

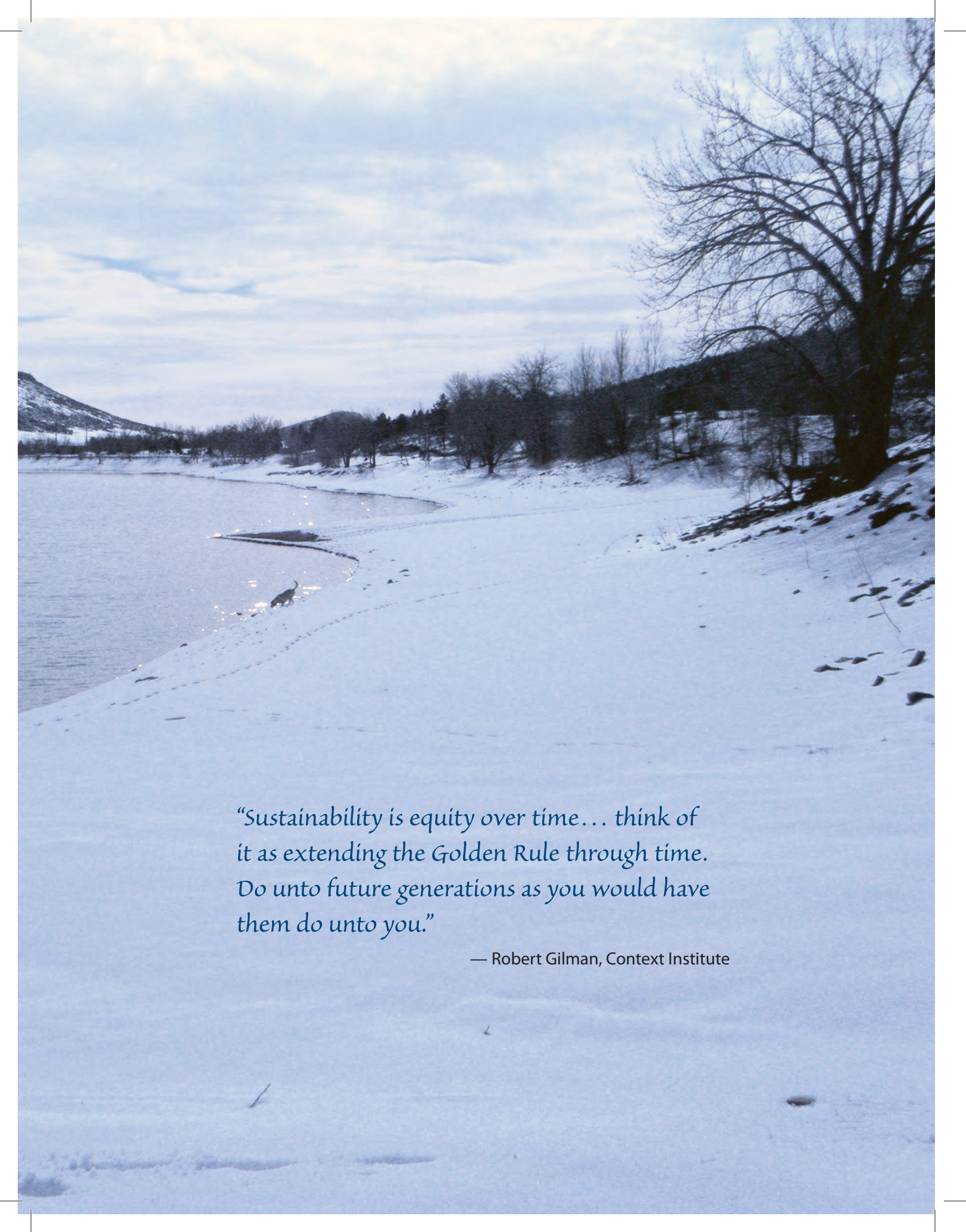
# Municipal Government Sustainability Management Plan

August 2013



City of  
Fort Collins



A serene winter landscape featuring a snow-covered shoreline next to a calm body of water. A dog is walking along the water's edge, leaving tracks in the snow. The background shows a line of trees and a cloudy sky. The overall mood is peaceful and quiet.

*“Sustainability is equity over time... think of it as extending the Golden Rule through time. Do unto future generations as you would have them do unto you.”*

— Robert Gilman, Context Institute

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## Letter from the Sustainability Coordinator

The City of Fort Collins has a long history of promoting sustainable practices through a variety of innovative programs and policies. The 2013 Municipal Government Sustainability Management Plan outlines the goals, objectives, and strategies that will help guide the City organization on a long-term sustainable path. In 2011, the City reorganized and created a new service area called Sustainability Services. Sustainability Services includes three new departments: Environmental Services; Economic Health; and Social Sustainability. The new service area and Sustainability Team are responsible for creating a culture of sustainability within the City administration and throughout the community.

The main intent of our work is succinctly summarized by Paul Hawkin who said, "Leave the world better than you found it, take no more than you need, try not to harm life or the environment, make amends if you do."

The Sustainability Team has provided annual reports to City Council since 2009 and has continued working on the effort by strengthening the goals and implementing initiatives for each of those goals.

Several key indicators from 2005-2012 of success are the measurements of annual metric tons CO<sub>2</sub>e (carbon emission equivalent) calculated per employee, per square foot, and per vehicle:

- employee's emissions dropped from 36 to 26 MT CO<sub>2</sub>e;
- emissions per square foot has dropped from 46 to 36 MT CO<sub>2</sub>e;
- the emissions per fleet vehicle has dropped from 7.7 to 3.5 MT CO<sub>2</sub>e.

The Sustainability Team solicited input on the initiatives from the organization's Strategic Issues Team and other key leaders. All information gathered from the Sustainability Team and Technical Taskforce members, including input from the Strategic Issues Team has been compiled into this report. The work to date has served to strengthen working relationships among departments, encourage collective ownership for problem solving, and will improve long term planning and maximization of resources. As a ClimateWise partner, the City staff consults and mentors the business community.

The Sustainability Core Team is made up of representatives from various City departments including Operation Services, Recreation, Parks, Transportation, Natural Areas, Human Resources, Risk Management, Purchasing, Utilities, and Sustainability Services. New team members will be joining the team in 2013.

The City's Municipal Government Sustainability Management Plan identifies goals, objectives, strategies, and actions to move the City toward increased efficiency and resiliency because:

- Economic health, social inclusion, and environmental quality are mutually interdependent;
- City policy choices have long-term impacts to the community;
- Sustainable practices equal long-term cost effectiveness;
- Organizational and community awareness, responsibility, participation, and education are key elements of sustainability; and
- Local actions have regional, national, and global implications.

Within this document are recommendations made by the Sustainability Team to augment existing goals, strategies, and metrics, because how we acquire energy and how efficiently we use resources will determine if the City operations can achieve transformational change.

*Sustainably yours,  
Dr. Rosemarie Russo, Sustainability Coordinator*

**Introduction**

In 2004, the City developed “The 2004 Action Plan for Sustainability” that defined the path to demonstrate the organization’s commitment to sustainability. A number of successes were achieved, including LEED certification for three buildings, improved recycling, and completion of energy retrofits. In 2005, the City established a multi-departmental Sustainability Team that reviews and tracks City operations that help us achieve the goals.

In 2009, the Action Plan was evaluated and priority goals were set against the 2005 baseline data. 2005 was selected as the baseline year to be consistent with state goals and several local municipalities in order to collaborate on a regional basis. An overarching carbon goal was established as well as an inventory of carbon, electricity, water, natural gas, fuel, and solid waste usage. Each year since 2009, annual short-term and long-term strategies for the reduction and mitigation of the organization’s net carbon emissions have been developed by the Sustainability Team. The 2013 Municipal Government Sustainability Management Plan follows in the footsteps of the initial program successes by incrementally transforming the City’s governmental operations into an environmentally-sustainable government with the long-term goal of becoming carbon neutral. The Plan lays out strategies to reduce our environmental impact, save energy, and support workforce health. The Plan documents long-term goals accompanied by interim benchmarks that measure progress, and provides a list of strategic actions that can be implemented by individuals to help make progress on the organization’s sustainability goals that will address the top goals. Appendix A documents a series of short, medium and long-term strategies. A baseline standard for four additional and/or amended goals will be set. In addition to working towards municipal sustainability goals, the City intends to focus on a community-based 2013 Sustainability Plan that will guide future policy decisions and seek input for promoting various sustainability goals throughout Fort Collins.

*Below is a time line of the City’s sustainability progress over the past decade:*

<p><b>2004-2006</b></p>	<ul style="list-style-type: none"> <li>• Created the 2004 Sustainability Action Plan</li> <li>• Began entry and verification of data</li> <li>• Environmental Services Department starts publishing Annual Municipal Sustainability Report</li> <li>• Formed Sustainability Team</li> <li>• Analyzed carbon and time line reduction strategies</li> </ul>
<p><b>2007-2009</b></p>	<ul style="list-style-type: none"> <li>• Half time Sustainability Coordinator hired</li> <li>• Developed numerical goals for key environmental goals</li> <li>• Formulated ten priority goals</li> <li>• Established a baseline carbon inventory and 20% carbon reduction goals to be consistent with other Colorado municipalities, ClimateWise partners, and the State</li> <li>• Joined ClimateWise Program to demonstrate leadership</li> <li>• Set strategies for each goal</li> <li>• Published Municipal Quarterly Reports</li> <li>• Utilities begins publishing GRI Reports</li> <li>• A 1.3 million dollar ARRA grant was used to fund key sustainability projects. Funding ended in 2012.</li> </ul>
<p><b>2010-2011</b></p>	<ul style="list-style-type: none"> <li>• Formed Technical Taskforce Teams to prioritize and implement projects</li> <li>• Developed Quality Management Plan for municipal carbon inventory</li> <li>• Wastewater Treatment Plant publishes Carbon Inventory Report</li> </ul>
<p><b>2012</b></p>	<ul style="list-style-type: none"> <li>• Updated Municipal Sustainability Action Plan and solicited feedback regarding new and amended goals</li> <li>• Provided Budgeting for Outcomes (BFO) feedback to City Executive Lead Team</li> <li>• Earn ClimateWise Platinum level Award (2010-2012)</li> <li>• Contracted the Carbon City and GEMS Reporting Project</li> <li>• Sustainability Services Area established</li> </ul>

## Policy Statement

The Sustainability Team leads the work within the City organization that supports the municipal over-arching sustainability principle: "To systematically, creatively, and thoughtfully utilize environmental, human, and economic resources to meet our present needs and those of future generations without compromising the ecosystems on which we depend."<sup>1</sup> The policy has been incorporated into the City Plan.

## Vision

The City Organization will create a culture of sustainability through engagement, education, collaboration, and innovation.

## Mission

Leading responsibly through triple bottom line stewardship.

## Team Projects and Roles

*The Team's role is to:*

1. Review the Sustainability Plan during the first quarter every five years in terms of strategic objectives and specific initiatives including additional new goals and amendments.
2. Assist with education, provide outreach, and design and implement employee engagement activities (i.e., Challenges).
3. Identify and implement strategies for each of the sustainability goals annually.
4. Communicate information about goals and innovative projects across the organization.

The Core Team's function is to communicate with respective departments about goals and initiatives.

*2012 Core Team Members Include:*

<i>Environmental Services:</i>	<i>Operations:</i>	<i>Purchasing:</i>	<i>Recreation:</i>
Rosemarie Russo	Stu Reeve	Jim O'Neill	Peggy Bower
Lucinda Smith	Steve Strickland	Opal Dick	Treloar Bower
Bonnie Pierce	Ken Mannon	<i>Utilities:</i>	<i>Parks:</i>
Brian Woodruff	Tracy Ochsner	Lucas Mouttet	Bill Whirty
Susan Gordon	<i>Risk Management:</i>	Michelle Finchum	<i>Transportation:</i>
<i>Natural Areas:</i>	Lance Murray	Kim DeVoe	Emma McArdle
Rachel Steeves	<i>Human Resources:</i>	Carol Webb	
	Lynn Sanchez	Deb Harris	

In addition to the Core Team, Technical Taskforce Teams (TTT) have been developed to provide expertise on strategic planning of each goal. A new Team will be developed for local food projects.

*TTT Members include:*

<i>Carbon:</i>	<i>Fuel Reduction:</i>	<i>Education and Outreach:</i>	<i>Parks/Natural Areas:</i>
Rosemarie Russo	Brian Woodruff	Rosemarie Russo	Rachel Steeves
Bonnie Pierce	Tracy Ochsner	Michelle Finchum	Bill Whirty
Lucinda Smith	Doug Clapp	Deb Harris	<i>Sustainable Purchasing:</i>
<i>Energy:</i>	Becky Moriarty	<i>Water:</i>	Jim O'Neill
Stu Reeve	<i>Solid Waste</i>	Lucas Mouttet	Opal Dick
Kim DeVoe	<i>Reduction:</i>	Bill Whirty	<i>Employee Health</i>
Steve Strickland	Errin Henggeler	Eric Olson	<i>and Safety:</i>
	Caroline Mitchell	<i>Funding:</i>	Lynn Sanchez
	Susie Gordon	Brian Woodruff	Lance Murray
		Lucinda Smith	

*New 2013 Members:*

Mary Miller, Gardens; Lori Birchler, Transportation; Ken Morrison, Water Treatment; Mike Knox, Streets; Sharon Thomas, Social Sustainability; Pete Iengo, Utilities; and Kim Overholt, Environmental Services. The new IT Manager will serve on the Team. Invitations have been extended to Poudre Fire Authority and Police Services.

## Team's Progress

A survey of the Sustainability Team was conducted in 2011 in regards to strategic planning, the role of the Team, and the internal and external web site content. The feedback was that the Team should continue to meet and act as ambassadors to their respective departments with the addition of Technical Taskforce Teams (TTT). TTT meet separately to discuss technical issues in their given field of expertise. The priority set for 2012 was on general training (i.e., the Mindful Movies and corporate training seminars with ClimateWise partners) of all employees and implementing select projects. The main task in 2012 was to evaluate strategies to achieve each of the ten goals. Input has been received on the goals for carbon, energy, transportation, parks, natural areas, and education. The Team identified priority projects for 2013, which have been listed in the 2013 Implementation Grid (see Appendix B). These 2013 and 2014 priority projects will help the City make progress on its Sustainability Goals.

2005-2012  
Progress

## Future Plans

The key areas that will need to be addressed by the Sustainability Team are infrastructure efficiency, identifying and implementing climate mitigation and adaptation strategies; engaging employees and community members in various sustainability actions; revising policies that impede sustainability progress; and establishing sustainability accountability at the individual and department level throughout the organization.

In addition to adoption of the new goals, the following actions will be implemented by staff contingent upon funding and staff resources:

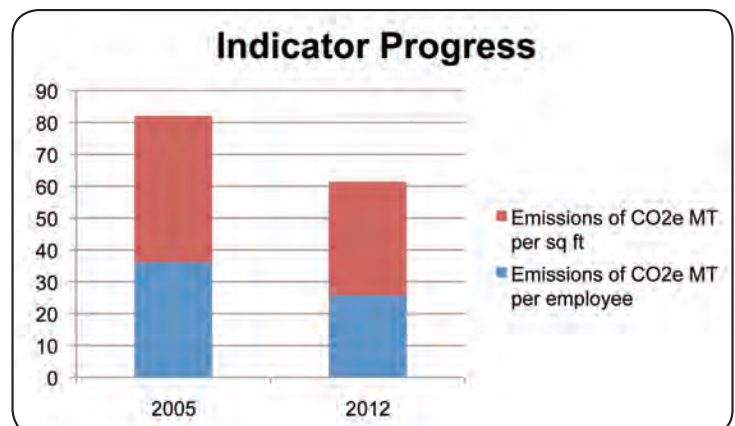
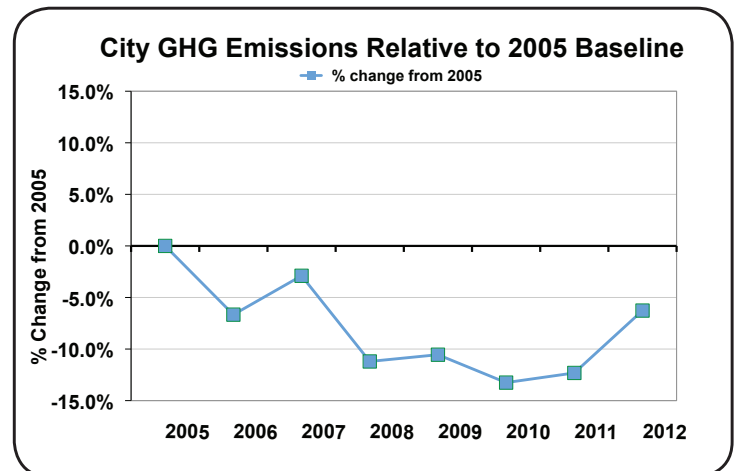
- Outreach, smart metering, and behavioral changes
- Re-commissioning
- Computer power management and server virtualization
- Increased load shedding. Load Management is the process of modulating demand by reducing energy use when costs are highest (i.e., peak and coincident peak times which is generally 3-7 pm). The Waste Water Treatment Plant achieved a \$54,000 annual cost savings using this technique in 2010. As more electric vehicle charging stations are brought on-line, the key to optimizing this technology is to charge vehicles when energy costs are the lowest (i.e., late evenings)
- LEED Existing Building and/or Architecture 2030 adoption

## Key City Indicators and Strategies (2005-2012)

Changes in key City indicators between the 2005 baseline and 2012 indicate positive reductions. These indicators illustrate various ways to show progress based on a per capita or square foot measurement. The following indicators relate to key emission sources:

- Total CO<sub>2</sub>e emissions — 6.3% decrease
- Scope 1<sup>2</sup> (direct carbon emissions) — fleets: 37% decrease and natural gas: 27% increase
- Scope 2 (energy indirect emissions) — 11.4% decrease
- Scope 3 CO<sub>2</sub>e emissions (gases from waste and recyclables to the landfill and air travel) — 5% decrease
- Per sq. ft. CO<sub>2</sub>e emissions — 22% decrease
- Per employee — 29% decrease
- Per vehicle emissions — 55% decrease
- Percent of electricity generated by clean, renewable energy on-site — .04% increase
- Change in tons of waste sent to the landfill — 8% decrease
- Waste diversion — increased from 80% in 2005 to 81% in 2012 (including office and industrial materials).

Data from 2005 to 2012 indicates that total carbon emissions for City operations decreased by 6.3%. The majority of carbon emissions during 2012 were from electricity (52%) and solid waste (27.5%).



