

## 2018 Dane County Departmental SMART Fund

### Funding Opportunity Description

The Sustainability Subcommittee of the Public Works and Transportation Committee is responsible for distributing grant money to county departments from a \$2 million fund in the county's capital budget. This fund helps support the county's goal of becoming more sustainable. For example, it supports initiatives that fulfill the county's desire for reducing greenhouse gas emissions by implementing systems that result in more efficient energy use and investments in renewable energy production at our various facilities. This fund is a part of the county's continued efforts to ensure that important natural resources and ecosystem services are maintained for current and future generations. The fund can be used by your department to help you implement strategies identified in the [Dane County Government Sustainable Operations Plan](#), to supplement current budget items that do not have enough funds to incorporate additional sustainable measures, or to fully fund projects that are not in the current budget, but that will improve the sustainability of county operations and reduce long-term costs. The committee will select projects to fund based on their consistency with the sustainability principles adopted by the Dane County Board (on October 18, 2012) to guide county government management, operations, and policy making, as well as based on their ability to further implement the [Dane County Government Sustainable Operations Plan](#).

#### **Benefits of this fund:**

- Alignment of departments and staff toward a common understanding of sustainability
- Clarity and consistency in assessing and organizing actions and programs for sustainable government operations
- Enhanced policies and programs incorporating a sustainability perspective
- Enhanced reputation as a proactive contributor to a more sustainable community
- Reduced operating costs

#### **Dane County's Sustainability Principles:**

Dane County strives to operate in a sustainable way that will:

- Reduce and eventually eliminate county government's contribution to fossil fuel dependence and to wasteful use of scarce metals and minerals;
- Reduce and eventually eliminate county government's contribution to dependence upon persistent chemicals and wasteful use of synthetic substances;
- Reduce and eventually eliminate county government's contribution to encroachment upon nature and harm to life-sustaining ecosystems (e.g., land, water, wildlife, forest, soil, ecosystems); and
- Reduce and eventually eliminate county government's contribution to conditions that undermine people's ability to meet their basic human needs.

#### **Eligible Applicants:**

Dane County Departments

**Award Information:**

**Application Deadlines:** There are 3 application deadlines for 3 rounds of funding. Solicitations for applications will go out via email about 1 month before each deadline.

1. Feb 9, 2018 — At this time up to 50% of the funds will be awarded.
2. July 2, 2018 — At this time up to an additional 25% of the funds will be awarded.
3. October 8, 2018 — At this time the remainder of the funds will be awarded.

The subcommittee generally makes award decisions within a couple of weeks of the application deadline depending on complexity of the proposals and the subcommittee meeting schedule.

**Examples of types of projects that would be eligible:**

- Renewable energy or energy efficiency improvement investments for county facilities, such as solar lighting, LED lighting upgrades, energy efficient boilers, etc.
- Water conservation improvements
- Covering the cost differential between conventional and fuel-efficient vehicles to purchase more fuel-efficient fleet vehicles or convert existing vehicles to more fuel-efficient and lower-emission vehicles
- Purchase of new or upgraded equipment that will improve the overall efficiency of facilities and reduce greenhouse gas emissions, reduce the use and disposal of toxic products, reduce maintenance costs and/or staff time using the equipment, and/or facilitate better tracking, measurement, and verification of sustainable outcomes in county operations

**Application and Submission Information:**

Apply electronically to Lisa MacKinnon at [Mackinnon@countyofdane.com](mailto:Mackinnon@countyofdane.com) and Greg Brockmeyer at [Brockmeyer@countyofdane.com](mailto:Brockmeyer@countyofdane.com).

Please include the following in your application:

- 1) A detailed description of your proposed project
- 2) How the project, if carried out, will meet the county's sustainability principles
- 3) How the project, if carried out, will implement specific goals, objectives, and strategies identified in the [Dane County Sustainable Operations Plan](#). Indicate which goals, etc.
- 4) How the county might build upon the sustainability outcomes of the proposed project
- 5) How your department intends to track and measure the outcomes of the project, if funded, such as cost savings, energy reductions, maintenance reductions, etc. and who will be responsible for measurement and verification.
- 6) Budget Sheet: Include all costs of achieving the objectives of the project.
- 7) Estimated cost savings to the county due to implementation of the project and the payback period. Include here information on estimated Focus on Energy incentive savings if your project is eligible for FOE incentives (see <https://focusonenergy.com/business> or contact Lisa MacKinnon for assistance in getting this information).

Questions are to be directed to Lisa MacKinnon at 267-1529 or Greg Brockmeyer at 266-4519.

