Helena Climate Change Task Force

Action Plan 2009

HELENA, MONTANA
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Task Force

Action Plan

August 19, 2009

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List of Abbreviations

ACEEE - American Council for an Energy Efficient Economy (organization)
AERO - Alternative Energy Resources Organization (organization)
akW - average kilowatt (the average power produced or used over the course of a year)
ARRA - American Recovery and Reinvestment Act of 2009 (also known as the "stimulus bill")
B20 - Biodiesel-Gasoline blend with 20% biodiesel
BIGCC - Biomass Integrated Gasification Combined Cycle electricity generating plant
BTU - British Thermal Unit (unit of energy, roughly equivalent to the amount of energy in a match)
CACP - Clean Air and Climate Protection (software provided by ICLEI)
CAFE - Corporate Average Fuel Economy (federal mileage standard for vehicle fleet)
CAPPA - Climate and Air Pollution Planning Assistant (software available from ICLEI)
CAP - Climate Action Plan
CCF - hundred cubic feet (unit of water that is equal to 748 gallons)
CO_2 - Carbon Dioxide (greenhouse gas)
CO_2e - Carbon Dioxide equivalent (converts all major greenhouse gases to a consistent unit)
CFL - Compact Fluorescent Lightbulb
DEQ - Montana Department of Environmental Quality
DOE - United States Department of Energy
DSM - Demand Side Management (technical term for utility conservation programs)
EECBG - Energy Efficiency and Conservation Block Grant (part of ARRA)
EPA - United States Environmental Protection Agency
ET - Evapotranspiration
FY - Fiscal Year (July 1 - June 30, used by the City of Helena for its budgeting)
GHG - Greenhouse Gas
GHP - Geothermal Heat Pump
GPCD - Gallons Per Capita Per Day (unit of water)
GPD - Gallons Per Day (unit of water)
HATS - Helena Area Transportation System
HCC - Helena Citizens Council
HOLMAC - Helena Open Lands Management Council
hp - horsepower (a unit of power often used for pumps, 1 hp = 0.746 kW)
HPS - High Pressure Sodium (conventional streetlight)
HVAC - Heating, Ventilating, and Air Conditioning systems
ICLEI - International Council for Local Environmental Initiatives (organization)
IECC - International Energy Conservation Code
IMP - Implementation Working Group & Recommendations
INT - Interim Recommendations
IPCC - Intergovernmental Panel on Climate Change (United Nations sponsored group)
IR - Independent Record (Helena newspaper)
IT - Information Technology (city department)
kW - kilowatt (1,000 watts of power)
kWh - kilowatt-hour (the amount of energy consumed by a 1,000 watt device in one hour)
LED - Light Emitting Diode (efficient lighting technology)
LEED - Leadership in Energy and Environmental Design (green building standard)
MCA - Montana Code Annotated (laws of the State of Montana)
MDT - Montana Department of Transportation (state agency)
MEIC - Montana Environmental Information Center (organization)
MMBTU - millions of BTUs (m = thousand)
MW - megawatt (1,000,000 watts of power)
MWh - megawatt-hour (the amount of energy produced by a 1,000,000 watt generator in one hour)
NARUC - National Association of Regulatory Utility Commissioners
NMTAC - Non-Motorized Travel Advisory Council (Helena committee)
NREL - National Renewable Energy Laboratory (federal DOE facility)
NRG - Energy Working Group and Recommendations
NWE - NorthWestern Energy (Montana's largest utility, providing electricity & gas service)
NWEC - NW Energy Coalition (organization)
NWS - National Weather Service (federal agency)
NWSEED - Northwest Sustainable Energy for Economic Development (organization)
O&M - Operation and Maintenance Costs
PAYT - Pay-As-You-Throw (recommended solid waste policy)
PID - Proportional Integral Derivative control, for process water pumps at WWT plant
REAP - Rural Energy for America Program (USDA funding program)
SAVE - Student Advocates Valuing the Environment (organization)
SEL - Spectrally Enhanced Lighting
SLD - Special Lighting District
T12, **T8**, **T5** - linear fluorescent lightbulbs of decreasing diameter and increasing efficiency
TAWSE - Try Another Way State Employees (State of Montana alternate transportation program)
TWRP - Transportation, Waste, Recycling, and Public-Private Partnership Working Group and Recommendations
UATD - Urban Area Transportation District (recommended transportation policy)
USB - Universal System Benefit Program (supports energy efficiency, renewable energy, and low-income programs via a charge that appears on electricity and natural gas bills in Montana)
USDA - United States Department of Agriculture
USGS - United States Geological Survey
VFD - Variable Frequency Drive (an efficient type of motor)
VMT - Vehicle Miles Traveled
WARM - EPA's Waste Reduction Model
WTR - Water Working Group and Recommendations
WECC/NWP - Western Electricity Coordinating Council / Northwest Power Pool
WEEL - Working for Equality and Economic Liberation (organization)
WWT - Waste Water Treatment

Contents

Action Report Introduction

Background

On December 3, 2007, Helena's City Commission passed resolution 19530, which states, in part:

"(T)here is scientific evidence sufficient to conclude that global climate change is occurring, that humans are contributing to it, and that reductions in greenhouse gases (GHG) are necessary in order to avert the negative consequences of a changing climate".

The resolution recognized that human actions are driving disturbing climatic trends observed in Helena in recent years, including earlier snowmelt, reduced stream flows and increased wildfire activity. Continued ecological changes around the state have the potential to take a severe toll on Montana's agriculture, tourism, recreation, and hydroelectric power production sectors.

In this resolution, the Commission pointed out that actions to lower GHG emissions will likely result in a numerous ancillary benefits, including reduced energy costs, reduced traffic congestion, and reduced local air pollution. Further, GHG reduction plans typically result in lesser reliance on finite supplies of fossil fuel, increased jobs in the green building, energy efficiency, transportation and renewable energy sectors, and constitute a significant step towards achieving independence from foreign sources of fuels.

The Commission also acknowledged that cities across the country are taking significant steps to cut their GHG emissions. To date, 960 cities have adopted the US Conference of Mayors Climate Protection Agreement, representing more than 80 million Americans. The Agreement commits cities to strive towards the goals of the Kyoto Protocol, a global treaty that requires signatories to cut global warming pollution 7 percent below 1990 levels by the year 2012. Montana municipalities that have signed the Mayors' Climate Protection Agreement include Billings, Bozeman, Missoula and Red Lodge.

The Helena City Commission resolved to join the growing number of cities working to address climate change, while increasing the resilience and self-reliance of our Helena community. The Commission formed a citizen-managed task force to assess the City's GHG emissions and the vulnerability of the City's water supply. The Task Force was also assigned to recommend to the Commission ways that the City could reduce Helena's GHG emissions and increase the resilience of the City's water supply.

Global Climate Change Close to Home

Helena has not been immune to the effects of a warming climate. A few examples help to illustrate the point and set the stage for the work undertaken by the Helena Climate Change Task Force. Since April 1880, Helena has been host to a National Weather Service (NWS) station. Based on the data collected by the NWS, overall annual average daily temperatures have been calculated and compared on a yearly basis. The annual average temperature in Helena is 43.9 °F, based upon 128 years of data. Of the 10 warmest years on record, four have occurred since 2000: 2001, 2003, 2006, 2007. The warmest year on record is 2007 with an average daily temperature of 48.4 °F (McCahon, 2008). Likewise, extreme summer temperatures in Helena have increased over the last two decades (based on National Weather Service data complied by DEQ), with the average number of days over 90 degrees doubling. Comparatively, the coolest years on record occurred sporadically between 1911 and 1996, with 1951 reported as the coolest year with an average daily temperature of 39.8 °F (McCahon, 2008). Stream flow records in Helena's primary water source, the Ten Mile watershed, echo the surprising changes in temperature. Readings from the United States Geological Survey (USGS) Tenmile Creek gage station reveal that the average summer runoff for the past 8 years was 34 percent lower than the average runoff for the 85 previous years.

Similar trends appear throughout Montana and the northern Rockies. US Temperature and Precipitation Trends show decadal average increases from 1976 forward (http://www.cpc.ncep.noaa.gov/trndtext.shtml). All of Montana is shown as getting warmer. The Montana Climate Office (http://climate.ntsg.umt.edu/) has Weather Station Trends 1951-2004 (http://climate.ntsg.umt.edu/mtclimate/multi-city_files/frame.htm) for Billings, Great Falls, Bozeman, Missoula and Kalispell, showing increasing average March temperatures and decreasing annual snowfall.

The warmer, drier trends we've seen in Helena and much of the Northern Rockies have played a role in landscape-scale "eruptions" of bark beetle populations. While bark beetles are a native species to the Northern Rockies ecosystem, the current outbreak exceeds any population spike in the past 125 years of data—the beetles are responsible for the death of enormous swaths of trees in the forests surrounding Helena (Raffa et al. 2008). Long term climate variability will likely increase the magnitude and distribution of these types of fundamental ecosystem changes (Coops et al. 2009).

So, what's driving these changes? In 2007 the United Nations Intergovernmental Panel on Climate Change (IPCC) issued its fourth in a series of reports stating that significant climate changes observed worldwide are "very likely" due to anthropogenic (human-caused) release of GHGs since the beginning of industrialization (IPCC 2007). The IPCC is a scientific intergovernmental body composed of hundreds of scientists from around the world, including Dr. Steven Running, a University of Montana professor of forestry.

GHGs are released into the atmosphere when we burn fossil fuels like coal, gasoline, diesel and natural gas for electricity, transportation, heat, and industrial processes. Significant levels of GHGs are also released by the anaerobic decay of organic materials in landfills and waste water treatment, and in the production of material goods and agricultural products. The IPCC ruled out natural factors as significant contributors to the rapid global temperature increase observed over the past half century. The Commission, as expressed in Resolution 19530, has reached a conclusion consistent with the findings of the IPCC.

The IPCC points out that a continually warming planet will drive the spread of infectious diseases, amplify the frequency of deadly heat waves and destructive coastal storms, and push droves of species to extinction. But climate change itself should not be seen as the root of these problems. Ultimately, it is our current energy system, built on the combustion of fossil fuels, which threatens human health, commerce, agriculture, and ecosystems as we know them.

Summary of Task Force Deliberations and Recommendations

Following the passage of resolution 19530, Mayor Jim Smith selected nine citizens to participate in the Helena Climate Change Task Force, including City Commissioner Alan Peura and Helena Citizens' Council representative, Rebecca Ridenour. The Task Force was chaired by citizen member Stan Bradshaw and vice-chaired by citizen member Patrick Judge. From the outset, the Helena Climate Change Task Force pursued three primary initiatives:

1. Work with City staff and the International Council for Local Environmental Initiatives (ICLEI) to conduct an energy and GHG assessment for Helena's municipal government;
2. Assess the vulnerability of Helena's water supply system in light of continued climate change and make recommendations to secure adequate water supply;
3. Recommend actions to the City Commission to reduce both municipal and community-wide GHG emission levels.

On the first topic, the Task Force made an early recommendation that the City become a member of ICLEI to make use of its Clean Air and Climate Protection (CACP) software. ICLEI has an extensive international track record, and has developed an effective software package for performing GHG inventories and action plans. By using the same software (and the same set of underlying assumptions) as many other cities, Helena's results could be more easily and confidently compared.

The City Commission joined ICLEI in April 2008, and by November 2008, City staff had used the ICLEI software to complete an inventory of municipal consumption of electricity, natural gas, diesel fuel, etc. for two test years,2001 and 2007. An assessment of community-wide GHG emissions was not included at that time due to extra cost and complication. The Task Force released the municipal GHG Assessment at the close of 2008 (Appendix G – note also that Appendix C contains a chronology of the major Task Force activities). The results show that Helena's City Government reduced its energy use by 18 percent and its GHG emissions by 20 percent over that six-year period. Very few cities begin the process with the welcome news of a pre-existing downward trend in emissions.

The next step was to establish an emission reduction target and a timeline to guide the implementation of specific recommendations. The Task Force considered two possible targets: 1) an aggressive path that maintains the same rate of decrease already achieved by the City in the 2001-2007 timeframe, and 2) a more modest path recognizing that the next set of reductions will likely be more difficult to achieve. These two trend lines can be seen in each of

two graphs, one for energy and one for GHG emissions , that appear in Appendix H. The Task Force agreed that the modest path, which envisions a 20 percent reduction from 2007 levels by 2020, is suitably strong and achievable. A recommendation for the City Commission to endorse that goal is included in the report as "IMP-6".

In order to research potential recommendations for cutting emissions and increasing the resilience of Helena's water supply, the Task Force formed the following three working groups. Additional members were recruited from the public to broaden the scope of expertise in each group:

1) Energy Efficiency & Municipal Operations (NRG)
2) Water Supply, Treatment, and Delivery (WTR)
3) Transportation, Waste, Recycling, and Public/Private Partnership (TWRP).

Later in the process, a fourth group was formed to work specifically on Implementation of the recommendations. The Task Force felt strongly that their efforts should not languish as "just another report on the shelf," but rather be translated into substantive action. Examples of the Implementation recommendations include the hiring of a Sustainability Coordinator, the creation of a "Green Team" of City staff, and the creation of an ongoing Citizen Conservation Board.

While the GHG Assessment unfolded, the working groups reviewed strategies already being pursued by the City of Helena (e.g. the installation of LED signal lights), and also by other cities working to reduce their GHG emissions. Each working group contributed to a master "options inventory" -- a comprehensive listing of GHG reduction and water supply strategies that have been considered by and found useful in other communities. Throughout the process, City staff helped refine that list. This research process revealed strategies that make the most sense for the City of Helena (some of which are already occurring, and need only to be continued).

In September 2008, the Task Force issued a Mid-Term Report to the City Commission (Appendix F1), with four specific recommendations. The Task Force felt the recommendations were timely and reasonable, regardless of the final outcome of their deliberations. The Task Force continues to stand by those recommendations, which include:

1) That the City reduce permit fees for certain construction or installation projects that are for renewable energy;
2) That the City Commission endorse a change in State law to allow cities the authority to adopt energy building codes more stringent than the state code;
3) That the City create a "green" procurement team that would review existing office equipment inventory and purchasing schedules and create a policy that would increase the energy efficiency of municipal office equipment; and
4) That the Utility Billing Unit reformat water bills to provide more transparency to customers: namely, to explain key billing terminology (e.g. define "CCF" in terms of the numbers of gallons it represents); and to provide customers with a breakdown of the previous twelve months of water usage.

(See Appendix F1 for a more detailed description of these recommendations and the rationale behind them.) The Commission, after staff review of the recommendations, responded as follows:

Recommendation (1)—based on the staff finding that the City's permit requirements and costs seemed consistent with those of other cities, the Commission endorsed the exploration of other incentives besides fee reductions;

Recommendation (2)—the City accepted this recommendation and brought it to the League of Cities and Towns as an action item for the 2009 Legislature. Although the League supported the legislation (HB 420), the version that passed was considerably weakened.

Recommendation (3)—the staff research indicated that the City IT department already had a policy emphasizing Energy Star purchases, and suggested that for other City equipment, the City's administrative services department could coordinate the development of a green procurement policy. The Commission endorsed that approach.

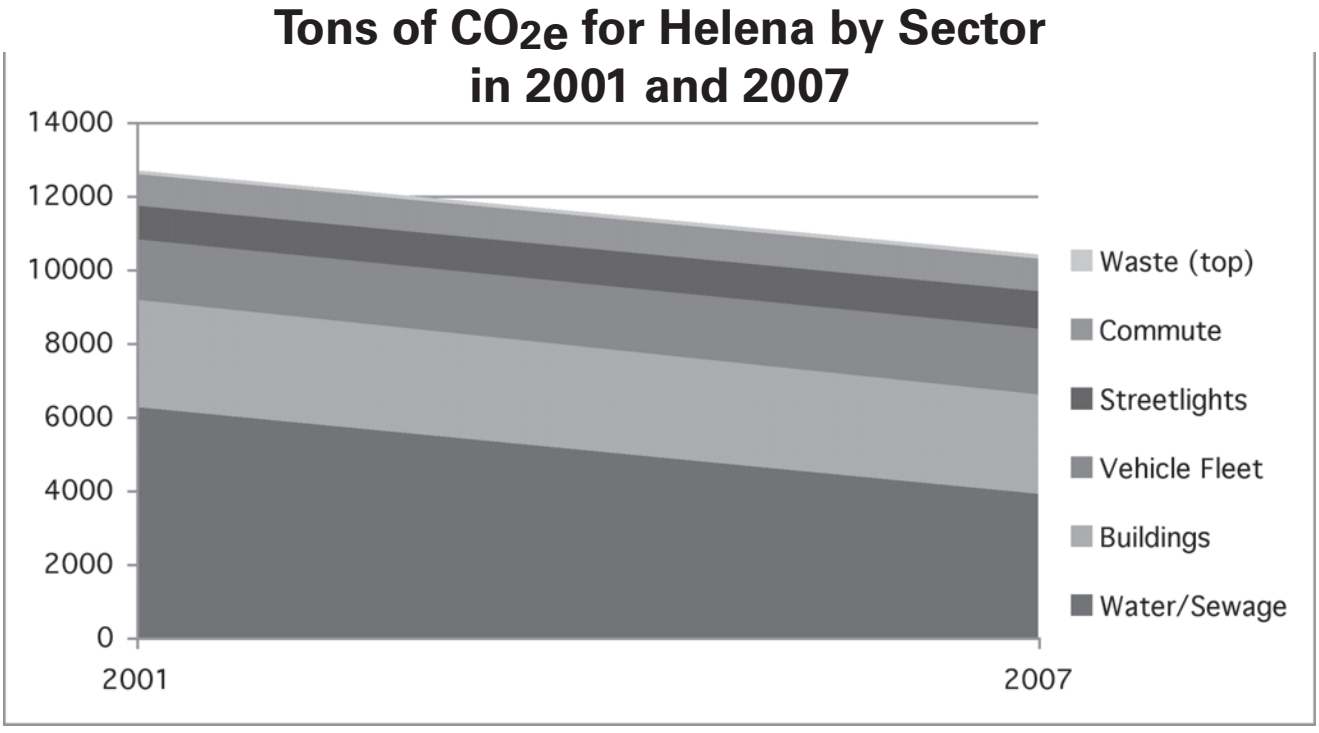
Recommendation (4)—First, the finance department modified the City water bill to identify the gallon-equivalent of the billing unit (1 CCF = 100 cubic feet = 748 gallons). Second, the staff suggested that conversion to an electronic billing system could provide the best access to a customer's water-use history, but noted that such a system could cost as much as $95,000. The Commission endorsed the idea of an electronic billing option because of its potential use in all City billing functions.

The Task Force provided interim recommendations on two other occasions. In March 2009, the Task Force weighed in on the City's proposed list of projects to receive funding under the Stimulus Bill (officially, the American Reinvestment and Recovery Act of 2009). These appear as Appendix F2. Later in May, the Task Force recommended projects for funding by the federal Energy Efficiency and Conservation Block Grant program (also part of ARRA). This communication appears as Appendix F3.

Each of the working groups consulted closely with City staff in relevant departments in order to, (1) benefit from their considerable expertise and practical knowledge of how the City operates, and (2) learn what efforts the City had already undertaken to reduce energy use or GHG emissions. City staff members have been helpful and informative at every turn.

In addition to this Introduction, the report includes four chapters (2 through 5) that contain the findings and recommendations of the working groups. As can be seen in the table below, the Task Force developed thirty-eight measures (beyond the six interim recommendations) designed to (1) significantly reduce municipal energy use and GHG emissions, (2) create a basis for a broader community effort to reduce energy use and GHG emissions, and (3) enhance the resilience of the municipal water supply. The NRG recommendations provide one possible path for meeting the "20 percent under 2007 by 2020" goal.

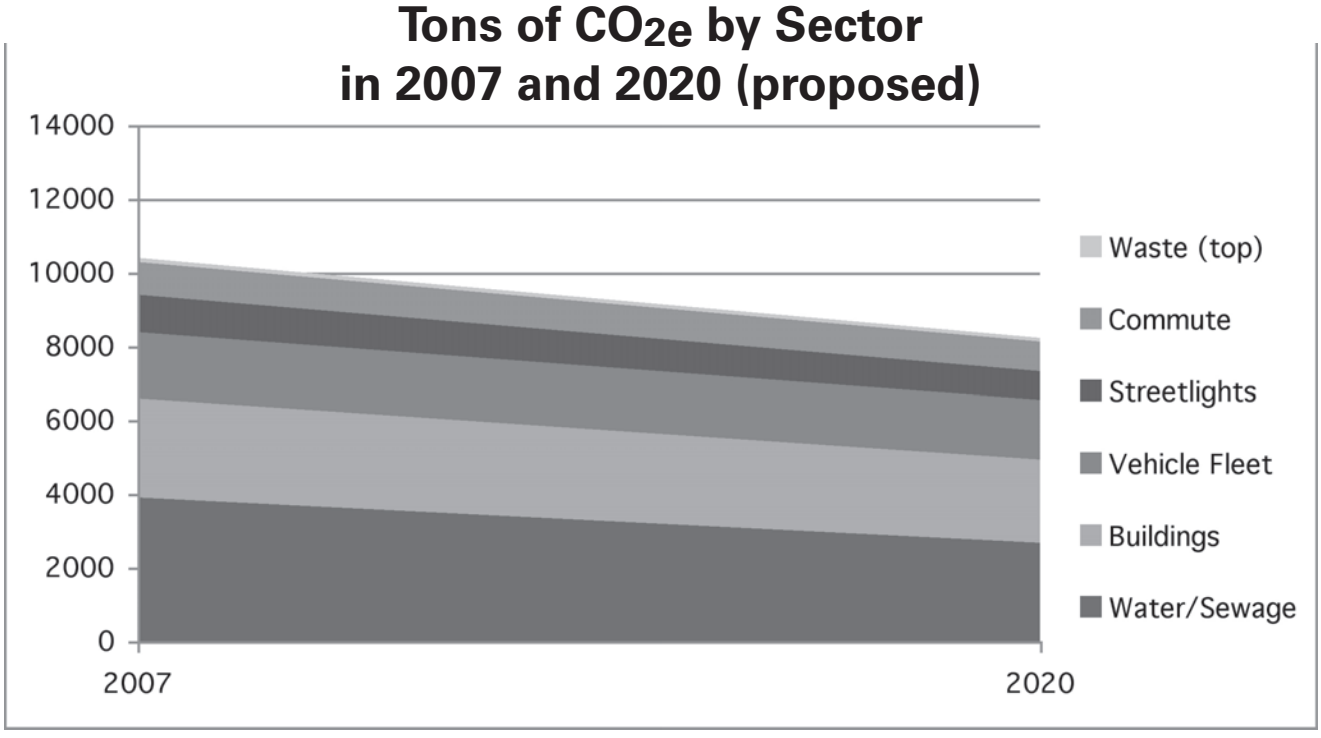
	2001	2007	% Change
Water/Sewage	6263	3908	-37.6
Buildings	2910	2691	-7.5
Vehicle Fleet	1631	1788	9.6
Streetlights	922	1005	9
Commute	863	891	3.2
Waste (top)	102	114	11.8
TOTAL	**12691**	**10397**	**-18.1**



Now, at the close of its 18-month tenure, the Task Force respectfully submits this final report to the Commission. Our City staff and commissioners must be commended for their fiscal and environmental leadership to date, however, there is more to be done. The Commissioners we elect and the staff we employ should continue to lead Helena towards energy security, a stable water supply, and GHG emission reductions across every department of municipal operations. Simultaneously, the City should strive to motivate the citizens of Helena toward this same goal with programs and policies that encourage and enable emission reductions and water conservation community-wide. This task will require the active involvement of Helena's citizenry, and strong partnerships with Lewis & Clark County, the State of Montana and our local businesses.

The recommendations contained in this report are important early steps that Helena can take in the global effort to mitigate the devastating impacts of our fossil fuel-based energy system. Through these recommendations, we expect that Helena will build a stronger, more resilient community and local economy.

	2007	2020	% Change
Water/Sewage	3908	2669	-31.7
Buildings	2691	2266	-15.8
Vehicle Fleet	1788	1609	-10
Streetlights	1005	774	-23
Commute	891	802	-10
Waste (top)	114	103	-9.6
TOTAL	**10397**	**8223**	**-20.9**



2007 CO2 EMISSIONS (TONS):	**10397**
2020 GOAL (20% REDUCTION):	**8318**
DIFFERENCE:	**2079**

INDEX

#	TITLE	CO2 SAVINGS (TONS)	NOTES
INT-1	Reduced Fees for Renewables (9/17/08)		
INT-2	Energy Efficient Building Codes (9/17/08)		
INT-3	Green Team / Procurement Policy (9/17/08)		
INT-4	Transparency in Water Bills (9/17/08)		
INT-5	Stimulus Recommendations (3/6/09)		
INT-6	Block Grant Recommendations (5/13/09)		
IMP-1	Sustainability Coordinator		
IMP-2	Municipal Green Team		
IMP-3	Citizen Board		
IMP-4	Outreach / Education		
IMP-5	Data Collection		
IMP-6	GHG Reduction Goal		
IMP-7	Mayors Climate Protection Agreement		
IMP-8	Funding		
NRG-1	Water Supply - Tenmile Lighting	111	
NRG-2	Water supply - Tenmile Heat Pump from NRG-1	274	301 if acting independently
NRG-3	Water Supply - Tenmile Biomass	210	
NRG-4	Waste Water - Recent Projects & Proposals:		
	• Aeration Project	258	
	• Stirling Engines	292	
	• Heat Recovery - Blower Building	62	
	• VFD / PID for Process Water Pumps	32	
NRG-5	Water / Waste Water - Zero Energy Target	0	"reach goal"–up to 2000 additional tons
NRG-6	Buildings - Energy Strategy	0	
NRG-7	Buildings - Efficiency Standards	88	
NRG-8	Buildings - Lighting	290	
NRG-9	Buildings - Plug Loads	0	savings to offset load growth
NRG-10	Buildings - Rates & Policies	0	
NRG-11	Buildings - Renewables	47	
NRG-12	Fleet - CAFE, etc.	179	
NRG-13	Fleet - Biodiesel Study	0	potentially 151 tons
NRG-14	Streetlights, Traffic Lights, & Fire Tower	231	
NRG-15	Employee Commute & Waste	100	89 from commute, 11 from waste
WTR-1	Water Rates		
WTR-2	Upgrade Treatment Facilities		
WTR-3	Lush and Lean Landscaping		
WTR-4	Community Incentives		
WTR-5	Education & Outreach		
WTR-6	Regulatory		
WTR-7	Municipal Watershed Protection		

#	TITLE	CO2 SAVINGS (TONS)	NOTES
TWRP-1	Transportation - Motorized		
TWRP-2	Transportation - Non-Motorized		
TWRP-3	Pay as You Throw		
TWRP-4	Solid Waste Reduction Goal		
TWRP-5	Disposal Plastic Bag Fee		
TWRP-6	Back to the Tap Policy		
TWRP-7	Green Blocks Program		
TWRP-8	Local Food		
	TOTAL	2174	
		105%	of needed savings -- 95 extra tons

KEY:

INT (6)	Interim Recommendations
IMP (8)	Implementation
NRG (15)	Energy Work Group
WTR (7)	Water Work Group
TWRP (8)	Transportation, Waste, Recycling, Public-Private Partnership Work Group

44 total (38 new ones)

IMP – INTRODUCTION
Implementation (IMP)

Mission Statement

The Implementation Working Group's mission is to identify activities and strategies supporting successful accomplishment of the recommendations put forth by the Climate Change Task Force. Specifically, this Working Group researched opportunities to integrate community and municipal activities, seek citizen and staff input and involvement, ensure continuous improvement of Helena's Climate Action Plan, and bolster the City of Helena's ability to remain resilient to the longer-term impacts of climate change.

Members:

Anna Jones-Crabtree , IMP Chair
Ben Brouwer (AERO)
Patrick Judge (NWEC/MEIC)
Stan Bradshaw

Discussion

The Task Force recognizes that the City faces a variety of challenges in implementing many of our recommendations. Many recommendations will require a commitment to out-year planning and resources (both human and financial). Almost all recommendations cut across departments and staff, requiring increased coordination and collaboration. And, some recommendations, although they cannot be specifically quantified in terms of tons of greenhouse gasses reduced, are critical to developing systems that support the resiliency of the City of Helena to meet the climate change challenges of the future. Tracking progress, identifying effective implementation strategies, and finding partners and resources on a City-wide basis for next steps will require focus.

The Task Force also recognizes that while many of the direct effects of climate change on our natural environment in Montana (decreased snowfall, reduced stream flows, increased fire activity, etc.) are already present, there will be additional effects to our human systems that are not yet evident. Further, within the next century, Helena will likely face the reality of depleted fossil fuel resources. Preparing our human systems to adapt to climate change and reduce resource consumption requires a collaborative approach between the City of Helena, the Citizens of Helena, and other members of the larger community within Lewis and Clark County.

The recommendations contained in this chapter are meant to help create the capacity within the City to meet the challenges described above. The recommendations in this chapter work together to form a foundation from which all other recommendations in the report can be collectively monitored, and used to support a community approach to climate change.

Index #	Description	Notes
IMP-1	Sustainability Coordinator	Suggests duties for a .FTE staff to support implementation of Task Force recommendations and to foster continual adoptions of environmentally sustainable practices
IMP-2	Municipal Green Team	Proposes the formation of a City-wide team to support implementation of recommendations and to facilitate ownership and adoption of environmentally sustainable practices by all City employees
IMP-3	Citizen Conservation Board	Proposes the creation of a Citizen Board to provide review, support and oversight for City-wide sustainability programs and policies
IMP-4	Outreach / Education	Develop a variety of outreach and education programs for City employees, businesses, and citizens
IMP-5	Data Collection, Reporting and Monitoring	Create an annual report to document activities implemented by the City, including specific monitoring of GHGs and tracking of other resources such as water
IMP-6	GHG Reduction Goal	Recommends the establishment of a GHG reduction goal of 20% below the 2007 level by 2020
IMP-7	Mayors Climate Protection Agreement	Asks Helena Mayor Jim Smith to sign the agreement, joining nearly 1000 other mayors
IMP-8	Funding & Leveraging Resources	Recommends longer-term options for funding sources, and identifies short-term grant opportunities

IMP-1 Hire Sustainability Coordinator

Department
Administrative Services, Public Works, Community Development
The specific department is less important than the authority to work across staffs and disciplines.

Target or Goal
• Significantly reduced GHG emissions and water consumption in City operations and community-wide; energy cost savings in City operations
• Develops, coordinates and implements other resource conservation activities

Projected Benefit
Not quantified, but significant for successful implementation and follow-through on GHG recommendations

Savings / Cost
.5 to 2 FTE, shared with County

Timeline
Upon passage

Related Actions
Green Team, Citizen Conservation Board, Outreach & Education, Ongoing Data Collection

Existing Actions
City is currently committed to hiring .5 FTE shared with County—pending receipt of Energy Efficiency and Conservation Block Grant (EECBG).

Partnerships / Related Interests
Lewis & Clark County, numerous other stakeholders engaged in climate related activities

Recommendations

To ensure implementation of the individual recommendations in this report, related to both municipal and community-wide GHG reductions and water conservation, the Task Force recommends hiring staff adequate to manage the following duties:

• Administer federal Energy Efficiency and Conservation Block Grant; seek additional funding to help finance municipal and community-wide energy efficiency, water conservation, renewable energy projects and other resource conservation and climate change related activities -- GHG Assessment and other ICLEI milestones need to be prepared / accomplished for the community at large (forecast, goal setting, development of recommendations, etc.), to complement this report;
• Foster the creation of programs and policies that promote environmental sustainability and assist City departments to reduce environmental impacts from operations;
• Track the implementation of recommendations identified by the Task Force in this report, and in the future by the Green Team and Citizen Conservation Board;
• Coordinate with the Green Team, Citizen Conservation Board and other interested stakeholders to research and implement additional municipal and community-wide policies and programs to reduce GHG emissions, conserve water, cut energy costs and implement other resource conservation and climate change activities;
• Report GHG savings, water savings, energy savings, fuel savings and cost savings in an annual report to the Commission;
• Coordinate with the Montana Department of Environmental Quality's Energy and Pollution Prevention Bureau and Helena-area non-profit organizations to educate businesses and residents about energy efficiency, renewable energy, and water conservation opportunities and benefits;
• Seek funding through grants and partnerships to leverage City resources;
• Staff and coordinate activities of the Green Team; and
• Staff and coordinate activities of the Citizen Conservation Board.

Consider funding position with a combination of the following revenue sources: energy efficiency grants (Missoula, Bozeman), a dedicated account created by energy savings or from utility rebates (Bozeman), a volumetric tax on garbage disposal (Boulder, CO), a volumetric pass-through fee on natural gas/electricity consumption administered by NorthWestern Energy (Boulder, CO), new water rates, or revenue from a Transportation District. Part of the hiring requirements could include developing partnerships or successful grant applications to supplement funding for the position.

Summary of Benefits

- Additional revenue from grants and partnerships directly related to this staffing
- Coordinated City and County actions to reduce GHG emissions and conserve water and energy
- Focused follow-though and implementation of individual recommendations in this report
- Creating the capacity for a community approach to climate change

Similar Actions in Other Cities

Missoula, Bozeman, Boulder CO, Northfield MN, and many others.

References and Resources

Local Government Energy Office Primer, ICLEI Webinar / Power Point (April 14, 2009)
http://www.icleiusa.org/action-center/financing-staffing/energyoffice
http://www.icleiusa.org/library/documents/Energy%20Office%20Intro%20Webinar%204-14.ppt/view?searchterm=energy+office+powerpoint
Lewis & Clark County: Laura Erikson, Grants Coordinator, 447-8383, lerikson@co.lewis-clark.mt.us
Bozeman: Natalie Meyer, Grants and Climate Protection Coordinator, (406) 582-2317, nmeyer@bozeman.net
Missoula: Kisha Schlegel, Grants Administrator 406.258.3688, kschlegel@co.missoula.mt.us
Boulder, CO: Jonathan Koehn, Environmental Affairs Manager, (303) 441-1915, koehnj@bouldercolorado.gov
Example position description Gillette, Wyoming http://www.ci.gillette.wy.us/employ/CurrentJobOpenings/SustainabilityCoordinator.pdf

IMP-2 Develop Green Team

Departments
All departments should have a participating representative

Target or Goal
Coordinate inter-department GHG emission reduction projects and other resource conservation and cost savings activities

Projected Benefit
Not quantified, but can be significant with City-wide participation

Savings / Cost
.1 FTE for each department (using existing staff) (variable based on annual action plan activities)

Timeline
Implement upon passage, ongoing

Related Actions
Green Team / Procurement Policy (INT-3), Sustainability Coordinator (IMP-1), Citizen Conservation Board (IMP-3), Outreach/Education (IMP-4), Data Collection (IMP-5), GHG Reduction Goal (IMP-6)

Partnerships / Related Interests
Lewis & Clark County, Citizen Conservation Board, etc.

Recommendations

The Task Force recommends forming a Green Team of staff from each City department to ensure implementation of the Task Force recommendations, and to ensure input from City staff in the ongoing development of effective sustainability policies and practices. The City Manager would select staff from each City department to participate on the Green Team based on expertise in waste reduction, energy and water conservation, commitment to environmental sustainability, leadership, and organizing capability with other department staff. We recommend that the City Manager appoint existing staff to the Green Team, based not only on skill sets but on interest level, ability to champion resource conservation efforts, and to work across departments creating collective support for resource conservation activities. While we estimate the amount of time for each department's participation at. 1FTE, to this will be variable based on the activities undertaken. Green Team participation should be integrated into day-to-day City business creating efficiencies and cost savings. We recommend the Green Team meet regularly to achieve the following tasks and be responsible for:

- Tracking implementation of recommendations assigned to their department;
- Developing new policies, programs and processes to conserve resources and enhance the environmental sustainability of City operations;
- Coordinating inter-department sustainability initiatives, contests and campaigns;
- Encouraging fellow City staff to use low-cost and no-cost resource saving practices at work -- examples include turning off lights and computers when not in use, cutting down on printed material, recycling whatever is possible, carpooling, riding the bus, walking or biking to work, limiting air-conditioner use, turning down the thermostat during winter months, etc.;
- Supporting education and outreach of environmental sustainability activities across all City staff;
- Providing input into an annual City-wide environmental sustainability progress report; and
- Develop a one-stop shop list for greener products that the City purchases on a continual basis (paper, cleaning supplies, etc.) — could be housed on an internal City website.

Summary of Benefits

- Coordinated City-wide sustainability and resource conservation operations
- Reduced GHG emissions and water consumption

Similar Actions in Other Cities

US Forest Service, Rocky Mountain Region, Sustainable Operations Program
Santa Fe, New Mexico
Nashua, New Hampshire
Pasadena, CA
Salt Lake City, Utah

References and Resources

USDA Forest Service: Anna Jones-Crabtree, Sustainable Operations Coordinator, Rocky Mountain Region. See the Green Team Toolkit posted at www.fs.fed.us/sustainableoperations

IMP-3 Develop Citizen Conservation Oversight

Department
Appointed by the Mayor

Target or Goal
Citizen support, participation in and oversight of GHG reduction, water conservation and other resource conservation and sustainability measures undertaken by the City of Helena

Projected Benefit
Not quantified, but can be substantial over time

Savings / Cost
Not quantified, but supports creating human and financial capacity to enact climate change and other sustainability measures

Timeline
Upon passage, ongoing

Related Actions
Sustainability coordinator (IMP-1), Green Team (IMP-2), Outreach/Education (IMP-4), Data Collection (IMP-5), GHG Reduction Goal (IMP-6)

Existing Actions
Helena Climate Change Task Force, Helena Open Lands Management Advisory Council (HOLMAC), etc.

Partnerships / Related Interests
HOLMAC, Parks Board, Helena Citizens Council, and Helena Housing Authority

Recommendations

To ensure thorough implementation of the Task Force recommendations as well create the ongoing capacity to develop a community approach to climate change, the Task Force recommends that the Commission undertake two primary activities under this heading:

A. Form an ongoing Citizen Conservation Board that will support the implementation of Task Force recommendations. This could include such activities such as conducting a community-wide GHG emmissions inventory reviewing, analyzing, and recommending policies, intended to: reduce municipal and community-wide GHG emissions, conserve water, implement other resource conservation activities and build a community approach to climate change. We suggest the Conservation Board be composed of members with expertise in the following sectors: Helena Citizens Council(1), Watershed/Water Conservation (2), Environmental Organization(2), Business/Building Industry(2), Transportation(2), Citizens at-large(2) and student leaders (high school or younger, Carroll College, UM Helena)(2). The Conservation Board will be staffed by the City's Sustainability Coordinator.

B. Commission should adopt amendments to the mission statements of existing citizen boards, committees, councils and commissions (where appropriate) that reflect a commitment to reduce municipal and community-wide GHG emissions, conserve water, implement other resource conservation activities and help Helena make the transition to a sustainable economy. In particular, the Commission should modify the mission statements of the following entities, which all have significant impacts on community-wide GHG emissions: Helena Housing Authority, Helena Open Lands Management Advisory Committee, Zoning Commission, Non-Motorized Transportation Advisory Council, Planning Board and Board of Appeals. In all cases the Commission should work with existing council members in drafting and adopting mission statement alterations or amendments.

Summary of Benefits

- Citizen review, support and oversight of City sustainability policies and programs
- Consistent approach to policy development and implementation of resource conservation activities across City boards and committees

Similar Actions in Other Cities

Missoula, Bozeman
Ashland, Oregon Conservation Commission

References and Resources

Missoula Greenhouse Gas Energy Conservation Team: http://www.ci.missoula.mt.us/index.aspx?NID=492

Bozeman Climate Action Team: http://www.bozeman.net/bozeman/government/commission/task%20force/Climate%20Task%20Force/climateTaskForce.aspx

Ashland, OR Conservation Commission http://www.ashland.or.us/CCBIndex.asp?CCBID=193

IMP-4 Develop Education & Outreach

Recommendations

Education and outreach efforts designed to publicize GHG reduction, water conservation and other resource conservation measures will be a critical tool for reaching both municipal and community-wide GHG reduction, water conservation, and sustainability targets. Solutions-oriented outreach should be combined with education about the impacts of inaction.

Coordinate with the Montana Department of Environmental Quality's Energy and Pollution Prevention Bureau and with Helena-area non-profit organizations to conduct education and outreach for businesses and residents about energy efficiency, renewable energy, water conservation, and other resource conservation opportunities and benefits. Outreach should highlight the global importance of GHG reductions, as well as ancillary benefits such as clean air, improved public health, reduced traffic congestion and a stronger local economy.

Specific educational activities, directed by the Sustainability Coordinator, may include:

- Co-sponsor tours and seminars directly related to reducing GHG emissions and conserving water;
- Promote or co-sponsor annual "Bike to Work Week" or other alternative transportation events. Publicity within City staff and community-wide should focus on alternatives to single occupancy vehicle commuting, including biking, walking, carpooling, riding the bus and working from home. Similar events could be hosted for other topics areas such as water, waste/recycling, green purchasing, and energy;
- Publicize available tax credits, grants, rebates and loans for home energy efficiency improvements with links from City website; post available fliers (NorthWestern Energy, DEQ) at City offices, and utilize annual mailing in water bill insert;
- Publicize City "Lead by Example" projects with Helena-area news releases;
- Give annual awards to recognize and honor staff and community leaders for their contributions toward creating a more sustainable City government and community;
- Utilize Federal and State Agency programs that support continued resource conservation in all areas such as EPA's Water-Sense and Waste-Wise programs;
- Publish an annual environmental footprint report for the City of Helena highlighting accomplishments, lessons learned, out-year planned activities and partnerships;
- Develop a sustainable resource-use program targeted at businesses in the Helena area as a way to foster a community approach to climate change; and
- Partner with Helena Schools at all levels to include sustainability practices and principles in the curriculum, engaging community youth in developing future resource conservation projects.

Department

Variety of departments participate, Implementation responsibility of the Sustainability Coordinator

Target or Goal

Broader public awareness of practices and programs to reduce GHG emissions and water consumption
Broader resource conservation and environmental sustainability activities.

Projected Benefit

Not quantified, but can be substantial and creates a community approach to climate change

Savings / Cost

Not quantified

Timeline

Upon passage, ongoing

Related Actions

Sustainability coordinator (IMP-1), Green Team (IMP-2), Citizen Conservation Board (IMP-3)

Existing Actions

Education and advertising for Helena Area Transportation System (HATS)

Partnerships / Related Interests

Lewis & Clark County

Summary of Benefits

- Increased staff and public awareness of climate change and its causes, impacts, and solutions
- Synergistic and ancillary benefits resulting from key employees and citizens implementing actions causing others to also take actions

Similar Actions in Other Cities

Bozeman, MT
Missoula, MT
Fort Collins, CO

References and Resources

Listing of rebates, tax credits, loans and other incentives: http://www.dsireusa.org/incentives/index.cfm?re=1&ee=1&spv=0&st=0&srp=1&state=MT

Resources for promoting bicycle commuting: http://www.bikeleague.org/programs/bikemonth/

National Renewable Energy Lab, Technical Assistance Program Contact Misty Conrad

City of Fort Collins, Colorado Climate Wise Program http://www.fcgov.com/climatewise/

EPA's Water Sense and Waste Wise Programs http://www.epa.gov/epawaste/partnerships/wastewise/index.htm http://www.epa.gov/watersense/

Yellowstone Business Partnership Uncommon Sense Program for Businesses http://www.yellowstonebusiness.org/our_programs/sustainability/

IMP-5 Implement Program of Ongoing Data Collection, Monitoring, and Reporting

Recommendations

Monitoring and reporting is a standard component of any successful climate action plan. It is the final milestone in ICLEI's framework:

"Milestone 5. Monitor and verify results. Monitoring and verifying progress on the implementation of measures to reduce or avoid greenhouse gas emissions is an ongoing process. Monitoring begins once measures are implemented and continues for the life of the measures, providing important feedback that can be use to improve the measures over time." http://www.iclei.org/index.php?id=810

Boulder, CO updates its Climate Action Plan (CAP) annually as part of the City budget process, with new emissions tracking and program results. Each year since 1994 (when the initial emissions inventory was created), City staff has updated the inventory with current figures for consumption of electricity, natural gas, and vehicle fuels, in addition to solid waste production.

City staff members have expressed some interest in looking at alternate software, such as that used by the state DEQ for the "20 x 10" initiative. These staffers expressed some initial frustration in working with ICLEI. In contrast, the Task Force members had a more positive experience. The Task Force is concerned about maintaining continuity. Creating an inventory of emissions is a challenging process as it is. Moving to a different program with different assumptions could skew the results – producing artificial "trends", for example, that are not reflective of the actual situation. To minimize the chance for this kind of error, the Task Force urges that any change in software be accompanied by a new analysis of the 2001 and 2007 data. Even if the City continues with ICLEI, this might be necessary. ICLEI has now updated its "CACP" software to a 2009 version (from the 2003 original). Using it is optional, but doing so requires all previous data to be re-entered.

Other software options are available as well. City staff have already started collaborating with Montana DEQ using the EnergyCAP program which is found at http://energycap.com/

Department

Sustainability Coordinator

Ideally, City staffers who were involved in the initial GHG Assessment can assist in helping to train this person. Task Force members are also available to help explain the work they did to quantify emissions and reductions.

Target or Goal

This recommendation will support the goals described in NRG-7, and reductions described in other recommendations. Ideally data collection will include not just energy usage and GHG emissions, but will also encompass water consumption (and eventually track other resource conservation activities such as the implementation of green purchasing practices and waste diverted from the landfill).

Projected Benefit

Not modeled separately – supports and helps enable the savings described in other recommendations

Savings / Cost

Initial efforts required months of staff time. Future efforts should be easier. *(See "Savings / Cost Explained.")*

Timeline

The Task Force strongly recommends that the inventory be updated on an annual basis, if not more frequently.

Related Actions

Tracking of energy use should help inform the comprehensive energy management plan and its updates (see NRG-6). The Green Team, Sustainability Coordinator and Citizen Conservation Board should be directed to publish an annual City-wide Environmental Footprint Report documenting progress made, lessons learned and highlighting out year activities.

Existing Actions

In addition to the data collection performed for the original GHG assessment, the City has access to energy audit information from NorthWestern Energy.

Partnerships / Related Interests

ICLEI membership / Cities for Climate Protection

Another potential membership is the Mayor's Climate Protection Agreement, started by Seattle Mayor Greg Nickels (IMP-7) David Lemieux is the contact at the State DEQ for the modeling behind the Governor's "20x10" initiative. City Commissioner Paul Cartwright also works on this project, through the Governor's Office and DEQ.

Advantages of moving to that program include:

- funded by the State of Montana – no cost to the City
- the State would be able to automate much of the data collection / data entry, saving City staff-hours
- the City and the state have already established a working relationship
- the software has been around for nearly three decades, and offers features unavailable in the ICLEI software (better reports, weather normalization, etc.)

Some of the drawbacks include:

- although the software includes GHG data analysis capability, it appears that its original and primary purpose was energy tracking and efficiency (and to catch billing errors, etc.), rather than municipal government and community GHG modeling and reduction
- the software does not appear to support a comprehensive analysis of GHG emissions – sectors like transportation and waste should continue to be analyzed
- the software also does not appear to support a community-wide model of energy use and GHG emissions
- ICLEI membership offers many other services (trainings on applying for stimulus funds, funding an energy office, etc.). The Task Force believes these would be useful to a Sustainability Coordinator.

Yet another option is the "Community Energy Opportunity Finder" developed by the Rocky Mountain Institute.

The Task Force recommends that the City continue its relationship with ICLEI, for at least another year, while also learning more about the EnergyCAP software. If nothing else, EnergyCAP will likely make data collection for CACP analysis much easier.

Savings / Cost Explained

The initial effort to inventory emissions required several months of staff time ($14,000 budgeted, $18,000 spent). Future efforts should be easier, but only if better protocols are established to systematize the collection, storage, and analysis of information. Considerable volunteer hours and resources were expended by Task Force members on the analysis. With some initial assistance, a Sustainability Coordinator should be able to perform this function with minimal extra cost to the city. City staff members have expressed some interest in looking at alternate software, such as the EnergyCAP program used by the state DEQ. Doing so might involve additional costs (although the Task Force understands that working with DEQ could involve free access to this program), but could also save on ICLEI membership fees.

Summary of Benefits

Monitoring and reporting are necessary for measuring progress toward the city's emission reduction goals, and for making changes to the Climate Action Plan (or its implementation) along the way if necessary.

Similar Actions in Other Cities

The Homer, AK CAP includes monthly reporting of City energy use.

The Burlington, VT CAP includes ongoing monitoring and reporting of emission reductions.

The Seattle, WA CAP has regular reporting with participation by the City interdepartmental climate team and the sustainability advisory panel.

References and Resources

ICLEI Milestones: http://www.iclei.org/index.php?id=810
ICLEI Clean Air and Climate Protection Software:
http://www.icleiusa.org/action-center/tools/cacp-software
ICLEI also has another tool for "decision support," to help model and prioritize reduction strategies. The Climate and Air Pollution Planning Assistant (CAPPA) software is described at:
http://www.icleiusa.org/action-center/tools/decision-support-tool
Rocky Mountain Institute Community Energy Opportunity Finder:
http://www.energyfinder.org/
U.S. Mayors Climate Protection Agreement:
http://www.seattle.gov/Mayor/Climate/
City of Mercer Island, Washington http://www.mercergov.org/Page.asp?NavID=2519

IMP-6 Establish a Municipal Greenhouse Gas Reduction Goal

Recommendations

Setting a target is the second milestone in the ICLEI process. After the Task Force completed the municipal emissions inventory, it decided to adopt a target to guide its efforts. The Task Force was pleased to see that Helena's emissions are already on a downward trend, based on the analysis of 2001 and 2007 data. In that six-year period, CO_2 emissions dropped 18.1% (from 12,691 tons to 10,397 tons) even as Helena's population increased.

Sticking with that rate of decline would result in a 48% reduction from 2007 levels by 2020 (13 years). The Task Force recognizes that it would be difficult to sustain that rate, and instead adopted a more conservative goal of 20% below 2007 levels by 2020. This goal is comparable to many adopted by other cities. According to the ICLEI "Cities for Climate Protection Milestone Guide," most cities aim for a 15% reduction over a 15-20 year period – "ICLEI recommends considering a long-term emissions reduction target of at least this level."

The Task Force also recommends that the Commission establish interim goals.

Summary of Benefits

A reduction goal provides an objective against which to measure progress, and allows the City to quantify its commitment to fighting global warming.

Similar Actions in Other Cities

ICLEI's "Cities for Climate Protection Milestone Guide" contains the following table:

CO_2 Reduction Targets of Select CCP Jurisdictions

Jurisdiction	% Below Baseline Emissions	Target Year
Austin, TX	10-20%	2010
Berkeley, CA	15%	2010
Burien, WA	10%	2010
Burlington, VT	10%	2005
Chula Vista, CA	20%	2010
Durham, NC	5%	2025
Hillsborough Co., FL	20%	2010
Miami-Dade Co., FL	20%	2005
Minneapolis, MN	20%	2005
Oakland, CA	15%	2010
Portland, OR	20%	2010
Saint Paul, MN	20%	2005
Takoma Park, MD	20%	2010
Toledo, OH	20%	2020
Tucson, AZ	20%	2010

Department

City Commission

Target or Goal

Specific greenhouse gas reduction goal for City government of 20% below 2007 levels by 2020

Projected Benefit

This is a Process recommendation that will support the goals and reductions described in other recommendations.

Savings / Cost

No cost

Timeline

Ideally, the commission will consider and adopt this goal in the third quarter of 2009.

Related Actions

IMP-7

Existing Actions

The City has passed several resolutions indicating its commitment to conserve natural resources, reduce its contribution to global warming, and increase the efficiency of its operations.
EXAMPLES INCLUDE:

- Resolution No. 19530 (12/3/07) – Global Climate Change Resolution
- Resolution No. 19556 (5/5/08) – Resolution of Commission Intent for FY2009 Budget
- Resolution No. 19622 (1/12/09) – Original Stimulus Resolution
- Resolution No. 19630 (3/9/09) – Expansion of Stimulus Resolution for Energy Eff., etc.

With Resolution No. 19530, the Commission created a Climate Change Task Force, and asked it to prepare an emissions inventory. That work has been completed. The Task Force now asks the commission to adopt a specific numeric goal for reducing its emissions.

The City of Bozeman adopted a goal in 2008 to reduce its emissions to a level 15% below 2000 levels by 2020. The Task Force considers the proposed Helena goal to be both ambitious and attainable. There has been significant good work already done by the City in the period since 2007, which will help meet the goal recommended in this document.

The Mayors Climate Protection Agreement asks cities to reduce their emissions to a level 12% below 1990 levels by 2012, essentially meeting the Kyoto agreement in their jurisdiction.

References and Resources

ICLEI Cities for Climate Protection Milestone Guide
Bozeman Climate Action Plan

IMP-7 Sign Mayors Climate Protection Agreement

Recommendations

The Task Force recommends that Mayor Jim Smith sign the US Conference of Mayors Climate Protection Agreement. As a signatory, Helena would join nearly 1,000 other cities nation-wide, including the Montana cities of Bozeman, Billings, Red Lodge and Missoula, in committing to meet three actions:

- Strive to meet or beat the Kyoto Protocol targets: 7% reduction in GHG emissions (community-wide) from 1990 levels by 2012 (this was already accomplished for the municipal government);
- Urge the state and federal government to enact policies and programs to meet or beat the greenhouse gas emission reduction target suggested for the United States in the Kyoto Protocol; and,
- Urge the U.S. Congress to pass bipartisan greenhouse gas reduction legislation.

This action by the Mayor and subsequent communications to Montana's federal delegation and Governor will lend support to state and national efforts to reduce GHG emissions. The signature will also require Helena to move quickly to complete a comprehensive, community-wide GHG emissions reduction goal and strategy that meets or exceeds the Kyoto Protocol. The Task Force believes that signing the Mayors Climate Protection Agreement is an important, practical, and symbolic step towards strengthening a nation-wide movement to address climate change.

Summary of Benefits

Many unquantifiable benefits but shows long term commitment by the City of Helena

Similar Actions in Other Cities

Nearly 1000 other cities have signed on to this commitment. In Montana this includes Missoula, Bozeman, and Red Lodge.

References and Resources

http://usmayors.org/climateprotection/agreement.htm.

Department

Mayor

Target or Goal

Supports implementation of other goals

Projected Benefit

Not quantified, but shows commitment to long-term implementation, and can be significant

Savings / Cost

Not quantified but can be significant both from a cost standpoint as well as other resource conservation

Timeline

Upon adoption

Related Actions

IMP- 6

Existing Actions

Through a variety of activities the City has already met the first action of reducing GHG emissions by 7% from 1990 levels

IMP-8 Develop Funding and Leveraging Resources

Department
City Commission

Target or Goal
Reinvest any financial savings resulting from the recommendations of this report into additional climate change and resource conservation activities, and actively pursue grant/funding opportunities that can provide resources for implementation.

Projected Benefit
This is a Process recommendation that will support the goals and reductions described in other recommendations.

Savings / Cost
Significant but yet unquantifiable, provides resources for implementing recommendations

Timeline
Upon adoption

Related Actions
IMP 1 - 7

Existing Actions
The City Commission's Annual Budget Resolution of Intent for FY09 has a multitude of statements relating to sustainability and climate change. These statements should become more specific towards implementing recommendations from this report, taking advantage of the synergistic effects of intent where possible.

The City has submitted detailed requests under the federal ARRA (stimulus) program and the Energy Efficiency and Conservation Block Grant program. In its FY2010 budget (adopted June 22, 2009), the City Commission included a $50,000 general fund contingency allocation for climate change related projects.

Partnerships / Related Interests
A variety of partnership opportunities exist and can be tailored based on the specific funding and/or grant source pursued.

Recommendations

There are two components to this recommendation. The first focuses on developing structural processes that support the longer term funding for staff and resources to support a sustainability program. The second lists examples of existing funding resources that the task force identified.

Component 1 – Develop structural processes supporting funding for staff and resources for a sustainability program

Many sustainability programs largely pay for themselves through the savings achieved through reduced energy, fuel, and water consumption. Other funding streams have included rebates or taxes based on amount of consumption. IMP-1 outlines some of these options.

Component 2 – Actively Pursue Existing Grant and Partnerships Opportunities

The completion of this climate action plan is significant. It provides a foundation from which the City can actively pursue resources for implementation. There are increasing amounts of funding opportunities offered by the Federal Government and other sources related to climate change activities. Helena can be a model for other Cities. The Task Force strongly recommends identifying capacity within existing City staff to actively pursue opportunities that make sense. Once a Sustainability Coordinator is hired, these positions can and should create an active grant program.

One excellent example is the Climate Showcase Communities Grant Program, which offers grants ranging between $100,000 and $500,000: http://epa.gov/cleanenergy/energy-programs/state-and-local/showcase.html

Other opportunities include:

- U.S. Department of Agriculture's Rural Community Development Initiative
- The Northwest Sustainable Energy for Economic Development (Northwest SEED) organization is looking to partner with communities to secure these funds: http://www.nwseed.org/about/opportunities.asp
- USDA also offers the Rural Energy for America Program (REAP), with a total of $60 million available and a deadline of July 31, 2009: http://farmenergy.org/news/usda-announces-reap-funding-for-2009

Summary of Benefits

Substantial but not quantifiable at this time

References and Resourcess

NREL Contacts, Agency Contacts, expert contacts, contractors, etc.

NRG – INTRODUCTION
Energy Efficiency and Municipal Operations (NRG)

Mission Statement (adopted April 16, 2008):

The Energy Work Group will work with ICLEI (www.iclei.org) and City of Helena staff to assess the City of Helena's municipal energy use and associated greenhouse gas emissions, investigate opportunities for the City to reduce its energy usage through conservation practices and efficient technologies, and investigate opportunities for the City to incorporate increasing amounts of renewable energy into its mix of resources.

MEMBERS:

Patrick Judge, NRG Chair
Kristine Edwards
Anna Jones-Crabtree
Max Milton
Thomas Murray
Alan Peura, Liason to ICLEI
Rebecca Ridenour
Els Van Woert

DISCUSSION:

Over the course of 2008-2009, the NRG group met six times, and interviewed and worked closely with key City staff. Carrie Hahn and Liz Hirst put forth an extraordinary effort in gathering data and preparing the initial greenhouse gas emissions inventory. The NRG group also benefitted greatly from the input of Gery Carpenter (City Facilities), Don Clark (Water Supply and Wastewater Treatment Facilities), Tim Magee (Administrative Services), Art Pembroke (Information Technology), Ed Robinson (City Fleet), and Laura Erikson (Lewis & Clark Co.). The City of Helena and Lewis & Clark County are fortunate to have such dedicated public servants. The Task Force would also like to thank John Campbell of NorthWestern Energy, who consistently provided prompt and useful responses to queries.

The group's first accomplishment was the publication of the GHG Assessment. The Assessment showed that between 2001 and 2007, the City of Helena had already reduced its municipal energy use and associated greenhouse gases by impressive amounts. Hoping to continue the downward trend, the group proposed a working target of "20% below 2007 levels by 2020," and set about identifying specific measures to allow the City to accomplish that goal. All told, the group needed to identify 2,079 tons of CO_2 reductions (which would move the City from 10,397 tons to 8,318 tons). It succeeded in doing so, and compiled the following list of recommendations representing 2,174 tons of CO_2 savings. In-depth descriptions of each recommendation follow.