## Game-Changing Projects 2010-2012

The City of Fort Collins is committed to operating in a manner that lowers its ecological impacts while strengthening its economic and societal leadership — the Triple Bottom Line (TBL). The following ten projects had the most significant environmental and/or economic returns. These types of projects result in long-term, fiscally sustainable progress and should be replicated and scaled-up throughout the organization. The City should use the top “Game Changing” project rankings from each year, 2010-2012, and duplicate those types of projects across the organization. These include: load shedding and management; outdoor lighting; retrofits (i.e., high pressure sodium and LEDs); indoor lights (i.e., LEDs and T-5s); and various challenges (i.e., energy and transportation). The outreach campaigns and the numerous employee and community challenges required relatively low investments. Some savings are estimates for various reasons such as: projects have not reached a full annual cycle, behavior changes are self-reported, or select buildings added loads that lower the efficiency gains.

### 2010-2012 Projects Annual Benefits Ranking

Project	Social Benefits	Estimated Environmental Benefits per Year	Annual Financial Savings
Asphalt, Concrete, Toilet Recycling	Toilet rebates, recycling, City services cost less	4,239 MT CO <sub>2</sub> e reductions	\$266,356
Metal Recycling	Resource	559 MT CO <sub>2</sub> e reductions conservation	\$142,077
2012 Employee, Citizen, and ClimateWise Challenges	Promotes employee and community engagement	51 MT CO <sub>2</sub> e reductions	\$111,057
Energy Building Challenge	Employee education	1,949 MT CO <sub>2</sub> e reductions and engagement	\$79,820
Wastewater Load Shedding	Lower operating costs	544 MT CO <sub>2</sub> e reductions City services	\$54,000
EPIC Recommissioning	Resource conservation	39 MT CO <sub>2</sub> e reductions	\$44,289
Wastewater Methane Capture	Heat recovery, lower emissions	not calculated	\$28,943
70W High Pressure Sodium Street Lights Replaced with LEDs	Lower operating costs	334 MT CO <sub>2</sub> e reductions	\$26,000
Server Virtualization	Resource conservation, energy savings, lower VOCs level (ozone)	21 MT CO <sub>2</sub> e reductions	\$24,344
250 W MV Street Lighting to 150 W HPS (292)	Safety, better lighting	237 MT CO <sub>2</sub> e reductions	\$24,033

**Total Estimated Savings:  
7,952 MT CO<sub>2</sub>e  
\$800,919**

In addition to TBL analyses, the organization should increase carbon accounting for major projects. Staff should compare projects in terms of carbon reduction costs, and prioritize budget offers accordingly, to reach carbon neutrality. A carbon analysis has been conducted for several projects.

### Carbon Costs

Purchase/Project	Initial Investment	CO <sub>2</sub> e MT Avoided	Carbon Cost/Ton	Funding Sources
High Pressure Sodium Lights	\$11,729	237	\$49	Utility
Server Virtualization	\$185,000	1,600	\$116	EECBG
Load Management	\$35,000	60	\$583	EECBG
Boiler Replacements	\$140,000	208	\$673	EECBG
CNG Buses	\$240,000	70	\$3,429	Federal Grant
Earth Vessel	\$11,000	.23	\$47,826	Federal Grant



Nationally and internationally, many municipal governments are adopting goals based on revised scientific findings related to climate change.<sup>4</sup> There is scientific consensus that a global atmospheric concentration of less than 450 parts per million (ppm) of carbon dioxide equivalent (CO<sub>2</sub>e) is necessary to avoid dangerous anthropogenic interference with the climate and to limit global temperature increase to less than 2°C. Increasingly, climate scientists have determined that the concentration may need to be 350 ppm or less. Data suggest that in order to reach these necessary global concentrations, goals need to be adjusted to decrease emissions by 80 to 95% below 1990 levels by 2050. Governments have begun to adopt these targets as long-term goals. The European Union (EU) has committed to reduce its emissions by 20% below 1990 levels by 2020. The EU has an ultimate goal of reducing its carbon emissions by 80 to 95% below 1990 levels by 2050. Some local (and national) governments are using this goal as an interim step to achieving long term neutrality.

After examining and evaluating emerging best practices and strategies to reduce local carbon emissions, the Sustainability Team has revised the 2009 organizational goals by:

- Expanding the energy goal to include building intensity goals and a set on-site distributive renewable goal.
- Setting separate goals for office, industrial, and public access waste.
- Setting a 2% per year increase in sustainable purchases for office and industrial products starting in 2013.
- Adding a 20% local food goal beginning in 2013 for City staff.

Given the new reduction goals and generated capacity being adopted by other jurisdictions such as Austin and Denmark for their operations, the organization will set an aspirational date to achieve carbon neutrality. Austin has set a carbon neutral goal for municipal operations by 2020. Denmark set a goal to reduce carbon emissions 40% below 1990 levels by 2020, with associated goals of 30% renewable energy-consumption and gross energy savings of 4% (relative to 2005). Denver's municipal operations goal for 2020 is to double renewable energy produced from its own facilities over its 2012 baseline for City staff.

In a recent U.S. mayoral survey about energy and carbon reduction strategies, the top five areas identified included LED energy efficient lighting, low-energy buildings, solar electricity generation, energy efficient pumps and appliances, and hybrid vehicles. The emphasis on low-energy buildings and solar generation supports the revised energy goals.

The new goals have been presented to the Sustainability Team and the Strategic Issues Team. The Energy Technical Taskforce examined the costs associated with the new potential energy goals and their contribution to an overall carbon reduction goal.

### **Building Energy Intensity Goal**

In 2012, emissions from electricity accounted for 53% of the City organization's carbon emissions. Given the high percentage, two new goals were developed. These goals should be implemented in a specific sequence. Although the energy intensity goals mirror the overall energy goal, the significant difference is a financial return. Energy costs are based on numerous factors such as building size, so addressing reduction in GS 50 buildings will result in economic gains especially during peak periods. The City activity schedule at such buildings as EPIC match the time when rates are highest, especially during summer months. The energy intensity goals should make building managers more aware of their costs and encourage City leaders to take an active role in conservation. As buildings meet their energy intensity goals, then the next step will be renewable energy purchases. It is imperative that conservation be addressed first so that solar or geothermal systems are right sized. By replacing 3MW of electricity of coal generated energy to solar, The City has the opportunity to reduce carbon emissions by 4%, surpassing the existing goal of a 20% reduction by 2020. The variability in this scenario is that we are adding square footage each year. The downside of using the renewable energy approach is that it is relatively expensive compared to other strategies. For example, by reducing industrial waste by 100%, the organization could also reach a 24% carbon reduction by 2022. Our current goal is only set at 10% per year so that would need to be revised. Emissions from other waste areas (i.e., office and public access dumping) do not have a significant reduction potential. Plus, in the past few years, the City organization has achieved noteworthy financial gains from industrial recycling at the Hoffman Mill site. In 2012 the site generated \$266,356.

### **Sustainability Purchasing**

The revised purchasing goal does not have an important carbon reduction potential but the eco-advantage is that it will help to reduce packaging which adds to our office waste challenges. Office waste remains at a low rate compared to other sustainable organizations.

### **On-Site Distributive Goal**

Although the cost to purchase 3MW of renewables has been estimated to be approximately \$8 million, by purchasing the solar through a purchase power agreement at a rate of two cents kWh the costs will be lower than current summer rates.<sup>5</sup> The advantage



is locking in a cost to avoid rate increases. Last summer, rates were 4 cents per kWh. The organization pays fixed, energy, facility demand and coincident peak charges for approximately 75 buildings. The 2012 summer rates rose by approximately 4%. Solar provides energy during the most expensive rate period (i.e., coincident peak hours). CSU is achieving a net gain in energy at their solar farm during the summer coincident peak hours. Plus, by installing solar, the organization avoids transmission losses and adding to indirect carbon and air pollutant emissions. The Water Treatment Plant's Pilot Project is yielding cost lower than the traditional electrical cost. Additional agreements would require Council approval since contract terms are greater than five years.

### **Local Food Goal**

In addition to the revised infrastructure goals, the City has set a local food goal to address the social dimension of sustainability. The internal goal and subsequent outreach helps support the community local food goals. By supporting local food production, more farmers will receive fair remuneration and the organization can lower the food miles of our purchases. The average US meal travels 1,500 miles from farm to consumer. Adding a food goal is consistent with the policies established in City Plan, including but not limited to: EH 3.1 "Support programs such as "Be Local" Northern Colorado...; ENV 4.5 The City will encourage and support the establishment of community gardens and other horticulture projects throughout the City to provide food, beautification, education, and other social benefits; and SW 3 "the City will encourage and support local food production to improve the availability and accessibility of healthy foods." The organization can fray additional costs by becoming a member of the LoCo Food Distribution network.

Similar to the purchasing goal, the local food goal will not lead to high carbon reduction rates. However, it will positively impact the community social sustainability goals (i.e., healthy citizens).

In addition to new goals, the Technical Task Force for Education and Outreach strongly recommends enhancing external initiatives to include citizen engagement that helps enhance community initiatives that support the community's sustainability vision.

### **Goal #1 — Carbon**

Reduce greenhouse gas (carbon) emissions from municipal operations at least 2% per year starting in 2010, in order to achieve a reduction of 20% below 2005 levels by December 31, 2020; and ultimately to achieve carbon neutrality for the municipal organization.

### **Goal #2 — Electricity and Natural Gas**

Reduce municipal energy consumption by 20% of the 2005 baseline by 2020, reduce demand peak use by 15% by 2020, and achieve a 20% Kbtu/sq. ft. reduction in all City facilities from 2005 baseline levels. If funding is available, purchase 20% of energy from renewable sources by 2020 with 10% provided by onsite distributive energy.

### **Goal #3 — Fuel**

Reduce traditional fuel use by the City's vehicle fleet by 20% by 2020 and reach a 1.5 average vehicle ridership (AVR) by 2020 for city employees.

### **Goal #4 — Solid Waste Reduction**

Reduce solid waste from: public access facilities by 5% each year; municipal workplace and office by 10% by weight each year; and each industrial byproduct at least 10% each year.

### **Goal #5 — Education and Outreach**

Information about the municipal sustainability program will be available to all levels of the community — students in grades K-20 and university, the general public — as well as internal customers.

### **Goal #6 — Funding**

Foster a culture of sustainability in the organization and advance municipal goals through various funding mechanisms (i.e., Innovation Fund, grants). Identify and implement innovative improvements to the City's physical plant and operational procedures that are not otherwise funded.

### **Goal #7 — Parks/Natural Areas**

Maintain a 30% forest canopy density in suitable areas of City Parks and 70% of native vegetative cover in Natural Areas.

### **Goal #8 — Water**

Reduce municipal operations water irrigation use and increase efficiency per acre. Reduce building water use by 20% by 2020.

### **Goal #9 — Sustainable Purchasing**

Implement sustainable purchasing practices throughout the City organization and establish means to verify departments' compliance with revised purchasing policy. Establish quantifiable goals of 2% increase in office and industrial sustainable purchases annually starting in 2013.

### **Goal #10 — Employee Safety and Health**

Incorporate a city-wide program fostering a culture of health and safety. Increase the number of employees that participate in the Wellness Program from 45% to 75% by 2020. Lower accident frequency and severity.

### **Goal #11 — Local Food**

20% of food purchased by staff for City functions will be grown within 50 miles or prepared by a local business, beginning in 2013.



## Goal #1 Carbon



### Goal

Reduce carbon emissions from municipal operations at least 2% per year starting in 2010, in order to achieve a reduction of 20% below 2005 levels by Dec. 31, 2020, and ultimately achieve carbon neutrality for the municipal organization.

### Relevance

- CO<sub>2</sub>e includes heat-trapping gases such as carbon dioxide and methane. As fossil fuel usage has increased over the last 200 years, the concentration of CO<sub>2</sub> in the atmosphere has increased at a quicker rate than natural systems can absorb them. Trapped CO<sub>2</sub> gradually increase the amount of heat in the atmosphere, causing a slow, gradual rise in temperatures.
- The City can provide regional leadership to reduce carbon equivalent emissions (CO<sub>2</sub>e) in a manner that supports clean tech jobs and reduces the City's annual energy costs. For example, the electric vehicle stations at City Hall helps support Spira, a local company.
- The City is now able to validate what areas of operation generate the most carbon emissions. Not surprisingly, carbon emissions and energy costs are directly related — meaning reduced CO<sub>2</sub>e emissions result in a corresponding decrease in energy costs.
- Because of the uncertainty involved in setting and meeting goals decades out, staff set interim targets of 2% annual reductions in addition to long-term goals.

### Benchmarks

2005 Municipal carbon emissions: 68,667 MT CO<sub>2</sub>e

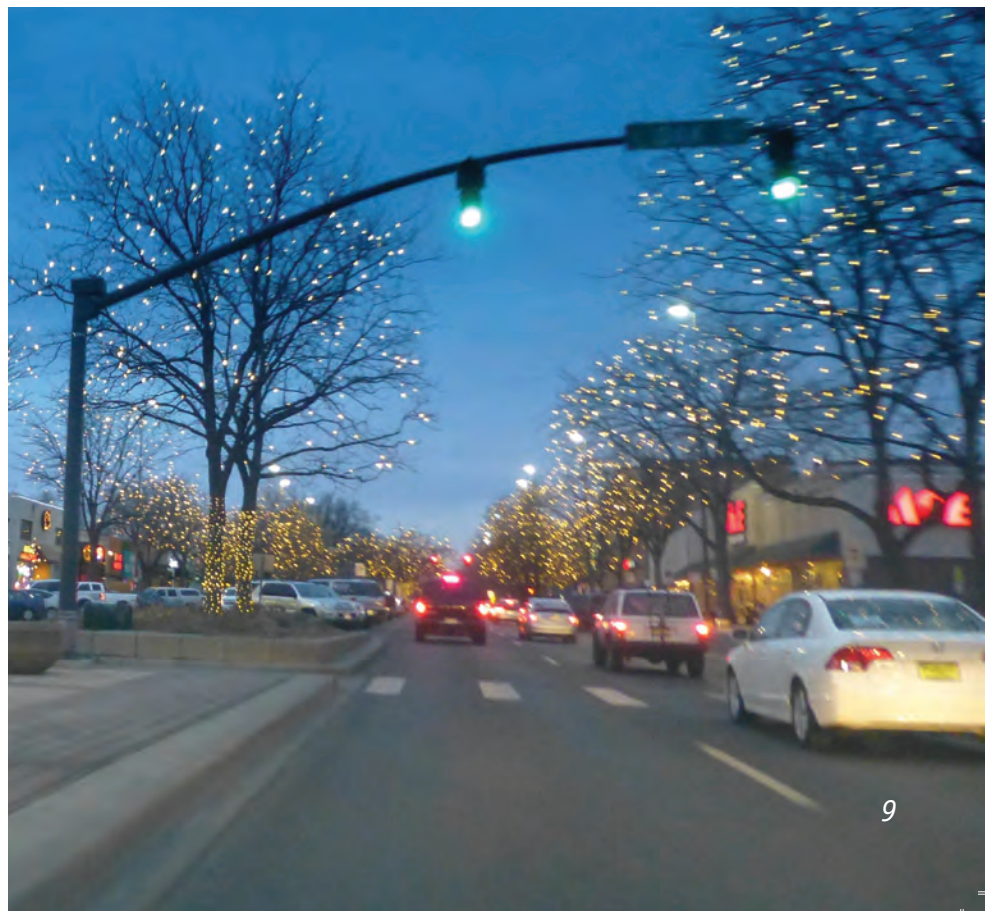
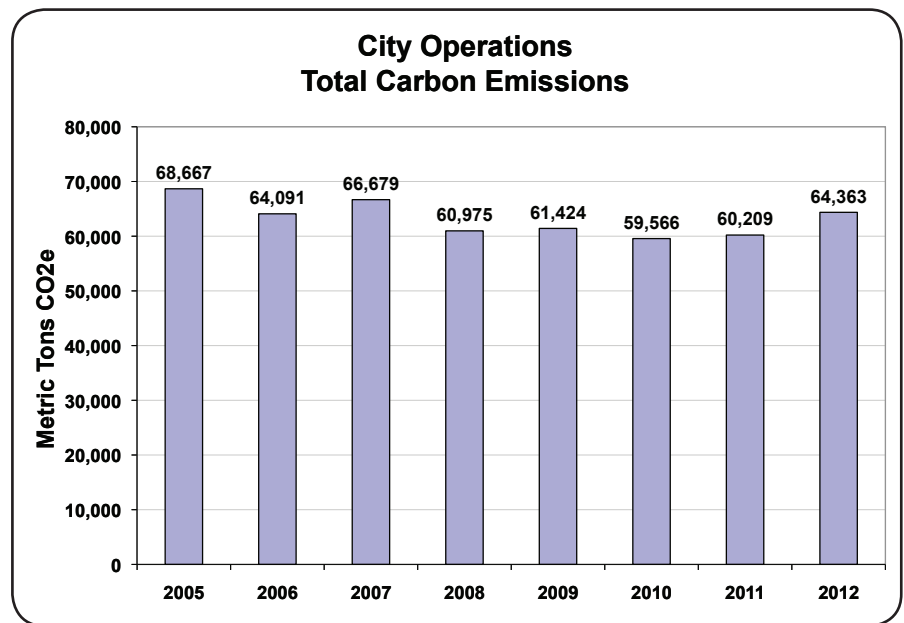
2012 Municipal carbon emissions: 64,363 MT CO<sub>2</sub>e

### Accomplishments

- The City joined “ICLEI — Local Governments for Sustainability,” a nonprofit that assisted the City in benchmarking its greenhouse gas emissions and related costs. Since 1997, the City has participated in ICLEI’s “Cities for Climate Protection Campaign,” beginning to quantify municipal carbon emissions in 2000.
- The City of Fort Collins has moved to calculating all of its carbon emissions inventories using the Greenhouse Gas Emissions Management System (GEMS) database. This change has allowed greater efficiency in conducting the annual carbon inventory and the implementation of

more quality assurance and control measures. The Quality Management Plan (QMP) provides detailed descriptions of methods, emission factors, and data sources. [www.fcgov.com/climate-protection](http://www.fcgov.com/climate-protection)

- Updated the “Green It, Mean It” website and external website portal and utilized them as inspirational and educational resource. The site includes periodic progress reports, management dashboards, successes, tips, and resources.
- Developed municipal carbon performance measures for community dashboard.



### Short-term Plans

- Identify and implement at least three priority projects for each sustainability goal annually.
- Complete Innovation Fund projects and approved budget fund offers to help reach the sustainability goals over a 3-year period.
- Completion of at least three building and grounds audits (water, energy, and solid waste), if Innovation Fund proposals are awarded.

### Long-term and Ongoing Plans

- Environmental Services Department will work to identify and assess three departments per year to

determine baseline levels and strategies to meet the carbon commitment. Energy conservation practices, adoption of new technology, and investments in renewable energy sources will be implemented.

- Staff plans to evaluate the feasibility of developing high-level estimates of the carbon impacts of future Budget Offers that are submitted for the 2015/2016 budget process and Innovation Fund. If feasible, this would enable the carbon impact to be considered as one of the offer evaluation criteria.
- Set aspiration date for the organization to reach carbon neutrality.