**Dane County Sheriff Freeway Service Team  
CNG Fuel System and LED Lighting Proposal**

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**Department:** Dane County Sheriff's Office

**Address:** 115 W Doty Street  
Madison, WI 53703

**Project Title:** Freeway Service Team CNG Bi-Fuel System and LED Emergency  
Lighting Package

**Project Location:** 115 W Doty St, Madison, WI 53704

**Project Coordinator:** Sergeant Matt Alsaker  
[alsaker.richard@danesherriff.com](mailto:alsaker.richard@danesherriff.com)  
608-284-6876

**Total project costs:** \$26,537.46

**Funding amount in current budget:** \$0.00

**Funding amount requested:** \$26,537.46



**Project Description:**

The Freeway Service Team (FST) program currently operates two vehicles. The newest vehicle is a 2016 Ford F250 Super Duty. In 2016, SMART Funds were awarded to equip this vehicle with a CNG Bi-Fuel System. The CNG conversion resulted in a 29% reduction in fuel costs and now 72.2% of the fuel used by FST is CNG. This vehicle has over 130,000 miles on it.

The second vehicle is a 2008 GMC with diesel engine that has over 350,000 miles. We are working toward replacing this vehicle. We have secured over \$56,000.00 in cash and equipment donations from local companies toward the purchase of a new FST vehicle. The new vehicle will be a Ford F350 Super Duty and is projected to cost \$77,832.00. We hope to equip this vehicle with a CNG system and new "smart" LED emergency lighting / scene safety lighting system.

The Dane County Sheriff's Office requests \$13,495.00 for the purchase of a CNG Bi-Fuel System to be installed in the new 2018 Ford F350 Super Duty Freeway Service Team (FST) Truck that is being equipped to be put into service in the fall of 2018. This CNG system would be installed locally by Barnes Green Energy. Barnes Green Energy has extended a \$1,610.00 discount on the cost of this system (actual value of system \$15,105.00). The inclusion of a CNG Bi-Fuel System will provide a dramatic reduction in fuel costs to the county and reduce harmful environmental

emissions. The annual fuel savings is projected to be \$2,175.00 using CNG instead of gasoline. The CNG system has a rapid return on the investment and will pay for itself within 6.2 years.

The Dane County Sheriff's Office requests \$13,042.46 for the purchase of the SoundOff Signal bluePRINT "smart" emergency lighting and scene lighting LED system for the new FST truck. The system uses advanced mPower LED lights which are brighter, produce less heat, and use less power than standard emergency / scene lighting. The advanced lighting system not only reduces energy output, but enhances deputy and commuter safety on the Beltline.

The Freeway Service Team Deputies are a highly visible service as they patrol the Beltline. This visibility affords an excellent platform to promote low-emission vehicles and will enhance Dane County's reputation as a proactive contributor to a more sustainable community.

### **FST Program Summary:**

Since December 2001, the Dane County Sheriff's Office has provided a Freeway Service Team (FST) providing assistance to motorists on the USH 12-18 Beltline from Interstate 39 - 90 to Old Sauk Road. Each month the FST program responds to approximately 400 calls for service. This program is staffed by two deputy sheriffs who patrol the Beltline for 12 hours a day to assist motorists (free of charge). The FST deputies respond to disabled vehicles, vehicle crashes, debris in the roadway, assist County Highway, and address other safety concerns to keep the highway moving efficiently and safely. The FST deputies work with the many other stakeholders from different jurisdictions on the Beltline including: law enforcement, fire, EMS, Dane County Highway Department, and the Wisconsin Department of Transportation. The many construction projects on the Beltline and Verona Road area have made the role of the FST even more important.



The FST program is operated by the Dane County Sheriff's Office under a contract with the Wisconsin Department of Transportation and is funded by a Federal Grant administered by the Wisconsin Department of Transportation. The FST vehicle is a four-wheel drive truck with specialized equipment to assist motorists. The vehicle is equipped with a changeable message sign, appropriate fluids, traffic cones and other appropriate equipment needed to assist a stranded motorist or manage a traffic incident.

**Describe how the proposed project moves the county toward meeting the following Sustainability Principles. Responses to this section will be used to determine the relative level of sustainability for each project.**

*Reduce and eventually eliminate county government's contribution to fossil fuel dependence and to wasteful use of scarce metals and minerals.*

The FST program responded to approximately 4720 service calls in 2017. The vehicles consumed approximately 6260 gallons of fuel while travelled approximately 48,300 miles. This level of service creates a large demand for fuel. To reduce the fuel consumption of the FST truck, the new truck will be equipped with a gasoline engine with a CNG prep package. Gasoline costs are lower than the current diesel fueled truck and provide the flexibility to add a CNG Bi-Fuel System that will further reduce harmful emissions.