Index	Description	CO_2 Savings in 2020 (tons)	Notes
NRG-1	Water Supply – Tenmile Lighting	111	
NRG-2	Water Supply – Tenmile Heat Pump	274	
NRG-3	Water Supply – Tenmile Biomass	210	
NRG-4	Waste Water – Assorted Projects: • Aeration Project • Stirling Engines • Heat Recovery – Blower Bldg. • Process Water Pumps	 258 292 62 32	
NRG-5	Waste Water – Zero Energy Target		"reach" goal
NRG-6	Buildings – Energy Strategy	NA	
NRG-7	Buildings – Efficiency Standards	88	
NRG-8	Buildings – Lighting	290	
NRG-9	Buildings – Plug Loads	0	offsets load growth
NRG-10	Buildings – Rates & Policies	NA	
NRG-11	Buildings – Renewable Energy	47	
NRG-12	Fleet – CAFE, etc.	179	
NRG-13	Fleet – Biodiesel Study	0	potentially 151 tons
NRG-14	Street, Traffic, & Fire Tower Lights	231	
NRG-15	Employee Commute & Waste	100	89 commute, 11 waste
TOTAL:		2174	

NRG 1 - Lighting Upgrade at the Tenmile Water Treatment Facility

Recommendations

In partnership with NorthWestern, a plan is in place to upgrade lighting at the Tenmile water treatment facility. The latest fluorescent bulbs (T5) are much more efficient than the older incandescent technology. T5 technology gets five- to six-times the number of lumens per watt, compared to incandescent, allowing the plant to have fewer fixtures. The actual savings will depend on installation requirements.

Before implementation, the City should consider Spectrally Enhanced Lighting (SEL), a technology that offers 18 - 40% energy savings over T8 lighting being considered in similar lighting retrofits.

As planned, the project will reduce electricity consumption at the Tenmile plant by approximately 200,000 kWh per year -- a full 17% of the plant's 2007 consumption level of 1,147,882 kWh. According to the CACP software, this corresponds to an annual CO_2 reduction of 111 tons (from 641 to 530 tons per year).

Project cost is $18,000. According to Don Clark, this project would have a one-year payback for the city, considering the $5000 rebate from NorthWestern Energy.

In 2007, the City spent $95,000 for electricity at the facility (which comes out to 8¢ per kwh). A 17% reduction would be $16,000. Roughly this amount will be saved, year after year (with the value of savings increasing as the price of energy rises).

Summary of Benefits

Cheaper to operate – short payback period for investment.

Longer bulb life reduces operating and maintenance costs

Similar Actions in Other Cities

Numerous

References and Resources

www.eleek.com Lamping Comparison Chart

http://www1.eere.energy.gov/buildings/sel_potential_savings.html

Spectrally Enhanced Lighting

Department

Public Works – Water Treatment

Target or Goal

Replace all T8 bulbs with T5 bulbs or spectrally enhanced lighting (SEL)

Projected Benefit

CO_2 reduction of 111 tons

Savings / Cost

Project cost $18,000 with one-year payback (assuming $5000 rebate from NorthWestern Energy)

Timeline

Spring/summer 2009

Existing Actions

Lighting conversion, City/County Building

Partnerships / Related Interests

NorthWestern Energy

NRG-2 Study / Install Water-source Heat Pump at the Tenmile Facility

Department
Public Works - Water Treatment

Target or Goal
Install water-source heat pump at Tenmile facility to reduce energy use and greenhouse gas emissions.

Projected Benefit
CO_2 savings of 274 tons

Savings / Cost
Total cost of $350,000 (estimate from City's Stimulus Resolution #19630, see Appendix E4) Expected savings of approximately $40,000 per year, giving an 8.75-year payback (exclusive of grant funding, NWE assistance and rising energy costs.)

Timeline
2011. A plan and much of the resource are already in place (water tanks). But the plan should be updated.

Related Recommendations
IMP-5
NRG-1

Partnerships / Related Interests
NorthWestern Energy

Recommendations

Since the late 1990s, the City has planned to utilize the water tanks inside the Tenmile Plant in a heat pump system for HVAC, replacing the current electric-powered heating system (electric resistance heating is notoriously inefficient). The plan should be re-evaluated to reflect rapidly advancing technology and new funding opportunities.

On its own, this measure is expected to save 540,000 kWh in HVAC expenses, nearly 50% of the facility's entire electricity usage (1,147,882 kWh in 2007). According to the CACP software, this measure would lower the facility's annual CO_2 emissions by 301 tons.

However, because more efficient lighting is being installed (NRG-1), the heat pump will likely require an additional 50,000 kWh per year to make up the heat that was formerly supplied by the inefficient lights. This reduces the net savings to 490,000 kWh per year, which corresponds to 274 tons of CO_2 savings.

There could be significant opportunities for grants and other assistance. At the time of this report, the DOE (through the American Reinvestment and Recovery Act) has allocated $50 million for commercial deployment of geothermal heat pumps (GHPs).

In its Stimulus Resolution (#19630, see Appendix E4), the City listed this project, along with an estimated cost of $350,000. Federal grants, along with potential assistance from NorthWestern Energy would ideally cover most of the initial investment. The Task Force endorsed this project in its Stimulus Funding Recommendations (Appendix F2).

In 2007, the City spent $95,000 for its electricity use at this facility (which is about 8¢ per kWh). At this price, a 490,000 kWh reduction would be expected to save the City roughly $40,000 per year (once the initial investment is paid off). The savings would only increase with rising energy prices.

According to the EPA, geothermal heat pumps can reduce energy consumption and corresponding emissions significantly – up to 44% compared to air-source heat pumps and up to 72% compared to electric resistance heating with standard air-conditioning equipment. GHPs also improve humidity control by maintaining about 50% relative indoor humidity, making GHPs very effective in humid areas.

Summary of Benefits

- Reduction in electricity used for heating and cooling
- Projected long life of equipment means rapid payback and years of savings
- Extensive resource in place (water tanks) with minimal cost to utilize that resource

Similar Actions in Other Cities

Unknown

References and Resources

Department of Energy: http://www.energysavers.gov/your_home/space_heating_cooling/index.cfm/mytopic=12660

Government Technology, Solutions for State and Local Governments: http://www.govtech.com/gt/692607

NRG-3 Study / Install Biomass Generator at the Tenmile Facility

Recommendations

A study should be undertaken to assess the feasibility of locating a small-to-medium scale biomass generator at the Tenmile plant. The generator would be grid-tied and would have the potential to offset a major portion of the energy used at the Tenmile plant. The system could also provide heating for the plant. (The Task Force focused on the Tenmile Plant, due to its proximity to forest fuels reduction projects, but similar systems could be installed at the Missouri River Treatment Plant and the Waste Water Treatment Plant.)

Compatible systems (such as Biomax supplied by Community Power Company) can produce from 5 kW to 50 kW. A 50 kW facility would produce 377,000 kWh per year, assuming a capacity factor of 86% (50 kW x 8760 hr/yr x 0.86) as described in the BioMax frequently asked questions webpage: http://www.gocpc.com/

According to the CACP software, reducing the plant's electricity use by that amount would produce an annual CO_2 savings of 210 tons.

The BioMax generator is a combined heat and power system, but the value of both the heat and the power are included in the electricity savings (as the facility is currently electrically heated and has only nominal natural gas use).

Ideally, federal assistance could cover purchase and installation costs. The BioMax website advertises generator costs of between $700 and $5000 per kW ($35,000 and $250,000 for a 50 kW system). The Task Force endorsed this project in its Stimulus Funding Recommendations (Appendix F2).

In 2007, the City paid $95,000 for electricity at the Tenmile plant, which comes out to 8¢ per kWh. At this price, a reduction of 438,000kWh would save the City $35,000 per year (with the value of the savings increasing as the price of energy rises).

Montana law currently limits grid-tied renewable energy systems to 50 kW. The Tenmile plant currently uses about 131 akW, so this project would not be able to meet the entire need of the plant without an amendment to the law.

This is not a closed loop system in the traditional sense, where fuel is grown specifically to burn. Rather, it will likely depend on trees harvested from the Tenmile watershed, as part of fuel reduction / bark beetle abatement / water protection efforts. The lifecycle carbon impacts for such projects are consequently more complicated / difficult to compute. Fuel reduction projects involve their own financial and carbon costs. But it can also be argued that these projects reduce the risk of catastrophic fire, and major carbon emissions (with none of the energy being captured).

"Although biomass-based generation is assumed to yield no net emissions of CO_2 because of the sequestration of biomass during the planting cycle, there are environmental impacts. Wood contains sulfur and nitrogen, which yield SO_2 and NOx in the combustion process. However, the rate of emissions is significantly lower than that of coal-based generation. For example, per kilowatthour generated, biomass

Department

Public Works – Water Treatment

Target or Goal

Construct a 50 kW biomass facility, using a modular approach that would allow for future expansion if changes to Montana law allow for larger net-metered systems.

Projected Benefit

CO_2 savings of 210 tons (or roughly three times that much if systems are also pursued at the Missouri River Treatment Plant and the Waste Water Treatment Plant)

Savings / Cost

- In its Stimulus Resolution (#19630), see Appendix E4, the City listed this project with an estimated cost of $500,000.
- Expected savings of approximately $35,000 per year, giving a 14-year payback (at current energy prices, and exclusive of federal assistance).

Timeline

Plan timetable should dovetail with Tenmile Watershed Collaborative Working Group study (per Don Clark).

Related Actions

Tenmile watershed vulnerability mitigation

Existing Actions

FEMA fuel reduction project on the Red Mtn. Flume

Partnerships / Related Interests

Collaborative Working Group to address issues within the Tenmile watershed

integrated gasification combined-cycle (BIGCC) generating plants can significantly reduce particulate emissions (by a factor of 4.5) in comparison with coal-based electricity generation processes. NO_x emissions can be reduced by a factor of about 6 for dedicated BIGCC plants compared with average pulverized coal-fired plants."

http://www.nrel.gov/docs/fy04osti/32575.pdf
http://www.nrel.gov/analysis/forum/pdfs/m_mann.pdf

Summary of Benefits

- Grid-tied system energy offsets
- Reduction of fuels protects the Tenmile watershed, important to Helena's water supply.

Similar Actions in Other Cities

Burlington, VT (biomass gasification)
CA: Mount Lassen, Rio Bravo, and Hayfork
Orofino, ID has proposed a major, stimulus-funded woody biomass cogeneration project.

References and Resources

http://www.eia.doe.gov/oiaf/analysispaper/biomass/
Community Power Corporation http://www.gocpc.com/
Zia Haq, Biomass for Electricity Generation, Energy Information Administration: http://www.eia.doe.gov/oiaf/analysispaper/biomass/

NRG-4 Efficiency Upgrades, Tenmile Facility

Recommendations

1. Numerous improvements to the aeration system were completed in June 2008. According to a NorthWestern Energy factsheet (Appendix N), project features of the 2008 aeration efficiency work include:
   • Direct "aeration-to-blower" control of dissolved oxygen levels
   • 125 horsepower Gardner Denver positive displacement, rotary screw type blower with a premium efficiency motor
   • Variable Frequency Drive connected to the new blower motor
   • Elimination of excess "blow-off" air into non-active aeration basins
   • Ability to constantly match dissolved oxygen levels to changing influent levels and BOD loading rates
   • Designed to meet expected influent increases for many years -- can handle current demand at 60% of blower capacity

   The Task Force has included the past projects described below in the GHG analysis because they occurred after the 2007 test year. According to NorthWestern Energy, these improvements are saving 460,986 kWh per year (16% of the WWT plant's total 2007 electricity usage of 2,910,880 kWh, and about 30% of the electricity previously used for aeration). According to the CACP software, this reduction corresponds to 258 tons of CO_2 savings (14% of the 1828 tons produced in 2007).

   The aeration system improvements had a total cost of $103,205 (although slightly different figures are reported in the Independent Record article referenced below), but the City received a $64,000 grant from NorthWestern. According to NWE, the city's $39,205 share has a payback of just 1.5 years, which suggests an annual savings of about $26,000 (or more, considering potential electricity price increases).

   (As a check to this calculation — in 2007, the City paid $224,474 for electricity at the WWT plant, which comes out to 7.7¢ per kWh. At this price, a reduction of 460,986 kwh would save the City $35,000 per year, which is in the ballpark. The discrepancy probably results from the actual method of pricing, which involves demand charges, etc.)

Department

Public Works – Water Dept.

Target or Goal

Recent projects and proposals, including:
• Aeration system improvements, completed in June 2008
• The waste water plant has committed to two Stirling Engines, one of which was installed earlier this year.
• secondary blower building heat recovery
• VFD (variable frequency drive) / PID (proportional-integral-derivative control) for process water pumps.

Projected Benefit

644 tons of CO_2 savings each year:
• Numerous improvements to the aeration system, completed in June 2008: 258 tons of CO_2 savings (14% of the 1828 tons produced in 2007)
• Two 43 kW Stirling Engines: 292 tons of CO_2 savings each year
• Heat recovery project for the blower building: 62 tons of CO_2 savings each year
•VFD (Variable Frequency Drives) and PID controls: 32 tons of CO_2 savings each year

Savings / Cost

$379,205 total costs, $64,859 total annual savings:
• $39,205, 1.5-year payback, $26,000/yr savings
• $300,000, 7.4-year payback, $26,000 yr savings
•) $30,000, 3.5-year payback, $8,470/yr savings
• $10,000, 2.3-yr payback, $4,389/yr savings

Timeline

All of these projects are completed, underway, or expected to be implemented in the near future.

Related Recommendations

INT-5
NRG-5

Partnerships / Related Interests

NorthWestern Energy – Dave Bausch & John Campbell; Power Services of Montana (contractor for the aeration efficiency project)

2. Two Stirling Engines are being installed, which will produce electricity from the methane gas by-product of the waste-water treatment process. The two 43 kW engines are expected to generate 70 kW continuously, and run at 85% capacity factor to produce over a half million kWh per year: 70 kW x 8760 hrs / yr x 0.85 = 520,000 kWh / yr

   According to the CACP software, a reduction of that amount yields 292 tons of CO_2 savings each year.

   And according to an article in the February 12, 2008 Independent Record, the cost of a Stirling Engine is about $250,000 -- NorthWestern Energy provided a $100,000 grant on the first one. At a price of 7.7¢ per kWh, the electricity savings of both engines translates to $40,400 per year. Assuming a cost to the City of $150,000 x 2 engines, this produces a payback of about 7.4 years. The payback period will be shorter, if the price of electricity increases. http://helenair.com/articles/2008/02/12/local/85lo_080212_energy.txt

3. According to John Campbell at NorthWestern Energy, "The waste heat recovery project will consist of an air-to-air heat exchanger - to recover heat from the discharge air on the new cycloblower. Note: The discharge air temperature for the new blower is about 160 or 170 degrees F. The waste heat recovery system will eliminate the use of the electric unit heaters (they will be removed from service). Propane-fired unit heaters will be installed as back-up heaters in case the blower is taken down for service or repair." This project was endorsed by the Task Force in its Stimulus Funding Recommendations (Appendix F2).

   The proposed heat recovery project for the blower building would eliminate the need for the existing electric heater units, which use 110,000 kWh / yr.

   According to the CACP software, a reduction of that amount yields 62 tons of CO_2 savings each year.

   The total cost of the heat recovery project is $30,000. At a price of 7.7¢ per kWh, the electricity savings converts to $8,470 per year, giving a payback of about 3.5 years (shorter, with price increases or if NorthWestern Energy funds are considered).

4. According to John Campbell at NorthWestern Energy, "NWE provided assistance and incentive funds for VFDs and PID control for 20 hp process water pumps. The VFD eliminates recirculation of water from the discharge of the pump back to the intake and maintains a constant discharge pressure. . . Note: PID is a type of control system (proportional-integral-derivative control) that is commonly used with VFDs."

   The VFD and PID control for the 20 horsepower process water pumps are expected to save 57,000 kWh per year. According to the CACP software, a reduction of that amount would result in 32 tons of CO_2 savings each year.

   According to John Campbell's recollection, the cost of the VFD / PID process water pump project was in the neighborhood of $20,000. NorthWestern Energy provided a $10,000 grant for this project, leaving approximately $10,000 as the city's share. Using a price of 7.7¢ per kWh, the electricity savings converts to $4,389 per year, giving a payback of about 2.3 years (shorter, with price increases).

5. In its Stimulus Resolution (#19630, see Appendix E4), the City also listed the following projects, both of which were endorsed by the Task Force in its Stimulus Funding Recommendations (Appendix F2):
   • "Changing lighting fixtures from T-12 to T-5 in all storage and equipment buildings" — $20,000 project cost
   • "Replacement of computer control system for the entire plant to include energy management" — $300,000 project cost

In addition, the WWT plant has pursued numerous other green building /energy conservation projects, such as the installation of at least one on-demand hot water heater in one of the offices. Other projects, such as the original methane/heat energy (for the digesters & some of the buildings) were completed before the 2007 model year, so were not included in this analysis.

Summary of Benefits, Direct

- Increased efficiencies to continue the exceptional progress of WWT plant, making this a model facility nationally.(NRG-5)
- Stirling Engines will burn waste methane, which was previously flared and occasionally off-gassed (which can produce an odor).

Similar Actions in Other Cities

East Helena was inspired to take similar actions at its smaller waste-water treatment plant – see NorthWestern Energy factsheet -- efficiency case-study (Appendix N)

References and Resources

"City getting grants to conserve energy" -- IR, 2/12/08:m http://helenair.com/articles/2008/02/12/local/85lo_080212_energy.txt

NorthWestern Energy factsheet -- efficiency case-study (Appendix N)

NRG-5 Zero Waste Wastewater Treatment Energy Target

Department
Public Works – Waste Water Treatment

Target or Goal
Zero net energy consumed

Projected Benefit
This target is not needed for the City to meet the "20% below 2007 by 2020 goal," and it was not quantified. But the Task Force sees such impressive progress and potential at the WWT facility that it wanted to include this recommendation as a "reach" goal. If it were to be accomplished, upwards of 2,000 tons of CO_2 could be avoided each year.

Savings / Cost
N/A

Timeline
On-going

Related Actions
INT-5
NRG-13

Existing Actions
- Installation of Stirling Engines
- Early stages of exploring an algal biomass pilot project at WWT facility

Partnerships / Related Interests
NorthWestern Energy
CTW Energy

Recommendations

The City should take broad steps to set the framework for achieving a net zero waste water treatment facility here in Helena: it is believed that Helena's would be the first in the nation. Steps will include establishing energy reduction goals, identifying large energy sinks in the facility and alternatives to those, attracting research activity from Montana's universities to assist plant managers, and seeking regional and national recognition for the City's efforts that might attract further resources.

The City of Helena is already a national leader in the area of energy efficiency in its wastewater treatment systems. City managers have shown extraordinary commitment to reducing the energy footprint of the facility, reducing its impact on the City budget and preparing the facility for the future growth of Helena.

To achieve the goals underlying this report, still more energy savings will be required of the WWT facility. According to the GHG Assessment, WWT activities contribute 40.4% of the C02 emitted and 31.9% of the energy consumed by City government activities (down from 50.8% and 47.1%, respectively, in 2001.)

To continue the remarkable success of the WWT facility, the City will have to attract grants and funding from a variety of sources: future efficiency upgrades will come at a cost that might have a longer payback time horizon than past projects and will thus be a tougher sell through normal budgeting channels.

Don Clark and Mark Fitzwater have already attracted the attention of CTW Energy (Bozeman company, with a pilot project in Deer Lodge), which has proposed siting a algae/oil/biodiesel pilot facility at the WWT plant. With the help of partners like CTW Energy, Helena stands to improve the environmental performance of its wastewater treatment process, and achieve substantial savings on energy. Biodiesel and possibly excess renewable electricity and heat could be produced. These services will allow the City to generate additional revenue, manage operations more effectively, and attract progressive companies to the area.

In its Stimulus Resolution (#19630, see Appendix E4), the City included the following project, which was endorsed by the Task Force in its Stimulus Funding Recommendations (Appendix F2):

- Primary scum removal system – "system upgrade with grease interceptor to enhance methane" -- $500,000 project cost

If this type of additional fuel could be obtained, the WWT plant could install a third Stirling Engine, and heat the entire complex (some small buildings are still being heated electrically).

Summary of Benefits

- Helena recognized as a national leader in efficiency
- Goal and resulting recognition will open doors to grant funding

Similar Actions in Other Cities

None

References and Resources

http://helenair.com/articles/2009/07/04/national/116na_090704_unclesam.txt

NRG-6 Develop a Comprehensive Energy Management Strategy

Recommendation

A Comprehensive Energy Management Strategy would start with a detailed analysis of the City's energy use, across all of its departments, and end with establishing goals and an overall action plan for energy conservation, renewable energy activities and long-term management and monitoring of the City's energy consumption. While this recommendation focuses specifically on facilities, in the future it could also include other mobile energy users such as fleet vehicles. The City should ensure that it has current energy audit information on all of its buildings. Using that information, it could evaluate different options for reducing energy use and greenhouse gas emissions across the system as a whole – looking not just at individual projects, but synergies across buildings, or within a single building. Integrated Design principles can often produce substantial energy savings with surprisingly modest investments. Investments in insulation, for example, might be recouped with savings on a replacement boiler, which could now be made smaller.

The Strategy document should be prepared by July, 2010, as one of the first tasks of the newly-hired Sustainability Coordinator. The Task Force believes this recommendation can be implemented rather quickly, as it builds upon existing City strategies (see below) and can be modeled after similar documents adopted by other cities.

The City already looks at energy usage data and potential efficiency projects collectively, across many of its buildings (apparently, it's somewhat rare for a City to have a centralized "facilities department" – in fact, Helena may be the only community in Montana to use this approach, which has proven effective in bringing greater focus to energy issues). The Task Force applauds the City's practice of funding individual projects from a broader (non-departmental) budget, which allows for pooling of resources. The City has strong financials, and access to the Intercap loan program. As a consequence, it has not had a need to pursue energy performance contracts (as is being done in Missoula, etc.).

In general, the City is in a good position with upkeep, which has allowed several energy projects to move forward (rather than being postponed for needed maintenance and repair work).

According to the Facilities Director, the City's bigger challenges have to do with technology availability. Sometimes technologies aren't quite ready for widespread deployment, although the City is willing to do its part in helping to test newer products in limited applications.

The City also continuously balances whether to allow building components to last through their useful life, or if it is more advantageous to substitute newer, higher efficiency products.

The Task Force feels that the Facilities Department is doing very good work, albeit with a small staff.

A listing of specific City-owned buildings, a description of their energy usage and other features, and planned efficiency projects is included as Appendix J.

Department

New Sustainability Coordinator & Facilities Department

Target or Goal

This is a Process recommendation that will support the goals described in NRG-7, and reductions described in other recommendations.

Projected Benefit

Not modeled separately – this recommendation supports and helps enable the savings described in other recommendations.

Savings / Cost

$0

Timeline

July, 2010

Related Actions

INT-5
IMP-1
IMP-2
IMP-3
NRG-7

Existing City Actions

The Task Force was impressed to learn that the City already takes a comprehensive approach for managing energy in buildings (highlighted below in Recommendation.)

Partnerships / Related Interests

City Green Team, citizen advisory boards, outside technical (engineering) expertise if necessary, but it is recommended that the City energy office / green team will possess those skills

In its Stimulus Resolution (#19630, see Appendix E4), the City included numerous building related projects, largely targeted at the City County building and including the following estimated costs:

- $650,000 for "installation of building wide cooling in place of window air conditioners"
- $50,000 for "installation of proportional and computerized boiler controls"
- $30,000 for "insulating all steam and condensate lines"

In its Stimulus Funding Recommendations (Appendix F2), the Task Force endorsed all of these projects, and also recommended "staff time or contractor to develop and adopt energy and resource-efficient building standards for existing and new City facilities."

In its June 17, 2009 application for Energy Efficiency and Conservation Block Grant funds, the City and County jointly requested a total of $259,000 for "new controllers and burners for the boiler, insulation of the boiler pipes and a central cooling system to replace the individual window units" to go along with $168,211 in leveraged funding from these two local governments.

As described in IMP-1, the Task Force believes that an energy office can be largely self-supporting. The combination of stimulus funds and energy bills savings should cover both initial and ongoing costs. As a member of ICLEI (or a similar organization), the City can draw upon that organization's expertise for using stimulus funds & self-financing techniques for the energy office and this activity. The energy office would develop the Comprehensive Energy Management Strategy in-house, using its internal resources. The sustainability coordinator would ideally work closely with the facilities director, other City staff, and members of any ongoing citizen advisory board. In addition to their rapid energy savings payback, efficiency projects often significantly reduce City utility and maintenance costs over the long-term, thereby providing resources for other activities.

Similar Actions in Other Cities

Dawson Creek, British Columbia, Canada: http://www.planningforpeople.ca/index.asp

References and Resources

EPA/Energy Star website provides a set of guidelines and a tool for comprehensive energy management: http://www.energystar.gov/index.cfm?c=guidelines.guidelines_index
NREL, Misty Conrad
ICLEI
Gery Carpenter, Facilities Department, City of Helena

NRG-7 Adopt Energy Efficiency Standards for City-Owned Buildings

Recommendation

In 2009, the Montana Legislature passed SB 49 establishing an energy efficiency standard for new state-owned and leased buildings. The law requires that these buildings "be built and operated as high-performance buildings" and that they "exceed the International Energy Conservation Code (IECC) most recently adopted by the department of Labor and Industry by 20% or to the extent that is cost-effective over the life of the building or major renovation." The Task Force recommends that the City adopt a similar standard. Incorporating energy efficiency into new buildings is cheaper than (and preferable to) retrofitting later. LEED certified buildings also can be attractive show-pieces, serving demonstration purposes.

Yet, at the same time, the City has only modest plans for major new construction projects by 2020 (mostly parking garages – the 15th St. garage associated with the new State Fund building may be LEED certified). The new transit facility would be a great place to showcase sustainable, renewable and efficient technology. However, focusing on existing building stock will be the source of most of the building-related energy savings that can be achieved in the near term. Therefore, a similar standard should be required for those facilities, and a retrofit calendar established.

Recognizing that this recommendation will take some time to filter into the existing building stock, the Task Force assumed an average 10% reduction in building heating fuel use (for both space and water heating) by 2020. The facilities in the "buildings" section of Helena's GHG inventory collectively used 140,914 therms of natural gas in 2007. 10% of that is 14,091 therms. Assuming an approximate figure of $10 per therm, the savings would be $140,914 per year (higher, with price increases). The Task Force did not have figures for the initial, up-front investment costs required to produce these savings.

* The fiscal note of SB 49 states, "New buildings and major renovations will likely have some higher initial costs; however, these costs should be offset by savings over the first several years of operation."

This reduction produces a modest, annual savings of 88 tons of CO_2. Additional savings would accrue on the electricity side, as better performing buildings also reduce air conditioning load. The bulk of Helena's municipal building-related CO_2 emissions comes from electricity use rather than heating fuel.

Another bill that passed the 2009 legislature, HB 420, gives local governments the authority to adopt efficiency

Department

Facilities Department & New Sustainability Coordinator

Target or Goal

- All new City-owned or leased buildings should perform 20% better than International Energy Conservation Code standards (the IECC version most recently adopted by the Montana Department of Labor & Industry).
- The City should adopt a similar standard for existing buildings.

(The Task Force is open to other approaches, such as Energy Star or LEED, if they are similarly effective.)

Projected Benefit

88 tons of CO_2 annually

Savings / Cost

$140,914 per year (higher, with price increases)

Timeline

The City should develop and adopt these efficiency standards in concert with its Comprehensive Energy Management Strategy (NRG-6), and with the same target date of July 2010.

Related Actions INT-2

In its Stimulus Funding Recommendations (Appendix F2), the Task Force recommended "staff time or contractor to develop and adopt energy and resource-efficient building standards for existing and new City facilities." (INT-5)

- NRG-6
- NRG-8

Existing Actions

Numerous: See Recommendation Overview

Partnerships / Related Interests

The Governor has adopted a "20 x 10" initiative for a 20% reduction in state government energy use by 2010. The Department of Environmental Quality is charged with implementing the initiative, has considerable expertise in this area, and could be a good resource for the City.

standards more stringent than the state code. While those standards are "voluntary" and "incentive-based" if applied to private developers, there is nothing that prevents the City from 1) adopting strong standards, and 2) ensuring that its own buildings comply.

Note that the IECC includes both prescriptive (aka "construction") and performance-based standards, and covers not just the thermal envelope of buildings, but also mechanical systems, lighting systems, alternative building materials, and other features.

The City should also address "split-incentive" barriers to energy efficiency, for City-owned buildings that are rented out (or vice-versa) and with City-subsidized housing (split incentives occur when the entity making the investment does not directly see the benefit of the savings, as is often the case with rental situations). The City should ensure that all of these properties have current energy audits and that they comply with the efficiency standards that get developed. The City may also need to step in to help finance those projects (with energy performance contracts or other tools).

The Facilities Department has taken an active role in looking for energy- and money-saving opportunities in existing City buildings. One example is simply ensuring that windows operate as intended, allowing City staff to take advantage of natural cooling, ventilation, and daylighting. On the mechanical side, the City is working to ensure that all of its steam and condensate lines get properly insulated, and is working on computerized boiler controls for the City-County building.

Electronic controls is an area in which the City has made impressive strides. Occupancy sensors for lighting is one example (see recommendation NRG-8).

Recently, an 80-ton chiller was installed on the roof of the City-County building. The City worked with Johnson Controls on this "top notch efficiency" project, but is hoping for a more elaborate computerized control system in approximately two years.

The Facilities Department stresses the importance of working with a building's natural features. For example, the movement of the sun heats the building differentially throughout the day, and the HVAC system should respond to those changes. According to Gery Carpenter (Facilities Director), "intelligent control enhances comfort" and leads to productive, efficient workers. "Saving energy is not worthwhile if it leads to uncomfortable, unhappy, and unproductive workers. Saving energy is a by-product of intelligence and efficiency." Simply having enough thermostats can make a world of difference (so the heating in one person's office isn't controlled by a thermostat on the other side of the building that may be in a totally different environment, based on the position of the sun, for example.) Having a staged system is desirable not only for comfort, but from a demand charge perspective as well.

Another idea is to explore the use of reflective roof coloring (white and silver rooftops not only absorb less heat in the summer, but they emit less in the winter):

http://www.washingtonpost.com/wp-dyn/content/article/2009/06/13/AR2009061300866_pf.html

It appears that these many good projects are paying off. The Greenhouse Gas Assessment shows a 5% decrease in energy usage in the buildings category between 2001 and 2007.

See Appendix J for detailed notes compiled by Carrie Hahn about the City buildings and some of the other energy projects that have been completed, started, planned, or considered.

In its Stimulus Resolution (#19630, see Appendix E4), the City proposed the following projects, which the Task Force endorsed in its Stimulus Funding Recommendations (Appendix F2):

- $770,000 in matching funds for the Helena Housing Authority's $2.4 million Energy Performance Contract: http://helenair.com/articles/2008/06/04/local/106lo_080604_hha.txt
- A total of $600,000 to be used for Head Start and Early Head Start, which the Task Force endorsed (to the extent that some of this money would be used for efficiency projects).
- $4,000,000 for Rocky Mountain Development Council (RMDC) "weatherization and increased energy efficiency in single and multi-family homes occupied by low income households."

Similar Actions in Other Cities

The Homer, AK CAP recommends energy audits for all City buildings, followed by appropriate weatherization and other improvements. The Homer CAP also recommends that all new City buildings meet LEED standards, and that all buildings be operated with a heating thermostat setting no higher than 68, and cooling no lower than 75. Salt Lake City also has a recommendation for a LEED Silver ordinance for new buildings and renovations.

The Aspen, CO Climate Action Plan includes energy and resource-efficient standards for all existing City facilities. It also requires that the City invest in all measures with a simple payback of 10 years or less. City-funded retrofit projects must exceed IECC standards by 15%. The Aspen plan suggests energy audits for affordable housing units, and upgrades to EnergyStar or better. The Boulder CAP has a similar recommendation for minimum efficiency standards in affordable housing units.

The Montana Climate Action Plan recommends a 30% increase in building performance over 2003 IECC by 2020 for both new and substantially renovated buildings.

References and Resources

Montana Climate Action Plan (see recommendations RCII-4 and RCII-5):
http://www.mtclimatechange.us/CCAC.cfm

NRG-8 Improve Lighting Efficiency of City Buildings

Department
Facilities Department & New Sustainability Coordinator

Target or Goal
• Convert exit signs to LED as soon as possible
• Complete changeover to T5 fluorescent bulbs by 2013
•Pursue other projects as identified by City staff, ongoing climate / energy committee, or others

Projected Benefit
290 tons of CO_2, annually

Savings / Cost
• Savings: $53,091 per year. It is unknown what the initial cost would be to produce these savings, but lighting projects typically have a relatively short payback period.
• In its Stimulus Resolution (#19630, see Appendix E4), the City included a plan for "changing all lighting fixtures from T-8 to T-5 fixtures with room sensors," at an estimated cost of $50,000.

Timeline
Ongoing, with major progress completed by 2013

Related Actions
• The Task Force has already endorsed the conversion of all T8 to T5 lighting fixtures (with room sensors) and the conversion of exit signs to LEDs (INT-5, Appendix F2).
• NRG-14 recommends that the City invest in efficient street lighting and lighting for the Fire Tower.

Existing Actions
Numerous: See Recommendation

Partnerships / Related Interests
NorthWestern Energy has a variety of Demand Side Management programs that can assist with the up-front cost of lighting upgrades (similar to the program that helped fund the efficiency projects at the waste water treatment plant).

Recommendation
This recommendation is listed separately, as lighting is often a big-ticket item in terms of cost-effective energy savings. The U.S. Department of Energy's proposed energy efficiency standards for linear fluorescent tubes and incandescent reflector lamps have the potential to save up to 1.6 trillion kilowatt-hours over 30 years, which would save consumers $70 billion. (Docket #: EE-2006-STD-0131)

The City feels that it has already acquired much of the "low hanging fruit" in this area, but studies show tremendous new potential with emerging technologies such as LEDs. Therefore, the City should continue to prioritize lighting as a potential low-cost strategy for achieving energy savings and greenhouse gas reductions.

Significant advances in lighting efficiency were implemented five-to-six years ago with the conversion from T12 to T8 light fixtures and other simple changeouts. The Civic Center has most of the remaining incandescent lightbulbs (due to dimmer needs) and also some halogens for stage lighting.

Dimmable T5 bulbs were recently installed in the City-County building, but Gery Carpenter feels that a full-scale changeover is still four-to-five years out. According to Gery, some of the Lighting Design Lab products may not be ready for real-world deployment, based on dust factors, maintenance considerations, etc.

The Facilities Department is installing occupancy sensors as part of the remodel of the City-County building. Sophisticated "dual sensors" detect both motion and heat (to prevent lights from going out on people who are quietly working), and give occupants the ability to tailor the settings (full brilliance, half brilliance, etc.). If this project is successful, it will be expanded to other City buildings.

Other lighting projects that the City is pursuing include:
• new lights at Legion Field, funded by the recent Parks Bond
• fire department lighting possibilities – discharge lights (although they take awhile to come on)
• "Commisioners agree on new LED sign for Civic Center" (Helena IR, 2/10/09): http://helenair.com/articles/2009/02/10/local/75lo_090210_led.txt
• the airport recently installed more efficient runway lights (although the airport authority is a separate entity): "Project bid flies low" (Helena IR, 5/27/09): http://helenair.com/articles/2009/05/27/top/top/50lo_090527_airport.txt

According to the American Council for an Energy Efficient Economy (ACEEE), "Lighting accounts for 20% of all electricity use in the U.S. and more than 40% of electricity use in offices . . . Nationwide, if all commercial buildings installed state-of-the-art energy-saving lighting systems, their lighting energy use could be reduced by at least 40%." http://www.aceee.org/press/op-eds/op-ed5.htm

Using these figures, a 40% reduction in lighting-related energy use in offices translates to a 16% overall reduction in electricity use (40% of 40%).

A 16% reduction in all electricity use in the "buildings" category of the CACP software yields an annual savings of 290 tons of CO_2.

The facilities in the "buildings" section of Helena's GHG Assessment collectively used 3,318,216 kWh of electricity in 2007, 16% of which is 530,915 kWh. Assuming a rough figure of 10¢ per kilowatt-hour, the savings would be $53,091 per year (or greater, with price increases). It is unknown what the initial cost would be to produce these savings, but lighting projects typically have a relatively short payback period.

Summary of Benefits

The typical incandescent bulb releases 90% of its energy as heat rather than light (i.e. for a 60 Watt bulb, only 6 Watts goes to light), and lasts for only about 1000 hours. By comparison, a compact fluorescent lighbulb (CFL) uses about one-fourth the power to produce the same amount of light, and lasts ten times as long. Assuming 10 cents per kWh, replacing a single bulb saves about $45 over its lifetime (even when including the up-front cost of the bulbs). Assuming a 50/50 mix of coal and hydroelectric power in Montana, it will also save about 450 pounds of carbon dioxide.

Even more impressive are LED lights, which use just one-tenth the energy of an incandescent bulb, and last up to 100,000 hours – long enough for them to be considered "semi-permanent" parts of a structure, akin to plumbing fixtures. This feature greatly reduces maintenance costs. Another benefit of LEDs is the absence of the trace mercury that exists in CFLs.

The ACEEE factsheet mentioned above lists other advantages, from reduced glare ("which helps reduce eye strain and improve worker productivity") to the absence of flickering and humming with electronic ballasts, to more natural-looking light.

Similar Actions in Other Cities

- Anacortes CAP recommends LED conversion for exit lights and building lights, in addition to streetlights.
- Seattle CAP suggests a requirement for high-efficiency linear fluorescent lights.
- United States Congress passed energy legislation in 2007 (HR 6, signed by George W. Bush on 12/19/07) that included a lighting efficiency standard. Because incandescent bulbs cannot meet this standard, most will be phased out by 2014. Many other countries have passed similar laws banning these inefficient bulbs.

References and Resources

American Council for an Energy Efficient Economy (ACEEE): http://www.aceee.org/press/op-eds/op-ed5.htm
Lighting Design Lab (Seattle): http://lightingdesignlab.com/
Integrated Design Lab (Bozeman): http://www.idlbozeman.com/index.html
"Green Promise Seen in Switch to LED Lighting" (New York Times, 5/30/09)
Calculations performed by Montana Environmental Information Center (and presented in a January 5, 2008 Power Point): Calculations performed by MEIC (January 5, 2008 Power Point): Because CFLs last so much longer, and because prices have come down so much, you end up paying about the same amount for the bulbs. Here is the math:

– Assume a 15 Watt CFL replaces a 60 Watt Incandescent, for a savings of 45 Watts.
– The lifetime of a CFL is about 10,000 hours
– The energy saved is therefore 450,000 Watt-hours (or 450 kwh).
– 450 kwh x $0.10 = $45
– Assume NorthWestern gets roughly 50% of its power from coal, based on communications with Dave Fine and Frank Bennett: http://www.epa.gov/cleanenergy/energy-and-you/how-clean.html
– Assume that an average coal plant produces about 2 lbs CO_2 / KWH.
– Then NWE's electricity carries a carbon footprint of about 1 lbs CO_2 / KWH. (these numbers are confirmed by greentagsusa.org)
• 1 lb / KWH x 450 KWH = 450 lbs CO_2

NRG-9 Reduce "Plug Loads" in Buildings

Department
New Sustainability Coordinator, Procurement Staff, Green Team

Target or Goal
• City procurement policy for purchasing Energy Star appliances only
•City policy requiring life-cycle analysis for new equipment
•Computer monitors upgraded to LCD screens (use 1/3 the energy)
Immediate installation of "vending machine misers" with explanatory stickers
• Green Team effort to reduce the use of inefficient, employee-owned appliances (individual coffee-makers, etc.)

Projected Benefit
The Task Force assumes that additional plug-load efficiencies will be able to offset growth in electricity demand, but probably not able to reduce demand significantly below the 2007 levels.

Savings / Cost
The Task Force assumes that any incremental cost for better performing appliances would be quickly recouped with energy savings.

Timeline
The Green Team should be formed ASAP. Procurement policies should be adopted shortly thereafter (by end of 2009).

Related Actions
Green Team / Procurement Policy (INT-3)
Green Team (IM P-2)

Existing Actions
Numerous. See Existing Actions in main text

Partnerships / Related Interests
Employee Groups: Green Team

Recommendation

"Plug load" refers to the energy demand of electrical equipment used in a building. The growth of electronic plug loads has been extremely rapid. The NW Power and Conservation Council describes the growth of Information, Communication, and Entertainment (ICE) devices in the residential sector as "explosive": http://www.nwcouncil.org/library/2009/2009-03.pdf (p. 12)

A factsheet by the ACEEE reports that "Office equipment is the fastest growing use of electricity in U.S. commercial buildings . . ." (http://www.aceee.org/press/op-eds/op-ed4.htm)

It is reasonable to suspect that a similar trend is taking place in government offices (with laptops, power point projectors, routers, chargers, scanners, digital cameras, printers, copiers, etc.). ACEEE urges procurement policies that limit purchases to Energy Star "power managed" equipment (with sleep modes, etc.). It is also important to ensure that these energy saver features are properly set (enabled). Whenever possible, office equipment should be completely shut down at the end of the day, to save even more energy. Another good opportunity is the use of smart power strips that can guard against "phantom loads" – the unnecessary and constant use of energy by devices, even when they aren't being used.

ACEEE notes that many computer monitors and "most copiers, laser printers, and fax machines" have high energy requirements due to electric resistance heating elements, so special care should be taken with these products.

To be most effective, energy saving efforts need to involve both equipment (energy efficient technology) and behavioral changes (energy conservation). If the City purchases high efficiency devices, but employees bring in their own individual appliances (coffee-makers, etc.), much of the potential savings could be lost. A City Green Team could play an important role in this area.

Because the City has already begun purchasing Energy Star devices, the GHG analysis assumed that the potential for cuts below the 2007 level was limited. But holding that level while the City grows should be achievable.

There is always a balance between the benefits of allowing equipment (and facilities) to last for their entire life, or replacing grossly inefficient products even before they have ceased to function. In many cases, the latter is justified on both environmental and economic grounds. This is why life-cycle analysis that includes "embedded energy costs" is important.

As a final note, vending machine misers (which have motion sensors and software to turn off lights and even refrigeration during long periods of dormancy) have incredibly short payback periods. The Task Force urges immediate adoption of this technology.

Existing Actions

The City has a mumber of purchasing practices and energy management policies that influence plug load.

PURCHASING

- The City/County has a coordinated Information Technology (IT) department, with input from an IT steering committee and IT board (City Manager, County Administrator, Commissioners, etc.).
- Energy Star products are already standard for all new computer and printer purchases. The City/County takes advantage of discounts available by buying through the same arrangements as the State.
- Computers are replaced on a schedule, about 25% per year which comes out to about 100 or so. The City/County is currently purchasing mostly Hewlett-Packard machnes. Old machines are used somewhere else in the City/County or sold in surplus sales to schools, etc. Occasionally some go to e-waste recycling events, which costs a little. But the policy is to keep any e-waste out of the landfill.
- Most printers are shared and on a network, which allows centralized accounting and volume records.
- Other than IT, there is no central purchasing.
- Each department has its own budget.
- Copiers and some other equipment are on a schedule. Often, there is a lease purchase agreement so the City is not responsible for disposal. Coffee-makers and refrigerators are not purchased by the City, but are sometimes installed by employees as desired.
- Operational efficiency has primacy over energy efficiency. If equipment choice would lower productivity (i.e. take longer to do job, cause delays in work momentum etc.) then it is avoided. Personnel is a bigger piece of budget than energy use. It is important to protect the work team from frustration.
- Policies for contracting are not standardized and need review
- The City / County is bound by bidding requirements for large purchases. Energy Star type specifications must be stated. Contract language can be created that states the desired performance standards (important for purchases >$25,000).

ENERGY MANAGEMENT

- The City/County policy is for computers to be turned off after work for security reasons as much as energy savings.
- Monitors go on sleep mode and are easy to bring back on line. It is not worth it to put the central processing units on sleep mode, as they are networked and can take up to 10 minutes to come back online. If an employee is going to be out of the office of a few hours or more, the The City/County recommendation is to put the machine to sleep or shut it down.
- Servers are on constantly, around the clock. Numbers are down to 16 or 17 hours per day, versus 24 hours a few years ago.
- Virtualization and more powerful machines, and wider broadband means one machine can host 3 or 4 servers. Servers are a main focus for innovation in energy use so each new purchase tends to be better. Servers are on about a three-year schedule.
- Copiers are purchased through various departments (with oversight regarding networking issues) but tend to be shared between 4-5 people or a floor depending on workload. Usually these are on lease contract and new ones tend to be Energy Star.

Summary of Benefits

ACEEE lists the following additional benefits of Energy Star equipment:

- “Generally less noisy (from reduced fan operation)”
- Longer lasting
- “Less waste heat, improving comfort within the office and reducing air-conditioning load”

Similar Actions in Other Cities

The Anacortes CAP includes both an LCD computer monitor program and a vending machine miser program. The Aspen CAP includes a procurement requirement for Energy Star or equivalent equipment. The Boulder CAP includes a program to promote employee energy conservation.

References and Resources

NW Power and Conservation Council: http://www.nwcouncil.org/library/2009/2009-03.pdf

For an example of a study that shows how energy efficiency can offset all new electricity demand, see: http://www.nwenergy.org/power

American Council for an Energy Efficient Economy (ACEEE): http://www.aceee.org/press/op-eds/op-ed4.htm

"Environmental Alarms Raised Over Home Electronics" (ABC News, 2009) http://abcnews.go.com/print?id=7576544

NRG-10 Work with the Utility (NorthWestern Energy) and Regulator (Public Service Commission) on Policies to Support Conservation and Renewable Energy

Recommendations

Utilities and regulators can assist customers with conservation projects in a variety of ways – by making direct grants and rebates, offering technical assistance, or offering rate structures that provide the right incentives. Examples include:

- An emphasis on volumetric (per kWh) rates instead of flat monthly service charges -- the Task Force finds that NorthWestern Energy currently does well in this area compared to many other utilities (at least for residential customers who do not have demand charges);
- Inverted block rates, whereby customers pay one "per kWh" price up to a certain level of consumption, and higher prices beyond that;
- Interruptible rates, whereby customers agree to participate in momentary suspension of service (commonly, this is done just with certain appliances, not the whole house) in exchange for a cheaper rate – the utility can cycle through these customers to manage a power peak, rather than acquiring additional supply; and
- Time-of-use rates, whereby customers can shift their energy use (for some appliances) to off-peak hours to get a cheaper rate.
- "Decoupling" which attempts to remove the utility disincentive to successful conservation projects by severing the link between revenues and sales.

While some of these techniques may make more sense for residential rather than governmental customers, others clearly benefit both.

The Task Force recommends the City join forces with other Montana cities and energy efficiency advocates in working for changes in rate structures.

One specific area of frustration identified by staff is with demand charges. Larger energy consumers (like commercial and government facilities) are charged by the utility based primarily on their peak power usage. Efforts to reduce energy use (on a kWh basis) can produce little reward if the customer continues to have the same peak power requirement. An example is the Civic Center, which is frequently leased out for concerts or other events. During those times, the City has little control over the peak power demand, which can be significant. In an office setting, even occupancy sensors can add to a higher peak usage, if many employees return from the same meeting at the same time, for example.

Department

New Sustainability Coordinator & Facilities Department

Target or Goal

This is a Process recommendation that will support the goals and reductions described in other recommendations.

Projected Benefit

Not modeled separately – this recommendation supports and helps enable the savings described in other recommendations.

Savings / Cost

This recommendation would be implemented as part of the duties of the new Sustainability Coordinator, and other existing staff. As such, it would not impose additional costs.

Timeline

Ongoing. Most of these changes could take place through utility or regulatory action. One example, NorthWestern has already started an intensive study of "decoupling" (severing the link between revenue and sales to align the utility's interests with the cause of energy conservation). It is likely that the company will submit a filing in early 2010. The 2011 (or subsequent) legislature(s) could play a role in advancing some of these policies.

Related Actions

- Work with the utility to get a "Green Blocks" residential energy conservation program started in Helena (TWRP-7).
- Other projects, such as a community net-metered solar array (NRG-11), would also require outreach to the utility, the regulator, and possibly the legislature.
- Conservation friendly rate policies can be applied to water utilities, as is recommended in WTR-1 and WTR-6.

Partnerships / Related Interests

NorthWestern Energy
Montana Public Service Commission

The Task Force is sympathetic to this concern, and encourages the City to conduct further research on possible solutions (whether it be a more favorable rate structure, peak shaving options, and/or the use of some kind of distributed generation).

More basic than rate structures is the simple provision of useful data to the customer. Tools that assist the City in monitoring its current and historic usage can be very useful in identifying and prioritizing specific efficiency and education projects.

References and Resources

An excellent website for tracking energy efficiency (and renewable energy) policies in the various states is: www.dsireusa.org

ACEEE also ranks the states for their efficiency policies (in 2008, Montana was listed as 27th): http://aceee.org/energy/state/montana/mt_index.htm

A very good introduction to decoupling can be found at:
http://www.nwenergy.org/publications/the-transformer/2007/the-transformer-november-28-2007
with a follow-up article at:
http://www.nwenergy.org/publications/the-transformer/2008/the-transformer-february-25-2008

NRG-11 Study / Develop Renewable Energy Projects at City / County Facilities

Recommendations

Helena has a truly outstanding renewable energy resource. According to the State of the Rockies Report Card, published by Colorado College in 2008, Lewis & Clark County gets the following "grades" for its renewable energy potential:

- Biomass: B (44,058.7 Tonnes / yr)
- Solar: B- (8,275.5 Million MWH / yr)
- Wind: A- (3.6 Mean Power Class)
- Geothermal: A (181.3 mW / m^2)

The Task Force recommends that the City work with Lewis & Clark County on a joint project to install a 10 kilowatt solar electric array on the City-County building.

The County estimates that a 10 kW solar electric system in Helena would produce 47 kWh / day (17,155 kWh per year). According to ICLEI's CACP software, reducing electric usage at the City-County building by that amount would save 10 tons of CO_2 per year (from 224 tons to 214 tons).

The solar electric system is expected to produce 17,155 kWh per year. At 10¢ / kWh, that would save the City $1,716 per year (more, with price increases). The total cost of the system could approach $100,000, but the City's share could be substantially reduced through grants or rebates. (The Task Force had recommended that this project be pursued under the Energy Efficiency and Conservation Block Grant program.)

In its Stimulus Resolution (#19630, see Appendix E4), the City envisioned a more comprehensive solar electric program that would "consider installation on the following buildings: City-County building; Main Fire Station; Eastside Fire Station; Chamber of Commerce building; Neighborhood Center; Wastewater Treatment Plant; Water/Wastewater Utilities Building; Tenmile Treatment Plant; MRTP; and City Shop," with an estimated total cost of $465,000. In addition, the City identified "numerous opportunities for both solar and wind turbine projects at all three [water] treatment facilities," with an estimated cost of $1,000,000. The Task Force endorsed these projects in its Stimulus Funding Recommendations (Appendix F2).

In particular, it recommends a wind energy project – perhaps at the County landfill site, where anemometer data has been collected for some time. Montana's net metering law has a 50 kW limit. Good models for wind projects of that size are:

Department

L&C County, New Sustainability Coordinator & Facilities Department

Target or Goal

Place a 10 kW solar electric system on the City-County building, and potentially others. The Task Force also recommends that the City (or the City & County) identify an appropriate site to move forward with a 50 kW wind turbine, and that it investigate other potential renewable energy projects as described below.

Projected Benefit

Solar: 10 tons of CO_2 per year
Wind: 37 tons of CO_2 per year

Savings / Cost

- Solar: $1,716 savings/yr, $100,000 cost
- Wind: $6,570 savings/yr, $190,000 cost

(See Recommendation for details)

- Another approach is for the City to lease the space and purchase the energy, but not own the generator. (see References)

Timeline

- The stimulus funding is designed to promote "shovel ready" projects in the very near term. PV panels should be installed and operating by the end of 2009.
- The wind project should be investigated in 2009. It could theoretically come online by the end of 2010.

Related Actions

- INT-1 urged that the City adopt policies to mitigate building permit fees for solar electric or other renewable energy installations.
- INT-5
- INT-6
- NRG-3 recommends a biomass project at the Tenmile Treatment Plant
- NRG-14 recommends that the City invest in solar-powered street lighting and Fire Tower lighting.

Existing Actions

See Recommendations

Partnerships / Related Interests

- Lewis & Clark Co.
- eXploration Works!
- NorthWestern Energy, John Campbell

1) the new turbine at the Cascade Co. Road and Bridge Department northwest of Great Falls, and
2) the turbine recently approved by the City of Great Falls for MSU-Great Falls College of Technology.

Assuming a conservative 15% capacity factor, a 50 kW wind turbine in the Helena area would produce 65,700 kWh / yr (0.15 x 50 kW x 8760 hours / yr). According to the CACP software, reducing electric usage at the City-County building by that amount would save 37 tons of CO_2 per year (from 224 tons to 187 tons).

The cost of the Cascade County 50 kW wind turbine was $190,000, but the county expects a full payback in 20 years or less. (Back-calculating, at 10 cents per kWh, that means 1,900,000 kWh over 20 years, or 95,000 kWh / yr. Dividing by the maximum potential output of 438,000 kWh / yr gives a capacity factor of 22%, which is reasonable for Great Falls with its excellent wind resource.)

If a 50 kW wind project in the Helena area produced 65,700 kWh annually, it would produce $6,570 in annual savings (at 10¢ per kWh). This would be a payback of approximately 29 years – sooner, if electricity prices increase due to carbon regulation or if co-funding is secured.

The Task Force also recommends that the city:

- Investigate the potential to partner on a geothermal project ;
- Investigate the potential for biomass-to-energy, in association with forest fuel-reduction projects (especially with beetle-killed trees) – however, all such projects need to be pursued in a sustainable fashion, preserving the benefits of a healthy forest ecosystem (habitat, erosion control, etc.) – see recommendation NRG-3;
- Investigate the potential for a solar thermal project (more successful than the one described below), a technology which typically has quite favorable economics;
- Investigate the potential for a micro-hydro project (installing a pelton wheel in water supply line coming from a reservoir, for example); and
- Investigate the potential for a "community net-metered" solar project such as the one at Ellensburg, Washington (58 kW, 66 subscribers).

EXISTING ACTIONS

For a time, there was a solar thermal "pre-heat" system at the East Side Fire Station. The facilities department expressed disappointment with it, after 11 years of trying to make it work.

In October 2004, Sundance Solar (Red Lodge) installed a 1.92 kilowatt solar electric system on the Neighborhood Center, a building which the City leases to other tenants. According to the National Renewable Energy Laboratory's "PVWatts" tool, the system would be expected to produce about 2,400 kWh per year if it were oriented to the South, but because it is oriented to the East, this figure is reduced to 1,754 kWh (or about $175 in annual electric bill savings, assuming 10 ¢ / kWh). (http://www.nrel.gov/rredc/pvwatts/version1.html)

According to Gery Carpenter, the system was not set-up to measure actual output, and it would be essentially impossible to determine the production from the net consumption data (because the electricity usage of the site dwarfs whatever the production might be).

The City is also a half owner of the LEED-certified eXploration Works! Museum, which opened in November 2007. According to John Campbell of NorthWestern Energy, the museum has 7,032 Watts of solar-electric capacity (24 x 208 Watt roof-mounted panels + 12 x 170 Watt pole-mounted panels with a Zomeworks solar-tracking system). Installation costs were $53,000 ($7.50 per watt), but the museum received a $39,750 grant from NorthWestern Energy's USB program. Estimated annual production is around 10,000 kWh ($1,000 in annual savings at 10¢ / kWh). The museum also has four flat-plate Vissman solar hot water collectors, and a 300 gallon hot water storage tank. PPL-Montana helped fund that project (with a grant of approximately $10,000).

Summary of Benefits

Increasing the use of renewable energy (solar, wind, etc.) delivers many benefits:

- Reduced combustion of fossil fuels
- Reduced greenhouse gas emissions
- Reduced "criteria air pollutants" – SOx, NOx, CO, PM, as well as mercury, etc.
- Reduced water usage (thermal power plants have substantial cooling water needs)
- Reduced solid waste (fly ash often has harmful impurities)
- Inexhaustible, free, domestic fuel
- Stable & predictable prices (no fuel price risk, low environmental risk, low O&M costs)
- Feduced price risk (through enhanced diversity of the energy portfolio)
- Local economic development (job creation, property taxes, etc.)

Similar Actions in Other Cities

Battleboro, VT CAP includes municipal solar pilot projects.

Homer, AK CAP includes wind or solar pilot projects at City facilities, and also hydroelectric turbines in the municipal water lines.

Ellensburg, WA

References and Resources

For more information on lease options, see the following NREL webinar: "Third-Party Financing . . . for Public Sector PV Projects" (5/27/09) http://apps1.eere.energy.gov/wip/pdfs/tap_webcast_20090527_coughlin.pdf

http://www.nrel.gov/rredc/pvwatts/version1.html

www.cascadecountywind.com

Colorado College "State of the Rockies" Report (2008): http://coloradocollege.edu/stateoftherockies/08ReportCard/RenewableEnergy.pdf

Exploration Works! contact is Beth Flint http://www.explorationworks.org/

Ellensburg, WA project Contact is Gary Nystedt – Gary gave a presentation at the Harvesting Clean Energy Conference in Billings, MT on 1/26/09. His Power Point is available at: http://www.harvestcleanenergy.org/conference/conferencearchives.htm

Other key renewable energy resources for Montanans include:

Montana Green Power: http://www.montanagreenpower.com

Montana Renewable Energy Association: http://www.montanagreenpower.com/mrea/

DEQ Energize Montana site (with info. on wind, solar, geothermal, biomass, etc.): http://deq.mt.gov/energy/

NRG-12 Adopt State Efficiency Standards and Improve Fleet Performance

Department
Public Works / Fleet Maintenance

Target or Goal
Full compliance by 2011

Projected Benefit
The Task Force believes a 10% reduction from 2007 levels can easily be accomplished by 2020 (even with the natural growth that the City government can expect). This would equate to a reduction of 179 tons (from 1,788 tons).

Savings / Cost
- Some up-front incremental costs may be incurred in moving to hybrid or other technologies as opposed to conventional vehicles
- Fuel purchase (and maintenance) savings can be significant
- Federal incentives may be available

Timeline
Analysis of current average fuel economy, Fall 2009.
Implementation plan, June 2010.

Related Actions
INT-5

Existing Actionss
City already has purchased some Hybrids, upgraded its fleet and has trial use of electric vehicles.

Recommendations

The Task Force recommends that the City adopt the State of Montana's fleet fuel economy goals and standards, established by two major initiatives:

1) SB 449 (signed May 8, 2007) requires that all state vehicles purchased on or after January 1, 2008, meet or exceed the current federal Corporate Average Fuel Economy (CAFE) standard. Agencies must develop and implement programs to reduce fuel consumption in their vehicles. Certain state vehicles are exempt from these requirements:

- Vehicles used by the Office of the Governor, the Attorney General, or the Highway Patrol;
- Vehicles that are used primarily in off-road use;
- Vehicles used for road construction and maintenance;
- Vehicles used for maintenance, construction, or groundskeeping;
- Vehicles used primarily for moving and distributing large items or a large quantity of items;
- Vehicles with a manufacturer-stated seating capacity of more than six persons; and
- Vehicles using alternative fuels.

(The text of the bill is available at: http://data.opi.mt.gov/bills/2007/billhtml/SB0449.htm)

For 27 years, the federal CAFE standard for passenger cars was 27.5 mpg. In 2007, the Energy Independence and Security Act (signed 12/19/07) raised the CAFE standard so that it will ramp up, year-by-year, until it reaches 35 mpg in 2020 (for passenger and non-passenger vehicles).

On May 19, 2009, the Obama administration accelerated this timeline by adopting rules requiring 35.5 mpg overall fleet average by 2016 (39 mpg for passenger vehicles and 30 mpg for trucks). (http://helenair.com/articles/2009/05/20/national/top/50na_090520_autos.txt)

2) A second major initiative originated in the Governor's Office, also in 2007. After receiving the Climate Change Advisory Committee's final report, Governor Schweitzer asked all agencies to improve state vehicle fleets to 30 mpg or better, as part of his "20 x 10" initiative to reduce State Government energy use 20% by 2010: (See press release 11/19/07: http://governor.mt.gov/news/pr.asp?ID=513; 20 x 10 website: http://governor.mt.gov/20x10/default.asp)

Another approach would be a procurement policy that simply directs the purchase of the smallest and most efficient vehicle that can do the job, with some reasonable price collar (if there is a premium for hybrid or other technologies, for example).

