



Regional Partners.  
Regional Solutions.



Clean Cities and  
Communities

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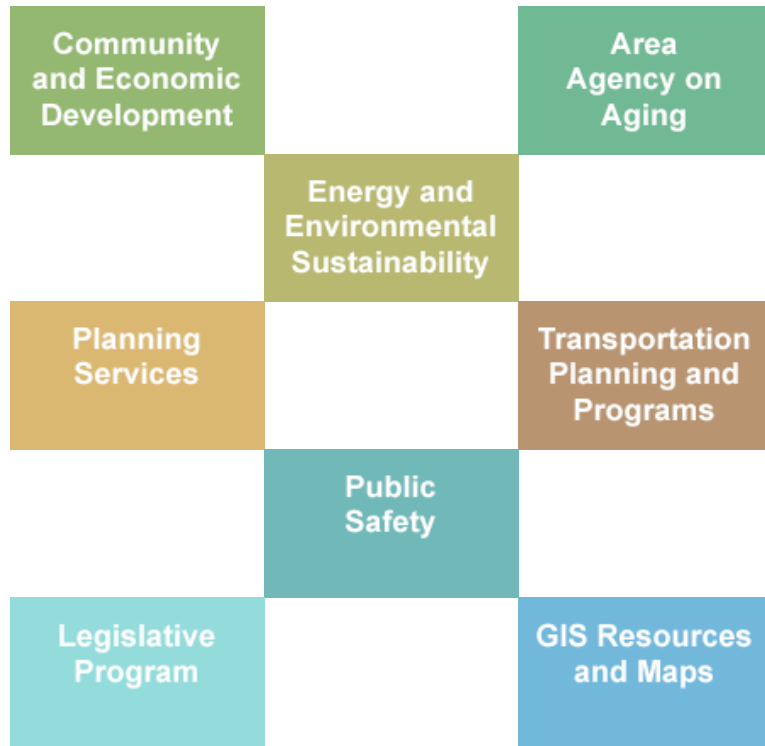
# Tulsa AV Pilot Project

## Oklahoma Engineering Conference

June 12, 2025

# About INCOG

- Established in 1967
- One of 11 Councils of Governments in Oklahoma
- Services covering Creek, Osage, Rogers, Tulsa, and Wagoner counties



# The Clean Cities Mission

Clean Cities coalitions enhance the economic, environmental, and energy security of the United States by working locally to advance affordable, domestic transportation fuels, energy efficient mobility systems, and other fuel-saving technologies and practices.



**Clean Cities** and  
**Communities**



# How We Work

We build **partnerships** with public- and private-sector transportation stakeholders and engage with communities to understand local priorities and develop community-driven solutions.

Coalition staff **offer technical assistance and hands-on problem-solving** support to fleets and communities, working to deploy clean transportation fuels and technologies based on a unique understanding of local needs.

Thriving on a culture of collaborative change, coalitions **harness decades of experience** to continue moving our transportation systems into the future.



Connect to unbiased,  
data-driven tools and  
resources



Build partnerships



Receive personalized  
experience rooted in  
local context



Collaborate on funding  
opportunities

# Clean Cities Portfolio



**Light, Medium, and  
Heavy-Duty  
Vehicles  
(on & off-road)**



**Alternative and  
Renewable Fuels  
and Infrastructure**



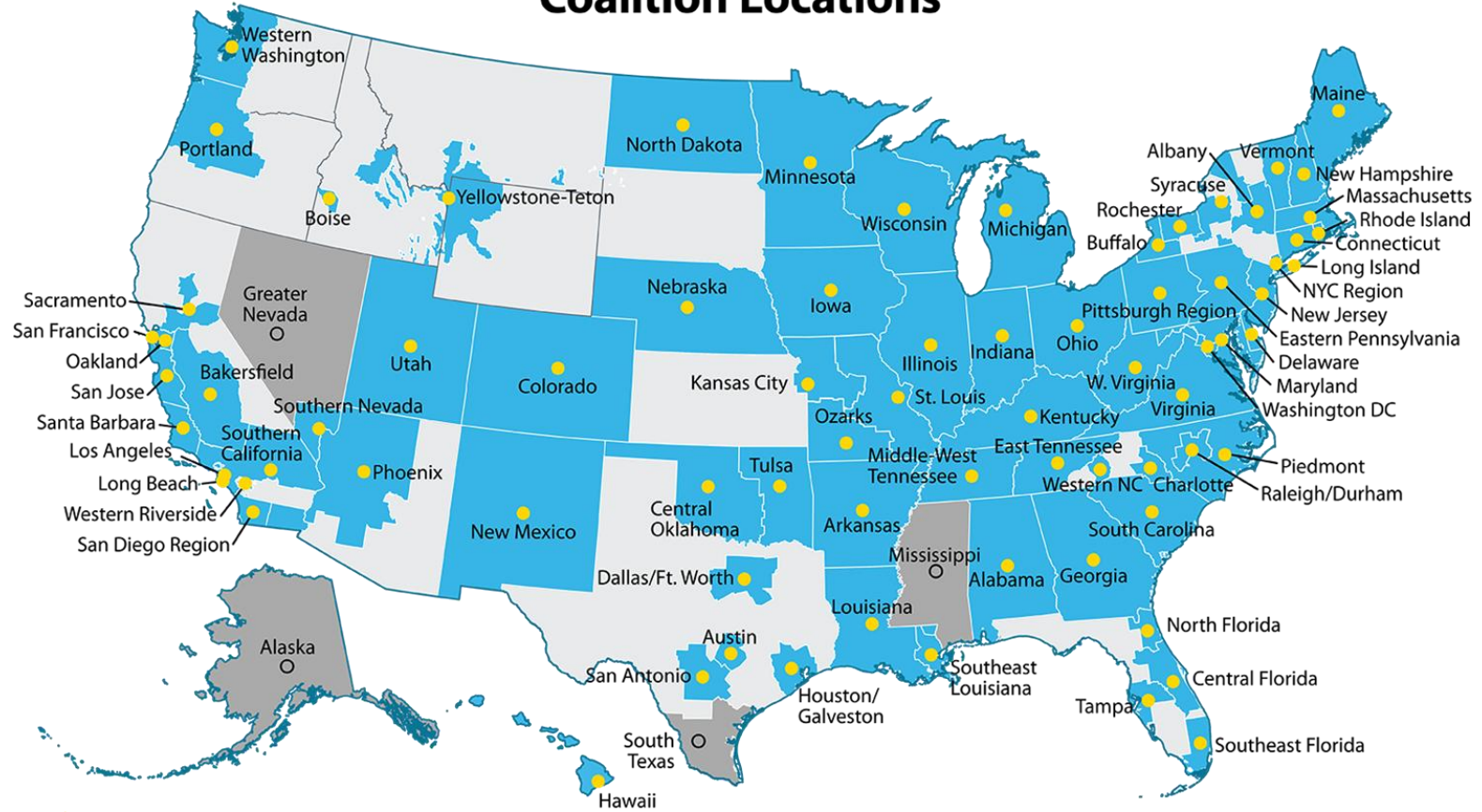
**Idle Reduction  
Measures and Fuel  
Economy  
Improvements**



