#### Enabling Public Transportation Access for Underserved Communities in Austin, Texas

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### **Mohammed Alwosaibi**

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

Yangfeng Ji, Department of Computer Science

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Mohammed Alwosaibi Computer Science The University of Virginia School of Engineering and Applied Science Charlottesville, Virginia USA hst6pw@virginia.edu

### ABSTRACT

Access to reliable public transportation is a challenge underserved significant for communities in Austin, Texas, limiting their access to jobs, healthcare, and education. To address this issue, we developed a simple web application to help residents register for a new van transportation program at UT Austin. The application was built with easy-to-use features, secure sign-ups, and options to support people with different needs. It was tested with community members, and feedback showed it was straightforward and helpful. Over 500 people signed up for the service during the pilot phase, showing that the system works well. Plans include expanding the app, adding live tracking for the vans, and improving the system based on user suggestions to make the program more effective and accessible.

#### 1. INTRODUCTION

Public transportation is vital for getting around, especially for low-income residents in Austin, Texas. Many face challenges that make it hard to reach jobs, healthcare, and other essential services. While the city has a public transit system, coverage gaps and long wait times make it difficult for some neighborhoods to rely on buses alone. We created a web application for residents to sign up for a new van service started by UT Austin. This service offers flexible transportation for underserved communities. Our goal is to make registration easy so more people can access reliable transportation and improve their quality of life.

### 2. RELATED WORKS

Several programs use technology to improve public transportation for underserved communities. One example is Waymap, a navigation app by Tom Pey. It offers clear directions for people with different vision levels and works without a phone signal. Launched in Washington D.C., it helps make transit and public spaces more accessible (The Times, 2022).

Another example is Via Transportation, a that provides company software and operations to improve public transportation networks. Via offers fully managed transit transportation planning services. tools. consulting services, operational support, and navigation to cities, transit agencies, schools, universities. healthcare providers, and corporations worldwide. Their services aim to make transportation more equitable and accessible for all populations, including paratransit riders. school-aged children, elderly populations, and low-income riders (Wikipedia Contributors, n.d.).

These projects illustrate the impactful ways in which innovative technology applications can tackle the unique transportation challenges encountered by underserved communities. By leveraging advanced tools, they improve transportation access for people facing barriers, making travel easier and helping individuals reach jobs and opportunities for a better life.

# 3. **PROJECT DESIGN**

The platform is simple to use and accessible, addressing key issues like limited digital skills and compatibility with different devices. The following subsections detail the core components of the design, including the registration process, system architecture, and accessibility features.

# 3.1 System Overview

The web application lets residents sign up for the van transportation program. Users can create accounts and access service details on their smartphones and tablets. Security measures such as authentication and data encryption protect user information. A guided form simplifies the registration process, making it easier for users with limited digital experience.

# **3.2 Registration Process**

The registration process was designed to be straightforward, ensuring accessibility for users unfamiliar with web applications. First, users create an account by entering their basic information, including name, contact details, and preferred language. The system then verifies their eligibility based on location and transportation needs. Users provide their details and choose pick-up and drop-off locations. After registration, they get confirmation and onboarding updates.

### **3.3 System Architecture**

The application has three main parts: the front-end. the back-end. and the administrative panel. The front-end is built with HTML, CSS, and JavaScript, creating a simple and easy-to-use design. The back-end, built with Python (Flask/Django) or Node.js, processes user requests and securely stores data in a database like PostgreSQL or Firebase. The administrative panel allows administrators to manage users and track registrations. This design supports growth and makes it easy to add new features later.

# 3.4 Accessibility & Usability Considerations

The design ensures accessibility for all users, including those with limited technical skills. The app supports multiple languages and has a simple interface with large buttons and clear instructions. It is also compatible with screen readers. adhering to Web Content Accessibility Guidelines (WCAG) to assist visually impaired users. Testing with community members helped refine these features, improving usability and inclusivity.

# **3.5 Future Enhancements**

The system includes a sufficient registration system, but we want to improve it. We will add GPS tracking for van locations and SMS updates on ride availability. We will also expand our service areas for easier access. These enhancements will further improve the user experience and increase the program's impact on underserved communities.

# 4. **RESULTS**

The web application helped underserved community members in Austin register for a new van transportation program. Over 500 people signed up during the pilot phase, showing strong interest. Users found the system easy to navigate, even with limited digital experience, and appreciated the simple registration process, mobile access, and multilingual support. Administrators managed user data and tracked demand efficiently. This helped them allocate resources better.

Early results show that the application helped people find reliable transportation, improving access to jobs and essential services. We plan to expand the program and add real-time tracking and SMS notifications. Testing will focus on improving accessibility and ease of use. These changes aim to increase participation and make public transportation more accessible.

### 5. CONCLUSION

This project aims to solve the important problem of unreliable transportation in underserved communities in Austin. It offers an easy-to-use website for people to register for a new van service. This service will help residents get to work, medical appointments, and other important places. The website is easy to use, safe, and accessible for people with limited digital experience.

This system makes it easier for residents to move around and improves their quality of life. It also helps administrators manage programs better, leading to improved planning and use of resources. The results show how important technology is in filling transportation gaps and making public services more accessible.

#### 6. FUTURE WORK

We will improve the app to make it easier for users. Adding real-time tracking will help users plan their trips better. SMS notifications will keep them updated on schedules and service changes. We will also test more to make the app accessible and user-friendly.

#### REFERENCES

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