## Goal #2 Electricity and Natural Gas



### Goal

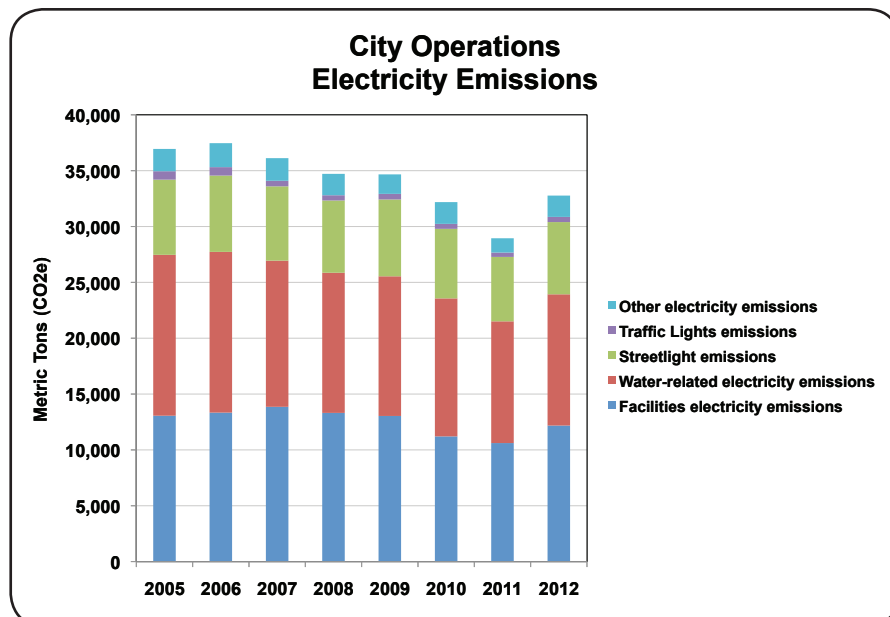
Reduce City energy consumption by 20% of the 2005 baseline by 2020, reduce demand peak use by 15% by 2020, and achieve a 20% KBtu/sq. ft. reduction in all City facilities from 2005 baseline levels. If funding is available, purchase 20% of energy from renewable sources by 2020 with 10% provided by onsite distributive energy.

### Relevance

- Electricity consumption is the primary source of carbon emissions. In 2012, the City government consumed 16,060,550 kWh of electricity at a cost of \$713,342 for its 70 general fund buildings.

The three Water and Wastewater plants and supplementary pumps (15,494,716 kWh), traffic lights (575,314 kWh), street lights (8,526,396 kWh), and miscellaneous sources (2,515,587 kWh), also consume massive amounts of electricity. The costs are approximately \$2,451,297. By reducing energy, the organization can save thousands of dollars.

- Lowering utility costs through conservation and efficiency reduces environmental impact and frees funding for municipal services like police and fire protection. The cheapest way to achieve lower utility costs is through conservation (e.g., turning off lights) and investments in efficiency (e.g., retrofit lighting). The City can also become a leader in energy efficiency by piloting new technologies and educating the community about the process.
- Energy consumption is a mix of electricity and natural gas. Electrical use has decreased but natural gas has increased. Approximately 2% of the increase of natural gas is from the new compressed natural gas buses. Overall emissions from energy have been reduced since natural gas is cleaner than the electricity, which uses a higher percentage of coal as a fuel source.



### Benchmarks

2005: Electricity — 44,582,789 kWh  
Natural Gas Emissions — 107,133 dTH

2012: Electricity — 43,172,562 kWh  
Natural Gas Emissions — 137,041 dTH

Electricity — 36,947 → 32,743 ↓ MT CO<sub>2</sub>e

Natural Gas — 5,695 → 7,284 ↑ MT CO<sub>2</sub>e

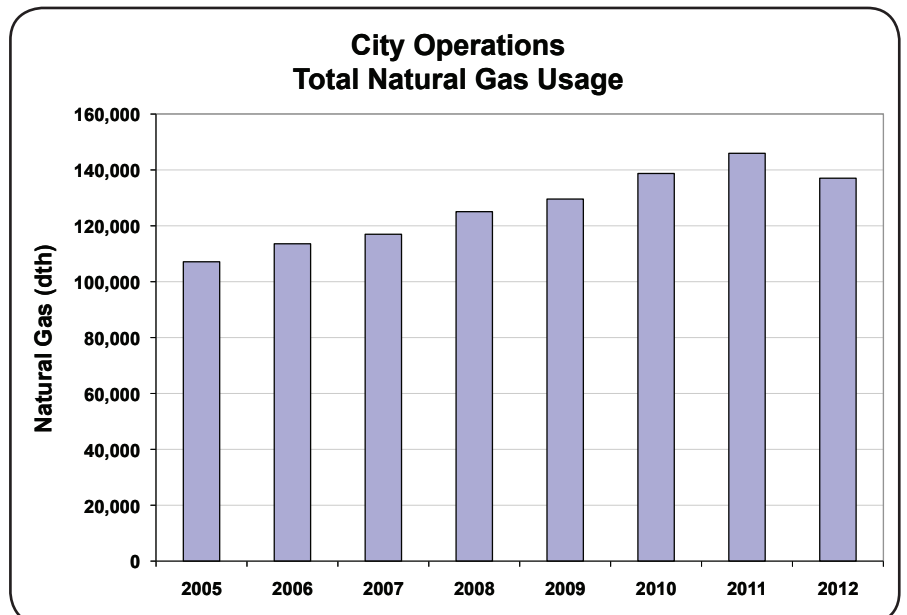
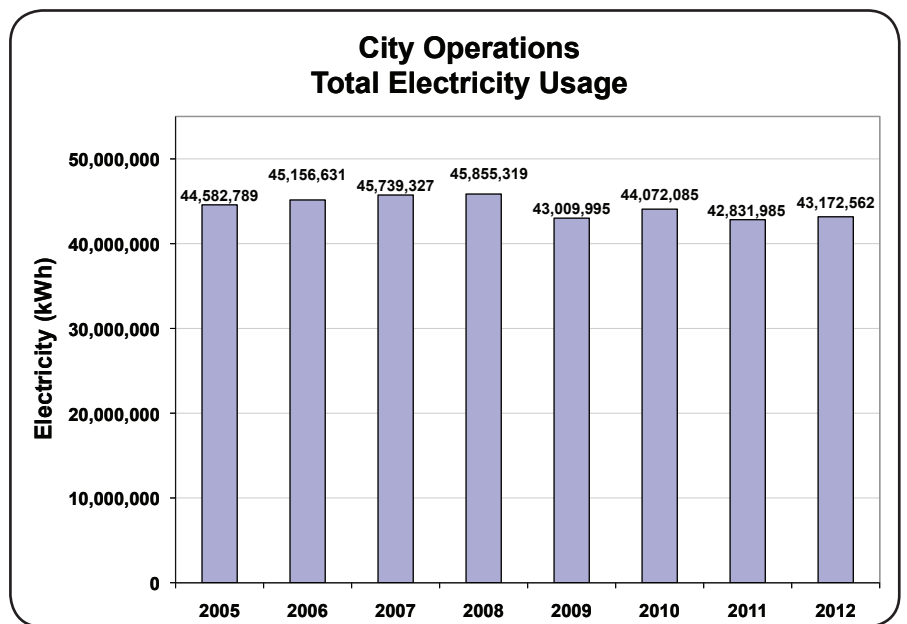


Although the raw consumption of natural gas has increased, natural gas is cleaner than energy produced from electricity so overall emissions have been reduced.

## Accomplishments

- In April 2008, the City hired an Energy Manager to reduce utility costs. Retrofits and lighting upgrades are conducted by staff each year, contingent on funding. In 2011, lighting upgrades saved \$31,456. Retrofits will continue for a number of years, saving the City additional funds.
- Beginning in 2001, the City began converting traffic lights to LED (light emitting diode) bulbs, resulting in an energy reduction of approximately 330,971 kWh. The LED bulbs are up to 90% more energy efficient than incandescent bulbs and last much longer, resulting in substantial annual savings. Today, 99% of traffic and pedestrian signals are equipped with LED bulbs.
- Since 2004, the City has followed the principles of LEED for construction of City facilities. LEED is a voluntary green building certification program that requires energy and water efficiency and sustainable materials and construction practices. One of our early successes was to build the first LEED-certified community center in the nation.
- Since 2006, the City has committed to meeting LEED Gold standards for all newly constructed buildings, reflecting a commitment made now by over 400 other local governments.
- Through a partnership with ENERGY STAR, staff measures and tracks energy performance of many City facilities.
- In 2012, building air barrier leakage and envelope testing was performed at the Utilities Service Center in support of planned comprehensive retrofits.
- Staff track and address overall reductions in municipal energy consumption, specifically through the following sectors: buildings; water production and delivery; wastewater treatment; street lights/traffic lights; and parks.
- Employee education campaigns featured internal challenges that encouraged smart individual actions to promote organization-wide change in energy use.
- There have been numerous mechanical systems improvements implemented by Operation Services and Utilities staff. These involve a multitude of departments that share the common goal of reducing the City's energy use to the greatest extent practicable. Comprehensive retro-commissioning and building envelope repairs were completed on City Hall, 215 N. Mason, and Collindale Golf Course.

- Replaced all City Hall parking lot High Pressure Sodium street lights with more energy efficient LED street lighting technology. In an attempt to test different LED technologies, products that provided the best light pattern for each of the three parking lots were chosen and installed. A triple bottom line analysis was done for each of the luminaires chosen including factors such as extended life of the luminaire and it's components, reduced maintenance activities, reduced energy consumption, capital cost, return on investment period, and color temperature of emitted light to enhance color visibility to the human eye.



## Short-term Plans

- Building retrofits will continue on an on-going basis, saving the City additional money.
- Retrofit outdoor lighting in restrooms and pavilions at the majority of the City's parks. An interior and exterior lighting retrofit at Transfort on Trilby and possibly an exterior lighting retrofit at the new Police Services building is planned for 2013.
- Increase communication and accountability regarding computer power settings.
- Operations Services will monitor savings at General Fund buildings.
- In addition to efficiency improvements, the City's footprint can be reduced by switching to renewable energy sources such as solar electricity. While solar is more expensive than traditional fuel sources today, purchase power agreements will bring those costs down. In addition, solar power provides a hedge against the rise of future energy costs and is a sustainable way to produce electricity. BFO offers will need to be developed.
- It may be possible to use funds from the High Performing Government Offer #42 to perform energy efficiency retrofits.
- Plan and design for a new high performance Utilities building downtown.
- City buildings will be evaluated for potential energy use reduction projects based on each building's energy audit results.
- Senior Center remodel project will incorporate LEED principles.

Beginning in 2013, staff will communicate electrical use reductions associated with:

- Renewable energy produced;
- Street and traffic light replacements;

*Compressed natural gas bus*



- Energy audits performed and recommissioning; and
- The energy intensity goal should encourage more managers to review the monthly energy reports that are posted on the CityNet "Green It, Mean It" site. This will allow staff to assess whether buildings are performing as well as they were designed because even LEED buildings need occupants to embrace energy conservation.

## Long-term and Ongoing Plans

The City receives approximately 1% of its electricity from local solar production (i.e., 215 N. Mason, Aztlan, Museum of Discovery, Water Treatment Plant), and a portion of the Medicine Bow wind output. Additional renewables are purchased through the percentage of renewable obtained by Platte River Power Authority (PRPA).<sup>1</sup>

The cost of purchasing renewable for 10% of our electricity, in addition to the PRPA mix, will be approximately \$200,000 per year at the current rates, but the 20 year cost will only be a \$40,000 premium.<sup>2</sup> A new PRPA Agreement may need to be drafted or the organization could apply as a key account customer to participate in the Fort Collins Solar Power Purchase Program Project. Renewable strategies include:

- Exploration of renewable energy sources like solar and waste sludge power generation;
- Efficient allocation of public dollars while leveraging incentives to develop a cost effective renewable energy program;
- Increase in on-site renewable portfolio as consistent with PRPA agreement, with geothermal, PV, solar thermal and wind.

The new energy goal is that:

All City facilities will achieve a 20% kBtu sq. ft./year reduction based on the 2005 baseline by 2020.

This will be accomplished using the following tools:

- Conservation through education;
- Improved management of operational practices;
- New policies for the purchase of electrical equipment;
- Energy audits for existing buildings;
- Installation of new efficient technologies in buildings, plants, and infrastructure;
- Raise awareness among City staff on the importance of energy efficiency and responsible use of resources;
- Develop and distribute Energy Savers tool kits to all facility representatives; and
- Review future leases of City facilities and develop an efficiency plan for building with long-term leases.
- Increase communication and accountability regarding computer power settings.



## Goal #3 Fuel Reduction



### Goal

Reduce the traditional fuel use of the City's vehicle fleet by 20% by 2020 and reach a 1.5 average vehicle ridership (AVR) by 2020 for City employees.

### Relevance

Fostering alternative transportation options has multiple benefits such as lowering emissions, cutting fuel expenditures, extending vehicle life, reducing reliance on foreign oil, and creating U.S. jobs by alternative fleet manufacturing. Reductions in traditional fuel use reflect multiple strategies such as use of more alternative fuels, increased fuel efficiency of fleet vehicles, and reduction of miles travelled. Biogenic fuels are produced from biological resources such as plants and other organics (vs. "fossil" fuels) and include biodiesel, ethanol and landfill gas. Although overall fuel use has risen the emissions have not because the City is using cleaner burning fuels.

### Benchmarks

2005: Conventional — 741,432 gallons  
Biogenic — 14,194 gallons  
Total Fuel Use — 777,410 gallons

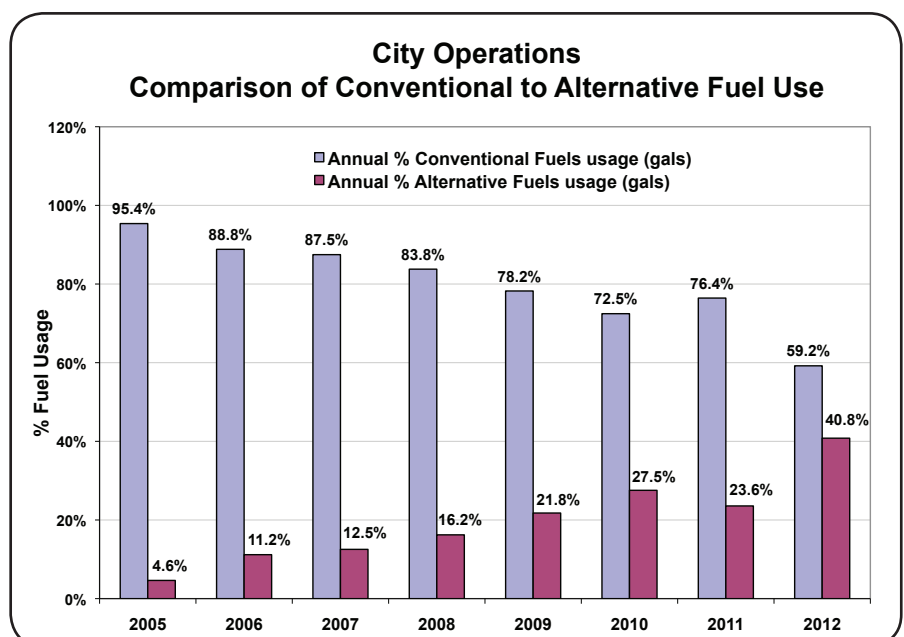
2012: Conventional — 782,765 gallons  
Biogenic — 32,026 gallons  
Total Fuel Use — 819,408 gallons

MT CO<sub>2</sub>e: 5,694 → 4,564

### Accomplishments

- Although fuel use has risen, emissions have fallen due to the use of biogenic fuels.
- Review fuel efficiency and emission standards in vehicle purchasing specifications.
- Purchased Pedicab which has been used to promote alternative transportation and sustainability events.
- Purchased two energy harvesting bikes and developed public educational displays at Aztlan and Senior Center.
- Develop and incorporate the following information: sustainable driving tips, anti-idling, seasonal driving tips, and vehicle use policies and procedures across the organization.
- Designate high efficiency and carpool employee parking spaces at new LEED buildings.
- Transfort promotion and installation of bike racks at all City facilities that requested racks.

- An "Anti-idling" Policy has been adopted and communicated through New Employee Orientation. This targets reduction of fuel costs and lower vehicle emissions.
- Employees have participated in Bike-to-Work Day(s).
- Distribution of bike repair kits and training repair instructions.
- Added additional hybrids, electric vehicles, and flex-fuel light-duty vehicles.
- Implemented the following priorities for the City vehicle purchases: alternative-fueled vehicles; downsize from original request; and add hybrids.
- In 2011, thanks to Federal funding, Transfort purchased six new compressed natural gas (CNG) buses and seven more are planned to be purchased in 2012. In the next two years, Transfort's fleet is expected to be 100% CNG. According to Federal Transit Administration calculations, heavy duty CNG vehicles are expected to reduce CO<sub>2</sub> emissions by over 50% per vehicle. That equates to Transfort decreasing 719 tons of CO<sub>2</sub> emissions per year and 8,640 tons of CO<sub>2</sub> emissions over the life of the fleet. This will contribute to Transfort's fleet reducing emissions by more than 50% since 2005, contributing to the Sustainability Goal to achieve a city-wide 20% CO<sub>2</sub> reduction by 2020.
- "ClimateWise Commuter Choices," a program to increase average vehicle ridership of commuters to ClimateWise businesses including City government, was proposed but not funded in the BFO process. Funding is still being sought from outside sources.
- The City hosted a Bike-to-Work summer event and a Bike-to-Work Wednesday competition.



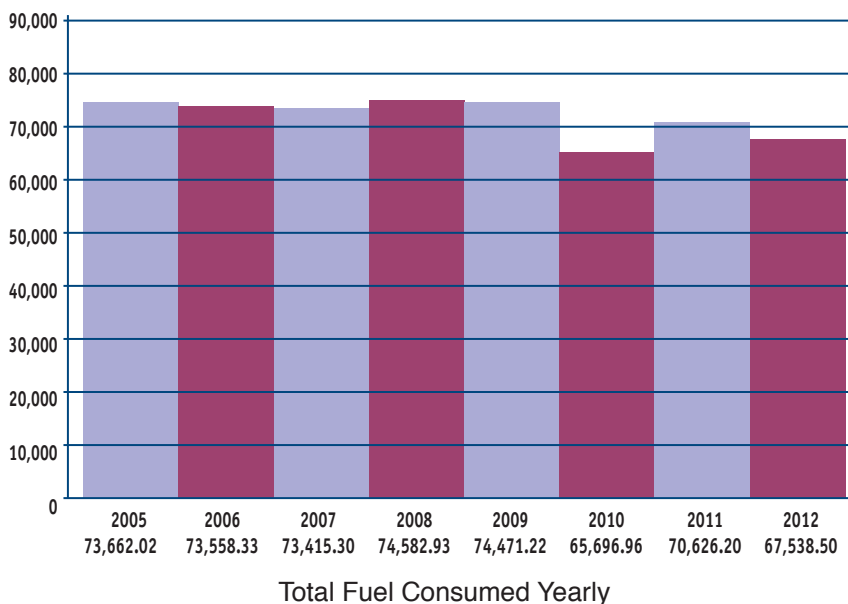
Participants of Bike-to-Work Day collectively saved \$453 and avoided 837 lbs. of CO<sub>2</sub>e emissions. The cumulative results of Bike-to-Work Wednesday were 400 tons of CO<sub>2</sub>e and \$106,666.