**New Mobility  
Choices &  
Emerging  
Transportation  
Technologies**



# Coalition Locations



# About the Tulsa AV Project

- ★ \$3.4 awarded by U.S. Dept of Energy's Vehicle Technologies Office in a program-wide funding opportunity announcement in FY22



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- ★ **Topic area: Clean Energy Mobility Solutions for Underserved Communities**





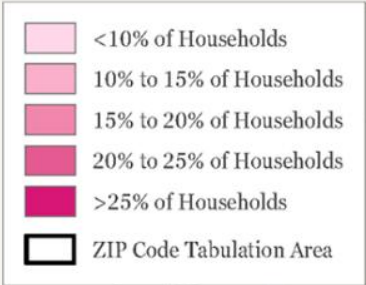
## About the Tulsa AV Project

- ★ \$3.4 awarded by U.S. Dept of Energy's Vehicle Technologies Office in a program-wide funding opportunity announcement in FY22
- ★ Topic area: Clean Energy Mobility Solutions for Underserved Communities
- ★ **Exploring the use of on-demand, autonomous vehicles to improve public transportation outcomes in North Tulsa**

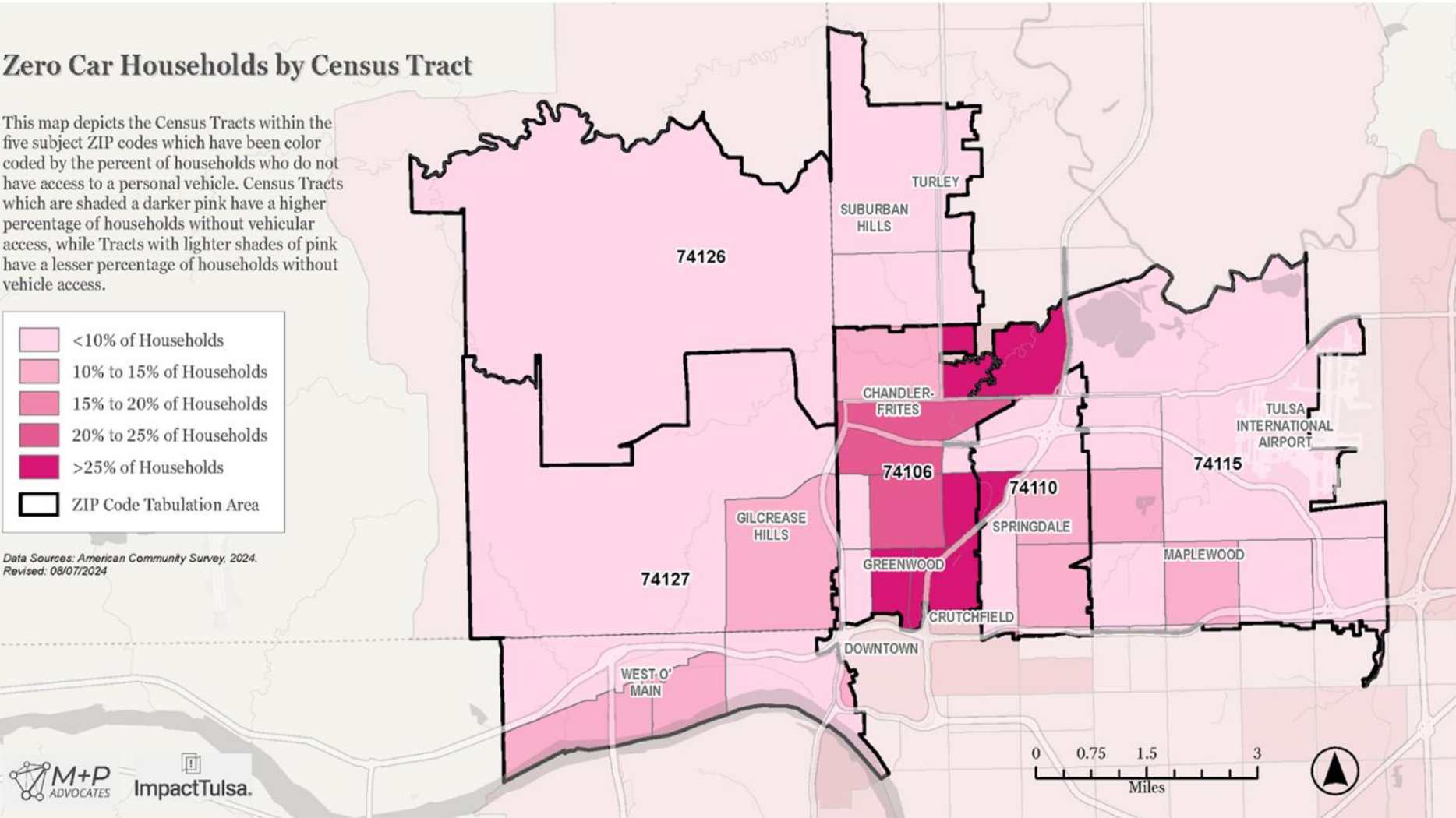


# Zero Car Households by Census Tract

This map depicts the Census Tracts within the five subject ZIP codes which have been color coded by the percent of households who do not have access to a personal vehicle. Census Tracts which are shaded a darker pink have a higher percentage of households without vehicular access, while Tracts with lighter shades of pink have a lesser percentage of households without vehicle access.



Data Sources: American Community Survey, 2024.  
Revised: 08/07/2024



# Project Partners

**Community  
Engagement Leads**



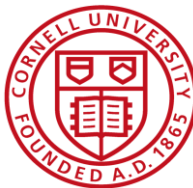
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**Service Operator**



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**Technical Teams**  
(dynamic routing algorithms,  
behavioral modeling, &  
technology validation)



