Electric Last-Mile Project

Principal Investigator: Grant Fisher
Presenter: Grant Fisher
Organization: Pecan Street Inc
Presentation Date: June 11, 2019
Project ID: TI087

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

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

### Timeline
- **Start:** October 1, 2017
- **End:** September 30, 2019
- ~90% Complete

### Budget
- **Total Funding:** $2,000,000
- **DOE share:** $1,000,000
- **Cost share:** $1,000,000
- **Budget Period 1:** $1,762,964
  - Expended: $1,762,964
- **Budget Period 2:** $237,036
  - Expended*: $13,025

* as of 2/28/2019

### Partners
- Capital Metropolitan Transportation Authority
- Electric Cab of North America
- Endeavor Real Estate Group
- Catellus Real Estate
- Overture Apartment
- City of Austin
- Autonomous Vehicle Vendor (TBD)

### Barriers
- Difficult to access transit
- Limited technology solutions and understandings of new solutions
### Project Objectives

<table>
<thead>
<tr>
<th>Objective</th>
<th>VTO TI Goals</th>
<th>Impact</th>
</tr>
</thead>
</table>
| Study public transit ridership in pilot neighborhoods using electric shuttles to help bridge the “last mile” | **National Security**  
Increase Alternative Fuel Use  
**Economic Growth**  
Allow for new technologies to be demonstrated  
**Reliability/Resiliency**  
Providing diverse transportation options | Increase connectivity to and from transit  
Improve the awareness of lack of first and last mile connectivity  
Provide new technology solutions to address the barriers |

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Project Approach

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**Budget Period 1**

- Task 1: Customer Engagement
- Task 1: Route Design
- Task 2: Creation and installation of data collection systems
- Task 3: Mobile and Web Development and Integration
- Task 4: Pilot Electric Bus Service
- Task 5: Data Collection

**Budget Period 2**

- Task 1: Continue Pilot Electric Shuttle Service
- Task 2: Data Collection and Analysis
- Task 3: Demonstration of Autonomous Technology
- Task 4: Project Documentation
## Milestones

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

### Budget Period 1

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobile apps integrated</td>
<td>Technical</td>
</tr>
<tr>
<td>Initial ELM report completed</td>
<td>Technical</td>
</tr>
<tr>
<td>Integration of ELM payment process with mobile app completed</td>
<td>Technical</td>
</tr>
<tr>
<td>Data collection systems integrated and installed in vehicles and passing acceptance protocols</td>
<td>Go/No Go</td>
</tr>
</tbody>
</table>

### Period 2

<table>
<thead>
<tr>
<th>Milestone</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autonomous Vehicle demonstrations completed</td>
<td>Technical</td>
</tr>
<tr>
<td>Data collection &amp; ridership</td>
<td>Technical</td>
</tr>
</tbody>
</table>
Project Accomplishments and Progress

Budget Period 1 Recap

Domain

Over 10k Yearly Miles*

Downtown

Over 5k Yearly Miles*

*Yearly miles extrapolated based upon project duration
Project Accomplishments and Progress

New Shuttle Route Most Successful to Date
Over 13k Yearly Miles*

Pricing Trial Completed with Fascinating Results
Half of the pricing trial was offered rides at $1, the other was name-your-own-price.

<table>
<thead>
<tr>
<th>Price Named</th>
<th>% of Riders</th>
</tr>
</thead>
<tbody>
<tr>
<td>$0.00</td>
<td>55%</td>
</tr>
<tr>
<td>$0.50</td>
<td>6%</td>
</tr>
<tr>
<td>$1.00</td>
<td>11%</td>
</tr>
<tr>
<td>$1.50</td>
<td>27%</td>
</tr>
<tr>
<td>$2.00</td>
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</table>

AV Route Selected for Autonomous Demonstration
Working with project team for deployment

Any proposed future work is subject to change based on funding levels
Collaboration and Coordination Among Project Team

Partners

Location Support From

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Overall Impact

Achievements to date
- Completed three electric shuttle deployments with over 10k trips and almost 19k passengers served
- Successfully Developed Technology Kit for vehicle data collection systems
- Published all collected data for researchers
- Created a reproducible, new form of transit service for agencies to implement (one has already!)
- Published pricing data for new forms for pricing for transit and deeper understanding of price models

Upcoming
- Demonstrating autonomous vehicle transit route

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**Project Objectives**
Study public transit ridership in pilot neighborhoods using electric shuttles to help bridge the “last mile”

To provide a demonstration opportunity to evaluate technology solutions to transit problems

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**Pricing Trial**

**New Transit Type**

**Autonomous Vehicle Demonstration**

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Technical Backup Slides
Domain Electric Shuttle Data

Kramer-Domain
Pickup Locations

Kramer-Ln Train Station: 62%
Domain Northside: 31%
Kramer Lane Station: 6%
Other: 1%
IBM: 2%

Kramer-Domain
Reason for Trip

Work / Meeting: 43%
Going Home: 42%
Shopping: 9%
Dining / Drinks: 6%
Other: 6%

Kramer-Domain
Dropoff Location

Kramer Lane Station: 50%
Domain Northside: 27%
Other: 21%
IBM: 2%

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**Mueller Electric Shuttle Data**

**Technical Backup Slides**

### Mueller Dropoff Locations
- 32% Residence
- 16% Aldrich / Simond District
- 20% HEB
- 8% Mueller Retail Center

### Mueller Pickup Locations
- 36% Residence
- 16% Aldrich / Simond District
- 18% HEB
- 7% Mueller Retail Center

### Mueller Reason for Trip
- 40% Work, Meeting
- 22% Going Home
- 12% Shopping
- 6% Dining, Drinks
- 20% Entertainment, Recreation

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[Map of Mueller Dropoff Locations]

[Map of Mueller Pickup Locations]

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PECAN STREET
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