		+	**-**
Growth in Tracy > SJ County	**+**	**Competitive Advantage** Food Services and Drinking Places (1,964) Administrative and Support Services (1,408) Merchant Wholesalers- Nondurable Goods (918) Nonmetallic Mineral Product Manufacturing (841) Merchant Wholesalers- Durable Goods (788)	**Local Advantage** Truck Transportation (799) Professional and Technical Services (529)
	-	**Emerging Opportunity** Warehousing and Storage (2,303) Food Manufacturing (718)	**Stable**

Source: California Economic Development Department 2009, Strategic Economics 2010

These subsectors are likely to be the sources of the greatest amount of employment and employment growth in Tracy. Consequently, it is critical that, when formulating policies and incentives augmenting "green business" in Tracy, the operations and requirements of the firms and industries in these categories are considered.

JOBS-SKILLS-RESIDENTS BALANCE ANALYSIS

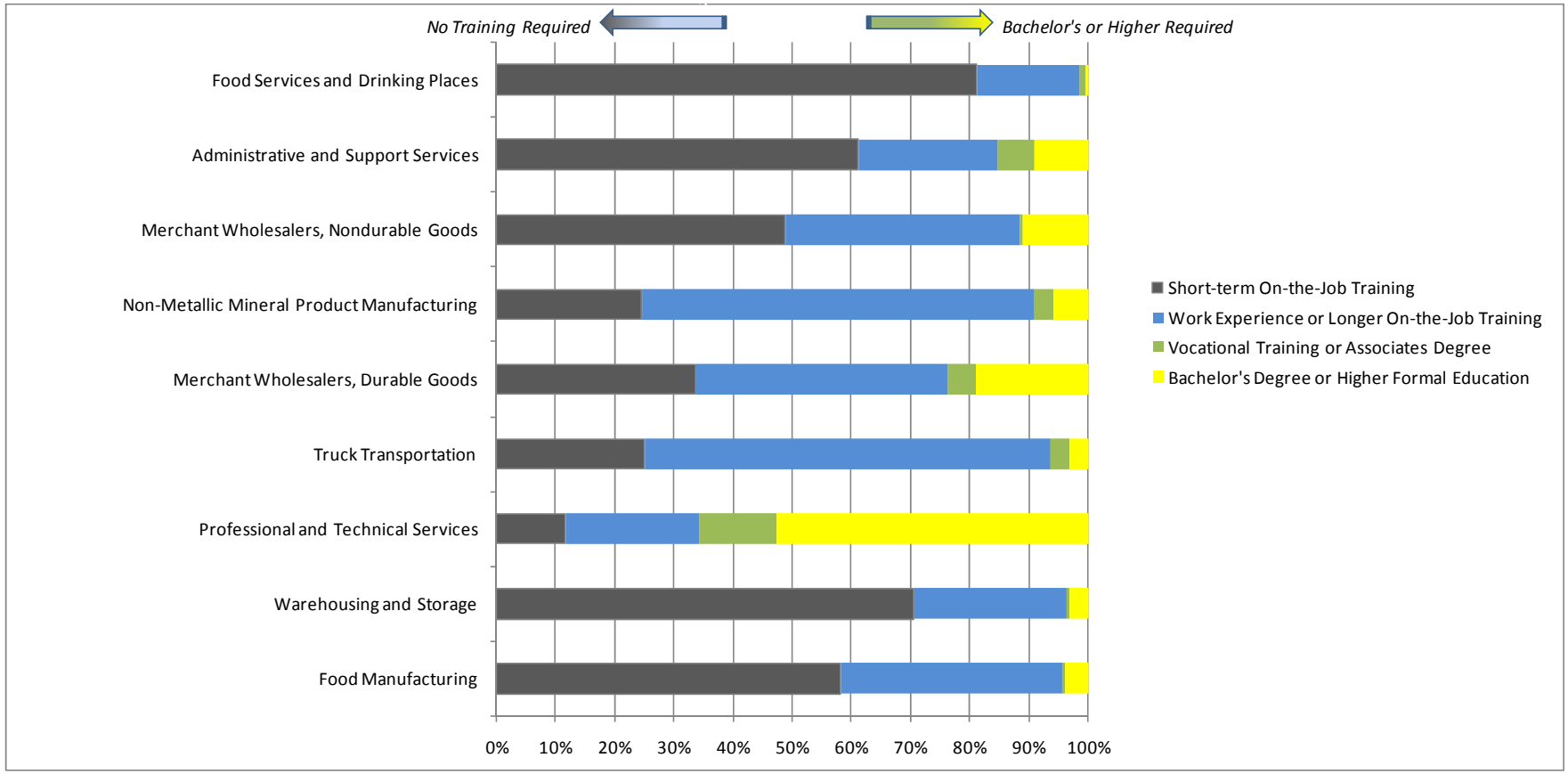
A metric that is often touted as a key element for a sustainable city is jobs-housing balance. The rationale behind this is that if the number of housing units is roughly equivalent to the number of jobs, there will be less in- and out-commuting; to the extent that there is intercity travel, a strong balance will ensure bi-directional traffic flows, reducing rush-hour congestion in a single direction. While the City of Tracy has experienced strong employment growth over the last several years, the city's population has grown at a faster pace than its employment. Consequently the city's jobs-housing balance has declined in recent years such that in 2008, there were roughly 0.73 jobs for every employed resident. However, this ratio significantly understates the imbalance that currently exists for commute flows of residents and works.