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**Technology Provider**



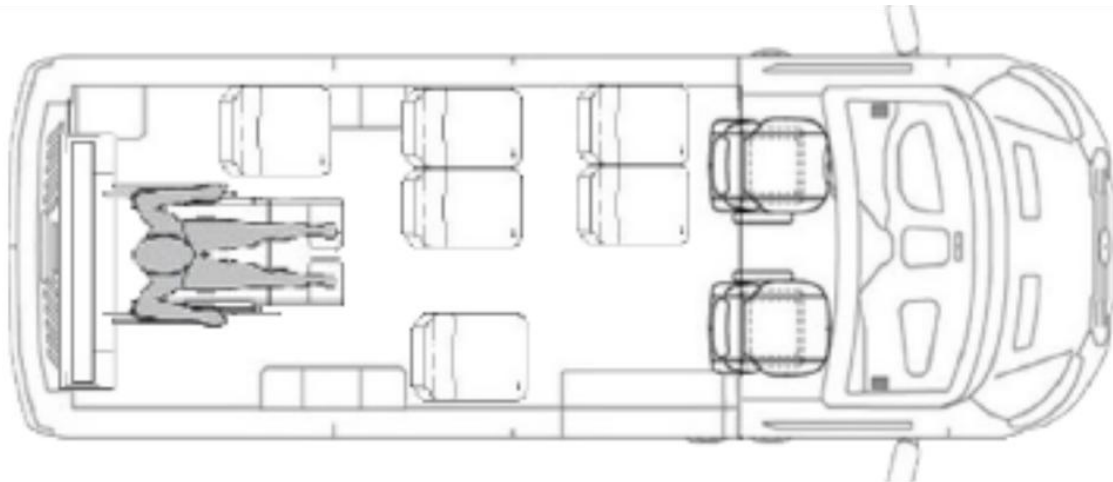
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**Admin & Support**



# About the Project

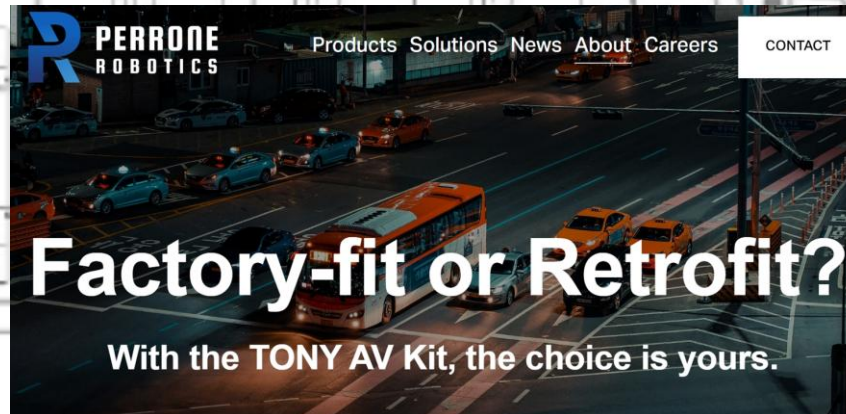
→ Four autonomous passenger vans



# About the Project

→ **Four autonomous passenger vans**

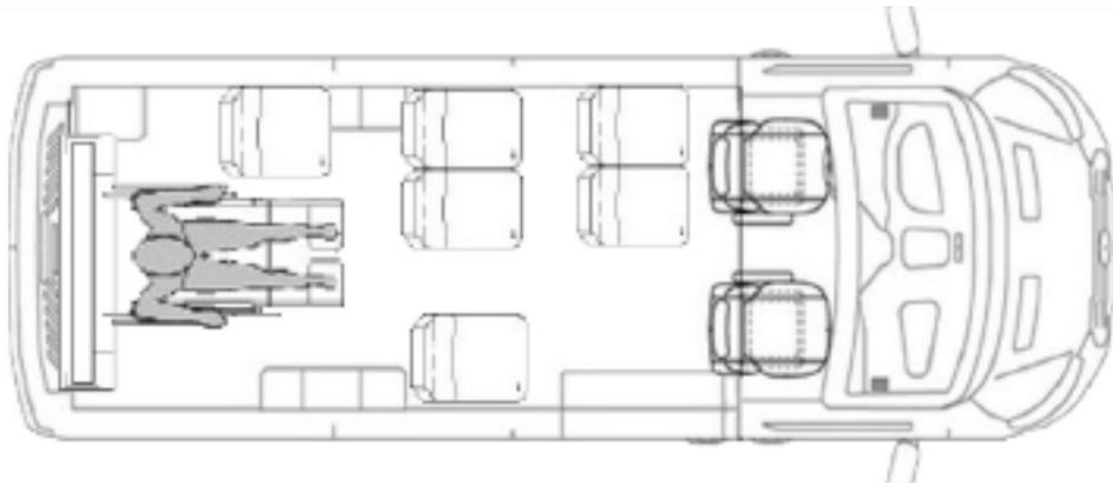
Perrone Robotics' patented TONY Autonomous Vehicle (AV) kit has been proven across 40+ different vehicle platform styles and is currently actively deployed across the U.S. The TONY AV kit has been incorporated in designs from the factory and is also outfitted in vehicles offered as turn key AV solutions.