The Task Force finds that there are numerous strategies employed by other communities to reduce energy use (and associated emissions) in municipal vehicles. For example, by purchasing efficient vehicles the City of Denver reduced its municipal fleet GHG emissions by 22%

between 1992 and 2005, despite a 19% increase in vehicle miles travelled. The Task Force recommends that the City review these strategies, and develop a specific plan to reach the state goal.

The City should start with a thorough examination of its fleet. Building on the information collected for the GHG Assessment, the study would catalogue the number, size, fuel type, and usage profile of all vehicles (it is likely that the City already has a pretty good inventory system, but this information would be specifically evaluated with an eye toward greenhouse gas emissions). Once this baseline information is in place, a plan should be developed to determine potential pathways for saving fuel and reducing carbon emissions. This plan should broadly consider strategies ranging from more efficient vehicles, to more efficient vehicle use (anti-idling policies, etc.), alternative transportation options (bicycles for some police activities, etc.), alternative fuels, reduction in vehicle miles travelled, and other ideas. Reductions in the age and size of the fleet can also lead to maintenance savings. The EPA has model maintenance protocols for reducing GHG emissions by heavy-duty diesel vehicles ("Best Environmental Practices for Fleet Maintenance").

In its Stimulus Resolution (#19630, see Appendix E4), the City included the following project, which was also endorsed by the Task Force in its Stimulus Funding Recommendations (Appendix F2):

- Electric vehicle pilot project – "Proposal to purchase up to 4 electric vehicles to test the viability in certain applications within the City" -- $80,000 project cost

Summary of Benefit

- Mileage increase = lower fuel bills
- Fuel cost savings can be leveraged for more efficient vehicle purchase, efficient maintenance practices (particularly for diesel fleet), and alternative fuel purchases (B20 Biodiesel)
- Concurrent reduction in particulates

Similar Actions in Other Cities

Vehicle fleets account for a large percentage of most cities' carbon budgets. As a consequence, many cities (such as the following) have developed creative strategies for reducing fuel costs and carbon emissions:

Anacortes, WA
Aspen, CO
Boulder, CO
Denver, CO – "Green Fleets" Executive Order (4/22/93)
Homer, AK
Hoover, AL [http://www.hooveral.org/Default.asp?ID=114]
Keene, NH
Salt Lake City, UT
Santa Barbara, CA
Seattle, WA

References and Resources

http://psgreenfleets.org
http://www.epa.gov/region09/cleanup-clean-air/cleandiesel.html
State & Local Toolkit: Basic Information: A Guide to Building Clean Diesel Programs
http://www.epa.gov/otaq/diesel/slt/basicinfo.htm
http://www.pscleanair.org/programs/dieselsolutions/devices.aspx
http://www.epa.gov/otaq/diesel/slt/design.htm
http://www.dieselforum.org/meet-clean-diesel

NRG-13 Study Biodiesel Use and Supply

Department
Fleet Maintenance

Target or Goal
Produce a study analyzing the potential for using a 20% blend of biodiesel in Helena's municipal vehicles

Projected Benefit
The study itself would produce no carbon savings, so none were assumed here. But the Task Force believes that biodiesel use could potentially reduce emissions from the city's diesel vehicles by about 15%. A 15% reduction would equate to 151 tons of CO_2 avoided each year.

Savings / Cost
A study by Booz-Allen & Hamilton, Inc., found fleets using a 20 percent biodiesel blend would experience lower total annual costs than with other alternative fuels.

Timeline
Study presented late 2010

Related Actions
NRG-5

Existing Actions
• A grease capture and repurposing system being considered at the WWT plant could complement or replace a fleet garage-based fuel storage system (NRG-5).

Recommendations
Although benefits of using Biodiesel are clear, a lack of supply presents a clear obstacle. This study would assess the options for supplying biodiesel blends for the fleet. Issues to be covered include: contracting with a supplier, storing and pumping at City facilities, and production of biodiesel from local sources.

There is precedent for the use of biodiesel blends in cold regions as well as the storage and pumping of biodiesel by a City or municipality. (See the Keene, NH information links provided below.).

A U.S. Department of Energy study showed that the production and use of biodiesel resulted in a 78.5% reduction in carbon dioxide emissions, when compared to petroleum diesel. Biodiesel also has a positive energy balance: For every unit of energy needed to produce a gallon of biodiesel, 3.24 units of energy are gained.

In 2007, the City used 94,845 gallons of diesel fuel, with a carbon footprint of 1,008 tons (GHG Assessment / CACP data). According to the CACP software, converting this use to B20 would lower emissions to 800 tons per year (a 21% reduction). However, the Task Force expects growth in municipal operations to reduce the potential savings somewhat, so a 15% figure was used instead.

Summary of Benefits
• Biodiesel reduces unburned hydrocarbons (93% less), carbon monoxide (50% less) and particulate matter (30% less) in exhaust fumes, as well as cancer-causing PAH (80% less) and nitrited PAH compounds (90% less). (US Environmental Protection Agency)
• Sulfur dioxide emissions are eliminated (biodiesel contains no sulfur).
• The ozone-forming (smog) potential of biodiesel emissions is nearly 50% less than petro-diesel emissions.
• Fleet maintenance costs are lower.
• BioDiesel is being produced from Montana-based crop sources.
• BioDiesel can be produced in-house using reclaimed cooking oil from local area.

Similar Actions in Other Cities
Hoover, AL: http://www.hooveral.org/Default.asp?ID=114

Keene, NH fleet biodiesel implementation presentation available at: www.granitestatecleancities.nh.gov/presentations/documents/070724_russell.pdf

References and Resources
http://www.biodiesel.org/
Clean Fuel Fleet program: https://www.afdc.energy.gov/afdc/prep/index.php
http://www.afdc.energy.gov/afdc/fuels/biodiesel_infrastructure.html
http://www.cleanair-coolplanet.org/for_communities/biodiesel.php
http://www.dieselforum.org/meet-clean-diesel
http://www.epa.gov/region09/cleanup-clean-air/cleandiesel.html
http://www.biodiesel.org/buyingbiodiesel/guide/guide_fleetmanagers.shtm

NRG-14 Convert Streetlights and Parking Lots to LED / Solar Technology

Recommendations

The 2007 CACP analysis reported that Helena streetlights consumed 1,650,032 kWh of electricity, which resulted in 922 tons of CO_2 being emitted into the atmosphere that year. This is an increase of 133 tons over 2001. The resulting cost increase to the City (and ultimately the property owner) was $148,543. The increases are disproportionate: while the increase in emissions is 17%, the increase in the cost is 35%. Note that the "per kWh" cost of energy for these districts is quite high - 35¢ in 2007 ($573,402 / 1,650,032 kWh) - but this probably includes all maintenance & capital costs as well.

The recommendations are aimed at decreasing energy use through more efficient lighting. Also, a recommendation is made to partner with other municipalities to develop strength in numbers and impress upon NorthWestern Energy the desire for alternative technologies.

Helena should strive to be the Montana leader in groundbreaking, original, and creative approaches to improving energy efficiencies in its street lighting. Such innovations might include (but not be limited to) changes in types of lighting used on its own properties (parking lots and exterior lights around buildings and in its parks, and the Fire Tower). Changes include LED and solar power conversions, conversion to dark skies compliant lighting, incentives for new development to incorporate innovative, new, and emerging technologies.

In a recent study in San Francisco, the best performing LEDs (both in terms of energy and upfront cost) used only 41 Watts - 70% less than the standard 138 Watt high pressure sodium (HPS) lamp. The DOE assumes 4,100 hours per year of streetlighting, so this comes out to 395 kWh of energy savings per year - about $40 in savings per bulb per year. The bulbs would produce additional savings in reduced maintenance, on the order of $15 per year per bulb. The upfront cost of this particular luminaire was $310, compared to $107 for the HPS model. Prices and performance are both improving rapidly for LED lights. The simple payback on this bulb was 3.7 years for new construction, and 7.4 years for retrofits.

In its Stimulus Resolution (#19630, see Appendix E4), the City included the following project, which was endorsed by the Task Force in its Stimulus Funding Recommendations (Appendix F2):

- "Proposal to retrofit existing streetlights to more energy efficient and ordinance compliant lighting" -- $1,500,000 project cost

Department

Streets

Target or Goal

Replace all Helena streetlights, area lights, parking lot lights, and the wintertime lighting of the Fire Tower (which is an important symbol of both the City and the City government) with LED and/or solar-powered technology. Achieve compliance with Helena's Dark Skies Lighting Ordinance.

Projected Benefit

See "Projected Benefit"

Savings / Cost

A 25% reduction in the 2007 streetlight-related energy expenditures would save $143,351 – an impressive annual savings amount that will only increase with future increases in energy prices. (As a check for this figure – Helena currently has 3,147 streetlights x $40 per light per year in potential savings = $125,880, which comports reasonably well with the other figure.)

Timeline

See "Timeline Detailed"

Related Actions

- Conversion to solar/LED/wind generation for night lighting at wastewater treatment facility, water treatment plants, and the Fire Tower
- INT-5

Existing Actions

See "Existing Actions Detailed"

Partnerships / Related Interests

- These actions would likely require cooperation by the Public Service Commission, NorthWestern Energy, and members of the 47 lighting districts in Helena.
- Montana DEQ has installed solar-powered parking lot lights at 1100 N. Last Chance Gulch, Helena.
- New World Windpower, LLC (Billings)
- City of Missoula

The Task Force recommends that:

1. an assessment be prepared, which would address:
   - the current streetlight use (including number of lights per property used), alternatives for shutting off lights (determining if extraneous lights are being used) and/or staggering lights' use;
   - The current use of motion lights in City-owned parking lots, with recommendations for areas where motion lights should be used;
   - The replacement of existing lights with LED lights; upfront capital cost will be higher than typical lights; however, the assessment should include a 20-year net present worth analysis, including the cost of replacement bulbs and the energy used/saved;
   - Street light reduction strategies that will meet the 25% GHG emission reduction by 2020;
2. All new streetlights (new and converted residential and/or commercial development) be dark skies compliant, and an incentive program be created for LED and solar-powered lights in new districts;
3. If any mercury-vapor (low efficiency and old technology) lights exist in Helena, replacement with LED should be made — sodium replacements should not be considered (while they are much more efficient than the mercury-vapor, if conversions are to be made, LED or something comparably efficient should be the preferred choice).
4. The City engage in discussions with the 10 largest municipalities in Montana regarding NorthWestern Energy practices (control of streetlights & maintenance) and possible creation of coalition of energy users — the coalition should advocate more alternative forms of energy (local wind farms, local solar) and more local control of streetlight conversions — it may have to petition the PSC for support, arbitration, and rule changes.

Projected Benefit

- The Task Force believes a 25% reduction in streetlight-related energy consumption (and GHG emissions) can be achieved by 2020. Individual replacement lights can save 50-70%, but some of this will be offset by growth. A 25% reduction yields 231 tons of CO_2 saved per year.
- The Task Force was impressed with the substantial energy savings already achieved in the area of traffic lights. As of 2009, all of the traffic signals have been replaced with LEDs. Because some of that work was done between 2007 and 2009, progress toward the 2020 goal has already been made. This will likely balance / more than balance any increases due to growth in this sector. Hence, the Task Force did not model any specific traffic light-related GHG savings (other than the dramatic reductions already achieved by 2007).

Timeline Detailed

1. By August 2010, install solar PV cells at the Fire Tower.
2. By August 2010, identify a City parking area that can be converted to solar lights. By August 2011, find a proprietor and/or secure grant funding for solar light conversion. Market Helena as a high altitude, cold climate area for researching solar usage. Upgrade the parking area as soon as possible.
3. By August 2010, identify a City parking area that can be converted to LED lights. By August 2011, find a proprietor and/or secure grant funding for LED light conversion. Market Helena as a high altitude, cold climate area for researching LED usage. Upgrade the parking area as soon as possible.
4. By August 2010, complete a light use assessment of City-owned parking lots and parks. (see below for more detail)

Existing Actions Detailed

Helena has completed the installation of LED traffic signals, and is also working with the State Department of Transportation on improving traffic flows & synchronization using cameras, etc. (See http://helenair.com/articles/2008/04/29/local/50lo_080429_signals.txt)

Current Situation – Streetlights

- The City of Helena passed "dark skies" lighting management ordinance (Dark Skies) in 1999.
- The Cityof Helena has 47 lighting districts. The districts do not cover contiguous areas -- that is to say, they are not necessarily adjacent to one another & many areas in the City limits do not have lights or a lighting district.
- There are 3,147 streetlights in Helena; it is estimated that 20% are Dark Skies compliant. Approximately 10-20 lights are retrofitted annually to meet the Dark Skies ordinance.
- 19% of NorthWestern Energy's flat rate charged to the City of Helena for streetlighting goes to energy supply, 68% goes to capital expense, and 13% to O&M, USBC, etc.
- Historic districts exist; the lights in these districts are believed to use more energy than newer lights. The number of lights falling into the Historic Exemption is unknown at present.
- Light districts are assessed at different rates based on type of fixture, height of pole, land use, and installation required beyond simple service.
- Cost for each lighting district is on annual property taxes.
- NorthWestern Energy runs the lights, including servicing.
- The City does not know exactly what types of lights are used or where.
- A district has to adhere to the rules established for that district, such as light style, distancing between lights, etc. A special district can be made, though, if an area wants to change lights. That district would then be a SLD (Special Lighting District).
- The conversion cost for all lighting districts to meet the Dark Skies initiative is estimated to be greater than $500K (in 2005).

In 2001, the City Commission proposed a "Street Lighting Fixtures Plan," but put it on hold following the findings of the SLD 192 special study (see below). Instead, the following rules were developed: all new districts would adhere to new standards; fixtures in existing districts would be converted to new standards under the current, ongoing maintenance/replacement process; lighting districts would have to vote on whether to allow a lighting retrofit program. It is estimated to take 10 person-years to inventory all the districts for a lighting retrofit program.

Recent History - Special Lighting District 192 Review

In January 2001 the Commission approved SLD 192 to be used as a study to determine the impact of the street lighting ordinance passed in January 2000. The study encompassed the location of lights, verification of lights (authorized vs. installed vs. assessed), verification of properties (authorized vs. served vs. assessed), verification of area per property (actual vs. assessed), and projected cost to convert to required lighting. The study took one person 10 weeks to prepare and showed: installed and billed lights differ from authorized lights; legal descriptions of properties need to be updated; district boundaries need to be officially updated to reflect served area; assessed square foot data does not agree with DoR data. In regard to conversion cost: 137 properties were assessed $6,411 in 2002 for 59 lights ($109/light average cost); if annual assessment was increased 37% or to $8,801 ($150/light), the conversion could be covered. The difference split between 137 properties would be an $18 increase per property ($8,801-$6,411)/137 = 17.5 or $18. The project stalled, because it was "cost prohibitive."

Summary of Benefits

Streetlights:

- Reduced energy costs for Helena's property owners.
- Reduced maintenance costs, with longer lasting bulbs.
- LED lights tend to be more directional, which not only saves energy, but also helps eliminate light pollution (and helps compliance with the Dark Skies ordinance).

Traffic Signals:

- Because LED traffic signals are composites of many bulbs, safety is enhanced. A single bulb burning out has little effect.

Similar Actions in Other Cities

Anacortes, WA included LED street lighting in its CAP.

Ann Arbor, MI uses LEDs for its streetlights.

Denver, CO is considering installing 5,000 solar panels to power lights along the 8-mile Northwest Parkway toll road: ("Sunny path ahead for toll road" -- Denver Post (3/24/09): http://www.denverpost.com/greenbusiness/ci_11981126)

Hayward, CA is proposing $8 million in stimulus funds to replace streetlights with LEDs citywide.

Los Angeles, CA is retrofitting 140,000 residential streetlights over a five-year period beginning July, 2009.

San Francisco, CA conducted a LED streetlight demonstration, as part of the DOE's GATEWAY project. Results of the study indicated energy savings of 50-70%, for the four different luminaires tested (compared to the standard 100 Watt high pressure sodium lamps).

Seattle, WA is replacing all 40,000 of its residential streetlights with LEDs using federal Energy Efficiency and Conservation Block Grant funds. (http://www.solidstatelightingdesign.com/documents/view/generic.php?id=117625)

A long list of other cities moving toward LED streetlights is posted at: http://www.newworldwindpower.com/LED%20update.htm

Bozeman, MT

Brattleboro, VT

Burlington, VT

Charleston, SC

Salt Lake City, UT

Seattle, WA (and undoubtedly others) also include traffic signal synchronization to improve traffic flow and reduce fuel use.

A long list of other cities moving toward LED streetlights is posted at: http://www.newworldwindpower.com/LED%20update.htm

References and Resources

DOE GATEWAY Demonstrations for LED lighting: http://www.netl.doe.gov/ssl/techdemos.htm

PSC final order (declining to initiate a rule-making to require LEDs at this time): http://www.psc.mt.gov/eDocs/eDocuments/pdfFiles/N2009-4-45_6998.pdf

New World Windpower LLC—information on petition to PSC for LED streetlight rule: http://www.newworldwindpower.com/LED%20MENU.htm

NRG-15 Employee Commute and Waste Reduction

Recommendations

Investigate options to reduce fuel use from employee commuting (through car pooling/trip reduction goals/incentives, telecommuting, non-motorized commuting, etc.). Something as simple as having sufficient bike racks can help create a positive climate for non-motorized commuting.

Establish a comprehensive recycling program, with leadership by elected officials and department heads; empowerment for staff (training, rewards, etc.); and policies/goals for procurement, waste-reduction, and conservation. Waste reduction ideas to help reach the 10% reduction goal will be varied, including everything from recycling toner cartridges (if not already being done), to implementation of electronic document filing / online systems to reduce the use of paper.

In its Stimulus Funding Recommendations (Appendix F2), the Task Force urged "recycling bins for increased sites for City and valley-wide collection as well as increased City operations collection."

2007 Employee Commute Category: 91 tons of CO_2 emittted (8.6% of City carbon budget)

- Reducing employee vehicle miles traveled by 10% would save 89 tons of CO_2 per year.
- It is likely that Citygovernment will add employees over the planning period, but it is also expected that the average fuel economy of vehicles will improve (in response to the new federal
- CAFE standards, and general technological progress). The Task Force expects these two factors to counterbalance each other (however perfectly or imperfectly), and did not attempt to model them.

2007 Employee Waste Generated: 114 tons of CO_2 emitted (1.1% of Citycarbon budget)

- Reducing employee-generated waste by 10% would save 11 tons of CO_2. The Task Force considered making the 10% reduction a continuous, annual goal, but also wanted to account for growth in Citygovernment. Further study about what is possible should be conducted.

Summary of Benefits

- Improved employee driving habits will result in fewer vehicular miles traveled and lower GHG emissions.
- Education program will lead to improved employee awareness of their contribution to GHG emissions, with information about lifestyle changes to help minimize those emissions.
- City-wide waste reduction of 10% leads to lower demand for products and reduction in GHG emissions associated with their production.

Department

City wide, personnel or human resources department

Target or Goal

- 10% reduction in total employee commute mileage (modeled after Anacortes, WA)
- 10% reduction in employee-generated trash to landfill

Projected Benefit

- Employee Commute: 89 tons of CO_2/yr
- Employee Waste: 11 tons of $C0_2$/yr

Savings / Cost

- Reduced employee commuting mileage will result in cost savings to individual City employees at the gas pump.
- Recycling and waste reduction will result in cost savings as fewer products are used.

Timeline

On-going

Related Actions

- Green Team (IMP-2)
- Education and Outreach (IMP-4)
- Transportation recommendations (TWRP-1, TWRP-2)
- Waste Reduction and Recycling recommendation (TWRP-3, TWRP-4) INT-5

Existing Actions

In 2009, the Citycommissioned a comprehensive study on recycling in Helena. (See "References")

Partnerships / Related Interests

- State of Montana (See "References")
- Montana DEQ (See "References")

County, community wide recycling, transportation

Similar Actions in Other Cities

- The Anacortes, WA CAP recommended the development of a "Trip Reduction Performance Program" for City employees with a goal of 10% reduction in vehicle miles traveled. The Charleston, SC CAP included a "Comprehensive Commuter Trip Reduction Program" modeled after Los Angeles' effort.
- The Homer, AK CAP included a statement that the City would "encourage its employees to reduce their commute-related emissions," by establishing "creative programs to encourage carpooling and non-motorized transportation."
- The Keene, NH CAP has a telecommuting recommendation, inspired by the San Francisco – San Mateo "Videoconferencing / Trip Reduction Project."
- The Seattle, WA CAP recommends that employers offer transit passes and lockers / showers to encourage alternate transportation.
- The Bozeman, MT CAP has a recommendation to "Support Solid Waste Recycling in Municipal Buildings, at Municipal Facilities, and in Public Spaces."

References and Resources

http://helenair.com/articles/2009/01/11/local/80lo_090111_recycle.txt
http://helenair.com/articles/2009/06/18/top/top/50lo_0901618_recycling.txt
State of Montana "Try Another Way State Employees" Program: http://www.tawse.mt.gov/
Montana DEQ "Recycling and Waste Reduction" Website: http://www.deq.mt.gov/Recycle/index.asp
www.drivesmarterchallenge.org
www.tawse.mt.gov
http://www.deq.mt.gov/Recycle/index.asp
http://savemobile.org/
www.energystar.gov
DEQ

WTR – INTRODUCTION
Water Supply, Treatment, and Delivery (WTR)

Mission Statement (adopted April 16, 2008)

The mission of this working group is to evaluate the vulnerability of Helena's water supply system and waste water treatment system to the effects of a warming climate, through a process of consultation with City staff and research of available information. Additionally, it is to recommend to the City specific response strategies to reduce future impacts of global warming on those systems.

Members

Stan Bradshaw, WTR Chair
Shannon Downey
Nancy Hall
Alan Peura
Ken Wallace

Discussion

Between June, 2008 and April, 2009, the water working group met eight times and communicated with key City staff, including Don Clark, Mark Fitzwater, Amy Teegarden, and Rich Lind. Over the course of its effort, the water working group reviewed the 2005 Water Facilities Plan (Water Plan), toured both the Tenmile and Missouri River treatment plants, reviewed local stream flow and watershed data for the Tenmile drainage, and reviewed and communicated with a number of other municipalities from throughout the west about water conservation programs. Staff at all levels of communication has been cooperative and forthcoming.

According to the Water Plan, the daily average demand per capita for water was 175 gallons per capita per day (gpcd). Maximum daily demand was 15.1 million gallons per day, or 487 gpcd. The Water Plan projected a growth from the population served in 2005 population of approximately 31,000 to a population of approximately 50,000 in 2025. The Task Force worked with these projections in making its recommendations.

Out of these inquiries, the Task Force has developed a series of recommendations. In some cases, especially as to infrastructure, the recommendations ratify the strategies described in the 2005 Water Plan. In other areas, especially as to the development of a comprehensive conservation strategy, the recommendations suggest amendments to the 2005 Water Plan.

Much of the impetus for our recommendations arises from the vulnerability of the Tenmile treatment plant to a wide assortment of climate-related threats. While the 2005 Water Plan commendably recommends a shift away from the Tenmile plant as the primary facility to the Missouri plant—"role reversal" in Water Plan jargon--the Tenmile plant remains a key part of the City's water supply strategy for many years into the future, especially in the summer months, when water demands are highest. The Water Plan projects that after role reversal and the planned upgrades to both plants, the projected combined treatment plant capacity—21 million gallons per day—should be sufficient to meet growth projections for 2025. In recent drought years, however, the watershed has not been yielding flows sufficient to even run the Tenmile plant at capacity. (Don Clark, Personal communication, June, 2008). In addition, the Water Plan estimates for water yield from the Tenmile watershed were derived from flow data taken from the 1978 water plan. A comparison of water yield between 2000 and 2007 suggest that those 1978 estimates may have been optimistic. See Appendix K. In short, the Tenmile plant and, by extension, much of the municipal summer water supply, may be ill-equipped to meet the challenges of either short-term drought or long-term warming in the face of an increasing population without additional measures to buffer the multiple challenges it faces.

Because the City has already identified much of the infrastructure improvements that are reasonably accessible over the next several years, the most cost-effective long-term strategy to reduce vulnerability to the City-wide system to the effects of climate change is a comprehensive conservation strategy that (1) addresses water rates, (2) includes an ambitious program of education and outreach, (3) offers incentives to encourage the adoption

of conservation practices, and (4) when necessary, includes regulatory measures to reduce water use. Finally, the Task Force endorses the coordinated approach to the protection of the Tenmile watershed adopted by the Tenmile Watershed Collaborative Committee. The experience of other cities in the West suggests that this multi-dimensional approach to water conservation is the most effective strategy for reducing demand. (http://ww.westernresourceadvocates.org/media/pdf/SWChapter3.pdf). Following are the six general recommendations that the Task Force offers for the city's consideration.

Recommendation	Description
WTR-1	Water Rates
WTR-2	Upgrade Treatment Facilities
WTR-3	Lush and Lean Landscaping
WTR-4	Community Incentives
WTR-5	Education and Outreach
WTR-6	Regulatory
WTR-7	Municipal Watershed Protection

Taken collectively, the goal of the waterconservation recommendations is to allow the City to reduce both average daily and peak per-capita demand to the point that, by 2025, the overall demand will remain equal to or slightly less than 2005 demand.

Finally, in order for the City to assess the efficacy of these programs over time, the City should continue to monitor water demand among all facets of its customer base. Because all the ity's customers are metered and because the City can track the amount of water coming into the waste wastewater plant, it has the infrastructure necessary to track changes in demand.

WTR-1 - Adopt Conservation Rates

Recommendation

The Helena City Commission should review and consider implementing a hybrid conservation-based water and wastewater utility rate structure that encompasses an inverted/inclined block rate structure that includes an overlay of seasonal water rates.

As part of the determination of the conservation rate structure, the commission should ask public works department staff for a thorough analysis of water/wastewater revenue so that the conservation rate structure can be implemented in a way that ensures sufficient revenue to continue efficient and effective fiscal management of the water and wastewater utilities.

Overview

In an effort to bring an increased conservation ethic to water utility consumers as municipalities confront drought, reduced stream flow levels, and increased demand driven by population growth, at least 60% of the water utilities in the United States have begun to use a conservation rate structure. Using price structures has proven to be an effective demand management tool. The typical goals of implementing a water conservation rate structure include:

1. Reducing peak water use
2. Reducing seasonal water use (e.g. inefficient outdoor water use in summer)
3. Reducing overall water system demand

The two most common conservation rate structures used in pursuit of these goals include:

1. Tiered Water Rates

This involves structuring water utility rates for the consumer in a way that increases the unit cost as consumption levels increase. This is typically done in block increments together with a base charge. The base charge is the mechanism that helps to ensure that the utility is able to receive sufficient revenue to maintain operations. However, it is recommended that the majority of costs continue to be recovered through the variable rate (rather than the base charge), to preserve the conservation incentive. Another approach is to break the link between utility revenues and sales, through a "decoupling" mechanism such as the one adopted for Cal Water in February 2008 (http://www.narucmeetings.org/Presentations/Smegal%20Water%20Committee%20Presentation%2011-08.pdf).

In Montana at least two cities use an "inverted block rate" for water. In Bozeman, water rates increase as use increases, with the lowest rate for use less than 7 ccf per month (ccf = 100 cubic feet), a higher rate for use between 8 and 15 ccf, and a top rate for 15 ccf or more per month.

Billings also uses three rate blocks for water, with the lowest rate at less than 4 ccf, the middle rate from 5 to 16 ccf, and the highest rate for any monthly use over 16 ccf.

Department

Finance Department & Public Works

Target or Goal

Reduce overall water demand, but especially summer demand on the water treatment plant.

Projected Benefit

Increase resilience of City water supply.

Savings/Cost

There may be a small fiscal outlay for the utility in conducting an upfront study of operations and revenue needs to ensure that utility revenues meet the minimum fiscal requirements. But the goal would be that any fiscal impact (in reduced water utility revenue) would be offset by reductions in operating costs.

Timeline

Immediate revenue study to ensure new rate structure will meet the utility operating and capital maintenance needs.

Related Actions

A comprehensive water conservation program that provides workable opportunities for citizens to reduce water consumption and thus reduce their rates.

Existing Actions

None

2. Seasonal Water Rates

This involves charging a higher unit cost for water consumption during the peak usage season as an additional economic incentive to conserve water. Typically this means higher water unit rates during summer, when outdoor usage increases.

A third option for structuring water conservation rates would be to combine both a tiered rate with seasonal rates. This is typically considered to be a hybrid water conservation rate structure.

Summary of Benefits

The projected benefit in this instance is that, by discouraging wasteful water practices and by providing incentives for water conservation, the conservation rate structure will build resilience into the City water supply over the long term.

Similar Actions in Other Cities

Bozeman, MT
Billings, MT
Santa Fe, NM

References and Resources

American Water Works Association: source of numero us studies on conservation rates and other information about water utilities accessed on November 24, 2008 http://www.awwa.org/Resources/Waterwiser.cfm?ItemNumber=29269&navItemNumber=1561

Water Conservation Incentives Through Rate Structuring http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/documents/dwgb-26-9.pdf

—From Georgia…provides a "how to" for water utilities to create a conservation rate structure: http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/documents/dwgb-26-9.pdf

http://www1.gadnr.org/cws/Documents/Conservation_Rate_Structures.pd

Good report from Washington: http://www.mrsc.org/Subjects/Environment/water/wc-ratedes.pdf

Briefing Paper: Summary of Current Water Conservation Practices in the Public Water Supply Sector of the Great Lakes-St. Lawrence Region http://www.glc.org/wateruse/conservation/pdf/FinalDraftConBrief.pdf

WTR-2 - Continue Upgrade of Supply and Treatment Facilities as Outlined in 2005 Water Facilities Plan

Recommendations

In 2005, the City completed a water facilities plan that proposed a number of upgrades and improvements to the municipal water supply system. For the purpose of this report, one of the most important recommendations in that plan is to reverse the roles of the City's two main sources of supply: Tenmile Creek, and the Missouri River. Currently, Tenmile Creek is the primary water supply for the City of Helena, providing water year-round. The Missouri River currently acts as a source of supply only in the summer. In the Water Plan, the City explicitly recognized the vulnerability of the Tenmile watershed to the adverse effects of both drought and catastrophic forest fire. At the time the Watet Plan was written, insect damage to the forest had not yet arisen to its current level of severity. Nor did the Water Plan factor in the possible vulnerability of the system to a long-term warming trend, i.e. climate change.

Nonetheless, in response to those vulnerabilities, the Water Plan proposed reversing the roles of the two major plants. By 2025 The roles would be fully reversed, with the Missouri River plant becoming the primary source of supply and the Tenmile plant becoming secondary. As part of this role reversal, the capacity Missouri River Treatment Plant would be significantly enhanced from a 2005 capacity of 7 million gallons per day to 13 million gallons per day. Given the relative lack of available groundwater—the Plan noted that attempts to identify groundwater in sufficient quantities to augment municipal supply failed--this appears to be the wisest strategy for enhancing the capacity of the source of supply. And from the standpoint of enhancing the resilience of the supply system through infrastructure enhancement, it fits well with the charge of the Climate Change Resolution.

The Water Plan also addressed the issue of unaccounted for water—water lost to leakage within the delivery system, and it proposed an aggressive program of system repair and upgrade to reduce the amount of unaccounted for water. The City has an ongoing program to address this issue.

Summary of Benefits

One of the primary benefits of this effort is to reduce the dependence of the City water supply upon the Tenmile Creek source, which already shows the effects of climate change. In addition, it taps the largest available source of water—Canyon Ferry Dam—to increase the amount of the supply over time.

Similar Actions in Other Cities

Unknown

Department

Public Works, Water Treatment

Target or Goal

To enhance supply and water treatment capacity to levels recommended in 2005 Water Facilities Plan by reversing roles of the Tenmile Treatment plant and the Missouri River Treatment plant to make the latter the primary supply source.

Projected Benefit

To increase resilience of City water supply

Savings / Cost

(fiscal impact, where appropriate): $19,500,000 is the cost projected the 2005 Water Plan.

Timeline

Ongoing with a 2025 completion date.

Related Actions

City treatment plant and distribution system upgrades

Existing Actions

See above.

References and Resources

2005 Helena Water Facilities Plan
USGS Daily Flow Statistics for Tenmile Creek: http://waterdata.usgs.gov/mt/nwis/uv/?site_no=06062500&PARAmeter_cd=00060,00065,00010
NRCS SNOTEL temperature data: http://www.wcc.nrcs.usda.gov/snotel/snotel.pl?sitenum=487&state=mt
USGS, Streamflow and Water-Quality Characteristics in the Upper Tenmile Watershed, Lewis and Clark County, West-Central Montana, Rpt 00-4129, 2000.
USGS, Streamflow, Water Qualify, and Quantification of Metal Loading in the Upper Tenmile Creek Watershed, Lewis and Clark County, West Central Montana. Rpt 02-4072, 1998.

WRT-3 Adopt "Lush and Lean" Landscaping Practices for Municipal Properties

Recommendations

The principal idea behind this strategy is to allow the City to provide a leadership role in adapting water conservation practices in the design and maintenance of municipal landscaping projects. These measures can include:

- The City-wide application of low water "lush and lean" landscaping concepts;
- The development of demonstration water-wise gardens on city property by working in partnership with local groups and businesses (e.g. Missoula)
- Provide for unit cost/benefit analysis of xeric retrofits;
- Conduct irrigation audits of City-maintained irrigated lands.

Summary of Benefits

The direct benefit is that the City government reduces its demand on city water supplies. The indirect benefit is that the City sets an example for the community at large by not only assessing its water use but by taking measures to reduce its use.

Similar Actions in Other Cities

La Cruces, NM
Missoula, MT
Tigard, OR

References and Resources

http://www.las-cruces.org/utilities/water-conservation/Water%20Documentation.html

Department

Parks Department

Target or Goal

To reduce water use on City properties.

Projected Benefit

To increase resilience of City water supply and also provide leadership to the community by demonstrating water-wise landscape practices.

Savings / Cost

Unknown.

Timeline

Ongoing with a 2012 completion date.

Related Actions

Develop waterwise demonstration gardens.

Existing Actions

The City Parks and Recreation Department (Parks) has already introduced a number of water conservation measures into its landscaping program, including:
The department has been converting landscaped areas to automatic sprinkler systems—all but two of the 65 parks have been converted to automatic irrigations systems.
Irrigation timing minimizes evaporation by operating at night:

- Parks is installing an automated, centralized control system in the ten biggest parks, allowing control of the irrigation systems from a central console.
- Where possible, the City uses water conserving tree bags to water trees or, in some cases, drip irrigation.

Partnerships / Related Interests

AERO; local landscaping businesses and nurseries

WTR-4 - Study and Develop Community Water Conservation Incentives

Department
Finance Department and Public Works Department

Target or Goal
To reduce daily per capita demand from 175 in 2005 to 100 gallons in 2025 (as an annual average), and to reduce maximum daily demand from 487 gpcd to 287 gpcd.

Projected Benefit
To reduce demand on the water supply system and consequently, reduce the need for infrastructure expansion and its requisite costs.

Savings / Cost
Potentially up to $200,000 per year in rebates, with an as-yet undetermined reduction in infrastructure costs. One approach to funding the rebate program is through a conservation fee either on an annual basis (Santa Fe) or by a cost per unit of demand.

Timeline
Assuming the start of implementation in 2010, full realization of benefits by 2025.

Related Actions
Outreach and education and regulatory strategies.

Existing Actions
To date, beyond a water conservation packet that includes a faucet aerator, a shower timer, and some educational material, the City of Helena does not have an incentive program.

Partnerships / Related Interests
Local businesses involved in hardware and appliance sales and landscaping.

Recommendations

Investigate the kinds of rebate programs that other communities have initiated to encourage conservation

Among the many cities that have implemented some kind of incentive program—most often expressed either as a rebate on the purchase of conservation equipment or as a give-away or "retrofit"—there appears to be a strong consensus that incentives are perhaps the single most effective water conservation tool available.

The central thesis of incentive programs is that the relatively low-cost investment in conservation actions by municipal water customers will help avoid much higher additional investments in infrastructure. In order to confirm that thesis, the Task Force recommends that the City conduct an avoided-cost analysis before making any significant investment in the program.

Successful rebate programs in other communities have included: (1) outdoor water-use programs such as evapotranspiration controllers or, in some cases, incentives for replacing high-water-use landscaping with drought-resistant landscaping; and (2) indoor programs such as rebates for low-flush toilets or high-efficiency washing machines, free low-flow showerheads, and others. Some cities, such as Las Cruces NM, have implemented incentive rebates for specific commercial applications of water. (Appendix K to this report reviews a variety of rebate programs with a summary of their advantages and disadvantages.)

Establish a funding source to support the rebate programs chosen by the City of Helena

The most direct approach to funding incentive programs is to impose a once-a-year conservation fee on water customers. For example, Santa Fe, NM has done this for several years. The Santa Fe charge ranges between $4.00 and $9.00 per year for single family residential service, depending on the size of the water line. Multi-family and commercial customers pay a higher fee, again depending on the size of the line.

Summary of Benefits

The direct benefit is that the City reduces its demand on city water supplies and forestalls the need for additional infrastructure expansions beyond those described in the 2005 facility water plan.

Similar Actions in Other Cities

Las Cruces, NM
Santa Fe, NM
Southern Nevada Water Authority (Las Vegas)
Denver, CO
Austin, TX
Tigard, OR
Prescott, AZ

References and Resources

For a survey of ET controllers as conservation measure , see: http://www.ci.austin.tx.us/watercon/et_controller.htm.

Irvine Ranch Study executive summary: htp://www.irwd.com/Conservation/ETExecutiveSummary%5B1%5D.pdf.

The Pacific Institute has studied SNWA water conservation efforts between 2000 and 2007. See it at the following link: http://www.pacinst.org/reports/las_vegas/LasVegas_Appendix%20A.pdf.

Concerning the cost-effectiveness of low-flow rebate programs: http://www.cuwcc.org/docDetail.aspx?id=8090 http://www.cuwcc.org/docDetail.aspx?id=8188

Showerheads as a significant source of water use: http://www.sahra.arizona.edu/programs/water_cons/home/bathroom_shower.htm.

Efficiency of low-flow showerheads: http://www.fypower.org/res/tools/products_results.html?id=100160.

For information on efficiency of machines high-efficiency washing machines, http://www.toolbase.org/Technology-Inventory/Appliances/horizontal-axis-clothes-washers.

For a general survey of conservation programs throughout the southwestern United States: Western Resource Advocates, Smart Water: http://www.westernresourceadvocates.org/water/smartwater.php

WTR-5 Develop a Multi-Faceted Education and Outreach Program on Water Conservation

Department:
Public Works department; water treatment

Target or Goal
To reduce gallons per capita per day demand from 175 in 2005 to 100 in 2025, as an annual average, and to reduce maximum daily per capita demand from 487 to 287.

Projected Benefit
To reduce demand on the water supply system, and consequently reduce the need for infrastructure expansion and its requisite costs.

Savings / Cost
Unknown.

Timeline
Start implementation in 2010 and implement all components of the program by 2015.

Existing Actions
Helena has few educational programs relating to water, and only one substantial effort was identified that focuses on water conservation. (See "Existing City Actions")

Partnerships / Related Interests
Local businesses involved in hardware and landscaping and local schools.

Recommendations
Representatives from multiple cities surveyed in the preparation of this report noted that education is the core of their programs and the key to widespread behavioral changes in water use. The Task Force recommends that the City embark on a comprehensive outreach and education program that includes the development of a water conservation webpage on the City website that is prominently featured on the City home page; an educational component that would involve the City working with local landscaping businesses and nurseries to provide information to members of the community on waterwise landscaping approaches; demonstration water wise gardens developed and maintained in cooperation with local non-profits groups; City-sponsored workshops, seminars, and cooperative educational efforts with schools and universities; pre-adult and adult school programs; in-home audits and advice; and a voluntary cooperative program with restaurants and lodging establishments to provide informational signs and literature on water conservation.

Existing City Actions
The Lewis & Clark Co. Water Quality Protection District has a robust educational program for water users, land owners, and others. These educational programs, however, are predominatly directed at water quality, as opposed to conservation. Other, smaller activities related to water conservation do exist, such as distribution of water conservation kits to residents upon request. School children who visit the Helena waste water treatment plant also receive a conservation kit and first-hand instruction on the need for clean water. However, aside from the District's Water Watch program, none of these other activities represent a robust or concerted effort at community water conservation education. Helena does have some limited educational information on the City website, but not in a central location and the pages are difficult to find. The Helena Public Works web site at: http://www.ci.helena.mt.us/departments/public-works/water-treatment/conservation-tips.htm contains the most relevant information, but water conservation is "hidden" within the water treatment section of Public Works. Further, the site has little content. It includes one page of water conservation tips and links to a few other programs, many of which are related to xeriscaping in other states and not wholly applicable to Helena. Another page for Public Works, somewhat inexplicably found by going through the water treatment links, provides a half page of voluntary water restriction guidelines.

Summary of Benefits

The direct benefit is that the City reduces its demand on City water supplies and forestalls the need for additional infrastructure expansions beyond those described in the 2005 Water Plan.

Similar Actions in Other Cities

Santa Fe, NM
Southern Nevada Water Authority (Las Vegas)
Denver, CO
Austin, TX
Tigard, OR
Prescott, AZ

References and Resources

City of Austin Outreach Program: http://www.ci.austin.tx.us/growgreen/
City of Eugene Water Conservation Web page: http://www.eweb.org/content.aspx/0e75d4f0-d7e0-4bb6-b0ca-f1244906af60
Salt Lake City Water Conservation Page: http://www.ci.slc.ut.us/Utilities/conservation/
Santa Fe Water Conservation Education and Outreach: http://www.santafenm.gov/index.aspx?nid=1256
City of Tucson Project WET training: http://www.tucsonaz.gov/water/education.htm.)
University of Oregon Climate Leadership Initiative: http://climlead.uoregon.edu/programs/programs.html#education

WTR-6 Research and Adopt a Targeted Program to Regulate Water Use

Department
Public Works department; water treatment

Target or Goal
To reduce gallons per capita per day demand from 175 in 2005 to 100 in 2025 (as an annual average) and to reduce maximum per capita daily demand from 487 gpd to 287 gpd.

Projected Benefit
To reduce demand on the water supply system, and consequently, reduce the need for infrastructure expansion and its requisite costs.

Savings / Cost
Unknown.

Timeline
In the near term (starting in 2010), research various regulatory measures adopted in other locales. After outreach and education and community incentive programs have been fully implemented, adopt specific regulatory measures designed to reduce waste of water.

Related Actions
Community incentives and outreach and education.

Existing Actions
Helena has adopted few ordinances related to water conservation. (See "Existing City Actions Explained")

Partnerships / Related Interests
Home Builders' Association.

Recommendations

Regulatory measures incorporate water conservation practices that are required by ordinance, code, or other statutory mechanism employed by a local government. The Task Force recommends that much of a regulatory program of water conservation be implemented after all the other strategies have been implemented, and then as needed to further reduce per capita consumption to the targets described elsewhere. The point of deferring a comprehensive regulatory scheme until completion of the other strategies is to first derive as much conservation benefit from the voluntary strategies as is possible.

Based on a limited review of cities and counties, regulatory measures have most often been adopted for a relatively rapid response to a water "emergency," such as a widespread and long-lasting power outage, or loss or contamination of a supply reservoir. Helena has adopted an emergency ordinance. Many communities have also codified conservation measures because of developing concerns with their water supplies. Fewer communities have allocated meaningful resources to enforcing water conservation codes, although some have established substantive penalties for violations and a few have created seasonal or full-time positions charged with community education and enforcement ticketing.

Examples of water conservation measures aiming at permanent changes in water use (as opposed to emergency measures) at the community-level are most pertinent for consideration here. Helena's population will continue to grow, and our climate is likely to become warmer and more arid. Recommendations for water conservation regulations should be coordinated with temporary or permanent incentive measures to further encourage participation.

Specific ordinance options that the City should investigate include:

- Building codes designed to ensure water efficiency features in new buildings, such as dual metering systems for indoor and outdoor use, and a requirement for water conserving fixtures on new construction and retrofits;
- Specific regulation of irrigation and watering, such as mandatory irrigation scheduling;
- Prohibitions on wasteful water practices such as watering off of landscaped areas and onto hard surfaces; constraints on vehicle washing practices (e.g. requiring automatic shutoff nozzles on hoses); prohibitions on the use of potable water to wash hard surfaces without a safety or public health reason;
- Landscaping regulations such as requiring low-water-use plantings on public property, prohibition of restrictive covenants that require high-water-use turf grass;

Existing City Actions Explained

The water regulations of Helena City Code at Title 6, Chapter 2 provide for a water use reduction staging plan that can be voluntary or mandatory (see §6-2-3, Rule 8). Two non-emergency, conservation-related ordinances are on the books. The water regulations prohibit leaving water fixtures and pipes in a leaky condition, or letting fixtures run when not being used for the purpose intended (see §6-2-3, Rule 17). In addition, the Plumbing Code at Title 3, Chapter 7 includes an allowance for the use of non-water urinals (see §3-7-1E).

Summary of Benefits

The direct benefit is that the City reduces the demand on City water supplies and forestalls the need for additional infrastructure expansions beyond those described in the 2005 Water Plan.

Similar Actions in Other Cities

Southern Nevada Water Authority (Las Vegas)
Denver, CO
Austin, TX
Albuquerque, NM
Santa Fe, NM

References and Resources

Tucson, AZ 2008. Update to Final Water Plan: 2000-2050. City of Tucson Water Department. 89 pages.
Denver, CO. 2008. Operating Rules of the Denver Water Board. Effective August 1.
Chapter 14: Water Conservation.
Chapter 15: Drought Response
Santa Fe, NM. 2008. Santa Fe City Code, Chapter 25, Water. Amended through June 30, 2008.
Albuquerque, NM. 2008. Albuquerque Code of Ordinances, Chapter 6: Water, Sewers, and Streets, Article 1, including:
Part 1: Water Conservation, Landscaping and Water Waste
Part 4: Water Conservation Large Users
Part 5: Water Conservation by Request
Part 6: Plumbing Fixture Retrofit on Sale
Austin, TX 2008. Austin City Code, Title 6 Environmental Control and Conservation, Chapter 6-4, Water Conservation.
U.S. Environmental Protection Agency (EPA). 2008. Notification of Intent to Develop Draft Performance Specifications for High Efficiency Urinals. May 22.
U.S. Environmental Protection Agency (EPA). 2007. Notification of Intent to Develop Draft Performance Specifications for Showerheads and Related Devices. August 30.
Helena City Code, Title 6, Chapter 2, Water Regulations, and Rules Governing at 6-2-3 (See rules 8 for water use reduction staging plan, and rule 17 for water waste from leaking plumbing. Also, Title 3, Chapter 7 Plumbing Code).

WTR-7 Pursue Water Supply/Municipal Watershed Protection

Department
Public Works

Target or Goal
To protect those parts of the watershed that are effectively fully functional and to restore those parts of the watershed that have been impaired by human activity.

Projected Benefit
To enhance the resilience of the Tenmile watershed as a key part of the municipal water supply.

Savings / Cost
The fiscal impact of this effort, if successfully implemented, will be a substantial savings; if Tenmile's attributes as a municipal water supply were substantially compromised or destroyed by natural or human-caused events (e.g. wildfire), the cost of replacing that source, either through an upgrade of the Missouri River as a source of supply or in securing new, as yet unknown supplies, would be considerable.

Timeline
The collaborative committee will terminate in September 2009. Implementation of the committee's recommendations will be ongoing. Various attributes of this strategy will take several years, perhaps up to and exceeding a decade, to implement.

Related Actions
Conservation strategies

Existing Actions
The City has completed on a collaborative watershed planning process to begin to address the health of the Tenmile Watershed. The City has developed a watershed forest management plan for municipal lands within the Tenmile Watershed.

Partnerships / Related Interests
USFS, DEQ, Private landowners in the upper Tenmile watershed; various local and state conservation groups.

Recommendations
Implement the recommendations of the Tenmile Watershed Collaborative Committee, and pursue a variety of strategies directed at maintaining the health and resilience of the watershed as a source of municipal water.

After the water working group began meeting, the Commission passed Resolution #19605, appointing the Tenmile Watershed Collaborative Committee (TMWCC) to address key resource issues in the Tenmile watershed. The TMWCC completed its deliberations and submitted its recommendations to the City Commission on June 17, 2009 after the water working group had completed its report and recommendations. (See Appendix O). The TMWCC included recommendations to accomplish the following goals:

- Protect and improve water quality
- Protect City water delivery infrastructure
- Protect and improve long-term quality of wildlife habitat
- Reduce the damage of major wildfire
- Promote the potential for restoration in the watershed of a viable fishery and wetlands
- Provide for present and future public safety

A number of these goals are directly consistent with the Task Force recommendations, while the others, if not directly related to protecting the integrity of the municipal water functions of the watershed, nonetheless complement the Task Force recommendations.

The Task Force endorses the recommendations of the Tenmile Watershed Collaborative Committee and recommends a suite of activities directed at improving the overall health of the watershed and enhancing its resilience in the face of any number of potential harms to the watershed. These recommendations include:

- Developing TMDL and Non-point source management prescriptions;
- Assessing stream and riparian conditions and restoring where warranted;
- Managing watershed forests for optimal yield as a source of municipal water;
- Pursuing a watershed plan involving all stakeholders.

In addition the Task Force recommends that the City take an active role in assuring the TMWCC recommendations are implemented.

Summary of Benefits
Direct benefits will be to help secure the Tenmile watershed from catastrophic damage to its function as a source of municipal water supply.

Similar Actions in Other Cities:
Unknown.

References and Resources
Research references, references contained in Appendix, website addresses, NREL Contacts, Agency Contacts, expert contacts, contractors, etc.

TWRP – INTRODUCTION

Transportation, Waste, Recycling, Public-Private Partnerships (TWRP)

Mission Statement (adopted April 16, 2008)

The TWRP Working Group will identify opportunities within the community of Helena to reduce GHG emissions in the sectors of waste management, transportation and public-private partnerships, and will identify ways to educate and inform the public about water conservation and reduction of GHG emissions.

Members

Will Selser, TWRP Co-Chair
Ben Brouwer, TWRP Co-Chair
DD Dowden
Rebecca Ridenour
Stephanie Wallace

Discussion

The TWRP Working Group has, over the last 18 months, researched community-wide GHG reduction measures adopted by other municipalities, and has met with and invited comments from Helena City staff. The recommendations in this section are intended to incentivize and enable changes in the Helena community that will result in resource conservation and GHG reductions. While the GHG emissions inventory conducted in partnership with ICLEI did not provide data for community emissions, TWRP's research targeted likely areas for improvement: transportation, waste reduction, and an assortment of public-private partnerships.

A further, more in-depth analysis of community opportunities for GHG reduction and resource conservation is still needed. This analysis should be preceded by a community-wide GHG emissions inventory.

The Task Force recognizes that there are several City and County-appointed boards and committees that influence community-wide GHG emissions and Helena's water supply. Those citizen boards include the Helena Housing Authority, Helena Open Lands Management Advisory Committee, Zoning Commission, Non-Motorized Transportation Advisory Council, Planning Board, Board of Appeals and Tenmile Watershed Collaborative Committee. TWRP Working Group recommendations overlap with discussions taking place in each of these citizen boards.

The TWRP Working Group is especially indebted to Ed Robinson, Fleet Superintendent; Kathy Goroski, Recycling Supervisor; and Ben Sautter, Streets/Traffic Superintendent. Data and suggestions received from the Bozeman and Missoula Public Transit authorities, NorthWestern Energy, and the Growing Community Project have proven invaluable to our efforts as well.

Recommendation	Description	Goal(s)	Possible CO_2 Savings
TWRP-1	Urban Area Transportation District	Create funding mechanism for public transportation	Not quantified
TWRP-2	Non-motorized Transportation Policy	Replace vehicle miles driven with pedestrian/bicycle miles	Not quantified
TWRP-3	Pay as You Throw	22% reduction in trash to landfill by 2015 (base year = 2006)	See figures from Waste Reduction & Recycling recommendation
TWRP-4	Solid Waste Reduction Goal	35% reduction in trash to landfill by 2020 (base year = 2006)	7,087 tons CO2 annual savings
TWRP-5	Disposable Shopping Bag Fee	30% reduction in disposable shopping bag usage by 2011	653 tons CO_2 annual savings
TWRP-6	Back to the Tap Policy	Public education campaign to encourage using tap water; eliminate City purchases and sales of bottled water	Not quantified
TWRP-7	Green Blocks Program	In 100 homes reduce consumption of electricity by 5%, and natural gas by 2.5%	161 tons CO_2 annual savings
TWRP-8	Local Food Production Policy	Community gardens w/in walking distance of neighborhoods by 2012; increase sale of Montana-grown food 20% .	Not quantified

TWRP-1 Support Formation of an Urban-Area Transportation District

Recommendations

The goal of this recommendation is to decrease vehicle miles driven in the Helena area for commuting and non-work related travel, and to increase the mobility of elderly, disabled, low-income, student and visitor populations.

The Task Force urges the City Commission to support the formation of an Urban Area Transportation District (UATD) in order to establish a consistent base-funding source for capital costs, operation and maintenance of an expanded Helena-area public transportation system. The Task Force believes that a UATD would be the most effect way to build and maintain high-quality public transportation with regular service to Helena commuters, elderly, disabled, low-income, student, and visitor populations.

Expanded public transportation service should be designed to interface with a regional transportation initiative being coordinated by the Yellowstone Business Partnership and with existing and future regional transportation options (Helena Regional Airport, Greyhound, and future passenger rail). Many details of an expanded public transit system have already been laid out in the 2006 Helena Area Transit Development Plan Update for the years 2007-2011.

A Helena-area UATD may only be created by a petition and a vote of the people included in the district, however City staff should play a role in publicizing how a UATD would work, what the fiscal impacts would be and how improved service would benefit Helena-area communities.

City support should include staff involvement in:

- Mapping a proposed UATD and identifying which properties would be assessed (Fall 2009, Winter 2010)
- Identifying an appropriate assessment rate for the district and drafting petition language (Fall 2009, Winter 2010)

Summary of Benefits

DIRECT

- Reduced street repair and maintenance costs
- Reduced GHG emissions and other air pollution
- Reduced commuting stress and traffic congestion during peak hours
- Increased access to services (retail, health care, public events, parks, etc.) for elderly, disabled, student, low-income and visitor populations

Department

Public Works

Target or Goal

Increase public transportation ridership from 122,011 (2008) to 222,001 by 2012

Projected Benefit

Estimated annual saving of 213 tons CO_2

Savings / Cost

Not quantified

Timeline

2009-2011

Related Actions

- 2006 Helena Area Transit Development Plan Update authored by LSC Transportation Consultants
- 2004 Update of the Greater Helena Area Transportation Plan
- Construction of new bus facility targeted for 2010/2011
- The City Transit staff has developed maps of two possible expansions of the current Helena Transit District

Partnerships / Related Interests

Lewis & Clark County, Jefferson County, Broadwater County, Helena Area Transportation Council, City of East Helena, Helena Business Improvement District, Rocky Mountain Development Council, St. Peter's Hospital, property owners/developers in outlying areas, Montana Department of Transportation, Try Another Way State Employees (TAWSE), Friends of Downtown Helena, Helena Chamber of Commerce, Montana Smart Growth Coalition, Plan Helena, and the Yellowstone Business Partnership.

INDIRECT

- Reduced costs for build-out of existing streets to accommodate increased traffic
- Reduced demand for expensive new parking facilities
- Safer streets for pedestrians and bicyclists
- Lower parking costs for Helena employers
- Lower transportation costs (fuel, vehicle maintenance) for public transportation users
- Higher revenue for area businesses from visitors

Similar Actions in Other Cities

Missoula, MT
Bozeman, MT
Brattleboro, VT
Boulder, CO

References and Resources

2006 Helena Area Transit Development Plan Update authored by LSC Transportation Consultants: http://www.lsccs.com/projects/helenatdp/index.htm

TWRP-2 Improve Non-Motorized Transportation Policy and Infrastructure

Overview

The Task Force urges the City Commission to support and fund recommendations of the Non-Motorized Travel Advisory Council (NMTAC) that will increase the ease of non-motorized transportation in Helena and decrease vehicle miles driven. Without a thorough study of community-wide GHG emissions related to transportation, it is difficult to quantify the GHG impacts of specific measures. Evidence from other communities indicate that the potential GHG savings of replacing vehicle miles traveled with non-motorized transportation will be significant. For example, in Brattleboro, VT, shifting 10 trips per day from single-occupant automobiles to bicycles cut 7 tons of CO_2 emissions per year. The use of four bicycles for police patrols in Brattleboro has contributed to the annual elimination of 12 tons of CO_2.

Through a combination of policy changes and budget allocations, the City should plan for and build infrastructure and conduct educational programming that eases and enables pedestrian and bicycle travel.

Recommendations

1. Adopt a "Complete Streets" transportation design ordinance. A Complete Streets ordinance should ensure that City transportation planners and engineers consistently design and operate the entire roadway with all users in mind - including bicyclists, public transportation vehicles and riders, pedestrians of all ages and abilities, and private motor vehicles.
   • Important elements of a policy statement are identified by the National Complete Streets Coalition (www.completestreets.org)
   • Ordinances should be developed in coordination with NMTAC and the Helena Area Transportation Council by January 2010.
2. Adopt policies and infrastructure changes necessary to gain a League of American Bicyclists "Bicycle Friendly Community" designation.
   • Criteria areas include engineering, education, encouragement, evaluation and enforcement. NMTAC should advise specific infrastructure and policy changes to the Public Works Department and Commission by January 2010.
   • Missoula and Billings have achieved Bicycle Friendly Community status
3. Extend the Centennial Trail bike/pedestrian pathway west to Spring Meadow Lake and east to the East Helena bike path. A hybrid trail that includes pavement for cyclists, and a softer, natural surface for pedestrians should be considered. Prioritize for completion by July 2010.
4. Review all pedestrian bump-outs by January 2010 to ensure that they allow bicycle passage without causing bicyclists to enter the main vehicle lane. Reconstruct bump-outs where necessary.

Department
Public Works/Streets, Parks and Recreation, Police

Target or Goal
Replace vehicle miles driven with pedestrian and bicycle miles

Projected Benefit
Not quantified

Savings / Cost
Not quantified

Timeline
Ongoing

Related Actions
• Completed a Safe Routes to School infrastructure improvement program
• Began the Centennial Park improvement project which will include the reconstructed Centennial Trail pathway.
• Provided funding for a consultant to assist the Non-Motorized Travel Advisory Council (NMTAC) with educational efforts
• Partnered with MT Department of Transportation (MDT) to change traffic lights on 11th Avenue, Prospect and North Main Street, installing ADA compliant curbs, thereby increasing pedestrian/bicyclists safety while increasing vehicle flows and reducing idling times.

Partnerships / Related Interests
NMTAC, Helena Area Transportation Council, City Parks and Recreation Department, Helena Chamber of Commerce, MDT, Helena Bicycle Club, Plan Helena, Try Another Way State Employees (TAWSE), Helena Vigilante Runners, and Helena bike stores

5. Connect major destinations (shopping hubs, schools, parks, downtown, residential neighborhoods) with a network of signed and striped on-street bike routes and sidewalks by July 2010.
6. Fund the NMTAC to conduct educational programming to promote non-motorized transportation options in Helena from July 2010 to July 2015
   • Components should include bicycle commuting classes, a printed map of safe/efficient bike routes around the city, advertising and outreach encouraging non-motorized transportation, advertising and outreach defining the rights and responsibilities of pedestrians, bicyclists and motorists.
7. Continue/expand the seasonal use of bicycle-mounted Police patrols (ongoing).

