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PROVIDING A DYNAMIC, DATA-DRIVEN MICRO TRANSIT SERVICE WITH SMART DISPATCH USING ARTIFICIAL INTELLIGENCE REPORT SUMMARY Background

FTA's Accelerating Innovative Mobility (AIM) Initiative Grant results focus on implementing artificial intelligence dispatch to provide a dynamic, data-driven micro-transit service . Using advanced technology by automating the dispatch system can optimize the cost of managing transportation operations for PHT's on-demand paratransit service. The report also outlines the project's current implementation and future capabilities, providing a roadmap for the continued success of the project.

West River Transit Authority, Inc. dba Prairie Hills Transit (PHT) and HB Software Solutions-QRyde, a transportation software technology company, partnered to to demonstrate FTA's Accelerating Innovative Mobility (AIM) initiative. The partnership focused on developing and deploying an AI-based dispatch system to optimize the cost of managing PHT's paratransit operations manage more rides with the same number of dispatchers. The system improved the efficiency and effectiveness of paratransit operations by managing more rides with the same number of dispatchers. The AI- based dispatch system automates the decisions currently made by human dispatchers, using real-time data derived from driver apps, consumer apps, text/voice notification systems to make dispatch decisions. The initiative reduced the reliance on human dispatchers making decisions based on sticky notes and radio communication.

The new system, named DISPATCH360 by QRYDE, is a game-changer in transportation operations. FTA's AIM initiative provides federal research funds to project teams to demonstrate innovative, practical approaches, practices, and technologies that enhance effectiveness, increase efficiency, expand quality, promote safety, and improve public transportation riders' experience.

Objectives

PHT implemented a new real-time dispatching system for its on-demand public transportation services that reduced data latency, allowing vehicle location updates to be conducted in near-zero latency, and enabling artificial intelligence (AI) and machine learning techniques to make real-time dispatching decisions automatically. This project had the following objectives:

- 1. To develop a high-performance dispatch system to bring telemetry data, driver messaging, and performance data from the field almost instantly with near-zero latency.
- 2. To manage more rides with the same number of dispatchers.
- 3. To achieve a high level of operational efficiency and seamless mobility for PHT customers.



Findings and Conclusions

From the outset, the project goal was to successfully employ an AI-based dispatch system paratransit customers could use to book and manage same-day rides for medical and behavioral treatment appointments to serve a rural community. This goal was accomplished through:

- Implementation of the software and hardware architecture with communication/network layers
- Deployment of AI/machine learning technologies to handle new, late, and no-show trips
- Education and service marketing for customers
- Delivery of data expectancy metrics providing accurate, real-time information.

Potential value to transit riders include:

- Increased access for seniors, students, and individuals with limited personal mobility
- Improved equity and accessibility to public transit
- Improved efficiency
- Use of public-private partnerships for demonstration, data sharing, and knowledge transfer

Benefits

This project supported USDOT's Rural Opportunities to Use Transportation for Economic Success (ROUTES) initiative by providing improved access to employment and healthcare to the population served in the PHT service area. South Dakota DOT analyzed data regarding demand distribution and vehicle miles traveled to quantify the benefits of rural transportation infrastructure projects and provide safety on frequently traveled paths.

An increase in transit ridership yielded environmental benefits from the project, including a reduced carbon footprint, improved mobility, and increased accessibility to economic opportunities for PHT customers. The system allowed up to 85-90% of decisions to be driven by real-time data and with less involvement from human dispatchers. The planned dispatch system upgrade allowed PHT to monitor its vehicles in near-instant time and expanded automated dispatch control throughout PHT's geographical area and across transit services.

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