# MunicipalSustainabilityAnnual ReportEnvironment



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Those who say it can't be done shouldn't get in the way of those doing it. - George Bernard Shaw As a Platinum ClimateWise Partner, the City of Fort Collins' Municipal government is committed to reducing greenhouse gas emissions 20% below 2005 levels by 2020, beginning in 2010. The organization is equally committed to systematically addressing all aspects of sustainability through a triple bottom line lens for projects, policies and purchases and by implementing numerous projects that address each of the 11 priority sustainability goals. The City plans to add three new goals in 2014: Water Quality, Social Equity and Biodiversity.

As part of its leadership role, staff shares these goals and projects with other ClimateWise partners and departments throughout the organization to capitalize on projects that have a significant return on investment. Each year, the Sustainability Team identifies new and on-going projects that produce measurable results. See Table 1 for the 2013 ranking.

# 2013 Highlights (2005-2013)

- Total carbon emissions are down 7.6%
- Carbon emissions from electricity are down 9.4% • Carbon emissions per square foot have decreased by 4 metric tons
- Conventional fuel use is down 19%
- Electricity use for water and wastewater production is down 5.6%
- Electricity emissions from traffic signals is down 42% • Well Day participant health claim costs were 33% lower than non-participants
- The City's leadership is evident from numerous 2013 local and national awards:

- Environmental Purchasing Leader in the Office Depot National "Greener Purchasing" Awards • Fifth consecutive Platinum level ClimateWise Award
- 3-STAR Community rating in the Sustainability Tools for Assessing and Rating (STAR) Community Program
- Gold Leaf Award for Outstanding Arbor Day Programs Platinum Bicycle Friendly Community by the League of American Bicyclists
- Robert Havlick Award for Innovation in Local Government

The City is investigating adopting more aggressive greenhouse goals based on the recent scientific findings of accelerated temperature changes and local impacts (i.e. High Park Fire, floods). 2013 was the 6th warmest summer in the past 125 years.<sup>1</sup> Dependent on Budgeting for Outcomes (BFO) funding, the City hopes to increase renewable energy supplies for internal operations, pilot anti-idling devices, expand the Energy Challenge campaign (i.e. Georgetown Competition) and

continue auditing City buildings for energy efficiency improvements. The Climate Change Indicators Report (EPA, 2014)<sup>2</sup> presents clear evidence that the impacts of climate change are

Average temperatures have risen across the contiguous 48 states since 1901, with an increased rate of warming over the already occurring across the United States:

past 30 years. Seven of the top 10 warmest years on record have occurred since 1998. Glaciers have been melting at an accelerated rate over the past decade. The resulting loss of ice has contributed to the

Every part of the Southwest experienced higher average temperatures between 2000 and 2013 than the long-term average

dating back to 1895. Some areas were nearly two degrees warmer than average. Since 1983, the United States has had an average of 72,000 recorded wildfires per year. Of the 10 years with the largest

acreage burned, nine have occurred since 2000, with many of the largest increases occurring in western states.

The EPA report is consistent with findings in the National Climate Assessment Study. The City organization has taken a national leadership role through Mayor Karen Weitkunat's appointment to the White House Task Force on Climate Resilience and Preparedness. Staff is assessing local vulnerabilities and proactively planning for impacts. Appendix A lists projects being planned and implemented for 2014.

> Sustainably yours, Dr. Rosemarie Russo, Coordinator

#### 2013 ClimateWise Platinum Partner Achievements

#### **Community Capacity Building:**

- Performed 381 home and 15 homeowner association sprinkler system audits, and 130 Healthy Home assessments.
- Supported 54 new solar sites with the Solar Rebate Program, adding 269 kW of capacity.
- Increased participation in the Green Energy Program and funded first community solar garden.
- Added a second Compressed Natural Gas (CNG) fueling facility and seven electric vehicle charging stations.
- Converted 56 golf carts from gasoline to electric at the Collindale Golf Course.
- Purchased three new electric Nissan Leafs and a CNG dump truck for Fort Collins Utilities Water Department.
- Generated \$600,000 by selling recycled asphalt, concrete and soils.
- Recycled 4,000 cubic yards of mulch, which was donated to citizens as well as used on City property.
- Donated 6,150 pounds of fresh produce to the Food Bank of Larimer County from the Garden of Eatin', and 2,467 pounds through the Plant it Forward Program.

#### **Operational Innovation:**

- Expanded screening project to repurpose dirt from excavation projects.
- Conducted seven energy and water audits on City buildings to improve efficiency and pilot new technology. New pressure valves and rotator sprinklers saved approximately 3.5 million gallons of water.
- Six community parks received Audubon Sanctuary certifications.
- Hosted summer and winter Bike to Work Days; 225 participated. 127 City staff biked to work 15 times or more and 51 participated in the Bike to Work Wednesday Challenge.
- Increased number of earned Well Days by 12 percent, with 758 employees participating in the Well Days Incentive Program.

#### **Department Accolades:**

#### One Planet Participation:

- Utilities Water Resources Divisions 100%
- Utilities Master Plan and Floodplain Administrative Division 92%
- Utility Customer Connections Department 88%
- Utility Regulation and Government Affairs Division 83%
- Utilities Electric Systems Engineering Division 69%
- Office Recycling Diversion Champions:
- City Hall West Complex 52%
- Lincoln Center 39%
- Gardens on Spring Creek 38%

#### National and State Awards:

- Recognized for exemplary Environmental Purchasing in the Office Depot Greener Purchasing Awards -- 1 of 30 awards from 17,000 organizations.
- Received a 3-STAR rating in the Sustainability Tools for Assessing and Rating (STAR) Community Program.
- The Forestry Division received Gold Leaf Award for outstanding Arbor Day programs.
- Recognized as Platinum
   Bicycle Friendly Community
   by the League of American
   Bicyclists.
- The Lincoln Center received LEED Gold Certification for the renovation and expansion.
- ClimateWise Platinum Level Partner Award (2009-2013).
- The Streets Department received the "Safe and Sustainable Snowfighting" award from the Salt Institute.
- Received Gold designation in relation to being a Solar Friendly Community.
- Received Robert Havlick Award for Innovation in Local Government from Transforming Local Government Conference for the new Sustainability Services Area division.
- Awarded the ICMA Center for Performance Analytics Certificate of Excellence.

#### **Measures that Matter**

Changes in the key City indicators between the 2005 baseline and 2013 demonstrate positive reductions. These indicators show progress based on a per capita or square foot measurement. The following indicators relate to key emission sources:

#### 2005-2013 Indicators:

- Total CO<sub>2</sub>e emissions: 7.6% decrease
- Per 1,000 sq. ft. CO<sub>2</sub>e emissions: 4 metric tons
- Per employee: 5 metric tons, a 37% decrease
- Per vehicle emissions: 0.8 metric tons decrease
- Electricity generated by clean, renewable energy onsite: 36 kW increase
- Change in tons of waste sent to the landfill: 52% decrease
- Carbon emissions from electricity: 9.4% decrease
- Conventional fuel use: 19% decrease
- Electricity used for traffic signals: 42% decrease
- Electricity use for water and wastewater production: 5.6% decrease



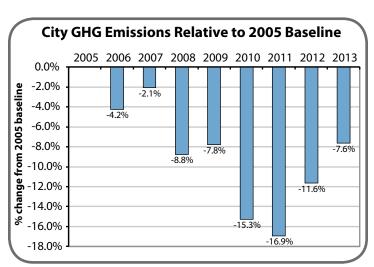
- Scope 1 (direct carbon emissions)<sup>1</sup>: 2,375 metric tons CO<sub>2</sub>e increase
- Scope 2 (energy indirect emissions)<sup>2</sup>: 3,490 metric tons CO<sub>2</sub>e decrease
- Scope 3 CO<sub>2</sub>e emissions (gases from waste to landfills, recyclables, personal vehicle travel, and air travels)<sup>3</sup>: 3,510 metric tons CO<sub>2</sub>e decrease
- Scope 1: Direct carbon emissions (i.e., natural gas, fuels) Scope 2: Indirect energy emissions (i.e., electricity)

1

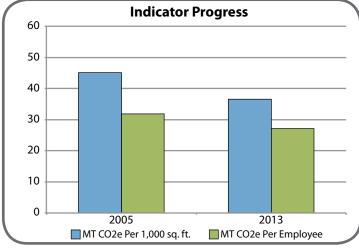
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3

Scope 2: Indirect energy emissions (i.e., electricity) Scope 3: Other indirect emissions (i.e., travel, landfill waste, recycling)



Graph 1 – Emissions Relative to 2005 Baseline



Graph 2 – Emissions Per Square Foot and Per Employee

#### Goal #1: Carbon

Reduce greenhouse gas (carbon) emissions from municipal operations at least 2% per year starting in 2009, 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: Waste Reduction and Recycling

Reduce solid waste from: public access facilities by 5% each year; municipal workplaces and offices by 10% by weight each year; and each industrial byproduct by 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, the general public — as well as internal customers.

#### **Goal #6: Funding**

Foster a culture of sustainability in the organization and advance municipal sustainability goals through various funding mechanisms (i.e., Innovation Fund, grants). Identify and implement innovative improvements to City facilities 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. 50% of urban Natural Areas acres will be maintained in a greater than 75% native vegetation condition by 2030.

#### Goal #8: Water

Reduce municipal operations water irrigation use and increase efficiency per acre. Reduce building water use 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 program fostering a culture of health and safety. Increase the number of employees that participate in the Well Days Program from 45% to 75% by 2020. Lower accident frequency and severity.

#### Goal #11: Local Food

Beginning in 2013, 20% of food purchased by staff for City functions will be grown within 50 miles or prepared by a local business by 2020.