- Parks Department (Forestry, Golf, Cemeteries, and Parks) have worked hard to get fuel consumption numbers back to or under the 2005 target. This success can be attributed to employee engagement and working with Fleet services on the conversion of small utility vehicles and golf carts to electric. (see graph below)
- Installed three electric charging stations at City Hall.
- Participated in the Clean Cities Program.
- Implemented the following priorities for the City vehicle purchases: alternative-fueled vehicles; downsize from original request; and add hybrids.
- Optimize efficient planning with routing to meet operational and service requirements while reducing drive time and trip distance, and thus reducing fuel consumption.

### Short-term Plans

- Encourage fewer vehicle trips, continuing to reduce other emissions that impact public health such as carbon monoxide, nitrogen oxides, organic gases, sulphur oxides, and particulate matter.
- Increase average vehicle ridership among City workers through increased biking and mass transit options.

**Golf, Forestry, Cemetery and Parks Overall Fuel Data 2005-2012 Yearly Totals**



- Purchase new software to establish fuel usage by fleet operations that will provide the current scope of fuel consumption.
- This software program will allow Purchasing to maintain and update vehicle data for the City's fleet, including vehicle information (make, model, year, and acquisition date). In addition to the specific vehicle records, all operating, maintenance, warranty, and fuel costs incurred by a vehicle should be recorded.
- An Eco-Driving Initiative is being planned using community-based social marketing to change behavior of City employee drivers. The program goal is to improve fuel economy and reduce carbon emissions. Employee groups that are 50-100% field-based will be prioritized first.
- Optimize route planning efficiencies to meet operational and service requirements while reducing drive time and trip distance, and thus reducing fuel consumption.
- Coordinate with ClimateWise and EcoDrive Program to reduce fuel used in City-owned vehicles. Projects include: hosting a seminar about transportation options, holding a Transportation Challenge, and conducting EcoDrive seminars. Once the educational component is complete, participants will compete to reduce total consumption over a specified period of time (e.g. one month). The department or participants with the highest percent fuel reduction will be awarded the winner.
- Begin reporting baseline data annually to Leadership Team, including:
  - Number of vehicles
  - Fuel use by department and vehicle class
  - Average miles per gallon (mpg) per vehicle
  - Type of fuel used
- Fort Collins partnered with City of Loveland, CSU, and the Electrification Coalition to launch "Drive Electric Northern Colorado" in February 2013.
- Continue exploration of use of landfill gas to fuel City buses and/or other equipment or facilities.
- Begin transitioning from corn ethanol fuels.

### Long-term and Ongoing Plans

- Utilize technology to better track consumption by department.
- Review advances in cellulosic ethanol.
- Install additional telematics such as electronic global positioning system (GPS) devices in fleet vehicles to increase vehicle counting efficiency.



## Goal #4 Solid Waste Reduction



### Goal

Reduce waste from: publicly accessible facilities (5% per year); municipal workplaces and offices (10% per year); and, industrial operations (10% per year) based on data reported for previous year.

### Relevance

Making staff knowledgeable about their habits relating to solid waste and how to reduce waste is a powerful tool for achieving waste reduction and diversion goals, reducing carbon emissions, and extending landfill life.

The City generates three streams of waste: the material that is deposited by the public in waste containers at parks, natural areas, and recreational facilities (including illegally dumped items); industrial byproducts from activities such as street sweeping, stormwater detention pond clean-outs, and repair/maintenance of water and sewer pipes; and discarded "office" types of material from administrative buildings, shops, warehouses, and utility plants. Systems for collection and management vary, as does the potential for capturing materials from each of these waste streams to be re-used, recycled, or composted.

A goal was introduced in 2008 aimed at diverting 80% of the municipal organization's waste stream from landfill disposal by 2020. After a series of meetings to update the Municipal Government Sustainability Management Plan, a cross-departmental group of employees found that the 80% goal was not a workable policy because it fails to grasp the complexity of managing the organization's multiple streams of waste. With three distinct types of waste coming from distinct and separate City sources, a single metric cannot measure when progress is being made for each of these categories. And, importantly, the old 80% goal fails to reflect hard work and accomplishments routinely being made by employees at reducing waste, recycling, and re-using materials.

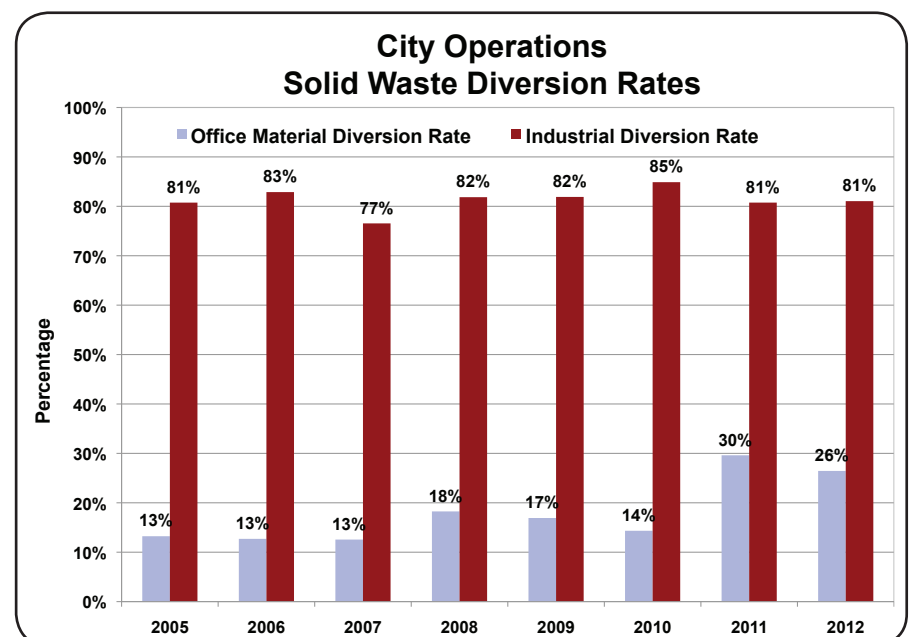
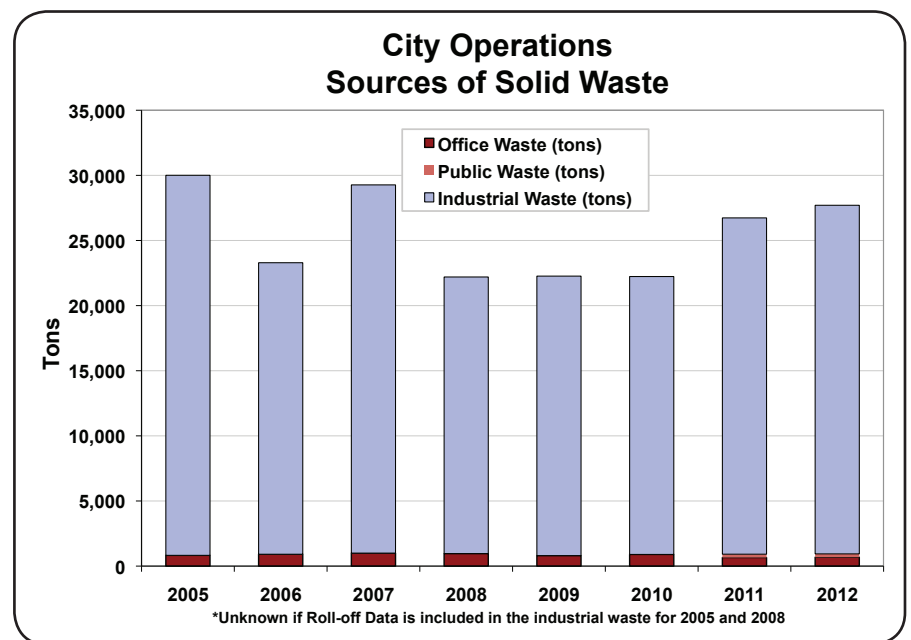
### Benchmarks

2005: Office Waste — 826 tons  
Industrial Waste — 29,180 tons  
Public Wastes — N/A  
Office Recycling — 126 tons  
Industrial Recycling — 122,404 tons

2012: Office Waste — 683 tons  
Industrial Waste — 26,764  
Public Waste — 257 tons  
Office Recycling — 246 tons  
Industrial Recycling — 114,461 tons

### Accomplishments

- A cross-departmental group was convened to develop top priority strategies and actions for City operations to reduce the waste stream.
- Collected outdated or unusable City uniforms, including those from Police Services, Utilities, and Poudre Fire Authority, to be recycled through Red Star.
- Developed solid waste generation and diversion rates by department.
- Educational materials and/or signs were posted on or around the recycling receptacles to serve as a point of reference for employees.



- Developed and implemented Recycle This campaign.
- Sustainability Coordinator performed waste audits at five buildings.
- Posted information to website about Bargain Box recycling interdepartmental program.
- Created green event guidelines for City buildings which can be rented out for public events including EPIC, the Senior Center, and Northside Atzlan Community Center.
- Updated internal Sustainability web page to include most recent recycling information as well as zero waste events guides and green office resources, such as junk mail suppression service (i.e., Catalog Choice).
- Streets Department increased their recycling in areas where crew's trucks are parked.
- Utilities and Larimer County met and discussed how to turn "waste" dirt into a useful product for Larimer County.
- Parks shop looked at their trash and also the need for better "infrastructure" (i.e., more smaller recycling bins).
- Excess cemetery dirt is going to Roselawn for an improvement project.
- Purchasing uses an online auctioning process, PropertyRoom.com and PublicService.com for police evidence. Materials of higher value (i.e., vehicles, ping pong table) are taken to Centennial Auction.
- During 2012, industrial sources of waste for City operations were identified as waste from roll-off containers and waste that was self-hauled to the landfill by City employees. This data was collected retroactively for 2005 through 2011, and is now included in all carbon inventories (Note: it cannot be determined if roll-off containers were accounted for during 2005).
- Implement a two-sided printing policy to be adopted by all divisions with two-sided printing capability. Set duplex as the default print option on shared machines and work stations. Require two-sided printing for all procurement, consultant contracts, and contracts for printing, copying, and related services from outside vendors. MIS conducted a study in 2011 that showed the City spends close to a million dollars (\$878,852) annually for printing and copying operations. The City prints approximately 13,128,420 pages at a cost of .55 per page annually.
- Rewrite the contract so janitorial staff will no longer be responsible for trash. Instead, they will collect recycling at individual workstations to discourage excess trash production.
- Rewrite the contract so janitorial staff will no longer be responsible for trash. Instead, they will collect recycling at individual workstations to discourage excess trash production.
- Parks is conducting an internal survey to target a few commonly generated items for recycling.

### **Long-term and Ongoing Plans**

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### **Short-term Plans**

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- Plan and design projects to reduce the volume of municipal waste self-hauled to Larimer County Landfill.
- Separately track the City's three categories of waste: industrial; general office waste; and public-generated waste.
- Pinpoint opportunities to provide additional convenient recycling containers.
- Increase composting and use of Earth Vessels throughout the organization.
- Enhance the internal recycling web page so it is easy to access and transparent.
- Start work now to create a compost facility for City operations, knowing that permits will take multiple years.
- Increase communication to employees about what can be recycled.
- Publicize Hoffman Mill services to all departments.
- Work with vendors at golf courses and Lincoln Center to reduce waste.
- Continue relocating construction excavation material for use as street base fill.
- Increase office diversion rates of departments by 10% by monitoring and communicating to employees about department diversion rates.
- Create centralized paper purchasing per City Division. Report paper purchases quarterly to Sustainability Program.
- Increased diversion, especially for office waste.
- Reduction in overall waste generation.

## Goal #5 Education and Outreach



### Goal

The municipal organization will provide sustainable educational opportunities to all levels of the community — students in grades K-20 and university, the general public, businesses, and staff through programs, workshops, presentations, training, and Web resources.

### Relevance

Education is critical to the success of any initiative, especially if the proposed initiative requires a change in employee behavior. Efforts in 2012 focused on explaining why initiatives were being implemented by helping employees understand the cost and environmental ramifications of wasting resources. Outreach centered on sharing success stories to spur innovation and adoption of energy efficiency and renewable power throughout the community.

Although the number of training events have increased, participation has remained stable. Channel 14 tracking is not available, making an assessment of its educational effectiveness difficult. The Education Team is using Community Based Social Marketing (CBSM) to recalibrate messaging (see Appendix C for more information on CBSM).

### Benchmarks

2005: Approximately 30 training seminars

2012: Approximately 55 training seminars

### Accomplishments

- Conducted seven engagement challenges in 2012. Cumulative savings were \$111,057 and a 51 MT CO<sub>2</sub>e reduction.
- The City hosted numerous energy efficiency training classes to explain how to reduce energy consumption at home and identify incentives available for improvements to air conditioners, insulation and windows. Nearly 100 City employees participated, of which over 50 employees have made energy efficiency improvements to their homes.
- Utilities offered numerous seminars and tours for their staff as part of the One Planet Program.
- City maintains both an internal and external Sustainability website. The internal site includes, but is not limited to: Sustainable Purchasing Guidelines, recycling guidelines, challenges, current articles, numerous PowerPoint presentations, and scholarship information.
- Through involvement in the Colorado Climate Network and Colorado Energy Strategic Group, staff has partnered with other communities to address natural and environmental resource issues.

- Annually, Fort Collins Utilities participates in national Public Power Week with the American Public Power Association.
- ESD staff hosted 10 training sessions and 22 movies for staff and ClimateWise partners. Some trainings and educational outreach were combined. For example, Give a Watt: Pedal It Forward, an educational event that used energy harvesting bikes to power LCD units to display energy tips at CSU. The event kicked off a month-long Transportation outreach. Attendance was 83 participants. The aim was to get all employees fully engaged in the City's sustainability efforts, both at work and in their homes.
- Utilities education programs focus on watershed protection and water and energy conservation. Utilities specifically matched their programs to school district curriculum and standards.

*Utilities Education Program includes:*

- The WaterSHED program that includes standards-based science and math activities designed to give students real world, scientific experiences in local streams and rivers.
- Dr. WaterWISE provides scientific, hands-on water conservation activities for third, fourth and fifth graders.
- An energy program that consists of hands-on labs customized for grades six, eight, and high school. Students explore power sources as well as practical applications of insulation, lighting, and energy peak demand.
- Eight outdoor classrooms located within walking distance of nearby schools. These classrooms showcase wetlands and provide space for short- and long-term scientific studies.
- The Residential Environmental Program Series and Biz Ed continue to operate, now for more than 25 years. In addition, other City departments also

### Challenge Benefits:

2012	Participants	Yearly CO <sub>2</sub> e** (pounds)	Yearly Savings
<b>Sustainability</b>	35	84	\$16,800
<b>FortZED City Employees</b>	31	48	\$69,384
<b>Pedal It Forward</b>	51	60	\$8,640
<b>Food</b>	29	103.353	\$16,233
<b>Bike-to-Work Day*</b>	197		
<b>Bike-to-Work Wed.</b>	55	400	\$106,666
<b>Healthy Homes</b>	23	0	0
<b>Total</b>	421	102,845	\$111,057
<b>Tons</b>		51.4225	

\*Daily total

\*\*Assumes behavior is continued throughout the year.



- offer educational workshops and lectures to the public on topics related to the environment.
- Hosted Net Zero Cities Symposium. Approximately 325 participants attended the event.
- The Sustainability Coordinator worked with Webber Junior High and CSU on a holiday giving project. Students traded incandescent bulbs from their homes for CFL or LED lights. They decorated the old bulbs as Christmas ornaments, then wrapped them in beautiful little bags with a CFL automatic LED night light, or non-toxic natural air freshener for the "Adopt A Family Project." Over one hundred bags were distributed.

### Short-term Plans

- Provide public outreach through the Residential Environmental Program Series and Biz Ed, targeted presentations, and workshops to audiences such as Poudre School District, CSU, Homeowner Associations (HOAs), and religious organizations to promote lasting behavior change within targeted communities.
- Implement employee challenges as required under ClimateWise for the Platinum level.
- Encouraged staff participation in community initiatives such as FortZED to identify individual benefits relative to the desired default behavior.
- Identify opportunities for collaboration within and outside organization through volunteer projects and additional training.

- Continue to host Corporate Training Series and Mindful Movies to develop a community that values, encourages and supports the pursuit of learning opportunities at all stages of life.
- Recognize the important role that families play in creating an environment in which learning is both valued and encouraged.

### Long-term and Ongoing Plans

- The Customer Outreach Team will continue to meet monthly to coordinate outreach to local businesses.
- As employees are educated about the merits of a sustainable Fort Collins, additional initiatives can be identified for employees to make an impact within their respective divisions. An effective feedback loop will continue to generate incremental improvements over time and involve new staff in the process.
- Involve a demographically balanced group of citizens in decision-making processes that directly impact their community.
- Supervisors are key stakeholders that should be regularly engaged in the City's sustainability efforts. Most department directors have more day to day interaction and involvement with their staff, thus they have the ability to significantly influence the outcome of initiatives, as well as the attitudes towards an initiative. Encourage supervisors to hold a monthly meeting that can be used as a platform to inform and update staff on various sustainability program initiatives. The Sustainability Coordinator could present at department meetings at least once a quarter to keep supervisors engaged with the program. Making regular presentations at staff meetings will also serve to increase recognition for the initiatives being implemented.
- Increasing visibility and engaging key leaders helps justify continued financial support for sustainability programs and staffing.
- Encourage all employees to add a sustainability goal to Talent and Rewards performance management system.

*Community "Give a Watt Pedal It Forward" Transportation Challenge*



*Far right:  
Adopt a Family  
Healthy Home and  
Energy Holiday Project  
at Webber Junior High*



## Goal #6 Funding



### Goal

Foster a culture of sustainability in the organization and advance municipal sustainability goal through various funding mechanisms.(i.e., Innovation Fund, grants). Identify and implement innovative improvements to the City's physical plant and operational procedures that are not otherwise funded.