Barnes Green Energy reports they can add the system after the truck is put into service in the event it is in service prior to the July application deadline for the SMART fund. Equipping the replacement FST truck with a gasoline engine and a CNG Bi-Fuel System installed by local business Barnes Clean Energy will dramatically reduce fossil fuel dependence on gasoline with the switch to cleaner burning CNG.

A 2018 Ford F350 truck offers a CNG capable 6.2 liter V8 engine. The Ford Motor Company considers Wisconsin to be a "Cold Weather" state, so it cannot offer a CNG only model. The Ford F350 would be equipped with two tanks; one utilizing gasoline and the other holding 20.5 gas gallon equivalent of CNG. The truck engine starts with gasoline and automatically switches between fuel systems to maximize the use of CNG. CNG has an octane rating of 130 compared to regular grade gasoline's rating of 87, this has the potential to optimize the engine's thermodynamic efficiency by using a higher compression ratio (Ford Alternative Fuel Buyer's Guide 2015). CNG and gasoline have similar ranges, with a 20.5gge Type 4 CNG Tank the FST truck will have the same range as a conventionally powered truck.

The SoundOff Signal bluePRINT system uses new LED technology. The light heads are smaller, brighter, and draw less energy from the already heavily taxed batteries on the trucks. The system has built in "cut-off" switch, allowing secondary equipment to be taken off battery power and preserving battery life. The system is a "smart" system that, based on pre-programmed driver actions, automates an increase and decrease in the use of the emergency and scene lighting on the vehicle. This system reduces distractions for the driver, increases intersection safety, and increase scene safety.

This system was recently installed on the three new Traffic Team squad cars with excellent results. Traffic Team members with the SoundOff Signal bluePRINT system have reported increased compliance with the Move Over law (making it safer for the deputy and motorist they have stopped), vehicles yielding more quickly to the emergency lighting (general public can see the emergency lights better), vehicles yielding at intersections better (reduced risk of crash while in heavy traffic), and Traffic Team members report the smaller light heads afford better visibility out of the squad.

*Reduce and eventually eliminate county government's contribution to dependence upon persistent chemicals and wasteful use of synthetic substances.*

Natural gas vehicles (NGV) cost less to maintain because CNG burns very clean. NGV show significantly less engine wear, spark plugs last longer, and oil changes are needed less frequently. CNG use may extend the interval for oil changes due to it being cleaner burning, reducing the amount of waste engine oil created by the FST truck. Mufflers and pipes on NGV last longer because CNG does not react with the metals of these components. This new truck may have a longer duty life due to the lowered maintenance costs and reduced engine wear.

The SoundOff Signal bluePRINT system uses smaller LED light heads, using less materials to produce. The light heads on the exterior of the vehicle are a flexible synthetic material, allowing them to expand and contract with the temperature / moisture changes in Wisconsin. The light heads are less susceptible to damage from weather or from being accidentally hit.

*Reduce and eventually eliminate county government's contribution to encroachment upon nature and harm to life-sustaining ecosystems.*

The FST vehicles operate under extreme conditions. The vehicle is operated as an emergency response vehicle. The vehicle operates in heavy traffic, resulting in constant acceleration and braking. The vehicle idles for extended periods of time while protecting and clearing incidents. Table 1 shows the gallons of fuel used under actual driving conditions from 2017.

Table 1

FST Miles Driven	Actual Miles Per Gallon	FST Gallons of Fuel Used
48,300	7.72	6260

The 2016 conversion of the 2016 Ford F250 to a CNG system has resulted in 72.2% of the fuel used by the FST program being CNG fuel. Of the fuel used in 2017, approximately 1740 gallons were fossil fuels. This was primarily in the form of diesel fuel to operate the old 2008 GMC.

*Reduce and eventually eliminate county government's contribution to conditions that undermine people's ability to meet their basic human needs.*

The FST program has already seen a 29% reduction in fuel costs since the conversion of the 2016 Ford F250. A CNG Bi-fuel system on the new 2018 F350 would provide additional fuel savings. Additionally, it would allow us to avoid purchasing the F350 with a diesel engine.

In December of 2017, Dane County paid \$1.23 per gallon of CNG versus \$2.48 per gallon of diesel fuel. This is a 50.4% cost reduction or savings of \$1.25 per gallon. Based on the 1740 gallons of fossil fuels used in the FST trucks in 2017, a CNG Bi-Fuel conversion could save \$2,175 annually.

The SoundOff Signal bluePRINT system is a “smart” system with one of the primary development goals being increased safety of those around the vehicle (driver, passing motorists, etc.). The enhanced lighting and interactive nature of the system will enhance safety for all the commuters, highway workers, and emergency personnel working scenes on the Beltline.