Project	Social Benefits	Annual Estimated Environmental Benefits	Carbon Savings (MT CO <sub>2</sub> e)	Annual Financial Savings
Wastewater New Blowers	Resource conservation	1,800,000 kWh electricity saved	1,216	\$144,000
Water Treatment Plant Lighting	Safety and better lighting	214,574 kWh electricity saved	145	\$17,165
Water Treatment Filter Bay	Resource conservation	28,256 kWh electricity saved	24	\$2,260
EPIC Parking Lot	Safety and better lighting	46,446 kWh electricity saved	31	\$3,716
Transfort Lighting	Resource conservation	18,030 kWh electricity saved	12	\$1,442
Streets Parking Lot	Safety and better lighting	16,422 kWh electricity saved	11	\$1,313
Nix Parking Lot	Safety and better lighting	7,029 kWh electricity saved	5	\$562
Traffic Operation	Safety	3,671 kWh electricity saved	3	\$294
Ice Machine Replacement	Resource conservation	3,000 kWh electricity saved	2	\$240
Metal Recycling*	Resource conservation	578,277 lbs. recycled	3,935	\$168,797
Single-stream Recycling*	Resource conservation	536,852 lbs. recycled	772	Not calculated
Hoffman Mill Road Recycling*	Savings for residents	144,328 tons recycled	9,032	\$779,792
Electronic Plan Review	Resource conservation	13 lbs. avoided	6	\$87,000
Forestry Inventory & Mulch*	Savings for residents	2,087 tons mulched	3,073	\$10,000
Yardwaste Composting*	Soil enhancement	1,144 tons composted	1	Not calculated
Pool Filter	Safety	235,000 gallons of water saved	0.1	\$557
Library Low-Impact Development Project	Water conservation	100,000 gallons of water saved	0.04	\$237
Elm Street Parkway Xeriscaping	Beauty	25,000 gallons of water saved	0.01	\$60
Electronic Plan Review	Resource conservation	5,607 gallons of fuel saved	53	\$19,624
Electric Golf Carts	Cleaner air - better health	3,300 gallons of fuel saved	21	\$11,550
CNG Dump Truck	Cleaner air - better health	1,200 gallons for fuel saved	13	Not calculated
Two Stroke to Electric	Cleaner air - better health	995 gallons of fuel saved	9	\$3,482
Traffic Control Trailer	Cleaner air - better health	700 gallons of fuel saved	7	\$2,450
Three Nissan Leafs	Cleaner air - better health	479 gallons of fuel saved	0	\$1,676
Bike Fleet	Cleaner air - better health	30 gallons of fuel saved	0	\$105

\* On-going project + www.cngva.org

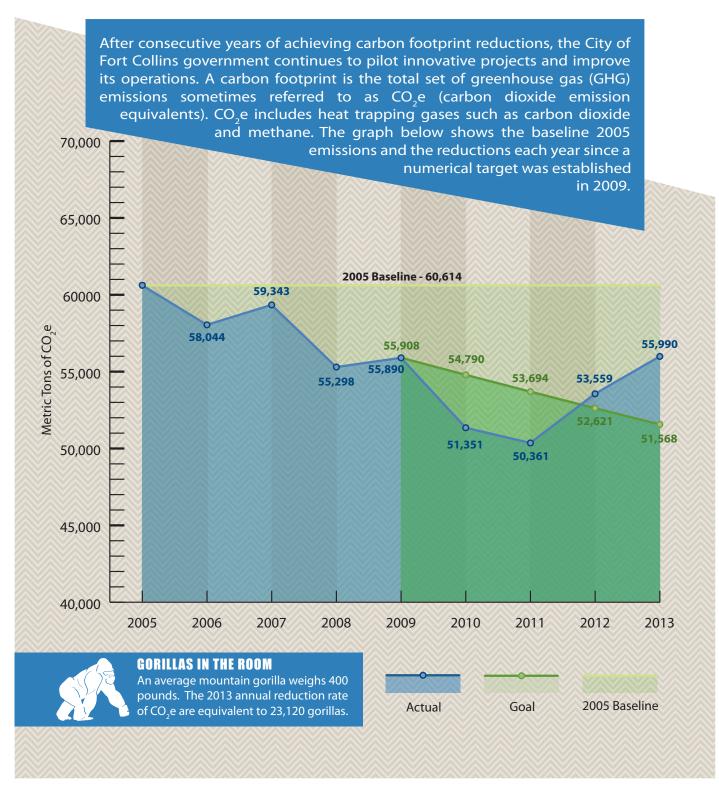
**Total Estimated Savings:** 

\$1,244,478

17,568

Table 1 – Co-benefit Project Ranking

# **Carbon Footprint Reductions**



Graph 3 – Carbon Footprint Reductions

#### Goal #1: Carbon

Reduce greenhouse gas (carbon) emissions from municipal operations at least 2% per year starting in 2009, 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.

#### **Benchmarks**

2005 Municipal Emissions: 60,614 MT CO<sub>2</sub>e

2013 Municipal Emissions: 55,990 MT CO<sub>2</sub>e

#### Significance

The City can provide regional leadership to reduce carbon dioxide equivalent emissions (CO<sub>2</sub>e) in a manner that supports local jobs and reduces the City's annual energy costs.

Given that electrical use is responsible for 59% of emissions, an interdepartmental team from Operation Services, Utilities and Environmental Services Departments conducted audits of six City buildings. Audits were conducted with a building champion. Select audits included applying community based social marketing techniques (i.e., department meetings, weekly prompts, pre- and post-occupant surveys, employee challenge competition, staff interviews, and training). Technical work included site audits, equipment replacements, control modifications and partial recommissioning.

Major modifications based on audit findings included installation of destratification fans, remodeling to address five-inch gaps in the building shell at the Transit Center. A redesign of Police Services server room and recommissioning of HVAC may be implemented depending on available funding. Equipment upgrades from inefficient hardware and watering devices resulted in water savings. Citywide building water use and water use per employee has decreased by 40%. Irrigation reductions are approximately 10% lower. Behavior-change results varied but were closely tied to strong building champions. For example, Streets had a 17% reduction of computers being left on and a 13% drop in staff utilizing energy- intensive space heaters.

#### Accomplishments

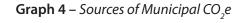
- Municipal emissions were reduced by 7.6% below 2005 baseline levels. A comparison of other cities' emission targets and progress are shown in Graph 3.
- Updated the "Green It, Mean It" website as an inspirational and educational resource. The site includes periodic progress reports, management reports (i.e., carbon reports, diversion and purchasing reports by departments), successes, tips, and resources.
- Monitored municipal carbon performance measures

for Community Dashboard.

 Identified and implemented at least three priority projects for each sustainability goal annually.

16% Natura Gas

• Implemented 12 Innovation Fund projects.



7% Vehicle

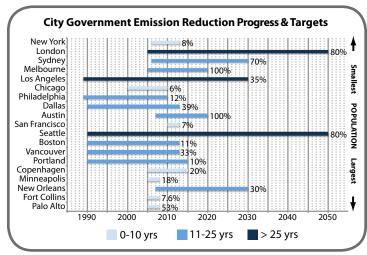
60%

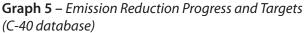
**Electricity** 

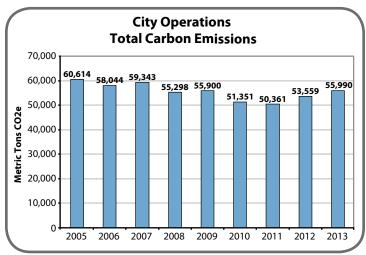
15%

Solid Waste

Travel









#### Goal #2: Electricity and Natural Gas

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.

#### Water Treatment Solar Farm

#### **Benchmarks**

- 2005 Electricity: 44,716,649 kWh Natural Gas: 107,133 Dth
- 2013 Electricity: 44,260,386 kWh Natural Gas: 169,945 Dth

#### **Emission Changes:**

Electricity: 3,490 MT CO<sub>2</sub>e ↓ Natural Gas: 3,339 MT CO<sub>2</sub>e ↑ Total Decrease: 151 MT CO<sub>2</sub>e

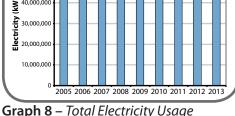
#### Significance

#### Electricity:

Electricity consumption is the primary source of carbon emissions. In 2013, the City government consumed 44,260,386 kWh of electricity at a cost of \$2,389,297.

The region's abundant geothermal wind and solar power generation resources could help transform the region's electrical generating system. The transformation has been started in part by state renewable energy portfolio standards and the City Energy Policy. However, on-site renewable distributed energy for

**City Operations** Total Natural Gas Usage 180,000 160,000 (**49**) 140,000 **g** 100,000 Natural 80,000 60.000 40,000 20,000 2005 2006 2007 2008 2009 2010 2011 2012 201 Graph 7 – Total Natural Gas Usage **City Operations** Total Électricity Usage 50,000,000 (hy) 40,000,000



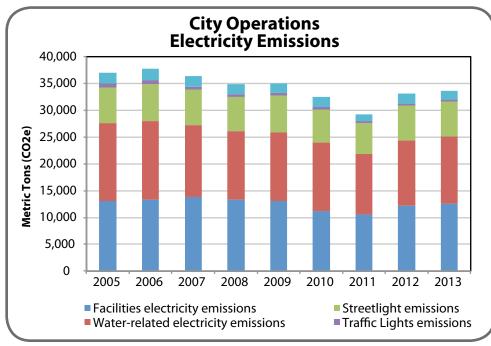
City owned facilities remains below 1%. As the regional climate becomes hotter and dryer, there will be less water available for the cooling of thermal plants which use about 40% of the surface water withdrawn in the US.<sup>3</sup> A large increase in the portion of power generated by renewable energy sources may be feasible at reasonable cost and could substantially reduce water withdrawals.<sup>4</sup> As evidenced by the Water Treatment Plant and CSU's solar plant, a strategic investment in renewables pays dividends, especially during the summer when electricity demands and costs peak. The City continues to experience rising electricity rates of approximately 4% annually.

