Dane County Sheriff Investigative Services Bureau Fossil Fuel Reduction Plan

County Department: Dane County Sheriff's Office

Address: 115 W Doty Street
Madison, WI 53703

Project Title: Investigative Services Bureau Fossil Fuel Reduction Plan

Project Location: 115 W Doty St, Madison, WI 53703

Total project costs: $101,235

Funding amount in current budget: $0.00

Funding amount requested: $101,235

This document outlines a proposal that would reduce fossil fuel consumption and greenhouse gas emissions for three detective vehicles from the Dane County Sheriff's Office that generally drive 25 or more miles for work daily by replacing their high-mileage former patrol vehicles with Ford Fusion Energi plug-in hybrid special service vehicles.

Project Background and Description:

Including the supervising sergeant, there are 26 detectives that currently comprise the Dane County Sheriff's Office Investigative Services Bureau (ISB). These detectives are each assigned a personal vehicle as they travel independently around the county, and often out of county, piecing together timelines and evidence to work towards solving the hundreds of open criminal cases in Dane County. Except for two, all ISB fleet vehicles are Ford Police Interceptor SUVs that were once used on patrol and were passed down to the bureau after they reached 100,000+ physical miles (not including idle hours) as historically it was most cost effective to recycle vehicles for the ISB instead of purchasing new vehicles for detective use. However, patrol deputies and detectives have very different travel needs and usage patterns and as vehicles evolve, better options are becoming available.

Patrol vehicles are pursuit rated and are made to accelerate fast in an emergency in favor of fuel efficiency; they are designed to get law enforcement from A-to-B as quickly as possible. As a result, their average MPG is markedly diminished compared to that of an SUV that a member of the public might own. For instance, the average MPG for an Interceptor in the Dane County Sheriff's Office fleet is around 13-15 MPG, depending on idle time. In addition, patrol squads are designed to operate in extremes: from running 100+ MPH on a high-speed chase, to idling at a scene or traffic stop, and everything in between. While this proposal is not for patrol vehicles, it is noteworthy that pursuit vehicle vendors are beginning to offer idle control programs on factory builds, and the Sheriff's Office is considering all options to reduce our fossil fuel footprint for future fleet purchases. For safety reasons, it is imperative that police vehicles remain running during calls and traffic stops as this is how their radio, video recording apparatus, computer systems, and other instrumentation remain operable

without draining the vehicle battery. As idle management options become available from the factory, the Sheriff's Office will begin exploring how we can best utilize them.

While it may seem cost efficient on the front-end to "trickle down" former patrol squads for other department needs instead of buying new, there are hidden costs associated with this approach. For instance, the department pays a large amount for repair costs, not to mention they are not ideal for fuel efficiency for the reasons outlined above. In other words, not only do these vehicles have a higher environmental impact, they also are expensive to keep on the road considering both fuel and repair/maintenance costs. Until recently, fossil fuel powered vehicles were the only option available to meet the demanding needs of the law enforcement patrol use case. Beginning in 2020, Ford is offering the first pursuit-rated hybrid SUV, and the Sheriff's Office will be testing three of them; if they perform satisfactorily and do not incur significant additional repair/maintenance expenses compared to their non-hybrid pursuit-rated counterparts, the Sheriff's Office could eventually replace the entire fleet with pursuit-rated hybrid vehicles. With that said, it will be years before those vehicles trickle down to the detectives in ISB. Replacing three current ISB Interceptor squads with Ford Fusion Energi plug-in hybrids through this grant would be a significant step forward in reducing the department's current carbon footprint.

In 2017, Lt. Kerry Porter applied for the SMART grant and was awarded a Ford Fusion hybrid (non plug-in version). Initially, some detectives were skeptical about how a hybrid vehicle would accelerate and handle for non-pursuit police work; but now that Fusion hybrid is highly coveted, and it is driven by a senior detective. The Bureau Sergeant confirmed that if plug-in hybrids were offered, ISB detectives are willing to use them.

Fully charged, the Ford Fusion Energi plug-in hybrid special service vehicle is the only plug-in hybrid rated for non-pursuit police use available on the market now that can travel 25 miles on electricity alone before switching to a standard gas/electric hybrid mode. When a detective is travelling around the county for interviews, he or she would be able to travel up to 25 miles using no gasoline which also equates to no emissions. In addition, the combined hybrid electric/gasoline 42MPG EPA estimated fuel efficiency of the Ford Fusion Energi would nearly triple the MPG observed on current ISB squads.

Estimated Cost Savings:

According to AAA, the Wisconsin average cost for unleaded fuel as of October 06, 2019, was $2.503 per gallon. At that rate, for a detective to travel 25 miles, it currently costs the Sheriff's Office approximately $4.17. If utilizing the Ford Fusion Energi plug-in hybrid special service vehicle, that fuel cost would be reduced to $0.00.

For three detectives to travel the first 25 miles gas-free daily, the Sheriff's Office would realize a **fuel cost savings of $3,252.60 per year** (assuming 5 days a week/52 weeks a year). In addition, that would be a combined **19,500 miles traveled yearly utilizing zero fossil fuels**.