### Relevance

- Establishing a secure source of funding is imperative to advancing the sustainability program. The Municipal Government Sustainability Management Plan contains 11 goals. While many departments do receive some funding, they would often like to do more but are limited in budget. The Innovation Fund is a mechanism used with increased frequency and success across the City as a way to seed efficiencies, encourage innovation, and leverage savings into more efficiencies.
- Innovation Funds promote collaboration across departments, enhance the City's culture of innovation, actively supports the sharing of best practices, and lowers the environmental footprint of our municipal operations.
- Innovative projects support and enhance the City's application of sustainable thinking and decision-making.
- Employees on the ground and at all levels throughout the organization know their operations best and are well positioned to propose creative solutions. Innovation Funds can empower employees to think creatively and offer ideas.
- Non-departmental funding such as the City's Sustainability Scholarships support employee learning in sustainability and is another tool to increase employee knowledge, empowerment, and motivation.

### Benchmarks

2005: Innovation Fund — N/A

Sustainability Scholarship — N/A (began 2006)

2012: Innovation Fund — \$100,000

\$100,000/year awarded to fund innovative improvements to the City's physical plant and operational procedures.

Scholarship Fund — \$10,000

Waste Innovation Improvement Fund — \$60,000 was available through funds paid in lieu of landfill tipping fees by departments who self-haul waste to the landfill.

### Accomplishments

- In 2012, \$13,289 was awarded to 31 employees for sustainability learning, \$100,000/year was awarded to fund innovative improvements to City's physical plant and operational procedures, and \$60,000 was available for waste innovation improvements.
- The Sustainability Scholarship program was instituted in 2006, when City budgets were declining. Employees may apply for up to \$800. Since 2008, scholarships have been awarded to 78 recipients for sustainability trainings, conferences, certifications, etc. Each recipient shares material with the Sustainability Team or department.
- An Innovation Fund of \$100,000/year was established in 2011. An interdepartmental team was formed to evaluate and select projects. Ideas were solicited from across the organization. Proposals had to demonstrate how they address one or more municipal sustainability goals and that no other source of funding is available. Projects were ultimately selected to meet a range of values, including cost-effectiveness, advancement of renewable energy, and support for process improvements.
- In 2011, three projects were funded:
  - 1) expansion of the solar thermal at EPIC to add 24 collector panels,
  - 2) energy efficiency retrofits at Collindale Clubhouse (lighting, HVAC controls, insulation), and
  - 3) lighting updates for the Senior Center parking lot.The three projects, when fully implemented, are estimated to save over \$13,000/year in utility and maintenance costs and deliver at least a 12% return on investment.
- In 2012, 28 proposals were received and 13 projects funded: Southridge Golf efficiencies (LeaAnn Haisch, Bill Wirty); Traffic Ops and outdoor lighting (Sandy Aragon, Bryan Garrett); consolidate left-over office supplies (Sue Kenney, Rosemarie Russo); City departments bikes and gear (Chris Anderson, Rosemarie Russo); tire pressure monitors (Katy Bigner, Shane Armfield); PV on NIX (Karen Mancini, Ethan Cozzens); inventory City trees (Denae Cameron, Zac Hall); paint 215 stairwells (Angie Rhodes, Bruce Byrne); flat screen TV in 215 lobby (Patty Netherton, Orin Ryssman); NIX outdoor lighting (Angie DeiLaura, Tracy Ochsner, Ethan Cozzens); battery chain saws, including dual battery packs (Zach Hall); and Collindale II electric cart storage (Bill Whirty). The 2012 energy-related projects are estimated to save over \$14,000/year in utility and maintenance costs, deliver an estimated average 17% return on investment, and payback will average just under six years.
- Together, the 2011 and 2012 projects are expected to reduce over 120 MT CO<sub>2</sub>e/year.

- Waste Innovation Fund awarded included bin purchases and dirt screening.

### Short-term Plans

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- The City's Innovation and Sustainability Teams will identify, rank, and fund sustainability projects.
- Publish current sustainability accomplishments.
- Engage top leadership.
- Work with Finance Grant Administrator to identify potential grant opportunities.
- Creating visibility for the sustainability program in the City by documenting existing practices and their cost saving implications is an important first step in gaining internal support. Engaging managers in the sustainability program and identifying strategic partnerships will provide necessary visible support for sustainability.

- Continue the Sustainability Scholarship Fund, Innovation Fund, and Waste Innovation Fund. Increase recognition of award recipients and project benefits. Evaluate the ease of the application process and consider ways to offer more support to employees.
- Implement the new Workplace Safety Initiative Fund.
- Evaluate ways to increase financial incentives for departments to implement sustainability initiatives and receive financial savings.
- Research and develop grant proposals for innovative sustainability initiatives.
- Explore Revolving Loan Fund for Sustainability.

### Long-term and Ongoing Plans

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- Support best management practices, including asset management and environmental management systems.
- Focus on equipment upgrades to save energy in the major building repairs, roofing, and capital improvement projects.
- Explore aggregate purchasing.
- Develop a BFO offer to continue the Innovation Fund so that it:
  - Becomes self-sustaining in a relatively short time period.
  - Motivates facility managers to implement energy efficiency projects.
  - Saves facilities operating dollars, translating to saved tax dollars.
  - Decreases energy resources used by the City.





## Goal #7 Parks/ Natural Areas



### Goal

Maintain a 30% forest canopy density in suitable areas of City Parks and 70% of native vegetative cover in Natural Areas.

### Relevance

Forest canopies aid in carbon dioxide absorption; shade and reduced air conditioning needs; increased property values; stormwater absorption; traffic calming along streets and pedestrian buffers from vehicles; and habitat for wildlife.

Natural Areas support maintaining a natural species cover to promote and restore biodiversity.

### Benchmarks

#### *Forest Canopy/Native Vegetation*

2005: Unavailable

2012: 30% — Forest Canopy in suitable areas of City parks

70% — Native Vegetation in Natural Areas

### Accomplishments

- In 2011, the City adopted a policy to have 30% of the city covered by tree canopy in parks in suitable areas. To measure the current coverage, the City conducted an audit using state-of-the-art software STRATUM (measure of street trees) and UFORE (measure of citywide coverage). Both studies also calculated the environmental and economic benefits of those trees. As of 2012, the City's tree canopy coverage stood at 30%.

### Short-term Plans

- The City will maintain Parks as designated in the Master Plan with an emphasis on periodically replacing landscaping to more drought tolerant species, wildlife and habitat management, resource management education, and water conservation.
- Develop a maintenance cycle and establish new trees in vacant planting locations. Use new tree inventory to determine the location and size of future street tree plantings.
- Park Planning and Maintenance will work together on park designs to maximize "no mow areas," while providing a park that meets the needs of the community.
- Continue with grassland restoration projects such as 50 acres of native seed at Coyote Ridge Natural Areas.

- Continue to manage non-native vegetation through IPM (Integrated Pest Management) techniques.
- Plan and implement riparian restoration projects along the Poudre River Corridor.

### Long-term and Ongoing Plans

- Replace 5% of existing plantings with xeric native species.
- Maintain a 30% forest canopy on City-owned property.
- Plant native flora species and eradicate non-natives at Natural Areas to maintain 70% natural species cover.
- In 2013 the City will move forward on the second half of the McMurry Natural Area restoration project which is looking to create about three more acres riparian forest, and 2.25 acres of willow shrub and wetland areas. It also removes concrete and old cars used as riprap along that section of the Poudre River shoreline.
- By 2017, the City will replace sections of the turf grass at five facilities with xeric plants if funding is available through Innovation or a BFO offer.

*Flowers in  
Old Town Square*



## Goal #8 Water



### Goal

Reduce municipal operations water irrigation use and increase efficiency per acre. Reduce building water use (normalized to account for weather conditions), 20% by 2020.

### Relevance

Generally over 50% of potable water commercially and residentially is used for irrigation, making irrigation efficiency one of the easiest ways to reduce potable water consumption. The City uses water for maintaining parks, street medians, and operating City facilities. Using native, drought-tolerant landscaping represents one way to decrease the demand for landscape irrigation and address climate change adaptation strategies. The City will also address lowering indoor water use.

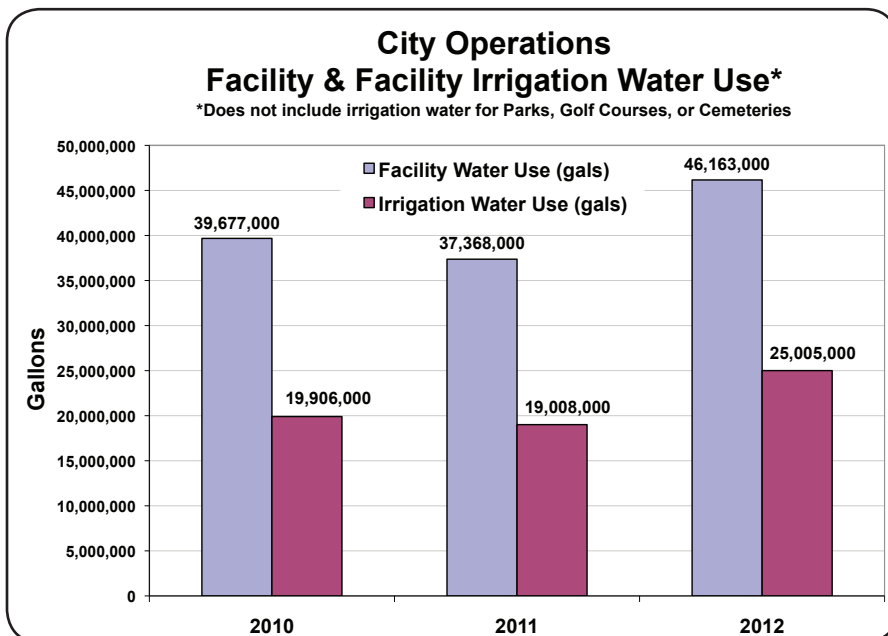
### Benchmarks

2005: Indoor Water — 93,356,584 gallons  
Outdoor Water — Unavailable

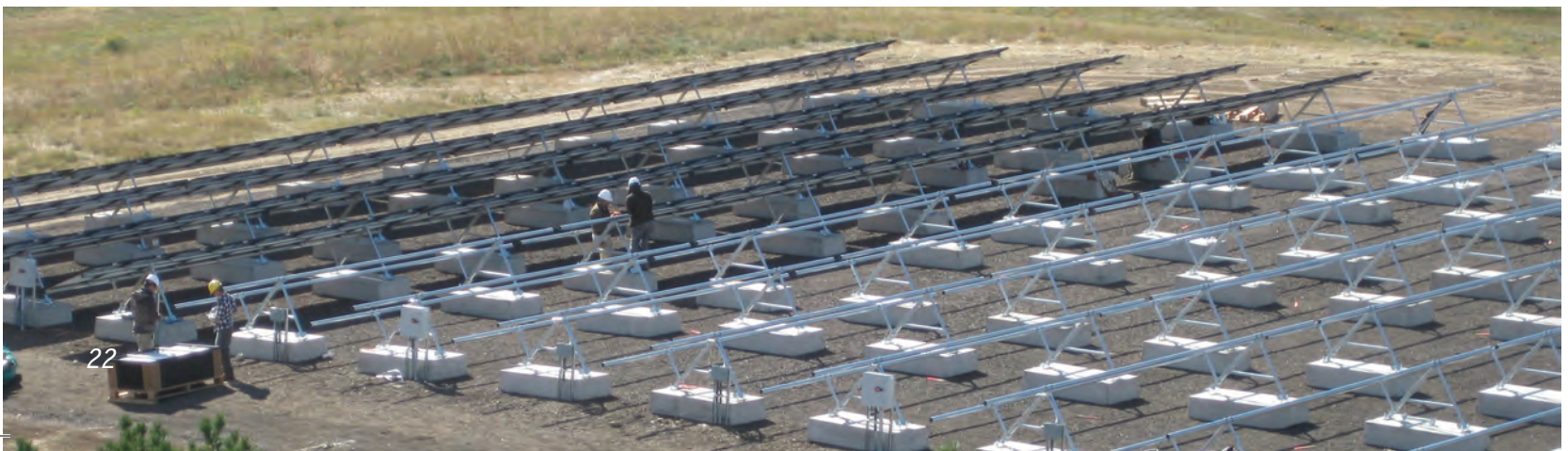
2012: Indoor Water — 46,484,424 gallons  
Outdoor Water — Unavailable

### Accomplishments

- The Parks Department has been proactive in reducing water use through various strategies. Every park has an evaporative transport (ET) controller ranging from 11 stations to over 100 stations controlled with satellites. Parks switched several parks from domestic to raw water, yielding a \$26,908 savings annually since 2010. Raw water is used at 19 parks, which reduces the energy costs of pumping and transport. Raw water accounts for 78% of all park acreage. Through the use of ET controllers, the City has saved \$9,074 since 2009. Additional savings have been made by adjusting schedules based on ET needs. In 2010, a 3.5% savings was achieved at City Park and Rolland Moore Park.
- Conducted Year of Water activities: Watershed Bike Tours and Earth Day displays.
- Utilities linked with community working group to update the Water Supply and Demand Management Policy. They held meetings that were much more in depth than more traditional general outreach.
- In July 2011, Water Engineering and Field Services sponsored its annual Flood Awareness Week to promote public safety.
- Water Resources and Treatment staff participate in the annual Drinking Water Week sponsored by the American Water Works Association. In May 2011, Utilities focused on how Fort Collins water supports public health, provides fire protection, supports for our economic vitality and adds to our overall quality of life.
- Conducted water audits at 215 N Mason, 281 N. College, Senior Center, and Operation Services.



Solar farm at City's Water Treatment Plant





- Basil Hamdan managed a LID (Low Impact Development) stormwater project at 700 Wood Street.
- A Watershed Tour was given to City employees.
- The medians on West Mountain Avenue were renovated with new irrigation heads that include up-to-date technology.

### Short-term Plans

- Modify water schedules to match turf needs at Parks and City buildings.
- Install self-closing nozzles on wash down hoses at Parks shops.
- Invest in more energy efficient pumps and use low-application rotators on slopes at Parks.

### Long-term and Ongoing Plans

- Continue to conduct water audits at City facilities and implement necessary equipment and landscape modifications.
- Parks has set a long-term goal of reducing long-term potable water use by 50% from 2005 levels



*Fountain at Oak Street Plaza*

through improved landscaping, improved irrigation technology, introduction of reclaimed water at other areas within the city, and more efficient indoor water fixtures.

- The Sustainability Coordinator, Intern, and Utilities Water Specialist will continue to provide technical assistance and conduct water audits at City facilities.

### Goal

Implement sustainable purchasing practices throughout the City organization and establish means to verify departments' compliance with revised purchasing policy. Establish quantifiable goals of 2% increase in office and industrial purchases annually starting in 2013.

### Benchmarks

2005: No Data Available

2012: Industry — 6% of purchases met sustainable criteria  
Office — 32% of purchases met sustainable criteria\*

*\*Based on limited data from two vendors.*

## Goal #9 Sustainable Purchasing



### Relevance

Like an effective green building program, the City's purchasing strategy can drive change in the broader marketplace through its purchasing power. The City purchases large quantities of cleaning supplies, paper products and computers. Ensuring that these important products meet sustainable criteria sends signals to the marketplace that sustainable product demand exists. As the City reduces the amount of products purchased and promotes greater recycling participation, costs will be reduced and other organizations can adopt best practices based on the City's experiences.

Sustainable Procurement is needed to avoid pitfalls such as choosing energy-intensive vending machines or hazardous cleaning supplies when better choices are readily available.

### Accomplishments

- In 2012, the Green Purchasing Institute (GRI) completed a review of City's purchasing practices that identified successes and opportunities for improvements. Current City strengths included: new construction services (LEED Gold); green cleaning services; computer purchases (EPEAT Gold); road construction (recycled aggregate); traffic signal lighting products (LED); demolition services and low-fuel vehicle purchasing.
- Adopted the Sustainable Procurement Policy.
- Increased the number of contracts that meet standards. The dry cleaning and janitorial contracts are examples. A baseline is being developed.
- Vendor proposals are encouraged to be submitted electronically.



- Support pilot testing of potential new products.
- Purchasing engaged in cooperative ventures with other jurisdictions through state bids.
- Outreach through staff email, staff meetings, and supervisor training.
- Established tools and increased the tracking of sustainable office and industrial products.
- In conjunction with other departments, Purchasing and the Environmental Services Department increased green office practices by updating the Policy, exploring products which lend themselves to standardization; enhanced the website to include recommendations of top five office products and preferred vendor contact information; updated Green Building Standards; increased use of recycled or remanufactured toner cartridges; reduced print material; and used 30% post-consumer waste recycled content paper.
- Increased consciousness of sustainability practices by including sustainability in manuals and hosting trainings such as Purchasing 101 and triple bottom line seminars.
- Developed a Bargain Box Program for departments to exchange and re-use office products.
- Developed Sustainable Certification Guide, Top 5 Office Product Alternative Guide, and on-line purchasing instructions.
- The Purchasing Team held a two day charrette and developed the following vision: “The City of Fort Collins is the recognized leader in the sustainable purchasing arena. Sustainable purchasing takes into account the triple bottom line of environment, social and economic aspects. Sustainable purchasing also recognizes the product life cycle of acquisition, utilization and disposal. Safety is a recognized element in environmental and social segments of the criteria.”
- Purchasing has established the following sustainable vehicle replacement criteria: light duty vehicles—over 90,000 miles (i.e. Cars/Pickups/Vans); mowers—4,000 hours; utility trucks—5,000 hours; small dump trucks—120,000 miles (gas);

*Preferred vendor  
Office Depot.*



150,000 miles or 500 hours (diesel); tandem dump trucks—150,000 miles; backhoes/loaders—8,000 hours; trailers—10 years + condition; sweepers—8,000 hours; other equipment—case by case basis. An economic and physical analysis is performed on all vehicles as well.

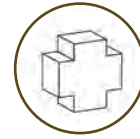
### Short-term Plans

- Assist other departments with strategies recommended in the GPI Report audit such as scanner purchases.
- Require purchase of best available fuel efficient vehicles/net emissions reduction. Prioritize product areas for review and update specification and standardization across the City.
- Update Building Standards to reflect the most current international sustainability requirements.
- Create a tracking and reporting tool.
- Create an effective City-wide communication tool.
- Develop a sustainable procurement website.
- Educate and train City staff on sustainable purchasing.
- Hire new Senior Buyer concentrating on sustainable purchasing.
- Establish evaluation criteria for selecting a product or vendor that will incorporate sustainability factors, including the bidding company's own sustainability qualifications.
- Require every department to use the preferred vendor for office supplies: Office Depot and the recommended vendor : Grainger for Industrial products so that tracking data is more accurate.
- Based on Purchasing Team input, select product categories and specifications to increase the EPP rate for all office and industrial products by 2013.