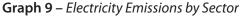
#### Natural Gas:

Although the raw consumption of natural gas has increased, natural gas is cleaner than energy produced from electricity, so overall emissions have been reduced. 2013 ranked as the 16th snowiest season in the 124-year snow season record and a particularly cold winter with a 4°F drop in temperature, so the increase may be due to the number of "heating" days.

#### Accomplishments

- Through a partnership with ENERGY STAR, staff measured and tracked energy performance of 70 City facilities.<sup>5</sup>
- Reduced plug loads and improved smart controls and building demand response at seven City facilities as part of Energy Audit Project.
- Employee education campaigns featured internal challenges that encouraged smart individual actions to promote organizationwide change in energy use.
- Wastewater Treatment Plant is working with the State of Colorado and the Colorado Industrial Energy Challenge to achieve a 15% reduction in overall energy usage.
- Employed integrative design to coincide with capital upgrades at Senior Center.







#### **Goal #3: Fuel Reduction**

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.

Bike to Work Winter Challenge

#### **Benchmarks**

- 2005 Conventional: 498,671 gallons Alternative: 34,017 gallons Total Fuel Use: 532,688 gallons
- 2013 Conventional: 406,216 gallons Alternative: 180,917 gallons Total Fuel Use: 587,133 gallons
- MT CO<sub>2</sub>e: 4878  $\rightarrow$  4059 = 819 MT CO<sub>2</sub>e decrease

#### Significance

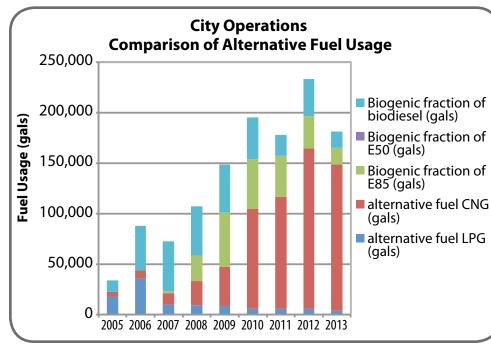
Fostering alternative transportation options has multiple benefits such as lowering emissions, cutting fuel expenditures, extending vehicle life, reducing reliance on foreign oil, and creating U.S. jobs in alternative fleet manufacturing. The City has been instrumental in modeling alternative fuel and vehicle technology in collaboration with Northern Colorado Clean Cities and Drive Electric Northern Colorado. The City's awardwinning fleet operates nearly 700 alternative fuel vehicles of the 1,600 in the fleet.

#### Accomplishments

- Although fuel use has risen, emissions have fallen due to the use of biogenic fuels.
- Purchased four bicycle repair stations. They were installed at 215 N. Mason, the Northside Aztlan Community Center, Transfort, and the Transit Center.
- Bike repair kits and training repair instructions were distributed to 117 N. Mason and Lincoln Center.
- Hosted Bike-to-Work Days and competitions (summer/winter).
   Participants collectively saved \$6,014 and avoided 16 lbs. of CO<sub>2</sub>e emissions.
- Participated in the Clean Cities Program.
- Purchased the following alternative transportation vehicles:
- 3 Nissan Leafs
- Obtained first Compressed Natural Gas (CNG) dump truck for Water Utilities. Installed a slow-fuel

appliance to fuel the truck at Utilities.

- Started operation of MAX Bus Rapid Transit system, which provides fuel-efficient mass transportation along the Mason Corridor.
- The City will be a national test community in conjunction with the Electrical Vehicle Coalition.
- Began an eco-driving training program for drivers of City vehicles that can improve fuel economy by 15%. Eco-driving provides department managers with a tool that has the potential to save the City 100,000 gallons of fuel, \$300,000 operating cost, and 1,000 tons of CO2 annually. A classroomtraining program was delivered to employees in the Natural Areas and Parks departments.





MAX Bus Rapid Transit

Graph 10 – Comparison of Alternative Fuel Usage

#### Goal #4: Waste Reduction and Recycling

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

#### **Benchmarks**

- 2005 Office Waste: 826 tons Industrial Waste: 29,180 tons Public Waste: N/A Office Recycling: 126 tons Industrial Recycling: 122,404 tons Public Recycling: N/A
- 2013 Office Waste: 717 tons Industrial Waste: 13,452 tons Public Waste: 290 tons Office Recycling: 268 tons Industrial Recycling: 146,710 tons Public Recycling: N/A

#### Significance

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, storm water detention pond cleanouts, and repair/maintenance of water and sewer pipes; and discarded "office" material from administrative buildings, shops, warehouses, and utility plants. The City decreased the amount of industrial waste sent to the landfill through an innovative project targeting the mixture of wet soil, concrete, rocks and metal that is generated by Utilities operations. These materials are now being dried, separated and then reused. This project saved \$96,000 in addition the benefits of reusing the materials. The program has been a resounding success, leading to a 45% decrease in materials sent to the landfill since 2012.

Green Cone Composter

Due to an increase in road projects, the amount of recycled concrete increased by 85% and asphalt by 24% since 2012. See Table 1 – Annual Ranking of Technical Innovation Projects.

#### Accomplishments

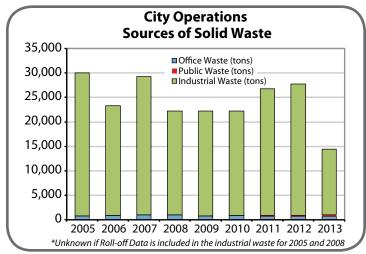
- Staff conducted recycling audits at 18 facilities. Equipment, signage and procedural changes were implemented to increase office and public recycling diversion rates.
- Forestry and Sustainability Services offered holiday tree

recycling for the public at three locations.

- The City continued to recycle old uniforms through Red Apple Recycling, a regional textile recycling company that donates a percentage of profits to local schools.
- Fort Collins Police partnered with the U.S. Drug Enforcement Administration for two National Prescription Drug Take-Back Day events. In April, citizens dropped off 993 pounds of unused, unneeded, and expired overthe-counter and prescription medications and an additional 974 pounds in October.



**Graph 11** – Solid Waste Diversion Rates



Graph 12 – Sources of Solid Waste



#### **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, the general public — as well as internal customers.

#### Pedal It Forward Energy Harvesting Bikes

#### Benchmarks

2005 30 training seminars

2013 55 training seminars

#### Significance

Education is critical to the success of any initiative, especially if it requires a behavior change. City staff incorporated strategies for promoting pro-environmental behavior based on research from environmental psychologists, conservation psychologists, and community-based marketing techniques.

#### Accomplishments

- Conducted 10 engagement challenges in 2013. Cumulative savings were \$864,341 and a 4,003 MT CO2e reduction.
- Highlighted rooftop solar installation at Discovery Museum and 215 N Mason through education exhibits.

- Maintained internal and external Sustainability websites. The internal site includes, but is not limited to: Sustainable Purchasing Guidelines, recycling guidelines, challenges, current articles, numerous presentations, a lending library, and scholarship application information.
- Hosted training sessions and movies for staff and ClimateWise partners.
- Launched a new sustainability TV series called Full Circle.
- Assisted Old Town Library on a Recycling Challenge involving 35 participants.
- 53% of the Utilities workforce participated in the One Planet Program, which supports sustainability and employee engagement. Participation increased by 17% from 2012 and the completion rate was 87%.



- The Environmental Services, Economic Health and Utilities Departments, along with the Colorado Clean Energy Cluster, hosted the second annual Net Zero Cities Conference, featuring 70 speakers from 15 countries.
- Garden of Eatin' Education Program hosted seed to table programs throughout the growing season.
- The Social Sustainability Department presented a Suicide Prevention/Awareness message to City employees participating in the Well Days Program and provided poverty training within the City to community members and staff.
- Offered 630 courses through the Talent and Rewards Program.

Challenge	Water Savings (gallons)	Fuel Savings (gallons)	Energy Savings (kWh)	Carbon Savings (MT)	Financial Savings	Social Benefits
Mayors Water Challenge*	19,845,387	146,233	17,949,668	3036	\$846,099	Promotes employee and community engagement
Give-A-Watt			1,984,062	120	\$7,974	Less air pollution - better community health
Pedal It Forward				643	\$2,257	Community engagement
Adopt-A-Family			229,950	195	\$1,301	Reduces growing number of families living in poverty
BTW Summer Challenge		866		8	\$3,031	Increased public health
BTW Day – Summer		497		5	\$1733	Improved air quality - better community health
Parks Recycling				3	\$94	Resource conservation
BTW Winter Challenge		348		3	\$1,218	Increased public health
Kids Water Challenge	1,258,570			1	\$410	Community education
BTW Day – Winter		9		0.09	\$32	Reduction in obesity levels
Totals	21,103,957	147,953	20,163,680	4,014	\$864,149	

\*Data provided by Wyland Foundation

 Table 2 – Behavior Change: Challenges

#### Goal #6: Funding

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 facilities and operational procedures that are not otherwise funded.

#### **Benchmarks**

- 2005 Innovation Fund: N/A Sustainability Scholarship: N/A (began 2006)
- 2013 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

A Waste Innovation Improvement Fund was available through funds paid in lieu of landfill tipping fees by departments who self-hauled waste to the landfill.