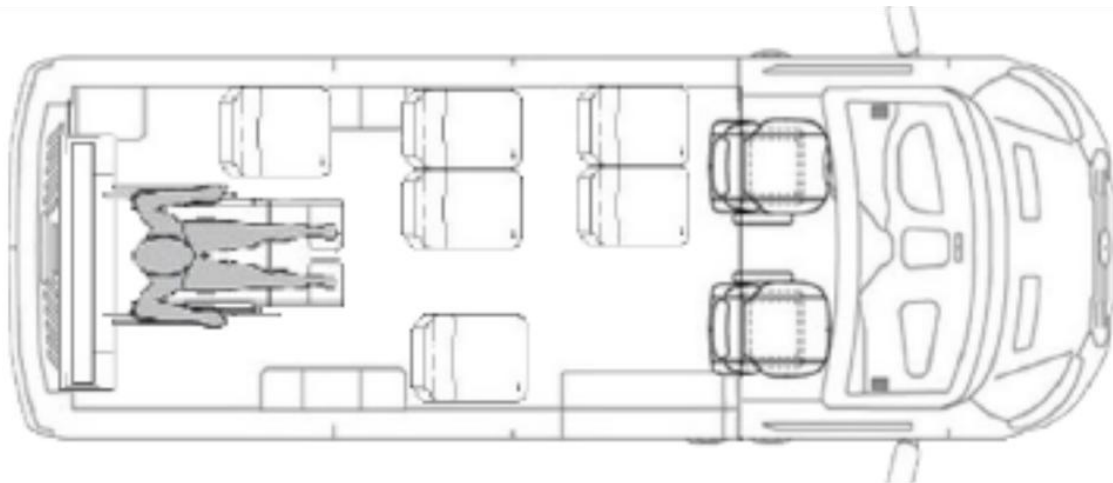
# About the Project

- Four autonomous passenger vans
- **Wheelchair access via lift**



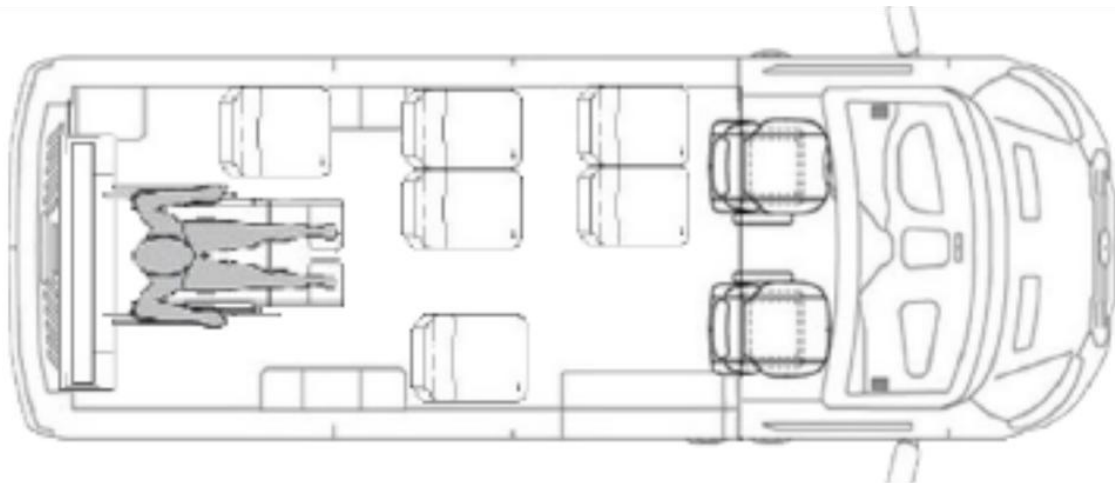
## About the Project

- Four autonomous passenger vans
- Wheelchair access via lift
- **Operation expected to begin late 2026**



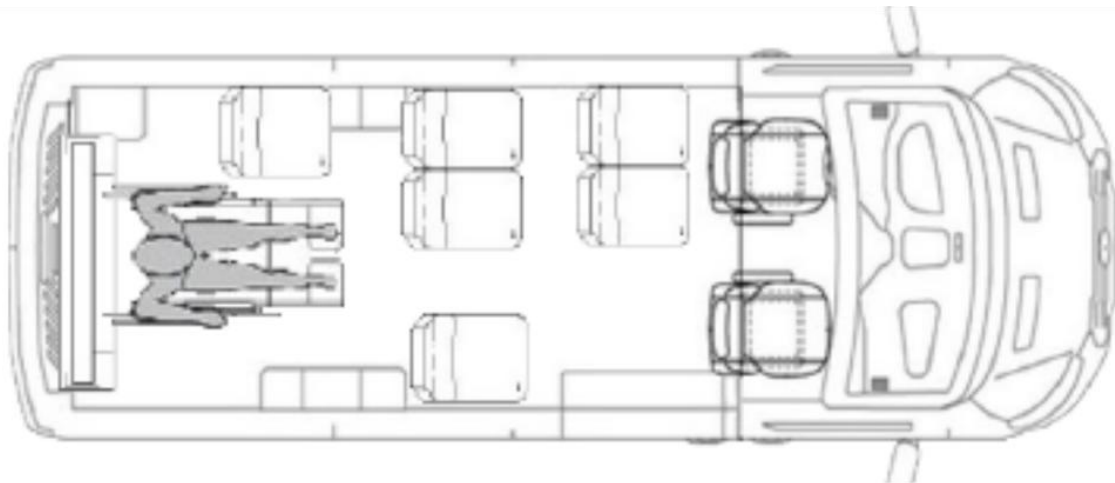
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- **Pilot will last one year**



# About the Project

- Four autonomous passenger vans
- Wheelchair access via lift
- Operation expected to begin late 2026
- Pilot will last one year
- **Overarching goal: demonstrate that AVs in a transit setting can improve mobility outcomes in transportation-burdened areas**



Recruitment events

Listening events

Surveys

Success criteria

### **Community engagement with North Tulsa [INCOG, Terence Crutcher Foundation]**

#### **Cornell**

Fleet management  
framework

Integration with  
behavioral models and  
AV technology

#### **MIT**

Creation of behavioral  
models

Creation of non-  
monetary incentives for  
demand shaping

### **Technology Development [Cornell, MIT]**

Creation of transportation system  
digital twin

Integration testing and validation of proposed  
technology in a real-time environment for  
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### **Technology Validation and Rapid Prototyping [NREL]**

Community engagement to  
publicize proposed pilot

Outfitting vehicles with AV  
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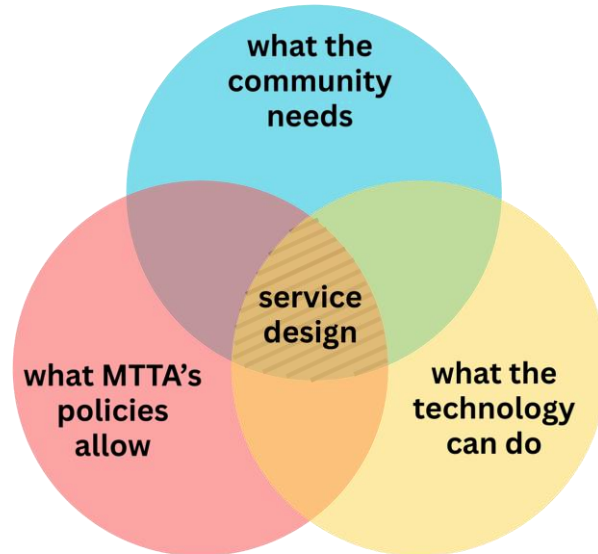
Operation of proposed  
pilot