Summary of Benefits

Direct

- Reduced street repair and maintenance costs
- Reduced GHG emissions and other air pollution
- Reduced commuting stress and traffic congestion during peak hours
- Increased access to services (retail, health care, public events, parks, etc.) for elderly, disabled, student, low-income and visitor populations

Indirect

- Reduced costs for build-out of existing streets to accommodate increased traffic
- Reduced demand for expensive new parking facilities
- Safer streets for pedestrians and bicyclists
- Lower parking costs for Helena employers
- Lower transportation costs (fuel, vehicle maintenance) for non-motorized transportation users
- Higher revenue for area businesses from bicycle visitors
- Increased health and wellbeing for non-motorized transportation users
- Helps position the City for access to federal funding for obesity and diabetes avoidance/reduction programs

Similar Actions in Other Cities

Eugene, OR
Missoula, MT
Brattleboro, VT
Seattle, WA
Portland, OR

References and Resources

National Complete Streets Informational Workshop, 2008, www.completestreets.org
Centers for Disease Control (CDC), Obesity, Halting the Epidemic by Making Heath Easier, March 24, 2009, http://www.cdc.gov/NCCdphp/publications/AAG/obesity.htm
National Association of Realtor's poll, 2007
For every drop of $50 in weekly commuter costs, a family can qualify for $8,000 more in purchased home value. Bozeman – DTYQ (Drive Till You Qualify)
Climate Action Plans – Brattleboro, VT; Aspen, CO, Missoula, MT, etc. (CD available)
Transportation for America Blueprint for Reform, http://t4america.org/blueprint

TWRP-3 Establish True Pay-As-You-Throw (PAYT) Program

Recommendations

The Task Force recommends that the Public Works Department implement a true Pay-As-You-Throw (PAYT) solid waste program, which only charges residents for the actual pounds of waste they generate.

Traditionally, residents pay for waste collection through property taxes or a fixed fee, regardless of how much—or how little—trash they generate. PAYT is a system of managing trash services just like electricity, gas, and water utilities. Households pay a according to how much of the service they use. When the cost of managing trash is hidden in taxes or charged at a flat rate, residents who recycle and prevent waste subsidize their neighbors' wastefulness. Under PAYT, residents pay only for what they throw away.

Less waste and more recycling mean that fewer natural resources need to be extracted. In addition, greenhouse gas emissions associated with the manufacture, distribution, use, and subsequent disposal of products are reduced as a result of the increased recycling and waste reduction PAYT encourages.

Implementation steps:

- Summer and Fall 2009: Hire SERA, Inc. to design PAYT system for Helena. This consulting firm is the national expert on PAYT systems.

Likely implementation steps to follow:

- By January 1, 2010: lower the annual "default" Transfer Station disposal amount allowed before PAYT billing goes into effect from 4,000 to 2,000 pounds.
- By January 1, 2011: replace all 300 gallon alley-based disposal barrels with 90 gallon residence-specific containers and reduce the default transfer station disposal amount to 1000 pounds.
- By January 1, 2012: reduce the default transfer station disposal amount to zero.

Summary of Benefits

- Increased household and business recycling and waste reduction
- Decreased landfill demand
- Reduced hauling fuel costs and emissions from hauling to landfill

Similar Actions in Other Places

Bozeman (modified PAYT)
Lewis & Clark Co. (modified PAYT)
City of Helena (modified PAYT)

References and Resources

US Environmental Protection Agency site explaining the principles of PAYT: http://www.epa.gov/epawaste/conserve/tools/payt/index.htm

MT Department of Environmental Quality site explaining PAYT programs in Montana: http://www.deq.mt.gov/Recycle/PAYT/index.asp

SERA, Inc, Lisa Skumatz, national expert and consultant on PAYT programs: http://www.serainc.com/

Department

Public Works

Target or Goal

19% reduction in trash to landfill by 2011, 22% by 2015

Projected Benefit

See GHG savings estimates in Solid Waste Reduction Goal, TWRP 2-B

Savings / Cost

SAVINGS:

- Decreased hauling to landfill and lower tipping fees paid to the county for landfill disposal.

COSTS:

- Consultant to design PAYT system for Helena
- Likely conversion costs include 90 gallon barrels for each City residence, scale system to weigh barrels and adjustments to billing system

Timeline

Full implementation of PAYT system by January 2012 (timeline details in recommendation summary)

Partnerships / Related Interests

Lewis & Clark County

TWRP-4 Adopt a Resolution to Meet EPA Goal: 35% Recycling of Municipal Solid Waste

Department
Public Works

Target or Goal
Divert 19% of Helena's solid waste by 2011; 22% by 2015; 35% diversion by 2020 (Use 2006 as reference year).

Projected Benefit
- 19% diversion by 2011 saves 3,842 tons of CO_2 per yr
- 22% diversion by 2015 saves 4,449 tons of CO_2 per yr
- 35% diversion by 2020 saves 7,078 tons of CO_2 per yr

(The first two targets come from the Act, while the third was developed by the task force.)

- An additional 8.5 tons of savings was calculated for reduced truck trips
- 2020 total: 7,078 tons + 8.5 tons = 7,087 tons

(see calculations below)

Savings / Cost
SAVINGS:
- Decrease in direct payments to L&C County for waste taken to their landfill
- Reduced staff costs, fuel usage and vehicle wear from reduced hauling trips to the county landfill.
- 2006 transfer station trucks to landfill = 2211 X 24mi/trip = 53,064 miles. A 20% reduction = 10,613 miles
- A reduction in driver hours of 9/week X 52 = 468 fewer staff hrs /yr

COSTS:
- Reduced revenue to both the City Transfer Station and the county Landfill
- Purchase of additional recycling containers
- Increase in staff costs for more/more frequent route servicing
- Increased CO_2 emissions from more collection miles to service more recycling sites

Timeline.
Draft and pass resolution by end of 2009, begin implementation July, 2010

Related Actions
Pay As You Throw recommendation; Disposable Shopping Bag fee; Back to the Tap Policy

Partnerships / Related Interests
Working for Equality and Economic Liberation (WEEL)/ Growing Community Project (composting for gardens); S.A.V.E. Foundation; Green Team

Recommedations
The Montana Integrated Waste Management Act (75-10-803 MCA), directs Montana to reduce the volume of solid waste that is either disposed of in landfills or incinerated.

The Task Force recommends that Helena adopt policies and programs in accordance with the Act's strategy for integrated solid waste management and set the following targets for increasing rates of recycling and composting in the City, using 2006 tonnage figures as a baseline reference:

(a) Divert 19% of the City's solid waste by 2011;
(b) Divert 22% of the City's solid waste by 2015;
(c) Divert 35% of the City's solid wast by 2020.

The City should lead by example and create a new paradigm--rewarding employees who show interest and leadership in reducing waste and recycling. The integrated solid waste management strategy is based on a hierarchy of prioritized approaches to managing waste. These approaches, in order of priority, are as follows:

(1) Source Reduction: Waste Avoidance - Reduce costs of handling and disposal, conserve resources, reduce pollution.
   a. The first alternative to consider for waste management, "living lightly" (having minimal impact on our environmental resources), and reducing pollution.
   b. The most effective and financially beneficial way to reduce waste going into landfills or being incinerated.
   c. Specific policies or programs include: PAYT system, Disposable Shopping Bag fee, Back to the Tap Policy.

(2) Reuse: (Giving a second life to a used product or material).
   a. Extends the benefits of these investments and contributes to 'source reduction' by reducing the effects of our "throw-away society." A lot of energy and resources are saved each time a product or material is reused.
   b. Different from recycling because it does not require expending additional energy to convert materials into a new form.

(3) Recycling: Introducing used materials or products into manufacturing processes to produce a new product.

a. Requires collecting materials, processing them to form appropriate raw materials, and manufacturing a new product.
b. Involves the purchase of Recycled-Content Products.
c. Specific policies or programs:

(4) Composting: Waste Diversion - Return materials to valued use: conservation of resources, economic development, community participation, avoided costs of disposal
a. Whether sold, given away, or re-applied on-site, there must be a demand for this material in order to continue the process. This option should be considered for all waste materials that are biodegradable and that cannot be reused or reduced.
b. Specific policies or programs:

(5) Landfill & Incineration: Disposal - Manage materials that can not otherwise be avoided or diverted

General Policy and Program Recommendations to meet waste diversion targets:

- Increase the availability of recycling drop-off sites to Scratch Gravel Solid Waste Dist. residents.
- Investigate and report on possible incentives (taxes, grants, contracts) for commercial/non-profit waste haulers offering recycling pick-up in City limits.
- Investigate the costs of partnering with the non-profit Headwaters Cooperative Recycling, Inc. vs. implementing a similar program in-house.
- Investigate the impact on revenues and operational costs of instituting a minimum per-transaction cost at the Transfer Station.
- Examine the "Blue Bag" curbside program for efficiency and cost effectiveness.
- Investigate ways to create incentives for staff/personnel within City facilities to increase and maximize waste reduction and recycling of office/facility generated waste.
- Investigate the need for more in-building recycling bins to accommodate the need and desire to recycle office waste.
- Adopt minimum waste and recycling guidelines for City-permitted, City-funded or City-sponsored events.
- Have the City assume the current S.A.V.E. group plastics and recycling on a permanent basis and increase the frequency to once a month. Thus far, the City has been reluctant to commit resources to support the plastics program. Without additional resources, the City may not have the capacity to take over the plastics program. In addition to the advertised partnerships (City of Helena, City-County Sanitation, Pacific, S.A.V.E., State of Montana), the program also relies on resources from Carroll College, Headwaters Recycling, and others. It is our hope that a permanent or ongoing collection could be established for the higher-value items (type 1 & 2 plastics). In this case, S.A.V.E. would continue its bimonthly collections for other items, potentially including propane containers, e-waste, or Type 4-7 plastics.
- Regarding tax payer expenses, we request that the City to consider the full cost of waste disposal along with recycling (i.e. Recycling costs, but it should break even if the per-ton cost of recycling is less than the per-ton cost of solid waste.) For more information about Full Cost Accounting, see the EPA's site at http://www.epa.gov/waste/conserve/tools/fca/index.htm.
- Explore utilization of existing capacity to expand recycling. Simply increasing infrastructure (two trucks collecting from each house each week) would double costs, provide excess waste capacity that would not limit household generation, and would double fuel use—potentially negating benefits of the collection program. Substantial investment in recycling and establishment of pay-as-you-throw might be achieved by alternate weeks of collection for trash, with weekly trash collection requiring an additional charge.
- A sorting facility and convenience center should be considered to avoid congestion at the Transfer Station.
- Provide glass collection at additional locations outside the Transfer Station to prevent single trips just for glass. Options include providing public sites, providing sites through a public/private partnership, or in conjunction with other collection events such as plastic drives.

Calculations

According to Dusti Johnson at the State of Montana DEQ, the EPA break down for the composition of municipal waste works well for Montana:

33% - Paper
12.5% - Food
12.8% - Yard
7.6% - Rubber, Leather, Textiles
5.6% - Wood
5.3% - Glass
8.2% - Metal
12% - Plastic
3% - Other
100%

These components were further lumped into the CACP software categories, as follows:

33% - Paper Products
12.5% - Food Waste
12.8% - Plant Debris
13.2% - Wood / Textiles
28.5% - Other
100%

With these percentages applied to Helena's 2006 solid waste production of 41,437 tons, the software calculates 20,222 tons of associated carbon dioxide (CO_2) emissions.

A 19% diversion (leaving 33,564 tons of waste) results in 16,380 tons of CO_2 -- a savings of 3,842 tons.

A 22% diversion (leaving 32,321 tons of waste) results in 15,773 tons of CO_2 -- a savings of 4,449 tons.

A 35% diverstion (leaving 26,934 tons of waste) results 13,144 in tons of CO_2— a savings of 7,078 tons.

CO_2 reductions from reduced truck trips (estimated 11,492mi/year/(15 mi/gallon) = 766 gallons diesel x 22.2 lbs of CO2 / gallon = 17,005 lbs CO2 = 8.5 tons CO2 saved per year of CO_2 saved.

Summary of Benefits

- Resource conservation and emissions reductions from lower material production
- Increased household and business recycling and waste reduction
- Decreased landfill demand
- Reduced hauling fuel costs and emissions from hauling to landfill

Similar Actions in Other Cities

Aspen, CO
Homer, AK
Brattleboro, VT
Anacortes, WA

References and Resources

EPA 2005, CO_2 Calculations and References: http://www.epa.gov/RDEE/energy-resources/calculator.html
EPA 2006, WAste Reduction Model (WARM)
http://www.epa.gov/osw/rcc/resources/action-plan/act-p1.htm
State of Montana Integrated Waste Management Plan (2006): http://www.deq.state.mt.us/recycle/intewastemanag.asp
City of Helena Solid Waste staff
Lewis & Clark Co. Landfill Analysis – Sherrel Rhys, Landfill Manager

TWRP-5 Institute a Per-Bag Fee System to Reduce the Use of Disposable Shopping Bags

Recommendations

Clean-up of wind-blown plastic bags at landfills costs taxpayers in the Helena area thousands of dollars each year. Stores in Helena distribute an estimated 9,900,000 shopping bags annually, with an associated GHG emissions impact of 2178 tons of CO_2. The emissions from disposable bags are significant. GHG emissions from plastic bags (0.2 kg / bag x (2.2 lb / kg) x (1 ton / 2000 lb) = 0.00022 tons / bag) (0.00022 tons / bag x 9,900,000 bags used in Helena each year = 2178 tons of CO2)

Lewis & Clark County staff reported that plastic bag clean-up costs approximately $10,000 at the County landfill. In addition, plastic bags cause the death of hundreds of thousands of birds and animals that mistake them for food each year. Paper bags, if not recycled, pile up in landfills, releasing greenhouse gases as they decompose. Only a small percentage of shopping bags are actually recycled. Both paper and plastic bags require a considerable one-time use of energy and natural resources.

Several area retailers currently offer small credits to customers who don't use a disposible bag. The Real Food Market recently implemented a fee for disposable paper shopping bags and stopped distributing plastic bags entirely. The store offers recycled cardboard boxes to customers and offers a $0.10 credit or donation to Montana Shares for each reusable bag that a customer uses. The combination of measures has cut the number of disposable bags leaving the store by more than 90% and has equated in significant financial savings for the store. Van's Triftway gives the customer $.05 cash for each of the reusable bags used to bag their grocerie purchase.

The Task Force recommends that the City set a per-bag fee based on the model recently implemented in Seattle. Elements of the bag fee include:

- Retailers must charge $0.10 to $0.25 for bags distributed at Helena stores. The fee should be high enough to effect a change in purchasing patterns.
- Businesses with profits under $1 million may keep 100% of the money generated by the fee. Stores with larger profits must return 75% of fee revenue to the City of Helena.
- 80% of fee revenue will go toward waste prevention, recycling programs and environmental education programs. The remainder will go toward subsidizing reusable bags.
- The City should use the bag-fee revenue to provide reusable bags to low income households.
- In Seattle a city-wide referendum was used to pass the fee.

Department

City Commission, Finance/ Administration

Target or Goal

30% reduction of disposable shopping bag distribution at stores in Helena by July 2011

Projected Benefit

Projected shopping bags saved at Helena stores: 2,970,000 and 653 tons CO_2

Savings / Cost

SAVINGS:

- Reduce the volume of landfill (shopping bags compose 2%-5% of landfill volume)
- Reduce cost of cleaning up plastic bag litter at and near transfer station and on other City land. (Estimated $10,000 per year at the County Landfill.)
- Reduce maintenance cost incurred by plastic bag litter that clog drains, machinery, waterways

COSTS:

- Administrative costs to local businesses (offset by fees collected by the same businesses)
- Administrative costs establishing and managing fee system for City

Timeline

Implement per-bag fee by July 2010

Related Actions

Many local retailers are voluntarily offering a small credit ($0.05 or $0.10 per bag) for using a reusable bag. The Real Food Market recently implemented a fee for the purchase of disposable shopping bags.

Partnerships / Related Interests

Schools, merchants, and service groups could all be enlisted to promote the use of reusable bags.

Summary of Benefits

DIRECT:

- Reduced resource consumption and GHG emissions
- Lower litter pick-up costs at landfills
- Revenue for recycling and resource conservation programs
- Retailers reduce costs of stocking disposable bags

INDIRECT:

Consumer behavior shifts towards lower impact purchasing patterns
Bigger market for reusable bags at retail stores

Similar Actions in Other Cities

Cities: San Francisco (banned plastic shopping bags), Seattle ($0.20 fee/shopping bag), Los Angeles (ban on plastic bags starting 2010). Countries: Ireland, Taiwan, China, Australia, Bangladesh, Rwanda, and Bhutan, Italy, Belgium, Switzerland, Germany, and Holland,

References and Resources

CO_2 emissions from disposable bags: http://timeforchange.org/plastic-bags-and-plastic-bottles-CO_2-emissions
Information about reusable bags and policies to limit the use of disposable bags: http://www.reusablebags.com
Slideshow highlighting impacts of disposable plastic bags: http://www.poconorecord.com/apps/pbcs.dll/article?AID=/20080506/MULTIMEDIA02/80505016
San Francisco plastic bag ban article: http://www.sfgate.com/cgi-bin/article.cgi?file=/c/a/2007/03/28/MNGDROT5QN1.DTL
Los Angeles plastic bag ban article: http://www.huffingtonpost.com/2008/07/23/la-plastic-bag-ban-dispos_n_114557.html

TWRP-6 Adopt a Municipal Back-to-the-Tap-Policy

Summary of Benefits

In contrast to the City of Helena's tap water, which is filtered and delivered through an energy-efficient infrastructure, bottled water is an incredibly wasteful product. Bottled water is commonly packaged in single-serving plastic bottles made from fossil fuels. Nationwide, the resource impacts are significant: The Pacific Institute estimates that the energy used for pumping, processing, transportation, and refrigeration brings the annual fossil fuel footprint of bottled water consumption in the United States to over 450 million barrels of oil equivalent—enough to run 3 million cars for one year. Bottled water production and transportation in the US produces 2.5 million tons of CO_2 per year. Helena-specific consumption data are not available. Most plastic water bottles, four of every five, are not recycled and end up in landfills instead. Furthermore, plastic recycling in Helena is sporadic, not widely available, and marginally cost-effective for Helena-area recycling businesses. Reducing the quantity of plastic bottles used should be the City's first step.

Many municipalities concerned about resource consumption and GHG emissions are implementing Back-to-the-Tap policies and programs that publicize the safety, convenience and low cost of tap water while eliminating purchase of bottled water for government use.

The Task Force recommends that the Commission take several steps to lower the impact of Helena's bottled water consumption:

(1) Conduct an internal audit of bottled water purchases for employee use. Identify volume purchased and sold, cost to City, and environmental impact.
(2) Audit sale of bottled water at City-sponsored, funded or permitted events (Civic Center, Alive@Five, etc). Identify volume sold, environmental impact, and revenue to City.
(3) Conduct an educational campaign urging City employees and residents to use municipal water instead of water sold in disposable bottles.
  • Campaign should highlight the safety and convenience of municipal water and should point out the environmental impact and cost of bottled water.
(4) Eliminate City purchases of bottled water for employee use.
  • Provide City employees with reusable water bottles, and ensure that drinking fountains are available in City work places.
(5) Ban sale of bottled water at City-sponsored, funded or permitted events.
  • Ensure that drinking foundations are available at events and that reusable bottles are available for sale at concessions.

Department
Public Works, City Commission, Finance

Target or Goal
Public education campaign to encourage using tap water; eliminate City purchases and sales of bottled water

Projected Benefit
Not quantified

Savings / Cost
• Reduced cost to City and taxpayers by eliminating purchase of bottled water.
• Extend life of landfill.
• Reduce cost of litter cleanup and removal at events and meetings.

Timeline
• Audit and report City purchases and usage of bottled water to Commission in Fall 2009
• Implement education and marketing program by January 2010
• Eliminate City purchase or sale of bottled water by July 2010

Partnerships / Related Interests
S.A.V.E. Foundation

Summary of Benefits

DIRECT:

- Lower resource consumption and GHG emissions
- Lower cost to City government
- Reduced landfill waste

INDIRECT:

- Consumer behavior shifts towards lower impact purchasing patterns

Similar Actions in Other Cities

New York City
Paris
Rome
Florence
Liverpool
Toronto
Salt Lake City
Minneapolis
San Francisco
San Jose
Santa Barbara
Chicago
Charlottesville
Vancouver

References and Implementation Resources

Table of municipal "back-to-the-tap" policies: http://www.earth-policy.org/Updates/2007/Update68_data.htm#table1

Information about municipal "back-to-the-tap" policies: http://www.earth-policy.org/Updates/2007/Update68.htm

Information about bottled water standards and environmental impacts: http://www.nrdc.org/water/drinking/bw/exesum.asp

News article about Paris back-to-the-tap campaign: http://news.bbc.co.uk/2/hi/europe/4373205.stm

TWRP-7 Adopt a Green a Blocks Program

Recommendations

That Task Force recommends that the City of Helena partner with NorthWestern Energy, Lewis & Clark County, HCC, AERO, and S.A.V.E. to conduct energy, water and waste audits and retrofits in 100 homes. The audits will be followed-up with installation of cost-effective conservation measures and on-going educational efforts to publicize conservation measures and encourage further action by participants. Partners will handle a variety of different program components. Program publicity, registration and follow-up media and publicity will be coordinated by the City Manager's office but may be contracted to a Helena-area non-profit organization or business. HCC and AERO will assist with participant recruitment through existing networks and programs. Energy audits and services will be conducted by KEMA, Inc, a contractor for NorthWestern Energy. Water usage audits and conservation measures will be conducted by Helena Public Works Department or a contractor. Waste stream and recycling audits will be conducted by S.A.V.E. Ongoing neighborhood conservation projects in each of the participating Green Block areas will be facilitated by AERO.

A pilot Green Blocks project was conducted by the City of Missoula in partnership with NorthWestern Energy, Mountain Water and Allied Waste between June 2008 and June 2009. A Green Blocks logo, application forms and registration materials are already developed and may be used by the City of Helena at no cost. NorthWestern reports that, on average, each of the 100 participating homes saved 25 dekatherms of natural gas and 540 kilowatt hours of electricity over the year following the audit and weatherization services. That's an annual savings of about $290 per house ($0.12/kWh, $9.00/Dkt).

Benefits

- Model case-studies of cost-effective conservation measures.
- Energy cost savings for 100 homes.
- GHG emission reduction.
- Public awareness of cost-effective conservation measures.
- Stronger neighborhood connections.
- Better publicity of existing utility and non-profit conservation programs.

Similar Actions in Other Cities

Missoula (2008 and 2009)

References and Resources

Details about Missoula Green Blocks Project: http://www.ci.missoula.mt.us/index.aspx?nid=517

NorthWestern Energy: Danie Williams, DSM Professional (406) 497-3516, danie.williams@northwestern.com

City of Missoula: Kisha Schlegel, Grants Administrator 406.258.3688, kschlegel@co.missoula.mt.us

Alternative Energy Resources Organization (AERO): Ben Brouwer, Energy Program Manager 406-443-7272, bbrouwer@aeromt.org

Helena Citizens Council: Rebecca Ridenour, HCC representative on HCCTF

S.A.V.E. Foundation: Matt Elsaesser, Executive Director, (406) 449-6008, recycle@savemobile.org

Department

City Manager, Public Works/ Water Treatment, Community Development/Planning

Target or Goal

Target 100 homes for: 5% reduction in electricity consumption, 2.5% reduction in natural gas consumption, 5% reduction in water consumption, 10% reduction in trash to landfill.

Benefits

Annual savings: 161 tons CO_2 (natural gas and electricity), water savings, additional GHG and natural resource savings from waste reduction.

Savings / Cost

Total cost: $160,000; cost to City depends on match w/ NorthWestern Energy

Timeline

Fall 2009

Related Actions

Education/Outreach

Partnerships / Related Interests

NorthWestern Energy, Helena Citizens Council, Alternative Energy Resources Organization (AERO), and S.A.V.E. Foundation

TWRP-8 Increase Local Food Production and Consumption

Department
Administrative Services/Finance, Parks and Recreation

Target or Goal
Community gardens within walking distance of every neighborhood by 2012; increase sales of Montana-grown food 20% by 2020.

Projected Benefit
Not quantified

Savings / Cost
Not quantified

Timeline
On-going

Related Actions
- Permitting the Helena Farmers' Market on City streets and parks
- Management of the Waukesha community garden since the 1970s
- Leasing of City property for a classroom and community garden adjacent to the YMCA
- Planning for community gardens in new neighborhood parks

Partnerships / Related Interests
Growing Community Project, Helena Farmers' Market, Lewis & Clark County Extension, Alternative Energy Resources Organization (AERO)

Recommendations

The Task Force recommends that the City facilitate increased food production in City limits, and increased consumption of locally-grown or Montana-grown food in order to reduce GHG emissions due to the transportation of food shipped long distances.

The total GHG emissions related to food production, processing, transportation, and preparation for the City of Helena has not been measured, but estimates can be derived from from research conducted on the US food system. While studies vary, a typical analysis shows that the US food industry accounts for about 10% of the fossil fuels burned in this country (Hill 2008). On average, transportation accounts for about 14% of the total energy used by the food system, with an average food item travelling between 1,300 and 1,500 miles from farm to plate (Hill 2008). Consuming food grown and processed in the Helena area (or Montana) can help to reduce community-wide GHG emissions. A study by the University of Montana's Environmental Studies Program and Grow Montana showed that by sourcing ingredients for a typical hamburger and French fries meal from Montana-grown and processed ingredients, the UM dining service cut greenhouse gas emissions by 65% for that meal (Hassanein et al 2007).

The combination of well-informed backyard gardening, widely available community garden plots, and a vital Helena Farmers' Market will help to ensure community-wide reduction in GHG emissions, a strengthened agriculture economy, and bolstered food security in the face of changes brought about by finite fossil fuel supplies and shifting climate patterns.

The Task Force recommends that the City take the following actions to encourage local food production:

(1) Support the Helena Farmers' Market by continuing to grant a permit for the market on City streets and parks, and by publicizing hours of operation on the City website and with an annual water utility billing flier.

(2) Partner with community organizations to construct new community gardens on City property within walking distance of every neighborhood by 2015. Match capital improvement and management costs of new gardens (fences, soil, irrigation, tool sheds, administrative management, etc.) on City property at the value of maintenance costs that are avoided for 3 years by the construction of gardens on property that would otherwise have to be mowed, watered and fertilized. Total annual maintenance cost for City parks with basic amenities is estimated at approximately $5,000 per acre, based on communications with City staff. Include the development of new community gardens on City property, where appropriate, in the long term planning for Helena parks.

(3) Fund the Parks and Recreation Department adequately to facilitate the development and public use of community gardens in Helena neighborhoods by assuming administrative management oversight (collection of fees, water costs, insurance coverage, and major infrastructure repair) for all community gardens approved and built on Helena City property. Partner with community organizations for the on-site management and maintenance of community gardens, as well as to provide educational programming. Publicize on the City website how the public may register for a City-managed community garden plot. Publicize contact information for community gardens sited on private land.

(4) Provide links to home gardening resources on the City website. Suggested links include ATTRA National Sustainable Agriculture Information Service, Lewis & County Extension Service, and the Growing Community Project. The City should promote water-wise gardening practices to minimize water waste, and should promote organic, sustainable, low-input gardening to reduce excess GHG emissions required to produce chemical fertilizers and pesticides.

Benefits

- Lower GHG emissions due to reduced food transportation, petrochemical usage (fertilizers and pesticides), and lawn maintenance
- Strengthened food security for Helena residents
- Support for Helena-area businesses and farmers
- Stronger neighborhood connections
- Enjoy fresher, healthier food

Similar Actions in Other Cities

- Portland, Community Gardens Office: 6437 SE Division, Portland, OR 97206, 503-823-1612
- Seattle, P-Patch Community Gardens Program: PO Box 94649, Seattle, WA 98124-4649, (206) 684-0264
- Missoula, Garden City Harvest: P O Box 205, Missoula MT 59806, (406) 523-3663

Rreferences and Resources

Neva Hassanein, Scott Kennedy, Beth Neely and Paul Hubbard. 2007. Tracing the chain: An in depth look at the University of Montana's Farm to College Program. Published by University of Montana Environmental Studies Program, Missoula, and Grow Montana, Butte. http://www.growmontana.ncat.org/docs/tracing_the_chain_e_summary_new.pdf

Holly Hill. 2008. Food Miles: Background and Marketing. Published by ATTRA—National Sustainable Agriculture Information Service. http://attra.ncat.org/attra-pub/PDF/foodmiles.pdf

Lewis & Clark County Extension: 100 W. Custer, Helena, MT 59602, (406) 447-8346 http://www.co.lewis-clark.mt.us/index.php?id=75

ATTRA—National Sustainable Agriculture Information Service: P.O. Box 3657 Fayetteville, AR 72702, (800) 346-9140. http://attra.ncat.org

Growing Community Project: 32 S. Ewing #109, Helena, MT 59601, (406) 495-0497. http://helenagcp.wikidot.com/

AERO—Alternative Energy Resources Organization: 432 N. Last Chance Gulch, Helena, MT 59601. (406) 443-7272. http://www.aeromt.org

Appendices

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ATTRA—National Sustainable Agriculture Information Service: http://attra.ncat.org

Helena Growing Community Project; http://helenagcp.wikidot.com/

AERO—Alternative Energy Resources Organization: http://www.aeromt.org

Appendix C
Helena Climage Change Task Force Timeline

The following is a brief outline of some of the major activities of the Helena Climate Change Task Force. The preparation of the Climate Action Plan was a major undertaking that took place over eighteen months. It involved numerous additional meetings and activities, but practical considerations preclude a more comprehensive listing.

December 3, 2007: Helena City Commission Adopts Resolution #19530
January 28, 2008: Task Force Appointed
February 19, 2008: Task Force Meeting #1
February 21, 2008: "helenaclimate" listserve launched:
http://lists.onenw.org/lists/info/helenaclimate
March 4, 2008: Task Force Meeting #2
April 2, 2008: Task Force Meeting #3
April 30, 2008: Helena Climate Change Task Force blog launched:
http://helenagcc.typepad.com/helena_climate_change_tas/
May 7, 2008: Task Force Meeting #4
May 12, 2008: Helena Climate Group co-hosts S. David Freeman at Civic Center
June 4, 2008: Task Force Meeting #5
June 21, 2008: Tour of Water Supply & Treatment System
July 2, 2008: Task Force Meeting #6
August 6, 2008: Task Force Meeting #7
September 3, 2008: Task Force Meeting #8
September 17, 2008: Bradshaw delivers mid-term report at city administrative meeting
October 1, 2008: Task Force Meeting #9
November 5, 2008: Task Force Meeting #10
December 3, 2008: Task Force Meeting #11
December 11, 2008: Bradshaw & Ridenour interview with Helena Civic Television
December 23, 2008: Task Force releases GHG Assessment; good media coverage follows
January 14, 2009: Task Force Meeting #12
February 4, 2009: Task Force Meeting #13
March 4, 2009: Task Force Meeting #14
March 6, 2009: Task Force delivers "Stimulus Funding Recommendations"
March 16, 2009: Task Force Work Session #1
April 1, 2009: Task Force Meeting #15
April 28, 2009: Task Force Work Session #2
May 6, 2009: Task Force Meeting #16
May 13, 2009: Task Force delivers "Block Grant Recommendations"
June 2, 2009: Task Force Work Session #3
June 22, 2009: Task Force Work Session #4
July 1, 2009: Task Force Meeting #17
August 5, 2009: Task Force Meeting #18 – Final Meeting

Appendix D
Relevant Local Press Coverage

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http://helenair.com/articles/2007/02/10/helena_top/a01021007_02.txt
"City's ideas good for environment, taxpayers" -- IR, 4/22/07
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"Helenans join national global warming effort" -- IR, 11/5/07
http://helenair.com/articles/2007/11/05/helena/a01110507_01.txt
"Hot topics on city agenda" -- IR, 12/3/07
http://helenair.com/articles/2007/12/03/helena/a011203_02.txt
"City taking active steps in addressing climate change" -- IR, 12/6/07
http://helenair.com/articles/2007/12/06/helena/a011206_03.txt
"City getting grants to conserve energy" -- IR, 2/12/08
http://helenair.com/articles/2008/02/12/local/85lo_080212_energy.txt
"Commission creates alternative-transportation council" -- IR, 2/12/08
http://helenair.com/articles/2008/02/12/local/90lo_080212_committee.txt
"Helena's new task force ready to find ways for city to conserve" -- IR, 2/20/08
http://helenair.com/articles/2008/02/20/local/85lo_080220_warming.txt
"Local groups take action to establish conservation clubs" -- IR, 2/28/08
http://helenair.com/articles/2008/02/28/local/100lo_080228_green.txt
"Helena biosolids are quite safe" -- IR, 3/19/08
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"Mixed signals: City updates traffic lights" -- IR, 4/29/08
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"Helena looks to transform transportation" -- IR, 6/15/08
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"Planning for future bus service" -- IR, 6/15/08
http://helenair.com/articles/2008/06/15/opinions/top/50op_080615_bus.txt
"Kids ride free this summer" -- IR, 6/16/08
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"City adds to project list slated for federal funding" -- IR, 3/10/09
http://helenair.com/articles/2009/03/10/top/80lo_090310_cityfunding.txt
"City commissioners' project list" – IR, 3/10/09
http://helenair.com/articles/2009/03/10/local/100lo_090310_projectlist.txt
"Federal funding on its way to Helena" -- IR, 3/13/09
http://helenair.com/articles/2009/03/13/top/75lo_090313_cityfunds.txt
"Wheels rolling on transit plan" -- IR, 5/6/09
http://helenair.com/articles/2009/05/06/top/top/50lo_090506_bus.txt
"Bike to Work Day highlights city issues of safe routes, fuel savings" – IR, 5/20/09
http://helenair.com/articles/2009/05/20/local/75lo_090520_bikework.txt
"Helena on the right track" – IR, 5/23/09
http://helenair.com/articles/2009/05/23/top/70lo_090523_walk.txt
"Project bid flies low" – IR, 5/27/09
http://helenair.com/articles/2009/05/27/top/top/50lo_090527_airport.txt
"Majority: Helena's not bike friendly" – IR, 6/1/09
http://helenair.com/articles/2009/06/01/opinions/top/irview_090601.prt
"Recycling on the brink" – IR, 6/18/09
http://helenair.com/articles/2009/06/18/top/top/50lo_0901618_recycling.txt
"More recycling opportunity needed" – IR, 6/25/09
http://helenair.com/articles/2009/06/25/opinions/top/irview_090625.txt
"Watts of savings" – IR, 7/17/09
http://helenair.com/articles/2009/07/17/top/top/50lo_090717_energy.txt

Appendices E
E1 Relevant City Resolutions

RESOLUTION NO. 19530

A RESOLUTION ON GLOBAL CLIMATE CHANGE FOR THE CITY OF HELENA

WHEREAS, there is scientific evidence sufficient to conclude that global climate change is occurring, that humans are contributing to it, and that reductions in greenhouse gases (GHG) are necessary in order to avert the negative consequences of a changing climate; and

WHEREAS, the effects of global climate change are already present in Montana in the form of decreased snowfall, earlier snowmelt, reduced stream flows in summer months, increased stream temperatures, increased fire activity, and numerous other impacts; and

WHEREAS, continued changes may negatively affect Montana=s economic viability in sectors such as agriculture, hydroelectric power production, recreation, and tourism; and

WHEREAS, government agencies at all levels throughout the west are undertaking a broad range of actions to address the effects of climate change; and

WHEREAS, the importance of action at the local level is underscored by the 720 mayors (representing 76 million Americans and including the mayors of Bozeman, Billings, and Missoula) who have already signed onto the U.S. Mayors Climate Protection Agreement; and

WHEREAS, actions taken to confront global climate change typically afford numerous ancillary benefits in the form of reduced energy costs, reduced traffic congestion, and reduced emissions of criteria air pollutants; and

WHEREAS, it appears to be in the best interests of the City of Helena and the inhabitants thereof that a task force be appointed to address the global climate change and green house gas issues as they affect the Helena citizenry and its environs.

NOW, THEREFORE, BE IT RESOLVED BY THE COMMISSION OF THE CITY OF HELENA, MONTANA:

Section 1. That the City of Helena move rapidly to assess the City=s greenhouse gas emissions by constructing a baseline emissions inventory and forecast.

Section 2. That a task force of five (5) to nine (9) individuals with appropriate professional and educational backgrounds and qualifications be appointed to work with the City Commission and staff to undertake and complete the assessment by:

a. examining the City=s energy use and proposing potential strategies for reducing waste and obtaining power from renewable resources;

b. examining the City=s current and projected sources of water supply, and the vulnerability of the water delivery and management systems to climate-related disruption;

c. recommending specific actions to the City Commission to:

(i) reduce both municipal and community greenhouse gas emissions level; and

(ii) increase the resilience of municipal public works in the face of global climate change.

d. identifying public and private partnership opportunities that can maximize strategies to reduce greenhouse gas emissions throughout the Helena community.

Section 3. That a time line be developed to ensure the task force completes its work in a period of not more than nine (9) months, and provide staff assistance to facilitate this process.

Section 4. That the task force is authorized to appoint technical working groups as it sees fit to address specific aspects of the overall charge.

Section 5. That the task force will sunset in twelve (12) months from and after its first meeting date.

PASSED AND EFFECTIVE BY THE COMMISSION OF THE CITY OF HELENA, MONTANA, THIS 3RD DAY OF DECEMBER 2007.

/S/JAMES E. SMITH ATTEST: MAYOR

/S/ DEBBIE HAVENS CLERK OF THE COMMISSION

E2 RESOLUTION NO. 19556 _

Resolution of Commission Intent for the FY2009 Annual Budget

WHEREAS, § 7-6-4030, MCA, requires the City Commission to adopt the final operating budget for the City of Helena; and
WHEREAS, §7-6-4034 and 4036, MCA requires the City Commission to determine and fix the appropriate tax levies; and
WHEREAS, according to the City Charter, the City Manager is charged with developing the preliminary budget for presentation to the Commission; and
WHEREAS, the City Commission has the authority and obligation, with the advice of the Helena Citizen's Council, to review that preliminary budget and make any and all changes it sees as being in the best interest of the community before final adoption; and
WHEREAS, the Commission realizes that being aware of Commission assessments early in the process will help the City Manager and City staff produce a document that is representative of the needs of the community; and
WHEREAS, it is the intent of the City Commission to provide unified direction to the City Manager and City staff regarding annual budget development; and
WHEREAS, the City Commission reviewed current programs and community needs at a work session; and
WHEREAS, the City Commission is committed to consider all public input throughout the budget process and adopt a budget providing needed services to and City budget policies for the citizens of Helena in the most efficient, cost-effective and sustainable manner; and
WHEREAS, the City Commission offers the following direction statements to the City Manager to assist in the preparation of the annual preliminary budget.
NOW, THEREFORE, BE IT RESOLVED BY THE COMMISSION OF THE CITY OF HELENA, MONTANA:

Section 1. Essential Services Sustainability:

A. Recognition of Services: The City Commission fully recognizes that what are most 1aimportant to our citizens are the reliable and quality everyday essential services the City provides including:
   1. clean water;
   2. public safety;
   3. waste disposal;
   4. storm water;
   5. community parks, neighborhood parks, open space, recreation;
   6. park and boulevard trees;
   7. streets, alleys, non-motorized infrastructure; and
   8. land use planning and review.

B. Funding of Essential Services: It is important that, within budget constraints, economical and predictable funding for these essential services be provided in the annual budget. Economical and predictable funding includes, but is not limited to:
   1. Funding Comprehensive Capital Improvement Programs (CCIP) in order to minimize maintenance costs on equipment and infrastructure as replacement or rehabilitation is needed (on a timely basis).
   2. Providing annual funding of regularly recurring CCIP components.
   3. Pursuing grants, donations and other alternative financing sources.
   4. Constantly analyzing operational and capital project efficiencies to avoid unnecessary costs in providing essential services.
   5. Issuing debt to pay for "big ticket" projects, allowing the city to:
      a. spread the cost over the useful life of the asset, and
      b. keep fees and rates as affordable and uniform as possible from year to year.
   6. Annually reviewing rates to:
      a. ensure adequate funding of operations, maintenance, and debt;
      b. address and consider funding up to 50% of the annual CCIP schedule of capital project priorities;

c. provide funding for part or all of the impact of inflation;
d. make incremental rate changes that are regular and predictable for citizens, consider the total tax and fee burden, and encourage continuing efficiency improvements by City operations;
e. adjust rates for water, wastewater, solid waste and recycling services based on actual usage and costs; and
f. encourage and reward conservation and recycling.

7. Investigate low-income assistance options as part of the essential system fee structures.
8. Investigate fee and tax incentives to meet the priorities established in this resolution.
9. Consider establishing a fully funded boulevard tree watering program.

Section 2. Assets:

A. Infrastructure Investment: The City Commission also realizes that the City has a tremendous investment in infrastructure, physical holdings and equipment.

B. Asset Management: Sound management, planning and economical funding is necessary to ensure that our infrastructure, physical holdings and equipment are maintained and not allowed to deteriorate. It is essential that the City:

1. inventory and assess the condition of the infrastructure and facilities;
2. identify necessary infrastructure and facility repairs and improvements;
3. track conservation measures and energy needs for city owned structures:
4. establish and maintain sound plans supported by good cost estimates for:
   a. capital improvements;
   b. facility management and improvement; and
   c. fleet management and replacement.
5. establish and implement long-term and short-term infrastructure, facility and fleet capital financing plans tied to viable cash flows;
6. establish reserves, methodology and technology for cost effective asset management; and
7. maintain a comprehensive inventory of all real property owned by the City which includes a description of the ongoing purpose for the property.

Section 3. Employee Investment:

A. Employee Compensation: The Commission realizes that the City's most valuable assets are its employees. The City must remain competitive and ensure the ability to attract and retain qualified individuals. Therefore, the City Commission:

1. reaffirms its commitment to equitably compensate employees;
2. encourages fair cost-of-living increases to all City employees, whether represented through collective bargaining agreements or not;
3. directs staff to keep the City's compensation and classification plan current;
4. directs staff to conduct periodic market studies, in order to assure staff compensation is maintained at a competitive level
5. will develop, with the input from the employees, a Wellness Program that rewards healthy lifestyle choices by employees and their families by implementing a system of employee financial contribution to the cost of health insurance;
6. will look into merit-based pay plan options.

B. Employee Education/Training: Promote staff quality and capability through continued professional education (CPE), accredited education opportunities, and training. Maintain employee financial assistance programs for accredited educational opportunities.

C. Proposed Staff: In order to assure the long-term viability of City staff, the City Commission will carefully consider all requests for new positions and additional full time employees, as well as changing service/staff needs, with an emphasis on:

1. increased service demands;
2. changing levels of service demands;
3. new service considerations;

4. the potential for new revenue sources; and
5. existing and projected budget constraints.

Section 4. Public Safety:

A. Homeland Security: The City Commission recognizes that following the events of September 11, 2001 the City's public safety role has expanded to include homeland security. It is important, even with difficult financial pressures, to maintain the present level of service for police and fire if at all possible, and that the services they provide should protect both the security and basic rights of citizens.

B. Fire Service Review: Consider the recommendations of the December, 2007 Fire Service Report in the development of City budgets and capital improvement programs. Also, consider additional options for public safety and the protection of structures, such as incentives for sprinkler systems in new construction, high density buildings, and renovations.

C. Urban Wildlife Plan: Implement the City's 2007 Urban Deer Management Plan. Continue to work with the Department of Fish Wildlife and Parks on authority and funding issues. Make ongoing assessments of food and water sources and other attractions for deer in areas with high concentrations of the deer.

Section 5. Community Participation:

The City Commission and Staff continuously reach out into the community seeking feedback that will help the City to enhance existing services and develop new services for the community. By encouraging community participation, the City will increase citizen awareness of the need to preserve and protect city assets and foster a good neighbor ethic and high quality of life.

A. Helena Citizens Council: The City Commission is committed to civic engagement, neighborhood self-determination and continuous improvement through the ongoing role of our Helena Citizens Council in City government.

B. Public Notification:

1. Investigate improved notification to citizens of proposed developments, zoning changes, CUPs, ordinance and regulation reviews, and other action items that might affect their neighborhood.
2. Improve the functionality and content of the city web site.

C. Citizen Advisory Boards and Committees: Conduct an annual review of the roster of citizen advisory boards and committees that provide essential advice and support for city services in order to identify both continuing and emerging needs for these citizen bodies as well as optimal membership and commission representation, including:

1. Creating a Public Works Advisory Board that would, among other duties, make recommendations for improving city operations to reduce emissions, increase recycling, and otherwise mitigate impacts upon our environment related to reducing pollution and green house gas emissions.
2. Continue negotiations and implementation, through an inter-local agreement, of a Joint Consolidated Planning Board with Jefferson County that would maximize land-use planning along our common border areas. The memorandum of understanding should reflect a relationship consistent with similar city-county land use authorities in the State of Montana.
3. Working with the Non-Motorized Travel Advisory Council, and Transportation Coordinating Committee (TCC), to
   a. expand development of Helena's neighborhood transportation program,
   b. implement the Greater Helena Area Comprehensive Transportation Plan, and
   c. coordinate non-motorized travel projects with the Helena Valley Public Transit Plan.
4. In an effort to increase youth engagement with local government, the Helena City Commission will work with youth and school groups to invite participation of students as citizen members of all our boards and commissions that support the work of city government.
5. Create a training program for those boards and commissions that consider quasi-judicial matters.

Section 6. Transportation:

The City Commission understands the importance of improving and modernizing the City's transportation infrastructure to ensure an efficient transportation system for Helena citizens. The City will:

A. continue to work with the Montana Department of Transportation (MDT) and Lewis & Clark County to plan for and complete all possible upgrades needed for our transportation network;
B. work for the earliest possible construction of the Custer Interchange and other Interstate system improvements authorized in the I-15 EIS and planned for the City of Helena and adjacent areas;
C. work to implement the recommendations contained in the updated City of Helena
Resolutions Of The City Of Helena, Montana
7 area Transportation Plan, and the Helena Valley Public Transit Plan;
D. support growth and expansion of our public transit system, including a new transit center, new buses, expanded hours (including for events), and new bus routes;
E. connection of that public transportation program to bike use, walking, and recreation;
F. support the recreational opportunity and preservation of rail corridors for future use with "rails to trails";
G. support easing of congestion downtown and other areas that are central to city residents;
H. pursue, under the leadership of the Neighborhood Transportation Program, neighborhood traffic studies, where recommended, and work to improve traffic and pedestrian safety and encourage non-motorized transportation across Helena, including;
1. improving the City's bicycle-pedestrian transportation network;
2. working with the school district to build and promote Safe Routes to schools;
3. working with developers and landowners seeking to be annexed to ensure that new bike-ped routes are adequate and connect well with the existing and planned non-motorized network ; and
4. enhancing city programs to build or support the building of sidewalks.
I. ensure compatibility and enhancement of an efficient transportation system when working with annexations and developers;
J. encourage the timely refurbishment and reconstruction of the existing street system through system-wide funding sources;
K. implement Commission-approved priorities; and
L. develop a new management structure to integrate neighborhood transportation, transit and street design for disabled citizens.

Section 7. Energy, Resource Conservation, Climate Change:

The City Commission recognizes the need to plan and implement sustainable policies to support the monitoring and control of rising residential, commercial and governmental energy costs for our energy future, and climate change mitigation activities.

A. The City of Helena will establish and maintain an energy conservation program to reduce its consumption of natural gas, electricity, and gasoline/diesel fuel in its daily operations summarizing these efforts in an annual report.
B. The City will seek and develop realistic and cost effective renewable energy resources to replace part of its existing fuel and electrical supply.
C. The City will take full advantage of state and private utility energy efficiency programs for which it is eligible.
D. The City will review opportunities and set goals for expanding recycling programs that would reduce solid waste disposal in the city-county landfill.
E. The City will pursue sustainable water and air quality through the City/County Board of Health, to address vehicle emissions, atmospheric particles, dust and wood smoke.
F. The City will encourage public education and investments in conservation and renewable energy, and will seek to lead by example in reducing energy and resource use.

Section 8. Land Uses:

The City should manage land and land use decisions under its purview in ways that maintain and enhance our quality of life while minimizing costs to future generations. This will include:

A. Continuing to implement the recommendations adopted in the open lands management plan.
B. Continue the review and revision of zoning and subdivision ordinances, including:

1. landscaping, signs and parking ordinances;
2. streamside protection standards;
3. requirements for block and sidewalk designs; and
4. subdivision standards.

C. Working with the county to establish joint infrastructure standards, and building and zoning codes in areas near the city, including growth policy provisions as outlined in MCA 76-1-601(4) and 76-1-410.

D. Reviewing the concept of impact fees and adopting those that support the development and the quality of life of Helena.

E. Create incentive for energy efficiency in new construction and renovations.

F. Create incentives for transportation corridors and hubs in new developments.

Section 9. Essential Human Services:

A. Assist Local Organizations: The City Commission is interested in assisting local organizations to provide essential human services to Helena's needy citizens as much as possible by sponsoring grant applications, sitting on boards and committees of the providing agencies and educating the public and state and federal officials on the importance of these needed services and the critical need for funding.

B. Public Awareness: The City Commission will support public service efforts to raise awareness and identify solutions to problems such as domestic abuse, drug and alcohol abuse by our youth, homelessness, and other community concerns.

Section 10. Business Development Programs:

A. Development Organizations: The City Commission recognizes the need to develop and promote plans that encourage and assist business development in the City of Helena. The City supports the Montana Business Assistance Connections Corporation, Chamber of Commerce, Business Improvement District, the Helena Parking Commission, and Downtown Helena Inc. in their efforts to expand and promote businesses. The City Commission encourages Helena's International Affairs Council to work with these organizations to facilitate trade missions from Helena's businesses and efforts to recruit foreign investment.

B. Advantage Helena: Continue support for the community branding, wayfinding, and strategic planning efforts that support downtown Helena and strengthen the relationships between our downtown and the entire Helena community.

C. Development Review Process: The City Commission recognizes the need for an improved development review process to meet the needs of a rapidly growing community. The City:

1. has identified the multi-departmental scope of this process;
2. must take an active role in development of fringe areas as integral parts of the City;
3. will annually discuss with the City Commission any potential fee and charge adjustments that might be needed to meet the related costs of providing the services; and
4. will consider incentives to reduce long term service and utility costs such as fire sprinklers in mixed use areas, transportation nodes or centers, water conservation landscape or systems.

Section 11. Annexation:

A. Work Plan for Annexation: Under the Work Plan for Annexation adopted by the City Commission, our program of annexation will continue with careful review of infrastructure needs and costs in the City-County interface.

1. The City will carefully monitor the development of service area boundaries to complement annexation policies. The Commission will address how and where to respond to requests for extension of city services.
2. The City Commission is aware of the pressures and effects growth and development place on existing established neighborhoods.
3. The City will balance the needs of a growing city with those of established neighborhoods in order to preserve "community".
4. Transportation areas and corridors are a City priority.

Section 12. Culture and Recreation:

A. Promote Arts, History & Culture: The City Commission recognizes the need for vibrant arts, history and culture as keys to quality of life in a community. To this end, the City will actively seek out public/private opportunities, and encourage a broad spectrum of community support. The City's efforts will continue to include, but not be limited to:

1. maintenance and operation of the Civic Center as an arts and entertainment venue for a wide variety of uses such as symphony concerts, entertainment events, arts and craft shows, conventions and other public or private events;
2. providing the Grand Street Theatre building as an arts and entertainment venue;
3. promoting and assisting the Montana Historical Society in obtaining funding to build a new and expanded Montana Historical Museum in Helena;
4. making available the Chamber of Commerce and Neighborhood Center buildings;
5. providing recreation and promotion of lifetime sports with less traditional recreation facilities such as BMX Park, Skate Park, Climbing Facilities, etc;
6. making Kindrick-Legion Field available as a high quality facility for American Legion and professional baseball;
7. promoting the HCTV (Helena Community Television) public channel as a means to communicate and promote local arts, history, civic activities, and cultural activities, including continued coverage of the City's planning and zoning boards;
8. promoting renovation and rehabilitation of historical, business and cultural vitality;
9. funding half of the Historical Preservation Officer, and related expenses, which are administered through Lewis and Clark County;
10. promoting and assisting the 6th Ward District's efforts to revitalize their historical neighborhood, as well as encourage and support similar neighborhood improvement efforts; and
11. promoting international cultural and academic exchanges.

B. Centennial Park: Reclamation and development of Centennial Park is important to the City Commission. City staff will work with the City-County Park Board to facilitate the development and implementation of the Centennial Park Master Plan.

C. Water Supply for Parks: Water conservation and alternative sources of water will be sought in order to achieve affordable irrigation water for the City's parks and golf course.

D. Youth Recreation: Support youth recreation opportunities, such as the Memorial Park swim pool, Centennial Park, enhancement of disk golf, possible expansion of the skate park, and consider options for a bouldering/rock climbing wall.

E. Neighborhood Parks Development: Establish a neighborhood parks development program.

PASSED AND EFFECTIVE BY THE COMMISSION OF THE CITY OF HELENA, MONTANA,
THIS 5th DAY OF May , 2008.

James E. Smit, MAYOR
ATTEST: Debbie Havens, CLERK OF THE COMMISSION

E3 RESOLUTION NO. 19622

A RESOLUTION DECLARING CERTAIN INFRASTRUCTURE PROJECTS

TO BE PRIORITIES WITHIN THE CITY OF HELENA.

WHEREAS, the United States Congress is considering enacting legislation for the economic stimulus of the national economy; and

WHEREAS, that legislation is projected to provide federal funding for local government infrastructure projects; and

WHEREAS, the disbursement of those funds may be dependent on the readiness and prioritization of local government projects to proceed with haste; and

WHEREAS, the City of Helena desires to be positioned to qualify for such federal funding assistance for various priority City projects as may be available under such an economic stimulus program.

NOW, THEREFORE, BE IT RESOLVED BY THE COMMISSION OF THE CITY OF HELENA, MONTANA:

Section 1. The Helena City Commission hereby declares its intention to formalize the readiness and priority of these infrastructure projects.

Section 2. Projects 1-8, as shown on page 1 of Exhibit A attached hereto, are listed in order of priority and are projects that are designed and ready to be advertised for competitive bidding within the next six (6) months.

Section 3. Projects 1 and 2 listed on page 2 of Exhibit A are projects that are in the design stage and can be ready to be advertised for competitive bidding within six (6) to eighteen (18) months.

PASSED AND EFFECTIVE BY THE COMMISSION OF THE CITY OF HELENA, MONTANA, THIS 12th DAY OF JANUARY, 2009.

James E. Smith, MAYOR

ATTEST: Debbie Havens, CLERK OF THE COMMISSION

Res. No. 19622

Economic Stimulus Projects—0-6 Months-Ready to Go To Bid—City of Helena Priorities

Project	Department	Estimated Cost	Comment
1 Transit Facility	Helena Bus	$3,000,000 #	#1 State Priority for Transit Facility. Preliminary Design Complete. Bus Fund is General Fund supported. No money for Capital Improvements This facility would enhance public convenience for using mass transit.
2 Centennial Park Earthwork (Landfill Reclamation)	Partks	$2,500,000	Fill material, top soil and earthwork necessary Improvement to "cap" existing landfill and transform the site into a surface that can support construction and development. Once earthwork is completed the city will renovate the landfill site into a community multi-purpose sports and parks complex and non-motorized transportation corridor.
3 Trail System Enhancement/ Expansion	Parks/Streets	$1,000,000	Enhance and expand the existing non-motorized trail system to incorporate ADA compliance, connectivity, and increase non-motorized transit opportunities to 2004 transporation plan.
4 15th Street Parking Garage	Parking /General Fund	$6,500,000	This parking garage is necessary due to the growth of the central area of the City and existing businesses in the Great Northern area. This would be a financial burden for the general fund and the City due to the economic downturn.
5 Airport Gravity Main	Wastewater Utility	$3,000,000	To replace Airport Lift Station that is undersized and obsolete. Can no longer handle east side growth. Gravity main needs to cross airport property to plant. No capital money existing in Wastewater Fund due to` $12,000,000 investment to meet Federal & State environmental regulations. Heavy debt load in fund.
6 ADA Ramps/Countdown	Various	$1,000,000 $5,000-$10,000	Target 100 major pedestrian corridors Timers throughout the City of Helena. per intersection
7 Main Replacement Projects	Water/ WW Utility	$1,000,000	Currently designed and ready to bid (California/ Sanders/Airport Road).
8 Airport Road	Streets/ Gas Tax	$3,000,000	The reconstruction of Airport Road from Washington to Carter bordering the Reconstruction airport. This road is used as a truck by-pass and would connect recent or planned improvements along Cedar and Last Chance Gulch. Difficult to accomplish with SID due to cost and airport property.
9 Red Mountain Flume Reconstrution (piping)	Water Treatment	$5,000,000	The flume provides water to Chessman reservoir in the 10-mile drainage. The Reconstruction (piping) current flume is a wooden structure that is 100 years old. The last major renovation 20+ years ago. Necessary to provide water to City of Helena.
TOTAL REQUESTED		**$26,000,000**	

Res. No. 19622

Economic Stimulus Projects—6-18 Months-Ready to Go To Bid—City of Helena Priorities

Project	Department	Estimated Cost	Comment
1 Pretreatment with DAF	Water Treatment	$6,000,000	Current pretreatment is ineffective and limits filtration capacity. Even with (Dissolved Air Flotation) large alum doses, turbidities onto the filter are the same or exceed raw water turbidities. This is the next master plan phase for the Missouri River Treatment Plant.
2 Woolston Reservior	Water Treatment	$4,000,000	3 million gallon reservoir that replaces two smaller reservoirs - one of which Replacement is out of service and both are obsolete. Necessary for water supply and fire protection.
TOTAL REQUESTED		**$10,000,000**	

City Supported EIS Approved State & Federal Projects Through MDOT Listing

9 MDT I-15 Corridor Improvements	Montana Department of Transportation	a. Custer Interchange b. Washington/Frontage Road Realignment c. Cedar Street Widening d. I-15 Bridge e. Capital Interchange Improvements f. Eastside Loop Road (1-15 to Highway 12 East) g. Montana Avenue Grade Separation/ Intersecton Improvements

E4 RESOLUTION NO. 19630

A RESOLUTION QUALIFYING CERTAIN PUBLIC

PROJECTS IN THE CITY OF HELENA FOR ECONOMIC STIMULUS FUNDING

WHEREAS, on January 12, 2009, the Helena City Commissionpassed Resolution No. 19622 in anticipation of the United States Congress adopting legislation for the economic stimulus of the national economy; and
WHEREAS, the United States Congress has now enacted such legislation for the economic stimulus of the national economy; and
WHEREAS, that legislation provides federal funding for local government infrastructure projects; and
WHEREAS, in light of this economic stimulus legislation, the City has since reviewed the projects initially proposed in Resolution No. 19622 and desires to expand the funding list to include programs and projects that will benefit and enhance alternative energy, energy efficiency and conservation, public art, public parks, transportation, and projects for low-income individuals; and
WHEREAS, the disbursement of those funds is dependent on the readiness and prioritization of local government projects to proceed with haste; and
WHEREAS, the City of Helena, in refining the projects under Resolution No. 19622 by adding additional priority projects, is prepared to apply under the economic stimulus program for the federal funding assistance available for these City infrastructure projects.

