Dallas-Fort Worth CLEAN CITIES

North Central Texas Council of Governments

Multimodal Autonomous Delivery Project

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August 11, 2025

Project Partners

ARLINGTON
THE AMERICAN DREAM CITY

Dallas-Fort Worth
CLEAN CITIES

North Central Texas
Council of Governments

UNIVERSITY OF
TEXAS
ARLINGTON

airspacelink

Clean Cities and
Communities

TARRANT
AREA
FOOD
BANK

CLEVON

MOZEE

AERIALOOP
DRONE DELIVERY AIRLINES

The Initiative

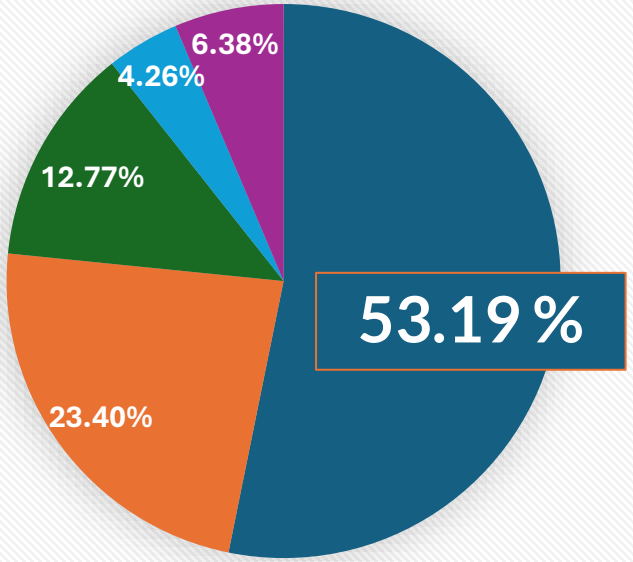
- This material is based upon work supported by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy (EERE) under the Vehicle Technologies Office Award Number DE-EE0010635
- Conduct a pilot program to test the efficiency and scalability of autonomous, electric delivery vehicles to:
  - **Deliver essential food items to individuals who are mobility challenged**
  - **Reduce emissions**
  - **Improve the efficiency and reliability of last-mile delivery**

The Pilot: Technology Demonstrations

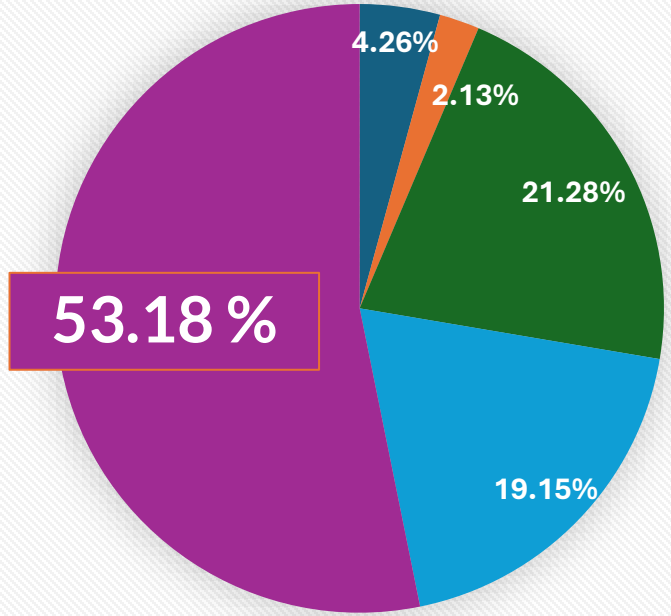
- **Two week-long demos in September 2024 and May 2025**
- **300 food boxes** delivered to Tarrant Area Food Bank clients in East Arlington
- **Area chosen considered a mobility-challenged community,** with a below-poverty rate of 26%
- Deliveries carried out using **Aerialoop's aerial robot** and **Clevon and Mozee's autonomous vehicles**
- **Airspace Link** provided for determining delivery routes
- **Routes avoided flying/operating over residential areas** and high-traffic roadways