As noted above, 20 percent Tracy's resident workforce is employed within the city, significantly less than the 73 percent that would be predicted if spatial match were the only factor determining where residents work. Some combination of job quality, accessibility, and occupation/skills requirements drives a higher proportion of Tracy workers to commute that would be necessary if the jobs located in Tracy were better matched to the skills and needs of residents. To some extent, this phenomenon is natural and to be expected- employment opportunities are highly idiosyncratic and workers rarely limit their job searches to such a narrow geographical area. Nevertheless, one mechanism for reducing in- and out-commuting is to foster a strong match between the skills of Tracy's residents and the training/educational requirements of Tracy's jobs. The following analysis examines the degree to Tracy's residents may be qualified for jobs in the Key Subsectors, identified above. The analysis also includes an assessment of the quality of these jobs, to determine whether they are likely to offer wages at a level sufficient for workers to afford housing in the city.

Job Match Analysis

Figure 5 shows the distribution of training requirements for occupations within each of the Key Subsectors. In general, occupations in these subsectors do not have high training or educational requirements. While more than 50 percent of jobs in the Professional and Technical Services Industries require at least a bachelor's degree, for all other subsectors, at least 76 percent of jobs require no post-secondary education.

Figure 5: Training Requirements of Key Tracy Subsectors, 2006



Source: California Economic Development Department, Strategic Economics 2009

In comparison, Table 3 shows the educational attainment of Tracy residents. Highly trained or educated residents are unlikely to hold jobs for which they are overqualified while residents with low levels of education attainment are unlikely to be offered jobs with high training requirements. Consequently, for there to be a good skills-jobs match, the distribution below should closely resemble the occupational requirements shown above.

Table 3: Educational Attainment of Tracy Residents, Age 25+, 2000 - 2008

	City of Tracy		San Joaquin County	
	2000	2006-2008	2000	2006-2008
Less than High School Diploma	18.5%	13.6%	28.8%	23.6%
High school diploma	25.3%	31.8%	25.2%	28.8%
Some college or Associate Degree	38.1%	35.1%	31.5%	31.3%
Bachelor's Degree or Higher	18.0%	19.6%	10.2%	11.7%
Total	100%	100%	96%	95%

Source: 2000 Census, 2006-2008 American Communities Survey, Strategic Economics 2009

In 2008, 55 percent of Tracy's resident workforce had some post-secondary education, including 20 percent that held bachelor's degrees or higher. This suggests that a potential source of mismatch between Tracy's jobs and residents is that the resident workforce may be "overqualified" for employment in the largest, most-rapidly growing subsectors of the local economy.