NOW, THEREFORE, BE IT RESOLVED BY THE COMMISSION OF THE CITY OF HELENA, MONTANA
Section 1. The Helena City Commission hereby declares its intention to formalize the readiness and, within each category, the priority of these public projects:
A. Projects 1 through 11, as shown on page 1 of Exhibit A attached hereto, are general projects.
B. Projects 1 through 21, as shown on pages 2 and 3 of Exhibit A, are alternate energy, energy efficiency, conservation, and public art projects.
C. Projects 1 through 11, as shown on page 4 of Exhibit A, are housing and low-income projects and Montana Department of Transportation projects that the City is supporting.
PASSED AND EFFECTIVE BY THE COMMISSION OF THE CITY OF HELENA, MONTANA, THIS 9th DAY OF MARCH, 2009.
James E. Smith, MAYOR
ATTEST: Debbie Havens, CLERK OF THE COMMISSION

Res #19630 Economic Stimulus Projects City of Helena Priorities—General Projects

Project	Department	Estimated Cost	Comment
1. Transit Facility	Helena Bus	$3,000,000	#1 State Priority for Transit Facility. Preliminary Design Complete. Bus Fund is General Fund supported. No money for Capital Improvements. This facility would enhance public convenience for using mass transit.
2 Centennial Park Earthwork (Landfill Reclamation)	Parks Improvement	$2,500,000	Fill material, top soil and earthwork necessary to "cap" existing landfill and transform the site into a surface that can support construction and development. Once earthwork is completed the city will renovate the landfill site into a community multi-purpose sports and parks complex and non-motorized transportation corridor.
3 Trail System Enhancement/ Expansion	Parks/Streets	$1,000,000	Enhance and expand the existing non-motorized trail system to incorporate ADA compliance, connectivity, and increase non-motorized transit opportunities to meet the goals of the 2004 transporation plan.
4 15th Street Parking Garage	Parking/ General Fund	$6,500,000	This parking garage is necessary due to the growth of the central area of the City and existing businesses in the Great Northern area. This would be a financial burden for the general fund and the City due to the economic downturn.
5 Airport Gravity Main	Wastewater Utility	$3,000,000 T	o replace Airport Lift Station that is undersized and obsolete. Can no longer handle east side growth. Gravity main needs to cross airport property to plant. No capital money existing in Wastewater Fund due to $12,000,000 investment to meet Federal & State environmental regulations. Heavy debt load in fund.
6 ADA Ramps/Countdown Timers	Various	$1,000,000 $5,000-$10,000 per intersection.	Target 100 major pedestrian corridors throughout the City of Helen
7 Main Replacement Projects	Water/WW Utility	$1,000,000	Currently designed and ready to bid (California/Sanders/Airport Road).
8 Airport Road	Streets/Gas Tax	$3,000,000 T	he reconstruction of Airport Road from Washington to Carter bordering the Reconstruction airport. This road is used as a truck by-pass and would connect recent or planned improvements along Cedar and Last Chance Gulch. Difficult to accomplish with SID due to cost and airport property.
9 Red Mountain Flume Reconstruction (piping)	Water Treatment	$5,000,000	The flume provides water to Chessman reservoir in the 10-mile drainage. The current flume is a wooden structure that is 100 years old. The last major renovation 20+ years ago. Necessary to provide water to City of Helena.
10 Pretreatment with DAF (Dissolved Air Flotation)	Water Treatment		$6,500,000 Current pretreatment is ineffective and limits filtration capacity. Even with large alum doses, turbidities onto the filter are the same or exceed raw water turbidities. This is the next master plan phase for the Missouri River Treatment Plant.
11 Woolston Reservior Replacement	Water Treatment	$4,000,000	3 million gallon reservoir that replaces two smaller reservoirs - one of which is out of service and both are obsolete. Necessary for water supply and **fire protection.**
SUBTOTAL - General Projects			**$36,500,000**

Res #19630 Alternative Energy, Energy Efficiency, Conservation & Public Art Projects

Project	Department	Estimated Cost	Comment
1 City County Building	Community Facilities (CF)	$50,000	Changing all lighting fixtures from T-8 to T-5 fixtures with room sensors.
2 City County Building	CF	$650,000	Installation of building wide cooling in place of window air conditioners.
3 City County Building	CF	$50,000	Installation of proportional and computerized boiler controls.
4 City County Building	CF	$30,000	Insulating all steam and condensate lines.
5 Waste Water Treat. Plant	Public Works	$20,000	Changing lighting fixtures from T-12 to T-5 in all storage and equipment buildings.
6 Photovoltaic Arrays on roofs	CF	$465,000	Consider installation on the following buildings: City County building; Main Fire Station; Eastside Fire Station; Chamber of Commerce building; Neighborhood Center; Wastewater Treatment Plant; Water/Wastewater Utilities Building; Ten Mile Treatment Plant; MRTP; and City Shop.
7 Water Source Heat Pump for TMT	Public Works	$350,000	This HVAC system could potentially save 2/3 of the energy needed to heat and cool the TMTF. Design completed in the late 90's but budget constraints didn't allow for the project to be completed There are Northwestern Energy incentive funds available or this project.
8 Biomax Heat and Power System TMIF	Public Works	$500,000	This system utilizes forest biomass to produce heat for TMTP and power. This system could be a grid type where energy not used at the could be sold back to the power company.
9 Replace of Computer control system	Public Works	$300,000	Replacement of computer control system for the entire plant for Wastewater Plant to include energy management.
10 Primary Scum removal system	Public Works	$500,000	System upgrade with grease for Wastewater Plant interceptor to enhance methane.
11 Heat Recovery system	Public Works	$30,000	Heat recovery system for blower building. North Western Energy project funding available.
12 Solar and Wind Turbine projects	Public Works	$1,000,000	There are numerous opportunities for both solar and wind turbine projects at all three treatment facilities.
13 Electric Vehicle Pilot Project	City-Wide	$80,000	Proposal to purchase up to 4 electric vehicles to test the viability in certain applications within the City.
14 Street Light Energy Conservation/Compliance	City-Wide Retrofits	$1,500,000	Proposal to retrofit existing streetlights to more energy efficient and ordinance compliant lighting.
15 Traffic Circle	Community Dev.	$15,000	Public Art Committee proposal for the traffic circle located at Butte and Sanders
16 Art Project/Centennial Pk	Community Dev.	$30,000	Public art project for Centennial Park
17 City Green Team	Administrative Services	$10,000	Professional development, training, & coordination of team to be composed of current City staff.
18 Water Conservation /Rebate Program	Administrative Services	$200,000	Incentive rebate program for low-flush toilets & low-flow shower heads, high-efficiency washing machines, Evapotranspiration (ET) irrigation controllers, etc.
19 Water Usage Audit	Public Works	$50,000	Audit usage of water in City operations
20 Community Gardens dev.	Parks & Recreation	$25,000	Infrastructure (fencing, irrigation, and garden bed construction) in 5 undeveloped parks.
21 Water & Wastewater On-line Billing	Administrative Services	$60,000	Develop on-line billing system for water & wastewater utility accounts with accessible usage data and
SUBTOTAL - Energy & Conservation, Art Projects		**$5,570,000**	

Res #19630 Housing and Other Low Income Programs

Project	Department	Estimated Cost	Comment
1 Energy Performance Contract	Helena Housing Authority	$770,000	The HHA will probably use the money to match the $2.4 million Energy Performance Contract they have for completing renovations and energy improvements on their 366 units.
2 HEAD START	RMDC	$100,000	Used to make improvements in existing facilities in Lincoln, Boulder etc.
3 Early Head Start	RMDC	$500,000	This funding will be through a competitive grant program.
4 Weatherization	RMDC	$4,000,000	Weatherization and increased energy efficiency in single and multi family homes occupied by low income households.
5 Emergency Shelter Grant	RMDC	$239,000	To be used for rent, security and utility deposits, back rent for permanent housing, cannot be used for emergency shelter expenses.
6 Commodity Distribution Program	RMDC	$27,000	Value of additional food available
7 Community Service Block Grant	RMDC	$300,000	Money for 18 month period, used to provide services to homeless.
8 Senior Meals	RMDC	$25,000	Used for congregate and home delivered meals for Lewis and Clark, Jefferson and Broadwater Counties.
9 CDBG funds	Deptartmnet of Commerce	$1,800,000	Will probably be available for Economic Development projects.
10 Neighborhood Stabilization Funds	Deptartment of Commerce	$19,600,000	Available primarily for acquisition and redevelopment of foreclosed and/or abandoned properties and the demolition of blight Resulting housing will benefit 50% to 125% of median income .
11 Tax Credit Assistance	Deptartment of Commerce	$7,800,000	To be used to provide gap financing and/or additional funding for tax credit project (existing and proposed) possible additional source of funds for Eagles Manor II and the Caird project.

SUBTOTAL - Housing and Other Low Income Programs $35,161,000
TOTAL STIMULUS PROJECTS $77,231,000

City Supported EIS Approved State & Federal Projects Through MDOT Listing

1 MDT I-15 Corridor Improvements	Montana Department of Transportation	a. Custer Interchange b. Washington/Frontage Road Realignment c. Cedar Street Widening d. I-15 Bridge e. Capital Interchange Improvements f. Eastside Loop Road (1-15 to Highway 12 East) g. Montana Avenue Grade Separation/Intersecton Improvements

Appendices F
F1 Midterm Report

TO: TIM BURTON, City Manager
FROM: GLOBAL CLIMATE CHANGE TASK FORCE
SUBJECT: MID-TERM REPORT AND RECOMMENDATIONS
DATE: SEPTEMBER 17, 2008
CC: TIM MAGEE, Director of Administration and Finance

This is the Global Climate Change Task Force's Mid-term Report with interim recommendations. The primary purpose of this report is to update you and the City Commission on the progress of the Task Force as it completes the first half of its term.

From the outset, the Task Force has pursued two primary initiatives. The first of those initiatives is to work with the City staff and the International Council for Local Environmental Initiatives (ICLEI) to conduct a greenhouse gas (GHG) emissions assessment for the City of Helena's municipal operations. The second was to form working groups to explore: a) options for reducing emissions across the spectrum of municipal operations, and b) to examine the resilience of the municipal water supply in light of continued climate change and to develop recommendations for improving that resilience.

Greenhouse Gas Emissions Assessment.

As to the GHG assessment, the Task Force recommended and the City approved the program offered by ICLEI for conducting the assessment. The rationale is that ICLEI has an extensive international track record in local GHG assessment and has developed an effective software package for performing the assessment.

It has taken longer than the Task Force imagined for that assessment to unfold for a variety of reasons. At the inception of this process, the Task Force did not fully grasp how long it would take to initiate the assessment. First, the City and the Task Force had to vet the ICLEI process to make sure it would be a good fit. This entailed inquiring of other cities -- in particular Bozeman -- as to their experience with the software; and also deliberation by the City over whether to hire someone not currently on city staff or to train existing staff in order to keep the expertise in house.

Nonetheless, the City has joined ICLEI (a prerequisite for the use of the ICLEI program) and the City has had two staff members trained on the software. Because the use of existing city staff necessitates finding someone to cover existing staff operations, the City has hired temporary help to enable the staff to conduct the assessment. Because of the limited availability of that temporary help, it has taken longer for the staff to fully initiate the assessment. As of this report, the staff has projected that it will have the assessment completed by the end of November, two months before the expiration of the Task Force.

The GHG emissions assessment is necessary to the Task Force developing emission targets, and specific recommendations for meeting those targets. The late delivery of the assessment may move the Task Force to seek an extension of its term in order to properly complete its work.

Task Force Working Groups.

The second initiative that the Task Force has pursued was to create a number of working groups to research various strategies for reducing GHG emissions. As part of this effort the Task Force recruited other interested citizens who were not on the Task Force to participate in this effort. The Task Force settled on three working groups:

The Energy Working Group, whose missions is to work with ICLEI and the City of Helena staff to assess municipal energy use and the associated emissions, to investigate opportunities within municipal operations to increase energy efficiency, and to investigate opportunities for the city to incorporate renewable energy more fully into the mix of the city's energy resources.

The Transportation, Community Opportunity, and Solid Waste Working Group, whose mission is to identify opportunities within the community of Helena to reduce GHGs in the sectors of waste management, transportation and land use. It will also educate and inform the public about ways to conserve energy and water and to reduce GHG emissions.

The Water Supply Working Group, whose mission is to evaluate the vulnerability of Helena's water supply and waste water treatment systems to the effects of a warming climate. As with all of the groups, it will accomplish its research goals through a process of consultation with city staff. Additionally, it will recommend specific response strategies to reduce future impacts of global warming on those systems.

While the final findings and recommendations of these groups will depend in large part on the results of the GHG assessment, the Task Force determined that it ought to forge ahead by researching strategies that have been pursued both by the city of Helena (e.g. the installation of LED signal lights) and by other cities who have already embarked upon a similar endeavor. By conducting this preliminary research, the Task Force will be able to move more quickly to match its recommendations to the findings of the assessment when it is completed.

A major part of the working group effort has been to develop an options inventory which is simply a comprehensive listing of greenhouse gas reduction and water supply strategies that have been pursued by cities around the nation. Over the course of the summer, city staff helped refine that list. It provides a valuable reference from which the Task Force hopes to identify the strategies that make the most sense for the city of Helena to pursue. Between now and the release of the GHG assessment, the working groups will further refine the list by culling strategies that don't seem to be a good fit for Helena and more fully researching the strategies that appear to hold some promise.

Interaction with City Staff.

From the outset, City Manager Tim Burton has helped us to meet productively with key city staff in the least disruptive ways possible. As a result of those efforts, Task Force members not only participated in a day-long tour of the city's water supply and waste water treatment systems, they have been able to meet with key city staff. For their part, city staff members have been helpful and informative at every turn. The Task Force looks forward to continued cooperation with city staff in the months to come.

Mid-Term Recommendations.

As a result of its work thus far, the Task Force hereby recommends that the City Commission take the following four actions. We propose these interim measures because they are relevant to our mission, they are policies which make sense regardless of whatever other findings the Task Force makes, and they can have a somewhat larger effect if they are put into practice in advance of the final report. They are as follows:

1) Reduce permit fees for certain construction or installation projects that are for renewable energy.

Issue: This proposal arises from the fact that the permit fee for installing solar panels can easily amount to several hundred dollars, when using the current fee schedule. Renewable energy systems remain capital intensive, and are inordinately penalized by a sliding-scale system. A survey of other Montana cities suggests that Helena's fee is much higher than most places. Both the renewable energy installers and customers have complained about the policy.

Recommend: Enact a reasonable ceiling ($100 or less flat fee) on renewable energy permit fees to remove this disincentive, or in the alternative, eliminate the fee entirely.

Advantage: Removes a financial barrier to installation of renewable energy sources, whose installation will reduce the overall GHG emissions attributable to the Helena community. Helps encourage small businesses.

Disadvantage: This may result in some lost revenue to the city.

Fiscal Impact: ***Work with City staff to determine***

2) Seek the City Commission's endorsement of a change in state law to allow cities the authority to adopt energy building codes more stringent than the state code.

Issue: Currently, state law does not allow cities to adopt building codes that differ from the state code.

Recommend: The city seek a change in the next legislative session to either remove the cap on the city's authority to adopt building codes or to propose specific language that will narrowly enlarge the cities' authority to adopt codes more stringent than the state when those codes are designed to achieve greater levels of energy efficiency.

Advantage: This would allow the city the flexibility to be more responsive to new developments in energy-efficient building techniques and materials than it could be under the current limitations of the law.

Disadvantage: Builders and contractors may object to this increased flexibility because it could mean that they would need to be attentive to local variations in building codes.

Fiscal Impact: No major fiscal impact is foreseen. It is anticipated that any lobbying effort would be conducted by the League of Cities & Towns (if they concur), or by an independent City of Helena lobbyist

if one is hired. The recommended code changes could be developed by a voluntary effort such as the Climate Change Task Force.

3) Recommend that the City create a "green" procurement team that would review existing office equipment inventory and purchasing schedules and create a policy that would increase the energy efficiency of municipal office equipment.

Issue: In an effort to reduce both energy costs and energy-related GHG emissions, a number of governmental entities and private businesses have created green procurement policies. A "green team" of employees conducts the research and makes recommendations for the best procurement options**.**

Recommend: Create a team within the city staff that would review existing equipment purchasing policies and purchasing schedules and develop a purchasing policy that favors the purchase of energy efficient office equipment. This should include options that allow city leadership and the commission to consider both economic payback and GHG reductions.

Advantage: The development and implementation of such a policy would allow for incremental improvements in the energy efficiency of electronic office equipment.

Disadvantage: None noted.

Fiscal Impact: As to the creation of the procurement team, the fiscal impact won't be reflected in increased expenditures, but rather in the allocation of some staff time for developing a policy. As to the fiscal impact of an eventual policy, it is unknown, as it will depend on the substance of the policy and the specific procurement decisions that result.

Recommend that the Utility Billing Unit be asked to reformat water bills to provide more transparency: namely, to explain key billing terminology (e.g. define "CCF" in terms of the numbers of gallons it represents); and to provide customers with a breakdown of the previous twelve months of water usage.

Issue: Currently water bills explain charges in terms of "CCF" and provide no explanation of what a "CCF" is. The bill does not currently explain how much water the customer has used in the recent past (e.g. previous twelve months).

Recommend: That the City Commission direct the Utility Billing Unit to reformat city water bills to provide greater transparency to the water customer.

Advantage: This will provide water customers a better understanding of what their bills are for, and will allow conservation-minded customers a convenient way to track their water usage.

Disadvantage: A possible disadvantage to this recommendation is that it could result in increased printing and mailing costs, depending on the approach taken.

Fiscal impact: Work with City staff to determine.

Conclusion.

Despite some unanticipated delays, the Task Force has made substantial progress in gathering information and in working with city staff to understand city operations. Over the next half year, the Task Force anticipates an increase in the level of its activity and continued cooperation with city staff. It is hoped that the Task Force will complete its charge by mid-February, 2009, but realistically, it is anticipated that additional time will be needed to produce a quality report.

F2 Stimulus Recommendations

Helena Climate Change Task Force
Stimulus Funding Recommendations and Endorsements
March 6, 2009

Endorsement of existing resolution priorities

General Projects

1. Transit Facility
2. Trail System Enhancement/Expansion
3. 15th Street Parking Garage—add covered bike storage
4. Red Mountain Flume Reconstruction
5. Woolston Reservior Replacement

Alternative Energy, Energy Efficiency, Conservation & Public Art Projects

1. Change lighting fixtures from T-8 to T-5 fixtures with room sensors in City County Building
2. Install building-wide proportional and computerized boiler controls in City County Building
3. Insulating steam and condensate lines
4. WW Treatment change light fixtures from T-12 to T-5 in all storage and equipment buildings
5. PV arrays on roofs
6. Water source heat pump for TMTF
7. Biomax heat and power system for TMTF
8. Replacement of computer control system for WW plant
9. Primary scum removal system for WW plant
10. Heat recovery system
11. Solar and wind turbine projects
12. Electric Vehicle Pilot Project
13. Energy Performance Contract for HHA
14. Head start improvements (to the extent that the funding would be utilized for efficiency upgrades)
15. Weatherization, RMDC funding
16. Community Development Block Grants (to the extent that the grants are, in part, directed to greenhouse gas reduction strategies, i.e. green jobs, energy efficiency improvements)
17. Street Light energy conservation retrofits

HCCTF recommendations (cost estimates are approximate)

1. Full-time staff position devoted to coordinating energy efficiency measures, greenhouse gas reduction strategies, climate adaptation, sustainability projects, and procurement of stimulus funds related to these efforts. Include professional development and training such as ICLEI Training (April 14). ($160,000 for two year funding)
2. Professional development, training and coordination of City Green Team composed of current city staff ($10,000)
3. Water conservation incentive rebate program for low-flush toilets, high-efficiency clothes washers, low-flow shower heads, Evapotranspiration (ET) irrigation controllers, etc. ($200,000)
4. Audit water usage in City operations ($50,000)
5. Replace inefficient water fixtures based on water usage audit in City operations (cost

unknown)

6. Replace exit signs with efficient LED fixtures (cost unknown)
7. Staff time or contractor to develop and adopt energy and resource-efficient building standards for existing and new City facilities (cost unknown)
8. Recycling bins for increased sites for city and valley-wide collection as well as increased City operations collection (cost unknown)
9. Infrastructure and development of neighborhood community gardens in 5 "undeveloped parks" (fencing, irrigation, garden bed construction) ($25,000)
10. Training of existing City staff (e.g. fire department personnel) to conduct irrigation audits of City lands (cost unknown)
11. Develop online billing system for water and wastewater utility accounts with accessible usage data and transparent usage accounting (e.g. gallons instead of CCFs) ($60,000)

F3 Conversation Block Grant Recommendations

From: bradshaw [mailto:bradshaw@mt.net]
Sent: Wednesday, May 13, 2009 9:48 PM
To: 'LERIKSON@co.lewis-clark.mt.us'; 'Tim Magee'
Cc: 'Patrick Judge'; 'Rebecca Ridenour'; 'Alan Peura'; 'DD Dowden'; 'Ben Brouwer'; 'Kristine Edwards'; 'Anna Jones-Crabtree'; 'Nancy Hall'
Subject: Recommendations for the

Laura and Tim:

After our meeting last week, the Task Force reviewed your request for support for the Energy Efficiency and Conservation Block Grant Program, and arrived at the following recommendations and responses:

1) Seek funding for three-quarter time energy coordinator position; draft a position description specifically seeking someone with appropriate energy/environmental-science education and experience with an expressed expectation that the position would convert to full time if the person is successful in achieving sufficient environmental and economic savings to justify it as a full-time position. At $25 per hour, ≤ time, with 30% overhead, the cost for this position would come in at around $50,000.

2) Commit to assist the City/County in converting the relevant parts of our report to become the template for the Energy Efficiency and Conservation Strategy.

3 Support, as a first-priority project, the installation of solar panels on the city county building, and support at least one other project, if the funding is available. A couple of options might be one from Waste Water Treatment Plant or perhaps look at a pilot project with LED streetlights—assuming finding the right lighting district. Given that the grant funding is for energy efficiency and conservation, it would be appropriate to have an energy efficiency project to complement the solar panel project which fits into a category of "renewable" energy.

I hope you find this helpful. If you have questions, about any of these recommendations, please don't hesitate to contact me.

Thanks for involving us in this effort.

Stan Bradshaw

Appendix G
GHG ASSESSMENT

Energy & Greenhouse Gas Inventory for the City of Helena's Municipal Operations

Prepared by Patrick Judge Final Draft -- January 3, 2009

Early in 2008, the Helena Climate Change Task Force recommended that the City of Helena join the International Council for Local Environmental Initiatives (ICLEI) and that it use ICLEI's software to analyze the city's carbon footprint, beginning with the operations of the city government itself. The City Commission accepted that recommendation.

The data collection and initial analysis were performed by city staff members Liz Hirst and Carrie Hahn, for the years 2001 and 2007. Liz and Carrie labored for several months to complete the painstaking project, and did an excellent job. On several occasions, beginning in August, members of the Energy Working Group met with Liz and Carrie, to check in and offer any technical assistance that might be needed. One early suggestion was to make sure to translate the "dekatherms" unit of natural gas usage reported on NorthWestern Energy's bills to the "therms" requested by the program (by multiplying by 10).

On December 3rd, Liz and Carrie presented their findings to the Helena Climate Change Task Force. The initial analysis (Data Set 1) revealed the following:

Data Set 1 -- City's Original Analysis

Energy (MMBTU)	2001	2007	% Change
TOTAL	111,443	84,313	-24.3

Carbon (tons CO2e)	2001	2007	% Change
TOTAL	12,183	9,666	-20.7

Energy Cost ($)	2001	2007	% Change
TOTAL	1,233,607	1,990,059	61.3

These results were quite encouraging, showing significant decreases in both energy consumption and associated carbon emissions. Much of that reduction occurred in the water and waste water treatment plants, which were (and continue to be) the city's largest category for both energy and carbon. When broken out, that category shows an extraordinary 49% reduction in energy use and a 37% reduction in carbon emissions. Clearly, Don Clark and his team are highly deserving of commendation, based on their efforts to increase efficiency and to conserve both financial and environmental resources. The level of creativity, innovation, and commitment they have demonstrated is truly exemplary.

The city also benefitted from good work being done in many other departments. The initial analysis showed a 15.9% reduction in energy use in city buildings, and a 17.5% reduction in building-related carbon emissions. Other categories showed relatively modest increases. The overall net energy savings had a substantial beneficial impact on the budget. Had the improvements not been made, the city would be paying more than half a million dollars extra, every year, on its energy bills. That analysis is as follows:

Cost per Unit Energy	2001	2007
$ / MMBTU	11.07	23.60

Helena used significantly less energy (27,130 MMBTU) in 2007 than in 2001. Using the 2007 energy price (above), the savings is:

27,130 MMBTU x $23.6 / MMBTU = $640,268

Despite these impressive improvements, the city's energy bill still rose by 61% (in nominal dollars) over this period. That's because the efficiency gains -- while very dramatic -- were insufficient to fully counter the impact of rising energy prices. The overall price of energy paid by the city more than doubled over this time period.

On December 12th, the Energy Working Group met with Liz and Carrie to further familiarize itself with the ICLEI software and results. The working group identified a number of refinements they wished to make, including the following:

1) Part of the change in the reported building emissions was an accounting artifact. Between 2001 and 2007, the city took over the responsibility for paying the energy bills in several buildings (the Utility Maintenance building, the Chamber of Commerce building, and the City County building). Conversely, the city stopped paying the energy bill for the Neighborhood Center (which had a far bigger effect than the sum of the other three). These accounting changes skew the results, as they do not represent real changes in carbon emissions. The net effect is to artificially depress the energy and carbon numbers for 2007. Data Set Two was developed to address this concern. It assumes that each of these buildings (and also various vehicle categories) remained constant over the time period (did not suddenly appear or disappear). The results of that second analysis are as follows:

Data Set 2 -- City's Analysis *Modified to Address the Accounting Issues*

Energy (MMBTU)	2001	2007	% Change
TOTAL	115,318	89,471	-22.4
Carbon (tons CO2e)	2001	2007	% Change
TOTAL	12,584	10,199	-18.9

While these changes temper the reductions somewhat (the carbon reduction in the buildings category drops to 7.5%), the overall conclusions remain much the same.

2) The second modification the working group made was to the waste category. It was noted with some confusion that none of the solid waste that was reported had any impact on carbon emissions. The working group performed a sensitivity analysis by changing the waste category from "other waste" to "paper waste" (the worst emitter). Sure enough, this increased the carbon emissions -- but only modestly from 0 tons CO2-equivalent to 114 tons for 2007 (102 tons for 2001). In the city's overall carbon profile, this represents a change of about 1%. The paper waste category is thought to be a more accurate reflection of the actual waste stream (due to problems with the paper recycling program), so it was left in the analysis.
3) The third modification was a correction to the ethanol usage figures. While there was no ethanol use reported in 2001, in 2007 it shows up for various vehicles in various departments. The original analysis assumed "E-85", which is a blend of 85% ethanol and 15% gasoline and which requires a "flex-fuel" vehicle. The working group (in consultation with Liz and Carrie) felt that the ethanol usage was more likely E-10 (which runs in any gasoline-powered vehicle, and which is currently available in Helena).

Data Set Three was developed to include all of these modifications:

- addressing the accounting issues
- changing the waste category from "other" to "paper"
- changing the ethanol assumption from "E-85" to "E-10"

The results of that analysis are as follows:

Data Set 3 -- City's Analysis *Modified to Address the Accounting Ethanol, and Waste Issues*

Energy (MMBTU)	2001	2007	% Change
TOTAL	115,341	89,856	-22.1
Carbon (tons CO2e)	2001	2007	% Change
TOTAL	12,691	10,397	-18.1

4) The group also had questions about the mix of electricity resources assumed by the program. The program offers a list of regions to choose from, and Liz and Carrie correctly selected the Western Electricity Coordinating Council / Northwest Power Pool as Helena's region. However, the group had some reservation's about using the generic regional mix, because they suspected that NorthWestern Energy's specific power mix was probably more coal dependent. Some quick research confirmed that hypothesis:

Resource	WECC/NWP (2005)	NWE (2009)
Hydro	49%	25%
Coal	34%	55%
Gas	11%	7%
Nuclear	3%	1%
Renewable	2%	7%
Other (& rounding error)	1%	5%
TOTAL (%)	100%	100%

The assumptions used by the program included the following values for the carbon intensity of the WECC/ NWP mix:

2001 499.3 tons CO2-e/ gigawatt-hour
2007 546.9 tons CO2-e / gigawatt-hour

If corresponding (but larger) figures could be developed for NWE's mix, they might be entered into the program to increase the accuracy of the results. However, the Energy Working Group has not yet had a chance to investigate that issue further. It also may be unwise to do so, because it is likely that other Montana cities have simply used the regional mix, and maintaining consistency may be the best approach. Also, doing so would affect the overall emission totals more than it would the relative changes between the two years (and it is the latter metric that is of greater use to citizens and policymakers hoping to understand trends and the impact of various measures).

Members of the working group did express an interest in obtaining some kind of comparison to a similar city. The most obvious choice is Bozeman, which is roughly similar to Helena in both in size and climate, and which recently completed the same ICLEI process for the years 2000 and 2006. That comparison is as follows:

Tons CO2e	**Bzmn 2000**	**Helena 2001**	**Bzmn 2006**	**Helena 2007**
Buildings	2384	2910	3226	2691
Vehicle Fleet	1487	1631	1543	1788
Streetlights	326	922	564	1005
Waste	72	102	119	114
Water/Sewage	1958	6263	2652	3908
TOTAL*	**6227**	**11828**	**8104**	**9506**

*Note that the reported totals are slightly different from the totals shown here. In Helena's case, that's because the employee commute figures were left out -- Bozeman did not include those in its analysis. So the more meaningful apples-to-apples totals were used instead.

The comparison is useful in that it shows similar "ballpark" type results between the two cities, providing some evidence that major errors in the cities' analysis were avoided. It shows that while Helena's municipal carbon footprint is larger than Bozeman's, the City of Helena is on a downward trajectory (while Bozeman's emissions increased over this period).

Other Notes

The Energy Working Group wishes to make clear that this is a preliminary analysis only, and that the numbers are subject to change if other corrections / improvements are identified. That being said, it appears that the CIty of Helena has already made some good progress in addressing its own carbon emissions. Other projects that are underway (such as the LED traffic light replacement project, the upcoming Legion Field lighting project, and the upcoming Wastewater Treatment Plant Stirling Engine project) are not yet reflected in these results. There is much good work already accomplished, more on the way, and more that can be done. The working group is putting together a suite of recommendations to expand upon the city's efforts to reduce its emissions, and save taxpayers dollars.

Next Steps

The ICLEI program has four modules, only one of which (Government Analysis) has been completed. Other capabilities of the software include:

- forecast builder -- helps project how emissions are expected to evolve into the future, under "business-as-usual" assumptions.
- goal setting -- many cities adopt explicit reduction goals -- Bozeman, for example, adopted a goal of reduing emissions 15% below 2000 levels by 2020.
- modeling both the environmental and fiscal impact of potential recommendations -- this facilitates the creation of a Climate Action Plan for the city.

This entire process can be duplicated / expanded for the community at large (by using the other two modules). The City Commission may choose to continue with that level of formal analysis, but an extension to the task force's term would be required. Regardless, the task force is moving forward with recommendations that will help the citizens of Helena (not just their government) to use energy more efficiently. But it is only appropriate that the city government "lead by example", by first making sure its own house is in order.

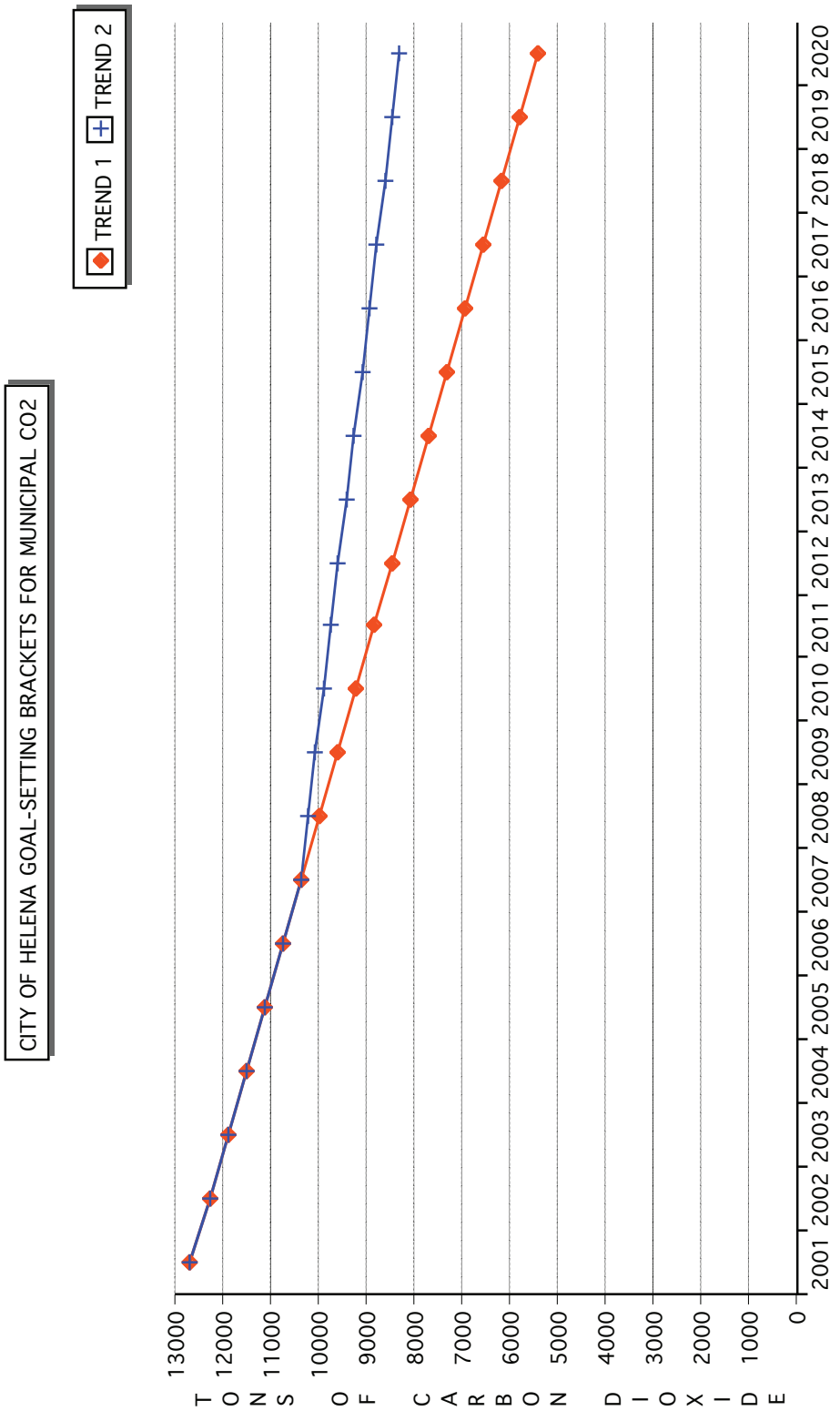
DATA SET THREE -- ORIGINAL ANALYSIS WITH ADJUSTMENTS TO CORRECT FOR ACCOUNTING ARTIFACTS, ETHANOL, AND WASTE

CATEGORY	2001 ENERGY (MMBTU)	2007 ENERGY (MMBTU)	ENERGY % CHANGE	2001 CO_2e (tons)	2007 CO2e (tons)	CO_2e % Change
Water/Sewage						
Missouri River T. Plant	8431	6678	-20.8	1114	983	-11.8
Ten Mile T. Plant	7453	3918	-47.4	1119	641	-42.7
Utility Maintenance	640	640	0	61	61	0
Wastewater Lifts	111	266	139.6	17	43	152.9
Wastewater T. Plant	32434	13198	-59.3	3304	1828	-44.7
Reservoirs & Pumps	4318	2235	-48.2	648	352	-45.7
SUBTOTAL	**53387**	**26935**	**-49.5**	**6263**	**3908**	**-37.6**
Buildings						
Batch Field	134	100	-25.4	19	16	-15.8
Batch Field CH4 Wells	210	130	-38.1	31	21	-32.3
Bus Station & Stops	410	394	-3.9	32	38	18.8
Chamber of Commerce	489	489	0	58	58	0
City County Building	2032	2032	0	224	224	0
Civic Center	7276	7348	1	673	604	-10.3
Eastside Fire Station	835	511	-38.8	83	55	-33.7
Golf Course	1527	1228	-19.6	206	181	-12.1
Legion Field	149	502	236.9	17	69	305.9
Memorial Park	223	193	-13.5	21	20	-4.8
Memorial Park Pool	1593	1821	14.3	131	151	15.3
Misc. Police	33	67	103	5	11	120
Neighborhood Center	5012	5012	0	522	522	0
Other Parks	154	112	-27.3	22	18	-18.2
Parking Garages	2937	2278	-22.4	434	366	-15.7
Shop Complex	2790	2525	-9.5	295	234	-20.7
Transfer Station	992	675	-32	137	103	-24.8
SUBTOTAL	**26796**	**25417**	**-5.1**	**2910**	**2691**	**-7.5**
Vehicle Fleet						
Building Division	108	168	55.6	9	14	55.6
Community Facilities	65	65	0	5	5	0
Engineering Division	79	100	26.6	7	9	28.6
Fire Department	794	926	16.6	68	79	16.2
Fleet Maintenance	80	80	0	7	7	0
HATS	1727	3307	91.5	149	283	89.9
Head Start	592	592	0	51	51	0
Miscellaneous	37	24	-35.1	3	2	-33.3
Parking	146	224	53.4	12	18	50
Parks	1131	1211	7.1	97	101	4.1
Police	3850	3735	-3	330	316	-4.2
Public Works	18	41	127.8	2	4	100
Solid Waste	5154	4757	-7.7	447	412	-7.8
Streets	3133	2826	-9.8	270	243	-10
Utility Maintenance	1125	1311	16.5	96	112	16.7

Vehicle Fleet (continued)

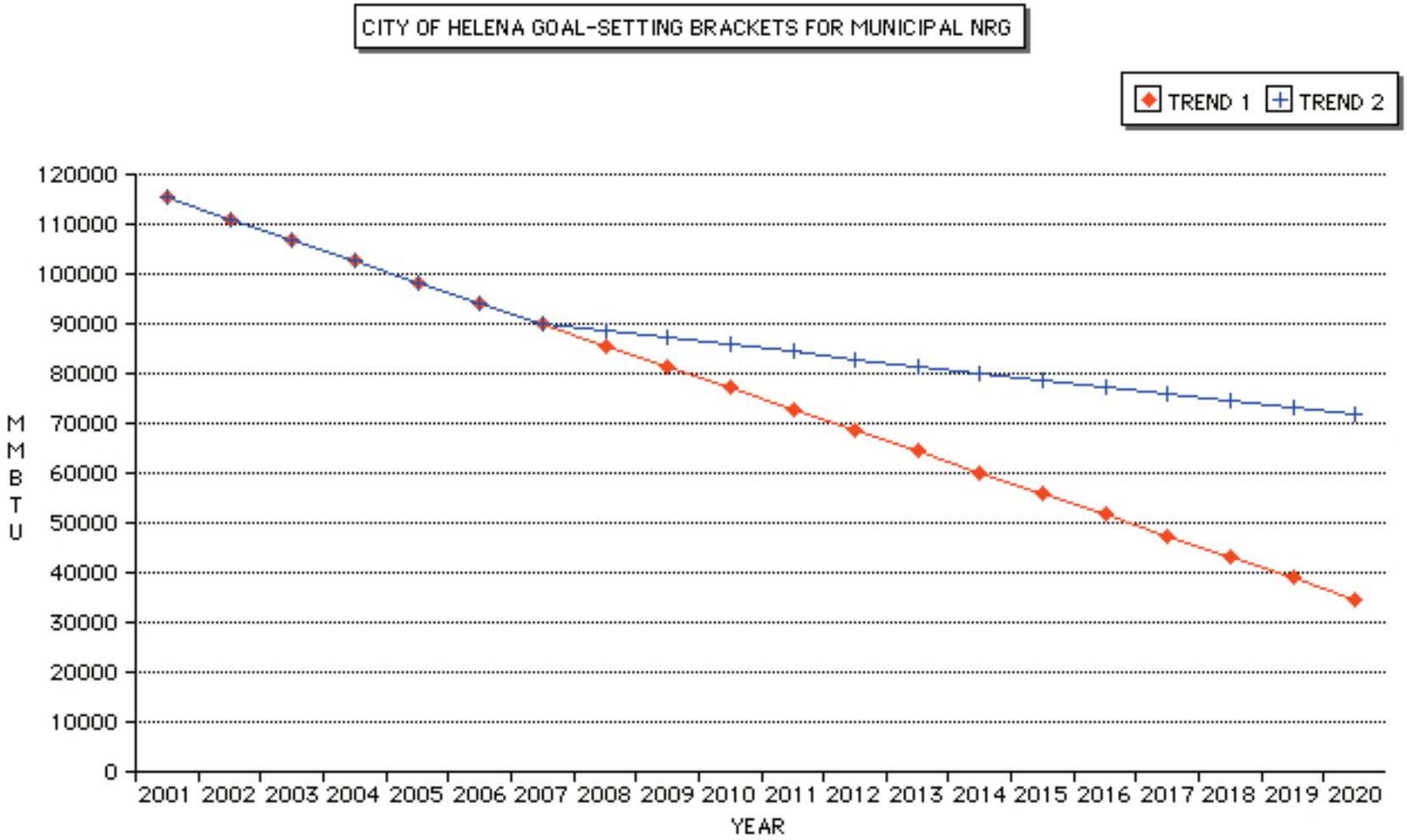
CATEGORY	2001 ENERGY (MMBTU)	2007 ENERGY (MMBTU)	ENERGY % CHANGE	2001 CO_2e (tons)	2007 CO2e (tons)	CO_2e % Change
Vehicle Maintenance	**147**	**147**	**0**	**12**	**12**	**0**
Wastewater Treatment	378	893	136.2	33	77	133.3
Water Treatment	390	502	28.7	33	43	30.3
SUBTOTAL	**18954**	**20909**	**10.3**	**1631**	**1788**	**9.6**
Employee Commute	**10065.8**	**10456**	**3.9**	**862.9**	**891**	**3.3**
SUBTOTAL	**10065.8**	**10456**	**3.9**	**862.9**	**891**	**3.3**
Streetlights	**6138**	**6138.8**	**0**	**921.5**	**1004.7**	**9**
Streetlights	5253	5632	7.2	789	922	16.9
Traffic Lights	885	507	-42.7	133	83	-37.6
SUBTOTAL	**6138**	**6139**	**0**	**922**	**1005**	**9**
Waste	**0**	**0**	**0**	**102**	**114**	**11.8**
SUBTOTAL	**0**	**0**	**0**	**102**	**114**	**11.8**
TOTAL (2nd method)	**115340.8**	**89856**	**-22.1**	**12690.9**	**10397**	**-18.1**
without employee commute				11828	9506	
DATA SET ONE	**111442.6**	**84312.5**	**-24.3**	**12183.1**	**9666.3**	**-20.7**
DATA SET TWO	**115317.8**	**89470.5**	**-22.4**	**12583.9**	**10199.3**	**-18.9**
DATA SET THREE	**115340.8**	**89856**	**-22.1**	**12690.9**	**10397**	**-18.1**

Appendix H
GOAL SETTING BRACKETS (ENERGY AND CARBON)



Trend 1 -- a continuation of the 2001-2007 rate of reduction (18.1% reduction between those years, from 12691 tons to 10397 tons). This would result in a 2020 emissions level of 5427 tons (57% below the 2001 level, 48% below the 2007 level).

Trend 2 -- 20% below 2007 levels by 2020. This trend line is less ambitious, and assumes the next 20% may be more difficult. This would result in a 2020 emissions level of 8318 tons (34% below the 2001 level).


CITY OF HELENA GOAL-SETTING BRACKETS FOR MUNICIPAL NRG
TREND 1
TREND 2
MMBTU
120000
110000
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020
YEAR

Appendix I
MAYORS CLIMATE SIGNATURE SHEET & AGREEMENT

The U.S. Conference of Mayors Climate Protection Agreement – Signature Page

You have my support for the Mayors Climate Protection Agreement.

Date: _____

Mayor: _____

Signature: _____

Address: _____

City: _____ State: _____ Zip: _____

Mayor's e-mail: _____

Staff Contact Name: _____

Staff Contact Title: _____

Staff Phone: _____

Staff e-mail: _____

Please add my comments in support of the Mayors Climate Protection Agreement. We will add these to the Website *(optional)*:

_____

_____

_____

_____

Please return completed form at your earliest convenience to:
The U.S. Conference of Mayors
Climate Protection Center

By Mail:
1620 I Street, NW
Washington, DC 20006

By Fax: (202) 293-2352

For additional information, contact
Kevin McCarty
kmccarty@usmayors.org

(202) 861-6728

The U.S. Mayors Climate Protection Agreement

(As endorsed by the 73rd Annual U.S. Conference of Mayors meeting, Chicago, 2005)

A. We urge the federal government and state governments to enact policies and programs to meet or beat the target of reducing global warming pollution levels to 7 percent below 1990 levels by 2012, including efforts to: reduce the United States' dependence on fossil fuels and accelerate the development of clean, economical energy resources and fuel-efficient technologies such as conservation, methane recovery for energy generation, waste to energy, wind and solar energy, fuel cells, efficient motor vehicles, and biofuels;

B. We urge the U.S. Congress to pass bipartisan greenhouse gas reduction legislation that 1) includes clear timetables and emissions limits and 2) a flexible, market-based system of tradable allowances among emitting industries; and

C. We will strive to meet or exceed Kyoto Protocol targets for reducing global warming pollution by taking actions in our own operations and communities such as:

1. Inventory global warming emissions in City operations and in the community, set reduction targets and create an action plan.
2. Adopt and enforce land-use policies that reduce sprawl, preserve open space, and create compact, walkable urban communities;
3. Promote transportation options such as bicycle trails, commute trip reduction programs, incentives for car pooling and public transit;
4. Increase the use of clean, alternative energy by, for example, investing in "green tags", advocating for the development of renewable energy resources, recovering landfill methane for energy production, and supporting the use of waste to energy technology;
5. Make energy efficiency a priority through building code improvements, retrofitting city facilities with energy efficient lighting and urging employees to conserve energy and save money;
6. Purchase only Energy Star equipment and appliances for City use;
7. Practice and promote sustainable building practices using the U.S. Green Building Council's LEED program or a similar system;
8. Increase the average fuel efficiency of municipal fleet vehicles; reduce the number of vehicles; launch an employee education program including anti-idling messages; convert diesel vehicles to bio-diesel;
9. Evaluate opportunities to increase pump efficiency in water and wastewater systems; recover wastewater treatment methane for energy production;
10. Increase recycling rates in City operations and in the community;
11. Maintain healthy urban forests; promote tree planting to increase shading and to absorb CO2; and
12. Help educate the public, schools, other jurisdictions, professional associations, business and industry about reducing global warming pollution.

Appendix J
NOTES ON CITY BUILDINGS

PREPARED BY CARRIE HAHN

November 17, 2008

Notes on City Buildings per interview with Gery Carpenter, Don Clark, Mark Fitzwater, Troy Sampson

1.City/County Building: City/County Building Inc. owns the building. The two managing partners are the City and the County. The board of directors consists of Tim Burton, Ron Alles, Andy Hunthausen, Matt Elsaesser, and Phil Hauck Sr. as the citizen at large. It is a 70,000 sq. foot building. Troy Sampson became the building manager in the fall of 03. Prior to July 07, the power bills were paid through a joint city/county board so I do not have energy information. Each department pays annually on a square foot basis.

Lighting-All the bulbs in city buildings have been retrofitted to T-8's. There are no more T-12's. The energy code says that lights must be turned off if no one is there. The motion lights such as the ones in the hallways and in the City Attorney's office are T-5's. The halls were done first for safety purposes. As lights are in need of repair they will be converted to T-5's. The parking lot lights have been put on timers and the front porch lights are on sensors. The life of fluorescents depends on how many times they are turned on and off. They are more expensive to replace but they use less energy. The janitors are also finding many calculators and computers are left on at night.

Elevators-This project has just been completed. The new elevators are predicted to use half of the energy consumption of the old ones.

Mail van-the mail van is paid for by all mail users. Troy keeps track of the mileage. It averages 9-15 miles per gallon. It is not fully utilized as it is rarely full. It travels a 20 mile route each week day.

Chiller-cutting edge technology-top notch efficiency

Roof-The roof was repaired this year and the insulation is good in the attic.

Recycling-Almost every office has one or more recycling barrels. Some employees have boxes under their desks for their recycling. A lot of what is put into the recycling barrels is garbage. The janitors do not have the time to sort garbage so if it appears to have garbage in it; the whole container is then put in the garbage. The State of Montana has a mandatory recycling program. Since we have state employees in this building, the State picks up our recycling every 2 weeks. We have 3 -90 gallon containers. It generally only takes one night for all 3 containers to be full. The janitors either have to leave the recycling in the offices for 2 weeks or dump them in the garbage. (Most often it is thrown in the trash because the offices complain to Troy about their containers being full.) I asked Troy if he could get more containers or increase the amount of pickups but he didn't know who handles it at the state. We also discussed educating the employees as to what can be recycled and what cannot.

Future: The boilers have been updated. There is a steam distribution project in the works to install computer controls to help with uncontrolled heat. The steam pipes would be insulated making the boilers more efficient and using less air conditioning to cool the building.

Future: Window Enhancement Project-This project will allow the bottom half of the windows to be opened and they will have screens on them. They are hoping to save 40-50% on cooling. All windows were converted to thermo paned in 2002 or 2003. They are not weather sealed or air tight. There are restrictions on building due to historical value.

2. Civic Center, Fire Station and Parks Dept: The Civic Center and Fire Station are considered one complex and the natural gas expense is split between the two. Parks Dept. pays a % of the utility costs based on their square footage. The boilers were redone in 1999 and their usage went down dramatically. The lighting was redone in 1995. The lights were changed to T-8's. The stage and ballroom chandeliers are the high users. During the summer months when there are few events held, the power drops dramatically. The heat is turned off unless there is an event. The auditorium can be heated within 3 hours of an event. The Civic Center and Fire Dept. are the only 2 city departments under the state contract for natural gas. One of the requirements

to qualify for the contract was a minimum usage of 5,000 DKT per year. Because of our warmer winters, they haven't met the required usage but so far the company has not cancelled them. A condition of going under the state contract is that Northwestern Energy doesn't service you as a customer and they would not have to accept us back if we chose to leave the state contract. Gery did not think we could get gas any cheaper now anyway.

Recycling: Most of the trash generated at the Civic Center is from public events. Gery said they have tried several things but feels that the general public is not ready for it and there is no way for him to enforce it. It only takes one person to contaminate the container and he does not have the manpower to sort trash. The trash generated from employees would be minimal.

3. **Wastewater Maintenance Building:** The main office and the interpretive center are the only 2 buildings maintained by Gery. The main office used to be a personal residence for the plant operator. When he left, the building was gutted. They put on a new roof, all new windows, Corbond insulation throughout and air conditioning. Employees helped with the project-painting, woodwork etc. The interpretive center was built with the help of employees also. The building is heated through the floor so it is always comfortable. It has a good boiler, insulation, and roof. Also has air conditioning.

   Prior to 2001 the plant burned only natural gas. In 2001 they started burning methane but it was sporadic due to boiler repairs. Once the boilers were repaired completely, they began burning only methane. Now they have a new boiler that is working fine. The boiler is also used to heat several of the buildings.

   The plant uses approximately 300 gallons per minute of water in the summer time and 200 gallons per minute if the 2 presses and blowers are going. All the water they use is recycled water including their irrigation. They also had savings of $1,000 by raising the water level in the lift station making less work for the pump.

   Lighting-at one time all the outside lighting around the plant was on photo cells. This was a waste of power because most generally nobody was there. All the photo cells were removed and switches put in so the lights are only on if someone is there. Other lights-as lights go out they are replacing them with electronic ones.
   Recycling-Employees collect the cans. They have a recycling container for their cardboard. The trash container is large because both water plants bring their trash to the wastewater plant for disposal. Many of the chemical containers are reused by their vendor. The plant uses a lot of oil and grease for the pumps.
   Future: They will be trying out an electric car next year. They are also working with Christopher Borton of Sage Mountain. He will be coming here to do an energy audit of the treatment plant. Don will be looking at using wind and solar energy. Eventually he would like to get rid of all the hot water tanks and replace them with hot water on demand tanks. He is also looking at some low profile wind turbines.
4. **Ten Mile Water Plant:** Building was built in 1989-90. It will be paid for in approx. 2012. It is semi-automated. They put in solar aerators this year at Chessman Reservoir which will make the water easier to treat and will use less chemicals.

   Future: They have a lighting project that will pay for itself in 1 ½ years by replacing the lights with energy efficient ones. They would also like to get rid of all the electric heat in the building and replace it using heat from the water.
5. **Missouri River Water Plant:** This plant was built in 1958. It just had a major upgrade switching to variable frequency drives. The plant is also heated by 700 hp motors. The operators are tracking power demands daily and are very careful of how the pumps are started up. Community Facilities will help them with maintenance work such as a new roof but Don controls the finance part.
6. **Eastside Fire Station:** This building is awaiting a remodel. It is approximately 30 years old. It needs a new roof, sleeping quarters and shower facility. Community Facilities only maintains the carpet cleaning and floor buffing. It is a brick building and is fairly energy efficient. All new lighting was put in 4 years ago. It has forced air heat and a/c which needs to be updated. Also needs a better hot water system.
7. **HATS:** This is one of the two worst buildings that the city owns. Every square inch of this block building is being used. It was built between 1956-1958 and was originally a Husky gas station. All of the buses will not fit inside so they are parked elsewhere. The only thing going for this building was that the roof was replaced 3 years ago. A new station has been designed and the land was purchased (off North Montana Ave-old Mergenthaler's lot). They are waiting for the funding to come from the federal and state. Gery expects this department to have the biggest expansion of any department within the next 5 years.

8. **Transfer Station:** This is the second of the worst buildings. It is a very small (12x36) construction trailer. It has 14 windows in it so it's cold in the winter, hot in the summer. It was brought to the site in 1991. There is nothing efficient about it! Gery did the architect work for a new building and hopes to get it going by March 09. It will be a nice building and comfortable for the employees.
9. **City Shop:** This building was remodeled in 06-08. All the offices were reinsulated and air conditioning put in. The cooling system is a forced air system and the heat is a boiler. A new roof was put on 7-8 years ago. It included some special features to help the efficiency of the building. The shop uses a waste oil heating system. All waste oil generated at the shop is kept to burn. When more oil is needed for the storage tanks, they get it at the transfer station. It has both north and south garage doors.

   Future projects: replace the last 4 doors with energy efficient doors, put controls on doors. Put touch pads to open doors. The shop floors need to be able to be cleaned easier. Drains need to be installed and the pits removed. This will enable them to save water also.
10. **Utility Maintenance:** This building was completed and occupied in March of 2005. It has metal siding and is almost maintenance free. The offices have gas forced heat and air conditioning. The system is programmable so it shuts down when it's unoccupied. The shop area is heated with infrared gas heat. There is only 1 window in the entire building that opens. All entrances have double doors to help prevent the smells from coming in. It was built with room for expansion on the upper level. They have a cleaning service for the building. They recycle their pop cans, cardboard and scrap metal.
11. **Swimming Pool & Golf Shop:** These buildings are under the Parks Dept. The swimming pool is undergoing a major reconstruction project at this time. Rich Lynd @ 447-8485 is in charge of that project. I did not compile any data on the golf shop building.
12. **Chamber of Commerce Building:** This building is owned by the city and leased out to the Parking Commission, Downtown Business Improvement District (1200 sq. ft.), Chamber of Commerce and the Small Business Assistance. The building operates under a board. They have no recycling in the entire building.

The city has employees in the Courthouse (city court) and Law Enforcement Center (police, SSD & animal control officer) also. The county owns both of those buildings.

Buildings that the city owns and leases out:

Grand Street Theater: They pay $1.00 a year. They maintain the building totally and pay all utilities. Gery is involved only if they are making changes and has helped them with remodeling.

Neighborhood Center: They pay a flat fee for facility management to Gery. All utility costs are paid by them. They also pay toward capital improvements for ex-a new roof. The building manager is Gary Curtis @ 431-1685.

Appendix K
Helena Water Supply Resilience Assessment and Recommendations of the Water Supply Working Group

Executive Summary

A major charge for the working group is to examine the municipal water system's resilience or vulnerability in the likely prospect of a warming climate, and to make suggestions for further securing the system against the effects of climate change. There have been a number of climate developments in the past decade to suggest that this examination is timely. The sustained, and apparently climate-related insect infestations—particularly the pine bark beetle—has raised concerns about massive forest die-off in much of the Helena Valley watershed, including the Tenmile Watershed. In addition, an examination of flow records for the Tenmile watershed over the past decade indicates that the watershed has been producing less water than the historic average yield. This may be the result of a smaller snow pack.

The working group has reviewed the Helena Water Supply, the 2005 Water Facilities Plan, and related documents. What is apparent from that review is that, over the past two decade, the city has actively engaged in planning efforts to assure that the municipal water supply can meet projected future growth, and has invested in major system improvements to meet those growth projections.

The City's water supply is largely dependent on the current effort to reverse the roles of the two primary sources of supply—Tenmile system, and the Missouri River system—so that the Missouri River Treatment Plant will become the primary, year-round source of supply and Tenmile will become a summer supplemental supply. In addition to this change, the facility plan recommends, and the city has embarked upon, an ambitious program of system improvements, from reducing loss to the system to improving the city reservoir system to improving metering within the city.

As to other potential sources of supply, the city initiated a study of the opportunities for groundwater development some years ago as a follow-up to a water reservation for potential groundwater that it received from the Department of Natural Resources and Conservation. That study did not show large-scale groundwater development to be promising option.

As to conservation, the Facility Plan is largely prospective. While it recommends, and the city has placed on its website, an outreach and education component, the remainder of the plan sets out an emergency conservation ordinance and identifies some possible future options for conservation.

Of the two primary components to the Water Supply, The Tenmile system, which will remain an important source of water even after the role reversal, shows the most vulnerability in the face of a warming climate. The 2005 Facility Plan identified the possibility of drought and fire, as well as the threat of drought reduced yield as some of the reasons for reversing the roles of the two systems. So the 2005 Facility Plan has properly identified some of the attributes of a warming climate in its analysis.

The plan, however, in forecasting the water supply's capability to meet projected water demands in 2025, assumes that the Tenmile watershed will yield sufficient water to meet the 8 million gallon per day capacity of the treatment plant in the summer months. This assumption of an 8 million gallon per day yield was based on the figures in the 1978 Water Mater Plan. Flow records suggest that those assumptions as to water yield from Tenmile Creek may no longer be reliable. In addition, anecdotal evidence from recent experience indicates that the 8 mgd is not currently being realized in many years during the highest periods of demand in the summer.

Becauseå of the clear vulnerability of the Tenmile system to climate related disruption and because options for sources of supply other than the Missouri River are so limited, the working group has focused on examining possible conservation strategies to enhance the resilience of the existing and future supply. The working group has reviewed water conservation programs within other cities throughout the west to identify potential conservation strategies, and has polled a number of cities as to their experience in the implementation of their strategies—what has worked best, and what has worked least. In addition working group members have spoken with some, though not yet all, of city operations staff to identify what measures city government has undertaken to reduce its water use. Notably, the City Parks and Recreation Department has already embarked on a number of water wise landscaping and maintenance strategies in its stewardship of city park lands.

As a result of the inquiries to date, the working group contemplates that the working group will offer the city commission a series of recommendations that address both ways to improve conservation within city operations and ways to improve conservation by city customers. The proposal will include an array of strategies that include specific conservation strategies for municipal operations, an aggressive outreach and education program, rate-based measures, possible ordinances, specific conservation incentives, and specific support for the recently convened Tenmile Watershed Collaborative effort.

The Water Supply Working Group (working group) anticipates offering a multi-year timeline within which to accomplish its recommendations, and will likely suggest that the recommendations, if adopted, be incorporated into the 2005 Facilities Plan.