Per the ISB sergeant, the average work miles traveled per year for a detective is approximately 25,000. Using the current unleaded price of $2.503 per gallon:

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- For one detective, at the EPA combined estimated 42 MPG for the Ford Fusion Energi plug-in hybrid special service vehicle, 25,000 annual miles would cost the Sheriff's Office approximately **$1,489.88 in fuel** plus approximately **$261.82 in electricity**, at typical MGE kWh prices, for a combined total running cost of **$1751.70** annually**.**

Versus

- For one detective, at 15 MPG in the aged Interceptor, 25,000 annual miles would cost the Sheriff's Office approximately **$4,171.67 in fuel.**

That is a fuel cost savings of $2,419.97 annually for each vehicle, or $7,259.91 for three.

If approved, these cars would be in service for 7+ years; the fuel cost savings for three vehicles after 7 years would exceed $50,000, depending upon fuel prices and electric rates.

In addition, while tough to specifically quantify, if three ISB Interceptor squads are replaced with new plug-in hybrids, the county would cease to pay for the increased maintenance they currently pay to keep three old, hard-driven beat up squads on the road. It is not uncommon for ISB squads to need major overhaul repairs like heater cores and transmission repairs in addition to frequent small repairs like serpentine belts and batteries just to stay operational. These repairs add up to thousands of dollars, and new vehicles would not incur these costs.

If this project is implemented, 3 current Interceptors will be pulled from the ISB fleet and sent to auction, and all auction proceeds are returned to the county's general fund. In recent past, the approximate auction purchase price for a Ford Interceptor SUV with 150,000 miles is around $3,500. Therefore, in addition to the fuel savings above, by removing and auctioning 3 Interceptors the county would gain an additional estimated $10,500.

Considerations:

Plug-in vehicles need a place to charge. A regular 120v outlet will charge the battery in approximately 7 hours. The logistics of charging would need to be considered depending upon who is assigned the plug-in hybrid vehicle. Detectives assigned to precincts would have an easier time accessing a 120v outlet compared to a detective assigned to park in the Dane County ramp. There are 120v outlets in the Dane County ramp, however they are highly sought after and there would be no guarantee a detective would be able to secure the use of an outlet daily. Alternatively, it would be possible to set up a 120v outlet with very minimal investment in the sub-basement of the Public Safety Building. If the squads are approved through the grant the Sheriff's Office vehicle coordinator would work with the ISB sergeant to identify the best candidates and locations for the hybrids.

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How would this project meet the county's sustainability principles?

Pertinent Principle 1: Reduce and eventually eliminate Dane County government's contribution to fossil fuel dependence and to wasteful use of scarce metals and minerals.

As proposed, this project would significantly reduce the county's contribution to fossil fuel dependence as the vehicles recommended can drive the first 25 miles after charging utilizing 100% electricity and zero fossil fuels. As they would be driven on a near-daily basis, over time, as outlined above, this results in a significant cumulative savings of fossil fuels thereby reducing the county's dependence on them.

Pertinent Principle 2: Reduce and eventually eliminate Dane County government's contribution to encroachment upon nature and harm to life-sustaining ecosystems.

As this project would cumulatively and significantly reduce the county's use of fossil fuels, there would be a remarkable reduction in exhaust and contribution to greenhouse gas emissions. Emissions from fossil fuel powered vehicles is known to be a major contributor to global warming, and global warming is fast destroying fragile habitats. By replacing three current ISB squads with higher performing, more fuel efficient vehicles the current negative impact of emissions on local ecosystems would be curtailed.

How would this project implement specific goals, objectives, and strategies as outlined in the Dane County Sustainable Operations Plan?

Pertinent Objective 1: Reduce total annual fuel consumption

Again, as outlined above, assigning 3 detectives who travel regularly for their casework plug in hybrid vehicles that can travel 25 miles on electric charge would significantly reduce the county's total annual fuel consumption over time. In addition, theoretically, a detective could travel more than 25 miles per day on fuel-free simply by charging a vehicle at a given stop whenever possible. This project would only be opening the door to all the possibilities for the department's fuel consumption reduction.

Pertinent Objective 2: Increase fuel efficiency of all fleet vehicles

By reducing the need for fossil fuels for several vehicles in the Sheriff's Office fleet, the fuel efficiency of the fleet overall would therefore be improved. In addition, the plan would be to slowly replace whenever possible less fuel efficient vehicles with CNG, hybrid, electric hybrid or otherwise more fuel efficient options. As outline in this proposal, by removing three older Ford Interceptor that perform at approximately 15 miles per gallon with Ford Fusion Energi plug in hybrid SSVs that perform at 42 combined miles per gallon, that is a significant step in reaching better overall fleet fuel efficiency.

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Pertinent Objective 3: Reduce emissions generated from the use of our fleet vehicles.

By replacing three vehicles that get fewer miles per gallon with Ford Fusion Energi plug in hybrids that drive the first 25 miles after a full charge on electric only, as mentioned above, the emissions for the Sheriff's Office fleet would be greatly reduced.