#### Significance

Establishing secure sources of funding is imperative to advancing the sustainability program. The Municipal Government Sustainability Management Plan contains 11 goals. The majority of successful projects have been funded through federal grants that are no longer available. A "Green to Gold" BFO was submitted in 2014 to support sustainability projects. The Innovation Fund is a mechanism used with increasing frequency and success across the City as a way to seed efficiencies, encourage innovation, and leverage savings into greater efficiency.

#### Accomplishments

- The Sustainability Scholarship Program has awarded 84 employees up to \$800 for sustainability trainings, conferences, certifications, etc. Recipients share material with the Sustainability Team or their department to increase employee knowledge, empowerment, and motivation.
- In 2013, 24 proposals were received and 12 projects funded through the City's Internal Innovation Fund.
- Waste Innovation Fund awards included recycling bin purchases and dirt screening equipment.

#### Goal #7: Parks/Natural Areas

Maintain a 30% forest canopy density in suitable areas of City parks and 50% of urban Natural Areas acres will be maintained in a greater than 75% native vegetation condition by 2030.

#### **Benchmarks**

#### *Forest Canopy/Native Vegetation* 2005 Data not available

2013 30% forest canopy in suitable areas of City Parks27% of urban Natural Areas exceeds 75% native vegetation

#### Significance

Forest canopies aid in: carbon dioxide absorption; shade and reduced air conditioning needs; increased property values; storm water absorption; traffic calming along streets and pedestrian buffers from vehicles; and, habitat for wildlife. Natural Areas supports cultivating native species to promote and restore biodiversity.

#### Accomplishments

- Lee Martinez Park was recertified as an "Audubon Sanctuary." All six certified community parks have recertification built into program management.
- With financial resources from the Innovation Fund, Forestry purchased a GPS system to complete an accurate inventory of City trees, including health and

damage assessments. The tree inventory is used to determine the location and size of future street tree plantings.

- Park Planning and Park Maintenance are working together on designs to maximize "no mow areas," while providing parks that meet the needs of the community.
- Visitation to the parks and trail system exceeded three million in 2013.
- The Downtown Botanical Crew planted 1,100 perennials that were grown in-house at the Gardens on Spring Creek.
- City Park Nine golf course achieved full Audubon certification in 2013. South Ridge and Collindale are in the process of completing two more categories (water quality and public outreach) to achieve full certification.
- The Forestry Division planted 323 trees.
- Natural Areas sponsored 41 service projects involving 920 volunteers who donated 2,878 hours, a value of \$63,719.
- · Natural Areas worked with



Colorado Parks and Wildlife to successfully reintroduce Northern Redbelly Dace (Phoxinus eos), a small native fish, to Spottlewood Creek located within Soapstone Prairie Natural Area.

- Natural Areas received notice from the U.S. Fish and Wildlife Service that its allocation request for black-footed ferrets was approved and that Soapstone Prairie Natural Area and Meadow Springs Ranch meet all the requirements to become a new reintroduction site for this federally endangered species.
- Natural Areas removed the abandoned Josh Ames diversion structure with funding support from Colorado Water Trust. Part of a larger ecological restoration project at North Shields Ponds Natural Area, this project reconnected in-channel habitat for fish with the removal of the dam and reconnected the river with the floodplain by lowering the steep banks to allow for spring flows to regenerate the cottonwood forest and wetlands.

Pineridge Natural Area



#### Goal #8: Water

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



#### **Benchmarks**

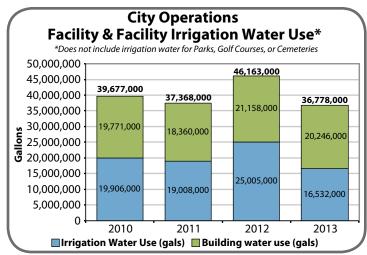
- 2010\* Building Water: 19,771,000 gallons Outdoor Water: 19,906,000 gallons Total Use: 39,677,000 gallons \*(2005 data is not available,)
- 2013 Building Water: 20,246,000 gallons Outdoor Water: 16,532,000 gallons Tota Use: 36,778,000 gallons

#### Significance

Generally, over 50% of potable water (for both commercial and residential customers) is used for irrigation, making irrigation efficiency one of the easiest ways to reduce potable water consumption. The City uses water to maintain parks and street medians, and operate City facilities. Using native, drought-tolerant landscaping represents one way to decrease the demand for landscape irrigation and address climate change adaptation strategies.

#### Accomplishments

- The Parks Department developed a Drought Response Plan. After 2013's shortage response plan was lifted, all park, golf and cemetery areas resumed irrigating at 90% of plant evapotranspiration.
- ESD, Operation Services and Utilities conducted water audits at 215 N. Mason, 281 N. College, Senior Center, and Operation Services. Building water use has been reduced by 40% and irrigation use by 10%.
- Parks Water Conservation Team audited five sites.



Graph 13 – Water Use

#### 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 purchases annually starting in 2013.



#### **Benchmarks**

2005 No data available

2013 Industrial: 16% of purchases met sustainable criteria Office: 43% of purchases met sustainable criteria\* \*Based on limited data from two vendors.

#### Significance

The City's purchasing strategies have driven change in the broader marketplace through its purchasing power and inclusion of sustainability language in standard RFPs. The City purchases large quantities of cleaning supplies, paper products and computers. Ensuring that these products meet sustainable criteria provides a model to the ClimateWise partners and business community.



Leader in Greener Purchasing National Award Ceremony

#### Accomplishments

- Established tools and increased the tracking of sustainable office and industrial products.
- Established sustainable vehicle replacement criterion. An economic and physical analysis is performed on all vehicles.
- Selected as a Leader in Greener Purchasing for Local Government Sectors by Office Depot. The leadership awards were based primarily on the percentage of customers' expenditures on products with greener attributes including ability to be recycled or remanufactured; energy-efficient; non-toxic; and/ or eco-labels such as Forest Stewart Council (FSC), Electronic Product Environmental Assessment Tool (EPEAT), GREENGUARD, GreenSeal, EcoLogo, etc.
   "Our winners are an elite group at the forefront of purchasing practice in the 21st century," said Yalmaz Siddiqui, Senior Director of Environmental Strategy for Office Depot.
- Established criteria and definition for sustainable purchases.
- Implemented fields in the City's financial tracking system for sustainable purchases by commodity.
- Launched new internal Sustainable Purchasing web site and updated external site.
- Incorporated Sustainability & Triple Bottom Line into Request For Proposal Evaluation Matrix.
- Completed implementation of Sustainable Purchasing Policy.
- Enrolled in the State Electronics Challenge (SEC).
- Mandated Office Depot as the exclusive vendor for office supplies.
- Mandated the purchase and use of 30% post-recycled content (PRC) paper.

#### 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 Well Days Program from 45% to 75% by 2020. Lower accident frequency and severity.

# Bike to Work Day registration

#### **Benchmarks**

Safety

- 2005 No data available
- 2013 Developing data for recordable accident frequency, total injury costs, days worked, modified and days lost.

#### Wellness

- 2005 No data available
- 2013 781 City employees earned 1,594 Well Days - a 2.5% increase in participation and an 11% increase in engagement since 2012.

#### Significance

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 City employees and citizens are exposed to in their daily activities.

Climate change affects human health in many ways including but not limited to heat- and cold-related deaths and illnesses, and increases in asthma and allergy-related symptoms (e.g. ragweed pollen). Warmer temperatures and later fall frosts also allow plants to produce pollen later into the year, prolonging the allergy season. The City continues to address climate change and proactively manage staff health and well-being.

#### **Accomplishments**

- Established the Safety Leadership Team to increase management engagement.
- Developed the Hazard Reduction Fund and awarded six projects.
- Increased engagement in **Employee Wellness Programs.**
- 93% of employees participated in the Mayo Clinic Health Assessment totaling 1,282 employees (a 4% increase over 2012) and 234 spouses (a 1% increase).
- More than 781 employees participated in the 2013 Well Days Incentive Program and the number of Well Days earned increased by 12% over last year. The program has resulted in 33% lower health claim cost for participants vs. nonparticipants.
- More than 1,000 people attended the Wellness Fair.

Event	Participants	Impacts
Bike to Work Day - Summer	219	
Bike To Work Summer Challenge	127	
Bike to Work Day - Winter	6	
Bike to Work Winter Challenge	51	
Totals	403	17 MT CO,e

 Table 3 – Active Transport

Bike to Work Challenge



#### Goal #11: Local Food

Beginning in 2013, 20% of food purchased by staff for City functions will be grown within 50 miles or prepared by a local business by 2020.

#### Benchmarks

2005 Data not available

2013 8%

#### Significance

Much of the food we eat comes from sources hundreds or thousands of miles away. In many U.S. communities, less than 3% of food consumption is locally grown or produced. Sustainable, local and organic food production and distribution strategies have enjoyed broadened community support in recent years. 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 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 such as reducing obesity and increasing access to healthy food.

Climate change, especially in the Southwest, poses a threat to agriculture. Extreme weather affects the market value of fruits and vegetables more than any other crops because the high water content and because sales depend on good visual appearance.<sup>7</sup> The combination of longer frost free seasons, less frequent cold air occurrences and more frequent heat waves accelerates crop ripening and maturity, reduces yields of corn, tree fruits and grapes, stresses livestock and increases agriculture water consumption.<sup>8,9</sup>

#### Accomplishments

 In 2013, the City organization adopted a local food goal and provided leadership for the Local Food Cluster.



