

Department: Dane County Sheriff's Office Address: 115 West Doty Street Madison, WI 53703	Total project costs: \$110,000.00
	Funding amount in current budget: \$0.00
	Funding amount requested: \$110,000.00
Project Title: Tactical Response Team (TRT) Truck & Trailer Replacement	
Project Location: 115 W. Doty Street, Madison, WI 53704	
Project Description: DCSO TRT requests \$110,000.00 for the purchase a 2017 Ford F350 Bi-Fuel chassis, CNG conversion and Custom Aluminum Service Body to replace our existing 2005 Chevrolet 2500HD truck and 32' equipment trailer. The project will describe the current DCSO TRT Truck and Trailer and how a new Compressed Natural Gas (CNG) bi-fuel truck would improve gas mileage and reduce harmful environmental emissions. Additionally, this project outlines potential savings, environmental footprint reductions, and ways of tracking monetary fuel savings.	

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

The Dane County Tactical Response Team (TRT) serves as a regional ALERT (Aligned Law Enforcement Response Team) tactical team. Our designated region is comprised of Dane County and 10 neighboring counties for mutual-aid response purposes. Dane County TRT, under the ALERT umbrella, serves over 1.1 million citizens, and has geographic responsibility for what amounts to approximately 20% of the State of Wisconsin's square mileage.

DCSO has a truck and trailer assigned to the TRT. The truck is a 2004 Chevrolet 3500HD pick-up truck. The engine is a 6.0L gasoline engine, producing 300hp and 360ft/lbs. of torque. It pulls a 15,000lb GVRW, 32' long trailer that is overweight by several thousand pounds. Based on fuel consumption records, the onboard computer and driver observations, the truck averages approximately 8mpg. The 12 year old vehicle has only 18392 miles on it; however it has spent hundreds upon hundreds of hours idling (necessary to keep on-board electronics running) while on both high-risk incident call-outs and training exercises. The TRT truck and trailer have also sustained significant wear and tear, due to the temperature extremes it is faced with, as well as not being stored in a climate controlled garage-which leads to premature replacement of expensive electronics and other tools contained within it.

A new TRT truck would not require a trailer, and would be more efficient, not only in fuel economy, but occupy a much smaller footprint. A vast majority of the time, TRT uses the truck and trailer as a place to hold briefings and to assemble specialized equipment for high-risk incidents. The trailer also serves as the storage facility for the TRT's NFDD (noise-flash diversionary devices), chemical agents, CBRNE (Chemical, Biological, Radiological, Nuclear Energy) protective equipment.

Because of the size of the vehicle, and lack of climate controlled storage, the truck and trailer are rusting and have experienced several mechanical failures. Also, due to a change in team tactics, the amount of space needed to house tools and equipment is much reduced, and a smaller, more efficient vehicle configuration would suffice.

- **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 cleanly. NGV's show significantly less engine wear, spark plugs last longer, and oil changes are needed less frequently. Mufflers and exhaust systems on NGV's last longer, due to the CNG exhaust not chemically reacting with the metals of those components. In certain NGV's, miles driven between oils changes can be extended to 25,000 miles.

It should also be noted that non-climate controlled storage has affected several tools that make High-Risk Calls safer for TRT deputies: the \$15000.00 Throwbot and \$12000.00 pole camera/under door viewer and \$10000 thermal imager. The freeze thaw cycles have dramatically reduced their battery life-and they are not replaceable by end users-and have to be sent back to their manufacturers for re-furbishing-well ahead of their expected product life-cycles. These devices are used to prevent TRT members from being directly exposed to IED's, booby traps and direct weapons fire when conducting high-risk operations.

- **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):**

As mentioned earlier, the TRT truck and trailer has relatively low mileage, but lots of engine idle time. Due to the weight of the trailer, and design of the motor, it consumes approximately 8 miles per gallon when towing the trailer. The proposed bi-fuel TRT truck would have much improved mileage, and savings in fuel, as it could run and idle primarily on CNG, especially when on calls for service in Dane County and other locales with CNG refueling infrastructure.

Additionally, the DCSO has recently invested significantly in CNG infrastructure in the PSB sub-basement, to include a CNG vehicle storage area with a special ventilation system. It would be ideal to have the new TRT equipment truck parked there, next to the Hostage Negotiation van, that is also a CNG vehicle. Having the TRT equipment truck stored in the secure, climate controlled PSB would aid not only in preservation of the special equipment, but would also be centrally located and stored with the TRT's Bearcat armored rescue vehicle, allowing more efficient operations for high-risk call outs-with vehicles and personnel departing from a single, central location.

Dane County also produces CNG from the County Landfill—turning county generated waste bi-products into fuel, that is used in County owned vehicles and is extremely environmentally responsible. This model could serve as an example to other county governments looking to expand Green Initiatives.

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

There is no greater human need than the preservation of human life. DCSO has organized special teams to provide a coordinated law enforcement response to situations involving persons in crisis, suicidal subjects, and/or barricaded subjects or hostage situations.

DCSO deems High-Risk calls for service to be: hostage situations, armed/barricaded subjects, sniper situations, certain jail disturbances, dignitary protection, dangerous arrest situations,

high-risk warrant service, suicidal subjects, and other special assignments that fall outside the capability of a standard patrol deputy response. The specialized team approach protects the safety of hostages, innocent persons, and involved law-enforcement personnel. The TRT provides south central/southwestern Wisconsin residents in crisis, and their loved ones, an opportunity for a safe and peaceful resolution.