Pertinent Objective 4: Increase the use of high-efficiency, renewable, and non-fossil fuels in all county fleet vehicles to transition away from the use of fossil fuels

This project would also meet this objective: replacing 3 ISB detective squads with new Ford Fusion Energi plug in hybrids is a culturally significant change that results in a measurable impact in the transition of police vehicles away from fossil fuels. This opportunity would allow people to see that the technological advances to plug in hybrids now make then an appropriate choice for non-pursuit police work.

Pertinent Objective 5: Increase opportunities for employees and county residents to use sustainable alternative modes of transportation

Offering three detectives plug-in hybrids is a major increase in opportunities for county employees to access and use more sustainable modes of transportation. As mentioned previously, detectives travel extensively often in rural areas and they currently have no opportunities to use sustainable transportation.

How might the county build upon the sustainability outcomes of this project?

Like with the hybrid purchased in 2017, once people have a chance to use a plug in hybrid and see how well it meets their needs, it will be much easier to shift the culture and people will be more comfortable simply replacing gasoline-only vehicles with other options. Due to the demands of law enforcement and the life-safety risks that come along with that use case, there is a national trend of agencies being somewhat hesitant to deviate from what works. Because law enforcement are often in life-threatening situations, questions that the general public doesn't face must be raised: what if a hybrid vehicle doesn't accelerate fast enough or a battery dies and leaves an officer in a dangerous situation? What if the department invests their already highly limited resources into vehicles that end up not meeting demands in the field, or they require expensive battery replacements to keep instrumentation running? Human nature causes many law enforcement agencies to stick with what they know. However, this grant offers a unique opportunity to test out new, energy efficient options with minimal risk and optimal gain for Dane County government. Once detectives drive and experience how capable a plug in hybrid is for their work, the culture will begin to shift and the risk will become obsolete.

How does the department plan to track and measure the outcomes of this project if funded? Include cost savings, energy reductions, etc. Who is responsible for these measurements and verifications?

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Every month the Dane County Sheriff's Office vehicle coordinator downloads two reports: one from the Dane County fuel pumps, and one from US Bank's Voyager gas cards. Each squad is tied to a numbered card and those reports upload directly into a fleet management software for record, so the fuel savings will be easily tracked and verified. A simple report will clearly show the reduced fossil fuel consumption on a plug–in hybrid vs. a gasoline only Interceptor.

Cost at a glance:

Per the enclosed quote from Ewald, per state contract, the cost of a 2020 model year Ford Fusion Energi plug in hybrid special service vehicle is $31,094. Three of them would be $93,282. Also enclosed is a bid from Kayser Ford. Through Kayser, one Ford Fusion Energi plug in hybrid special service vehicle is $33,745. Three of them would be $101,235.

Vendor	One vehicle	Three vehicles	Mechanism
Ewald	$31,094	$93,282	State Contract
Kayser	$33,745	$101,235	Local Preference

Your consideration for this proposal is very greatly appreciated, as is the opportunity to apply. Thank you for your time and attention, and thank you for creating opportunities to promote the use of renewable resources and fossil fuel alternatives to better enhance the lives of all Dane County residents. The Sheriff's Office would be proud to implement this project and be a part of the sustainable solution forward.

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SSV PLUG-IN HYBRID SEDAN

PATROL, PLUG IN, REPEAT

The Ford Special Service Plug-in Hybrid Sedan is the first Ford plug-in hybrid police vehicle to market. It's aimed squarely at specialized, non-pursuit applications like detective, investigative and administrative.

Strong evidence indicates daily duties can be performed in a zero-fuel/-emissions capacity: The EPA-estimated all-electric range is 25 miles[1] – patrol in this all-battery mode at speeds up to 85 mph. Simply plug it in and do the same thing all over again, and again. Day-on-day savings can rapidly add up. Whenever the need arises, this sedan seamlessly transitions into gasoline-electric hybrid mode: The EPA-estimated rating is a 42 combined mpg[1] with an EPA-estimated range of 610 miles[1]

Utilizing an optional 240-volt charger, power up the high-capacity, 9.0-kWh lithium-ion battery in approximately 2.5 hours.[2] It can also be fully energized in about 7 hours[3] with the standard 120-volt convenience charge cord that plugs into a conventional wall socket: Simply insert one end of the cord into an outlet, and then insert the other end into the vehicle's illuminated charge port.

These features are all for the good. And they're par for the course: AdvanceTrac® Electronic Stability Control, a Rear View Camera and the SOS Post-Crash Alert System™

Unique 5-spoke alloy wheels add a hint more shine to the outside; purpose-built police living quarters welcome you inside. The police-formed front seats feature slimmed-down bolsters, heavy-duty fabric and anti-stab plates. Flooring material up front and in back is easy-clean vinyl – the rear bench seat is also vinyl. A reinforced top tray on the dashboard is for mounting equipment, and the police-purposed instrumentation includes a calibrated speedometer. Among other standard highlights, the overhead console has red-and-white task lighting, and there's the benefit of a rear power lug, plus an auxiliary power distribution box (PDB) in the trunk.