Acknowledgments

The working group has called on a number of city staff and on the staff of a number of other cities to develop this report. Within City Staff, Tim Magee and Carrie Hahn in the financial department have been both forthcoming and thoughtful in discussing billing options. Tim Magee was most helpful in modifying the city's water bills to identify how much water people are using. Within the water and waste-water departments, Don Clark and Mark Fitzwater have both been accommodating and helpful, as has Jon Rundquist, oversees work of both of those departments. In the Parks Department, Amy Teegarden and Rich Lind were both helpful in helping the working group understand the city's landscaping efforts.

Introduction.

Under the terms of Resolution Number 19530, the Climate Change working group must:

[examine] the City's current and projected sources of water supply, and the vulnerability of the water delivery and management systems to climate-related disruption; and

[recommend] specific actions to the City Commission to. . .increase the resilience of municipal public works in the face of global climate change.

Given the first of these two charges, the working group interpreted the second charge to address the resilience of the city water supply.

They embarked its mission by reviewing the City of Helena Water Facilities Plan adopted in 2005; reviewing the current water contract with the Bureau of Reclamation to supply water to the Missouri River Treatment Plant; touring the water supply and waste water treatment systems in place for he city of Helena, Reviewing recent climate data and stream flow data for the Ten Mile watershed; reviewing city operations affect the water supply; and researching existing water supply and water conservation programs in cities throughout the country to identify strategies that could help build resilience into the water supply system in the face of climate change.

The purpose of this report is to examine the existing water municipal water supply system, the existing long term plan for the system and to both identify features of the plan that should be retained and reinforced, and to make recommendations for additional measures to improve the resilience of the Helena Municipal Water Supply in the face of a warming climate.

Climate Change in Montana as it may Influence the Helena Municipal Water Supply.

In the past decade, there have been increasing signs of a warming climate in the Helena Valley and within the surrounding watersheds. According to United States Geological Survey (USGS) data for the Tenmile Creek gage site, since 2000, the annual summer runoff—June through September--for Tenmile Creek has been 3446 af , compared to an average annual discharge of the period of record of 5232 af. Over the past eight years, this represents, on average, a 34 percent reduction in summer runoff. More specifically, the mean of the monthly flows for the months of July, August, and September have gone from 13.0 cfs, 2.6 cfs, and 2.4 cfs respectively between 1914 and 1999 to 5.5 cfs, 0.70 cfs, and 0.63 cfs. Between 2000 and 2008, flows have not reached the mean of the previous 75 years in any single year.

Figure 1. Mean monthly Discharge, WY1914-WY1999 in cfs

June	July	August	September
74	13	2.6	2.4

Figure 2. Mean monthly discharge, WY2000-WY2008 in cfs

June	July	August	September
51	5.5	0.70	0.63

In addition, nearby SNOTEL sites (NRCS measuring sites that measure snow depth, water content, temperature, and precipitation) all indicate that winters are drier. At the Frohner basin site, between 1970, when records were first kept, and 2008, every winter month has shown a decreasing trend in snow-water content.

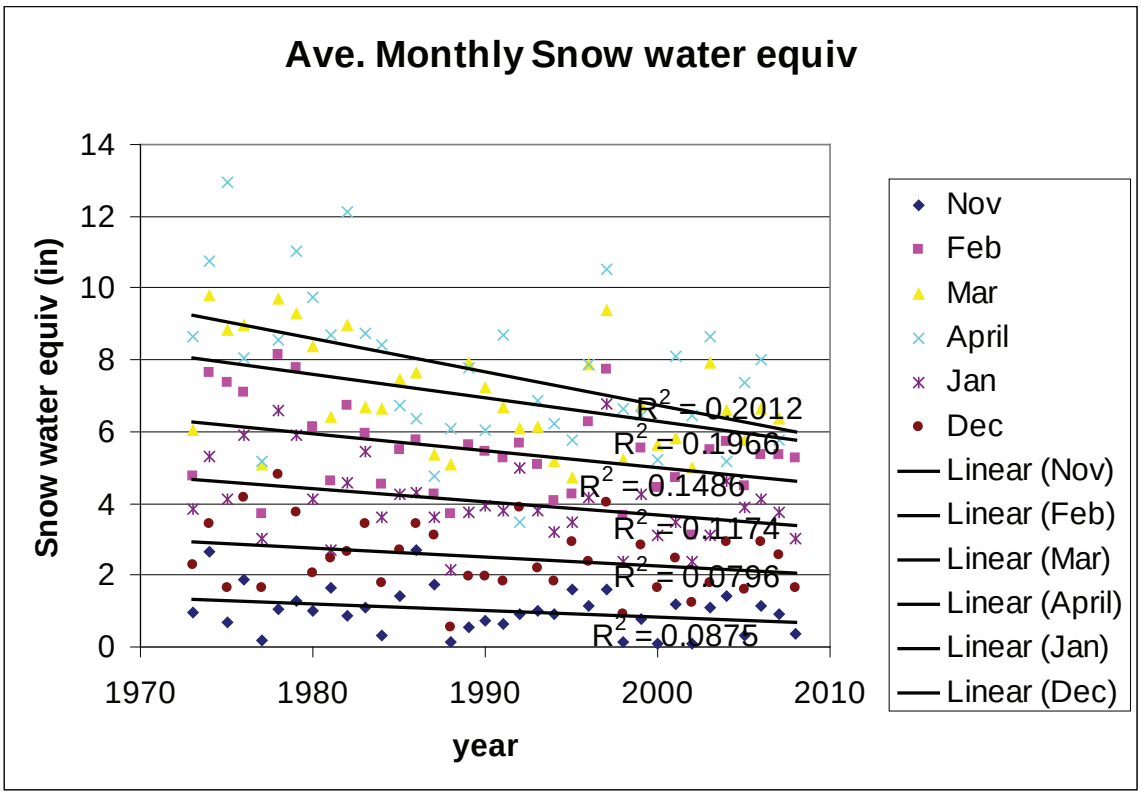


Figure 3.. This graph shows a downward trend in snow water equivalent for every winter month between 1970 and 2008. NRCS.

The City of Helena Water Supply.

General Description.

The City currently relies on three primary sources of supply:
- Missouri River
- Tenmile Creek
- Hale Collector (Eureka/Orofino)

The Missouri River and Tenmile Creek are surface water sources. They have historically supplied most (85%) of the City's demand. The Tenmile supply currently serves as a year-round source. The Missouri River source is currently used in the summer months only. As of the 2005 Helena Water Facilities Plan (Facilities Plan), the two sources of supply had a treatment capacity of 15 million gallons per day—8 million gallons per day from the Ten Mile Plant, and 7 million Gallons per day from the Missouri River Plant. The Facilities Plan proposes a "role

reversal" of the two plants which would make the Missouri Plant the year-round plant and the Ten Mile Plant the secondary plant. As part of this role reversal, the treatment capacity at the Missouri Plant would increase by 6 million gallons per day. The Tenmile plant would become a secondary plant.

The Hale Supply is a groundwater source, served by two collectors: Eureka and Orofino. Together these two sources have historically supplied the remaining 15 percent of the City's demand. Under the Facilities Plan, the Hale Supply will eventually be removed from the system.

The City operates two surface water treatment plants, the Tenmile Plant and the Missouri River Plant. The Ten Mile Plant was constructed in 1990. It uses contact adsorption clarifiers and conventional filtration for turbidity removal and gas chlorination for disinfection. The Ten Mile Plant is on the west end of the City. It delivers finished water by a gravity system.

The Missouri River Plant was constructed in 1959. It uses sedimentation and conventional filtration for turbidity removal and gas chlorination for disinfection. It delivers finished water via two pump stations (high zone and low zone).

The City's distribution system consists of two large pressure zones and five smaller zones. The system includes eight reservoirs and pump stations located on the south end of the City. The large zones are the Upper and Lower Malben-Woolston Zone.

The five smaller zones are the Winne Zone, the Hale Zone, the Upper Hale Zone, Reeder's Village, and Forrest Estates.

Missouri River Treatment Plant.

Since its construction in 1959, the Missouri Plant has undergone a number of improvements in both the treatment technology and the plant capacity. Water leaves the plant via a raw water pipeline[1] that delivers water into a 300 cfs capacity canal which then delivers water into the Helena Regulating Reservoir. Over 90 percent of the water delivered into the Regulating Reservoir goes to agricultural use. From there, water goes to the Missouri River Treatment Plant. The city recently entered into a 40-year water supply contract with the Bureau of Reclamation.

As of 2005, the treatment capacity at the Missouri River Plant was 7 million gallons per day. The Facilities Plan proposes to boost this to 13 million gpd by 2025. The raw water line from the Regulating Reservoir to MRTP has a 9 MGD capacity at low water level (elev. 3805.0) and 12 MGD at full pool (elev. 3820.5). To meet the long-term Missouri River Plant peak raw water summer demand (13.91 MGD), improvements to the raw water line will be necessary.

Tenmile Treatment Plant.

The Tenmile Treatment Plant operates under the strength of some of the earliest water rights in the state (dating back to 1864 and 1865). As of 2005, the city estimated that the Tenmile plant could deliver about 1,960 gallons per year. The existing facilities for the Tenmile Supply include two mountain reservoirs and one canal. The two mountain reservoirs, Chessman and Scott, have a total combined capacity of 744 MG. The approximate capacity of the flume and pipeline to the Plant is 8 MGD. The plant itself is designed to treat up to 8 million gallons per day. In addition, there are two wells at the treatment plant with 1050 gpm. These wells supplement the surface water treatment and can provide a limited amount of finished water in an emergency.

There are several challenges in the Tenmile raw water delivery system. The deliverable wintertime flow rate to the Tenmile Plant is often limited due to low stream flow and freezing conditions in the raw water conveyance channels. As the water freezes, it either does not reach or cannot enter into the raw water intake for conveyance to the plant. The Tenmile Plant shutdown during the months of March and April in 1997 was due to low stream flow and icing conditions. During that time, the City was supplied water from the Missouri River Plant which normally operates only during the summer. In addition, operations in recent years indicate that lower discharge of water from the basin is yielding less water than the treatment plant capacity. (Don Clark, personal communication, 2008) In addition, water quality testing on the wells in 2004 showed elevated levels of Radon.

Average Per Capita Demand for Water.

Average annual water use for the City of Helena water service area from 1999 to 2003 has been approximately

1 The Raw Water Pipeline has a delivery capacity of12 million gallons per day at full pool and 9 million gallons per day at low pool. This pipeline serves not only the Missouri River treatment plant, but also the Helena Valley Irrigation District.

175 gallons per capita per day (gpcd). This compares favorably to the 260 gpcd presented in the 1978 Master Plan. This difference may be attributed to the addition of meters to the distribution system and an aggressive water line replacement program.

Current and Projected Water Demand

As of 2004, the city service area population stood at over 32,000 people (2005 Facilities Plan, Chapter 5, p. 4, table 5-1) and projected a 2025 population of just over 50,000. (Id.)

City Facilities Plan.

Plan Recommendations for Upgrading the Water Supply Facilities.

The 2005 Facilities Plan recommended a number of upgrades to the water supply system to occur over the course of twenty years. It recommendations were based upon an assumption that population within current and future service areas will increase from a 2004 population of 32,000 to a 2025 population of over 50,000. It recommended improvements to both the Missouri River Plant and Tenmile Plant at a total estimated cost of $16,050,000. A number of those improvements have already occurred. In addition, the Plan recommended a number of upgrades of the treatment system at an estimated cost of $36,000,000. The city estimated that water system extension projects, if performed, could cost up to an additional $25,000,000.

In addition, the plan recommended additional upgrades in the distribution system to reduce the amount of unaccounted for water within the system.

Role Reversal as a Response to Tenmile Creek Vulnerability

Currently, Tenmile Creek is the primary water supply for the city of Helena. In the facilities plan, the City explicitly recognized the vulnerability of the Tenmile watershed to the adverse effects of both drought and catastrophic forest fire. At the time the facilities plan was written, insect damage to the forest had not yet arisen to its current level of severity. Nor did the Facilities Plan factor in the possible vulnerability of the system to a long-term warming trend, i.e. climate change. Nonetheless, in response to possible drought and fire, the Facilities Plan proposed reversing the roles of the two major plants. By 2025 The roles would be fully reversed, with the Missouri River Plant becoming the primary source of supply and the Tenmile plant becoming secondary. Even with role reversal, Tenmile is projected as a significant summer source of water for the city.

To meet the growth projection, the Facilities Plan proposes an upgrade that, when combined with the role reversal, will provide a plant capacity of 21 million gallons per day by 2025.

Conservation as part of the Current Facilities Plan

Chapter 5 of the City Facilities Plan describes the Helena Water Conservation Plan. The plan describes the "conservation area covered by the plan, describes an inventory of water resources and water budget, including both the water supply and existing water use. It then considers the ability of the water supplies to meet future water demands.

The plan sets forth the supply goals straightforwardly as "meeting the maximum day demand of the water systems' customers. Both the raw water delivery and treatment facilities must be capable of meeting these requirements, with the raw water source capable of sustaining the supply of water throughout the year." In response to that goal, it presents role reversal as the primary strategy to meet both current and future demands, and asserting a capacity of 8 mgd for the Tenmile system and 14 mgd for the Missouri River system once all the improvements are completed. (Appendix 5-A, p. 3). The projection for dependable annual yield from Tenmile watershed was based on figures contained in the 1978 Master plan (Appendix 5-A, Table 3). The yield from the Missouri River System is based on the Bureau of Reclamation 40-year contract. Id.

In addition to the role reversal strategy, the conservation plan reviews existing measures in place in 2005, including reduction in "Unaccounted for Water" through repairs to the distribution system, installation of meters and an automated reading system to more accurately read water use among the city's residential and commercial customers, information and education, leak detection, and a conservation ordinance to be initiated in times of water shortage. The conservation ordinance is a tiered response system based upon demand as a percentage of system capacity—e.g. When daily demand is 85 percent of the system capacity, then voluntary restrictions would go into place; when demand is at system capacity and city reservoirs are at 70 percent capacity, then watering would be allowed only on designated days and hourly water restrictions would apply.

Finally, the Facilities Plan identifies a variety of "possible future measures." These include conservation pricing, water efficient landscaping (presumably for the city), and fixture replacement. The Water Conservation Plan has a proposed section called "Tip and Links" which describes a series of water conservation measures that city water customers could initiate. (Appendix 5-A, p. 8). Ironically, the tips that are housed on the website are significantly different than what appear in the Facility Plan, and much more far-reaching.

Vulnerability of the Helena Municipal Water Supply to Disruption by Climate Change.

Recent Trends

As noted above, There are a number of trends in the local snow pack and flow data that suggest that change is afoot in local climate behavior:

The past decade of stream flow data in the Tenmile drainage shows a downward trend in the volume of water discharged by the watershed;

Amount of moisture in the snow pack has shown a steady downward trend in the past four decades;

Discharge from the upper Missouri River Basin above Canyon Ferry Reservoir has declined significantly over the past decade.

In addition, these climate trends have already manifested themselves locally both in the number and duration of wild fires throughout the northern Rockies, and in an epidemic of bug-killed trees in our forests.

These trends suggest that the Helena municipal water supply may be vulnerable not only in the Tenmile drainage, but possibly, over time, in the upper Missouri drainage.

First, it is important to note that the Facilities Plan describes a projected peak demand in 2025 that it assumes will be met by the water supply units operating at capacity. While the plans to expand the Missouri treatment facility and raw water delivery seem like the most sensible infrastructure response, those improvements alone may not be sufficient to meet the projected demands in 2025. During peak usage, the plan contemplates full utilization of both the Missouri facility and the Ten mile facility.

As described above, there are already trends in Tenmile watershed discharge that cast serious doubt on the ability of that facility to operate at maximum capacity during periods of peak demand. Limits are not with the treatment capacity of the plant, but with the yield of the watershed. Add to that the clear vulnerability of the Tenmile watershed to damage from wildfire and bug-kill, and Tenmile seems an especially fragile watershed in the face of current climate trends.

As to the Missouri River Facility, while its connection to Canyon Ferry Dam offers some buffer from the peaks and valleys of yield from the headwaters watershed, there are some indications that surface water discharges from the upper Missouri have already experienced substantial decline in recent decades. Review of historic flows at the U.S.G.S. gage on the Missouri at Toston indicate that annual average volume of inflow into Canyon Ferry over the past ten years has decreased by nearly 37 percent in relationship to the average of the 109 years of record preceding the last decade.

Potential Threats to the Municipal Water Supply From a Warming Climate

If the trend of decreasing volume continues, there may be a point at which the capacity of the Missouri River facility to meet the projections could come into question. If significant parts of the headwaters watershed become as vulnerable to bug kill and potential for wildfire that Tenmile currently faces, the ability of the Missouri River plant to meet its supply projections could be further compromised.

As noted elsewhere, climate projections indicate not only warming climate, but smaller snow pack, earlier runoff, smaller volumes of water available within the watershed, lower mid-summer flows, and greater frequency and intensity of wildfires.

The threats of warming climate are especially acute in the Tenmile watershed where yield already shows indications of being insufficient to meet the projected needs in 2025. Because it is a smaller, less diverse drainage than the headwaters of the Missouri, its vulnerability to disruption from a warming climate is substantially greater than is the vulnerability of the Missouri River facility.

In the Missouri watershed, while the diversity and expanse of the drainage area makes it less vulnerable to a single catastrophic event such as wildfire, the flow declines of the recent decade suggest the Missouri system is not completely invulnerable to the effects of climate change. Finally, because the Missouri River facility is dependent upon the structural integrity of Canyon Ferry Dam, catastrophic failure of the dam would result in a sudden and calamitous loss of water supply

The vulnerabilities described above are heightened by the reality that the city of Helena has no other feasible options for a large-scale augmentation of its water supply beyond Canyon Ferry dam. As the Facility plan notes, there is little to no opportunity to develop groundwater in any significant quantities to augment existing supplies.

Working Group Recommendations.

Given the trends of a declining snow pack and reduced stream flow combined with the lack of any significant water sources other than what is already in play, the working group proposals address not only long-term watershed strategies, but also proposed a multi-year strategy for increasing the role of conservation in our local water-use culture. As a practical mater, any attempts to increase our water supply over the plans announced the Facilities Plan will likely be expensive, and perhaps prohibitively so. In light of that, an aggressive and comprehensive strategy of increasing conservation is the most cost-effective long-term strategy.

The working group recommendations described below are grounded in our research not only into what the city has done so far, but also in an examination into the efforts of other city throughout the country—but especially the west—in their efforts to secure their water supply against the effects of drought and chronic shortage. Because of the scope of our charge and the time within which we had to complete it, the recommendations that we put forth are necessarily general. Whatever group is called upon to implement the general recommendations of this plan will have to provide more specificity than we are able to do within the limitations of our charge.

Specifically, most of the recommendations found below are grounded in terms of additional further inquiry. This is especially true as to financial and cost considerations.

Conservation Strategies.

In pursuing research into conservation strategies, the working group found that there is a wealth of experience upon which to draw throughout the country and especially from other states in the West. While climate change has not been the express motivation in other cities—chronic drought being the primary impetus—the strategies which other communities have pursued offer both some appropriate models to emulate and, in many cases a good real-world test of those strategies.

Throughout our research, we have tried to remain cognizant of one over-riding real-world fact. Our municipal water supply, which has served us well thus far, is a utility that has to pay for its operational costs. Any conservation strategy has to take into account the need to meet those costs and structure its program accordingly, so that it does not inadvertently bankrupt the system. The recent experience of the City of Tucson, with one of the most aggressive water conservation programs in the Southwest, provides a sobering cautionary tale. Tucson water recently announced a $15 million budget shortfall that it attributed, in part, to the effects of its aggressive conservation program reducing demand and the recent economic downturn. So, any conservation program needs to attend to the operational bottom line.

On the other hand, municipal water is cheap. Currently, residential customers of Helena municipal water supply pay a base monthly rate of $2.18 and a water usage rate of $2.46 for each 100 cubic feet (748 gallons) of water used. In other words, our water usage rate is about .3 cents per gallon. While the commercial and multi-family water base is somewhat higher than the residential base ($3.50 per month) the usage charge is the same. And currently, Helena has neither a seasonal rate to reflect higher demand in the summer or any volume based rate differential.

With this in mind, the working group recommends a multi-faceted conservation strategy that addresses infrastructure conservation opportunities, the rate structure, outreach and education, conservation incentives, and conservation regulations. The working group proposes a five-year timeline to implement its recommendations, starting with an ambitious upgrade of outreach and education and a modification of the rate structure, progressing to specific conservation incentives, and finally improving the regulatory approach to water conservation.

The city water utility already incorporates some conservation strategies in its operations. In the material below, we will identify the conservation measures that are in place.

Conservation Water Rate Structure

Conservation-based Water/Wastewater Rates Structure

Description:

In an effort to bring an increased conservation ethic to water utility consumers as municipalities confront drought, reduced stream flow levels, and increased demand driven by population growth, by 1992 approximately 60% of the water utilities in the United States use a conservation rate structure. Using price has proven to be an effective demand management tool and the typical goals of implementing a water conservation rate structure include:

Reducing peak water use

Reducing seasonal water use (reduce inefficient outdoor water use in summer)

Reducing overall water system demand

The two most common conservation rate structures used in pursuit of these goals include:

TIERED WATER RATES.

This involves structuring water utility rates for the consumer in a way that increases the unit cost as consumption levels increase. This is typically done in block increments together with a base charge. The base charge is the mechanism that helps to ensure that the utility is able to receive sufficient revenue to maintain operations.

In Montana at least two cities use an "inverted block rate" for water. In Bozeman water rates increase as use increases, with lowest rates for use that is less than 7 ccf per month (ccf = 100 cubic feet), a higher rate for use between 8 and 15 ccf, and a top rate for 15 ccf or more per month.

Billings also uses three rate blocks for water, with the lowest rate at less than 4 ccf, the middle rate block is 5 to 16 ccf, and the highest rate is any monthly use over 16 ccf.

SEASONAL WATER RATES.

This involves charging a higher unit cost for water consumption during the peak usage season as an additional economic incentive to conserve water use. Typically this means higher water unit rates during summer, when outdoor usage increases.

A third option for structuring water conservation rates would be to combine both a tiered rate with seasonal rates. This is typically considered to be a hybrid water conservation rate structure.

It should be noted that an essential ingredient of successful conservation rate structures is a more frequent billing schedule, such as monthly, rather than less frequent quarterly billing structures. Consumers are best able to understand and manage a conservation-based rate structure with more frequent billing cycles. [Isn't Helena already on a monthly billing schedule]

RELATED CITY OF HELENA ACTIONS (WHAT HAS THE CITY DONE?)

The City of Helena does not currently use a water conservation rate structure for the water utility, using neither the inverted block rate nor seasonal rates. [Can we describe what Helena does use?]

Projected Fiscal Impacts and Other Costs.

Water conservation rate structures are intended to reduce overall water demand as a response to growing concerns over water supplies, but it is important that any rate structure must also ensure adequate revenue required to maintain utility operations and support capital maintenance needs.

Therefore, it should be anticipated that any fiscal impact that reduces water utility revenue would be offset by reductions in operating costs.

In addition, there may be a small fiscal outlay for the utility in conducting an upfront study of operations and revenue needs so that the ultimate conservation rate structure is sufficient to ensure that utility revenue meets the minimum fiscal requirements.

Time Line.

A conservation-based water utility rate structure could be launched almost immediately, starting with a comprehensive revenue study that would be essential to ensure that the new rate structure revenue would meet the utility operating and capital maintenance needs.

Task Force Recommendation.

It is our recommendation that the Helena City Commission should review and consider implementing a hybrid conservation-based water and wastewater utility rate structure that encompasses an inverted/inclined block rate structure that includes an overlay of seasonal water rates. This review should come as part of the annual utility rates process. Coupled with this rate structure it will be important to reformat the water/wastewater utility bill in order to make the consumption units and the rate structure transparent and understandable to consumers. The utility bill format should contemplate an online or email option that allows ongoing consumer monitoring of water usage as well as electronic payment options to reduce the use of paper bills and mailing.

In addition, this rate structure should be closely coupled with a comprehensive water conservation program that provides options and opportunities for consumers to reduce their water use. Such a conservation program should consider making low-flow fixtures and other mechanisms available that can reduce water usage through in-home infrastructure. (See Community Incentives) It will also be important to provide regular public outreach and education on the conservation measures and rate structure.

As part of the determination of the conservation rate structure, the commission should ask public works department staff for a thorough analysis of water/wastewater revenue so that the conservation rate structure can be implemented in a way that ensures sufficient revenue to continue efficient and effective fiscal management of the water and wastewater utilities.

Reduction of Unaccounted for Water and Reduction of Metered Leaks.

DESCRIPTION:

Unaccounted for water (UAW) is the difference between what is measured coming into the waste water treatment plant and what is metered to be used by all customers. It includes leakage, flushing of mains, hydrant flushing, unauthorized connections or use, and inaccurate metering. (See City of Helena Water Facility Plan, Chapter 5, p. 5-6.).

In addition, the strategy for the reduction of metered leaks (in residential or commercial buildings) should enhance the ability of customers to be aware of leaks in order to fix them at the earliest possible moment. This is particularly important where, as in Helena, there are ordinances that prohibit the water fixtures and pipes in a leaky condition (see §6-2-3, Rule 17). Two actions inform this strategy—(1) mandatory installation of meters in customers buildings with automatic readings by the city; and (2) city notification to costumers when the city identifies a likely leak upon receiving readouts that suggest a leak.

RELATED CITY OF HELENA ACTIONS:

According to the city's facility plan, the city is addressing this in two ways. First, every customer is metered. Second, In the course of upgrading the water treatment system and doing on going repair and maintenance, the city hopes to reduce its unaccounted for water from system leakage. In 2002, UAW represented 23 percent of the total water brought into the system. The efforts described above project a reduction in that loss to 18 percent by 2010. Id.

There are opportunities for improvement of leak reduction at the consumer level, in Helena, however. Every household is equipped with a leak detector on its meter, and the city of Helena website has a page that explains how to read the meter. Often, however, water meters are in places that are inconvenient to get to read, so people may not regularly check them. Helena's billing office gets a read-out of meters that show if there is a continuous leak appearing at a residence.

PROJECTED FISCAL IMPACTS AND OTHER COSTS:

The fiscal impacts of the ongoing upgrade of the water distribution, the fiscal impacts and other costs have been accepted.

TASK FORCE RECOMMENDATION.

The working group recommends that the City continue its effort to reduce the amount of unaccounted for water as descried in the 2005 Facility Plan. .

SOURCES:

City of Helena Water Facility Plan, Chapter 5, p. 5-6.

Lush and Lean Municipal Landscaping.

DESCRIPTION:

The principal behind this strategy is to allow the city to provide a leadership role in adapting water conservation practices in the design and maintenance of municipal landscaping projects. These measures can include:

- The city-wide application of low water "lush and lean" landscaping concepts;
- The development of demonstration water-wise gardens on city property by working in partnership with local groups and businesses (see, e.g. Missoula)
- Provide for unit cost/benefit analysis of xeric retrofits;
- Conduct irrigation audits of city-maintained irrigated lands.

RELATED CITY OF HELENA ACTIONS:

The City Parks and Recreation Department has already initiated a number of water conservation measures into its landscaping program. Over the past several years, the department has been converting landscaped areas to automatic sprinkler systems—as of now of the 65 parks that are irrigated, all but two have been converted to automatic irrigations systems. In addition, irrigation timing is set to minimize evaporation by operating at night; and irrigating less frequently but deeper. Also, the Parks department is in the process of installing an automated, centralized control system in the ten biggest parks which will allow control of the irrigation systems from a central console. In a related vein, the department is exploring the installation of rain and wind sensors at Centennial Park. Finally, where possible, the city uses water conserving tree bags to water trees or, in some cases, drip irrigation. While it hasn't initiated a city-wide program of drought tolerant plantings, it is looking at the use of drought tolerant grasses on some parks.

PROJECTED FISCAL IMPACTS AND OTHER COSTS:

The installation of additional water-saving technologies will require expenditures of both funds and personnel time. Some of the changes, such as rain and wind sensors, or other forms of ET controllers, can be adapted into regular budget cycles.

TIMELINE:

The time line for developing a more comprehensive Lush-and-lean landscaping program for the city will be over a period of years to allow new technologies.

In addition, the development of one or more demonstration gardens will likely unfold over the course of one or more years, as the city seeks partnerships to proceed with a this approach.

TASK FORCE RECOMMENDATIONS:

The working group recommends that the city expand the current water conservation efforts on the city's irrigated properties by (1) conducting irrigation audits of city-maintained irrigated lands; (2) developing one or more demonstration gardens; (3) conducting cost/benefit analysis of xeric retrofits on city lands.

4. Community Incentives

INTRODUCTION.

Among the many cities that have implemented some kind of incentive program—most often expressed either as a rebate on the purchase of conservation equipment or as a give-away—there appears to be a strong consensus that incentives are perhaps the single most effective water conservation tool in the array of tools available to them. The information below looks at some of the most common incentives; weighs the pros and cons of various incentives based upon information gleaned from other cities' experience with them, and, in some cases based upon independent studies into the relative efficacy of the incentives; and makes recommendations to pursue or defer, or reject certain incentives.

The central thesis of incentive programs is that the relatively low-cost investment in conservation actions by municipal water customers will help avoid much higher additional investments in infrastructure. In order to confirm that thesis, the working group recommends as to any incentive that will involve some near-term fiscal impact, that the city conduct an avoided-cost analysis before making any significant investment in the program.

FUNDING OF INCENTIVE PROGRAMS.

The most direct approach to funding incentive programs is to impose a "once-a-year conservation fee on water customers. Santa Fe has done this for several years. The Santa Fe charge ranges between $4.00 and $9.00 per

year for single family residential service, depending on the size of the water line. Multi-family and commercial customers pay a higher fee, again depending on the size of the line. The working group recommends that the city explore the various funding options presently in use to determine what is most suitable for Helena.

Water Smart Landscape Rebates.

Description: These are incentives—either in the form of direct cash rebates or water bill credits—for the purchase or installation of water smart (e.g. low consumptive use) landscaping features. These range from rebates for the installation of irrigation timers, drip-irrigation systems, rain sensor switches, hose timers, or even the planting of plants on a city's approved water wise plant list. In at least one case, Peoria, AZ has a two-tiered rebate system to encourage residents to plant low-water demand plants as opposed to putting their landscape entirely into rock ("zero-scaping"). Las Vegas, through the Southern Nevada Water Authority, offers customers $1.50 per square foot of grass removed and replaced with xeriscape with no cap on maximum square footage.

Specific incentives:

IRRIGATION CONTROLLER REBATES (LAS VEGAS, PEORIA AZ).

These are also called Evapotranspiration (ET) controllers. An ET controller automatically adjusts the amount of water applied to your landscape based on weather conditions. The "smart" ET controller receives radio, pager or internet signals with evapo-transpiration information, to replace only the moisture your landscape has lost to heat, humidity and wind. There have been a number of studies done on the efficacy of ET controllers in conserving water.

RELATED CITY OF HELENA ACTIONS:

None.

PROJECTED FISCAL IMPACTS AND OTHER COSTS:

TIMELINE:

TASK FORCE RECOMMENDATIONS:

The working group Recommends that the City investigate the kinds of rebate programs that have offered rebates and establish a funding source to support the provision of rebates for ET controllers.

Indoor conservation incentives and rebates.

DESCRIPTION:

These are incentives to encourage more conservative indoor water use.

SPECIFIC INCENTIVES:

High-efficiency washing machines.

DESCRIPTION:

Also known as horizontal axis (front-loading) machines, these machines can use 40% less water and up to 50% less energy than top-loading machines.

RELATED CITY OF HELENA ACTIONS:

None.

PROJECTED FISCAL IMPACTS AND OTHER COSTS:

High efficiency washers cost between $600 and $1,500—generally more than a top-loading machine. Rebates offered by cities ranged from $100 to $150. . In Santa Fe, as of September 2008, over 1400 washing machines have been purchased that take advantage of the rebate.

TIMELINE:

TASK FORCE RECOMMENDATION:

The working group Recommends that the City investigate the kinds of rebate programs that have offered rebates and establish a funding source to support the provision of rebates for high-efficiency washing machines.

Low Flow or High Efficiency Toilets.

Description: Low-flow toilet rebate programs are one of the most ubiquitous—and successful—of the incentive programs that we found. The amount of rebates often distinguishes between low flow (1.6 gpf) or high efficiency toilets, which flush at 20% less than low flush models. These rebate programs appear to be a substantial source of water savings In addition, the experience of other cities suggest that, when compared to finding and

developing new sources of supply, toilet rebates programs are quite cost-effective. After 1992, federal law required the installation of 1.6 gpf-or-less toilets in new construction.

RELATED CITY OF HELENA ACTIONS:

None

FISCAL IMPACTS AND OTHER COSTS:

Rebates range from $25 to $125 per toilet, depending on design.

TIMELINE:

TASK FORCE RECOMMENDATION:

THE WORKING GROUP RECOMMENDS THAT THE CITY INVESTIGATE THE KINDS OF REBATE PROGRAMS THAT OTHER COMMUNITIES HAVE INITIATED, AND ESTABLISH A FUNDING SOURCE TO SUPPORT THE PROVISION OF REBATES FOR LOW FLUSH TOILETS IN HOUSES BUILT BEFORE 1992.

Free Low-flow Shower Heads, faucet aerators.

DESCRIPTION:

A number of municipalities offer rebates for low-flow shower heads or offer free faucet aerators—some even offer free showerheads. By some estimates, after the toilet, the shower is the biggest user of indoor water. Most of the places these incentives are offered, they are offered as free-of-charge items. In fact, Rio Rancho offers a water saver kit that includes a low-flow showerhead, a kitchen faucet aerator, a toilet dye tab, and a volume measurement bag. Low flow showerheads are estimated to reduce home water and home heating consumption by as much as 50%. As of 1992, federal law requires faucet fixtures to restrict maximum water flow at or below 2.5 gpm at 80 psi or 2.2 gpm at 60 psi.. Non-conserving showerheads use between 5 to 8 gpm while faucets use between 4 to 7 gpm. Id.

RELATED ACTIONS BY THE CITY OF HELENA:

Helena already offers a faucet aerator as part of a water conservation package that it hands out to school children, but the aerator program isn't widely offered or widely known.

FISCAL IMPACTS AND OTHER COSTS:

The fiscal impacts will include the cost of purchasing aerators or showerheads that would be offered as part of the program.

Timeline:

Task Force Recommendation: The working group recommends that the city expand its faucet aerator program and make the aerators more widely available at a number of locations in the city. In addition, the working group recommends that the city investigate showerhead programs offered by other cities and initiate a similar program in Helena.

Single family gray water incentives.

DESCRIPTION:

Single family gray water systems allow households to capture water from kitchen, sink, and shower use and apply it to landscaping.

RELATED ACTIONS BY THE CITY OF HELENA:

Thus far, the city of Helena has not acted with regard to gray water systems. The 2007 Montana legislature passed HB 259, which defines "gray water" and "gray water reuse systems" as a plumbing system in a single family residence (see MCA 75-5-325); and establishes minimum requirements for the use of gray water reuse systems (see MCA 75-5-326). Specifically, gray water reuse systems may not be used to irrigate plants to be consumed by humans, and a gray water reuse system cannot be located within a flood plain. Id. In addition, In addition, state Board of Environmental Review must adopt rules allowing the use of gray water systems and limit the amount of water allowed to be used in such systems, address the use of gray water and include any provisions necessary to protect public health and the environment. (see MCA 75-5-305). As of this writing, the state has not adopted regulations for the installation and use of gray water systems.

The primary concern in the allowance of gray water systems is the issue of water pollution. Studies indicate that properly handled gray water has a fraction of the nitrogen content of other household waste waters and, as a result, it can be fully treated within two to three feet of the surface of the ground. A few cities have created

incentives for the installation of gray water systems. The incentive may be based on the amount of water saved over a ten-year period, such as that offered by the Eat Bay Municipal Utility district in California, or as simple as creating regulations under which such systems would be legal. While there is a great deal of information on what states allow the use of gray water re-use systems, information about how they have performed is less accessible.

FISCAL IMPACTS AND OTHER COSTS OF ENABLING GRAY WATER SYSTEMS:

The fiscal impact would depend on what the city offers as incentives.

TIMELINE:

The time line is largely dependent on the state drafting rules to implement the 2007 statute.

RECOMMENDATION OF THE TASK FORCE:

Because the state may not have completed rule-making by the time this recommendation is final, the working group recommends that the city follow the rulemaking process at the state level, and, when complete, consider either adopting the state rule, or if it deems necessary, adopt the state rule with modifications.

5. Education and Outreach

Representatives from more than one city surveyed in preparation of this report noted that education is the core of their programs and key to widespread behavioral changes in water use. All agree that the more water customers can be educated about water conservation, and accept conservation as a normal home- or business-owner practice, the less time, energy, and money will be expended by the city enforcing regulatory programs. Customers must be provided the information necessary to be able to understand the intent of conservation programs, and their economic and societal benefits. Water conservation education should begin at the youngest ages through city-school partnership programs. A variety of adult-oriented programs and activities and methods of educational outreach, are also described in the following sections.

RELATED CITY OF HELENA ACTIONS

Helena has few educational programs relating to water, and only one substantial effort was identified that focuses on water conservation. The Lewis & Clark County Water Quality Protection District has a robust educational program for water users, land owners, and others. For example, the District's long-running Water Watch education program for 4th and 5th graders appears to be very successful and well received by teachers and students alike. These education programs, however, are directed almost entirely at water quality protection, as opposed to conservation. Other, smaller activities related to water conservation do exist, such as distribution of water conservation kits to residents upon request. School children who visit the Helena waste water treatment plant also receive a conservation kit as well as first-hand insight to the need for clean water. However, aside from the District's Water Watch program, none of these other activities represent a robust or concerted effort at community water conservation education.

Helena does have some limited educational information on the city website, but not in a central location and the pages are difficult to find. The Helena Public Works web site at http://www.ci.helena.mt.us/departments/public-works/water-treatment/conservation-tips.html contains the most relevant information, but water conservation is "hidden" within the water treatment section of public works. The site has little content. It includes one page of water conservation tips and links to a few other programs, many of which are related to xeriscaping in other states and not wholly applicable to Helena. Another page for Public Works, somewhat inexplicably found by going through the water treatment links, provides a half-page of voluntary water restriction guidelines (see http://www.ci.helena.mt.us/departments/public-works/water-treatment/water-treatment/watering-restriction-guidelines.html.) It's hard to imagine either of these pages receive much traffic or have substantial influence on users. Similarly, there is a page on the Helena website that explains how to read in-home water meters (see http://www.ci.helena.mt.us/departments/administrative-services-finance/utility-customer-services/customer-inquiries/read-your-water-meter.html). This section appears under "Administrative services (Finance)" on the website menu; not a particularly intuitive place to look. If the City accepts the working group recommendation to create a water conservation page it would be helpful to provide an obvious link to such related topics.

Two other pages found on the Helena Public Works site provide direct links to programs of the American Water Works Association; one page links to the AWWA's "WaterWiser" page, which has some good consumer information but generally targets water professionals (http://www.awwa.org/Resources/Waterwiser). The other link goes to a specific WaterWiser page which offers a drip calculator for the homeowner/business to measure and

calculate the amount of water lost through leaky faucets (http://www.awwa.org/awwa/waterwiser/dripcalc.cfm). There is really no downside to including these links on the Helena Public Works site, but it is unclear what these pages might offer over the possibly dozens of other sites that could also be provided and might be more relevant to the home- or business-owner.

Although not codified within a regulatory framework, Helena's Growth Policy is supposed to include a comprehensive public information program governing landscape practices such as xeriscaping and composting (2001 Growth Policy Update). However, it doesn't appear as if this action from the Growth Policy was ever initiated, much less completed.

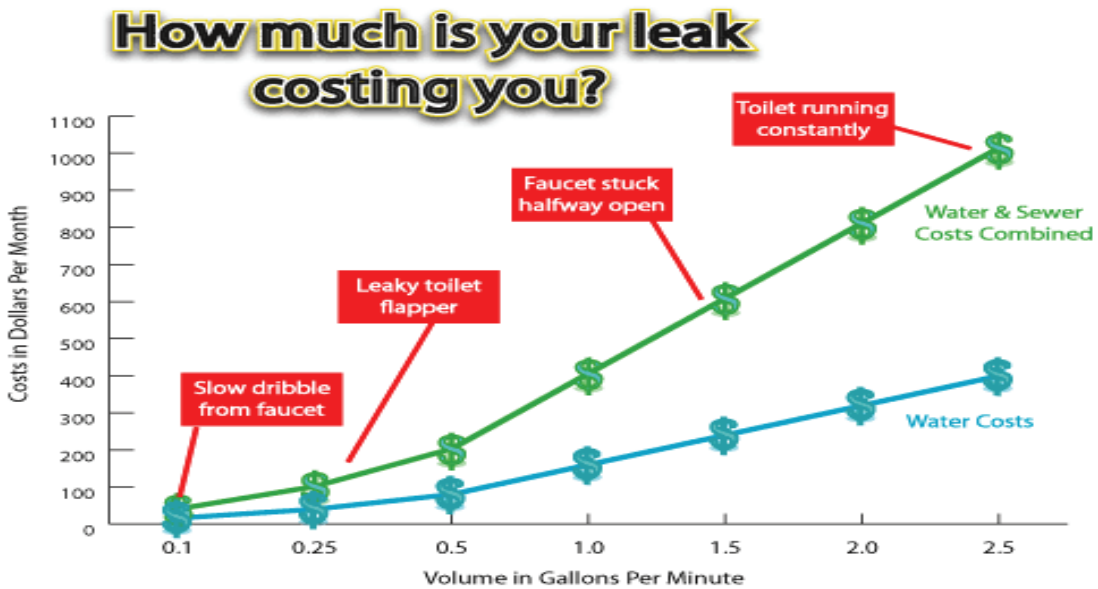
There is a lot of opportunity for the City of Helena to provide high quality, easy-to-find educational information and programs to residents and visitors. The examples provided above concerning the city web site illustrate one simple and inexpensive option. A stand-alone water conservation site should be developed that is obvious to the casual user and contains not only tips, guidelines and links to other valuable sites but also specific information about Helena programs, regulations, landscaping, irrigation, incentive programs and awards. Some possible educational options for the City to consider are identified in the following sections.

Educational Programs

Water Conservation Web Site Development

There are numerous reasons to create a water conservation page, with myriad sections and sites and links, on the City of Helena web site. First and foremost, use of the internet continues to increase, and Helena should promote citizen viewing of the web site as an inexpensive means to transfer information about the City. However, if water conservation is to be an important priority within Helena the site needs to be 1) easy to find, 2) easy to navigate, and 3) informative. The first two elements can more effectively be addressed through Helena's web program administrator; however, we would highly recommend that a water conservation web page not be unintentionally "hidden" within successive layers of Public Works programs. Rather, a water conservation web page could be part of an overall Sustainability or Climate Change or Energy Conservation header that, ideally, is shown on the home page as a first-tier header, or a first-tier header within the Helena Utilities section. The Eugene Water and Electric Board site is an example of a page with obvious emphasis on conservation measures and sustainability (see www.eweb.org). ***The working group recommends Web site as an immediate action item. Primary cost is labor, through existing City staff or contracted labor. ~$10,000.*** Potentially useful features shown on the EWEB page or other sites include:

Water Conservation is provided a prominent heading, equal to water quality and water rates (the EWEB Water Conservation Site is http://www.eweb.org/content.aspx/0e75d4f0-d7e0-4bb6-b0ca-f1244906af60;



Austin, Texas provides another example at http://www.ci.austin.tx.us/watercon/;)

Consumer tips in the form of highlighted text or separate pages, such as Finding and Fixing Leaks, Preventing Frozen Pipes, Finding and Reading a Water Meter, Developing a Water Budget, Low Water Irrigation Practices, Watering Recommendations, Rebates/Incentives for Low Water/High Efficiency Plumbing Fixtures, and so forth.

Links to other useful sites (some of these are listed in the reference section).

Easy-to-follow figures (such as a drawing of where water meters are normally located); diagrams (for example, a schematic of a toilet system to illustrate possible leak points, such as the flapper valve); and charts/graphs showing useful (precipitation trends, for example) or informative (such as water conservation goals for the City and progress toward achieving them) information. For example, the City of Austin, Texas includes this simple chart in educational materials and on the water conservation/rates web site:

Landscaping

Educational programs have proven highly effective for introducing homeowners and business owners to low water and xeriscape practices applicable to a city's unique climate and soil conditions. The following suggestions, based on discussions with staff from other cities considered in this research, are all recommended for development and implementation:

COLLABORATIVE LANDSCAPE PROGRAM.

One of the challenges with water conservation programs are they necessarily cross into many departments and programs. Initiation of low-water (or Lush and Lean) landscaping would need to involve utilities, parks and recreation, planning, and possibly permitting departments. Additionally, private vendors and educational institutions can offer significant resources and expertise. Austin, Texas has attempted to minimize confusion and bureaucratic redundancy by establishing a separate "GreenGarden" program that is a collaboration of five different city departments into one for education, consultation and advice. This program also serves as a clearinghouse for useful information and resources. An example of their approach to education and web-disseminated information may be found in Attachment A to this report and on the web at at http://www.ci.austin.tx.us/growgreen/. Recommended for long-term development and implementation. Funding would combine private and public sources.

PRIVATE-PUBLIC PARTNERSHIPS.

A number of cities have created partnerships with private industry to promote landscape education. The benefits are obvious, as landscape architects and landscaping service companies have expertise not readily available within Helena city departments. Private entities may develop materials for web site and print, put on workshops and seminars, and serve as advisors on appropriate boards and steering committees. In return, they presumably receive good exposure and advertising. Eugene and other cities work closely with extension services and universities. In Tucson, the SmartScape landscape program is contracted out to the University of Arizona extension service, and adult landscape classes are reported to be almost continually full. The program includes a professional certificate series of two-hour workshops designed to encourage consistent horticultural practices compatible with the urban Sonoran Desert. This professional series is directed at "Green Industry" workers (landscape designers, property managers, planners, nursery personnel, etc.) who are responsible for planning and maintaining urban landscapes. Certificates are awarded. Recommended for long-term development and implementation. Costs to the City minimal. (http://www.ci.tucson.az.us/water/smartscape.htm)

DEMONSTRATION GARDEN.

One highly visible method of educating residents about landscaping and water conservation is for the city to develop a demonstration garden. A number of cities are undertaking this effort, as it not only informs visitors about proper landscaping for a particular ecological niche, but also serves to illustrate the government commitment to water conservation. Missoula has a demonstration garden. Salt Lake City is developing, in partnership with private entities, a demonstration plant garden with emphasis on native plants and drought resistant species. Signs and other educational tools will be incorporated. Recommended for immediate development and implementation. Cost to the City would be low, primarily labor to work with private vendors in site design and oversight. (http://www.ci.slc.ut.us/Utilities/conservation/images/plantingplan.jpg) (Note: Salt Lake City is also reportedly developing a video program on conservation landscaping that can be downloaded from the internet.)

LANDSCAPE EDUCATION THROUGH REGULATION.

Educational programs are typically voluntary in nature, but one regulatory program has been developed to ensure that the public is exposed to low-water landscape principles. Santa Fe requires that retail plant nurseries provide their "end-use customers" with city-developed literature and regulations at the time of sale. For example, low water use landscape literature and water efficient irrigation guidelines must be provided at the time of sale of any outdoor perennial plants. Customers purchasing turf or grass seed or sod must be given city-provided literature indicating the restrictions to planting water consumptive turf. In addition, landscape contractors, maintenance companies and architects must provide their prospective clients with city-provided low water use landscape literature and water efficient irrigation guidelines at the time of presenting a service contract to the prospective client.

RECOMMENDATION:

Short-term development of educational materials and voluntary distribution by businesses, city staff, and others. Implementation as a regulatory requirement would be dependent on success of voluntary program. Cost of voluntary program would be primarily labor (for material development) and other minor direct expenses for printing.

WEB SITE.

The benefits of a good web site were previously described. Some of the landscaping-related information that could be posted on a web site include: Self audits, Compost programs, weather station info, summer watering rules, watering tips, irrigation specifications, and sprinkler testing guide, plant guides, and soil testing instructions. *Recommended for immediate development and implementation.*

City-Sponsored Education.

As was mentioned earlier, the Water Quality Protection District has educational programs for a few different constituencies, and a particularly-applied curriculum on water quality for 4th and 5th grade science students (the Water Watch program). Little else is offered by the City of Helena, and water conservation receives minimal attention. A number of cities have put together conservation-focused educational programs through their utilities, water, and/or sustainability programs. Options include workshops, seminars, collaborations with schools and universities. Development of educational programs would require a consistent commitment from the City and is recommended for immediate funding to allow implementation as a permanent, long-term project. Following are some examples of activities that could be contained within the education program.

SEMINARS AND WORKSHOPS.

Austin offers free WaterWise seminars to the public about every two months, with each seminar directed at one conservation tool or topic (irrigation, soil testing, leak detection in plumbing, etc).

SCHOOL CURRICULA.

Many cities have developed their own educational programs on water conservation for area schools, or have helped to sponsor curricula prepared by educators. Austin offers a number of such programs. One example is the "Dowser Dan Show" for assembly-type performances to children in 1st through 4th grades. Actors play a rotating cast of colorful characters who teach students about the water cycle, water pollution, and water conservation. With an annually-changing theme, bright costumes and upbeat music, the Dowser Dan Show has been running for fourteen seasons and is provided to schools free-of-charge by the city water utility.

Another resource prepared by the Austin water utility is the "Water in Our World" program for 5th grade students. This free program is a curriculum that includes a teacher's book, student books (in English and Spanish), videos about local water resources and supplies for projects and experiments. The unit is flexible: Chapters may be taught independently or in any order. Teachers using the Water in Our World course are offered a stipend to attend the required one-time teacher training session.

PRE-ADULT SCHOOL PROGRAMS.

Tucson Water authority offers a variety of in-class and guided tour programs tailored to all grade levels. These free programs provide age-appropriate lessons and interactive activities on water conservation, water supplies and water quality. Santa Fe's sustainability program has identified an ambitious educational goal to develop educational resources for climate and sustainability education. To achieve that goal the City will conduct a community-wide asset mapping of organizations and resources for climate and sustainability education at all levels e.g. informal and formal, K-12 and post secondary etc. and identify goals, objectives, funding sources and timeline for existence of such programs or assets within year one of this Plan (see Santa Fe's Sustainability Plan at http://www.santafenm.gov/index.asp?NID=1369/).

ADULT SCHOOL PROGRAMS.

Tucson offers the Project WET teacher training program and a summer internship for teach training in water conservation programs http://www.tucsonaz.gov/water/education.htm. San Antonio, Texas Water Services has created a partnership with University of Texas at San Antonio that awards grants and partnerships to students for work in their conservation programs. Eugene, Oregon has established a long-term relationship with the University of Oregon Climate Leadership Initiative.

COMMUNITY ACCESS TV

Helena has an incredible resource for education in the form of community access TV (HCTV). Videos on water conservation could be shown, and a city-sponsored, regular programming forum developed to discuss water conservation (and other sustainability topics).

IN-HOME/BUSINESS AUDITS AND ADVICE.

A number of cities conduct free home and business audits of water systems. The purpose of an audit, from the municipal perspective, is three-fold. First, it allows for inspection of a plumbing and irrigation system to identify leaks and immediate water saving measures. Second, it provides an opportunity to identify conservation measures that could be employed to reduce consumption, and save money and energy. At the time of the visit, the utility representative can distribute educational materials and even provide inexpensive water-saving components such as low-flow showerheads. Finally, on-site audits are an excellent educational and relationship-building tool between the municipality and customers of the water utility.

A major component of the audit-education program for some cities, such as Tucson, is on irrigation and management of water use, particularly with peaking loads and adjustments. Some businesses consume huge amounts of water in their production; this may not be the case for Helena, but an initial step would be to identify the top water users and conduct water conservation audits tailored as much as possible to their processes.

Not all cities provide water audits, although most are convinced of the multi-purpose value of such a program. In fact, Eugene Water and Electric Board discontinued their residential audit program (which had run for approximately 10 years) because, in part, their other educational initiatives have been so successful. In particular, EWEB's Green Grass Gauge campaign has widely accepted and used in the community as an effective tool to residential irrigation practices (http://et.eweb.org/et/jsp/process). Other educational programs on the EWEB website (undergoing formatting and location changes at the time this report was being prepared) report high internet visitation and increasing popularity. Nevertheless, even EWEB still conducts at-home consultations when requested, and they maintain a commercial irrigation audit program during the summer with temporary employees, usually hired through a college intern program.

Tucson has developed an extensive, free residential water audit program that gives customers an individualized survey of the water use in their home, and provides them with the tools and information they need to lower their water use and their water bills. Attachment B to this report includes a description of the steps conducted in Tucson's "Zanjero" program.

We recommend the City immediately begin to establish a water use and conservation audit program, with targeted implementation in the near future.

AWARDS.

There is no question that public recognition of water conservation programs can be an effective component of education and create an additional participation incentive. Most cities surveyed have created awards for water conservation, ranging from "conservation teacher of the year" to "conserver" awards for both business and residents. Tucson has created the WaterSmart Business Program. Participating businesses will conduct a self-audit

of their water use practices; develop a water management plan; and create a water budget. The city recognizes those for incorporating conservation best practices at the Copper, Silver, Gold and Platinum levels, depending on the level of water saving devices and practices used. Recognition and incentives (beyond the obvious monetary savings to the business) may include signs, plaques, advertising logos, discounts, networking opportunities, expedited permit reviews and possibly variances from future water restrictions.

For the past 12 years San Antonio has distributed WaterSaver awards recognizing local companies who have taken a leadership role in water conservation efforts. Measures demonstrating direct water conservation, innovative use of education or technology, or providing leading-edge water use models for industry are considered. Some examples of projects which may be submitted include:

- Noteworthy water conservation measures that have resulted in quantifiable water use reductions.
- Permanent structural changes, such as upgrades in facility systems, toilet retrofits, and landscape conversions, with associated demonstrable water use reductions.
- Changes in operational or behavioral practices, such as regular monitoring of water consumption and regular inspections of water using fixtures and systems that result in quantifiable water use reductions.
- Facility designs which emphasize water conservation and/or incorporate innovative water saving methods.
- Comprehensive employee water conservation education initiatives, school curriculums, or tenant education programs.
- Use of recycled, reclaimed, or harvested water to replace potable water.
- Development and/or promotion of technologies which have led to quantifiable water use reductions by those implementing the technology.
- San Antonio has also instituted a similar award that provides recognition for nonprofit, educational and neighborhood organizations that have demonstrated leadership in water conservation.

The working group recommends the City develop a water conservation recognition and awards program, with targeted implementation in the mid-term.

6. Signs and Literature.

Previously described in the section on regulatins, water conversation signs are used in some service industiries to inform patrons of water practices (i.e., water served druing dining only upon request). Signs also serve as educional tools, explaining to customers why waer conervation is imortant at the local and gloval levels, and how a particular business or public entity intends to help achieve sustainability goals. Posters and signs in kitchens, break rooms, laundry facilities and other work areas are valuable tools to educate employees about water conservation measures, such as turning off water while washing hands and disheOther forms of literature including handouts can serve a similar purpose as that described for landscape education. Another example would be developed by the City and distributed by title companies and realtors to inform property buyers of water conservation measures and requirements. City services such as the planning or permits department can also distribute handouts to customers.

The working group recommends the City develop a voluntary sign and literature component to the education program; required signage would be implemented if voluntary education efforts are not sufficiently used by businesses.

The internet has numerous vendors supplying water conservation signs and posters, and many cities have posted their literature on line. We recommend that Helena provide literature, signs and posters to the private sector, but opportunities for public/private partnerships in this area are many and could include:

- Restaurant/bar sector – work with local restaurants to develop signs/posters for placement in kitchens, bathrooms, and placards for tables.
- Hotel Industry – signs/posters for kitchens, laundry facilities and bathrooms. Placards for lobby and hotel rooms.
- Real Estate Industry including Lenders and Title Companies – literature for distribute with property information
- Helena School System – Posters for kitchens, break rooms, bathrooms
- Public sector including government offices, transit facilities, parks.

7. Regulatory Measures

DESCRIPTION.

Regulatory measures incorporate water conservation practices that are required by ordinance, code, or other statutory mechanism employed by a local government. Based on a limited review of cities and counties, regulatory measures have most often been adopted for a relatively rapid response to a water "emergency," such as a widespread and long-lasting power outage, or loss or contamination of a supply reservoir. Helena, for example, has some limited code providing authority to implement water use reduction stages in response to reduced supplies or emergencies. Many communities have also codified conservation measures because of developing concerns with their water supplies, typically depletion of ground water or surface water resources due to excessive withdrawal for growth as well as reduced supply recharge exacerbated by years of drought conditions. Fewer communities have allocated meaningful resources to enforcing water conservation codes, although some have established substantive penalties for violations and a few have created seasonal or full-time positions charged with community education and enforcement ticketing.

Examples of water conservation measures aiming at permanent changes in water use (as opposed to emergency measures) at the community-level are most pertinent for consideration as part of Helena's planned response to changes in our climate in that 1) Helena's population will continue to grow, and 2) our climate is likely to become warmer and potentially more arid. Recommendations for water conservation regulations could be coordinated with temporary or permanent incentive measures to further encourage participation.

None of the communities canvassed had developed water conservation strategies as a primary response to climate change concerns. Rather, communities initiated conservation measures for the reasons given above and have recently been adapting or even adopting those programs into a larger sustainability strategy. Eugene is an example of a city that is, through their Sustainability Commission, developing initiatives that will probably include regulations/ordinances for carbon footprint emissions.

RELATED CITY OF HELENA ACTIONS

Helena has adopted few ordinances related to water conservation. The water regulations of Helena City Code at Title 6, Chapter 2 provide for a water use reduction staging plan that can be voluntary or mandatory (see §6-2-3, Rule 8). Stage 3 applies when reservoirs are less than 70%, continuing depletion of supplies, peak demands for water at or near capacity, major power failures, and other scenarios. This stage includes mandatory watering and irrigation restrictions. Stage 4 requirements are imposed during a water supply emergency (various scenarios could apply) and prohibit any water use except for drinking water and sanitation. Penalties for violation may include civil penalties that get larger for multiple citations; and potentially disconnection of water service.

Two non-emergency, conservation-related ordinances are on the books. The Water regulations prohibit leaving water fixtures and pipes in a leaky condition, or letting fixtures run when not being used for the purpose intended (see §6-2-3, Rule 17). In addition, the Plumbing Code at Title 3, Chapter 7 includes an allowance for the use of non-water urinals (see §3-7-1E).

Finally, although not codified within a regulatory framework, Helena's Growth Policy is supposed to include a comprehensive public information program governing landscape practices such as xeriscaping and composting. (2001 Growth Policy Update) However, it doesn't appear as if this action from the Growth Policy was ever initiated, much less completed.

Regularoty Options

BUILDING CODES AND DEVELOPMENT REGULATIONS

These measures are designed to ensure that new buildings and substantive remodels of existing buildings are designed to use water efficiently, with minimal waste. Items (a) and (b) below represent approaches that other cities have pursued in the adoption of water conservation building codes.

DUAL METERING SYSTEM FOR NEW DEVELOPMENTS AND RETROFITS

Most new developments of residential or commercial facilities would be required to install two water meters so that irrigation can be monitored separately from indoor, potable supplies. A dual meter system has a number of advantages, including: 1) allows irrigation water consumption to be tracked separately from potable supplies, providing better information to owners and the city concerning water use practices, 2) accommodates a variable rate structure that distinguishes between, for example, lawn watering and irrigation vs. domestic

charges, 3) would be more adaptive for future "purple pipe" installation. This regulation would be appropriate as a requirement for incorporation [annexation?] into the city. Retrofit construction involving plumbing permits could also be incorporated into the ordinance. (Related ordinances include Tucson 2008 and Denver 2008, Chapter 15.)

