MEMPHIS AND SHELBY COUNTY DIVISION OF PLANNING AND DEVELOPMENT

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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

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Project ID: TI135

This presentation does not contain any proprietary, confidential, or otherwise restricted information.

OVERVIEW

Timeline

- Start: October 1, 2020
- End: March 31, 2025
- 46% Complete

Barriers Addressed

- Lack of EV technology present in Shelby County's fleet.
- Limited research on which EVs will meet organizational needs.
- 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
- Lion Electric
- 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: $38,663
- Budget Period 2: $857,684
  - Expended: $415,106
- 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

Any proposed future work is subject to change based on funding levels.

PROJECT APPROACH

Phase 1

- ✓ Identify light-duty and heavy-duty vehicle options
- ✓ Purchase chosen vehicles
- ✓ Charging infrastructure components analysis and purchase
- • **Go/No Go: Vehicle use aligns with intended use & contributes to fleet needs**

Phase 2

- ✓ Identify key personnel to attend training
- ✓ Identify manufacturer-specific training opportunities
- ✓ Charging installation and maintenance
- ✓ Data collection begins
- • **Go/No Go: Collect & summarize data**

Phase 3

- • Generate data hub or organizational structure
- • Incorporate data messages into outreach and best practice recommendations

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PROJECT ACCOMPLISHMENTS:

Purchased Lion6 Medium-Duty Truck

- Initially planned to procure one F-650 dump truck that would be converted to an electric drivetrain by SEA Electric.
- Began researching EV class 6 trucks.
- Developed a new plan to purchase a Lion6 truck and issued a purchase order.
- The Lion6 was delivered on November 21, 2022. RBE staff have incorporated it into the tire collection program, and project team is monitoring progress and issues.

Image via Leigh Huffman, Memphis-Shelby County Division of Planning & Development

PROJECT ACCOMPLISHMENTS:

Installation of Charging Stations Begins

- Installed one 60 kW DC Fast charging station at the 6465 Mullins Station Road using grant funds.
- Incorporated charging stations into a larger renovation project at the Roads, Bridges, and Engineering facility. Construction expected to begin in early summer 2023.
  - (3) 80 Amp Level 2 chargers
  - (1) 30 kW DC Fast charger (DCFC)
  - (1) 180 kW High Power DCFC