- Parks, Social Sustainability and Neighborhood Services departments constructed four community gardens in Rogers, Edora, Buckingham and English Ranch Parks.
- 1,034 vegetable seedlings were donated to organizations and individuals growing food for low-income populations.
- Students at Rocky High School and Webber Junior High School helped harvest crops at On the Vine CSA for Make a Difference Day.
- Webber Junior High students grew herbs that were given to local restaurants using produce from local farmers and ranchers.
- The City joined LoCo Foods Distribution as a buyer, allowing wholesale purchasing of locally grown or made products.

Make a Difference Day at On the Vine CSA with Webber Junior High



CSA Fair

#### **Department Projects and Champions**

#### Carbon:

• Adopted Architecture 2030 standards for new construction of City facilities.

#### Electricity:

- The Energy Audit Team implemented TBL strategies throughout municipal buildings by replacing 1,500-watt space heaters with 11-watt floor mats and 15-watt chair liners. Destratification fans and insulated blinds were also installed. Equipment replacements increased occupant comfort and productivity, while reducing energy use and carbon emissions. Lighting and plug retrofits are expected to lower energy output by 50%.
- Water Treatment Plant is planning a small hydrogeneration electric power project.

#### Fuel Reduction:

- Collindale Golf Course basement was converted to accept electric carts. All 56 player carts are electric. Customers preferred using electric carts, staff time was reduced on the O&M and electric carts are quieter than gas. The switch to electric is estimated to reduce annual greenhouse gas emissions by 21 MT CO2.
- Two Electric Vehicle (EV) charging stations located at the Museum of Discovery as well as two in the Civic Center Parking Structure supports residents adopting an environmentally friendly form of transportation. One of the charging stations at the Museum of Discovery is a "Level 3" DC Quick Charger that can recharge an electric vehicle in 20 to 30 minutes, the first in the Rocky Mountain Region.

#### Waste Diversion:

 Fort Collins became the first community in the state and region to pass an ordinance banning the landfill disposal of cardboard. In only nine months, curbside cardboardonly collection from businesses increased by 95% and by 9% at the City's Recycling Drop-Off Center.

#### Education and Outreach:

- Environmental Services began a program to train drivers of City vehicles in eco-driving skills, which can improve fuel economy by15%. Eco-driving provides department managers with a tool that has the potential to save the City 100,000 gallons of fuel, \$300,000 in operating costs and 1,000 tons of CO2 annually.
- Implemented behavior change programs at several City buildings.

#### Parks/Natural Areas:

• The Forestry Division received a grant from the Innovation Fund to help purchase a small solar charging system. The message system is trailer mounted, allowing Forestry to reduce fuel usage and vehicle operating costs. Due to size and functionality, this unit improved safety because the LED lights provide superior visibility.

 Forestry implemented a GIS-based tree inventory system. 18,000 trees were inventoried which is approximately onethird of City-owned trees.

#### Water:

- In cooperation with the Poudre River Libraries, a number of City Departments collaborated on a Low Impact Development (LID) project using the City's Innovation Fund to transform a stagnant pool of water into three flower beds that improve aesthetics, safety, water conservation (the garden irrigates itself and the turf nearby), drainage, and water quality. The interpretive signs serve as an educational tool. Rain and snowmelt running off nearby buildings and hard surface areas is now directed into a series of 3 rain gardens. Rainwater feeds the landscape areas in these rain gardens and gets filtered through the soil media. The water in the lower basin will also evaporate, cooling the area.
- CSU is delivering 1,000 lbs./day of pulp food waste to the Waste Water Treatment Plant to be injected into the facility's bio-digester (i.e. heat recovery).

#### Purchasing:

- Purchasing outreach resulted in a 10% increase in sustainable industrial purchases and an 11% increase for office supplies.
- Martinez Farm harvested 1,139 bales of hay from three Storm Water fields on Vine Street, saving \$8,987.

#### Safety and Health:

- Streets installed new Road Weather Information System (RWIS) sites at Harmony and Prospect. These sensors will aid in snow removal by analyzing and modifying the amount of de-icer applied.
- The Social Sustainability department worked with service providers to create a temporary severe weather shelter for homeless people.

#### Local Food:

- 60 volunteers worked on local food projects for a total of 240 hours. Projects included enhancing gardens at Affordable Housing units and assisting local CSAs.
- Staff developed local farm and restaurant guidance documents, joined LoCo Distribution as a buying member, and conducted a City survey to determine baseline purchases.
- Gardens on Spring Creek partnered with PSD to host a Farm to School Workshop and develop school garden guidelines.

The City organization has strengthened sustainability initiatives through the Sustainability Services Area (SSA), made up of the Economic Health Office (EHO), Social Sustainability department (SSD) and Environmental Service department (ESD). SSA represents an innovative and unique approach to local governance. The SSA approach is reflected in the collaborative efforts between ClimateWise and SSD and its launch of ClimateWise Social Superstars in 2012. As a cohort, the 2013 Social Superstars have made a positive social impact by dedicating over \$180,000 in resources and more than 7,800 hours of time. These efforts have directly benefited more than 100 organizations in our community.

#### Accomplishments

- EHO staff provided leadership on Economic Health issues throughout the community via numerous positions on various boards.
- SSD completed a Social Sustainability Gap Analysis to help inform the Social Sustainability Strategic Plan that will identify roles, priorities and actions for the City organization over the next 5-6 years.
- 43 elderly or disabled residents received snow-shoveling assistance from Adopt-A-Neighbor volunteers.
- The Colorado Water Innovation Cluster (CWIC) obtained 501(c)3 tax exempt status. The City provided challenge-grant funding (\$25,000), which was matched by \$31,000 in private sector investment.
- Northside Aztlan Community Center hosted:
  - Free showers during the September flood.
  - Cinco de Mayo with more than 10,000 people in attendance.

- Toys for Kids (December), which served approximately 350 kids.

- Toothbrushes, toothpaste and new socks were donated to more than 1,000 people being housed at Timberline Church during the flood.

- Staff members raised more than \$1,000 for United Way through the Employee Chili Cook-off.
- Students at CSU and Webber Junior High exchanged incandescent bulbs for new CFLs; the old bulbs were transformed into Christmas tree ornaments. The ornaments were packaged with energy and water saving devices and donated to the Rocky Mountain High School "Adopt-a-Family" Program.
- The solar rebate program supported 54 new sites, adding 269 kilowatts of capacity. Platte River Power Authority (PRPA) contracted to purchase 32 megawatts of new wind energy in eastern Colorado, which will be added to member communities' resource mix. The Fort Collins Solar Power Purchase Program was developed to add approximately five megawatts of new, locally installed solar systems.
- Fort Collins' Solar Rebate Program was launched in 2013. The available funding of \$500,000 for 20-year purchase power agreements was fully subscribed and letters of interest were above the available \$500,000 funding. The Solar Garden Program was implemented. The combination of the Solar Program and the new 32-MW

of wind production that PRPA is purchasing will meet the milestone of "6% of energy sold by 2015" in the Colorado Renewable Energy Standard (CRES).

- A collaborative Fall Clean Up between Neighborhood Services and CSU's Off-Campus Life Office matched more than 1,000 CSU student/staff with 171 neighborhood projects.
- Lindsay Ex, Planning, received a CanDo Champion award for urban agriculture code changes.
- Waste Reduction and Recycling Program (WRAP) provided more than 10,000 residents new recycling opportunities.
- City Council passed a resolution supporting a Friendship City relationship with San Cristobal de Las Casas. An initial visit and exchange was conducted.
- City Council adopted new goals for the community to recycle or compost 75% of its waste by 2020 and to reach zero waste by 2030. A second measure adopted is for the community to reduce its generation of landfill material to 2.8 pounds per capita per day by 2025.
- Debra Bueno was awarded the Community Leadership Impact award for service to the low income and Hispanic community for over 30 years.
- The Social Sustainability department allocated more than \$800,000 to 27 non-profit agencies providing assistance to low-moderate income citizen. In addition, \$1.75 million was allocated to affordable housing providers and the City's Homebuyer Assistance Program.
- CSU students conducted research to provide guidance on the role of Social Sustainability in the City.
- Sharon Thomas, Social Sustainability, received Women's Resource Center's "City Champion" award.
- Social Sustainability facilitated the transaction shifting ownership of the Murphy Center from United Way to Serve 6.8 with a smooth flow of services to homeless and near homeless people.

Slowly melting snowpack is key to benefit both the water supply and ecosystem health of the Fort Collins community. Increased temperature from climate changes could increase the cost of maintenance and treatment requirements for our drinking water supply and wastewater. The City's International Standards Organization-certified Water and Wastewater Treatment Plants are innovative; however, these facilities use more energy than the other 70 City buildings combined. Due to proactive management since 2005, electricity use has decreased by 6% in spite of increasing population served. The Water departments addressed adaptation strategies beginning in 2008 and have identified key vulnerabilities and options to address high risk and vulnerable scenarios. Additionally, in 2013, 17 City departments participated in another round of adaptation planning workshops to further identify organizational, infrastructure and service vulnerabilities. This effort is part of an ongoing effort to plan and address risks to the City's business continuity and services from anticipated climate change in the next 25-50 years.

Impacts on the local and regional climate have already been observed through the appearance of new diseases and invasive species threatening vegetation. Thousand Canker Disease (TCD) of black walnut was discovered in Fort Collins in 2011. Since then, walnut trees throughout the City have become infected. With its rapid spread, this disease has become a significant challenge to manage. Additionally, Emerald Ash Borer was recently detected in trees in Boulder. Preparing for this insect's arrival in Fort Collins is very important. When the Emerald Ash Borer gets to Fort Collins, there will be a huge impact to the community's urban forest. The increase of invasive species such as these insects and others is likely to be an on-going problem with climate change. as well. National studies indicate that highly vulnerable (e.g., people less able to recover from natural disasters due to age, race, or income) make up approximately 18% of the at-risk population.<sup>10,11</sup> Closer to home, the September 2013 floods and the Social Sustainability Gap Analysis revealed some inability to meet basic residential needs. For example, there was not a facility prepared to process donated produce for the number of individuals in some emergency shelters.