WATER CONSERVING FIXTURES FOR NEW DEVELOPMENTS AND RETROFITS

All new developments of residential or commercial facilities would be required to install/replace plumbing fixtures demonstrated to be water conserving and/or energy efficient. The "demonstration" of plumbing fixture efficiency would be through one or more of a variety of certification programs, such as those that carry an EPA WaterSense Label verifying that it meets minimum flow and/or efficiency criteria (http://www.epa.gov/watersense/index.htm). Code could be written to require that water conservation systems are installed and certified by a licensed contractor[2] no later than the time of final plumbing inspection. Alternatively, city inspectors could provide the necessary certification during final inspection. Either way, final city approval of the construction or retrofit would be contingent on meeting the conservation criteria. Numerous examples of such regulations may be found, including Santa Fe 2008; Albuquerque 2008; Austin 2008; Tucson 2008. Water conserving fixtures may include:

- Water closets. EPA estimates that toilets account for about 30% of residential indoor water consumption.
- Newer, low flow and high efficiency toilets use not more than 1.2 gpf. Numerous manufacturers have developed toilets that meet EPA's WaterSense criteria (see http://www.epa.gov/watersense/pp/find_het.htm)
- Urinals. Of the estimated 12 million in the U.S., EPA estimates that 80% are inefficient and use more than the federal standard of 1.0 gpf (EPA 2008). The California Urban Water Conservation Council developed a standard for high efficiency urinals of $\leq$0.5 gpf (including non-water urinals).
- Lavatory and kitchen faucets. EPA estimates that faucet flow accounts for more than 15% of indoor household water use. Efficient sink faucets and aerators can reduce a sinks water flow by more than 30%.

Metered faucets are automatic and distribute a fixed amount of water once initiated, such as those installed in airports that are triggered by movement of hands in the sink. A water conservation feature is to limit metered faucets in facilities that serve the transient public to 0.25 gallons or less per use.

High efficiency washing machines are designed to conserve save considerable quantities of indoor residential and commercial (i.e., laundromats) water and save energy. The California Urban Water Conservation Council estimates that these devices use 35 to 50% less water and 50% less energy than conventional models (see http://www.cuwcc.org/smartrebates-res-fixtures.aspx) Ratings developed by the Council or U.S. Department of Energy could be used as criteria.

IRRIGATION AND WATERING.

Most property owners do not follow or necessarily even understand irrigation practices that are compatible with our altitude, climate, and typical vegetative covers. Regulations and restrictions on irrigation water are potentially valuable methods of water conservation because they establish maximum watering limits. Further, irrigation regulations are well adapted to address some of the supply conflicts associated with reduced water consumption (i.e., loss of revenue that may be necessary for infrastructure operation and maintenance) since they effectively reduce water use during peak summer demand times. Imposition of irrigation regulations may have other benefits for property owners, particularly for new development landscaping, as they would encourage more emphasis on drought-tolerant landscaping.

IRRIGATION SCHEDULES.

Many cities have codified irrigation schedules to adjust demand times (i.e., reduce peak loads) and also increase irrigation efficiency, typically by prohibiting irrigation and lawn watering during the hot daylight periods (say, from 10:00 a.m. and 6:00 p.m)(Santa Fe, Albuquerque, Denver). These prohibitions may be in place year long or just imposed during the growing season. Often exemptions are included to allow manual watering, landscape stock at nurseries, and water removal from irrigation ditches. Additionally, some special circumstances may require exemptions, such as athletic fields used in the evening hours and golf courses. Another component may be to limit spray irrigation to a maximum of 3 days per week (usually odd/even based on property address).

2 Water conservation features would not necessarily have to be installed by a licensed contractor for retrofits. However, the certification would have to be conducted by a licensed professional.

LANDSCAPING.

Many communities have adopted landscaping programs, ranging simple (plant lists and contractor referrals) to comprehensive educational programs (showcase gardens, software, partnerships with colleges). Fewer have adopted regulations governing landscaping[3] but, based on the research done for this analysis there is a trend toward regulation of appropriate landscape communities. Concerns raised about landscaping regulations include:

A tendency toward complexity, with city code attempting to anticipate the myriad of landscape problems including property size, aspect, weather, soil types, landscape function, and so forth.

Inequitable application, in that residential "grass" landscapes are often most easily targeted for elimination, but business, industry, and government landscaping may have far greater net benefits.

A need to avoid "aesthetic" regulation; in other words, government should not be dictating landscape requirements based on appearances, only on energy use/conservation and public health, as appropriate.]

Salt Lake City has considered but not yet adopted landscaping regulations, in part for the reasons above but also because of inherent public sentiment toward green-lawns. However, the benefits of low-water landscaping are obvious. In Denver, traditional landscapes, reliant on cool-weather turf grasses and high-water demand species combined with inefficient irrigation systems and unimproved or poor soils, "have been documented as using between 20 and 50 gallons of water per square foot each year, far beyond the recommended 18 gallons of water per square foot of landscaping each growing season." (Denver 2008, Ch. 14, Sec. 57-100).

Possible landscape regulations include:

PLANT LISTS.

Many communities have published lists of plants that are suitable for use in landscaping. Some communities codify these plant lists, and require their use in new and retrofit landscaping. Eugene has modified this to include code concerning the removal of non-native plants and emphasis on the use of native plants in landscaping. An additional level of regulation to consider would be to prohibit the use of invasive species and non-native plants. For example, Russian Olive (Elaeagnus angustifolia) and Salt Cedar (Tamarix spp.) may not be sold or installed within the Santa Fe city limits because of their classification as noxious weeds. Albuquerque regulates landscaping on public properties, and requires the use of low and medium water plants on 100% of public properties except for golf courses and parks.

PROHIBIT RESTRICTIVE COVENANTS THAT REQUIRE THAT ANY PORTION OF LANDSCAPING BE TURF (GRASS).

Kentucky blue-grass and some other turfs are water intensive compared to native grasses, and generally not well suited to the Helena climate. Denver regulation prohibits any restrictive covenant or any amendment to a restrictive covenant that becomes effective on or after May 1, 2002, and that requires cultivated vegetation on property maintained by an individual property owner, *shall not* specify that any portion of the vegetation must be turf grass.

DISTRIBUTION OF EDUCATIONAL INFORMATION.

Educational programs are typically voluntary in nature, but one regulatory program has been developed to ensure that the public is exposed to low-water landscape principles. Santa Fe requires that retail plant nurseries provide their "end-use customers" with city-developed literature and regulations at the time of sale. For example, low water use landscape literature and water efficient irrigation guidelines must be provided at the time of sale of any outdoor perennial plants. Customers purchasing turf or grass seed or sod shall be given city-provided literature indicating the restrictions to planting water consumptive turf, per Chapter XIV. In addition, landscape contractors, maintenance companies and architects shall provide their prospective clients with city-provided low water use landscape literature and water efficient irrigation guidelines at the time of presenting a service contract to the prospective client.

ENFORCEMENT AND PENALTIES

Helena has established criminal and civil code, and the incorporation of water conservation enforcement provisions into that code should be developed with administrative, legal and police staff. The following provisions from other cities are provided for information and a sense of how water conservation measures can be enforced. In general, however, discussions with a limited number of staff in the cities with such provisions

3 Many communities have landscape regulations developed for purposes other than water conservation, such as requirements for planting in boulevards, vegetative mixes at intersections, landscape upkeep and so forth. This analysis refers only to conservation-related landscaping.

indicate that enforcement has in the past been limited, and is only now beginning to become commonplace. This points out a common recommendation that some mandatory water conservation measures, particularly those concerning irrigation practices and water waste, require citizen education. A phase-in period is recommended for accompanying educational programs concerning water conservation practices and new regulations to be widely distributed. In addition, it is recommended that criminal code be carefully applied, possibly only to repeat offenders or the most egregious circumstances. Denver initially implemented a time-of-day watering ordinance with criminal enforcement capability, but the judicial system did not support criminal penalties.

Use of an escalating penalty system, so that repeat violators pay increasing fines for each successive violation, with criminal penalties (for example, under negligence provisions) applied near the top of the system.

More stringent requirements and penalties for Large Users (in excess of 25,000 or 50,000 gallons day, or possibly an annual allotment)

Combine water conservation audit programs with enforcement capability. For example, allow water conservation staff to write tickets.

Develop a water conservation enforcement program similar to other "social" code systems. Tucson requires first-time violators of water conservation regulations to attend a Water Management Diversion Program training class.

COSTS AND FISCAL IMPACTS.

City costs to develop water conservation regulatory policies for new construction and retrofit buildings would initially stem from the rule-making process of developing and modifying city code. This effort would be expected to be relatively minor but involve administrative, legal and departmental staff time. A new water billing procedure (with separate accounting of irrigation vs. potable water) may need to be instituted. Developers and building owners would bear some added but minor construction cost to conform with the new code, for example the installation of dual water metering systems. The building and development regulations would result in some increased maintenance cost to the city, primarily in the tracking/billing of separate water meter systems. There should be little additional cost to enforce these regulations since the normal building and plumbing permit inspection processes would be used to check conformance.

TIME LINE.

The working group recommends that the City of Helena begin review of the regulatory options described in sub-sections 1 through 4 of this section as part of a five-year water conservation plan, and after selecting what it believes to be appropriate regulatory options, pursue the enactment of those as both the outreach and education and incentives programs come to maturity.

KEY CONSIDERATIONS IN THE ESTABLISHMENT OF A REGULATORY WATER CONSERVATION PROGRAM.

Because municipal regulatory programs can be sensitive, and at time controversial issues, the following suggestions for development and application of water conservation regulations may reduce the controversy in adopting regulations:

- Identify any impediments (infrastructure, legal, economic, political) first.
- All ordinances and initiatives should be checked against the reality of Helena's existing infrastructure. This is readily seen for programs involving, for example, new plumbing and irrigation systems, such as purple pipe.
- However, even regulations concerning irrigation schedules need to be carefully crafted particularly for large users, including public facilities that have relatively expensive infrastructure in place.
- Solicit ideas and initiatives from targeted user groups. For example, develop a landscape and irrigation working group to develop regulations such as plant list requirements, incentives for low-water landscaping, and irrigation schedules.
- Regulations should be based, to the extent possible, on *measurable* criteria developed to achieve long-range *goals*. Many cities have established specific water reduction goals. (For example, Albuquerque in 1993 established a goal of 30% reductions in per capita water use.)
- If there is doubt about the effectiveness of voluntary incentives and education programs for certain conservation measures, defer regulatory development until a determination can be made as to whether and how "success" will be achieved.
- Collect data to monitor program and regulatory effectiveness.

8. Watershed Protection

INTRODUCTION:

Management actions in the watershed, including the lack of actions, may affect both water quality and water quantity. Non-point source (NPS) pollutants are generated over extensive areas, concentrating in streams and lakes. The presence and character of vegetation affects water harvesting and infiltration, soil protection and erosion, filtration of runoff, and evapotranspiration, thus impacting water quality and quantity. Resilient watersheds are better able to absorb high rainfall or snowmelt events and better able to maintain groundwater flows during a drought.

The City of Helena obtains water from two watersheds: Ten Mile and Canyon Ferry. Tenmile is a relatively small watershed originating at the Continental Divide just west of town. It is contained within the Helena Lake watershed. Canyon Ferry is a large watershed originating at Three Forks where the Madison, the Gallatin, and the Jefferson Rivers join. Impacts to this watershed may originate at the headwaters of those rivers. Strategies for protecting the City's watersheds follow.

1. Develop TMDL and NPS Management

DESCRIPTION:

Total Maximum Daily Load (TMDL) and Non-Point Source (NPS) pollution management consists of assessing water quality measures such as sedimentation, riparian habitat, temperature, and other variables. A stream that fails to meet all water quality measurements is designated as an "impaired" stream, and the specific parameters that are not being met are known as "impairments." The assessment is followed by planning and implementation to address the identified impairments.

RELATED CITY OF HELENA ACTIONS:

The responsibility and authority for developing TMDL assessments and plans rests ultimately with the Montana Department of Environmental Quality, not with the City. The TMDL planning process was completed for the Lake Helena watershed in August 2006, of which Ten Mile drainage is a part. Personnel from the City Water Department participated to in the TMDL planning process for Ten Mile watershed.

The Lake Helena Watershed Water Quality Restoration Plan was the result of the TMDL process and consists of two volumes. Watershed Characteristics and Water Quality Status Review are found in Volume 1. Section 3.4.2.1 covers Ten Mile Creek from the headwaters to the Helena public water supply intake above Rimini; 3.4.2.2 covers Ten Mile Creek from the intake to the Helena Water Treatment Plant. Volume 2 covers water quality restoration approaches. Upper Ten Mile Creek above the intake shows no impairments; the reach from the intake to the water treatment plant show impairments for sediments and metals. The study concluded that "water withdrawals by the City of Helena affect the flow regime and sediment transport capacity of this segment." The City has made a tentative commitment to maintaining in-stream flows in Ten Mile Creek. Implementation of these tentative agreements is dependent on completing the planned upgrades of the Missouri River Water Treatment Plant and transferring to the Missouri River as the primary water source for the City.

The TMDL process for the Canyon Ferry watershed has not yet been started. The City should plan to be involved in that process, but, given that it does not control any of the land in the watershed and that its withdrawal is a relatively small part of the whole system, there seems little likelihood of direct actions the City can take to reduce non-point source pollution in the Canyon Ferry watershed. The City can and should advocate for whatever water quality controls seem in its best interest during the development of the TMDL plan.

PROJECTED FISCAL IMPACTS AND OTHER COSTS:

Completing the Missouri River Treatment Plant upgrades could be considered an indirect cost of implementing in-stream flows in Ten Mile Creek. Alternatively, the maintenance of in-stream flows could be considered an indirect benefit of those improvements that were undertaken for other primary benefits. The only known cost of participation in the Canyon Ferry TMDL process will be the commitment of City personnel time when the process gets underway.

TIME LINE:

Completion of the agreements for Ten Mile Creek in-stream flows can occur after completion of the Missouri Plant upgrades. The timeline for initiation and completion of the Canyon Ferry TMDL process is unknown, as it is not controlled by the City.

TASK FORCE RECOMMENDATION:

The working group recommends that the City complete negotiations for providing in-stream flows for Ten Mile Creek, and that it participates fully in the Canyon Ferry TMDL process.

2. Assess Stream and Riparian Conditions; Restore Where Warranted

DESCRIPTION:

This process is part and parcel of TMDL planning, and thus has already been completed for streams in the Ten Mile drainage. In the upper reaches, above the flume intake, stream cross sections were generally comparable to reference areas and the riparian area was in Proper Functioning Condition. The one exception was the area above the junction with Banner Creek where the width/depth ratio was high compared to the reference, and riparian areas were Functioning at Risk. In the reach between the intake and the treatment plant, stream cross sections were comparable to reference areas, and the riparian area was Functioning at Risk. This process has not been started for the Canyon Ferry watershed.

RELATED CITY OF HELENA ACTIONS:

The City has already started negotiating with the Environmental Protection Agency for the maintenance of in-stream flows in Ten Mile Creek, as referenced above.

PROJECTED FISCAL IMPACTS AND OTHER COSTS:

For the Ten Mile watershed, the costs associated with in-stream flows are indirect opportunity costs, as long as the Missouri River Treatment Plant is functioning at full capacity. Additional water quality improvements in the Ten Mile watershed may be obtainable, depending on the condition of riparian areas and stream banks on City-owned lands within the watershed, but the cost is not known at this time.

For the Canyon Ferry watershed, the time and energy costs by City personnel to provide political support to stream and riparian restoration are unknown. However, such investment will always yield benefits in terms of influence in the process. The City probably cannot afford *not* to be supportive. Financial costs are unknown, and depend on which restoration projects are proposed and approved for various lands, and to what degree the City decides to contribute (if at all). The City will need to pick and choose carefully among projects if it decides to pursue this strategy, as some may yield measurable results (i.e. sediment reduction, increased in-stream flow, etc.) that can reduce the costs of water supply and treatment, while others would have no direct affect on the City's water operations.

TIMELINE:

Unknown at this time; likely would occur over the next 5 years.

TASK FORCE RECOMMENDATION:

Work with the Ten Mile Watershed group and the Montana Department of Environmental Quality to discern the specific condition of riparian areas and stream banks on City lands in Ten Mile. Where warranted, develop ways to improve those conditions. This task would be well-suited to the City's Natural Resource Coordinator. [Does the city have a natural resource coordinator?]

Though the City has little direct control or authority in the watershed as a whole because it does not own much of the land, it should support any efforts to improve riparian and stream conditions in the Ten Mile watershed above the various diversions. Such support can be political, and could also possibly be financial. Funding for such projects is often available through state and/or federal sources. If matching money is needed to obtain state or federal grants for landowners to make improvements, the City may want to consider such financial support, depending on the costs and benefits of the specific project.

This option does not currently apply to the Canyon Ferry Watershed, as the TMDL process has not started and the City owns no land above the intake.

3. Manage Watershed Forests

DESCRIPTION:

Some communities have developed forest management plans for their municipal watersheds with an emphasis on forest health to limit severe impacts of insects, disease, and wildfire and to provide high quality wildlife habitat. Some examples are Hartford, CT, which owns approximately 30,000 acres, two-thirds of which are commercial forest lands, and Seattle, WA, which owns over 90,000 acres in the Cedar River basin. The Seattle Public Utility has developed a Habitat Conservation Plan to address declining populations of salmon, steelhead,

and other fish and wildlife species. Forest land management is one of three major components of the plan, and the upland forest management plan includes thinning and planting to restore desired structure and species diversity, plus road closures.

RELATED CITY OF HELENA ACTIONS:

In 2007 the City completed some thinning for forest health and hazardous fuel reduction on lands that it owns in the Ten Mile drainage. The project was stopped abruptly due to objections by the Alliance for the Wild Rockies.

Projected Fiscal Impacts and Other Costs:

The City can directly manage only the land it owns (approximately 600 acres) within the Ten Mile drainage. Depending on market conditions, the cost of forest treatments may result in a small net gain, a small net loss, or a break even. The primary non-financial cost to pursuing forest management on City-owned land is the potential for public controversy.

This option does not practically apply to the Canyon Ferry watershed, as the City does not own any forested land within the watershed.

TIMELINE:

The treatment plan that has already been developed for City-owned land could be dusted off and implemented at any time, given the political will. Developing the political will or a consensus among interested parties could take a matter of several months or many years, depending on the leadership provided.

TASK FORCE RECOMMENDATION:

The working group recommends that the City continue to pursue forest health thinning in the remaining untreated City-owned lands in the Ten Mile watershed. Managing this land for forest health and resilience is a positive step, and may encourage other landowners by example. With increasing impacts from mountain pine beetles, public sentiment appears to be more heavily favoring forest treatments for salvage and sanitation. Such treatments may be justified in order to recover some value from the dead trees, and for safety concerns regarding wildfire and potential injury from falling snags. Because there are multiple owners within the Tenmile Creek watershed, it will be important to engage those other owners in a collaborative effort to address the health of the entire watershed—see item 4 below.

4. Pursue a Watershed Plan Involving All Stakeholders

DESCRIPTION:

Including all landowners and interested parties (e.g. local, state, and federal government entities, private and non-profit groups), develop a comprehensive management plan for the entire watershed. Existing water quality [What about water yield? Management prescriptions can affect both timing and volume of flow. Given our charge, I would think we want to underscore the importance of protecting and improving the ability of the watershed to yield water for city use.] is only one aspect of such a plan; forest and riparian health, wildlife and recreation values, aesthetics, fire risk management, and risks of future disturbance can be integrated into one plan.

RELATED CITY OF HELENA ACTIONS:

The City passed a resolution calling for a Ten Mile Watershed Collaborative Committee on September 8, 2008. The committee is charged with making recommendations for sustainable forest and watershed management that will preserve and protect the City's watershed supply. That committee started meeting on November 20, 2009, and has formed working groups dealing with fire mitigation and water quality. None looking at the issue of yield?]

PROJECTED FISCAL IMPACTS AND OTHER COSTS:

Financial costs should be limited to little more than personnel time during the plan development phase. Environmental documentation, grant-seeking, and on-the ground implementation will likely result in additional financial outlays, but the extent is unknown at this time. When properly carried out, such collaborative efforts can often resolve long-standing disagreements over natural resource management. If the process is not managed properly or important stakeholders are not included, the process can result in hardened positions and entrenched impasse. A worst-case scenario typically degenerates to litigation.

TIMELINE:

The collaborative committee will terminate in September 2009. Assuming that the committee comes up with the desired recommendations, environmental documentation and implementation is likely to occur over the better part of the next decade.

TASK FORCE RECOMMENDATION:

The working group recommends that this process be given full support, and that the collaborative committee consider ecological health of the forest and streams, aesthetic, and recreational values when developing strategies for vegetation and watershed management.

References

In addition to the references cited above, the working group reviewed the following sources in its preparation of this report.

Conservation-based Rate Structure.

American Water Works Association: source of numerous studies on conservation rates and other information about water utilities accessed on November 24, 2008 - http://www.awwa.org/Resources/Waterwiser.cfm?ItemNumber=29269&navItemNumber=1561

Water Conservation Incentives Through Rate Structuring http://des.nh.gov/organization/commissioner/pip/factsheets/dwgb/documents/dwgb-26-9.pdf

From Georgia…provides a how to for water utilities to create a conservation rate structure: http://www1.gadnr.org/cws/Documents/Conservation_Rate_Structures.pdf

Good report from Washington: http://www.mrsc.org/Subjects/Environment/water/wc-ratedes.pdf

Briefing Paper: Summary of Current Water Conservation Practices in the Public Water Supply Sector of the Great Lakes-St. Lawrence Region -http://www.glc.org/wateruse/conservation/pdf/FinalDraftConBrief.pdf

Incentives and Rebates.

LANDSCAPING REBATES

http://www.ci.austin.tx.us/watercon/et_controller.htm.

http://www.irwd.com/Conservation/ETExecutiveSummary%5B1%5D.pdf.

http://www.pacinst.org/reports/las_vegas/LasVegas_Appendix%20A.pdf. (Study of SNWA rebate program 2000-2007)

INDOOR INCENTIVES AND REBATES

http://www.toolbase.org/Technology-Inventory/Appliances/horizontal-axis-clothes-washers (High Efficiency Washing Machines)

http://www.cuwcc.org/toilet_fixtures/Jordan_Valley_ULFT_Study_03-07-22.pdf. (Low-flush toilets as a source of water savings)

http://www.cuwcc.org/toilet_fixtures/Dual-Flush-Fixture-Studies.pdf (Cost-effectiveness of low-flush toilets)

http://www.sahra.arizona.edu/programs/water_cons/home/bathroom_shower.htm.(Low-flow showerheads)

(http://www.fypower.org/res/tools/products_results.html?id=100160.) (Low-flow showerhead efficacy)

Chicago Metropolitan Agency for Planning. Water Conservation BMPs: High Efficiency Clothes Washers, Ultra-low Flush toilets. April, 2008.

Water Conservation Coalition of Santa Cruz County, Rebate Programs. http://www.watersavingtips.org/rebate.html

EDUCATION AND OUTREACH

The WateReuse Association web site (www.watereuse.org) is an excellent resource for information about reclamation, recycling, and reuse of water in the U.S.

http://www.ci.slc.ut.us/Utilities/cs_water_conservation.htm

The Climate Leadership Initiative from Oregon at http://climlead.uoregon.edu/ has a variety of resources on water conservation and other programs.

Tucson, AZ 2008. Update to Final Water Plan: 2000-2050. City of Tucson Water Department. 89 pages.

Denver, CO. 2008. Operating Rules of the Denver Water Board. Effective August 1. Chapter 14: Water Conservation. Chapter 15: Drought Response

Santa Fe, NM. 2008. Santa Fe City Code, Chapter 25, Water. Amended through June 30, 2008.

Albuquerque, NM. 2008. Albuquerque Code of Ordinances, Chapter 6: Water, Sewers, and Streets, Article 1, including: Part 1: Water Conservation, Landscaping and Water Waste. Part 4: Water Conservation Large Users. Part 5: Water Conservation by Request. Part 6: Plumbing Fixture Retrofit on Sale
Austin, TX 2008. Austin City Code, Title 6 Environmental Control and Conservation, Chapter 6-4, Water Conservation.
U.S. Environmental Protection Agency (EPA). 2008. Notification of Intent to Develop Draft Performance Specifications for High Efficiency Urinals. May 22.
U.S. Environmental Protection Agency (EPA). 2007. Notification of Intent to Develop Draft Performance Specifications for Showerheads and Related Devices. August 30.
Helena, MT. 200?. Helena City Code, Title 6, Chapter 2, Water Regulations, and Rules Governing at 6-2-3 (See rules 8 for water use reduction staging plan, and rule 17 for water waste from leaking plumbing. Also, Title 3, Chapter 7 Plumbing Code).

REGULATORY MEASURES

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Albuquerque, NM. 2008. *Albuquerque Code of Ordinances, Chapter 6: Water, Sewers, and Streets, Article 1,* including:
Part 1: Water Conservation, Landscaping and Water Waste
Part 4: Water Conservation Large Users
Part 5: Water Conservation by Request
Part 6: Plumbing Fixture Retrofit on Sale
Austin, TX 2008. *Austin City Code, Title 6 Environmental Control and Conservation, Chapter 6-4, Water Conservation*.
U.S. Environmental Protection Agency (EPA). 2008. *Notification of Intent to Develop Draft Performance Specifications for High Efficiency Urinals*. May 22.
U.S. Environmental Protection Agency (EPA). 2007. *Notification of Intent to Develop Draft Performance Specifications for Showerheads and Related Devices*. August 30.
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OTHER CONSERVATION SOURCES.

Pacific Institute, Hidden Oasis, Water Conservation and Efficiency in Las Vegas. 2008.
Santa FE, New Mexico Ordinance No. 2008-3. Conservation Fee.
WaterSense. http://www.epa.gov/watersense/
City of Las Cruces Water Conservation Program. http://www.las-cruces.org/utilities/water-conservation/Water%20Documentation.html
Southern Nevada Water Authority Official Website: http://www.snwa.com/html/
Los Angeles Department of Water and Power Conservation Website: http://www.ladwp.com/ladwp/cms/ladwp001627.jsp.

Attachment A – *Austin Landscaping Page*

Tucson Water has resurrected the role of the Zanjero, the community water manager of the "old" Old Pueblo, to help Tucsonans manage the water use in their homes. The Zanjero Program offers residential customers with high historic water use an opportunity to have a **free** individualized water-use survey done at their home. The program is designed to help customers reduce water waste and lower their water bills. Here is a glimpse of the steps the Zanjero will take to identify water savings in a home.

Beginning the Survey

An inventory will be taken of all fixtures, such as the dishwasher, clothes washer, water treatment condition systems, and cooler. The water meter will be located and the volume recorded. The resident will be taught how to read the meter and use it to help detect leaks.

1. RECORD HOUSEHOLD INFORMATION.
2. INVENTORY FIXTURES AND RECORD:
   ___ dishwasher
   ___ clothes washer
   ___ garbage disposal
   ___ air conditioner
   ___ bottled water
   ___ gray water
   ___ water softener
   ___ cooler
   ___ hot water recirculator
   ___ carbon or reverse osmosis water filter
   ___ Locate meter, record information on audit form, and teach resident how to read meter.

The Indoor Survey

Next, bathrooms and the kitchen and utility room will be inspected for leaks. The flow rate of the toilet, faucets, and showerheads will be measured. Showerheads and aerators will be replaced free of charge if needed. Leaking toilet flapper valves will also be replaced.

1. Inspect bathrooms.
   ___ Drop a dye tablet into toilet tank to test for leaks.
   ___ Estimate gallons per flush of toilet and record.
   ___ Measure flow rates of showers and faucets and record.
   ___ Observe for leaks and record.
2. Inspect kitchen/utility room.
   ___ Measure flow rate(s) of faucet(s) and record.
   ___ Observe for leaks and record.
3. Conclude interior inspection.
   ___ Return to bathroom and observe for toilet leaks; record information.
   ___ Review and discuss interior inspection results with homeowner.
   ___ Replace showerhead(s) and aerator(s) as appropriate.

The Outdoor Survey

An inventory will be taken of features such as pools, misting systems, evaporative cooler, and greenhouses. An assessment of the landscape and an evaluation of any lawn areas will include measuring the flow rate of irrigated areas, checking pressure, and reading the meter.

1. Review General Characteristics with customer. Inventory and record:
   ___ pool
   ___ misting system
   ___ pets/animals
   ___ evaporative cooler
   ___ spa
   ___ fountain/pond
   ___ greenhouse
   ___ water treatment/softener
2. Inspect front/back yards.
   ___ Provide assessment of landscape type:
      ___ planting density
      ___ high/medium/low water use
   ___ Measure landscaped areas and record:

___ prepare sketch map of site
___ Assess irrigation methods and record.
___ Conduct flow test for each valve/station and record.
___ Conduct visual inspection for leaks, breaks, missing plants, runoff, etc., and record.
___ Evaluate lawn area(s) and record:
___ soil probe
___ rooting depth
___ soil type
___ measure flow rate for turfed areas
___ check pressure
___ flag sprinkler heads
___ conduct visual inspection
___ set up cups (if visual inspection OK)
___ run spray irrigation system
___ collect cup data
___ Record meter reading.

Concluding the Survey

The auditor will go over the survey results with the customer, suggest steps they can take, and leave a conservation information Packet.

1. Review landscape audit findings with homeowner.
___ Discuss irrigation scheduling theory.
___ Review irrigation system deficiencies.
2. Complete water audit review checklist.
3. Leave printed materials/information packet.
4. Conclude meeting with customer: record time out on form.

Scheduling an Appointment

Conservation surveys are available to residential Tucson Water customers.
You must be present during the two-hour survey.
To schedule an appointment, call the **Tucson Water Customer Service Office** at **(520) 791-3242**.

ATTACHMENT B

Options Deferred or Rejected

1. **Rain barrel rebates** (Santa Fe—See also James City, VA, rebate)

Description: Santa Fe offers a rebate of $30 on the purchase of a rain barrel. A Google of "rain barrel rebate" brings up dozens of cities offering these rebates in the past few years.

Discussion: As the outset, this rebate, which is to encourage the use of rain barrels to capture rain and use it on the garden, may raise water rights issues in Montana—Article IX, §3 of the 1972 Montana Constitution includes "atmospheric" water as part of the "waters of the state" subjection to appropriation for beneficial use. Short of a specific legislative exemption (of which there are none) this seems to require a water use permit for rain barrels.

In addition, for all the cities who have invoked this rebate, there is little to be found that discusses the efficacy of this rebate.

Recommendation: The legal question should be answered before any further effort is made to research this option. But given the questionable legality of this option, the working group recommends that, at this time, it be **Rejected.**

Sources:

Municipal Sources: Potential source of info on the performance of the option: Jim Harnum, Hamilton, ON, Public Works, ph. 905-546-2424 Ext. 4483;

Santa Fe, the water conservation office at (505) 955-4225] CO. may have addressed this issue**.**

2. Water Smart Car Wash Coupons (Las Vegas). If you use a Water Smart Car Wash, the water is recycled on-site or sent to a water treatment facility where it is treated and sent back to Lake Mead. Las Vegas offers a $2.00

discount coupon that can be presented to select car washes that recycle their water. This option might be best served by first surveying local carwashes, reviewing literature on the success of SNWA's program. **Deferred.**

3. **Irrigation Timers.** Irrigation timers automatically start and irrigation. Within that basic definition, however, there is a wide variety of timers. There are a number of studies that indicate that irrigation timers alone may often exacerbate over watering. It may well be that there is an irrigation timer system that will not have this result, but, within the time constraints of this task force, it seems prudent, for now to not actively pursue a rebate program that, if not carefully developed, could result in less conservation. **Deferred.**
4. **Turf Replacement Rebates.** See SNWA see also Prescott, AZ. See Pacific Institute Study above. The Pacific Institute study concluded that the SNWA landscape conversion rebate, from 2000 through 2007, had saved 13,914 af at a cost of $71,303,889. For Las Vegas, with water at a premium, this is a cost-effective program. See http://www.pacinst.org/reports/las_vegas/LasVegas_Appendix%20A.pdf. At least one study, which appears to have been heavily cited by the turf-growing industry, and which does not identify for whom it was conducted, concluded that turf replacement rebates are less effective than irrigation water management, and that turf replacement rebates were less cost effective than irrigation controller rebates. See Addink, **"Cash For Grass" A cost Effective Means to Conserve Landscape Water?** Because there appears to be some conflict as to the efficacy of these rebate programs, and because it appears to be a relatively costly program, a significant amount of inquiry should precede any decision to adopt such a program. **Deferred.**
5. **Water Smart Home Certification (Las Vegas).** According to SNWA, The Water Smart Home program promotes water efficiency by requiring homes built through the program to include water-smart landscaping and water-efficient appliances. Further, the Helena Building Industry Association appears to be taking some initiative on this issue—it is sponsoring a Green Building certification seminar in September 2008. While promising, this option should be deferred to allow for further inquiry of the HBIA (See Recommended Options, Community incentives, item 8. Further, it may well be appropriate to identify this as a priority in any follow-up of the working group work. SNWA initiated this program in partnership with the Southern Nevada Homebuilders Association. .SNWA asserts that a water smart home can save up to 75,000 Gallons over a home built ten years before the inception of the program. There may be a good opportunity for a public/private partnership working with HBIA, but it will take a substantial effort to develop such a program. **Deferred.**
6. **Hot Water Recirculation Systems.** (Santa Fe, Peoria, Las Vegas) In a hot-water recirculation system, a re-circulating pump rapidly pulls hot water from a water heater while simultaneously sending cooled-off water from the hot water lines back to the water heater to be reheated. In addition to having the convenience of hot water on-demand, the system conserves water and can save energy. One study has estimated that, at a minimum, a family of four may send as much as 12,000 gallons per year down the drain waiting for water to warm up. (see http://www.energy.ca.gov/title24/2005standards/archive/documents/measures/09/9_2002-03_UNDERSINK_HUTSLAR.PDF.) Hot water recirculation systems operate either by a manual switch or button or through a thermostatic control. The systems can range in cost from $400 to $700.. (See http://www.toolbase.org/Technology-Inventory/Plumbing/hot-water-recirculation; Also, http://www.greenhomeguide.com/index.php/knowhow/entry/1147/.) There appears to be a wide variance of opinion as to the potential energy savings from a recirculation pump (see http://www.builditsolar.com/Projects/Conservation/Recirc/RecircEnergy.htm. See also http://www.eere.energy.gov/buildings/building_america/rh_0704_home_improve.html. See also http://www.cuwcc.org/res_hot_water/PaloAlto_Hot_Water_Demand_Sept-2002.pdf.) In addition, automatic systems tend to be much more energy consumptive, while on demand systems are much less so. Id. (See also http://www.ornl.gov/~webworks/cppr/y2001/rpt/122464.pdf.) If the City of Helena were to consider offering such a rebate, it would do well to consider limiting such a rebate to the purchase of on-demand systems, in order not to undercut its energy efficiency initiatives. Another approach to the issue of hot-water waste might be through the promotion of conservation oriented placement of hot water sources close to the places of use in new buildings. (See http://www.ornl.gov/~webworks/cppr/y2001/rpt/122464.pdf.) Deferred.
7. **Reclaimed/recycled water (purple pipes)** (Lacey WA, San Jose, East Bay Municipal Utility District, Windsor CA, Rohnert Park CA). A number of communities, especially in California, that have water supplies that fairly routinely fall short of seasonal demand, have initiated some degree of municipal water recycling, or "purple pipe" programs (the "purple pipe" indicates that the water conveyed in those pipes is non-potable),

and restricted to certain uses. The rationale behind municipal water recycling programs is that any demand met by recycled water reduces the demand for high quality potable water. (See East Bay Municipal Utility District: http://www.ebmud.com/conserving_&_recycling/recycling/recycled_water/). While water recycling may be a viable opportunity for selected activities in Helena, the cost of excavating and laying parallel pipes in the city's delivery layout makes it impractical as a retrofit option. There may, however, be opportunities to bring recycling online for certain municipal facilities and for potential new development, or for existing or future industrial development. This would entail passing ordinances to require dual system piping in new developments. This approach has been common in California, (see League of California Cities, Recycling ad Reuse). In addition, there may be legal issues that attend the recycling of water that should be addressed. The level of background information and outreach necessary to realize those opportunities exceed the life and capabilities of the CCTF. Nonetheless, it may well warrant a close look as a long-term water savings option. **Deferred.**

8. EPA has published a notification of intent to develop water conservation criteria for showerheads, since showers account for approximately 17% of indoor residential water consumption. It is anticipated by EPA that the maximum flow rate for WaterSense showerheads will be no more than 2.0 gpm, and probably not less than 1.5 gpm (the current federal standard for showerhead flows is 2.5 gpm (EPA 2007). ***Deferred until standards established.***

9. Cisterns, catchment basins, and rain barrels can be used to capture rain water and store it for use in irrigation (but not for potable supplies). Some cities in arid climates are requiring that new homes install water capture systems, which can be particularly beneficial as a conservation measure during peak water use times. The use of cisterns and rain barrels can be problematic, as individual homeowners require education and training to monitor and use water from these sources. Open containers and catchment basins can also provide habitat for disease-transmitting mosquitoes. As noted in the Incentives section, there are questions about the legality of such devices in Montana ***Rejected as a regulatory program.***

10. Irrigation System Standards. Regulations for new or retrofit development landscaping can be expanded to include requirements on irrigation methods, to discourage misters or sprinklers and encourage drip irrigation, for example, and even the size of areas allowed to be irrigated (as opposed to xeriscaped). For example, some cities (Tucson, Denver) have different irrigation regulations depending on the size of the property, and whether it is commercial or residential. One city reviewed places controls and restrictions on "narrow strip" (25 feet) irrigation. Depending on width, drip irrigation or low flow low angle spray nozzles are required. Albuquerque requires the use of shut-off nozzles on hoses used for irrigation and outdoor purposes, except for residential landscape irrigation. The scope of this type of regulation is broad and intensive to impose and monitor. It requires expanded effort and possibly expertise on the part of planning staff to knowledgeably evaluate building permit applications. In addition, permit compliance inspections would be more intensive. We believe this type of program is best implemented through education, possibly including partnerships with local landscape companies. ***Deferred to Analysis of Standards for Specific Conservation Devices.***

11. Grey Water and Treated Water Irrigation. May cities are now allowing the use of grey water, collected from a residence or commercial building, and treated water (usually municipal wastewater) to be used in irrigation. Both of these techniques can provide effective water conservation while serving other benefits. On-site collection of grey water reduces the disposal and treatment cost for a large amount of wastewater. The use of treated water (through a "purple pipe" network) reduces the amount of wastewater otherwise discharged to the environment and, in the case of Helena, may help city compliance with TMDLs established by Clean Water Act regulation. The use of treated water also reduces the demand for clean water; in other words, why spend so much money and energy cleaning all of our water to drinking water quality when so much of it will be used to water lawns, irrigate crops, and keep plants healthy? The main problem with a regulatory approach to the use of grey water and treated water for irrigation is infrastructure. In the case of grey water, buildings must be initially constructed (or retrofitted at even greater relative expense) with a separate plumbing network to keep waste water isolated from grey, irrigation water. Treated water is dependent on a city effort to install separate distribution pipe, plus a separate plumbing system at the user to keep treated water isolated and identified as irrigation only, non-potable. Both of these concepts are important to future considerations, however. One

first step for treated water is to mandate dual metering and irrigation plumbing systems at all new buildings (see previous section on dual metering under building ordinances). Grey water would require a similar commitment. As an example, Tucson's Water Conservation Plan Update 2008 recommends that the City adopt an ordinance requiring that all new housing be plumbed to accommodate separate grey water capture systems for use in irrigation. ***Deferred for future planning and evaluation, and potential consistency with Montana programs.***

12. **Limit the amount of Cool Season turf allowed per property.** Communities such as Santa Fe have regulatory limitations on the amount of "cool-season" (i.e., Kentucky blue-grass and like) turf allowed per property, including maximum slope restrictions and grassed lots (less than 1,000 sq. ft or 10% of lot size, whichever is less, for residential with slight differences for multifamily and commercial). Public and recreational facilities are not exempt from these regulations; Santa Fe allows the use of cool season turfs at parks and golf course, but only the minimum amount needed for active recreational use. There has been a mixed review about the enforceability of such regulatory limitations. The appropriate first step should be to first launch an education and outreach effort to inform people about the benefits of going to less consumptive plantings. ***Deferred.***
13. **Xeriscape Landscaping and Screening Ordinances**. Communities in arid locations tend to place an emphasis on low- or no-irrigation landscaping. Tucson has been applying xeriscape education to residents for years and has some ordinances that specify xeriscaping while incorporating needs for canopy (i.e., screening) trees and oases within lots. Xeriscape designs will become more common in Montana, although as yet it is not a particularly common practice. One problem with xeriscapes is they can require even more careful maintenance, particularly while plant communities are established, and even in cities with a history of this practice there are "brown" zones where residents and even landscapers do not plant or maintain properly. ***Rejected.***
14. **Develop Watershed Protection Ordinances. :** The state of Colorado allows local governments "to exercise regulatory and supervisory jurisdiction… over all streams and sources contributing to municipal water supplies for five miles above any municipal water supply diversion." Such authority does not exist in state statutes that would give the City jurisdiction over lands outside its boundaries. The only place it can exercise jurisdiction outside the city limits is on lands owned by the City (e.g. approximately 600 acres in the Ten Mile drainage). The U.S. Forest Service owns the majority of land in the Ten Mile drainage, and the federal government is not constrained on its lands by local laws, so even if the laws were changed to allow the local governments jurisdiction based on water supply diversions, such jurisdiction would only apply to private lands. Private residents are unlikely to capitulate to such an expansion of City powers without dissent. The county governments are also likely to take exception, as well. For Canyon Ferry Reservoir, five miles upstream from the intake still leaves the vast majority of the reservoir outside of the jurisdiction. Twenty-five miles would have to be included to be truly effective. Even if state laws were changed and effective ordinances passed, the political and financial costs of enforcement would likely be high. **Rejected.**

Appendix L
SUMMARIES OF SELECTED CLIMATE ACTION PLANS

Prepared by Els Van Woert

- Anacortes, WA (November 2006; Population in 2000 = 15,000)
- Aspen, CO (March 2005; Population in 2000 = 5,900)
- Boulder, CO (September 2006; Population in 2007 = 94,000)
- Bozeman, MT (May 2008; Population in 2007 = 38,000)
- Brattleboro, VT (October 2003; Population in 2000 = 12,000)
- Burlington, VT (March 2000; Population in 2000 = 39,000)
- Homer, AK (December 2007; Population in 2005 = 5,400)
- Salt Lake City, UT (website updated through 2007; Population in 2007 = 181,000)
- Seattle, WA (September 2006; Population in 2007 = 594,000)

Anacortes, Washington CLIMATE ACTION PLAN: November 2006 (44 pages)

- Tons of equivalent CO2 (eCO2) emitted in 2000: 172,537
- City population in 2000: 14,557
- Per capita carbon footprint in 2000: 11.9 tons

-Estimated population for 2010: 17,333

- Tons of eCO2 to be emitted in 2010 if trends are not reversed: 205,440
- Within the greater community, transportation (41%), residences (33%), commercial buildings (21%) and industry (6%) were the biggest polluters.
- For the municipality, water treatment and sewage (81%) was far and away the biggest polluting sector, followed by city buildings (8%), fleet (7%), and street and traffic lights (3%).

Goal:

- Emissions inventory was community scale and municipal operations. The stated emissions reduction target for the entire city is a 15% decrease in eCO2 emitted (below 1990 levels) by 2020 (scientific threshold is 60-80% below 1990 levels).

Major ideas:

- A target for the local government's emissions ought to be 2-5% of the community's (Anacortes' was 7%)
- The municipality ought to be a leader / role model in instituting change
- Changes will require financial investments, but will save and generate income as well
- The value of utilizing recycling to cut emissions, especially municipal
- Emissions ought to be tracked over time—Anacortes used 2000 and 2005 for comparison

Proposed solutions:

- #1 recommendation: full time resource manager position
- Green power purchase for the municipality and community
- Energy star education, incentives, municipal standards
- Community green power/trip reduction challenges/incentives/competitions
- Boost recycling efforts
- Covert computer screens from CTR to LCD in municipal buildings
- LED conversion for exit lights, building lights, and streetlights
- Vending machine controllers
- Hybrid public cars
- Biodiesel for city's diesel fleet (mowers, garbage trucks)
- More efficient/smaller sewage pump motors
- Sewage efficiency upgrades: smaller aeration blowers/sludge drier installation
- Ongoing community committee oversight with corporate and stakeholder liaisons
- Timelines/measuring results
- Incorporate study into city-wide planning documents

Aspen, Colorado "Canary Initiative" CLIMATE ACTION PLAN: March 2005 (35 pages)

- Population, emissions, emissions by sector:
- 2004 Aspen community emissions: 840,875 tons eCO2
- 2004 Aspen per capita emissions: 50 tons eCO2/person (more than 2x national average)
- Projected emissions 2025: 1,116,291 tons
- Emissions by source 2004: 1) General Aviation: Jets = 150,000 tons eCO2; 2) Commercial Air @ Aspen =
- 135,000 tons eCO2; 3) Holy Cross electric = 125,000 tons eCO2; 4) Highway Vehicles driving HWY 82 = 125,000 tons eCO2; 5) Kinder Morgan (gas) = 82,000 tons eCO2; 6) Air travel via other airports = 50,000 tons eCO2; 7) Tourist travel (driving) = 40,000 tons eCO2; 8) City Electric = 39,000 tons eCO2; 9) Highway Vehicles, Around Town = 35,000 tons eCO2; 10) AM Gas = 21,000 tons eCO2; 11) Landfill = 12,000 tons eCO2; 12) General Aviation (props) = 10,000 eCO2; 13) RFTA Buses = 3,000 tons eCO2.

Goals/ targets:

The city of Aspen has a legally binding commitment to reduce its governmental GHG emissions by 1% per year as part of the Chicago Climate exchange. Between 2005 and 2006, emissions from municipal operations in Aspen were reduced 11.5% below 2005 levels. Regarding community reduction goals, Aspen aims to reduce its emissions 30% (below 2004 levels) by 2020 and 80% (below 2004 levels) by 2050.

Guiding ideas/approach:

- The Aspen CAP directly assesses the energy intensity of the Aspen economy as well as the carbon intensity of Aspen's energy sources.
- The Aspen CAP believes that "it is crucial that we replace fossil fuel energy with clean, renewable energy sources such as wind, hydro, solar and biofuels… Investing in renewable energy today decreases emissions now, encourages development of better technologies, thus ultimately enabling us to achieve our end goal."
- The Aspen CAP noted that "Significant political and community will is needed if these goals and the challenges presented y global warming are to be met. Ultimately, meeting this challenge will be the direct result of individual action that drives a revolution."
- The CAP document outlines the city of Aspen's goals for addressing climate change and how to achieve them… but also considers the document a mechanism for monitoring progress and a guiding document. -4-step process: 1) a green house gas emissions inventory; 2) an assessment of climate change impacts; 3) creation of an action plan; 4) plan creation for regional, state, and national advocacy.

Proposed solutions:

- Policy, Research and Education: actively track GHG emissions, city-initiated funding mechanisms to reduce emissions (carbon tax, offset program with revenue dedicated to local reduction projects, increase paid parking rates, energy intensity billing for electricity & gas), city employee/department head global warming/ operational changes education, city department-based emissions tracking and reduction goals, review all city policies/programs in early stages of development to integrate emissions reduction goals, identify areas of economic growth in Aspen in order to anticipate and effectively target emissions reduction policies, implement/ support education/outreach programs to elected officials, general public, media, community leaders (emissions information on bills, public educational events, public meetings, city programs), provide teachers/students access to educational materials, create educational programs and challenges in local schools that advocate sustainable living and global warming awareness, provide tools to the community for individuals and businesses to estimate their own GHG emissions and make reductions (Energy Tracker available on website), encourage and support reduction efforts at local, state, national, and international levels (lobbying for policy changes, working with other cities), commit to a biannual progress report on community emissions reductions.
- Energy Efficiency & Buildings: city investments in all energy efficiency measures with simple pay backs of 10 years or less, require life cycle cost to be calculated in the city asset management program, develop and adopt energy and resource-efficient stands for all existing city facilities (city-funded retrofit projects to exceed International Energy Conservation Code [IECC] standards by 15%), require EnergyStar or equivalent products for new equipment, explore requiring city-funded audits of affordable housing units at the time of sale and improve units to EnergyStar level or higher, convert city streetlights and traffic signals to the most energy efficient technology…all where appropriate… require all new construction (commercial and residential) to be 50% more energy efficient that the IECC code by 2009, promote/expand local residential energy efficiency programs funded through the city, utilities, and CORE (community office for resource

efficiency) and expand financing for the purchase of energy efficient appliances, heating and cooling systems, weatherization services, and renewable energy systems (community-based outreach efforts to promote energy and water conservation and solid waste reduction and provide efficient building designs assistance/technical resources to Aspen residential developers, designers, home builders and residents), develop/implement a plan wherein Aspen housing/commercial units REMP (Renewable Energy Mitigation Program) requirements though on-site renewable energy and efficiency practices (effectively retiring the REMP in-lieu fee option within a 10-year period through incremental increases in the % of renewable energy requires and raises in the fee structure), increase energy efficiency requirements for all construction, encourage and incentivize existing buildings to reduce emissions 20% below 2004 levels by 2009, explore requiring an energy rating of residential properties at time of sale, explore requiring energy use per square foot benchmarking for commercial properties at time of sale/change of use/building permit application, assist small businesses, non-profits, and public agencies to gain access to energy efficiency services.

• Ground & Air Transportation: encourage alternative transit for city employee commutes and travel whenever possible, reduce miles traveled per city employee 10% by 2009 through teleconferencing/pedestrian and bicycle transit/carpool options/city car share program, improve public transportation frequency/convenience in the Roaring Fork Valley, expand the number of businesses that offer passes to all employees and tourists by 10%, encourage businesses to offer transit passes to customers/clients, encourage businesses to provide local group travel options, encourage employers who offer subsidized parking to employees to allow employees the option of "cashing out" if they don't require vehicle parking, extend/increase parking rates for single occupancy vehicles, investigate a city-wide residential parking permit and a state-wide registration fee based on vehicle GHG emissions (revenue to go towards reducing single occupancy vehicle use), advocate transit-based alternative to and from Denver that is competitive with the personal automobile, create city policy that establishes a minimum fuel efficiency for each class/type of vehicle purchased, require low or no eCO2 emissions technologies in city vehicles/equipment, educate city employees on fuel-efficient driving (no unnecessary idling), maintain EPA's "best environmental practices for fleet maintenance" or similar policy, strongly advocate raising the federal corporate average fuel economy standard, encourage community to use low or no eCO2 technologies in non-road vehicles/equipment (mowers, etc.), work to increase private citizen fuel efficiency through education and support programs to retire and recycle inefficient vehicles, continue to promote growth through redevelopment and infill that maintains or improves quality of life for existing neighborhoods, explore limiting development where alternative transportation options are not available, conduct a comprehensive inventory of GHG emissions for air travel of residents and visitors via Aspen airport, create and manage and voluntary carbon offset program for travel wherein funds will be invested in local emissions reduction projects, encourage the use of more fuel efficient jets, encourage visitors to use public or fuel efficient transportation into Aspen, explore new technologies for auxiliary power units and runway taxi energy use.

• Electricity: support environmentally responsible and sustainable energy sources such as solar, wind, geothermal, biomass, and small hydro… meet all growth in electricity demand since 2004 with new, zero-carbon dioxide electricity sources with an end goal of 100% renewable energy by 2015… create a plan for the city of Aspen to purchase 100% or close of it's electricity from renewable energy sources (reduce demand, install on0site renewable energy systems, in all new electricity contracts require 10% of the portfoilio to come from renewables, require any new coal power the city buys to be "clean" to encourage technological development in this area, explore opportunities to invest in new large-scale wind, photovoltaic, geothermal and landfill gas system projects), city to explore a "hot water" utility where renewables would heat water for space and domestic water use, landfill methane recapture projects, encourage local utilities to increase their renewable energy portfolios to 25%, include renewable resource requirements in utility franchise agreements, support the deployment of small-scale renewable energy systems in mobile applications, provide technical assistance to builders/developers to incorporate building-integrated passive solar design/solar water heating and photovoltaics, support a gradual increase in the state renewable percentage requirement standard.

• Waste Reduction and Recycling: track recycling practices/quantities at all city facilities, require all city-funded events to be zero waste, create a guide to zero waste for city departments, introduce city office compost bins, obtain reuseable amterials for small city meetings and functions, city to use at least 30% post-consumer recycled products, city to purchase printers/copies with duplexing capacity, duplexing the default city

computer/printer setting, recycled paper memos, city contractors/vendors to use recovered material and recycle responsibly, require all city construction projects use 10% recycled content or reclaimed products, compostable plastic/recycleable paper/reuseable bags at store checkouts, promote deconstruction (reused) materials for building projects, increase curb side/residential/commercial recycling, develop residential food and yard waste collection options, assist local businesses in implementing better solid waste/recycling practices, promote the reuse and recovery of electronic devices and increasing recycling capacity for these items, electricity generation from landfill methane capture, increasing the recycling rate by 20% from 2006-2009, decrease the amount of solid waste generated.

• Carbon Offsets & Local Energy: create a local carbon offset program wherein funds are invested directly back into your own community, explore requiring permitted events to reimburse all city departments for energy use and offset their respective emissions (and require permit applications to quantify projected GHG emissions), work with special events to mitigate their GHG footprint by purchasing offsets from the local program, educate city staff/community re: global warming impacts of the industrialized food supply chain and encourage the cultivation and purchase of locally grown foods (food transport is hugely energy intensive) through local food purchasing for city events, surveying local area for potential land for food cultivation, catalog what types of food are currently being produced locally and where, expand the community graden, incentivize local food cultivation to homeowners and businesses, create and maintain an online list of locally grown food and restaurants that buy local, provide an online resource that enables the public to quantify the carbon footprint attached to various foods, create a booth at the farmer's market for home grown food
-Create an adaptation plan (for responding to global warming impacts), track and measure GHG reduction results.

Boulder, Colorado CLIMATE ACTION PLAN: 2005 (70 pages)

Population, emissions, emissions by sector:

• Boulder's 2004 GHG emissions= 1.81 million tons eCO2: 51% electricity, 28% transportation, 17% natural gas, 4% solid waste… by sector: 30% commercial, 28% transportation, 17% residential, 15% industrial, 5% CU (Colorado University @ Boulder), 4% solid waste, 1% street lighting.

• Goals/ targets: Reducing community GHG emissions 7% below 1990 levels by 2012 (lowest target w/in Kyoto Protocol), which amounts to a 24% reduction in emissions between 2005 and 2012.

Guiding ideas/approach:

• Overarching vision is to create a sustainable energy future for Boulder and Boulder County that dramatically reduces GHG emissions from current levels…to protect the natural environment while fostering a livable, vibrant and sustainable community.

• The Boulder emissions inventory was completed in 2004; since, city staff members update the inventory on an annual basis inputting electricity and natural gas consumption, vehicle miles traveled, and solid waste sent to the landfill. The CAP is updated annually as part of the city budget process, and staff prepare annual reports that track emissions/program results.

• Three primary strategies for reducing emissions: increase energy efficiency, switch to renewable energy and vehicle fuels & reduce vehicle miles traveled.

• Historical emissions data was recreated for 1990-2002, and forecast into the future under business as usual circumstances. The inventory didn't cover emissions sources such as aviation or locomotive transportation, agriculture/manure sources, solvents, land use/forestry, most good bought or sold in the city, or industrial emissions not associated with energy. Renewable energy purchase / green tags are counted—for the city, and late for local businesses and individuals, as information is available.

• Estimated annual total budget to achieve reductions ranges from $860K in 2007 to $2 million in 2012 (marketing, outreach, subsidies for critical services such as energy audits)… in case of an emissions reduction shortfall, significant funding for renewable energy purchases may be required in 2012.

• Cited a Sierra Club report that included the following key elements of sustainable communities: leadership, a plan, funding, communications, training, inspections/ audits/ measurement, efficiency rebate programs, renewable programs, green building, multifamily building programs, income qualified programs, green roofs.

• What a sustainable future means for Boulder: more efficient and healthier buildings that reduce community

energy costs, multi-modal transportation systems linking neighborhoods and business districts, wide availability of sustainable products including green building materials/high efficiency building equipment and cars/alternative fuels/organic food/etc., renewable energy and distributed generation systems to hedge against energy price volatility and electricity and natural gas distribution system vulnerabilities, innovative social programs ensuring that lower-income residents benefit from the shifts and changes brought about by a CAP, a vibrant economy and skilled workforce base on the demand for and provision of sustainable products and services, a strong sense of community pride in the city's efforts to protect the environment from global warming impacts.

Current climate change mitigation actions:

• University of Colorado @ Boulder "blueprint for a green campus" with the target of achieving "zero or positive net impact on climate by the year 2025," no city-federal integrated program with the federal laboratories (influential atmospheric research labs), Public Utility Commission/local utility agreement to requires Xcel Energy to spend up to $196 million on electric demand-side management and energy conservation programs from 2006-2013 (rebates for commercial building energy efficiency with lighting/ cooling systems/motors/refrigeration updates…residential programs to date not yet finalized, and rebates for solar and other alternatives due to statewide renewable energy portfolio standard legislation).

• Funding in 2005/2006 through a trash tax increase generated $516,000 that was put towards commercial and residential energy efficiency programs, developing long-term funding and policy options, workshops/ outreach/marketing, public process/technical and peer review/ greenhouse gas inventory tracking systems/1.5 fixed term staff… lots more additional staff proposed and other funding proposals: energy efficiency and renewable energy enterprise and fee, annual vehicle sticker fee, extended trash tax, renewable energy mitigation program/fund, increase the development excise tax, energy use/carbon fee, square footage fee.

Proposed solutions:

• Energy Efficiency: Continue and expand "building performance with EnergyStar" program including annual building audits/benchmarking by city, help businesses/ industry/ residents receive federal tax credits and rebates from the local utility, create small business EnergyStar and PACE programs, offer technical assistance and workshops for business and property owners, education and outreach, work with property/business owners on leasing practices/barriers to energy efficiency, facilitate contractor and building professional training (and awareness of local utility rebates), work with Boulder economic council and planning/development services to create incentives for construction/remodeling of energy efficient buildings, recognize industries' and companies' commitments and results, develop green build strategic or master plan, explore regulatory options (more aggressive building codes/standards), create industrial energy users group to share expertise/ successes/lessons learned, 50% of industrial users to participate in local utility rebate programs (namely recommissioning), connect industrial users with external resources, facilitate energy service company projects and performance contracting in the Boulder market, support skill development for facility/operations managers, residential weatherization, city-sponsored low-income weatherization program, CFL giveaways, develop user-friendly website to educate residents on ways in which to reduce GHG emissions, distribute/ install conservation kits to 300 homes/year, support/implement family energy audit programs, work with local retailers/contractors to promote energy efficiency equipment/practices, explore bulk purchase/installation program from common energy efficiency materials such as insulation, establish a policy for minimum efficiency standards in affordable housing program, city to set targets for reducing electricity use/natural gas use, establish a cost-allocation system to fund city energy efficiency improvements, promote employee energy conservation.

• Renewable Energy: Continue "Boulder Wind Challenge" with a goal of signing up 150 new business customers for wind power/year, local utility solar rebate and federal tax credit for onsite generation projects, provide education/outreach re: renewable technologies, EPA green power partnership, how to pursue renewable energy/financial resources, recognize companies for renewable energy purchase, collaborate with local renewable energy suppliers to maximize visibility and promotion, explore program where businesses/ city offers emissions offset option to customers, explore facilitation of bulk purchases of solar thermal/PV equipment for businesses, work with industrial users to increase wind purchases/explore onsite generation projects, sing up 1,000 new residential customers for wind power/year, explore program where neighborhoods meeting a certain % of electricity needs through renewable energy are recognized, evaluate a city incentive for

PV systems, city policy of having 20% of the city's electricity come from renewable sources by 2012, explore additional on-site generation projects at city facilities.