### Long-term and Ongoing Plans

- The sustainable guidelines will become the filter for purchasing decisions that drive a more sustainable marketplace and reflect the City's Sustainability goals. Purchases will be evaluated using the triple-bottom-line weighing the environmental, social and economic factors in making a purchasing decision.
- Encourage the purchase and use of materials, products and services that are fiscally responsible, reduce resource consumption and waste, promote local business opportunities, and promote human health and well-being.
- Update existing procurement policies and specifications to facilitate use of sustainably preferable products.

## Goal #10 Employee Safety and Health



### Goal

Incorporate a City-wide program fostering a culture of health and safety. Increase the number of employees that participate in the Well Day Program from 45% to 75% by 2020. Lower accident frequency and severity.

### Relevance

The City's Wellness Program goal is to provide all City employees and their families with exceptional services to motivate them toward healthy lifestyle choices and, ultimately, healthier and more productive lives. The Safety Team consistently looks for ways to improve operations and minimize the risks our employees and citizens are exposed to in their daily activities.

### Benchmarks

#### Safety and Wellness

2005: Unavailable

2011: Safety — Developing data for recordable accident frequency, total injury costs, days worked, modified and days lost

Wellness — 433 earned Third Well Day  
15% increase in Well Day participants from 2011 to 2012

Recordable Accident Frequency (RAF)  
rate is a measure of injury frequency = 8.3

Days Away, Restricted, or Transferred (DART)  
rate is a measure of injury severity = 4.7

The Safety Department continues to track injury frequency and severity. The Team offers training to reduce the number of injuries and infuse a culture of safety throughout the organization. The City was above the general industry and public entities for both RAF 3.5, 5.7 and DART 1.8, 2.5 benchmarks. These measures rank accidents per 200,000 hours worked.

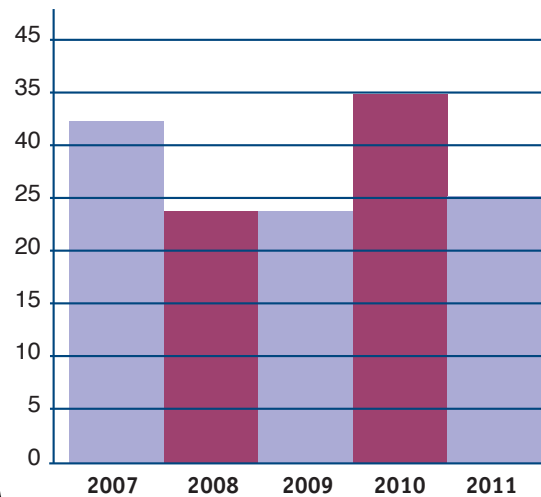
### Accomplishments

Well Day Program includes:

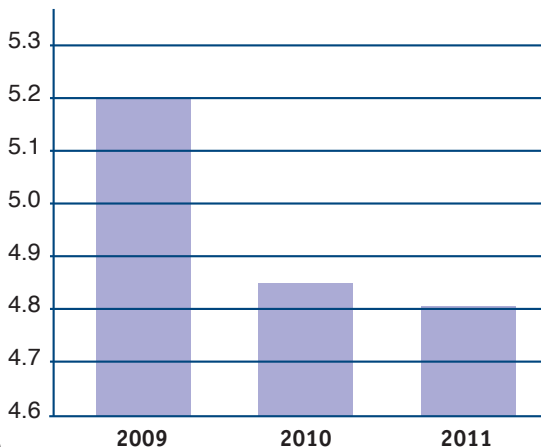
- Access to three fitness centers for employee use.
- A variety of classes on topics related to nutrition, stress reduction and management, tobacco cessation and exercise.

- An opportunity to earn up to three vacation days annually for qualified employees who complete, within a trimester, a wellness plan with multiple components related to physical activity, learning, behavior change and awareness.
- In 2010, Utilities hired a full-time health, safety and security manager (HSS) who reports directly to the executive director. The HSS manager is involved in the security at City facilities, implementation of new programs, facilitation of a Utilities safety committee, and working with the Wellness Program and the City's Risk Management Division to reinforce a focus on safety and education.
- In July 2011, Water Engineering and Field Services sponsored its annual Flood Awareness Week to promote public safety.

#### Number of Recordable Injuries



#### Days Away From Work, Restricted Duty, and Job Transfers (DART)





- Designed and constructed a “Nibble Garden” along the Spring Creek Bike Trail. The garden allows residents to stop and nibble on berries while riding on the trail. The garden is adjacent to Shire CSA, so it also helps to promote one of several CSAs in town.
- As part of the Make a Difference Day, 17 volunteers picked up organic compost (i.e. lama droppings). A lama’s digestive system processes seeds, so unlike horse manure the compost doesn’t produce weeds. Organic compost was delivered and spread at Affordable Housing Units including 300 First Street, Village on Plum, Village on Stanford, 811 Myrtle Street, and the gardens at the Senior Center. Volunteers assisted a local CSA “On the Vine” with fall harvesting, weeding, and removing of irrigation drip lines that needed to be replaced because of ash in the ditches. Promoting CSA’s ensures that land remains in agricultural production, residents have access to healthy food, less transportation miles are associated with our food, and community members gain a connection to each other and our land.

*Nibble Garden Earth Day installation on Spring Creek Bike Trail*

## Short-term Plans

- Increase the percentage of employees participating in the annual Mayo Clinic Health Assessment by 5% annually.
- Decrease the annual percentage of employees, each year, who are identified in the health assessment as having five or more health risk factors by 5% annually.
- Coordinate Wellness, Sustainability, and Utilities for the 21st Century program activities.

## Long-term and Ongoing Plans

- Develop internal policies that support and advocate support of local farmers and backyard gardens.
- Promote innovative wellness alternatives, such as herbs at select community gardens.
- Protect occupant health, comfort and well-being by maintaining acceptable indoor air quality.
- Create opportunities for all citizens to have access to healthy foods.
- Continue to host the Well Day Program for all eligible employees.
- Track recordable accident frequency, total injury costs incurred, days worked, modified duty, and days lost.





## Goal #11 Local Food



### Goal

20% of food purchased by staff for City functions will be grown within 50 miles, or prepared by a local business, beginning in 2013.

### Relevance

Most of the food we eat comes from sources hundreds or thousands of miles away. In most communities, less than 3% of food consumption is locally-grown and locally-produced. Sustainable, local, and organic food production and distribution strategies have enjoyed broadened community support in recent years. Locally, this is evident through attendance records at City-led educational opportunities. Also, the numbers of farms and acreage of land in organic production or being converted to organic methods is growing in the region. Nationally, the U.S. organic industry is one of the fastest-growing industries in the nation. Studies have shown that small farms reinvest more money into local food economies by purchasing feed, seed, and other materials from local businesses.<sup>6</sup> Since 1999 the global land area farmed organically has expanded more than threefold. Focused development of our local food network is a potential economic catalyst with many social and environmental benefits.

Communities across the country are engaging in food localization programs. Front Range communities in Colorado have begun a Local Food Shift Campaign. Denver and Boulder have committed to a 25% local food goal, although the definition of “local” boundaries vary. The essence of this nascent movement is shifting from a globalized, industrialized food system in which we all are dependent on distant and unreliable suppliers for our basic food needs, to a resilient and self-reliant locally-based food supply system where communities are able to provision their own essential food needs by relying on bio-intensive production methods that restore soil, rekindle connection with the land, and rebuild community.

### Accomplishments

- Developed an educational flyer of local CSAs that documents contact information and type of produce available (i.e., vegetables, mushrooms, fruit, flowers).
- Participated in local events to help promote CSAs.
- Organized two community events to assist CSAs with visibility and planting activities.
- Met with LoCo Food Distribution and Local Food Shift personnel to develop partnership plans.
- Developed a community garden educational flyer.

- Coordinated with Well Days Program to raise awareness and grant rewards for select activities (i.e., Farmers’ Market support).

### Short-term Plans

- Review best management practices from other municipal governments.
- Expand the number of existing community gardens.
- Revise community garden list.
- Host educational event for City staff and vendors about local resources.
- Write City policy for local food purchases.
- Review existing contracts with City vendors and incorporate new goal.
- Develop list of restaurants using local produce and products.

### Long-term and Ongoing Plans

- Research direct-to-consumer sales strategies to help keep costs down for the producer and the consumer by limiting or excluding distribution costs such as:
  - Buy-in Clubs (i.e., consumers make purchases from a local farmer online or by phone, then pick up the product at a communal distribution point).
  - Community Supported Agriculture. Help promote local CSA and outline different models (i.e., drop-in-shares, working shares).
  - Year round Farmers’ Markets. Lease City properties to help promote markets and refrigeration storage of produce.
- Incubator Farm Project — Assist new farmers and ranchers with access to land, water, equipment, and technical training.



## 2010-2012 Awards and Accolades

The City of Fort Collins and staff have received numerous sustainability-related awards in 2010-2012:

**ClimateWise Platinum Level Partner Award (2010-2011)**

**Gold Level Bicycle Friendly Community Award (2010-2011)**

*League of American Bicyclists*

**Ranked 3rd on the Best Bicycle Cities List (2011)**

*League of American Bicyclists and TheStreet.com*

**Sheldon Merit Award (2011)**

*Excellence in Environmental Planning for Plan Fort Collins*

**Energy Star Award (2010-2011)** — 215 N. Mason, 281 N. College, and Operation Services

*National energy efficiency recognition*

**EPA Director's Award of Recognition (2010-2011)** — Water Treatment Plant

*Partnership for Safe Water*

**ISO 14001 Certification (2011-2012)** — Drake Water Reclamation Facility

and Water Treatment Plant (2012) *TUV Rheinland of North America*

**Certificate of Achievement (2011)** — Pollution Control Lab

For attaining 100% acceptable results on unknown test samples for all discharge parameters listed in the City's Wastewater treatment permit

*Colorado Department of Health and Environment*

**Cleantech Champion (2011)** — Fort Collins Utilities

For visionary leadership in electric grid modernization

*Colorado Cleantech Industry Association (CCIA)*

**One of the Top 10 Cities Adopting Smart Grid Technology (2011)**

*U.S. News and World Report*

**2nd Best City for Weight Loss (2011)**

*Prevention.com*

**Community/Citizen Award (2010)**

*Colorado Alliance for Environmental Education*

**National Geographic's Aspen Institute Environmental Scholar Award (2010)**

*Sustainability Coordinator, Dr. Rosemarie Russo*

**Top 22 "2010 Smarter Cities" (2010)**

*For programs and investment in green energy by the Natural Resource Defense Council*

**Radon Action in the West Trailblazer Award (2010)**

*Brian Woodruff, Senior Planner*

**Energy and Green Building Award of Excellence and Northern Colorado Renewable Energy Society Honorable Mention (2010)**

*Pat Stanford, Stanford Village and Fort Collins Housing Authority*

**American Waterworks Water Conservation Award (2010)**

*Lauri D'Audney, Water Conservation Specialist*

**Gold Award from the Association of Communication and Marketing Professions (2010)**

*For interpretive signs at Soapstone Prairie National Area — Natural Areas Program*

- Expansion of solar thermal system at EPIC — yields a 14 MT CO<sub>2</sub>e reduction.
- Hoffman Mill Operation — yields a 4,239 MT CO<sub>2</sub>e reduction and annual savings of \$265,370.
- Completion of a Solar Power Purchase Agreement at the Water Treatment Plant — yields a 90 MT CO<sub>2</sub>e reduction and saves \$1,800 annually.
- Installation of three plug-in electric vehicle charging stations — promotes the use of electric fleet vehicles;
- Installation of high performance glazing windows at City Hall.
- Increase of CNG Transfort buses by seven buses in 2012 — yields a 719 MT CO<sub>2</sub>e reduction annually.
- Completion of the City's Environmentally Preferable Purchasing Assessment and Policy Amendments — demonstrates long-term cost effectiveness.
- Installation of a 36 kW photovoltaic collection system at the Museum and Discovery Science Center — yields a 32 MT CO<sub>2</sub>e reduction.
- Police Department electric bikes pilot — minimize air pollution and reduce maintenance costs.
- Sustainability Services hosted 22 Mindful Movie events and 11 corporate training seminars for staff and ClimateWise partners — raising local businesses and internal operations awareness.
- City staff constructed a nibble garden along the bike trail adjacent to a CSA to promote local food.
- ISO 14001 certification for Water Treatment Plant and Re-certification for the Water Reclamation Plant.
- Developed educational sustainability material — Water Bike Tour, Sustainability Project Bike Tour, Community Garden Resource, Sustainability Certification Guide, Comprehensive CSA listing, EPP Guidance, and Dirty Dozen Guide (2012) to increase sustainable participation in regards to purchases, policies and best management practices.
- Water Reclamation Facility is improving biogas utilization. Digester gas treatment represents an opportunity to offset all of DWRF's current natural gas use.
- The City continues to engage employees through various challenges each year. The challenges provide flexible activities that employees can engage in at the office or at home. ClimateWise partners often participate in the challenges. For example, in 2009, the Building Energy Challenge saved the City \$79,820.
- Operation Services continues to set automated controls for load management. This reduces peak demand charges.
- An Energy Team from Operation Services and Utilities retro-commissioned the HVAC systems, replaced pneumatic controllers and improved building controls at City Hall which will reduce carbon envisions by 17 tons annually. The Team implemented energy conservation measures at 215 N. Mason which will yield a \$3,083 annual savings and a reduction of 9 MT of CO<sub>2</sub>e reductions.
- The Old Town Parks Maintenance Shop and ESD partnered with local businesses to collect approximately 12 tons of organic matter (i.e. food and yard trimmings) per year which is processed in the City's Earth Tubs. The compost is used for landscaping and flower pots in Old Town.



### Recommendations and Opportunities

The general strategies for creating a culture of sustainability in order of priority are:

- Add a sustainability goal category to Talent/Reward to help infuse a culture of sustainability across the organization.
- Require all employees to set a Sustainability goal. Appendix A lists key activities for each goal as well as actions employees can implement at work and throughout the community.
- Each manager should work with Operation Services to schedule building audits for their respective departments.
- In addition to the revised infrastructure goals, the City has set a local food goal to address the social dimension of sustainability. By supporting local food production, more farmers will receive fair remuneration and the organization can lower the food miles of our purchases. The average US meal travels 1,500 miles from farm to consumer.
- Mandatory yearly attendance of at least one sustainability training seminar or participation in sustainability project and/or challenge by at least one member of each department.
- Institutionalize a set schedule for building and grounds infrastructure energy and water audits through either a formal third-party certification program such as LEED EB or annual departmental/individual work plans.
- Increase awareness of innovative practices and emerging technology.
- Use community based social marketing (CBSM) research to establish and evaluate outreach and education campaigns and provide CBSM professional development for staff. For example, use the CBSM filter during the BFO analysis to fund desired behavior changes that align with Sustainability goals (i.e., direct funds to conservation and technology adoption because they require greater efforts to achieve change). See Appendix C for additional information.
- Shift staff performance goals to external engagement to advance sustainability in the community. While it is very important to lead by example, municipal operations only account for 2.8% of the overall carbon emissions.

The strategies listed above will be communicated throughout the organization by:

- Targeting employees at Employee Orientation.
- Developing and providing a sustainability data to service area directors.
- Focusing on resource savings, fiscal savings, carbon emission reductions, and staff's perception about sustainability.

- Providing tools and resources to help employees at work while also promoting a more sustainable personal life.
- Evaluating work schedules to prioritize projects that have a high-return on investment, leverage existing funds, align with other organizational goals, and have both social and environmental benefits.
- Highlighting the health and environmental impacts of all City policy, as well as responsible use of City resources.
- Creating cross-function team opportunities for the three Sustainability Departments on joint projects.

Lessons learned since 2004 show that social, technological, and behavioral changes will have significant impacts on our ability to achieve our goals.

**A strong educational component is critical, if these strategies are to be successfully implemented. Knowledgeable and motivated employees will initiate sustainable practices.**

Staff will next focus planning efforts on developing the community-scale Sustainability Strategic Plan that will prioritize actions to advance sustainability in the community.

Additionally, managers need to be more aware of their energy use and the new building energy intensity goals.

The Sustainability Coordinator will continue to develop project reduction calculations for City projects.

### Barriers

The Sustainability Team needs assistance on overcoming the following barriers:

- There is no accountability across the organization when sustainability goals are not met. As such, the Sustainability Coordinator and Team can only encourage managers to adopt new practices. Several departments have expressed an interest in conserving resources, but do not have adequate funding or staff time to implement changes.
- Only a small percentage of departments are using the preferred office and recommended industrial vendors, which makes it extremely difficult to track compliance with Sustainable Purchasing Policy.
- Better load management is critical if the City is to reach its energy goals. For example, in 2012, staff spent months and substantial financial resources on retrofits, but the multiple loads added at City Hall and 215 N. Mason off-set improvements, such as

40% air leakage reductions and installation of high performance windows. Load management entails timing as well as capacity.

- Increasing organizational sustainability capabilities through dedicated funding.
- Setting specific accountability targets for individuals and departmental goals.
- Increasing sustainability purchasing accountability.
- Enhancing sustainability competencies through training.
- Highlighting key projects to the staff and community.
- Planning for unquantified risks, including water scarcity that affects the energy generation source mix (i.e., less hydroelectric in PRPA); increased federal and state water regulations; and increased water and energy rates. These threats will lead to increased emission factors; increased energy use from water and waste water plants and increased utility costs.
- Adjust additional building hours for coincident afternoon peak-energy use.

- Focus on equipment upgrades to save energy in major building repairs, roofing, and capital improvement projects.
- Require that all employees use EPA and Energy Star power settings, according to their work practices.

Organizational carbon reductions matter. The reductions are equivalent to:

- Annual greenhouse gas emissions from 1,188 passenger vehicles;
- CO<sub>2</sub> emissions from 639,097 gallons of gasoline consumed;
- CO<sub>2</sub> emissions from 13,258 barrels of oil consumed; or
- CO<sub>2</sub> emissions from the electricity use of 853 homes for one year.

However, if we strive to be “world-class”, the carbon reductions percentages need to rise from 6.3% to a much higher percentage, as exemplified by the reductions achieved by Melbourne (i.e., 34%), Vancouver (i.e., 100%) and the hundreds of municipalities that abide by the Kyoto Protocol targets.

