

**CAPITAL IMPROVEMENT PROGRAM**  
**City of Missoula CIP Project Request Form FY 2016-2020**

Program Category:	Project Title:	14 Project #	15 Project #	16 Project #
Community Service	Energy Conservation, Climate Action	CS18		CS-06

**Description and justification of project and funding sources:**

This CIP project is designed to reduce energy consumption, reduce utility expenses and improve the indoor air quality / workplace. This project is compliant with and promotes the Climate Action Plan (Resolution 7753). Implementing energy efficient building improvements in conjunction with expanding the use of clean, renewable energy and pairing fleet efficiency with driver training amplifies both investments for maximum energy conservation, dollar savings and carbon reduction return and improves employee, public and environmental health. This project is composed of the following items:

Fy16 City Hall HVAC - See Support Page Energy Saving HVAC & Lighting.  
 FY17 Solar and Lighting. Fleet Efficiency - See Support Page Econ Fleet.  
 FY18 Fire Station 4 HVAC-See Support Page Energy Saving HVAC & Lighting.

Is this equipment prioritized on an equipment replacement schedule?

Yes

No

NA

x

Are there any site requirements:

N/A

**How is this project going to be funded:**

Funding Source	Accounting Code	FY16	FY17	FY18	FY19	FY20	Funded in Prior Years
General Fund (Bond)		1,900,000	14,275	120,560	135,680		84,000
Road District		15,000	15,000				
		1,915,000	29,275	120,560	135,680	-	84,000

**How is this project going to be spent:**

Budgeted Funds	Accounting Code	FY16	FY17	FY18	FY19	FY20	Spent in Prior Years
A. Land Cost							
B. Construction Cost		120,000					-
C. Contingencies (10% of B)		160,000					
D. Design & Engineering (15% of B)		87,000					
E. Percent for Art (1% of B)							
F. Equipment Costs		1,503,000	29,275	120,560	135,680		
G. Other		45,000					
		1,915,000	29,275	120,560	135,680	-	-

**Does this project have any additional impact on the operating budget:**

Expense Object	Accounting Code	FY16	FY17	FY18	FY19	FY20	Spent in Prior Years
Personnel							
Supplies	321.431350.341		(5,000)				
Purchased Services	321.430220.341		(6,000)				
Fixed Charges							
Capital Outlay							
Debt Service							
		-	(11,000)	-	-	-	-

Description of additional operating budget impact: This project will reduce gas and electric utility invoices significantly. The exact amount can be determined at the completion of the design phase.

Responsible Person:

Responsible Department:

Date Submitted to Finance

Today's Date and Time

Preparer's Initials

Total Score

Jack Stucky

Veh Maint

3/13/2015

4/21/2013 0:00

js

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CAPITAL IMPROVEMENT PROGRAM					
Project Rating					
(See C.I.P. Instructions For Explanation of Criteria)					
Program Category:	Project Title:			10 Project #	
Community Service	Energy Conservation, Climate Action			CS-18	
Qualitative Analysis		Yes	No	Comments	
1. Is the project necessary to meet federal, state, or local legal requirements? This criterion includes projects mandated by Court Order to meet requirements of law or other requirements. Of special concern is that the project be accessible to the handicapped.			XX		
2. Is the project necessary to fulfill a contractual requirement? This criterion includes Federal or State grants which require local participation. Indicate the Grant name and number in the comment column.			XX		
3. Is this project urgently required? Will delay result in curtailment of an essential service? This statement should be checked "Yes" only if an emergency is clearly indicated; otherwise, answer "No". If "Yes", be sure to give full justification.			XX		
4. Does the project provide for and/or improve public health and/or public safety? This criterion should be answered "No" unless public health and/or safety can be shown to be an urgent or critical factor.			XX	Reducing energy and fuel consumption and deploying clean, renewable energy reduces the amount of harmful emissions associated with fossil fuel energy sources and greenhouse gas emissions, helping to mitigate the associated negative impacts to human health including asthma and respiratory diseases, heart disease, and mercury-related neurological damage.	
Quantitative Analysis	Raw Score Range	Comments		Weight	Total Score
5. Does the project result in maximum benefit to the community from the investment dollar?	(0-3) 3	This project is part of our energy savings, clean air, and carbon reduction effort. Energy and fuel efficiency and conservation projects directly result in dollar savings. Further, the energy generated by City renewable energy installations stabilizes the price and creates an exponential savings over time as purchased utility costs incrementally increase. Finally, these projects have positive impacts on public and environmental health.		5	15
6. Does the project require speedy implementation in order to assure its maximum effectiveness?	(0-3) 3	As soon as the projects are completed, the energy and fuel savings and associated cost savings can begin. Additionally, portions of this project replace antiquated HVAC components that will fail in the near future. Further, taking quick action will reduce harmful air particulate and emissions pollutants, improving public health and environmental quality. Finally, completed projects keep the City on course to achieve the time sensitive goals of the Conservation & Climate Action Plan.		4	12
7. Does the project conserve energy, cultural or natural resources, or reduce pollution?	(0-3) 3	Energy conservation and pollution reduction are key outcomes of this project. Efficient buildings and fleet, along with increased use of renewable energy, directly results in lowered demand for fossil fuel use (natural resources and energy) and in turn, the pollution from building operation and vehicle use.		3	9
8. Does the project improve or expand upon essential City services where such services are recognized and accepted as being necessary and effective?	(0-2) 2	This project promotes healthier, more productive workplaces and public buildings. The GPS fleet portion improves City services by shortening response times with efficient staff deployment and route optimization. Also, it allows for more efficient service planning (mowing, trash, maintenance, inspections, etc.) and improving IT HVAC function will help to safeguard server failure which would result in a disruption of multiple City services. Finally, the tools provided by the implementation of this project can improve employee and public safety, reduce traffic accidents and decrease wear-and-tear on vehicles.		4	8
9. Does the project specifically relate to the City's strategic planning priorities or other plans?	(0-3) 3	This project specifically relates to the City's Conservation & Climate Action Plan that was adopted by City Council in January 2013. The Plan sets the goal for municipal operations to be carbon neutral from the 2008 baseline by 2025. Interim goals include 10% reduction by 2015, 30% reduction by 2017 and 50% reduction by 2020.		4	12
Total Score					56

	<b>FY15</b>	<b>FY16</b>	<b>FY17</b>	<b>FY18</b>	<b>FY19</b>
<b>City Hall HVAC</b>	\$42,000.00	\$1,900,000.00			
<b>Fire Station 4 HVAC</b>				\$80,000.00	\$80,000.00
<b>Central Maint. Lighting</b>		\$15,000.00	\$15,000.00		
<b>Solar Study</b>	\$42,000.00				
<b>GPS Unit/Install</b>			\$7,975.00	\$19,140.00	\$19,140.00
<b>GPS Service</b>			\$6,300.00	\$21,420.00	\$36,540.00
	<b>\$84,000.00</b>	<b>\$1,915,000.00</b>	<b>\$29,275.00</b>	<b>\$120,560.00</b>	<b>\$135,680.00</b>

## Fleet Efficiency and Eco Driving

Funding this project will expand the use of GPS technology on fleet vehicles.

### Phase One FY 2017: \$14,275

Purchase and Install 25 Vehicle Path GPS Units (\$7,975)

Purchase monthly tracking and reporting subscription service (\$21/month x 25 units x 12 months = \$6,300)

### Phase Two FY 2018: \$40,560

Purchase and Install 60 Vehicle Path GPS Units (\$19,140)

Purchase monthly tracking and reporting subscription service (\$21/month x 85 units x 12 months = \$21,420)

### Phase Three FY 2019: \$55,680

Purchase and Install 60 Vehicle Path GPS Units (\$19,140)

Purchase monthly tracking and reporting subscription service (\$21/month x 145 units x 12 months = \$36,540)

## Simple Payback Calculations:

### Vehicle Path GPS

#### Project Cost (Phases One - Three)

Phase One

Phase Two

Phase Three

#### Project Annual Savings after Phase 4 completed\* (6192 gallons)

#### Simple Payback

estimated 8% reduction in total fleet fuel use (unleaded and diesel) from FY2013 records (180,000 gallons, rounded down) @ a blended unleaded diesel cost of \$3.50/gallon. These are only estimates without knowing future fuel costs or which vehicles/pieces of equipment will be chosen.

Math: 180,000 gallons x 43%=77,400 gallons. 77,400 x 8% reduction = 6192 gallons. 6192 gallons x \$3.5

\* It is unknown what the actual cost savings will be when projects are implemented. All savings are projections based

## **City Hall and Fire Station 4 HVAC Energy Savings Projects & Central Maintenance Lighting Retrofit.**

City Hall and Fire Station 4 have been identified as being extremely energy inefficient. Not only do these sites use significant quantities of electricity and natural gas, they also provide poor indoor air quality, fail quite frequently and contribute to a less than desirable public facility and workplace. Upgrading the Lighting at the Central Maintenance Facility will improve the light quality and reduce energy consumption.