• Transportation: Support transportation master plan initiatives and work with transportation staff to better incorporate GHG emissions reduction strategies into the plan, support ethanol and biodiesel infrastructure, educate auto dealerships and vehicle owners about flexible fuel vehicles and ethanol, promote biodiesel and highly fuel efficient cars (hybrid-electric vehicles), include information on website about how to receive rebates for hybrids, explore carbon offset program whereby drivers can offset the GHG impact of driving through renewable energy credit purchase.

• Educational Campaign: Create/implement a communications plan to engage all sectors, produce creative/informational educational materials for widespread distribution, coordinate at least one major awareness-raising event/year, collaborate with local social and environmental groups on their events and marketing efforts.

• Waste Reduction, Water Conservation: (no specific recommendations currently—waiting on more data).

• Urban Forestry: Develop an urban forest management plan to better define policies and standards for long term care including preserving and protecting existing trees, increasing public awareness of the value of the community forest, and maximizing the social, economic and environmental benefits of the forest for now and in the long term… on private land, city to offer lost-cost trees for residents to plant for share (100 tree goal for 2007), develop an educational campaign to promote planting trees for energy savings/eCO2 mitigation, consider revisions to the "green point program guidelines" to better educate builders/home buyers about strategic tree planting for energy conservation, determine the feasibility of strengthening tree preservation requirements in the land use code for private development.

Bozeman, Montana CLIMATE ACTION PLAN: May 2008 (49 pages)

• Population, emissions, emissions by sector:

• 2000 Bozeman Population: 27,500

• 2006 Bozeman municipal operations emissions: 7,866 tons eCO2: buildings (39%), water/sewage (33%), vehicle fleet (19%), streetlights (7%), waste (-2%)

• Estimated Bozeman population growth: 70,500 by 2020 (MAJOR GROWTH!)

Goals/ targets:

• Two-part plan addressing municipal operations first (leadership tool), then community emissions. Only the municipal operations recommendations have been achieved thus far. Goal for municipal operations is to have emissions reduced to 15% below 1990 levels by 2020 (this target year was specifically chosen to coincide with the completion of the "Bozeman 2020 Community Plan").

Guiding ideas/approach:

• Baseline emissions inventory taken in 2000, interim inventory again in 2006

• Looking at the "triple bottom line"—people, planet, profit

• Hired a Sustainability Coordinator to conduct the baseline emissions inventory and facilitate the municipal plan with the Bozeman Climate Protection Task Force

• Plans to hire another Climate Protection Coordinator to facilitate the community CAP (could be a consultant or graduate student intern).

Current climate change mitigation actions:

• Bozeman public library is the first silver rated LEED public building in Montana

• City hall being renovated using LEED existing building designs

• City diesel fleet is 50% bio-diesel

• Most of the city's traffic signals have been converted from incandescent light bulbs to LED's (80% more efficient).

Proposed solutions:

• Planning, building & energy: manage energy use, LEED standards, create sustainable O&M manual for buildings, employee conservation/education programs, green tag purchase, daylight janitorial services, energy fund (to show investment-payback re: energy efficiency projects).

• Transportation/land use: more traffic signals blinking red/yellow for longer hours (saves energy), roundabout

consideration, enact stricter vehicle purchasing policies, establish city fleet vehicle tracking method, increase city average fuel efficiency standard, anti-idling ordinance, LED program (replace all traffic lights), green bike program (buy bicycles for city employee use), transportation demand management pilot program (incentives to city employees to use alternative modes of transportation to get to work).

• Waste water and recycling: install electricity-producing turbines at water treatment plant, LEED building standards for city waste/waste water treatment buildings, city no bottled water purchase agreement, create water conservation goals and monitor progress, solid waste recycling promotion and capacity in public buildings, explore the potential for developing a glass recycling/reuse facility, 100% conversion to biofuels (at least B20) for city waste collection fleet, on-line monthly report of municipal recycling activity, develop program for solid waste co-use and resale including compost, landfill methane capture, micro-turbine power generation system for methane capture at sewage plants, building and equipment efficiency upgrades at water reclamation facility.

• Education: create/adopt community action plan, participate in "National Conversation on Climate Action," Gallatin Earth Celebration, hire sustainability director for community side of carbon reduction, tree planting program, k-12 climate change/sustainability education, adaptation plan (to detail city response to current and anticipated climate change impacts).

PRELIMINARY COMMUNITY CLIMATE ACTION PLAN SUGGESTIONS:

• Local incentives for hybrid/alternative fuel vehicles, gas tax, community-wide transportation demand management plan (requiring employers over a certain size to implement a plan), employee carbon reduction incentives, improved town path connectivity through land use planning, bicycling/walking path promotion/design considerations, accessible bike racks, sidewalk promotion, bike/pedestrian planning coordinator position, public transportation, light rail, public education, community supported agriculture.

Brattleboro, Vermont CLIMATE ACTION PLAN: October 2003 (38 pages)

• Tons of equivalent CO2 (eCO2) emitted in 2000: 195,520

• Per capita carbon footprint in 2000: 16.3 tons eCO2

• Brattleboro emissions by sector: transportation (45%), residential (19%), industrial (19%), commercial (9%), waste (8%)

• Brattleboro green house gas pollutants: gasoline (42%), heating oil (28%), industrial oil (18%), methane, diesel

Goal:

• The town/municipality aims to reduce emission levels 20% (from 2000 levels) by 2010. The community aims to reduce emission levels 10% (from 2000 levels) by 2010.

Strategies:

Municipal operations leadership, 10% community emissions reduction challenge public campaign.

• Evaluation criteria for proposed solutions: 1) bang; 2) buck; 3) environmental impacts; 4) public/political support; 5) feasibility

• Categories of review: transportation, energy, waste, general/other

• Presentation of ideas on the page: description, bang/buck, co-benefits, precedents/success stories

Proposed solutions:

• Policemen on bicycles

• Biodiesel fleet

• Efficient vehicle fleet/ordinance/lobby for higher federal fuel economy standards

• Biking/walking outreach/bike paths

• Increased public transportation

• No idling campaign

• Compact development zoning ordinances

• Alternative energy public school heating (biomass)

• Municipal building efficiency upgrades (government, school buildings)

• LED traffic signals

• Municipal solar pilot projects

• 10% energy efficiency challenge: low-income weatherization, energy rebates, citizen/school children education/outreach, traveling suitcase home energy informators, green lawn campaign (battery-powered, mechanical), CFLs, commercial competition/recognition for green actions
• Town/street tree planting
• District energy downtown
• Environmental sourcing (municipal)
• Landfill methane recovery
• Town recycling
• Home composting (providing bins)
• Pay as you throw" garbage billing
• Energy efficiency/environmental coordinator position

Burlington, Vermont CLIMATE ACTION PLAN: March 2000 (129 pages)

• Population, emissions, emissions by sector:
• Burlington eCO2 emissions by sector: 30% transportation, 30% industrial, 21% residential, 17% commercial, 2% waste
• 1990 emissions: 509K tons eCO2
• 1997 emissions: 624K tons eCO2
• Per capita eCO2 emissions: 13 tons/person in 1990 & 16 tons/person in 1997.

Goals/ targets:

• 10% below 1990 level emissions by 2005. Emissions reduction goal of 156,000 tons eCO2/year (from business as usual projections), aiming for 561,000 tons of eCO2 emissions in 2005

Guiding ideas/approach:

• Co-benefits of climate action: cleaner air, improved human health, improved economic vitality, and a more livable community.
• Created "household opportunities," "business opportunities," "institutional opportunities," "industrial opportunities," "municipal opportunities," and "transportation opportunities" guides to reducing emissions. For household, EnergyStar, drive less, fuel-efficient vehicle purchase, reduce, reuse, recycle, home energy efficiency, invest in renewable energy, turn off unused lights/appliances, set back water heater and thermostat, support climate-friendly products and services, support local agriculture, participate in climate-protection projects. For commercial, EnergyStar, renewable energy purchase, carbon transportation reduction, solid waste reduction/recycling, sourcing for climate neutral products, joining the business challenge to reduce emissions (PR action). For institutions, buy from the Burlington biomass cogeneration facility, green fleets, energy efficiency of buildings and operations, public outreach and education, the institutional challenge. For industries, greening industrial energy use, building energy efficiency, climate neutral network of nationwide visionary companies, waste reduction, combined heat and power and fuel switching, procurement and office equipment, green fleets, extended product responsibility, the industrial challenge. For municipal, demonstrating leadership, LED traffic lights, municipal fleets, city trees and shrubs, green municipal codes and ordinances, city employee incentives, recycling and solid waste reduction, climate wise program, municipal challenge. For transportation, new habits for personal vehicle use, fleet-scale demonstrations, better transportation policy, better public transit and transportation demand management, better transportation infrastructure, transportation challenges.
• 5 areas of focus: Municipal buildings and operations (6,000 ton reduction), full implementation of efficiency programs (20,000 ton reduction), public education campaign including a 10% community challenge (70,000 ton reduction), support biomass district energy and other alternative fuel supply options (35,000 ton reduction), implement transportation demand management projects and support climate friendly transportation policy at all governmental levels (25,000 ton reduction).

Current climate change mitigation actions:

• Energy efficiency measures installed in municipal buildings in Burlington since 1990 (-2000) have already saved the city $307,00 and 2,200 tons eCO2 annually.

Proposed solutions:

- Municipal action plan emissions reduction: building improvements, municipal fleet efficiency improvement, energy procurement and bulk purchases, tree and shrub planting, amend city municipal code and ordinances, promote voluntary employee programs, solid waste reduction.
- Community efficiency programs: smart new development, efficient equipment replacement, low income energy efficiency.
- Public education program and 10% challenge campaign: Guides created for different sectors to educate on how to reduce GHG emissions.
- Support biomass-fueled district energy and other renewable technologies: McNeil woody biomass heat co-generation facility, support of wind generation and residential solar programs and other alternative energy demonstration installations.
- Transportation demand management projects / climate-friendly transportation policy: operational guidelines for municipal and airport vehicles, link bike/recreation paths and strengthen their regional connections, encourage the expansions of passenger and commuter rail.
- Extras: Link with other community efforts, monitor and report emissions reductions, continue the climate protection task force.

Homer, Alaska CLIMATE ACTION PLAN: December 2007 (41 pages)

Population, emissions, emissions by sector:

- Average Alaska resident emissions: 88 tons CO2/year (4x the US national average)
- 2006 eCO2 emissions for the Homer community= 140,000 tons eCO2: 36% commercial, 24% residential, 21% transportation, 17% marine (boat fuel) & 2% waste.
- 2006 eCO2 emissions for the city of Homer= 5,400 tons eCO2: 28% water/sewer, 28% buildings/ streetlights, 18% fish dock, 14% harbor (electric/fuel use), 8% vehicle fleet, 3% high mast lights & 1% waste.

Goals/ targets:

- City plan to reduce GHG emissions 12% by 2012 and 20% by 2020 (from 2000 levels).

Guiding ideas/approach:

- Software used 2006 emissions and 2000 census data to estimate 2000 baseline emissions and project future business as usual population and emissions growth scenarios.
- The need to make the transition from "business as usual" to fundamentally new ways of thinking and acting in the face of climate uncertainty, energy uncertainty, and population growth.
- CAP measures are prudent regardless of climate change—will save taxpayers money and create a healthier, safer, and more livable and self-reliant community.
- City action in the wake of state and federal action… "Governor Palin formed a sub-cabinet on climate change that is chaired by the head of the Department of Environmental Conservation but to date it has had few meetings" (no member of AK state or federal political delegation supports mandatory reductions in greenhouse gases).

Proposed solutions:

- Energy Management (building energy efficiency, developing renewable energy to power city facilities): Research/develop/utilize renewable/alternative energy (hydroelectric turbines in the municipal water lines, one or more wind or solar pilot projects in city facilities, ocean current power generation, captured methane at sewer treatment plant for heating fuel, biofuel from fish oil or wastewater sludge); reduce energy by at least 25% through energy efficiency and conservation (policies/mechanisms for city employees to reduce daily work environment energy use, install metering/monitoring devices and provide monthly reports to track energy consumption re: city facilities/activities, replace lighting with EnergyStar/LED/other efficient lighting, integrate energy efficiency into city contracts, conduct energy audits for all city buildings and weatherize/ pursue other measures to improve efficiency, establish an energy efficient purchasing/leasing policy for not office equipment and appliances and replace inefficient equipment, build all new city buildings to LEED standards, limit heating thermostats to 68 degrees and cooling thermostats to 75 degrees in city buildings, replace harbor/dock ice-making machine with a more energy efficient setup).
- Transportation (city vehicle fleet, employee driving, support for non-motorized/public transportation in

the community): Develop a program to retire less efficient vehicles and replace with hybrids and other highly efficient vehicles, institute policies for city employees to use task-appropriate vehicles and limit miles traveled, establish creative programs to city departments to reduce their travel-related carbon footprint by promoting carpooling and non-motorized transportation, establish anti-idling policies for city vehicles/drivers, establish a car plug-in program to reduce cold engine starts, establish a public transportation system that includes park and ride lots and a downtown to spit shuttle service during high traffic months, expand pay for parking areas to encourage use of public transportation to help cover costs, promote development of a "free bike" program, establish a "bike library" program that allows local residents/visitors to pay a refundable fee to check out a bike at different locations in town, provide bike racks at all city buildings and parks.

• Purchasing & Waste Reduction (thoughtful purchasing & recycling strategies): establish a comprehensive user-friendly recycling program involving all city departments and facilities, adopt EPS' comprehensive procurement guidelines (a key component of the government's "buy recycled" program), undertake measures necessary to achieve green star award, establish a program aimed at greatly increasing the percentage of households that routinely recycle materials, continue to co-sponsor community-wide electronic recycling events, encourage commercial waste haulers to offer recycling pickup along with garbage pickup, form an advisory group to work with the borough to develop a comprehensive plan from improvements at the Homer bailing facility as it approaches capacity.

• Land Use (smart growth for compact, mixed-used development that reduces the need to drive): Support strong language in draft Homer Comprehensive Plan update that calls for denser and more compact development that increases emphasis on infrastructure for non-motorized transportation, update city planning and zoning regulations to promote land use strategies that include compact & mixed-use development / higher density development and infill, implement the Homer non-motorized transportation and trails plan to construct specific trails/sidewalks/safe crossings and revise the Homer code to require non-motorized circulation systems, institute traffic calming measures and "complete streets" designs to make bicycling and walking safer and more pleasant, develop Homer's town center with smart growth guiding principles, provide assistance to developers/builders in evaluating plans to increase energy efficiency and promote non-motorized transportation, adopt building codes and incentives to increase energy efficiency in all new residential and commercial development, keep abreast of new LEES standards for neighborhood development and building remodeling and consider adopting these standards in the permitting process.

• Outreach & Advocacy (public education, policy changes, supporting action at higher levels of government): Mayor of Homer will sign the US Conference of Mayors Climate Protection Agreement; Homer will urge support of programs and legislation at the state level to reduce global warming and facilitate adaptation to climate change in Alaska including AK participation in The Climate Registry and a multi-state greenhouse gas emissions reduction cap-and-trade program, legislation to establish renewable energy portfolio standards for electric utilities, provide opportunities for net metering, and prohibit development of new coal-fired power plants, upgrades of state roads to encourage non-motorized transportation, programs to provide funding to local governments to implement climate change mitigation and adaptation programs; Homer will keep abreast of federal proposed legislation and policies and will lobby for increased fuel efficiency standards, funding for renewable energy R&D and for local programs aimed at climate change mitigation and adaptation, and full participation and cooperation in international efforts to meeting mandatory GHG emissions reduction goals; Homer will work with the borough to promote increased community recycling, adoption of policies to reduce GHGs emitted from borough buildings, development of a borough-wide climate mitigation/adaptation plan; Homer will encourage the Home Electric Association to adopt institutional reforms aimed at increasing conservation and renewable energy and avoiding electrical generation from coal-fired power plants ("green pricing" option for members, net metering options, low interest loan programs to support renewable energy projects); Homer will seek alliances with other communities in AK and elsewhere to strengthen advocacy efforts.

• Adaptation Plan (creating a resilient local economy, protecting existing infrastructure, preparation for extreme weather events, adopting wise policies for future development): Work with groups to encourage local economic self-reliance so that community needs are met by locally-owned businesses and products as much as possible, encourage an "entrepreneurial spirit" and encourage sustainable business development through a "green business" indicator, encourage and support climate change and sustainability curriculum at the local college, anticipate and promote new opportunities in local agriculture, support green economic growth by

promoting policies that encourage businesses to employ sustainable energy practices, anticipate population increases due to "climate refugees" and institute growth management policies, keep abreast of erosion and sea rise and take proactive measures to protect and/or relocate city infrastructure, develop management plans for harbor facilities in response to climate change impacts, inventory storm water runoff system and identify problem areas, increase fire fighting capability, take steps to protect the capacity of wetlands and watersheds to store water and protection against extreme weather events, enact restrictions against development on erosion prone slopes or bluffs, assess the city's future drinking water needs and options for addressing those needs and encourage water conservation, take climate change into consideration in all long-range planning efforts.
• Creation of a "sustainability fund": repository for money from various sources to be used to implement measures recommended in CAP: Grant funding from state and federal programs and private foundations, a climate action plan tax modeled after that of Boulder CO (based on electricity usage), a per-gallon tax on all fuel transferred within Homer, voluntary "offsets" contributed by individuals and businesses wishing to reduce their carbon footprint by supporting projects aimed at reducing GHGs in the city at large, funds contributed by Homer to offset employee travel, savings resulting fro increased energy efficiency/conservation with implementation of CAP measures, parking fees… PUT TOWARDS data compilation, city building energy audits and renovations, renewable energy projects, city vehicle fleet upgrades, creative incentive or challenge programs, work with planning department staff, employee sustainability handbook, sponsorship of community events, liaison between city and broader (in scope) climate change policy developments, education and advocacy materials, website updates, grant-writing.

Salt Lake City, Utah CLIMATE ACTION PLAN: website updated through 2007

Goal:

70% reduction in greenhouse gas emissions (below 1990 levels) by 2040 @ pace of 3% reduction per year.

Main ideas:

- Money saved through energy efficiency can be reinvested in the community
- Using alternative energy supports the local economy
- Reduced waste will go a long way towards reducing emissions

Major areas of focus:

- Building energy efficiency, wind power, LED traffic lights, fleet conservation/alternative fuels, cogeneration at wastewater treatment plant, landfill methane capture—ALL significant financial returns.

Proposed solutions:

- City fleet: retiring vehicles, smaller job-appropriate vehicles, biodiesel (B5 at least), electric public transportation, increased bike lanes/parking, small parking enforcement vehicles, biodiesel/battery powered mowers, free bus passes for city employees, reserved parking spaces for city employee car poolers, pedestrian friendly/safe policies
- Energy: LEED ordinance (silver standard for new building/renovation), wind power purchase to power municipal buildings, lighting changes, automatic lighting, digital controls for building temperature and etc., hiring a full-time energy efficiency coordinator, LED traffic signals, landfill methane capture, cogeneration at the sewage plant (all saves on city electricity bills).
- City forest: pruning, pest monitoring (bio controls), planting
- Recycling/reuse/open space and water conservation
- Showcases/pilot projects
- Municipal vehicle anti-idling policy
- Improved emissions monitoring
- Business/citizen pledges to be proactive in reducing eCO2
- Establish business allies list—award "clean and green" status as way of recognition/advertising

Seattle, Washington CLIMATE ACTION PLAN: September 2006 (37 pages)

Goals/ targets:

- Kyoto target—reduce emissions 7% below 1990 levels by 2012 (reduce emissions by 680K tons eCO2).

Guiding ideas/approach:

- Seattle Mayor Nickels launched the US Mayors Climate Protection Agreement, a major initiative in jump-starting local climate change mitigation action.
- Launched the initiative because of: 1) concerning climate change impacts on electricity, water supply, etc.; 2) the big opportunity offered by reducing emissions to improve air quality, public health, quality of life, save money, and create good new jobs; and 3) disappointment at the lack of meaningful federal action on the issue.
- CAP includes 18 recommendations that focus on motor vehicle emissions and home & business natural gas consumption (building on the city's already substantial investments in climate protection led by the Office of Sustainability and Environment) with CAP progress reports and updates every two years.

Current climate change mitigation actions:

- Seattle has already reduced its global warming pollution some 60% from 1990 levels (as of 2006).

Proposed solutions:

- #1: Significantly increase the supply of frequent, reliable and convenient public transportation: 1/10 of 1% county sales tax increase to supply public transportation, streetcar service, light rail, express bus system improvements, budget raise for Seattle transit service to make transportation opportunity more frequent, improved downtown transit hub, synchronizing traffic signal timing to improve flow and reliability.
- #2 Significantly expand bicycling and pedestrian infrastructure: create a city bicycle master plan that improves on-road bicycling conditions, develops a way-finding system, establishes maintenance programs, double the number of bike lakes, increase bicycling parking requirements neighborhood business districts, a new bicycle transportation center, master plan for the urban trails system, pedestrian master plan, improve pedestrian safety by improving curbs and crosswalks.
- #3 Lead a regional partnership to develop and implement a road pricing system: budgetary investment in working with partners to analyze/develop road pricing scenarios, Seattle DOT and Mayor's office to work with agencies to promote regional road pricing and address legislative barriers.
- #4 Implement a New Commercial Parking Tax: 5%-10% tax for citywide commercial parking as a disincentive to driving.
- #5 Expand efforts to create compact, green urban neighborhoods: new zoning rules to allow increased height limits and greater development flexibility in exchange for incorporating energy efficiency green building practices/providing affordable housing, zoning changes to encourage more compact development and streamline regulations in al urban villages, city center strategy to accommodate 50,000 new jobs and 22,000 new homes downtime and in nine close to downtown neighborhoods, revise policies and regulations to ensure "transit oriented development" (compact, mixed-use where biking, walking and transit access are safe and easy), new regulations to ensure new development includes open space/trees/other amenities, open space impact fee on new development in Seattle's urban centers, adopting neighborhood commercial and multi-family zoning that has regulations and incentives to have more trees/vegetation per parcel, strengthening the city tree protection ordinance and providing incentives for private property owners to plant more trees and greenery.
- #6 Improve the average fuel efficiency of Seattle's cars and trucks: develop a comprehensive climate protection action awareness campaign including a "drive smart" component focused on fuel efficiency with a variety of media and venues, launch "smart fleets" targeted at replacing commercial fleets, city departments will enhance their clean and green fleets, more fuel-efficient and smaller taxicabs within the city limits (incentives to cab drivers using hybrids), explore ways to reduce taxi deadheading, police department to replace 20-60 non-pursuit vehicles with fuel-efficient hybrid electric cars, replace gas powered mowers with hybrid or electric mowers, reduce vehicle idling by equipping five city trucks with power inverters, replace three city gas trucks with more climate-friendly models, install anti-idling signs at heavily used park parking areas, city to offer an additional $25 incentive under its electric mulching lawn mower rebate program to ensure old mowers are turned in for disposal and are not used elsewhere.
- #7 Substantially increase the use of biofuels: city diesel biofuel fleet will go from B20 to B40, campaign

to increase biofuels as solution awareness, Seattle center to install a 500 gallon biodiesel tank allowing more equipment to be converted to biodiesel, identify further uses of biodiesel, develop a method of tracking biofuels sales, create new state legislative incentives to further the use and production of biofuels in Washington, provide funding to a public/private partnership (Puget Sound Clean Cities Coalition) to promote policies and practices that increase biofuels use, public transportation to use biofuels, federal legislation to promote biofuels, biofuels users guides, marine use of biodiesel.

• #8 Significantly reduce emissions from diesel trucks, trains, ships: "smart fleets" to reduce commercial fleet emissions, providing onshore power to cruise and container ships, freight infrastructure improvements, adjust traffic signals to improve the flow of freight traffic.

• #9: Maintain Seattle city light at zero net greenhouse gas emissions and meet load growth through conservation and renewable energy resources: purchase offsets to achieve zero net GHGs, acquire 7.25 MW energy conservation in 2007 and the same or more in 2008, continue to buy 3% of power needs with renewable wind energy though contract with Stateline Wind, as part of public campaign promote energy conservation measures for citizens, businesses and public institutions, make public aware of federal tax incentives.

• #10 Substantially increase natural gas conservation: public campaign to promote natural gas conservation, explore the feasibility of heat pump hot water heater installation in liwe of conventional water heaters.

• #11 Strengthen the state residential energy code: regulations to increase insulation levels in vaulted ceilings, require more energy efficient windows, restrict developers' ability to take credit for less than 15% window area as a means to avoid more insulation in floors/walls, require CFL for exterior/regular lights with daylight and motion sensors, require linear fluorescent lights to be high efficiency fluorescent fixtures (T-8's).

• #12 Reduce Seattle steam's use of natural gas: convert of its two boilers from fossil fuel to biofuel in the form of urban wood waste would avoid approx. 50,000 tons eCO2/year.

• #13 Continue the city of Seattle's strong leadership example: all city employees encouraged to take action to reduce personal GHGs on job and at home through employee outreach campaign lead by the Office of Sustainability and Environment, city to fully mitigate all business-related air travel by city employees by purchasing carbon offsets, use of climate-friendly cements using blast-furnace slag (fly ash concept) will be required as part of the city's contract specifications, department of the executive Green Team will assess and promote the purchase of other climate-friendly products such as computers and servers, climate-friendly city investing, Seattle public utilities will inventory GHGs and develop an action plan specific to water supply/ drainage/ wastewater/ solid waste management, interdepartmental efforts to develop recommendations on how the city can support local sustainable agriculture as a climate protection action.

• #14 Mobilize the entire community: radio ads offering tips to reduce GHG emissions from residences and businesses, public campaign using website/utility bills/city programs and other media, $75,000 neighborhood climate protection fund to promote/help finance neighborhood-based climate protection projects such as local biodiesel cooperatives/tool and car sharing programs/ anti-idling campaigns/community energy conservation actions, airport program to encourage air travelers to offset their carbon footprint from air travel, educational program for schools called "kids for climate protection."

• #15 Create the Seattle climate partnership: bring in the city's largest employers and develop a technical assistance program for the company to green up their business through energy conservation and commute trip reduction, host an annual event with business and political leaders to promote the partnerships' accomplishments and recruit new business partners, creating a non-profit home for the partership's efforts.

• #16 Leverage regional, state, and national climate solutions: promote strong climate action by local jurisdictions, advocate climate-friendly transportation, work towards statewide cap-and-trade system, advocate for state and national policies that encourage alternative transportation and renewable energy, continue to lead the climate movement on a local level.

• #17: Direct more resources to the challenge: hundreds of thousands of dollars allocated for climate-friendly vehicles and landscaping equipment, biodiesel tank, energy efficiency measures, community awareness and action campaign, single occupancy vehicle alternative promotion, technical and policy analysis, "smart fleets," green technical support, carbon emission mitigation, expanded public transportation, bike trails and lands, transit hubs, road repair, tree planting.

• #18 Monitor and report on progress: on a biannual basis with city interdepartmental climate team, sustainability advisory panel to oversee implementation of plan, etc.
• Extras: Banning all paper, cardboard, glass, metal, plastic in household/commercial garbage, providing convenient curbside and on-site recycling as part of solid waste collection at no additional charge, volume-based garbage collection fees, convenient curbside collection of yard debris and food waste for a modest fee, recycling education and outreach, plant trees in the city, pruning trees responsibly, educate citizens about the value of trees, devise incentives to encourage residential tree planting, coordinate tree management in the urban forests, partner for tree restoration, CREATE AN ADAPTABILITY PLAN.

Appendix M

OTHER SUPPORTING MATERIALS

(Available on request.)

- 2001 & 2007 Data energy underlying the GHG Assessment (19 spreadsheets)
- Power Point: "City of Helena Electric & Natural Gas Info" (2007?)
- Power Point: "Helena WWTP Energy Study: Partnership with DEQ" (late 2005?)
- Power Point: "City of Helena Solid Waste" (1/11/08?)
- Power Point: "City of Helena's Service Capacity and Growth" (5/7/08)
- Power Point: "Lighting Ordinance" (9/17/08)
- Power Point: "Streamline Carbon Footprint" (April 2009)
- Power Point: "Local Government Energy Office Primer," ICLEI (April 14, 2009)

Appendix N

NorthWestern Energy Factsheet

NorthWestern Energy

case study

project cost/savings...

Total Cost: **$103,205**

NWE Incentive: **$64,000**

Completion Date: **June 2008**

Customer Cost: **$39,205**

Annual Savings (kWh): **460,986 kWh**

Simple Payback with Energy Savings for the Customer: **1.5 Years**

project features...

- **Direct "aeration to blower" control of dissolved oxygen levels**
- **125 hp Garnder Denver positive displacement, rotary screw type blower with a premium efficiency motor**
- **VFD connected to the new blower motor**
- **Elimination of excess "blow-off" air into non-active aeration basins**
- **Ability to constantly match dissolved oxygen levels to changing influent levels and BOD loading rates**
- **Designed to meet expected influent increases for a significant number of years. Can handle current demand at 60% of blower capacity**

City of Helena Wastewater Treatment Facility

Helena, Montana

History

The City of Helena Wastewater Treatment Facility processes an average of 3 million gallons per day (MGD) of "wastewater". Beginning in the late 1990s, the plant underwent significant upgrades to meet EPA effluent standards and projected growth in the Helena community. This included three new bioreactors and a new aeration building.

Dissolved oxygen (DO) is necessary in the aeration process to promote the growth of aerobic microorganisms and the conversion of organic waste material into inorganic by-products. If the oxygen content is too low, the environment for the organisms becomes unstable and they die.

The EPA estimates that the energy consumption associated with aeration in secondary treatment make up from 30% to 60% of a wastewater facilities electrical energy costs. As a result, improvements to the aeration process including; fine air bubble diffusion, properly matching aeration demands to supply, reducing blower throttling, or in the case of axial turbine lowers, eliminating "blow-off", can have a significant impact on energy use.

Pre-Modification

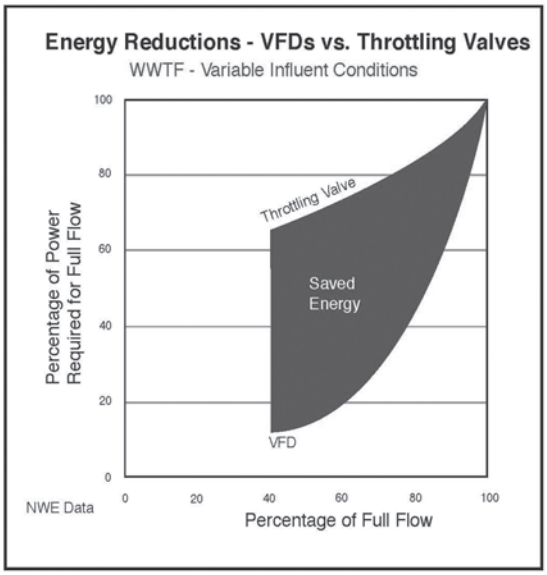
Prior to the modifications, the Helena WWTF utilized three 200 hp axial turbine blowers to supply air to the aeration basins. Only one blower operated at a time, with the other two serving as back-up. The air flow demand required to meet the peak DO loading rates was 2,180 scfm. At maximum inlet throttle, the airflow rate for each of the existing blowers was 2,940 scfm. As a result, 760 scfm was "blown-off" into an empty aeration basin.

It is also important to note that peak flow (6 MGD) is realized at the facility less than 1% of the time.

Efficiency Improvements

An energy study was developed through a collaborative effort between the WWTF operators and NorthWestern Energy. The results indicated that it would be possible to save approximately 30 percent of the

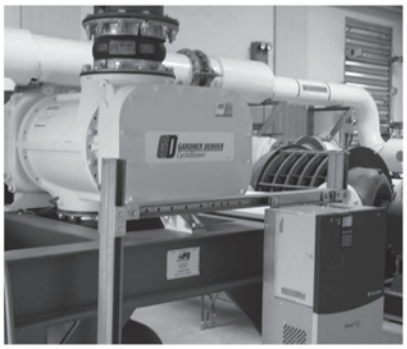
electrical energy used for aeration. The energy study recommended the replacement of one of the existing 200 hp axial turbine blowers with a 125 hp Gardner Denver model 9CDL23, positive displacement, rotary screw blower. The motor was fitted with a variable frequency drive (VFD).



In addition, to consistently match the dissolved oxygen demand, DO sensors were interfaced with the control system to accurately match blower speed (air flow) with the biological oxygen demand (BOD) loading rates.

Supplemental benefits besides the energy savings included eliminating the practice of dumping excess air into the aeration basin. Prior to the upgrades, operators needed to keep water in the auxiliary basin and keep sensors and related equipment in repair.

From a quality standpoint, the new system optimizes the specific amount of sludge produced at the facility, as well as providing a healthy and stable environment for the microorganisms. Proper dissolved oxygen levels keep the entire "floc" healthy, regardless of temperature and influent variations.



helical screw blowers

Helical screw blowers, like the type installed at the HWWTP, have a balanced compression cycle that eliminates pulsing.

Since the rotors on helical screw blowers do not touch each other or the housing, the rotors do not wear over time. Also, helical screw blowers are relatively efficient and are capable of delivering a constant discharge pressure at reduced speeds.

smaller wwtf applications •••

After learning about the modifications at the Helena WWTF, the City of East Helena made the decision to install VFDs at their treatment facility.

The East Helena WWTF processes an average of 180,000 gallons of wastewater per day - with a designed limit of 400,000 gallons.

The facility uses three 20 hp and three 25 hp blower motors - which, before the retrofit, "over-areated" the treatment basins.

VFDs were installed on all six of the motors at the WWTF. In addition, the staff is currently working on direct control of the VFDs using DO sensor controllers.

The East Helena WWTF is similar to other facilities in smaller Montana cities. The addition of VFDs and direct DO control show that significant energy improvements are possible,regardless of facility size.

project contacts and resources •••

Building Owner:
City of Helena, Don Clark
(406) 466-2927

Contractor:
Power Services of Montana
(800) 823-8665

NorthWestern Energy:
Dave Bausch, P.E.
(406) 497-2322

NorthWestern Energy
Delivering a Bright Future

Appendix O
Recommendations of the Tenmile Watershed Collaborative Committee

Mayor Jim Smith
316 North Park Avenue
Helena, MT 59623
Telephone: 406/447-8410 Fax: 406/447-8434
City of Helena

July 8, 2009

Mr. Kevin Riordan
Forest Supervisor
2880 Skyway Drive
Helena MT 59603

Dear Kevin:

On behalf of the City Commission, I am pleased to submit the Ten Mile Watershed Collaborative Committee's consensus goals and recommendations. The commission formally accepted them July 6, 2009.

City Commission Resolution #19605 charged the committee to develop recommendations to address several interrelated issues in the watershed. These issues arise from the threat of uncontrolled wildfire to the city's water supply infrastructure, the water quality that sustains it, and multiple watershed values.

The Ten Mile Watershed is a landscape of unique importance to the city of Helena and surrounding communities. Its multiple values include exceptional water quality, wildlife habitat, and public recreation. As Helena's municipal watershed, management of the resources and reduction of wildfire risk is a high priority and must be addressed. To reduce some of that risk, the city will soon begin fire mitigation on private and city-owned lands along the flume that delivers water to the water treatment facility.

Along with the city's commitment to take proactive efforts to reduce fire risks and to sustain water quality and wildlife habitat, I encourage the United States Forest Service to do the same by securing funding and resources to conduct an environmental

analysis (NEPA) that will address management goals and activities in the watershed. Understanding that the NEPA process can be time consuming, we encourage you to begin the process as soon as possible.

The commission endorsed these collaborative committee recommendations at the city commission meeting on July 6, 2009. We encourage you to incorporate the committee's goals and recommendations into your planning process. These recommendations represent broad and diverse community representation and consensus support. The use and incorporation of these recommendations will be key to the NEPA process and result in successful outcomes for the environmental analysis and future decisions. Please accept the city's commitment to stay involved in the process as needed and willingness to help facilitate future community engagement activities.

We appreciate your staff's commitment and involvement in the collaborative process. Active participation on the part of representatives from the Helena National Forest and Fire Science's Lab provided important advisory expertise to the committee's work. We appreciate your commitment to this process.

Sincerely,

James E. Smith, City Mayor

Ten Mile Watershed Collaborative Committee
Recommendations to City of Helena Commission

Submitted June 17, 2009

FACILITATOR'S SUMMARY

The following documents comprise the work of the Ten Mile Watershed Collaborative Committee (TMWCC), created by City Commission resolution #19605. As facilitator, I worked with the appointees for approximately eight months to implement the resolution's charge to develop recommendations on interrelated issues of importance to the City.

The TMWCC determined it would operate by consensus, meaning all members had to agree for a recommendation to move forward. It made its decisions incrementally – no decisions were considered final until all had been approved. In short, the recommendations that follow are an interrelated "package" that the Committee recommends the City support. Should the Commission choose to support some recommendations, but not others, it is highly likely that the Committee consensus would dissolve.

It is important to note that recommendations include both policy and process, the latter being an ongoing community engagement process initially recommended by the Forest Service, which with the Montana Department of Fish, Wildlife and Parks, served in an advisory (non-voting) capacity to the Committee.

At the Committee's June 8 meeting consensus was made on the enclosed recommendations, an accomplishment made possible by member dedication. Members of the Joint Working Group (subcommittee) are especially deserving of commendation, due to their commitment to meet weekly for most of the eight-month period.

The following documents have been approved by the Committee and comprise their recommendations.

Brian Kahn
Attorney
Artemis Common Ground
June 17, 2009

BACKGROUND

The Ten Mile Watershed Collaborative Committee (TMWCC) was appointed by the Helena City Commission Resolution #19605 on September 8, 2008, with the charge to develop recommendations to address interrelated issues in this uniquely important watershed arising from the threat of uncontrolled wildfire, including the City's water supply infrastructure, the water quality that sustains it, and multiple watershed values. The Committee established a goal of completing its work by June, 2009.

A subcommittee, the Joint Working Group (JWG) met on a weekly basis to develop proposed goals, proposed actions and overarching principles. The TMWCC met monthly to gather information and consider/act on JWG recommendations.

The Forest Service and Montana Department of Fish, Wildlife and Parks, as well as city and county agencies, provided important advisory expertise to the Committee's work.

On May 11, 2009 the TMWCC approved six goals:

- Protect and Improve Water Quality and Quantity
- Protect City Water Delivery Infrastructure
- Protect and Improve Long-Term Quality of Wildlife Habitat
- Reduce Damage of Major Wildfire
- Promote Potential for Restoration in Watershed of a Viable Fishery and Wetlands
- Provide for Present and Future Public Safety

It approved multiple recommendations for action items under each goal. Among these were:

- Specific actions to protect the community of Rimini through community outreach and engagement, development of defensible and survivable space around structures, and the establishment of evacuation routes in the event of major fire;
- Actions to protect the City's water supply infrastructure, including the flume delivery system, by removal of vegetation in proximity to structures, and other measures, including recommending eventual modification/replacement of the fire-vulnerable parts of the flume with metal pipe, and to explore the development of a pre-sedimentation basin to minimize the effects of sediment on the Ten Mile water treatment facility.

At its final meeting, on June 8, the Committee adopted recommendations concerning two additional major issues – watershed road density and Landscape-Scale Treatment (LST) of the watershed. The JWG spent considerable time collecting information and developing its recommendations on these important questions.

Watershed Road Density:

With regard to roads, the Committee considered importance for fire suppression as well as impacts on recreation, fisheries and wildlife. It recommended an overall reduction in road density/miles of road, and a collaborative process to make specific recommendations to the Forest Service. Given timelines for Forest Service decisions, the Committee requested that the City, if it supports the recommendation, communicate promptly with the Forest Service on that issue.

Landscape Scale Treatment:

The Committee based its recommendations on the following:

The Forest Plan for the Helena National Forest requires the agency to attempt to suppress all wildfires in the watershed. Over decades, it has successfully done so. This has resulted in a build-up of vegetative fuels beyond what would be present had wildfires not been suppressed, creating increased risk of landscape-scale, intense fire.

(1) As in much of the Rocky Mountain West, pine beetle infestation is moving through the watershed and there are no practical means of preventing this. When pine trees die, during the period "red" needles remain on the tree, risk of ignition is heightened. However, even live pine trees are easily ignitable.

(2) If a Ten Mile wildfire ignites with warm temperatures, low moisture content in trees, high winds, suppression of the fire – "stopping it" --it will not be possible. Such a fire has the potential to pose significant risks to public safety, water quality, movement of soils, sedimentation/erosion, recreation and other important values.

Based on the above, the JWG and TMWCC assessed whether actions could be taken to reduce these impacts of an uncontrolled wildfire. Research conducted by the Missoula Fire Sciences Laboratory of the United States Forest Service indicates that advance treatment of portions of a landscape with prescribed fire (carefully planned, limited and controlled, and used under favorable conditions) can substantially alter the behavior of a wildfire that

occurs in extreme conditions. Such treatments can modify wildfire behavior by altering the speed of its spread, the direction it burns, the intensity with which it burns. This, in turn, can "buy time", potentially enabling weather or other conditions to change, enabling suppression or reducing the eventual scale of the burned area.

The TMWCC carefully assessed a range of questions before recommending Landscape-Scale prescribed fire treatment. It fully realizes that there are "no guarantees", but rather the balancing of factors required by assessing risk and probabilities. It has concluded that the careful use of prescribed fire, including pre-fire fuels thinning where appropriate, represents the best strategy to minimize the risks of an uncontrollable fire in the Ten Mile watershed.

TEN MILE WATERSHED PRINCIPLES, GOALS, ISSUES AND ACTIONS

(Adopted by consensus May 11, 2009 by the Ten Mile Collaborative Watershed Committee)
The Committee did not establish prioritization of these Principles and Goals.

Principles to Guide Actions:

- Use an integrated interdisciplinary approach.
- Respect/protect private property rights.
- Maintain quality control and oversight of work.
- Minimize environmental damage.
- Don't lose sight of the big picture and purpose of the Ten Mile Collaborative Watershed Committee.
- Insure project designs meet Montana State Best Management Practices guidelines.
- Assess proposed actions for impacts on linkage zones, wildlife, recreation and watershed productivity.
- Secure adequate funding to assure implementation of all recommended action items.

Goal: PROTECT AND IMPROVE WATERSHED WATER QUALITY & QUANTITY

Issues:

- Customers at risk of loss
- Sedimentation/filtration: Treatability at plant
- Abandoned mine waste/contamination
- At risk from wildfire
- Failing septic systems (stream/wetlands impacts)
- City diversion affects quantity
- Impact on fishery

Action:

- Develop cooperative, interagency management agreement *(Utilize same approach/group as in Restoration Goal, below.)*
- Develop defensible space around inactive mine sites
- Identify sites at special risk due to wildfire.
- Develop mitigation strategies for such sites.

Goal: PROTECT CITY WATER DELIVERY INFRASTRUCTURE

Issues:

- At risk from wildland fire
- At risk from mine waste
- Limited funds for improvement Antiquated, vulnerable design
- Mixed land ownership
- Post-wildfire repair Vegetation close to flume *(see Dave Larsen proposal)*

Action:

- Implement flume proposal, as approved by the Ten Mile Watershed Committee
- Prioritize defensible/survivable space around city water supply infrastructure
- Obtain the needed funds
- The City should be part of fire suppression, prevention and response planning and implementation

Goal: PROMOTE POTENTIAL FOR RESTORATION IN WATERSHED OF A VIABLE FISHERY & WETLANDS

Issues:

- Water quality and quantity
- Lack of Management Agreements

Action:

- Develop Joint Management Agreement between DNRC, USFS, City of Helena, EPA, DEQ, FWP, etc. (JWG recommends same committee address Water Quality/Quantity.)

Goal: REDUCE DAMAGE OF MAJOR WILDFIRE

Issues:

- Rimini Safety
- Neighboring Communities Safety
- Damage from wildfire suppression efforts to multiple values
- Soils runoff
- Impact on aesthetic and recreation values
- Lots of fuel present
- Human starts (ignitions)

Actions:

- Thin fuels
- Evaluate potential projects
- Utilize spatial arrangement/location of treatments to modify wildfire behavior
- Develop defensible space around mine sites
- Develop defensible space around Rimini
- Develop defensible space within the community of Rimini.
- Utilize prescribed burning with proper site preparation and prescription
- Develop strategies for fire originating within Ten Mile, and those coming from outside
- Enhance local firefighting capability Mitigate power line risk
- Develop management agreement between agencies for mitigation strategy
- Implement fuel hazard reduction projects

Goal: PROTECT AND IMPROVE LONG-TERM QUALITY OF WILDLIFE HABITAT

Issues:

- Too many roads-(habitat fragmentation)
- Beetle caused loss of Lodgepole and Ponderosa pine habitat
- Beetle kill creates new habitat
- Loss of thermal hiding cover
- Significant wildlife corridor zone
- Natural ebb and flow of habitat
- Fragmented management
- Cumulative impacts of human activities
- Dollars for restoration
- Travel management

Action:

- Identify linkage zones and develop habitat conservation strategies
- If conflicts between fire mitigation and habitat conservation strategies develop, use interdisciplinary approach to resolve
- The USFS should coordinate planning/actions with FWP, and US Fish and Wildlife Service.

Goal: PROVIDE FOR PRESENT AND FUTURE PUBLIC SAFETY

Issues:

- Rimini residents at risk
- Area workers and users, firefighters at risk
- Lack of readiness/awareness of some people

Actions:

- Designate evacuation routes
- Develop evacuation plan and routes, including a maintenance agreement
- Implement an education program re safety
- Prioritize defensible space around human structures/assets, sensitive soils, and mine wastes ("Prioritize" when used in these goals, means to establish as a priority, in relation to other goals stated.) Make "survivable", not just defensible space-this involves an assessment of structural details *Pat McKelvey will provide definitions.
- Utilize a community-led program involving local leaders
- The Tri-County Firesafe Working Group should take the lead on this issue and secure the needed funds

Note: The Ten Mile Collaborative Watershed Committee should make a presentation of its overall recommendations (not just safety) to the Rimini Community.

COMMITTEE RECOMMENDATIONS:

Prevention Projects
Landscape-Scale Treatments
Road Density
Temporary Roads *(Adopted June 8, 2009)*
Flume Proposal *(Initially supported on March 13, 2009, with subsequent modifications.)*

Note: The following approvals are an interrelated "package" and only became final when all elements/sideboards were discussed and consensus reached.

Prevention Projects:

The JWG has identified the following prevention projects:
(1) Ask the City to assess the potential of undergrounding power lines, which impacts fire hazard and road design issues.
(2) USFS should cross-reference treatment projects with identified evacuation routes to achieve maximum synergy with treatments. Evacuation routes are identified in the Tri-County Regional Community Wildfire Planning Process as suggested by fire departments of jurisdiction.

Landscape Scale Fire Mitigation Treatment by Prescribed Fire:

(1) Endorse Finney's 20-40% of landscape treatment model; utilize the interdisciplinary team (IDT) approach to designate the areas and prescriptions for prescribed fire treatment envisioned by the model. IDT's should include experts in soils, hydrology, road maintenance and design, silviculture, fire suppression and fire mitigation, fish and wildlife, including participation by MT FWP.

Final determination of the percentage to be treated should be left to the specialists on the IDT.

Such treatments are not guaranteed to succeed. It is important that in public outreach that the proposed treatment not be oversold—it is a question of probabilities and risk management. At the same time, the serious risks and consequences to multiple values posed by unmitigated wildfire in Ten Mile need to be understood.

(2)The group endorses Finney's view that all units treated require the use of prescribed fire as a component to achieve the desired impact. Based on IDT evaluation, some sites may require forest fuel modification and/or removal prior to burning. In roaded areas, use of heavy equipment is acceptable to achieve this purpose.

(3) Treatment at this scale will require several years to implement.

4) The public is cautious/concerned about the use of prescribed fire, and developing public confidence is highly important. Toward that end, one or more initial on-the-ground testing/demonstration projects are important. The normal design/approval process should be accelerated, consistent with appropriate environmental review of the initial projects and overall project. Planning should involve the public; the initial project site(s) should be visible if possible and be located so as to begin the mitigation of the risk to Rimini.

(5) IDT should work to maximize synergy between fire mitigation and wildlife values for treatment areas.

(6) The direct participation of the Fire Sciences Lab and Mark Finney should be sought; Finney has communicated to the USFS his willingness to be involved.

(7) There are to be no new permanent roads.

(8) Ongoing community engagement is essential to maximize credibility, transparency, confidence and public support and to help assure that the Ten Mile Watershed Committee's recommendations are carried out as envisioned. The Forest Service initially suggested such a citizen/community group, and has indicated that the Stewardship Authority Model, as used on the Beaverhead-Deerlodge National Forest, is preferred, indicating that the existence of such a functioning group would help elevate the Ten Mile in USFS project prioritization. Under this model, the USFS signs an MOU with an umbrella organization comprised of interested groups. The JWG endorses this recommendation**.**

It is important that the group recognizes and communicates effectively with the existing Resource Advisory Committee.

The City of Helena's ongoing participation, formalized by signing MOU(s), had been suggested by City Manager Tim Burton. The JWG endorses this recommendation, and suggests that the City of Helena be a full participant and co-signer in the community engagement process, but not the "convener". Thus, the convener would be determined by the new "umbrella group".

Any appointments to the citizen engagement group should require as a condition that the person/organization appointed supports the goals, principles and the proposed actions adopted by the Ten Mile Watershed Collaborative Committee.

Not yet determined: How appointments are made and by whom. Or do groups volunteer and name their representative? Should the City appoint more than one representative (such as staff, HCC…)?

(9) Roadless/Roaded Areas of Ten Mile

a) Prescribed fire treatments will be used in both roadless and roaded areas of the watershed.

b) These distinct zones of the watershed need different "sideboards" defining acceptable approaches to treatment. No new roads, temporary or otherwise, will be constructed in the Inventories Roadless Area of Ten Mile. However, non-road firebreaks may be constructed if needed.

c) The potential use of mechanized equipment for Roadless Area treatment has not yet been resolved by the TMWCC. Therefore, one or more initial treatments shall be applied in the Roaded area, with the results being assessed by the IDT and community engagement group. Roadless area prescriptions will be then designed by the IDT process, as per 1), page one of "Landscape Scale Fire Mitigation Treatment…" and, prior to any roadless area application, presented to the community group for review and approval.

10) Temporary Roads

a. Temporary roads can only be used in implementing the Finney matrix when;

i. a) an equal distance of existing system and non-system road needs to have been decommissioned in follow up to the Travel Planning process or by other means, in advance of the construction of the temporary road, and a legally binding mechanism is used to assure timely removal.

ii. b)The IDT determines, and Community Engagement Group (CEG) concurs that:

1) relocating the specific treatment area, as per Finney's suggested flexibility of site specific locations, is not feasible in this specific case, and

2) machine trail/forwarding removal of fuels, by themselves, are not practical to achieve the prescription.

11) Road Density: The Ten Mile Watershed is a landscape of unique importance to the City of Helena and people of the city and surrounding communities. Its multiple values include exceptional water quality, wildlife habitat and corridors, public recreation, among others. Reflecting this, key goals identified by the Committee include fire mitigation, water quality protection, fish and wildlife habitat conservation and enhancement, reduction of the threat of unmitigated wildfire. Species in the Ten Mile include moose, elk, white-tail and mule deer, wolf, lynx, wolverine, black bear, grizzly bear, among others.

The watershed is the site of numerous activities which have had, and will continue to have, a cumulative impact on these multiple values. These activities include a history of fire suppression, road construction, mining and a multi-year EPA mine waste mitigation effort, as well as a range of prospective activities, including paving of the Rimini road, increased recreational development and use, and possible National Guard activities.

The presence of roads has been identified by the Committee as a highly important issue, relevant to multiple values, including but not limited to fire suppression, fisheries and wildlife habitat conservation and connectivity, and public recreation.

At first glance, the desire of wildlife/hunting advocates for some decommissioning of roads in the watershed, and the view of fire mitigation/suppression professionals that existing roads are important for these purposes, seemed incompatible. However, the group gave careful thought to these issues, and the importance of finding common ground. It recommends the following course of action:

The Helena National Forest is in the process of revising its Travel Plan, a critical component of which is the issue of road density and location. The location of many roads is not optimal in terms of fish and wildlife habitat, meaning that in specific locations roads reduce such habitat, below optimal levels**.**

To address this issue, the Committee endorses the goal of reducing road density. It recommends that as a part of the proposed, ongoing "Ten Mile Community Involvement Process" (referred to elsewhere in its recommendations) that a Road Density Subcommittee be formed to develop specific road recommendations for inclusion/adoption in the revised Forest Service Travel Plan to achieve this goal.

To assure a thorough and balanced assessment, the Road Density subcommittee should be comprised of fire suppression/mitigation specialists, conservation and community interests, and be advised by state and federal agency biologists. Members would, as with the broader Community Involvement Process, need to endorse the fish and wildlife habitat enhancement/road density reduction goal toward which the group is working. The group would carefully assess roads for importance for fire suppression and effects on fish and wildlife habitat and water quality, developing specific recommendations for roads to remain open, those to be gated, and those to be decommissioned to achieve the habitat enhancement goal.

The success of the Community Engagement Process will in part depend on substantial progress being made in a timely manner toward reducing total road density (miles of road).

Flume Proposal (The Ten Mile flume project was initially supported on March 13, 2009, with subsequent modifications.)

Proposal:

Cut and remove, or pile and burn, or mulch and spread, conifers that are 200 feet below portions of the flume that is on wooden trestle, and 75 feet above areas of wooden trestle. Cut and remove conifers that are within 200 feet on the uphill side of the flume where it has been excavated. Pile and burn existing down woody debris that is on the uphill side of the ditch portions of the flume. Wind firm species would be left but thinned out to 30 foot spacing between crowns. Some contour felling and staking would be preformed on the uphill side of areas that have been ditched. The distances suggested above are subject to change upon further study or recommendations from other specialists. Proposed mitigation work along the flume would be accomplished using the same prescription regardless of ownership (private land or Forest Service)

Desired Future Condition:

Manage the forested vegetation within 300 feet of the flume such that future fire intensity during peak summer conditions is reduced from a stand replacing, high intensity fire down to a low intensity surface fire with flame lengths less than 3 feet.

The mitigation work proposed will increase the effectiveness of fixed wing retardant drops or rotor wing bucket drops used during fire suppression operations along the flume in the event of a wildfire. Suppression crews with hand tools would be successful and could safely engage the fire.

Location:

Immediate adjacent to the flume

Present Forest Composition:

Mostly a mature lodgepole pine forest with a fully closed canopy. Some minor inclusions of subalpine fir, spruce, and Douglas fir.

Methods of Tree/Fuels Removal:

Use existing road access where it exists coupled with log forwarders and if feasible, helicopters. Consider floating shorter logs.

Expected Season of Work:

Any season when the impacts are acceptable. Not during spring break-up.

Maintenance Over Time:

Keep regeneration to less than about 6 feet tall.

Specific Safety Concerns:

None.

Flume Buffer:

231 acres

Summary of Modifications Adopted to the Flume Proposal:

At the 3/19 Joint Working Group meeting, the flume proposal was supported, with the following points added by consensus:

- Post-project roads will not be improved or their width expanded
- Treatment methods are be designed to cause the least soil disturbance possible and to minimize spread of noxious weeds.
- Confirmed/Supported DL's proposal to conserve wind-firm species.
- Targeted fuels removal should minimize vegetative cover disturbance.
- Contour felling will be practiced to reduce sediment delivered from above mitigation zone.

At the 3/27 meeting, the following additions were adopted:

- On the ditch portion of the flume, where the risk of erosion/sedimentation is high due to steep slopes or other factors, tree removal may be inappropriate.
- To minimize long-term risk to the flume and trestle, replacing the entire flume with metal pipe is recommended. This recommendation is not intended to delay implementation of the current mitigation project.

On April 13, the TMWCC adopted the flume proposal with the following clarifications:

- Use existing road access coupled with log forwarders, and if feasible, helicopters. At the conclusion of the flume project, roads will not be improved or their width expanded, with the exception of improvements designed to improve water quality.
- At the June 3 JWG meeting, the following suggestion of Don Clark was adopted, and approved at the June 8 meeting of the TMWCC:
- Explore the development of a pre-sedimentation basin to minimize the effects of sediment on the Ten Mile Treatment facility.

Timing:

All Ten Mile Watershed Committee recommendations are being forwarded to the City of Helena for its consideration.

In relation to the habitat enhancement/road density issue, the Helena National Forest's Travel Plan revision, currently underway, requires timely action. Therefore, if the City supports these road density reduction recommendations, the Committee proposes that the City communicate in a timely manner its support for these recommendations to the Helena National Forest.

Appendix P
Sustainability Coordinator Job Description

This information was taken from Gillette, Wyoming's Sustainability Coordinator Job Description. See: http://www.ci.gillette.wy.us/employ/CurrentJobOpenings/SustainabilityCoordinator.pdf

CITY OF GILLETTE

Human Resources Department
P. O. Box 3003 •Gillette, Wyoming 82717-3003
Phone (307) 686-5222 FAX (307) 682-0726

JOB POSTING ANNOUNCEMENT

In House & Open to the Public

Position:	Sustainability Coordinator
Division/Dept.:	Administrative Services
Job Code:	
Range of Pay:	57
Rate of Pay:	$48,543 to $68,007 annual salary
Benefits:	Yes
FLSA Status:	Exempt
Employment Status:	Full-time

RESPONSIBILITIES: Under general direction, develops, implements and maintains conservation programs within the City organization; implements education and outreach efforts to staff, businesses and residents.

Responsible for developing, implementing and coordinating resource conservation activities including but not limited to; recycling, water conservation, pollution prevention, waste reduction, waste water management, energy efficiency and storm water pollution prevention.

Works collaboratively with stakeholders including City staff, developers, residents, architects, builders, and regulatory agencies to facilitate the establishment of resource conservation programs.

Works closely with the Public Information Officer to communicate and market conservation programs to the staff and to the public. Seeks methods to fund conservation programs through coordinated efforts with the Grants Specialist

Performs other duties as assigned or required.

MINIMUM QUALIFICATIONS:
A Bachelor's degree with major coursework in environmental studies, natural resource conservation programs, communications, or closely related field is preferred.
Five (5) years increasingly responsible experience in the development and implementation of natural resource conservation programs, recycling, waste reduction, pollution prevention, or communication.
Equivalent combination of experience and/or education from which comparable knowledge, skills and abilities have been achieved may be considered.
Outstanding interpersonal and customer services skills required

KNOWLEDGE, SKILLS AND OTHER CHARACTERISTICS:
Knowledge of policies, practices and methods for developing and administering resource conservation programs.
Knowledge of current trends and strategies, principles and practices applicable to resource conservation.
Knowledge of applicable city, county, state and Federal statues, rules ordinances, codes, regulations, administrative orders, case law and other governing rules and regulations.
Knowledge of the City's and the Department's policies and procedures.
Knowledge of the principles and practices of media and public relations, methods in advertising and marketing and. basic principles and applications of graphic design and lay out.
Knowledge of the principles of file and records management.
Skill in assessing and prioritizing multiple tasks, projects and demands.
Skill in working within deadlines to complete projects and assignments.
Skill as a public speaker, effective writing skills (technical and news),
Skill in establishing and maintaining effective working relations with co-workers, other City employees, representatives from other city, county, state and/or Federal agencies, the news media, general public and/or others having business with the City of Gillette.
Skill in operating a personal computer utilizing a variety of software and operating systems/ applications.

To apply, complete a City of Gillette application form available at www.ci.gillette.wy.us/employ or through the Human Resource Department located at 201 E 5th Street, Gillette, WY. 82717
First review of applications is July 3, 2009.

Equal Opportunity Employer. Pre-employment drug screening conducted.