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Advancing Climate and Innovation Goals of Memphis and Shelby County: Electrification of Key Fleet Vehicles to Capture Cost Savings and Climate Benefits

Leigh Huffman, Principal Investigator Shelby County Government, Office of Sustainability and Resilience June 22, 2022 Project ID: TI135

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OVERVIEW

TimelineBarriers Addressed•Start: October 1, 2020•Lack of EV technology present in Shelby County's fleet.•End: December 31, 2023•Limited research on which EVs will meet organizational
needs.•J4% Complete•Lack of data to determine cost effectiveness and scalability
within Shelby County's fleet.

Partners

Shelby County Roads, Bridges, & Engineering Department
East Tennessee Clean Fuels
Memphis Light, Gas & Water
Ford Motors (Lonnie Cobb Ford)

Budget

Total Project Funding: \$1,004,024
DOE Share: \$500,000
Cost Share: \$504,024

•Budget Period 1: \$58,909

- •Expended: \$25,988
- •Budget Period 2: \$857,684
- •Expended: \$6,802
- •Budget Period 3: \$87,431



PROJECT OBJECTIVES

- 1. Implement a small-scale pilot of five electric vehicles (EV) in the Shelby County Roads, Bridges, and Engineering (RBE) fleet, which has no experience with these technologies.
- 2. Install charging infrastructure to support the demonstration vehicles and lay the foundation for future expansion of electric vehicles in the County fleet.
- 3. Make progress on climate action goals.

Barrier Impact:

- Shelby County will procure its first fully electric vehicles as part of the pilot program.
- EV test drives, demonstrations, and manufacturer calls will increase knowledge of which EVs meet organizational needs.
- Data collected in the latter part of the project will be used to determine future procurement of EVs.

Applicable VTO Technology Integration Goals:

- Improving fuel diversity
- Increasing local resiliency
- Reducing greenhouse gas emissions



PROJECT APPROACH





MILESTONES

	Milestone	Туре	Description	Progress
Budget Period 1	Vehicles are acquired and assigned to work schedules	Technical	100% of vehicles are acquired.	65% Complete
	Site selection for charging stations	Technical	Site plans for charging infrastructure developed and approved and in compliance with the Unified Development Code.	90% Complete
	Charging infrastructure installation	Technical	Installation of \geq 50% of charging infrastructure is complete and equipment is verified to be functional.	17% Complete
	Vehicle use aligning with intended use and contributing to fleet needs	Go/No-Go	Assessment of whether or not the vehicles adequately meet the needs of their intended use is completed.	50% Complete
Budget Period 2	Staff training	Technical	Employee training related to alternative fuel technologies is complete.	10% Complete
	Charging infrastructure installed	Technical	100% of infrastructure is installed.	Not started
	Identify key data points needed	Technical	Data requirements are identified and listed along with initial data in each of the identified categories (such as vehicle miles driven, fuel consumption, electric charging practices, etc.).	40% Complete
	Collect and summarize data	Go/No-Go	Data are organized into database or spreadsheet as necessary. Data are utilized in generating summary statements and evaluating for project's impact on costs.	Not started



PROJECT ACCOMPLISHMENTS: Decided on Charging Infrastructure Location

The charging stations will be located in an area with high visibility at the Roads, Bridges, and Engineering facility.







PROJECT ACCOMPLISHMENTS: Held EV Demonstrations

- Hosted EV owners in the Memphisarea at the RBE facility.
- The project team and representatives from MLGW, East Tennessee Clean Fuels, and other Memphis and Shelby County divisions attended the demonstrations.
- Teslas & Nissan Leafs at the Dec. 2021 event.
- Mach-Es at the Jan. 2022 event.
- The events allowed inspectors to test drive, learn, and provide feedback on whether the vehicles would meet their needs.





PROJECT ACCOMPLISHMENTS:

Issued Purchase Order for Shelby County Government's First EV

- Initially, were going to procure four F-250s that would be converted to plug-in hybrid electric vehicles (PHEV) by XL Fleet.
- Began researching EV pick-up rucks.
- Developed new plan to purchase 2-3 Ford Mustang Mach-Es and 1-2 Ford F-150 Lightnings.
- Secured a purchase order for first Mach-E purchase, which will be used by RBE as an inspection vehicle.





PROJECT ACCOMPLISHMENTS: Created Data Collection Plan

- Identified key data points needed for analysis.
- Began collecting initial data for similar vehicles already in the fleet to use as comparisons for the EVs.
- Data collected will be used to determine:
 - The return-on-investment for the vehicles
 - The return-on-investment for the charging stations
 - Projected emissions reductions for the fleet
 - Charging station preferences and vehicle expansion capacity
 - Energy needs for fleet expansion
 - Any positive impacts to work processes or issues that need to be addressed



PROJECT TEAM COLLABORATION & COORDINATION





IMPACT ON ENERGY EQUITY AND ENVIRONMENTAL JUSTICE

- Demonstrates continued commitment to improving air quality in Shelby County.
- Future Sustainability: If analysis demonstrates proof of concept, Shelby County will continue to integrate EVs into its fleet leading to further emissions reductions.

Shelby County: EJScreen 2017 Air Toxics Cancer Risk (National Percentiles)





SUMMARY

OBJECTIVE:

• Implement a small-scale EV pilot program and lay foundation for future EV expansion in the Shelby County fleet.

PROJECTED OUTCOMES:

• Project will improve fuel diversity, increase local resiliency, and reduce greenhouse gas emissions.

APPROACH:

• Procure a variety of vehicles and install charging infrastructure.

• Collect and analyze data.

MAJOR ACCOMPLISHMENT:

• PO issued for Shelby County Government's first EV.

NEXT STEPS:

- Complete vehicle procurement.
- Install charging stations.
- Begin collecting data to determine cost-effectiveness.