### **Pilot demonstration [INCOG, Perrone Robotics, Tulsa Transit, Cornell]**



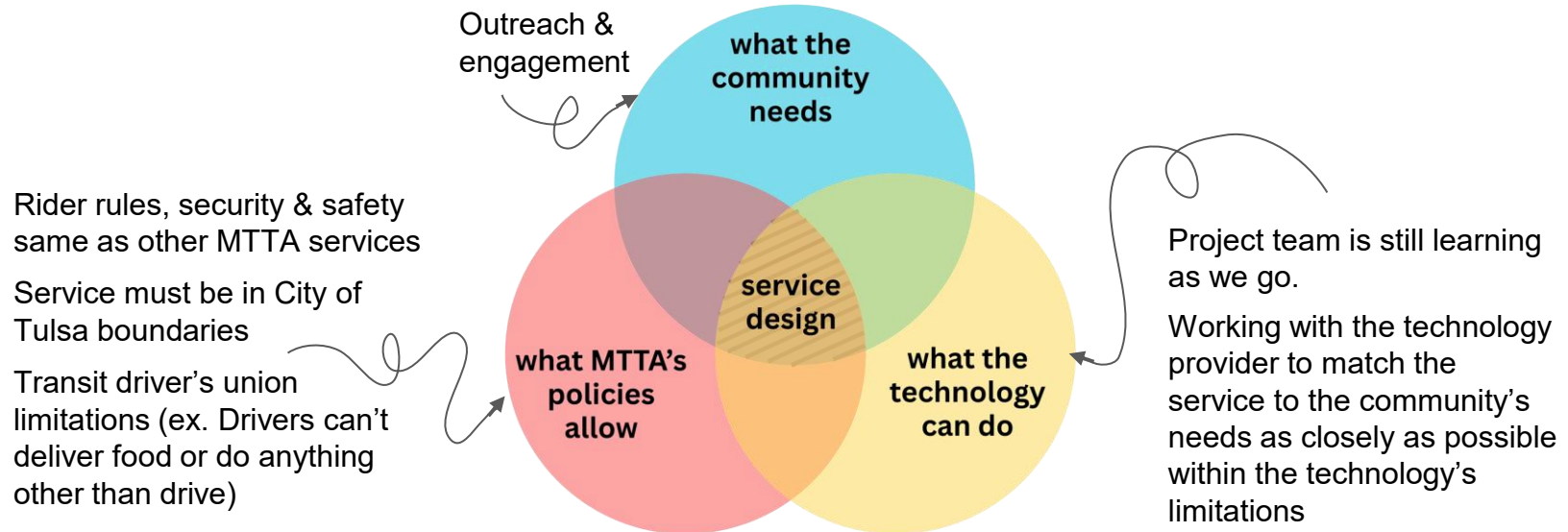
## Current Stage

- Understand current transportation service shortcomings in North Tulsa through meaningful engagement with the community
- Design a pilot service that addresses needs identified by residents



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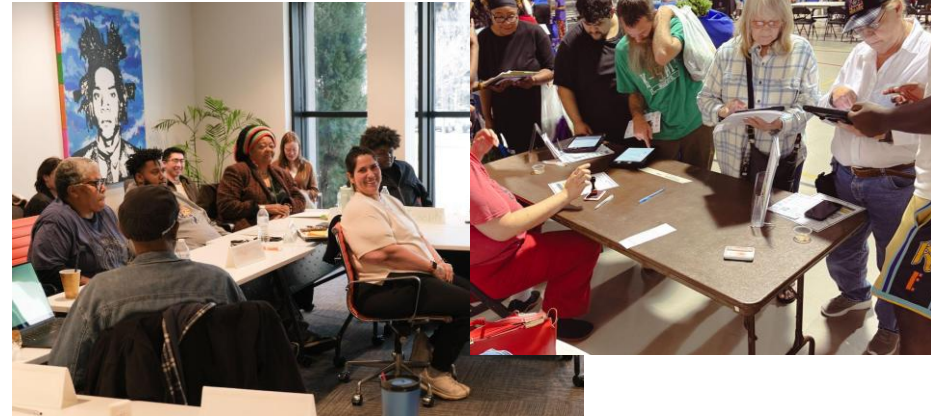
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# Community Engagement

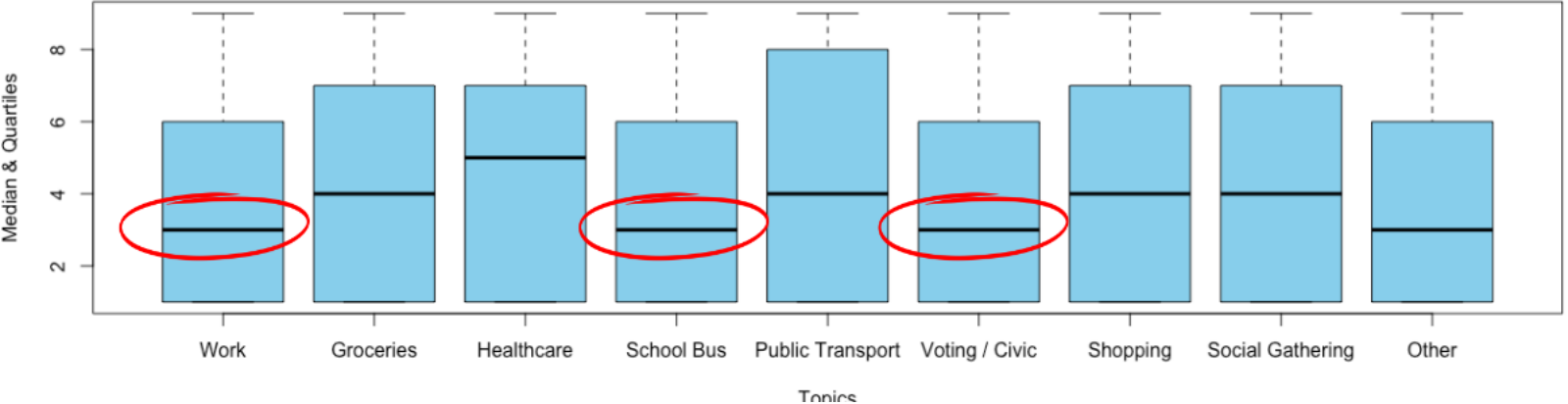
- **Community Advisory Board**  
(guides planning, communications, methods of outreach, and interpretation of information gathered)
- **Three surveys**  
(two analyzed, one remaining to distribute)
- **Two listening sessions**

Additional activities planned in BP2  
upon receiving authorization to continue



# Survey 1 Findings

Overall Legacy Fest Survey Barriers Ranking



Overall Legacy Fest Survey Obstacles Ranking



## Survey 2 Findings

- Residents lacking personal vehicles experience difficulty reaching everyday services and resources
- Top destinations respondents reported difficulty getting to were grocery stores, work, shopping, and healthcare, with these four accounting for 80% of all destination categories
- Greatest challenge faced by North Tulsans was walking distance/time, followed by accessibility and cost.
- One-hour bus headways, walking distance to stops, and limited service in the early mornings and late evenings limited the usefulness of public transit
- School access was identified as a top need (middle and high schools)
- Residents who have access to personal vehicles rarely utilize public transportation or other modes of getting around



# Takeaways from Listening Sessions

## Safety

- Walking as a mode of transportation presents major challenges due to a lack of pedestrian infrastructure
  - ◆ In Turley, participants cited major difficulty accessing bus stops because of unsafe access by walking
- Gaps in street lighting
- Stray dogs
- Concern about the safety of the autonomous system
  - ◆ Deep distrust of these systems failing in low-income areas
- Safety, comfort, and reliability are all non-negotiable—riders will not sacrifice dependability for innovation

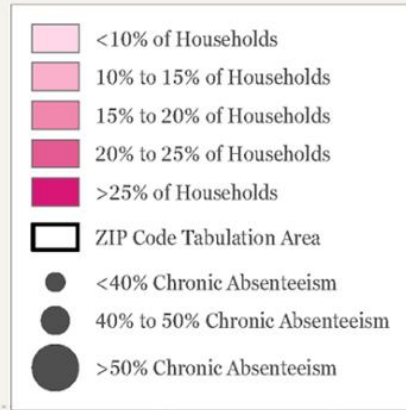
## Priorities

- Top priorities are access to school, work, and grocery shopping
  - ◆ Space needed on-board for grocery bags
- Early morning trips (before 6 AM) are not currently served by transit (need)
- General desire for the service to improve convenience
- Door-to-door service viewed favorably by locals
- Residents would like more flexibility than is offered through existing on-demand services, which requires booking three hours ahead of a trip
- Difficulty reaching locations in South Tulsa compared to locations in North Tulsa

