Utah Autonomous Shuttle Pilot

Executive Summary

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UDOT Keeping Utah Moving

UTA

Prepared By

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Executive Summary

The Utah Autonomous Shuttle Pilot, a collaboration between the Utah Department of Transportation (UDOT) and the Utah Transit Authority (UTA), provided passenger service at eight locations across Utah over a 17-month project period. Each location was served for varying periods of time, ranging from a few days up to eight weeks. Operational and performance data were collected at each site, as were ridership numbers and passenger feedback. These findings, along with interviews with the project team and site partners on lessons learned and recommendations, form the basis of this Final Report.

The Utah Autonomous Shuttle Pilot (see Figure 1) enabled residents and local transportation stakeholders to experience emerging Connected and Automated Vehicle (CAV) technology and form a better understanding of the types of use cases and opportunities this technology could provide in the coming years. The project met the following six goals agreed upon by the project team:

1. Expose the public to CAV technology and provide an educational rider experience for policy influencers, transit customers, and residents who are interested in the technology.
2. Assess the viability of the shuttle as a potential solution to creating first/last mile connections.
3. Understand the operational characteristics and constraints of the shuttle to help inform potential permanent operations in a transit network.
4. Interact with the public to assess opinions and attitudes about vehicle automation and the desirability of automated shuttles in the transport network.
5. Test the capability and readiness of the automated shuttle to communicate with traffic signal infrastructure using Vehicle to Infrastructure (V2I) communication.
6. Research and understand the factors that influence passenger and pedestrian trust in automated vehicles.

Figure 1: The Shuttle and Signage Along a Deployment Route

The Utah Autonomous Shuttle, an EasyMile EZ-10 Gen2 automated vehicle, visited eight locations during the project period:

1. **Utah Driver's License Test Track**, a state-owned testing site in West Valley City.
2. **Canyons Village**, a convention center in Park City, during the American Association of State Highway and Transportation Officials (AASHTO) Spring conference.
3. **Station Park**, a mixed-use development in Farmington.
4. **1950 West**, the location of several State of Utah office buildings in Salt Lake City.
5. **University of Utah**, in Salt Lake City, where the shuttle visited on two separate deployments.
6. **Utah State Capitol**, the state capitol building grounds in Salt Lake City that the shuttle visited for a short route demonstration and for a separate, short static demonstration.
7. **Mountain America Expo Center**, a convention center in Sandy.
8. **Dixie Convention Center**, a convention center in St. George.

Having the automated shuttle at different locations throughout the state allowed 6,878 riders to experience the technology firsthand, in addition to countless others who saw or interacted with the shuttle but did not ride. Riders were also asked to take a survey. Based on the 822 survey responses, nearly all riders (98%) felt safe on board. In addition, 95% stated that they think automated shuttles could complement public transit, and 95% had a more positive attitude toward automated vehicle technology after riding (see Figure 2).

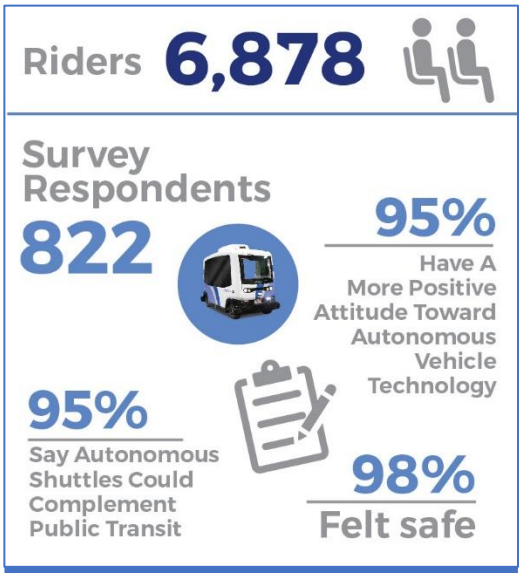

Figure 2: Project Results

Communication strategies employed by the project team included setting up a project website and email address, hosting two distinct kickoff events, and having staff on site at each deployment to answer questions and monitor the shuttle's operations. Videos of the project were created to introduce riders to the technology and eventually to summarize the project findings. Broad coverage of the automated shuttle by local media improved the visibility of the project. Project ambassadors at the shuttle stops gathered additional rider feedback through a digital survey taken on tablets provided by UTA.

This project created many learning opportunities for the project team, including the current state of CAV technology, the adaptability of automated shuttles as public transportation, and the ability of public agencies to integrate technologies into existing transit services. The project team learned the best types of environments for automated shuttles as well as the level of interest from local communities. These insights will help shape the next steps UDOT and UTA take in their CAV programs.

Challenges included securing the necessary government approvals, balancing the needs and priorities of many project stakeholders, overcoming the limitations related to CAV technology itself, and getting real-time data on the vehicle's location. There was one notable incident when a passenger was injured due to an abrupt stop by the vehicle. There were also challenges with service availability due to maintenance issues with the shuttle because there was only one vehicle available for the project.

This project demonstrated that CAV technology provides a safe option to educate the public on an emerging technology. And the research showed that experiencing the technology firsthand increased riders' understanding and trust of automated vehicles.

Project successes included the fostering of strong partnerships between project stakeholders and the cultivating of interest and enthusiasm from the public. In addition, the project demonstrated the ability to use automated shuttles as a first/last mile alternative and to successfully test connected vehicle components of an automated shuttle. There were also valuable lessons learned about the infrastructure and other support needs of CAVs.

The project team learned that given the current state of the technology, the most suitable operational characteristics of a permanent shuttle route would be a dedicated right-of-way with nearby storage and charging stations. For this project, a staff member was always on board the shuttle, but for a permanent deployment to be financially viable, operations with remote staff monitoring would be needed.