A new, bi-fuel TRT equipment truck would better suit the needs of TRT, as it would be more efficient idling (necessary to keep power to some electronic monitoring equipment and to maintain the vehicle's battery). A vehicle assigned to TRT must perform for long periods of time during all of Wisconsin's four seasons. TRT may be called upon anytime to respond to high risk calls. The team has been deployed on incidents lasting longer than 16 hours, and potentially days. Vehicles assigned to DCSO's special teams are utilized in austere environments, so dependability is of the utmost importance. At the present time, the TRT Truck and Trailer must be hooked up to both a shore power station and a trickle charger when not in use.

A 2017 Ford F350 Super Duty chassis (dual rear wheel configuration) and custom work truck body is available with a 6.2L V8 that is factory prepped for CNG/Propane conversions. As Wisconsin is deemed, a "Cold Weather State" it is unable to offer a CNG-only vehicle. The F350 would be equipped with two tanks: one for gasoline and the other for CNG. CNG has an octane rating of 130 compared to regular gasoline at 87. CNG and gasoline have similar ranges. Due to the fact that TRT serves a huge area of Wisconsin, the bi-fuel vehicle is a sound choice—able to utilize CNG in Dane County and when idling, and regular fuel when called out of the normal area serviced with CNG facilities. With an increasing number of CNG refueling facilities opening throughout Wisconsin, the probability of decreasing gasoline usage continues to increase the opportunities of utilizing CNG. The new truck is estimated to consume less than half the fuel than that of what the current truck and trailer consume, which will contribute to additional savings, provided this vehicle, appropriately configured, should last the County 15-20 years.

Not including the hours spent idling, the 18,392 miles recorded by the current TRT truck and trailer have burned over 2300 gallons of fuel, which is equivalent to 20.4 metric tons of CO₂, or 47.3 barrels of oil used or the equivalent emissions of six and a half (6.5) tons of waste recycled in a landfill. This is also equivalent to the amount of CO₂ produced by burning 21,812 pounds of coal: and this IS NOT including the necessary time spent idling to maintain electricity for the onboard electronics and vehicle batteries, or the use of fuel by the trailer's supplemental generator.

<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>

The metric tons of carbon dioxide emitted, barrels of oil used, and the estimated gasoline cost would all be much higher than the tables show. According to the EPA, 2300 gallons of gasoline used would need to be offset by 530 tree seedlings grown for 10 years.

BIO CNG, a natural gas refining company, advises replacing a typical older vehicle with a new NGV vehicle reduces exhaust emissions in the following ways:

- Carbon monoxide (CO) reduced by 70-90 percent
- Non-methane organic gas (NMOG) reduced by 50-75 percent
- Nitrogen oxides (NO_x) reduced by 75-95 percent
- Carbon dioxide (CO₂) reduced by 20-30 percent

Additionally, the service body is to be manufactured out of Aluminum, which is significantly lighter than the materials utilized in the TRT trailer. Lighter weight = improved fuel economy and less wear and tear on the new truck chassis. The service body can also be readily recycled at the end of its usable lifespan.

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.

By incorporating this new vehicle into its fleet, Dane County is taking positive steps to keeping a large, inefficient vehicle and trailer off the roads. Also, by housing this new vehicle in the PSB, (a climate controlled area) additional dollars will not be needlessly spent to replace vital/expensive tactical electronic equipment and other devices stored within this vehicle, prior to the end of its usable life. Additionally, the equipment will be more secure, as the locks on the trailer are malfunctioning.

Not only does Dane County produce CNG, its vehicles consume it, and harmful emissions are reduced. Additionally, the new vehicle and its storage location will help to reduce the amount of electronics/batteries that are in need of replacement.

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

A new CNG truck will benefit the DCSO and the TRT because of the safety and reliability benefits of CNG over conventional gasoline. The natural gas ignition point is 1,200 degrees Fahrenheit, double that of gasoline. Natural gas will not combust in concentrations below five percent and above 15 percent. Spilled or leaking gasoline will pool and may pose a significant threat if ignited. CNG 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 simply dissipate into the air.

The new CNG truck will be used in every village, town and city in Dane County, as well as 10 surrounding counties in the DCSO ALERT response area. A new vehicle has the potential to be utilized for TRT training days and High-Risk Incidents, alongside the Hostage Negotiation Team (HNT) and the Explosive Ordinance Disposal (EOD) team. The vehicle will also be prominently featured alongside the Dane County Armored Rescue Vehicle in community events such as National Night Out, Cambridge's Touch a Truck, Madison's Safety Saturday, parades, and at the public safety career fair the Alliant Energy Center. The significant community exposure may help open a dialog with Dane County residents regarding the benefits of CNG vehicles.

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 will retain the aforementioned information on the TRT Truck's fuel economy, average price per gallon of fuel, metric tons of CO2 dispersed and barrels of oil burned. In reference to a new NGV, DCSO will record information associated with CNG tank fill-ups for the next five (5) years. Additionally, hours spent idling and mileage will be recorded. The DCSO recognizes a new vehicle is a huge investment. Extra care will be exercised to ensure information will be transparent and provided in an efficient manner.

DCSO Sgt. Ira Simpson, an entry team leader for the TRT, will be responsible for documenting the fuel usage and subsequently reporting that information to the Dane County Department of Administration (DOA). The tracking will be completed quarterly, in a timely manner, on an Excel Spreadsheet, as provided by Baker Tilly Consulting in 2014. The timeframe could also be determined based on the reporting requirements of DOA. Additionally, the impact this vehicle has on the environment will be tracked using the following website: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>.

Contact: Sgt. Ira Simpson **Phone:** 608-576-1932 **Email:** Simpson.ira@danesherriff.com