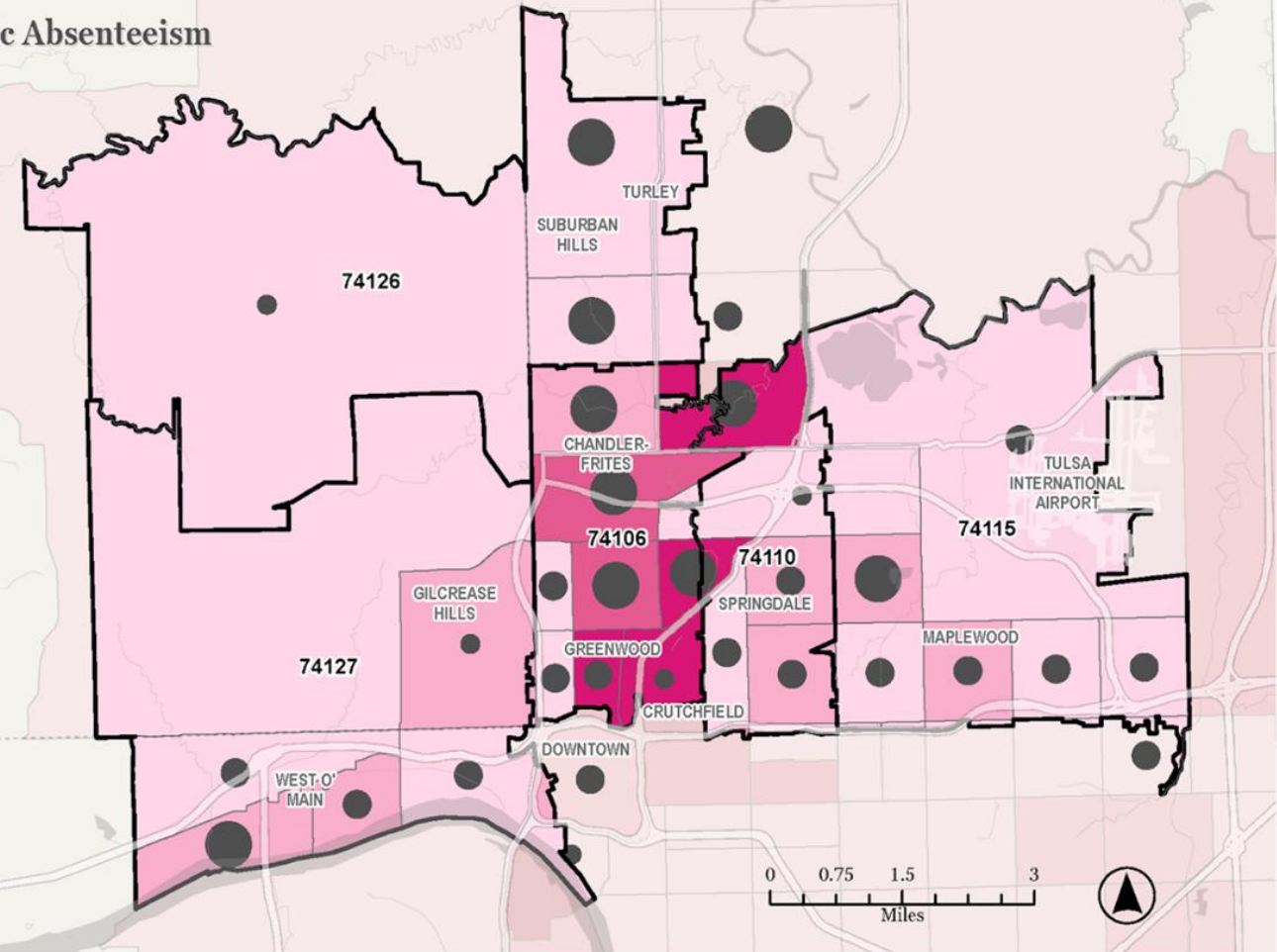
Other Analysis: Neighborhood Factors

## Zero Car Households & Chronic Absenteeism by Census Tract

This map depicts the Census Tracts within the five subject ZIP codes which have been color coded by the percent of households who do not have access to a personal vehicle. Census Tracts which are shaded a darker pink have a higher percentage of households without vehicular access, while Tracts with lighter shades of pink have a lesser percentage of households without vehicle access.



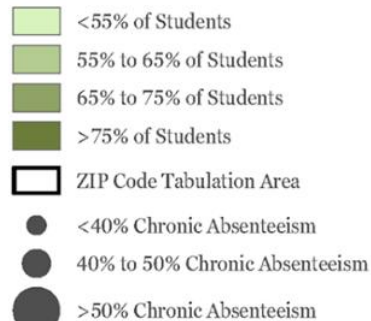
Data Sources: American Community Survey & ImpactTulsa, 2024.  
Revised: 08/07/2024



Percent of households lacking personal vehicle access in North Tulsa overlaid with chronic absenteeism rates (ImpactTulsa & American Community Survey Data, 2024)

## School Bus Eligibility & Chronic Absenteeism by Census Tract

This map depicts Census Tracts within the five subject ZIP code areas that have been color coded based on the percentage of students who do not get a school bus because they live less than 1.5 miles from their enrolled school. Census Tracts with a higher percentage of students not eligible for school bus transportation are shaded in darker green, while Tracts with lesser percentage of students not eligible for transportation are shaded in lighter green.



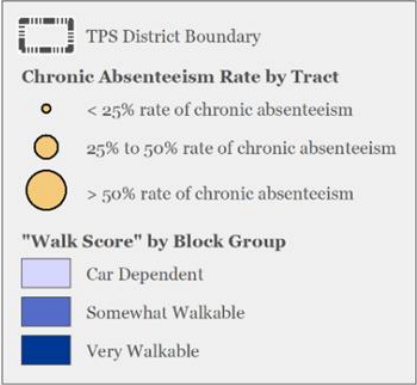
Data Sources: MP Advocates & ImpactTulsa, 2024.  
Revised: 08/07/2024



Figure 5. Map depicting school bus eligibility overlaid with chronic absenteeism rates (ImpactTulsa & American Community Survey Data, 2024)

# Walk Score by Census Block Group & Absenteeism Rates by Census Tract

Categorical "neighborhood walk scores" shown by Census Block Groups; Graduated symbols represent Chronic Absenteeism rates by Census Tract.



Data Sources  
Walk Score data: INCOG, WalkScore.com, 2018.  
Student data: ImpactTulsa, 2023.