Key Survey Results from Demonstration Participants

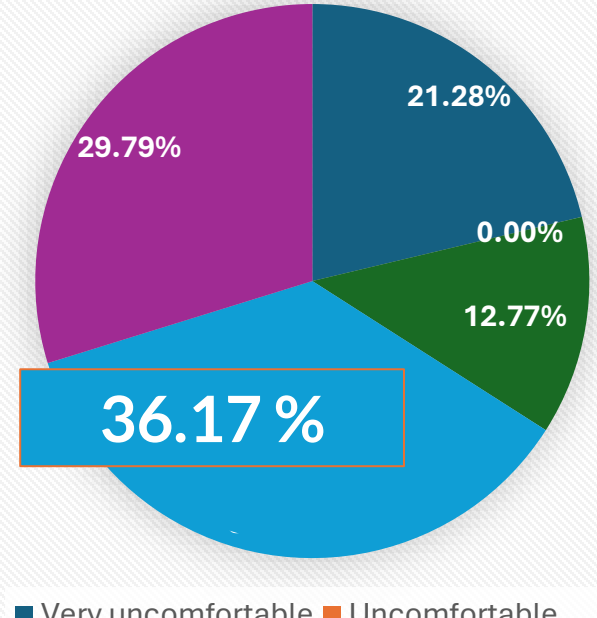
How satisifed were you with this delivery service?



How likely would you be to use this service again?



Are you comfortable with autonomous technology?



NCTCOG & Clean Cities Coalition Support

Completed:

- Conducting community outreach and production of media materials
- Assisting with project coordination and demonstrations

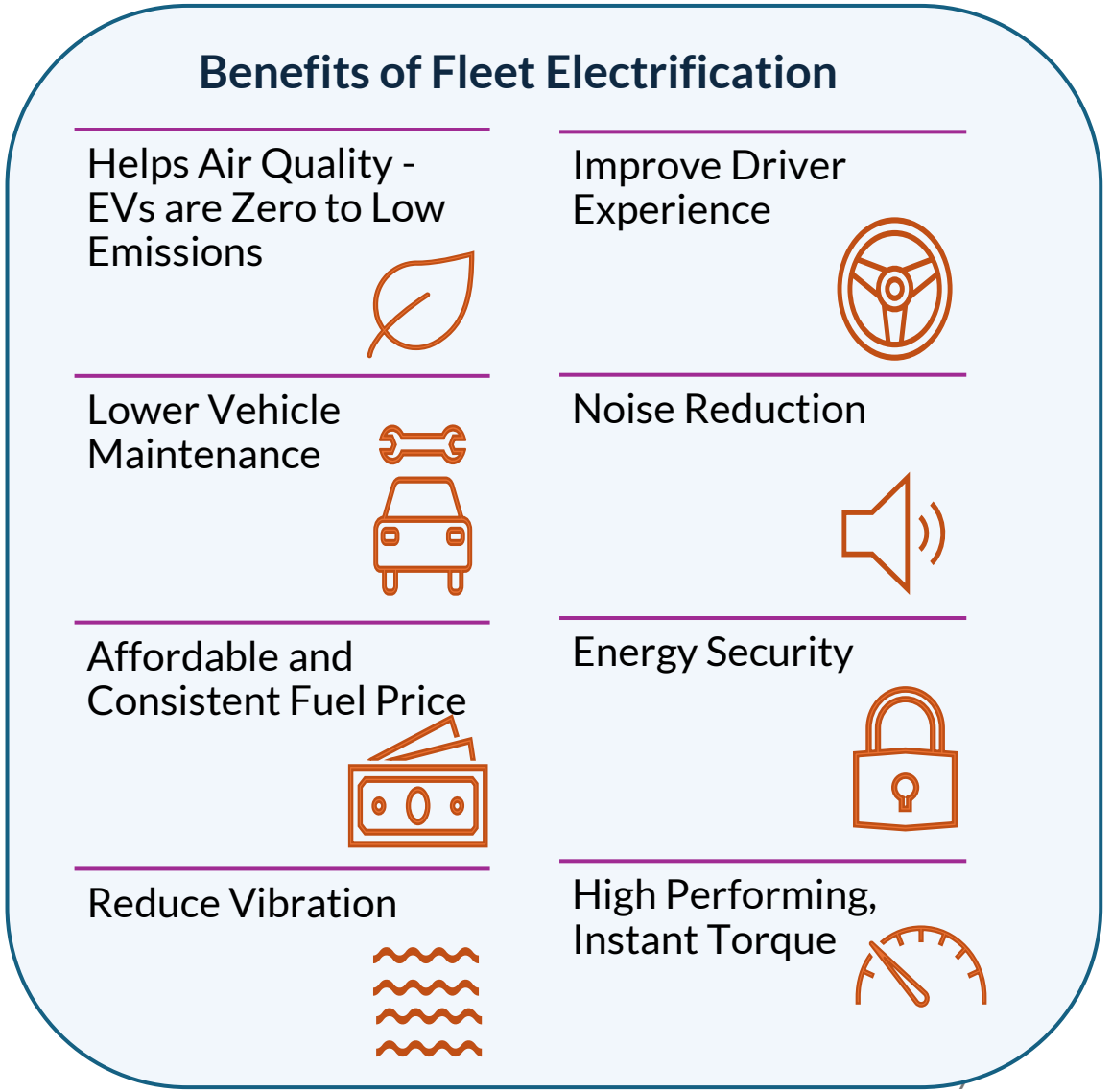
Coming Soon:

- Developing a "replication guide"
- Developing detailed analyses of:
  - Cost
  - Fleet electrification
  - Energy consumption and emissions associated with demonstration

Next Steps:
Fleet Transition Analysis

- **Assist TAFB in understanding the impact of transitioning fleets to electric vehicles (EVs)**

- **Steps of the Analysis Include:**
  - Calculate Annual Emissions for Current Fleet Inventory
  - Identify Potential Alternative Fuel Vehicle (AFV) Replacements
  - Calculate Emissions Reductions if AFV were Adopted
  - Identify Grant Eligibility
  - Estimate Total Cost of Ownership of AFV



Next Steps: Replication Guide

Purpose: provides a framework for other entities across the U.S. to replicate the project

Will Include:

Project Development

- Priorities and Objectives
- Target Audience
- Partner Identification
- Budget Development
- Funding Opportunities

Project Initiation

- Contracts, Agreements, and Approvals
- Community Outreach
- Demonstration Development
- Location Analysis

Conducting Demo

- Technical Coordination
- Ground Operations
- Aerial Operations
- Implementation Challenges and Opportunities

Demo Analysis

- Community Impact
- Cost Impact
- Environmental and Energy Impacts
- Lessons Learned
- Next Steps

Next Steps:
Energy and Emissions Analysis

- Uses data from technology partners (AirSpace Link, Aerialoop, Mozee, and Clevon)
- Demonstrates the efficiency (electricity usage) and emissions savings from using autonomous robots instead of traditional vehicles

250 kWH used to power robots throughout the demonstrations

Equivalent to 203 pounds of Carbon Dioxide Equivalent (CO_2e)

This is equivalent to the carbon avoided or sequestered by:

1.5 tree seedlings grown for 10 years

7.8 trash bags of waste recycled instead of landfilled

Source: EPA Greenhouse Gas Equivalencies Calculator

Next Steps: Location Suitability Analysis

- Utilizes data collected from demonstrations
- Model and map sites in the region suitable for multimodal delivery
- Allow for informed and targeted replication in NCTCOG region

Factors Considered

- Aerial Launch Sites
- Technology Limitations
- Residential and Commercial Land Areas
- Proximity to Populations Best Served
- Airspace Restrictions
- Access to Charging Infrastructure
- Electrical Infrastructure /Tall Structures
- Risk Factors

Next Steps: Cost Modeling

- Assists entities replicating project to understand financial commitments

- Analyzes:
  - Operator Cost
  - Energy Consumption
  - Vehicle Purchase, Maintenance, Insurance, Infrastructure, and Storage

Contact Us

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