Change

Ahead

Extreme temperatures will also affect City services such as street maintenance. According to a national business report, the more extreme heat events will lower labor productivity by as much as 3 percent for the construction sectors.<sup>13</sup> The Fort Collins region is expected to endure these productivity-diminishing heat effects.<sup>14</sup> Other costly impacts identified are lost agricultural capacity and increased energy demand.

President Barack Obama named Mayor Karen Weitkunat, to a 26-member Task Force on Climate Preparedness and Resilience made up of state governors, mayors, and other local officials. Mayor Weitkunat, as part of Task Force, will advise the President on how the federal government can best prepare communities for the impacts of climate change and to help speed recovery in cases of disasters. The Task Force is making recommendations for the modernization of federal grant and loan programs to more effectively support local resilience efforts. The Task Force has aligned its efforts into four main areas – disaster recovery and resilience, built systems (energy, water, transportation and facilities), natural resources and agriculture, and communities (human health and community development).

Looking ahead, staff is researching additional adaptation options described below.

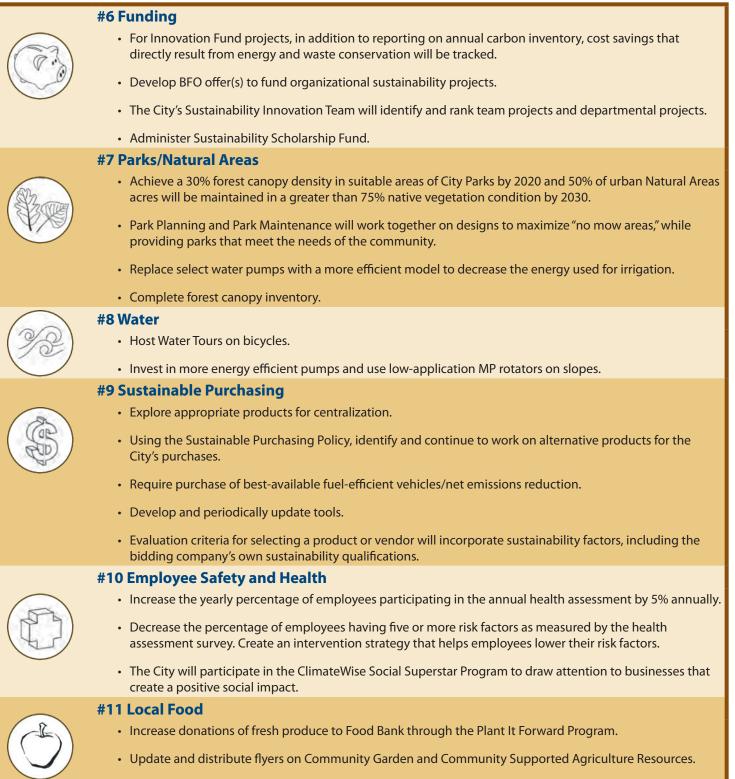
Escalating Effects	Potential Response Strategies
Heat stress due to lack of access to air conditioning and insufficient shade trees near low-income residents and outdoor City workers.	Increased tree planting around Affordable Housing units to lower temperatures. Plus, trees absorb approximately 1/5th of U.S. carbon emissions. <sup>12</sup>
Aggravation of respiratory and heart disease due to excessive heat.	Establish multiple cooling centers in highly efficient facilities with access to renewable energy sources near vulnerable populations.
Increased ground-level ozone heat waves can lead to respiratory distress.	Pilot installation of white and blue roofs and reflective parking lots or bike lanes.
Warmer seasons lead to shifts and distribution of disease transmitting mosquitoes.	Pilot use of Integrated Pest Management (IPM) techniques (i.e. bats) and less toxic pesticides and insecticides, and select use of insecticides for specific trees (i.e. Emerald Ash).

Vulnerabilities apply beyond natural ecosystems to citizens

#### Table 4 – Potential Response Options



### **Appendix A** — Implementation Schedule Continued



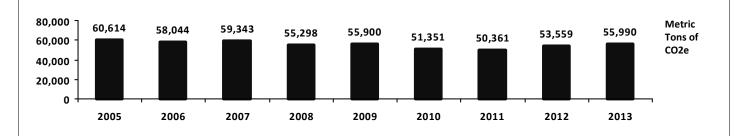
Join LoCo and CSA to increase availability of local produce at low cost.

# Fort Collins Comparative Municipal GHG Report

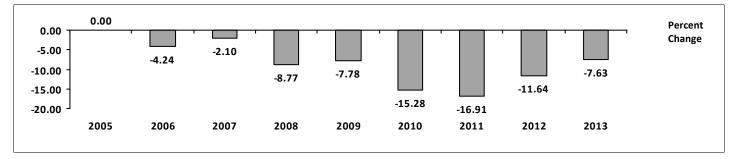
#### **Total Municipal GHG Emissions By Year**

<b>Year</b> 2005	<b>Total GHG Emissions (mt CO2e)</b> 60,614	Yearly % Change	% Change Since Baseline 2005 0.0%
2006	58,044	-4.2%	-4.2%
2007	59,343	2.2%	-2.1%
2008	55,298	-6.8%	-8.8%
2009	55,900	1.1%	-7.8%
2010	51,351	-8.1%	-15.3%
2011	50,361	-1.9%	-16.9%
2012	53,559	6.3%	-11.6%
2013	55,990	4.5%	-7.6%

#### Metric Tons of CO2e Emissions by Year



#### Percent Change in GHG Emissions from 2005 Baseline



GHG Report



#### **Scope 1- Direct GHG Emissions**

GHG Source	Quantity Used	Cost	MT of CO2e
Fleet- Gasoline Consumption	298,983 g	allons \$0	2,625.07
Fleet- LPG Consumption	177,530 g	allons \$0	102.79
Fleet- CNG Consumption	4,562 g	allons \$0	0.25
Fleet- Diesel Consumption	152,881 g	allons \$0	1,560.92

	Biogenic	Conventional		*emissions from con	ventional fuel only
Fleet- E50	0	0	gallons	\$0	0.00*
Fleet- E85	0	0	gallons	\$0	0.00*
Fleet- B10	0	0	gallons	\$0	0.00 *
Fleet- B15	0	0	gallons	\$0	0.00 *
Fleet- B20	11,702	46,807	gallons	\$0	477.90 *
Transporation Subtot	al	680,763	gallons	\$0	4,766.93
Facilities Natural Gas Co	onsumption	86,190	dTh	\$696,798	4,581.53
Water-related Natural O	Gas Consumption	20,942	dTh	\$0	1,113.21
Natural Gas Subtotal		107,133	dTh	\$696,798	5,694.74
Scope 1 Subtotal				\$696,798	10,461.67

#### **Scope 2- Energy Indirect GHG Emissions**

GHG Source	Quantity Used		Cost	MT of CO2e
Faclities Electrical Consumption	15,760,580	kWh	\$416,164	13,061.14
Water-related Electrical Consumption	17,514,981	kWh	\$0	14,515.05
Streetlight Electrical Consumption	8,123,199	kWh	\$0	6,731.87
Traffic Signal Electrical Consumption	907,818	kWh	\$0	752.33
"Other" Electrical Consumption	2,410,071	kWh	\$0	1,997.28
Scope 2 Subtotal	44,716,649	kWh	\$416,164	37,057.67

#### **Scope 3- Other Indirect GHG Emissions**

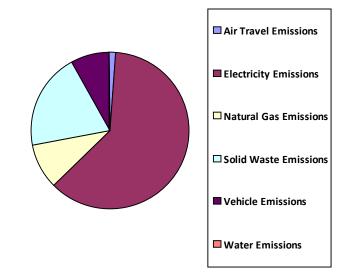
GHG Source	Quantity Used	Cost	MT of CO2e
Travel in Personal Vehicle (Reimbursed)	133,553 miles	\$50,817	66.25
Air Travel (Reimbursed )	311,146 miles	\$0	852.08
Office Waste from Municipal Facilities	826.00 tons	-	594.79
Industrial Waste from Municipal Facilities	29,180.00 tons	-	11,581.54
Public Waste	0.00 tons	-	0.00
Scope 3 Subtotal		\$50,817	13,094.67
Total Metric Tons of CO2e:			60,614.01

GHG Report

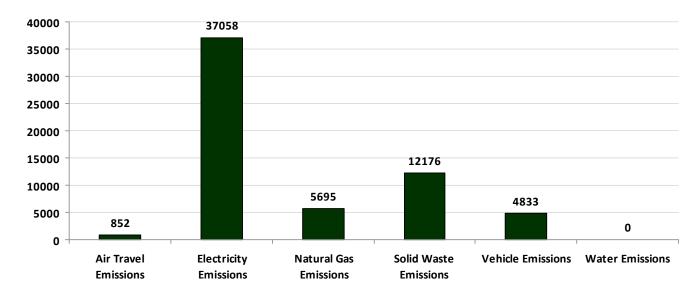


# **Municipal CO2e Emissions by Source**

Emission Source:	Metric Tons CO2e:	%
Electricity Emissions	37,057.67	61.1%
Solid Waste Emissions	12,176.34	20.1%
Vehicle Emissions	4,833.17	8.0%
Natural Gas Emissions	5,694.74	9.4%
Air Travel Emissions	852.08	1.4%
Total	60,614.00	100.0%