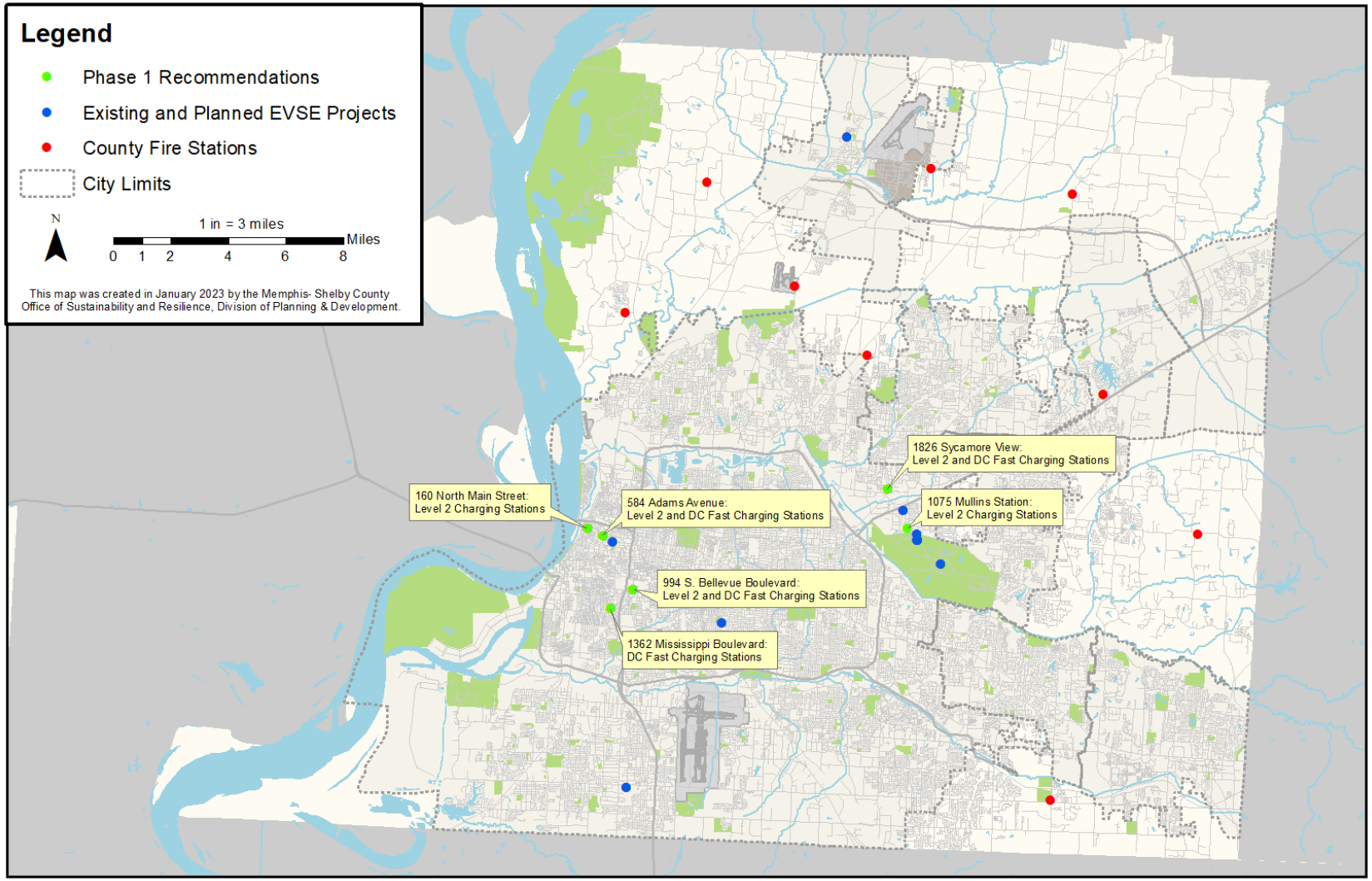
Image via Leigh Huffman, Memphis-Shelby County Division of Planning & Development

PROJECT ACCOMPLISHMENTS:

Researched Additional Charging Infrastructure Locations

- Identified 5 additional Shelby County facilities where the installation of Level 2 charging stations will be considered.
- Our analysis was based on 6 factors:
  - Number of parking spaces at facility
  - Availability of three-phase power
  - Electrical capacity at facility
  - Number of fleet vehicles parked overnight at facility
  - Proximity to planned or existing charging stations
  - Planned and existing EV/hybrid vehicles

Any proposed future work is subject to change based on funding levels.



PROJECT TEAM COLLABORATION & COORDINATION

- Department of Energy (Project Sponsor)
  - Shelby County Government (Prime Recipient)
    - Office of Sustainability and Resilience, Division of Planning and Development (Project Manager)
    - Roads, Bridges & Engineering Department, Division of Public Works
    - Support Services Department, Division of Public Works
  - Technical Assistance Partners and Supporters
    - Memphis Light, Gas and Water
    - East Tennessee Clean Fuels

Lion Electric Co.
(Vehicle Procurement)