**Describe how the proposal furthers implementation of the Dane County Government Sustainable Operations Plan goals, objectives, and strategies in your department and/or countywide. Please identify specific plan goals, objectives, and strategies accomplished.**

Equipping the new FST truck with a CNG Bi-Fuel System would make this truck only the second vehicle in the Sheriff’s Office fleet that is operated on an almost daily basis to be fueled by CNG. The routine operation of this truck will reduce emissions and reduce fuel costs for the FST program.

Equipping the new FST truck with the SoundOff Signal bluePRINT system will reduce the energy draw on the vehicles heavy duty batteries (prolonging their life), use smaller advanced LED light heads (fewer materials), and increase visibility of the truck (enhancing safety).

**Describe how the county might build upon the outcomes of the proposed project to work toward greater sustainability.**

The CNG Bi-Fuel System will benefit the county due to the redundant fuel systems and reliability benefits of CNG over conventional gasoline. The natural gas ignition point is 1,200 degrees Fahrenheit, twice that of gasoline. Natural gas will not combust in concentrations below five percent and above 15 percent. Spilled or leaking gasoline will pool and can pose a significant threat if ignited. NGV cylinders are subjected to a number of federally required “severe abuse” tests, such as heat and pressure extremes, gunfire, collisions and fires. If a CNG tank is punctured, the contents will dissipate in the air.

The FST truck will be prominently featured in community due to the more than 127,000 motorists that travel on the Beltline every day. The new truck will be clearly marked as a CNG equipped vehicle and the significant exposure to the community will help open a dialogue with Dane County residents about CNG vehicles.

A 2018 Ford F350 CNG truck utilizes the most up to date technology available in a CNG vehicle. It will save Dane County taxpayers thousands of dollars in fuel bills. It will preserve waterways and clean air. It can prevent soil contamination due to the dramatic reduction in carbon dioxide emissions and fossil fuels burned.

A NGV will excel in the role of being assigned to the FST. CNG will prove itself under the most extreme conditions while being safer and better for the environment. The fuel savings and reliability will influence decision makers hesitant to switch from a traditional gasoline based fleet to NGV. The CNG FST truck can refuel using existing County CNG refueling facilities at Robertson Road or commercial CNG fueling stations along the Beltline and Verona Road Corridor.

The SoundOff Signal bluePRINT system will provide better visibility to the FST truck and scene safety on the Beltline. The system will reduce risk to those working on the Beltline and reduce secondary incidents by providing better lighting at incident scenes. It does this all while using advanced LED technology which reduces energy output and reduces the materials needed to manufacture the light heads.

**Describe how your department will track and measure outcomes of the proposed project (i.e., annual cost savings, annual energy savings, resource use reductions, maintenance reductions, etc.). Include a timeline for measurement and reporting outcomes, and the staff member contact who is responsible for conducting the tracking and measurement.**

DCSO completes monthly reports for the FST program. These monthly reports and an annual summary report will detail the fuel consumption of the FST truck in gasoline and CNG. The FST program administrator will be responsible for documenting the fuel usage and subsequently reporting this information to the Dane County Department of Administration (DOA) upon request.

DCSO will also track the rate of secondary crashes or incidents along the Beltline where the FST truck with the SoundOff Signal bluePRINT system is involved.

**Budget.**

The cost of equipping a 2018 Ford F350 Super Duty truck with a CNG Bi-Fuel System with a 20.5gge (gas gallon equivalent) system is \$15,105. Barnes Green Energy has offered a \$1,610 discount on the installation of the system to Dane County, making the total cost to the County \$13,495.

Barnes Green Energy is located at 6433 Nesbitt Road, Madison, Wisconsin. Barnes, Inc. was established in 1981 by Mark Barnes as a landscape maintenance and snow removal company. Since its inception, the company has grown into a full-service, year-round maintenance and construction service business, adding tree trimming and removal, fertilizer/weed control, holiday lighting, landscape construction and landscape design to its wide array of services.



Barnes, Inc.'s staff of approximately 150 employees serves more than 1,000 customers in the Dane County, Wisconsin. Barnes, Inc. is a proud member of Wisconsin Clean Cities.

The cost of equipping the 2018 Ford F350 Super Duty truck with the SoundOff Signal bluePRINT is \$13,042.46. General Communications is the only local vendor for the SoundOff Signal bluePRINT system. They are located in Fitchburg (WI). General Communications was the vendor for the Traffic Team squads that are equipped with this system. Additionally, SoundOff Signal agreed to donate several mPower light heads to the project.

### **Attachments**

- Barnes Green Energy CNG Bi-Fuel system estimate.
- General Communications SoundOff Signal bluePRINT system estimate.