04/02/24 Revision

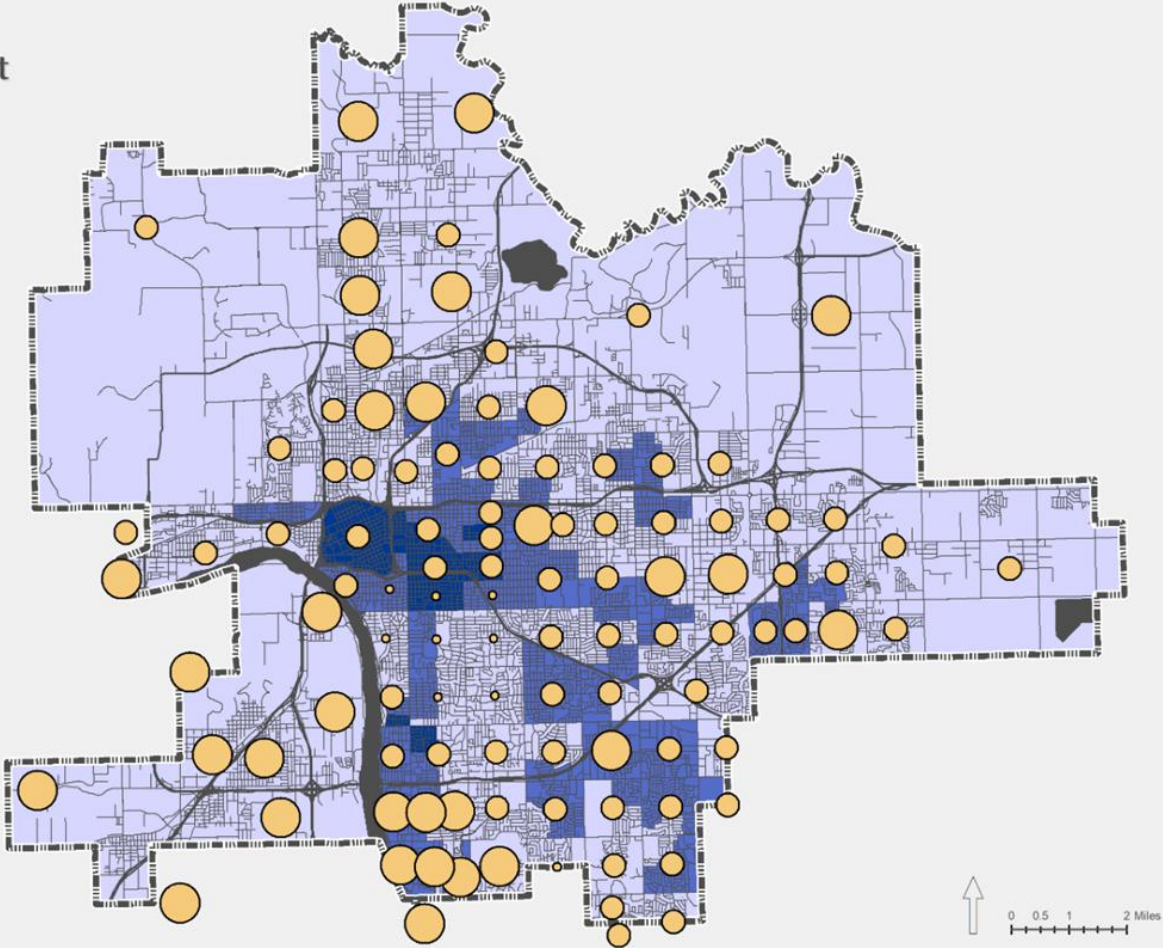
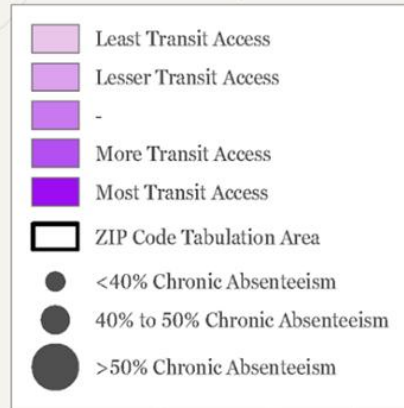


Figure 6. Map depicting walkability in North Tulsa overlaid with chronic absenteeism rates (ImpactTulsa & American Community Survey Data, 2024)



## Access to Public Transit & Chronic Absenteeism by Census Tract

This map shows Census Tracts located within the five subject ZIP code areas which have been colored by the level of access to public transit. Census Tracts with more access to transit are indicated by darker shades of purple, while Tracts with lesser access to transit are indicated by lighter shades of purple.