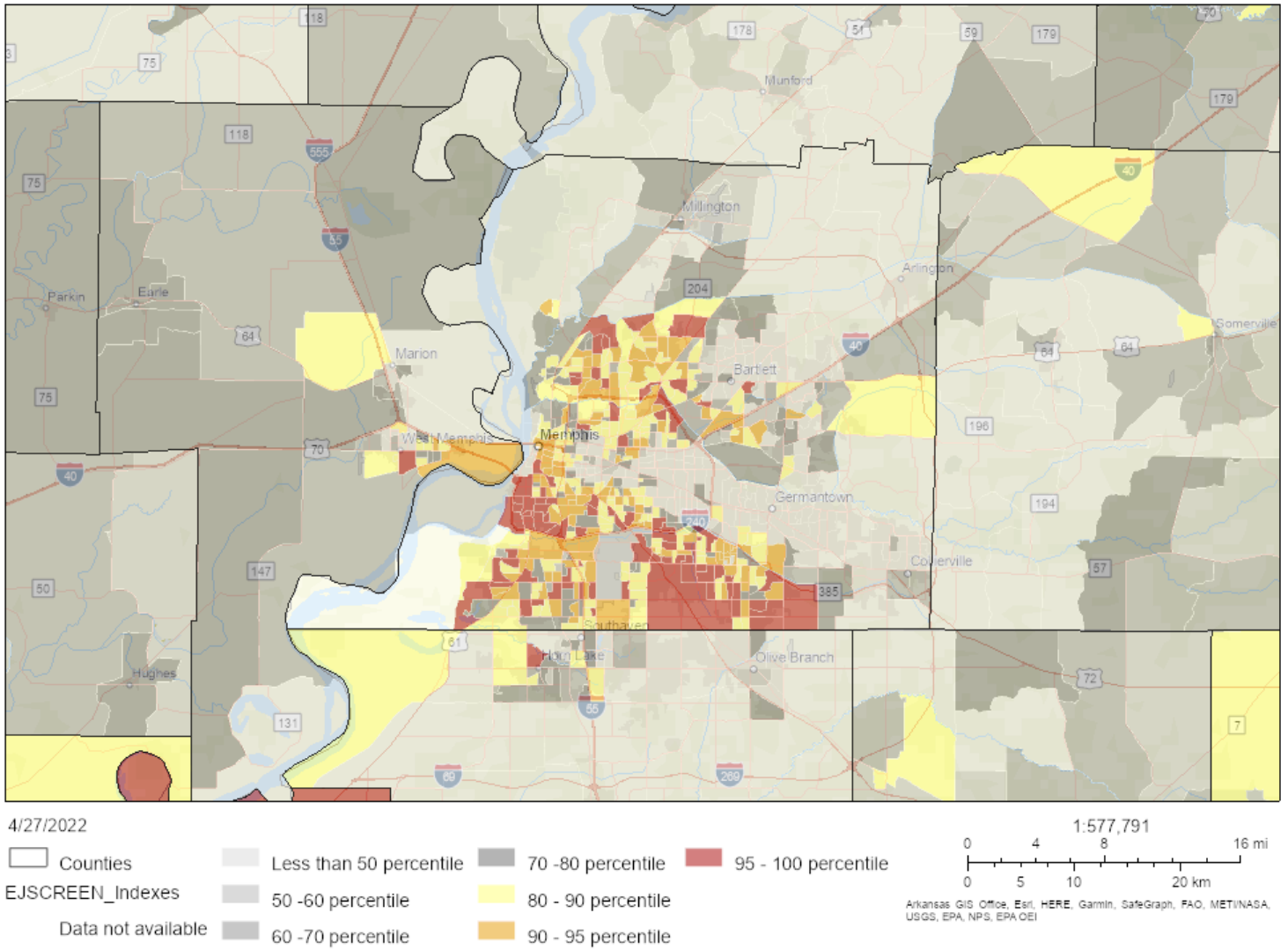
Lonnie Cobb Ford
(Vehicle Procurement)

PATH Company
(EVSE Procurement & Installation)

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)



Any proposed future work is subject to change based on funding levels.

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 ACCOMPLISHMENTS:

- Procured Shelby County Government's first medium-duty, all-electric truck.
- Began installing charging stations.

NEXT STEPS:

- Complete vehicle procurement.
- Complete installation of charging stations.
- Continue collecting data and begin data analysis.

Any proposed future work is subject to change based on funding levels.

TECHNICAL BACKUP SLIDES

MILESTONES

	Milestone	Type	Description	Progress
Budget Period 1	Vehicles are acquired and assigned to work schedules	Technical	100% of vehicles are acquired.	80% Complete
	Site selection for charging stations	Technical	Site plans for charging infrastructure developed and approved and in compliance with the Unified Development Code.	100% Complete
	Charging infrastructure installation	Technical	Installation of ≥50% of charging infrastructure is complete and equipment is verified to be functional.	20% 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.	20% 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.).	50% 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.	10% Complete

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