### **City Hall HVAC**

Budget: \$1,900,000

Fiscal Year: 2016

City Hall is not an energy efficient building. This building was selected based on high consumption and high energy costs as compared to other City buildings. Maintaining adequate indoor air quality is also a struggle. Many of the HVAC units are outdated and do not coordinate efficiently with other HVAC components. This jeopardizes our information system components in 911 and the Police desk. This results in heating water we have just paid to cool or cooling water we have just paid to heat. The HVAC system in the Information Technology area fails often exposing the I.T. components to extreme heat and extreme cold situations. Funding this CIP project will provide two or more energy efficient HVAC system designs to select from. The selected design will be purchased and installed in City Hall. The selected design will be implemented and construction will begin in FY16. Hopefully, it will be completed in late FY16 and/or early FY17. The end goal of this project may be ground water cooling systems and more efficient heating systems. This project may include upgrading air handling controls to reduce the amount of lead and lag time during heat exchange periods. This project may also include digital controls that will enable us to program occupied and non-occupied temperature settings, thus potentially reducing energy consumption during non-occupied periods.

## **FIRE STATION 4**

Budget: \$80,000  
Fiscal Year: 2018

Fire Station 4 has been identified as being energy inefficient. Funding this CIP project will enable a selected team of HVAC engineers to explore (research and design) ways to make Fire Station 4 more energy efficient and environmentally friendly. The goal is to reduce energy consumption, save money and reduce greenhouse gas emissions. This initial funding is for research and design only. This building was selected based on high consumption and high energy costs as compared to other City buildings. The end goal of this project may be ground water cooling systems and more efficient heating systems. Some of the existing boilers are not as efficient as the new models. It may be possible to replace old larger boilers with smaller more efficient boilers. This project may include upgrading air handling controls to reduce the amount of lead and lag time during heat exchange periods. This project may also include digital controls that will enable us to program occupied and non-occupied temperature settings, thus potentially reducing energy consumption during non-occupied periods.

## **CENTRAL MAINTENANCE LIGHTING**

Budget: \$30,000  
Fiscal Year 16 \$15,000  
Fiscal Year 17 \$15,000

Funding this project will make the lighting in the Central Maintenance Shop significantly more efficient. Replacing the existing T5 florescent lights with new style LED lights will provide more light where it is needed and reduce the energy consumption. If funded, we will replace approximately 85 T5 bulbs over a two year period of time with the new style LED bulbs. This would achieve an energy savings of approximately 99 watts per bulb. The payback period ranges from 6-7 years based on the cost of each watt ranging from .095 to .10 cents. Annual savings will range from \$5,400 to \$6,000 again based on the cost of a watt of electricity. This project will also improve the light quality in the shop providing an additional positive safety consideration.

## **Solar Power on City Buildings Study**

Budget: \$42,000

Fiscal Year: 2015

Funding this CIP project will enable a team of solar power engineers to analyze and recommend ways to increase the production of and expand the use of clean, renewable energy on City buildings. This initial funding is for research and design only and will explore both Solar Photovoltaic (PV) and Solar Thermal hot water heating to offset or reduce our dependence on traditional energy sources. Deploying renewable, solar energy generation with our ongoing energy efficiency building improvements amplifies both investments for maximum energy conservation, dollar saving and carbon reduction return.

The leverage factor or payback of this project will be determined by the engineering research. Technological advances in Solar Power and decreasing equipment costs have greatly improved the benefits and shortened the payback periods. Further, the energy generated by City installations stabilizes the price and creates an exponential savings over time as purchased costs incrementally increase.

As soon as the project is completed, the energy savings and associated cost savings can begin with implementation. Because of the project potential, installation will likely require phases. The sooner we study that potential, the sooner we can plan for implementation to move towards achieving the goals in the Conservation & Climate Action Plan.

The function of this project is energy conservation through on-site clean, renewable energy production which reduces pollution. Clean, renewable energy reduces the amount of harmful emissions associated with fossil fuel energy sources and greenhouse gas emissions, helping to mitigate the associated negative impacts to human health including asthma and respiratory diseases, heart disease, and mercury-related neurological damage.