Data Sources: INCOG, 2024; ImpactTulsa, 2024.  
Revised: 08/06/2024

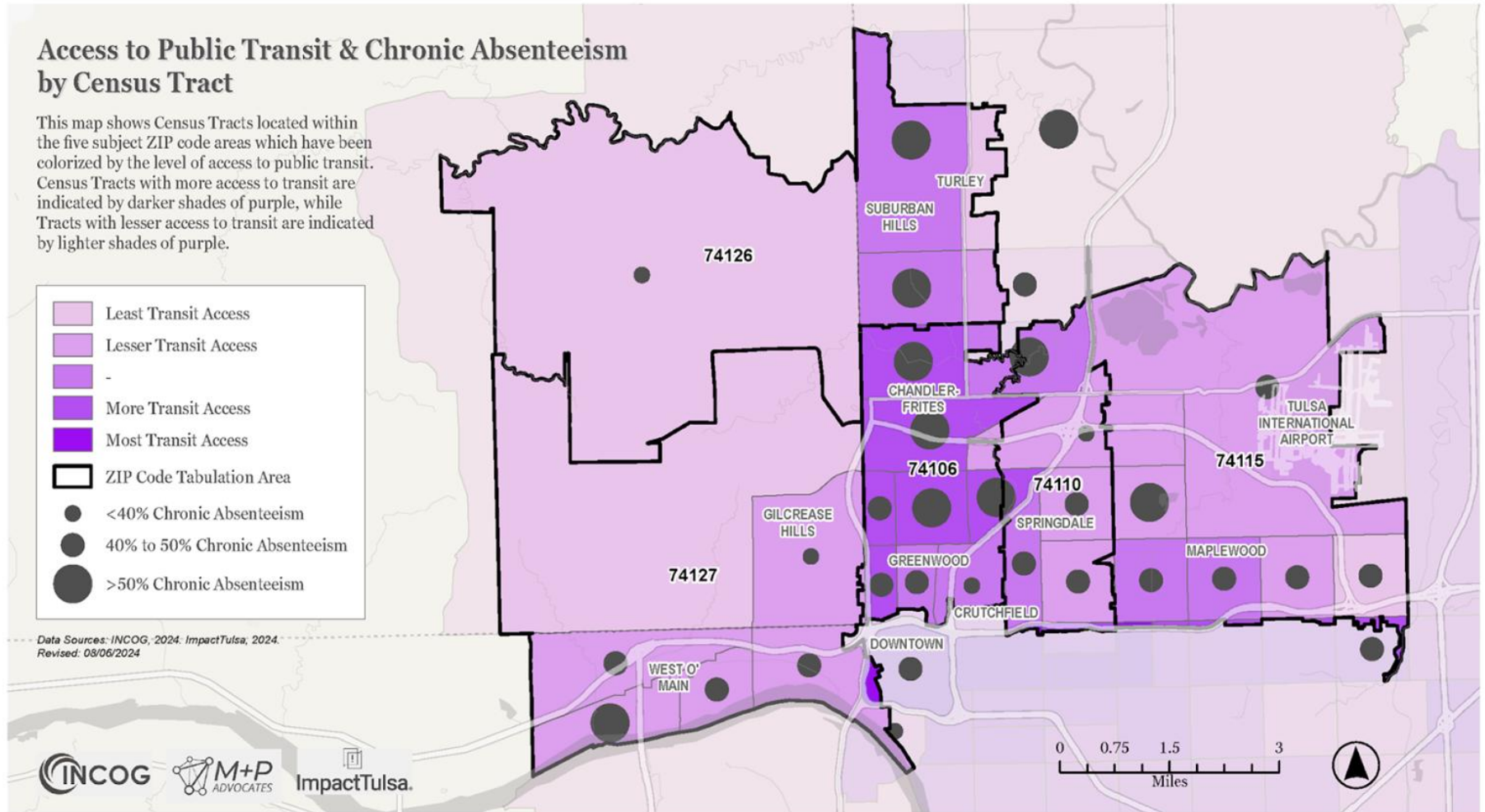


Figure 7. Map depicting levels of public transit service access in North Tulsa overlaid with chronic absenteeism rates (ImpactTulsa & American Community Survey Data, 2024)

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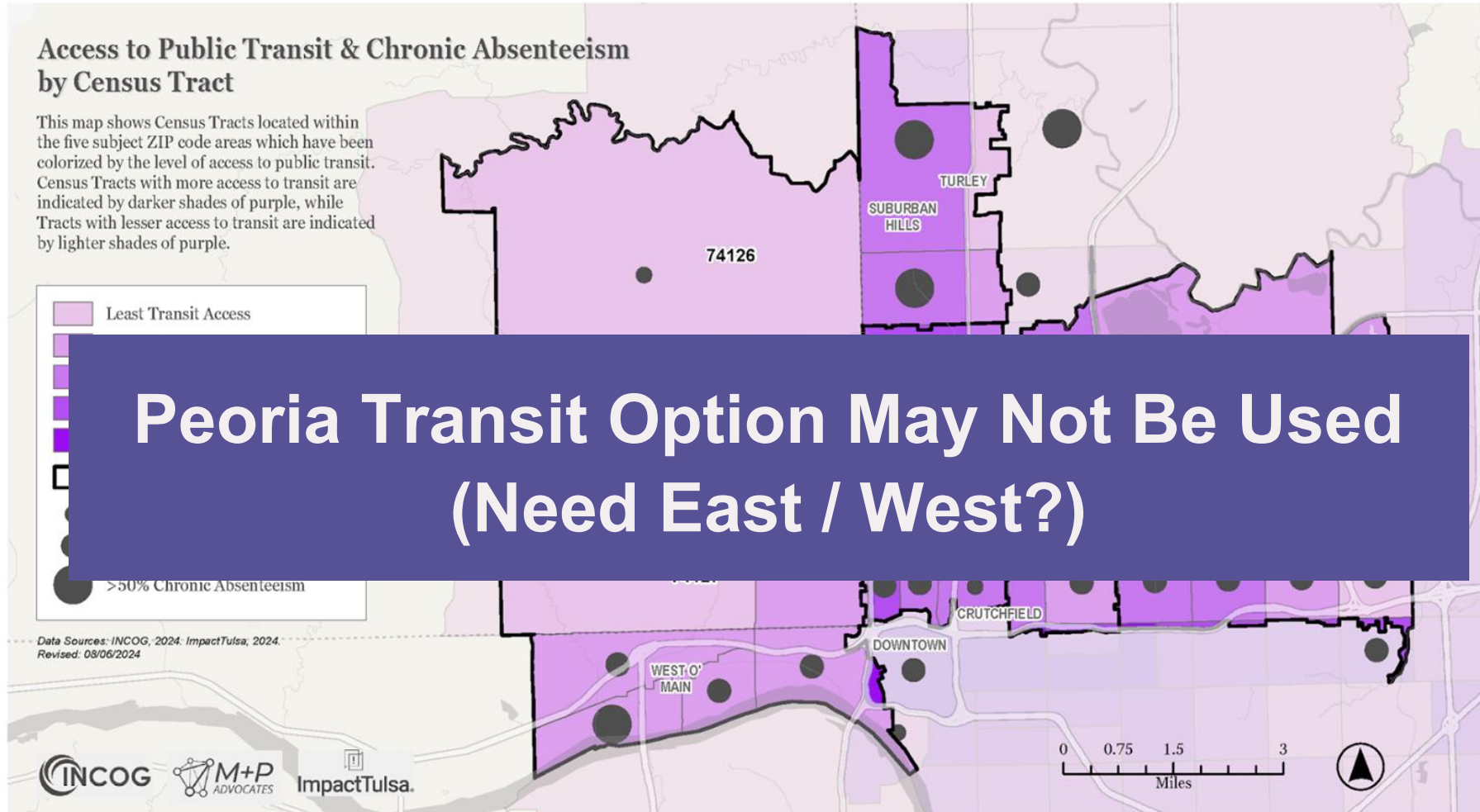


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# Future Engagement Plans

- The issue of safety will be investigated further in future listening sessions to better understand what would make riders feel safe when riding in an autonomous vehicle
- Effective communications strategies will also be explored to identify what messaging builds trust in new transit technologies and what language might turn people away
- The team will more closely examine competing preferences between service flexibility and expected wait times, which will inform the amount of time required between ride booking and the vehicle arriving at the pick-up site
- We will explore which destinations and connections are most critical for this service to meet the needs of local residents, including which specific employment hubs, schools, and grocery shopping destinations the community would like this service to provide access to
- Service design tradeoffs will be incorporated into discussions with the community to narrow in on preferences with respect to cost, wait time, walking distance, booking methods, signage, access points, and other service details (Survey 3.0)

The engagement team anticipates planning future listening sessions with focus groups of North Tulsa residents (such as transit-dependent individuals) to review specific service design options and alternatives. This approach will help to address any plans that may be in direct conflict with the needs of the community, specifically with regard to price, destinations, and accessibility.

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**Pilot demonstration [INCOG, Perrone Robotics, Tulsa Transit, Cornell]**

**Next Step!**

# Questions?

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