#### Metric Tons of CO2e by Emission Source

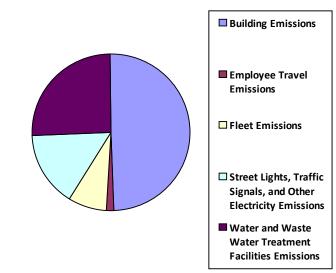


GHG Report

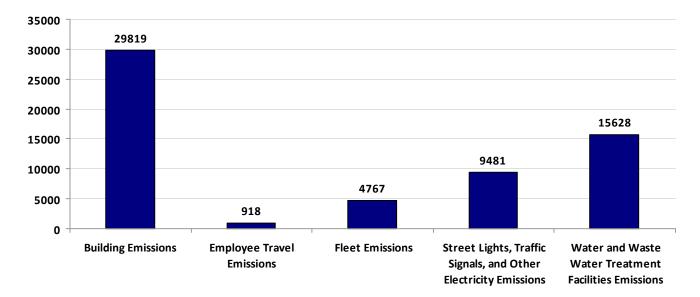


# **Municipal CO2e Emissions by Sector**

Municipal Sector:	Metric Tons CO2e:	%
Buildings Emissions	29,819.01	49.2%
Water and Waste Water Treatment Facility Emissio	15,628.26 ns	25.8%
Street Lights, Traffic, Signals and Other Electricity Emiss	5,401.40	15.6%
Fleet Emissions	4,766.92	7.9%
Employee Travel Emissions	918.33	1.5%
Total	60,614.00	100.0%



#### Metric Tons of CO2e by Municipal Sector



GHG Report

#### **Detailed Recycling Breakdown**

#### Recycling

Material	Quantity	Cost	MT of CO2e
Cardboard	48,880.28 lbs	-	-63.41
Aluminum	59.48 lbs	-	-0.45
Plastic	5,310.32 lbs	-	-3.93
Newsprint	45,951.03 lbs	-	-79.85
Mixed Office Paper	122,651.72 lbs	-	-186.93
Magazines	6,012.15 lbs	-	-6.76
Commingled	23,087.03 lbs	-	-34.77
Residue	0.00 lbs **	-	-
Office Recycling Total	251,952.00 lbs		-376.09

#### Scrap Metal

\*\* included in Landfilled waste - Scope 3

Material	Quantity	Cost	MT of CO2e
Aluminum	0.00 lbs	\$0.00	0.00
Copper	0.00 lbs	\$0.00	0.00
Brass	0.00 lbs	\$0.00	0.00
Steel	0.00 lbs	\$0.00	0.00
Mixed Metal	0.00 lbs	\$0.00	0.00
Crushing Facility	0.00 lbs	\$0.00	0.00
Material	Quantity	Cost	MT of CO2e
1.25 inch crushed concrete	18,303.59 tons	\$0.00	-
1.25 inch dirt and rock road base	0.00 tons	\$0.00	-
1.25 inch recycled asphalt	103,544.23 tons	\$0.00	-
	121,847.82 tons	\$0.00	
Other			
Material	Quantity	Cost	
Wood mulching	232.00 tons	\$2.00	-
Electronics	111.00 tons	\$12.00	-
Yard trimmings	213.00 tons	\$233.00	-
	556.00 tons	\$247.00	MT of CO2e
Industrial Recycling Total	122,403.82 tons	\$247.00	0.00



GHG Report



#### **Biogenic emissions from biofuels**

	Conventional	Biogenic		Cost	MT of CO2e
Fleet- E50	0	0	gallons	\$0	0.00
Fleet- E85	0	0	gallons	\$0	0.00
Fleet - B10	0	0	gallons	\$0	0.00
Fleet - B15	0	0	gallons	\$0	0.00
Fleet - B20	46,807	11,702	gallons	\$0	110.58
Fleet- B100		0	gallons	\$0	0.00
Fleet - Biofuel Total		11,702.00	gallons	\$0.00	110.58

#### **Indicator Breakdown**

Indicators	Annual Metric Tons CO2e Generated Per Indicator			
Number of City of Fort Collins Employees	1,898	Per Employee	31.93573	
Square Footage of Municipal Buildings	1,495,847	Per 1,000 Square Ft.	40.52153	
Number of Fleet Vehicles	917	Per Fleet Vehicle*	5.19840	
City of Fort Collins Annual Budget	\$465,122,000	Per \$100 of Budget	0.01303	

\*Only takes into account GHG Emissions from Fleet fuel use.

#### **Additional Data**

Total Water Use	93,356,584	gallons
Per Employee Water Use	49,187	gallons
Summer High Temperature (Fahrenheit)	103	degrees
Winter Low Temperature (Fahrenheit)	-10	degrees

GHG Report



#### **Scope 1- Direct GHG Emissions**

GHG Source	Quantity Used		Cost	MT of CO2e
Fleet- Gasoline Consumption	258,250	gallons	\$799,030	2,267.43
Fleet- LPG Consumption	3,914	gallons	\$6,372	22.66
Fleet- CNG Consumption	144,518	gallons	\$325,999	7.80
Fleet- Diesel Consumption	322	gallons	\$1,055	3.29

Biogenic		Conventional		*emissions from con	ventional fuel only
Fleet- E50	0	0	gallons	\$0	0.00*
Fleet- E85	16,402	2,894	gallons	\$57,571	25.41*
Fleet- B10	16,083	144,750	gallons	\$524,971	1,477.90 *
Fleet- B15	0	0	gallons	\$0	0.00 *
Fleet- B20	0	0	gallons	\$0	0.00 *
Transporation Subtotal		554,648	gallons	\$1,714,998	3,804.49
Facilities Natural Gas Con	sumption	143,958	dTh	\$663,688	7,652.22
Water-related Natural Ga	s Consumption	25,988	dTh	\$162,121	1,381.40
Natural Gas Subtotal		169,945	dTh	\$825,810	9,033.62
Scope 1 Subtotal				\$2,540,808	12,838.11

#### **Scope 2- Energy Indirect GHG Emissions**

GHG Source	Quantity Used		Cost	MT of CO2e
Faclities Electrical Consumption	16,626,189	kWh	\$778,644	12,609.53
Water-related Electrical Consumption	16,530,449	kWh	\$880,744	12,536.92
Streetlight Electrical Consumption	8,500,793	kWh	\$0	6,447.12
Traffic Signal Electrical Consumption	575,316	kWh	\$37,698	436.33
"Other" Electrical Consumption	2,027,639	kWh	\$692,210	1,537.79
Scope 2 Subtotal	44,260,386	kWh	\$2,389,297	33,567.70

#### **Scope 3- Other Indirect GHG Emissions**

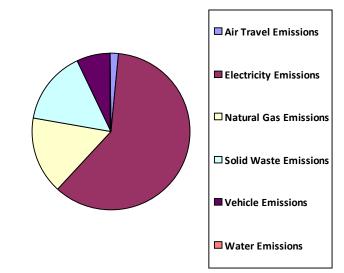
GHG Source	Quantity Used	Cost	MT of CO2e
Travel in Personal Vehicle (Reimbursed)	147,013 miles	\$0	72.92
Air Travel (Reimbursed )	358,936 miles	\$0	982.96
Office Waste from Municipal Facilities	717.19 tons	-	800.94
Industrial Waste from Municipal Facilities	13,451.64 tons	-	7,538.61
Public Waste	289.64 tons	-	189.15
Scope 3 Subtotal		\$0	9,584.58
Total Metric Tons of CO2e:			55,990.38

GHG Report

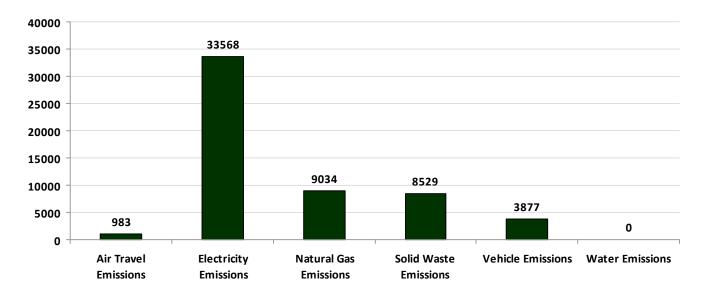


# **Municipal CO2e Emissions by Source**

Emission Source:	Metric Tons CO2e:	%
Electricity Emissions	33,567.70	60.0%
Solid Waste Emissions	8,528.69	15.2%
Vehicle Emissions	3,877.43	6.9%
Natural Gas Emissions	9,033.62	16.1%
Air Travel Emissions	982.96	1.8%
Total	55,990.39	100.0%



#### Metric Tons of CO2e by Emission Source

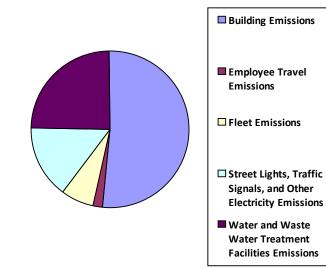


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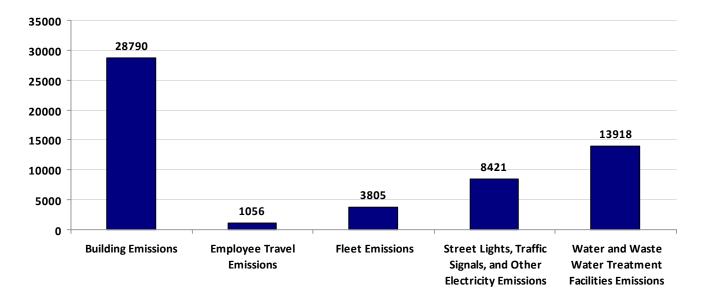


