Impact of Autonomous Vehicles on Public Transit

“Accessibility”

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Individuals with disabilities are a unique but sizable demographic. According to the U.S. Census, nearly one in five people in the United States have a disability. They also represent significant pent-up demand for transportation services. As a result, it is anticipated that there will be a notable increase in travel should fully automated vehicles succeed in expanding mobility access. ITS America “Driverless Cars and Accessibility” April 2019
How Accessible is Transit today?
- Transit buses – 99.8%
- Light rail – 92% to 97%
- Commuter Rail – 85%

Applying Technology to meet the Americans with disabilities Act (ADA):
Guidance FTA C 4710.1
- “2.3 Equipment Requirements for Accessible Service
It is not enough for a transit agency to have accessibility-related equipment or features. Section 37.167(e) requires that agency employees use the equipment or feature in order to provide accessible service to riders.”

Can a Smart Accessible vehicle understand the human touch and interactions required, when working with disabled clients.

By exceeding the customer expectations, can we tap into the disabled community pined up demand for travel?
Accessibility with AV?

- Vehicle
  - Shuttle Vs Van
  - Automated lift Vs Automated Ramp
  - Wheelchair management
  - Video Systems (remote + AI)
  - Human to Machine H2M
- Location – Precision docking
- Caregivers/attendant
- Infrastructure
- Staffing

A “fully accessible” and “fully automated” vehicle must address challenges beyond the purview of the vehicle, extending into transportation infrastructure. ITS America “Driverless Cars and Accessibility” April 2019
Impact of Automated AAV could have on the Business Model?

- Supporting shuttle and paratransit fleet
  - Drivers => Field support
  - Drivers => Attendants
  - Vehicle monitoring
  - Maintenance

Automated Accessible Capability

- Meets customer needs
- Time of Day
- Vehicles in the field
- Operating cost per operating hour
- Disabled Community Ridership

Field Support & Security

Graphs to depict what could happen to ridership and vehicle hours

Compensating Strategies for People with Travel-Limiting Disabilities (age 18–64)

- Reducing day-to-day travel: 70.6%
- Asking others for rides: 55.7%
- Limiting travel to daytime: 22.6%
- Giving up driving: 21.6%
- Using special transportation services: 14.4%
- Using public transit less often: 14.4%

Source: U.S. Department of Transportation, Federal Highway Administration, 2017 National Household Travel Survey.
Accessible Electric Autonomous Vehicle Project

1. Accessible features
2. Buy America
3. Electric vehicle
4. Autonomous Level 4
5. Automated wheelchair ramp (ADA compliant)
6. Voice assistance system
7. Automated ride kneeling
8. Fleet monitoring access
9. Mobile app
10. Interior/exterior touch screens
11. Video AI / Analytics

Attendant

Wheelchair
Accessible Automated Vehicle AAV at the VA Palo Alto Complex

• The Idea (research and demonstration) grant issued by MTC allowed VTA to identify and partner with Prospect SV, Department of Veteran Affairs, MTC, and Mineta Transportation Institute (MTI).

The project goals are as follows;

• Partner with private sector to identify an advanced ADA-Compliant and Transit-Ready Electric Autonomous Shuttle that meets Buy America
• Partner with private sector to acquire Robust Management Systems:
• Demonstrate and Refine the Accessible Shuttle capabilities over the course of the demonstration period:
• Business Process, Labor & Training assessment:
• Capture and Disseminate Findings:

Apply Technology to do more with the resources we have!
Next Steps

• Working with our AV and Accessibility Technology partners on new and exciting Human 2 Machine capabilities.
• Working with the VA center on infrastructure enhancements
• Engaging the VA research staff to support our design and testing.
• Identifying other Accessibility partners around artificial intelligence and Accessible functionality