*Fountain in Old Town Square*



# Appendix A

## Sustainability Performance Goals

Personal Action WORK COMMUNITY	Goal #1 Carbon	Goal #2 Electricity & Natural Gas	Goal #3 Fuel	Goal #4 Solid Waste Reduction	Goal #5 Education & Outreach	Goal #6 Funding	Goal #7 Parks/ Natural Areas	Goal #8 Water	Goal #9 Sustainable Purchasing	Goal #10 Employee Safety & Health	Goal #11 Renewable Energy	Goal #12 Local Food	Goal #13 Energy Intensity
Participate in a Sustainability Challenge, Mindful Movies or Corporate Training Seminar. See <i>Talent/Rewards and Green It, Mean It</i> page for details.	X	X	X	X	X			X	X	X	X	X	X
Be work station smart: Plug all work station lines in to a power strip, & switch it off when you're not using it. Enable power management features on your computer.	X	X											X
Be transportation smart: Participate in Bike-to-Work Challenge, carpool, eco-drive, use your FREE bus pass, or telework.	X		X		X								X
Look at your outdoor trash container the day before pick-up. If it isn't full ask Jim Pierce for a smaller container. It saves your department \$\$\$.	X			X									X
Be your office's compost champion! Utilize the City's green cones and earth vessels, & encourage others to compost.	X			X	X								X
Apply for a Sustainability Scholarship to attend a sustainability course or seminar.	X				X	X							X
Submit a department project to the Innovation Fund.	X					X							X
Request a department water audit through the Green It, Mean It website.								X					
Speak up — if you see an area of opportunity within the municipality, please bring it to Sustainability Coordinator's attention.	X	X	X	X	X	X	X	X	X	X	X	X	X
Use most sustainable purchasing guidelines and top 5 products when purchasing with our preferred vendor — Office Depot. <i>Guidelines available on the Green it Mean it website.</i>	X		X						X				X



Personal Action WORK COMMUNITY	Goal #1 Carbon	Goal #2 Electricity & Natural Gas	Goal #3 Fuel	Goal #4 Solid Waste Reduction	Goal #5 Education & Outreach	Goal #6 Funding	Goal #7 Parks/ Natural Areas	Goal #8 Water	Goal #9 Sustainable Purchasing	Goal #10 Employee Safety & Health	Goal #11 Renewable Energy	Goal #12 Local Food	Goal #13 Energy Intensity
Collaborate to reduce the number of orders that go out (which reduces transport & shipping material volume & costs).	X								X				X
Stay current on your area & seasonal hazards (i.e., review ice & snow safety procedures in the Fall or heat safety in Summer).					X					X			X
Practice eco-driving techniques that keep you safer & more efficient on the road.	X		X										X
Be the eyes of the City. Report misuse or vandalism through the iCare program at <a href="http://fcgov.com/accessfortcollins">fcgov.com/accessfortcollins</a> , or download the free Access Fort Collins app.							X	X	X				
Volunteer in Natural Areas Education program or as a Volunteer Ranger.							X						
Enjoy some nature therapy, unwind in one of the Natural Areas. Practice "leave no trace" (leave only footprints, take only pictures) ethics so others can enjoy it also.							X						
Purchase wind energy from the City of Fort Collins, <i>see details at Utilities</i> .	X	X									X		X
Be a sticker stickler, eat organic. <i>Download or request a copy of Dirty Dozen and Sticker guide.</i>	X											X	X
Support restaurants & businesses that use local foods & local food distributors. <i>See GreenMenu.com for details.</i>	X		X									X	X
Take at least one action in each of the category areas & receive 75 Well Days points!	X	X	X	X	X	X	X	X	X	X	X	X	X

## Implementation Grid to Support Municipal Goals



### #1 Carbon Emissions

- 2013 Complete update to 2004 Internal Sustainability Plan.
- 2013 Identify carbon reduction projects per return on investment.
- 2013+ Identify and implement at least one top priority project for each sustainability goal annually.
- 2014 Evaluate LEED and other programs such as Green Globes, Architecture 2030 and Building Research Establishment Environmental Assessment Method (BREEAM) for best management practices.
- 2014 Publish Annual Report, management dashboards, successes, tips, and resources.
- 2014 Continue to refine data for sustainability tracking.



### #2 Electricity and Natural Gas

- 2014 Three buildings will be tested annually to measure efficiency — dependent on Innovation Fund approval.
- 2013 Complete retrofit outdoor lighting at Traffic & Streets, Collindale, and Southridge Golf Course.
- 2013 Provide instructions so that all employees use the EPA and ENERGY STAR power settings on computers.
- 2013 Adjust additional building hours for coincident afternoon peak energy use.
- 2014 Encourage purchase of 98.5% condensing type heaters for all new buildings.
- 2014 Adopt Architecture 2030 standards for new buildings.
- 2014+ Complete HVAC Controls Retrofit Project and monitor savings at two buildings.



### #3 Fuel

- 2013 Seek to implement the following priorities for the City vehicle purchases: 1) alternative-fueled vehicles; 2) downsize vehicles from original request, and 3) hybrid. Track TBL impacts of vehicles purchased.
- 2013 Coordinate with ClimateWise and EcoDrive Program to increase average vehicle ridership among City workers. Projects include hosting a seminar about transportation options and a Transportation Challenge and conducting EcoDrive seminars.
- 2014 Increase percentage of alternative vehicles and equipment in fleet.



### #4 Solid Waste Reduction

- 2013 Plan and design implementation projects to reduce municipal waste volumes self-hauled by City departments to Larimer County Landfill.
- 2013 Maintain periodic meetings with the City's solid waste and recycling contractor to identify recycling opportunities.
- 2013 Continue relocating construction excavation material for use as fill. Present waste reduction/recycling information to new employees, work groups about "Recycle This" campaign.
- 2014 Offer greater opportunities to recycle in public access areas. Increase enforcement of illegal dumping in City property dumpsters (i.e., install locked bins).
- 2014 Create transparency and readily accessible tools enabling employees to take personal actions. Invest in infrastructure, when feasible, to process waste materials into new products.



## #5 Education and Outreach

- 2013 Work with vendors at Golf courses and Lincoln Center to reduce waste.
- 2013 Implement employee challenges as part of ClimateWise Program for the platinum level.
- 2013 Host Corporate Training and Mindful Movies in conjunction with CSU for business community and City employees (5 sessions).
- 2013 Development of One Planet Incentive Program in conjunction with Sustainability and Well Days Program.
- 2013 The City will promote leadership by participating in community initiatives such as Fort ZED, Business Outreach, and Master Naturalist.
- 2013 The Customer Outreach Team will continue to meet monthly to coordinate outreach to local businesses.
- 2014 Information about sustainable practices and wise use of natural resources will be available to all levels of the community — students in grades K-20, university staff and students, the general public, and employees as well as City staff.
- 2014 Outreach will be provided through the Residential Environmental Program series, and targeted presentations to audiences such as City staff, Poudre School District, CSU, Homeowner Associations (HOAs), and religious organizations.
- 2014 Periodical evaluations of external and internal outreach campaigns will be conducted by the Education Team.



## #6 Funding

- 2013 In addition to reporting on annual carbon inventory, cost savings that directly result from energy and waste conservation will be tracked.
- 2014 Develop BFO offer(s) to fund organizational sustainability projects.
- 2014 The City's Sustainability Innovation Team will identify and rank team projects and departmental projects.



## #7 Parks/Natural Areas

- 2014 Achieve a 30% forest canopy density in suitable areas of City Parks by 2020 and a 70% native vegetation cover in Natural Areas.
- 2013 The City will maintain Parks as designated and be built with an emphasis on periodically replacing landscaping to more drought tolerant species.
- 2013 Maintain a 30% forest canopy on City owned property through monitoring and replanting.
- 2013 Plant natives and eradicate non-natives at Natural Areas to maintain 70% native cover.
- 2014 Replace 5% of existing planting at Parks with xeric/native species.
- 2014 Park Planning and Park Maintenance will work together on park designs to maximize “no mow areas,” while providing a park that meets the needs of the community.
- 2014 Parks will replace select water pumps to a more efficient model to decrease the energy use for irrigation as part of the life-cycle program.
- 2014 Forestry staff will begin a more comprehensive forest canopy inventory.





## #8 Water

- 2013 Reduce municipal operations water irrigation use and increase efficiency per acre.
- 2013 Publish report on water audits at 215 N. Mason, 281 N. College, Senior Center, and Operation Services.
- 2013 Host Bike Water Tours.
- 2014 Invest in more energy efficient pumps and use low-application MP rotators on slopes.
- 2014 Install irrigation sub-metering and weather based controllers.



## #9 Sustainable Purchasing

- 2013 Develop baseline of sustainable purchasing.
- 2013 Increase communication.
- 2014 Explore products for centralization.
- 2013 Increase green office practices such as: use of recycled or remanufactured toner cartridges; reduction of printed material; use of 30% PCW recycled content paper; and use of other green office products.
- 2013 Create a tracking tool to report on sustainable purchasing activities versus baseline purchases.
- 2013 Create training programs for departments.
- 2013 Update the sustainable purchasing website in conjunction with the new green portal.
- 2013 Continue to work thru the 25 product categories identified in the green purchasing study.
- 2013 Assist other departments and groups with strategies recommended in audit such as scanner purchases.
- 2014 Using the Sustainable Purchasing Policy, identify and continue to work on alternative items.
- 2014 Require purchase of best available fuel efficient vehicles/net emissions reduction.
- 2014 Develop and periodically update tools.
- 2014 Evaluation criteria for selecting a product or vendor will incorporate sustainability factors, including the bidding company's own sustainability qualifications.



## #10 Employee Safety and Health

- 2013 Increase the yearly percentage of employees participating in the annual health assessment by 5% annually.
- 2013 Decrease the percentage of employees having five or more risk factors as measured by the health assessment survey. Create an intervention strategy that helps employee's lower risk factors.
- 2013 Increase the number of eligible employees that participate in the Well Days Incentive Program to 75% by 2020.
- 2013 Continue to host and resource a comprehensive Wellness Program for all employees.
- 2013 The City will participate in the Social Superstar Program that draws attention to businesses that create a positive social impact.



## #11 Local Food

- 2013 Review best management practices from other municipal governments.
- 2013 Expand the number of existing community gardens.
- 2013 Revise community garden resource list and distribute internally and externally.
- 2013 Host educational event for City staff and vendors about local resources.
- 2013 Write City administrative policy for local food purchases.
- 2013 Review existing contracts with City vendors and incorporate new goal.
- 2013 Develop list of restaurants using local produce and products. Distribute internally and externally.

## Community Based Social Marketing Research

In 2012, several staff members were awarded sustainability scholarships to attend a community based social based marketing (CBSM). Staff reviewed strategies for promoting pro-environmental behavior based on research from environmental psychologist, conservation psychologist, and social-based marketing professionals.

An environmental psychologist mainly focuses on the physical context of campaigns such as the color or placements of recycling bins, while conservation psychologists are interested exclusively in pro-environmental outcomes. Community-based social marketing involves systematic efforts to promote positive change within a community through simultaneous barrier reduction and benefit enhancement. The Sustainability Coordinator used CBSM research to evaluate outreach and education campaigns and staff professional development.

For example, a study in England found low adoption rates for behaviors such as installing micro generation, using more efficient vehicles, avoiding unnecessary flights, and using the car for shorter trips. Again, easy behavior which was more readily implemented included: increasing recycling, buying efficient products, wasting less food, and installing insulation. Given those findings, a campaign to discount insulation or Energy Star and Water Sense appliances is strategic. A “waste less” food campaign hasn’t been implemented yet at the City and could be developed. In addition to individual behavior research, group behavior holds promise for improving municipal outreach programs.

Another key finding of community-based social marketing is that one-to-one communications with members of the target audience is important (Haldeman & Turner, 2009).<sup>6</sup> Again, the approach taken by ClimateWise meets those parameters, but direct mail or website information may not. Efforts to increase ClimateWise and Key Account networking should receive increased funding and less emphasized placed on programs such as bill inserts or website development.

Based on Schultz research on the effectiveness of nearly 300 outreach campaigns, in order of magnitude from most to least changeable behavior is public recycling, central recycling, fuel conservation, public energy conservation, water conservation, curbside recycling, home energy conservation, and new technology adoption (Schultz, 2012).<sup>7</sup> These findings indicate, it may be beneficial to evaluate the budgets for our most and least changeable

campaigns, and adjust funding accordingly (i.e. direct funds to conservation and technology adoption because they require greater efforts to achieve change). A future strategy may be to focus the Residential Environmental Series and ClimateWise BIZ seminars to address the difficult areas (i.e. technology adoption). TBL return on investment analyses needs to be refined to evaluate benefits of existing programs, marketing campaigns, reporting efforts and projects.

Research on the effectiveness of competitions has shown the behavior changes are short-lived with the exception of groups or individuals that have won or received prizes or discounted items as a result of a competition. To capitalize on the competition and new technology research, a top ten technology devices should be developed and communicated to staff and community members. Select devices should be included piloted and awarded as part of the 2013 Sustainability Challenges.

Studies have shown that outreach campaigns need to be tailored for different types of audiences. For example, with motivated individuals, prompts and feedback are effective. To capitalize on that research, Spotlights were developed after each city challenge to report on cumulative financial, social and environmental savings. For the community programs such as the neighborhoods with high participation in energy conservation (i.e. home audits) and appliance rebates, acknowledgement and instructions on next steps are important.

The social-based marketing research shows that a key to changing behavior is identifying barriers and benefits of targeted behavior. A leading benefit is a person’s belief about the positive outcomes associated with a behavior such as saving money, protecting the environment or receiving recognition. The strategy used by ClimateWise is consistent with the benefits analysis. New challenges were implemented with staff and select ClimateWise partners to educate participants about the multiple benefits of select behavior. In addition to economic and environmental benefits, social benefits were quantified as well to appeal to the largest base of participants.

In the area of barriers, research shows making the pro-environmental behavior the default can lead to larger changes (Werner, Brown, Gallimore, 2010).<sup>8</sup> Based on these findings, the janitorial contract should be rewritten so custodians are no longer responsible for waste. Instead, they will collect

recycling at individual work stations to discourage excess waste production.

Research indicates that individuals are more likely to engage in select behavior if it is part of a social norm such as the FortZED pledge sheets or the City's prescribed challenges (Bamberg & Moser, 2007).<sup>9</sup> Last year, challenge participation among some departments gained momentum each month. Transportation had nearly a 100% participation rate in several challenges. A Spotlight was published on the Green It, Mean It site acknowledging departments, businesses and individuals that exhibited sustainable leadership. These types of announcements cover the social norming strategies that have been recommended.

Using incentives within programs can be a powerful tool to change one-time behavior such as solar installations (PV or solar thermal). The City staff Challenges have utilized incentives. It is time to scale up these incentive programs at the community level. A practical approach to utilizing the research on motivated audiences could be to provide prompts and feedback to departments and neighborhoods that have high diversions rates. For City departments' diversion data is being separated into select categories (i.e. office, community, residential and industrial) so that comparisons can calculate. Preliminary analysis for last year indicates office sites with the highest diversion were: Avery House, Customer Service and Utilities Water Meter Building D. The community service sites included the Water Treatment Plant and City Park Picnic Areas. The highest residential site was PFA Station 7 and the industrial leader was Hoffman Mill Road.

Internal outreach has also included prompts and

messaging in Stall News (i.e. bathroom signs prepared by the Well Day and Sustainability Staff). This technique aligns with the research that shows prompts have the most success for repetitive behaviors when they are placed in close proximity to target behavior and when they emphasize the correct behavior (i.e. "Please turn off your computer" or "Starve your Trash" (Werner, Rhodes, and Partain, 1998).<sup>10</sup>

On the opposite end of the spectrum, lottery type incentives have the highest results especially for individuals or groups that are not motivated. A lottery type challenge is planned for the departments with low and zero diversion rates including the Senior Center, Lincoln Center and PFA Station 1.

Another approach that isn't commonly used throughout the organization is cognitive dissonance tools that involve using small behaviors first to instill a favorable attitude toward an issue such as energy efficiency (i.e. providing small LED lights). Research shows that a person will engage in more pro-environmental behavior so their cognition is consistent.

Challenges or pledges have been shown in a number of studies to be the most successful following a commitment especially if it is made publicly (McKenzie-Mohr, 2011).<sup>11</sup> A good example of this was the "Be a Superhero for Sustainability," where photos were taken of participants after they signed a pledge. The photos were posted on the website to establish a social norm.

*Nibble Garden on Spring Creek Bike Trail*





## Waste Reduction Strategies

During November and December, an interdepartmental group of employees worked on developing recommendations to achieve the City's goal of diverting 80% of its waste stream from landfill disposal by 2020. The following report summarizes discussions among members of the "Waste Stream Team" about what next immediate steps could be taken, with the understanding that another update to the Municipal Government Sustainability Management Plan is anticipated in three or four years.

A significant recommendation by the Waste Stream Team is to alter the existing waste/recycling goal (set in 2008) since it needs further refinement in solid waste accounting for reporting on the amount of progress the City makes in this important area (it is imperative that progress toward creating a more sustainable municipal government can be accurately monitored). Employees have increasingly focused on measuring recycling and waste generated by the City. We have come to realize that a single waste diversion goal is too arbitrary to apply to a complex organization such as municipal government.

The City generates three streams of trash: the material that is deposited by the public in trash containers at parks, natural areas, and recreational facilities (including illegally dumped items); industrial byproducts from activities such as street sweeping, stormwater detention pond clean-outs, and repair/maintenance of water and sewer pipes; and, discarded "office" types of material from administrative buildings, shops, warehouses, and utility plants. Systems for collection and management vary, as does the potential for capturing materials from each of these waste streams to be re-used, recycled, or composted.

Data streamlining and analysis in 2013 is proposed that will render strong base-line metrics to reflect, as accurately as possible, the general amount (by weight) of discarded material that falls under the City's control, seasonal variability and better understanding of other influences that cause fluctuations in the recycling and waste streams.

### Trash Streams

1. **Public Areas Trash:** Steadily reducing the amount by 5% per year of trash collected in public access facilities (parks, recreational sites, natural areas, right-of-ways) using either weight or volumetric measurements as appropriate, by applying Triple Bottom Line analyses.  
Policy: offer greater opportunities to recycle in public access areas  
Policy: discourage illegal dumping on City property

2. **Office Waste:** Reduce the amount of trash generated by municipal workplaces and offices by 10% per year, by weight.  
Policy: create transparency and readily accessible tools enabling employees to take personal actions  
Policy: recognize and reward actions taken by employees and unique work groups  
Policy: celebrate successes at source reduction and recycling among work groups
3. **Special Wastes:** Achieve minimum 10% per year reduction in each of the industrial byproducts generated by City operations using either weight or volumetric measurements, as appropriate.  
Policy: apply Life Cycle Analyses to establish best re-use applications  
Policy: apply source reduction as a priority approach  
Policy: invest in infrastructure when feasible, to process waste materials into new products
4. **Refine data and ensure it is collected—and used—in a timely manner**  
Policy: establish a 2013 baseline for waste generation

### Objectives

Employees in Fort Collins' municipal government are committed to:

- Using a systematic, data-based approach to accomplish sustainability goals.
- Fulfilling High Performing Government strategic plans and an organization-wide culture of sustainability.
- Establishing accurate and comprehensive waste and recycling data and utilize the information when selecting new actions to implement.
- Calculating and making use of additional waste reduction benefits to the organization and community such as cost savings and greenhouse gas emission reductions.
- Persistently work to divert problematic materials (organic debris, excavated soils, drywall, carpet, etc.) from landfill disposal.
- Supporting and strengthening internal recycling programs that optimize employees' knowledge and participation.
- Actively creating more recycling options and publicizing the information throughout the organization.