# **Municipal CO2e Emissions by Sector**

Municipal Sector:	Metric Tons CO2e:	%
Buildings Emissions	28,790.45	51.4%
Water and Waste Water Treatment Facility Emission	13,918.32 ns	24.9%
Street Lights, Traffic, Signals, and Other Electricity Emissi	0,421.24	15.0%
Fleet Emissions	3,804.50	6.8%
Employee Travel Emissions	1,055.88	1.9%
Total	55,990.39	100.0%



#### Metric Tons of CO2e by Municipal Sector



GHG Report



#### Recycling

Material	Quantity	Cost	MT of CO2e
Cardboard	234,067.69 lbs	-	-303.64
Aluminum	1,610.56 lbs	-	-12.15
Plastic	18,789.84 lbs	-	-13.90
Newsprint	63,885.45 lbs	-	-111.01
Mixed Office Paper	145,487.03 lbs	-	-221.73
Magazines	0.00 lbs	-	0.00
Commingled	73,011.94 lbs	-	-109.95
Residue	0.00 lbs **	-	-
Office Recycling Total	536,852.50 lbs		-772.38

#### Scrap Metal

\*\* included in Landfilled waste - Scope 3

Material	Quantity	Cost	MT of CO2e
Aluminum	249,977.00 lbs	\$114,164.10	-1,701.09
Copper	8,473.00 lbs	\$12,609.00	-57.66
Brass	4,139.00 lbs	\$8,071.30	-28.17
Steel	314,601.00 lbs	\$33,323.76	-2,140.86
Mixed Metal	1,087.00 lbs	\$629.40	-7.40
	578,277.00 lbs	\$168,797.56	-3,935.17
Crushing Facility			
Material	Quantity	Cost	MT of CO2e
1.25 inch crushed concrete	33,739.14 tons	\$0.00	-
1.25 inch dirt and rock road base	1,901.03 tons	\$0.00	-
1.25 inch recycled asphalt	108,688.52 tons	\$0.00	-
	144,328.69 tons	\$0.00	
Other			
Material	Quantity	Cost	
Wood mulching	2,087.00 tons	\$0.00	-
Electronics	5.47 tons	\$0.00	-
Yard trimmings	0.00 tons	\$0.00	-
	2,092.47 tons	\$0.00	MT of CO2e
Industrial Recycling Total	146,710.30 tons	\$168,797.56	-3,935.17

GHG Report



#### **Biogenic emissions from biofuels**

	Conventional	Biogenic		Cost	MT of CO2e
Fleet- E50	0	0	gallons	\$0	0.00
Fleet- E85	2,894	16,402	gallons	\$57,571	94.31
Fleet - B10	144,750	16,083	gallons	\$524,971	151.99
Fleet - B15	0	0	gallons	\$0	0.00
Fleet - B20	0	0	gallons	\$0	0.00
Fleet- B100		0	gallons	\$0	0.00
Fleet - Biofuel Total		32,485.00	gallons	\$582,542.00	246.30

#### **Indicator Breakdown**

Indicators	A	nnual Metric Tons CO2e Ger	nerated Per Indicator
Number of City of Fort Collins Employees	2,061	Per Employee	27.16661
Square Footage of Municipal Buildings	1,532,612	Per 1,000 Square Ft.	36.53265
Number of Fleet Vehicles	863	Per Fleet Vehicle*	4.40845
City of Fort Collins Annual Budget	\$484,900,000	Per \$100 of Budget	0.01155

\*Only takes into account GHG Emissions from Fleet fuel use.

#### **Additional Data**

Total Water Use	37,738,293	gallons
Per Employee Water Use	18,311	gallons
Summer High Temperature (Fahrenheit)	98	degrees
Winter Low Temperature (Fahrenheit)	-4	degrees

#### Special Thanks to all the staff and community members who supported sustainability efforts:

Shane Armfield, Fuel Reduction Technical Team Lori Bichler, Sustainability Team Katy Bigner, FortZED Coordinator Ed Bonnette, Waste Stream Team Peggy Bowers, Sustainability Team Wendy Brichler, Finance Mike Brunkhard, Waste Stream Team Tim Buchanan, Waste Stream Team Ethan Cozzen, Waste Stream Team Rita Decourcey, Data Kelsey Doan, ClimateWise Team Rebecca Everette, Report Covergirl Michelle Finchum, Sustainability Team, One Planet Coordinator Susie Gordon, Waste Stream Team Jason Graham, Waste Stream Team Deb Harris, Sustainability Team Bruce Hendee, Planning Errin Henggeler, Waste Stream Team Alexis Hmielak, Photos Pete lengo, Social Superstar Doug Jardine, Waste Stream Team Ray Kemp, Data Barbara King, Affordable Housing Gardens Lee Managanaro, Water Treatment Project Ken Mannon, Sustainability Team Caitlyn May, Sustainability Team Mary Miller, Sustainability Team

Caroline Mitchell, Waste StreamTeam Ken Morrison, Water Treatment Project Lance Murray, Safety Liaison Tracy Ochsner, Sustainability Team Kim Overholt, Photos Jim Pierce, Waste Stream Team Bonnie Pierce, Data Analyst Hank Richardson, Waste Stream Team Stu Reeve, Energy Technical Team John Robson, Photos Rosemarie Russo, Sustainability Coordinator and Scholarship Review Team Lynn Sanchez, Wellness Coordinator Lisa Schroers, ClimateWise Team Kristi Schwickerath, Editing, Photos and Design Wendy Serour, ClimateWise Liaison Crystal Shafi, Social Sustainability Lucinda Smith, Sustainability Team Rachel Steeves, Natural Areas Technical Lead Steve Strickland, Energy Technical Team LeOra Spence, Data Ellen Switzer, Data Sharon Thomas, Sustainability Team Stan Welsch, Transportation Data, Fuel Reduction Technical Team Bill Whirty, Parks Technical Taskforce Team, Scholarship Committee Emily Wilmsen, Editing Brian Woodruff, Transportation Technical Team

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Robert Becker	Matt Fater	Errin Henggler	Jill Oropeza	Susan Strong
Katy Bigner	Jason Fields	Stephanie Himmelberg	Jean Pakech	Doug Swartz
Shane Boyle	Michelle Finchum	Cliff Hoelscher	Sue Paquette	Brian Varrella
Jean Carpenter	Kevin Gertig	Mark Kempton	Ken Sampley	Tom Vosburg
DeEtta Carr	Kelley Gonzalez	Janet McTague	Jolee Sawyer	Travis Walker
Lori Clements	Chuck Gross	Caleb Metzler	Glen Schlueter	Norm Weaver
Judy Dahlgren	Basil Hamdan	Lucas Mouttet	Wendy Serour	Jay Wolfe

#### **City Council/City Manager:**

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

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

Name	Department	Category	Progress
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	LEED AP	Current
Lindsay Ex	Advanced Planning	LEED AP	Current
Michelle Finchum	Utilities	Sustainable Management Certificate	In Progress
Jason Graham	Utilities	ISO Certified	Current
Doug Groves	Utilities	ISO Certified	Current
Jennifer Harvey	<b>Operation Services</b>	LEED AP, BD & C	Current
Errin Henggeler	Utilities Operations	ISO Certified	Current
Brian Hergott	<b>Operation Services</b>	LEED AP, BD & C	Current
Ron Kechter	Advanced Planning	AP	Current
Vike Knox	Streets	LEED, BD & C	Current
Chad Mapp	<b>Operation Services</b>	LEED AP, BD & C	Current
Ken Morrison	Utilities	ISO Certified	Current
lill Oropeza	Utilities	ISO Certified	Current
Tracy Oschener	Tracy Oschener	AP	Current
Matt Parker	Utilities	ISO Certified	Current
Robyn Philips	Utilities	ISO Certified	Current
Rosemarie Russo	Environmental Services	ISO Certified, Green Associate, Sustainable Management Certificate	Current
Jesse Schlam	Utilities	ISO Certified	Current
Don Skold	Utilities	ISO Certified	Current
John Stephen	Finance	AP	Current
Susan Strong	Utilities	ISO Certified	Current
Jason Stutzman	Purchasing	LEED AP	Current
Ali VanDeutekom	Zoning	LEED AP, BD &C	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

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

Bargain Box — citynet.fcgov.com/bb Challenges — citynet.fcgov.com/sustainability City Scholarship Program — citynet.fcgov.com/sustainability Climate Action Plan- fcgov.com/climateprotection ClimateWise — fcgov.com/climatewise Discounted Recreation Passes — citynet.fcgov.com/recreation Energy Policy — fcgov.com/electric/energy\_policy.php Energy Report Results —citynet.fcgov.com/sustainability/resources/ energy reports. Food — citynet.fcgov.com/sustainability Free Transfort Passes — citynet.fcgov.com/transfort Green Building — fcgov.com/greenbuilding Global Reporting Initiative — fcgov.com/utilities/gri.php One Planet — citynet.fcgov.com/oneplanet Purchasing — citynet.fcgov.com/purchasing Rebates — fcgov.com/conservation Risk Management — citynet.fcgov.com/riskmanagement Solar — fcgov.com/solar Sustainability Library — fcgov.ehr.com/learning Telework — citynet.fcgov.com/transfort Waste Diversion — fcgov.com/cardboard Water Conservation Plan — fcgov.com/water Wellness Program — citynet.fcgov.com/humanresources



For more information, contact Rosemarie Russo at rrusso@fcgov.com citynet.fcgov.com/sustainability