As Table 4 shows, although most of the jobs offered in these subsectors offer relatively high wages for their low training requirements, they are somewhat below the levels that are required to occupy much of Tracy's housing stock. Even in a highly suppressed housing market, from September to November 2009, the median sales price for a home in Tracy was $220,000. Using standard assumptions, a household would need to earn $48,400 per year to afford a home at that price. However, Professional and Technical Services is the only subsector wherein the median salary is greater than that figure. With the exception of Food Services and Drinking Places, the plurality of jobs in each of these subsectors offer salaries from $25,000 to $49,999, meaning that a two-income household at these wages could afford the median sales price. However, there is also a large share of jobs in each of these subsectors that offer less than $25,000.

Table 4: Wages of Occupations in Key Subsectors, San Joaquin County, 2009

NAICS code	Subsector	less than $25,000	$25,000 to $49,999	$50,000 to $74,999	$75,000 or more	Median Wage
311	Food Manufacturing	37%	52%	9%	3%	$ 32,007
327	Nonmetallic Mineral Product Manufacturing	16%	66%	13%	5%	$ 39,103
423	Merchant Wholesalers, Durable Goods	9%	53%	29%	10%	$ 46,759
424	Merchant Wholesalers, Nondurable Goods	20%	53%	21%	6%	$ 40,293
484	Truck Transportation	2%	92%	4%	2%	$ 41,535
493	Warehousing and Storage	20%	72%	6%	2%	$ 34,061
541	Professional and Technical Services	5%	39%	26%	30%	$ 60,011
561	Administrative and Support Services	25%	61%	8%	5%	$ 34,169
722	Food Services and Drinking Places	88%	11%	0%	1%	$ 21,050

Source: California Economic Development Department, Strategic Economics 2009

Taken with the commute patterns data, these suggest that a large share of Tracy residents commute to the Bay Area in order to access the higher wage jobs for which they are qualified. Simultaneously, residents of other areas of San Joaquin County commute into Tracy partly because they are unable to afford housing in the city. The first of these phenomena is difficult to address, given that only one of

the subsectors projected to generate significant employment growth in Tracy (Professional and Technical Services) will offer jobs that will satisfy the needs of highly educated workers. However, the expansion of Tracy's affordable housing stock is a key strategy for addressing the second issue which, in turn, would help to support the goals of the Sustainability Action Plan.

CONCLUSIONS

Despite its proximity to high-tech and research centers of the Silicon Valley and Alameda County, Tracy's basic economy is firmly rooted in blue-collar "goods movement industries," including truck transportation, warehousing and storage, wholesale trade, and food manufacturing. Secondary strengths in the city's economy are in industries that serve the city's rapidly growing residential population, including retail stores and restaurants. Recent employment growth and an advantageous geographic position near the Altamont Pass suggest that these industries will continue to be strong in the foreseeable future.

Despite this strong local employment growth, much of Tracy's dramatic residential growth is attributable to households with workers employed in the Bay Area, especially Alameda County. Concomitantly, the city's housing prices are such that many of the predominantly low-wage workers of jobs based in Tracy must commute in from elsewhere in the San Joaquin County and the rest of the Central Valley.

These phenomena point to the following strategies for enhancing the sustainability of Tracy's economy:

1) Augment affordable housing opportunities, aimed at households with workers whose incomes are likely match the profile industries in the key subsectors identified in this memo.
2) Link workers to training programs that will prepare them to adopt green practices in existing or related occupations
3) Incentivize the use of rail transportation by goods movement industries.
4) Incentivize the adoption of other green practices, such as local sourcing and recycling, by all industries
5) For local-serving businesses, brand and market "green" firms to Tracy residents.
6) When opportunities arise, leverage proximity to Bay Area to attract high-skilled jobs, including firms in Professional and Technical Services. Special attention should be paid to attracting green spin-offs from energy research labs in Livermore.