- Establishing incentives and celebrations for employees who implement waste reduction and recycling initiatives.
- Continuing to “right-size” trash service, including reduced number of trash container pick-ups and use of smaller trash bins, whenever possible.
- Incorporating wise resource use (plan for durability, reuse, recycle-ability) in long term planning and purchasing decisions.

## Strategies

Numerous actions will lead to meeting the City’s waste reduction and recycling goals, including but not limited to:

### *Improve Data*

Create dedicated website on internal website that is easy to access and transparent to employees.

- List trash/recycling contractor’s pick-up locations and level of services (frequency, size of container).
- List scrap metal collection sites.
- List Purchasing’s auction, donation, and reuse opportunities.
- Manage website through Operations Services, so information is updated as service changes occur.
  - Create a quick link that is easy to find, like the Wellness Program link.
  - Install auto-notification (e-mail) and “spotlight” articles on time-sensitive topics.
- Create a resource list for recycling hard-to-recycle materials and post for employee use.

Identify and separately track the City’s three categories of waste; industrial; general office waste; and, public-generated waste (from trash receptacles at parks, natural areas, and recreation facilities as well as littering/dumping on City property and household eviction situations).

- Identify land work with large events at recreation centers and public sites that may necessitate further waste reduction planning, an extra pickup of trash, more recycling bins, etc.
- Apply City data to use in comparative analyses with other municipal governments, using Colorado Department of Public Health and Environment (CDPHE) and Environmental Protection Agency (EPA) definitions.
- Identify items regularly found in the trash and estimate or weigh items to get baseline weight
- In waste and recycling data reports, include narrative to understand significant steps / fluctuations.

- Complete waste audits on a regular basis to establish amount of recyclables in trash bins.
  - Rely on vendor to provide assistance in emptying trash bins for sorting.
  - Invite employees to volunteer to conduct waste sorts.
  - Apply Make a Difference Day hours.
  - Potentially earn Well Days points.
- Identify where specific items are generated in significant amounts to target for additional diversion.
- Continue to use information from trash vendor to optimize trash reduction and recycling systems.
- Continue to quantify waste reduction in terms of money saved and carbon emissions avoided.
  - Consider allowing departments to use financial savings for further waste reduction efforts.

## Special Materials Recycling

Start work now to create compost facility for City operations, knowing that permits will take multiple years.

- Divert organic-rich debris (e.g., from Parks maintenance, detention pond maintenance) into compost.
- Compost will be readily put to use by Parks Maintenance, Golf Course, and others.

Increase involvement with ditch companies to divert limbs and materials from ditch cleanout work.

- Coordinate timing and process to collect materials.

Create soil recovery site(s) for excavated waste soils and wet soils.

- Process new soil products per specification (e.g., alternative daily cover for landfill, golf course berms).

Evaluate issues inherent in eviction situations, whereby Streets is required to remove household contents.

Create a carpet recycling/storage contract freight-sharing opportunity with other municipalities.

- Preferentially install carpet tiles rather than wall-to-wall carpet in new construction, remodels.

Explore local options for disposing of/selling unclaimed properties from Police

- Use Triple Bottom Line Analysis system in decision-making.

- Consider bidding out service for a local contractor/partner agency to manage unclaimed properties.

Create recycling options for “film” plastic (plastic bags and shrink wrap).

Identify ways to collect additional asphalt or scrap metal that is generated in small quantities.

- Use “fish cart” containers (durable, hold <1 yard, mounted on castors, tip for easy emptying).

Create storage options to accumulate sufficient quantities of hard-to-recycle-materials for efficient freight.

- Look at opportunity to design as part of new Integrated Recycling Facility.

Encourage use of goats or sheep to provide low-waste weed management services in stormwater detention areas and other appropriate City landscapes.

Create lists for internal municipal materials exchange, separated by department.

- Share existence of Facilities wood shop and make use of wood scrap.
- Identify other shop sites that have potential for sharing surplus scraps.

Improve recycling / mulching capabilities for dimensional lumber scraps and broken pallets.

Continue to expand industrial repurposing opportunities.

- Look for as-local-as-possible options.

Other hard-to-recycle materials to focus on include but are not limited to:

- Office supplies and furniture exchange; physical drop ‘n swap.
- Enhanced “free box” as an on-line resource for employees’ use.
- Drywall.

### **Continue and Improve Waste Reduction and Recycling Programs for Employees**

Increase communication to employees about what can be recycled.

- Post new, icon-based recycling guidelines throughout City facilities.
- Submit regular articles to Fort Shorts on timely recycling items, e.g., election sign recycling.
- Encourage use of “waste stations” with attached sign frames that consistently include:
  - Updated signage about what can/can’t be recycled.

- Both a trash can and a recycling can to avoid risks of “contamination” and physically connect bins to each other when possible, to prevent “straying.”

Increase employee knowledge and participation.

- Emphasize the importance of keeping contaminants out of the recycling stream.
  - Reduce residuals (contamination) in the recycling stream to 6% or less.
- Ensure each employee’s work site has a recycling bin provided.
- Revisit “Starve Your Trash” campaign.
  - distribute more of the small “saddle” bins to employees’ individual work sites.
- Explore options to earn well day points for waste reduction activities.
- Hold small parties for work groups to celebrate success.
- Highlight success stories.
- Provide “Road Show” opportunities for City work group staff meetings.
- Develop model/step-wise decision process ( life-cycle or TBLAM analyses) for making purchases.
  - for instance, use of carpet tiles instead of wall-to-wall carpet.
  - evaluate end-of-life management options for acquisitions.
- Link reports from data-base (GEMS) with Recycling pages of CityNet, and urge employees to become familiar with summaries and comparisons of waste diversion, by building, over time.
  - Consider creating competitions / challenges between buildings.

Continue to “right-size” trash service from vendor.

- Reduce frequency of collection services and downsize trash bins whenever possible.
  - Emphasize subscribing to smaller levels of service for regular use, get extra pickups as needed.
  - Promote approach of “thinking seasonally” or on events-based need for trash service.
- Educate employees about level-of-service change options / ease of shifting as often as necessary
  - Further streamline process of service changes, ordering roll-offs through Operations Services.
- Implement new procedure whereby trash vendor verifies that City employees have spoken with Operations Services first before adding roll-offs to collection routes.



## Site- and Situation-Specific Recycling and Waste Reduction

Pinpoint opportunities to provide additional, convenient recycling containers.

- Field crews' areas where trucks are returned at end of work day.
- Other, general building applications.
- Use special bins or poly-carts when durability is important and make sure they are clearly "signed."

Aim for near-zero waste in new building construction.

- invite sustainability team to share input at design stage on building materials to be used
- enhance design specifications for contractors to follow for reuse and recycling
- anticipate long term disposal/expansion needs of buildings before they are even built
- Invite sustainability team to tour deconstruction sites before project starts to identify trash/recycling/reuse opportunities.

Establish policies and procedures to help employees make waste disposal decisions.

- Develop series of questions/decision matrix to support when decisions are made, e.g., whether to

landfill certain materials, or alternatively, to pay extra to have discards recycled.

Add requirement for sports registrations and ball-field reservations that teams correctly use recycling bins.

Apply long-term planning to tree species selection for new plantings to consider:

- amount of wood waste / mulch generated over time due to tree growth and disease.
  - Anticipate future potential to use wood mulch in biomass digester(s) as a way to recover energy.
  - Carpentry uses for trees at end-of-life.

Cross pollinate with green purchasing policies that are under development to require better design specifications (more recycled content, better durability, etc.) for City acquisitions.

Encourage consolidated contracting; benefits of fewer contracts include greater efficiency and savings.

*Wind Farm*



## Acknowledgements to employees that participated in educational trainings, One Planet Program, national LEED and Sustainability Certification Program or sustainability challenges:

## Appendix E

Kathy Collier — Local Food  
 Dave Dale — Local Food  
 Lindsay Ex — Local Food  
 Michelle Finchum — Local Food  
 Brenda Flynn — Local Food  
 Matt Gibbs — Local Food  
 Deb Harris — Local Food  
 Brian Hergott — LEED Training  
 Robert D. Irish — *Revenge of the Electric Car*  
 Sarah E. Kane — EPP  
 Tom Knostman — LEED Training  
 Michael Knox — Training  
 Tamara Sue Lindenstein — Training

Courtney Livingston — Training  
 Albert C. Lochra — *Sea Change*  
 Robin MacDonald — EPP  
 Janet McTague — Local Food  
 Susan Mercier — Local Food  
 Lori Ann Middleton — EPP  
 Kenneth D. Morrison — Sustainability Progress  
 Robert Moseby — *Revenge of the Electric Car*  
 Louise Mosnik — Sustainability Progress  
 Ryan Mounce — Sustainability Progress  
 Lucas Morgan Mouttet — *Blue Gold*  
 Gail Elaine Neben — *Revenge of the Electric Car*

Patty Netherton — Local Food  
 Molly Ann North — Sustainability Progress  
 Tracy Oschner — *Revenge of the Electric Car*  
 Jim Pierce — Food Challenge  
 John Phelan — Local Food  
 Jeff Reichert — Local Food  
 Rosemarie Russo — Local Food  
 Glen Schlueter — Local Food  
 Dale Schnathorst — Local Food  
 Lucinda Smith — Training  
 John Stephens — Training  
 Brian Woodruff — LEED Training

### One Planet Program:

Nathan Ader  
 Hannah Ahrendt  
 Angel Anderson  
 Erik Anderson  
 Kevin Armstrong  
 Jennifer Authier  
 Kraig Bader  
 Jay Barber  
 Pablo Bauleo  
 Allison Becker  
 Michelle Becker  
 Katherine Bigner  
 D. Black  
 Jorin Botte  
 Shane Boyle  
 Adam Bromley  
 Terri Brown  
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 Steven Caganach  
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 Edward Meikel  
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 Mary Pekara  
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 Marsha Robinson  
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 Kenneth Sampley  
 Jesse Schlam  
 Glen Schlueter  
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 John Wong  
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 Virginia Wynne  
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### One Planet Ambassadors:

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 Brian Varrella  
 Caleb Metzler  
 Chuck Gross  
 Cliff Hoelscher  
 Crystal Shafii  
 Deetta Carr  
 Doug Swartz  
 Eric Olson

Errin Henggeler  
 Glen Schlueter  
 Hannah Ahrendt  
 Janet McTague  
 Jay Barber  
 Jay Wolfe  
 Jean Carpenter  
 Jean Pakech  
 Jennifer Authier

Jill Oropeza  
 Jolee Parmenter  
 Jon Haukaas  
 Judy Dahlgren  
 Katy Bigner  
 Kelley Gonzales  
 Ken Morrison  
 Ken Sampley  
 Kymberlie Koster

Laurie D'audney  
 Lori Clements  
 Lucas Mouttet  
 Matt Fater  
 Melissa Katsimpalis  
 Michelle Finchum  
 Norm Weaver  
 Robin Pierce  
 Shane Boyle

Stephanie Himmelberg  
 Sue Reed  
 Susan Strong  
 Tiana Smith  
 Tom Vosburg  
 Wendy Serour

**LEED, ISO, or Sustainability Management Certified:**

<i>Name</i>	<i>Department</i>	<i>Category</i>	<i>Status</i>
Allison Becker	Utilities	ISO Certified	Current
Megan Bolin	Sustainability Services	Green Associate	In Progress
Sarah Carter	Planning	Green Associate	In Progress
Kathy Collier	Utilities	AP, BD & C	Current
Ethan Cozzen	Operations	AP	Current
Lindsey Ex	Advanced Planning	AP	Current
Michelle Finchum	Utilities	Sustainable Management Certificate	In Progress
Doug Groves	Utilities	ISO Certified	Current
Errin Henggeler	Utilities	ISO Certified	Current
Ron Kechter	Operations	AP	Current
Allison Lommel	Advanced Planning	AP, BD & C	Current
Michelle Meis	Advanced Planning	Green Associate	Current
Ken Morrison	Utilities	ISO Certified	Current
Jill Oropeza	Utilities	ISO Certified	Current
Tracy Oschner	Operations	AP	Current
Matt Parker	Utilities	ISO Certified	Current
Robyn Philips	Utilities	ISO Certified	Current
Courtney Rippy	Advanced Planning	AP	Current
Rosemarie Russo	Environmental Services	ISO Certified Auditor, Green Associate Sustainable Management Certificate	Current
Jesse Schlam	Utilities	ISO Certified	Current
Don Skold	Utilities	ISO Certified	Current
John Stephens	Finance	AP	Current
Susan Strong	Utilities	ISO Certified	Current
Jennifer Ward	Utilities	ISO Certified	Current
Carol Webb	Utilities	ISO Certified	Current
Jerry Yakel	Utilities	ISO Certified	Current
Matt Zoccali	Utilities	ISO Certified	Current

**Special thanks to all the staff and community members who supported sustainability efforts:**

Ana Arias, <i>Editing</i>	Alexis Hmielak, <i>Photos</i>	<b>Review Team</b>
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Peggy Bowers, <i>Sustainability Team</i>	Pete Iengo, <i>Sustainability Team</i>	Wendy Serour, <i>ClimateWise Liaison</i>
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Michelle Finchum, <i>Sustainability Team</i>	Tracy Ochsner, <i>Sustainability Team</i>	Joe Vairgt, <i>Photos</i>
Susie Gordon, <i>Waste Reduction Technical Team</i>	Kim Overholt, <i>Photos</i>	Stan Welsch, <i>Waste Reduction Technical Team</i>
Jason Graham, <i>Waste Reduction Technical Team</i>	Jim Pierce, <i>Waste Reduction Technical Team</i>	Erich Whisenhunt, <i>Events and Challenges</i>
Doug Groves, <i>Waste Reduction Technical Team</i>	Bonnie Pierce, <i>Data Analyst</i>	Bill Whirty, <i>Parks Technical Taskforce Team and Scholarship Committee</i>
Luke Hall, <i>Nibble Garden</i>	Hank Richardson, <i>Waste Reduction Technical Team</i>	Brian Woodruff, <i>Transportation</i>
Deb Harris, <i>Sustainability Team</i>	Stu Reeve, <i>Energy Technical Team</i>	
Bruce Hendee, <i>Planning</i>	Rosemarie Russo, <i>Coordinator and Scholarship</i>	

**City Leadership**

Darin Atteberry, City Manager	Lisa Poppaw, District 2	Ross Cunniff, District 5
Karen Weitkunat, Mayor	Gino Campana, District 3	Gerry Horak, District 6
Bob Overbeck, District 1	Wade Troxell, District 4	



**For more information about sustainability programs, please refer to:**

City Scholarship Program — [citynet.fcgov.com/sustainability](http://citynet.fcgov.com/sustainability)  
Climate Action Plan- [fcgov.com/climateprotection](http://fcgov.com/climateprotection)  
ClimateWise — [fcgov.com/climatewise](http://fcgov.com/climatewise)  
Energy Policy — [fcgov.com/electric/energy\\_policy.php](http://fcgov.com/electric/energy_policy.php)  
Green Building — [fcgov.com/greenbuilding](http://fcgov.com/greenbuilding)  
Global Reporting Initiative — [fcgov.com/utilities/gri.php](http://fcgov.com/utilities/gri.php)  
Rebates — [fcgov.com/conservation](http://fcgov.com/conservation)  
Sustainability Library — [fcgov.ehr.com/learning](http://fcgov.ehr.com/learning)  
Telework — [citynet.fcgov.com/transfort](http://citynet.fcgov.com/transfort)

Challenges — [citynet.fcgov.com/sustainability](http://citynet.fcgov.com/sustainability)  
Wellness Program — [citynet.fcgov.com/humanresources](http://citynet.fcgov.com/humanresources)  
Bargain Box — [citynet.fcgov.com/bb](http://citynet.fcgov.com/bb)  
Discounted Recreation Passes — [citynet.fcgov.com/recreation](http://citynet.fcgov.com/recreation)  
Free Transfort Passes — [citynet.fcgov.com/transfort](http://citynet.fcgov.com/transfort)  
Risk Management — [citynet.fcgov.com/riskmanagement](http://citynet.fcgov.com/riskmanagement)  
Purchasing — [citynet.fcgov.com/purchasing](http://citynet.fcgov.com/purchasing)  
Water Conservation Plan — [fcgov.com/water](http://fcgov.com/water)

## References

<sup>1</sup> City Plan, (2011) City of Fort Collins, page 14.

<sup>2</sup> Scope 1: Direct carbon emissions (i.e. natural gas, fuels), Scope 2: indirect energy emissions (i.e., electricity), and Scope 3: other indirect emissions (i.e. travel, landfill waste).

<sup>3</sup> Overall renewable sources include RECs, solar, hydroelectric, and wind through PRPA purchases and on-site distributive power.

<sup>4</sup> Core Writing Team, Pachauri, R.K. and Reisinger, A. (Eds.). (2007). Contribution of Working Groups I, II and III to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. Intergovernmental Panel on Climate Change, Geneva, Switzerland. pp 104.

<sup>5</sup> Personal Communications (2012), John Phelan and Stu Reeve Energy Manager, John Phelan assumption: 10% of 43 GWh (from email) is 4.3 GWh. This would require about 3.0MW of solar at about \$8M. The cost is based on City buying solar at 2 cents Kwh from a power purchase agreement (also hits limit of city owned solar vis-à-vis Platte River agreement.). Stu Reeve assumption: will cost \$15 million if PV is at \$5.00/watt.

<sup>6</sup> Sustainable Table (2013). [www.sustainabletable.org](http://www.sustainabletable.org).

<sup>7</sup> Haldeman, T. & Turner, J. (2009). "Implementing a community-based social marketing program to increase recycling." *Social Marketing Quarterly*, 15, 114-127.

<sup>8</sup> Schultz, W. (2012). "Strategies for Promoting Pro-environmental Behavior: Lots of Tools But Few Instructions." *European*.

<sup>9</sup> Werner, Brown, Gallimore (2010). Light rail use is more likely on walkable blocks. *Journal of Environmental Psychology*, 30, 206-214.

<sup>10</sup> Bamberg, S., & Moser, G. (2007). "Twenty years after Hines, Hungerford, & Tomera: A new meta-analysis of psych-social determinants of pro-environmental behavior." *Journal of Environmental Psychology*, 27, 14-25.

<sup>11</sup> Werner, Rhodes, & Partain, (1998). Designing effective instructional signs with schema theory: Case studies of polystyrene recycling. *Environment and behavior*, 30, 709-735.

<sup>12</sup> McKenzie-Mohr, D. (2011). "Fostering sustainable behavior: An Introduction to Community Based Social Marketing." Gabriola Island, Canada: New Society.



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