Trilateral Accessible Transportation Subgroup Meeting

ATTRI Program Update

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• A U.S. DOT Multi-Year, Multimodal, Multi-Agency Research and Development Effort

• Identifying user needs of travelers with disabilities to develop new transformative applications to increase personal mobility

• Building collaborative research and deployment partnerships with other US and International research communities, both public and private

• Unique opportunity to develop and deploy novel applications for accessible transportation and extend those benefits to all travelers
76% of people with disabilities say adequate transportation is important to their job search. 29% consider it a significant problem in accessing jobs [1].

<table>
<thead>
<tr>
<th>Targeted Populations</th>
<th>Persons with Disabilities</th>
<th>Veterans with Disabilities</th>
<th>Older Adults</th>
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<tr>
<th>Types of Disabilities</th>
<th>Vision</th>
<th>Mobility</th>
<th>Hearing</th>
<th>Cognitive</th>
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| Enabling Technologies | ITS, Wireless & Sensors | Connected Vehicles | Automated Vehicles/ Personal Mobility | Robotics, Artificial Intelligence | Accessible Data |
ATTRI Technology Research Areas

Wayfinding & Navigation Solutions
- Indoor/Outdoor navigation & orientation Apps
- Situational awareness and text recognition devices

ITS & Assistive Technologies
- Travel and emergency announcements with captioning and haptic/flashing alerts
- V2V, V2I and V2P apps for pedestrians

Automation & Robotics
- Personal mobility vehicles for first/last mile connections
- Virtual caregivers/concierge services with machine vision/AI, V2X

Data Integration
- Accessibility data and information systems
- Interoperability and data needs

Enhanced Human Services Transportation
- Real-time multimodal trip planning & services
- Inclusive one-fare payment application for all travelers
Strong Partnerships

**Federal Partners**
- NIDILRR
- US ARMY-TARDEC
- ICDR
- White House
- Access Board
- DOL-ODEP
- DHHS-ACL
- VA
- NASA
- NRI

**U.S. DOT Research**
- FHWA
- FTA
- ITS JPO
- OST

**Research Institutions**
- CMU – Robotics
- GA Tech – Apps for Older Adults
- CCNY, Auburn, TRX – EAR Program

**International Collaboration**
- Accessible Transportation Trilat SG
- E.U. City Mobil2
- Japan MLIT/SIP Tokyo 2020 Olympics

**Private Industry**
- General Motors
- Toyota
- IBM
- Qualcomm
- Intel
- Singapore GreenMan Plus
### Stakeholder Feedback & Response Themes

#### Top Identified Barriers
- **75** Lack of / or inaccessible signage/ maps/ landmark identifiers/ announcements
- **71** Navigation difficulties (do not know when arrive, transfer time, distance)
- **67** Inconsistent accessible pathway infrastructure

#### Top Identified User Needs
- **102** Amenity information (e.g. restroom, shelter)
- **88** Real-time transportation information
- **76** Safety, security and emergency information

#### Top Identified Issues with Technology
- **46%** Training to use and awareness of new technology
- **21%** Affordability
- **16%** Performance quality (especially long-distance travel, rural areas)

*User Needs Final Report Due: Spring 2016*
## Technology Scan

### Recommendations for ATTRI

<table>
<thead>
<tr>
<th>Technology</th>
<th>Recommendations</th>
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| **Wayfinding & Navigation Solutions** | - Focus on integration of map data and standardized infrastructure descriptions from various sources  
- New data unique and specific to ATTRI users should be developed |
| **ITS & Assistive Technologies** | - Focus on remote assistance for stakeholders and opportunities to inform and aid barrier traversal  
- Modernizing assistive technology maintenance and asset management (area for advanced research) |
| **Automation & Robotics** | - Shared neighborhood autonomous vehicles which are cost effective and aid at traversing distances between transit stops, homes, and places of employment  
- Assist service models, electric vehicles, and autonomous vehicles create opportunities for novel accessible designs |
| **Data Integration** | - Reduce complexity and identify coordination in service matchmaking through open data and services  
- Develop environment for community generated data |
| **Enhanced Human Services Transportation** | - Support initiatives by ridersharing services to involve ATTRI stakeholders and develop accessible versions of these services  
- Support mode shift through private on-demand ride services |
Standard Accessible Data Platform
• Data standardization and interoperability is critical in developing applications which aspire to enhance the personal mobility of those with the greatest needs.

Universal Design Standards
• Universal design standards incorporate a philosophy that promotes the applicability of a technical solution to the needs of all user groups.

Integrated Payment
• Interoperable electronic fare payment that can be utilized across various modes of transportation by all travelers including those with disability, at all times, and for multiple consumer purposes.

Leverage Existing Technologies
• Leverage existing technologies, including ITS, on-demand technologies, data standards, innovative smartphone and mobile technology, and transportation and other assistive and enabling technologies.
Application Workshop Polling Results

Foundational Considerations

**Standard Accessible Data Platform**
- Smartphone-based navigation systems for indoor & outdoor use
- Wearable technologies
- Community navigators

**Universal Design Standards**
- Pre-trip and in-route traveler information
- Crowd-sourcing
- Virtual caregiver help for pre-trip planning and in-route support

**Integrated Payment**
- Automated Robotic Characterization of Pedestrian Zones
- Machine and robotic crosswalk assistant
- Slow-speed automatic vehicles

**Leverage Existing Technologies**
- Automated intersection crossing assistance
- Pedestrians interface with traffic signal and vehicles receive alerts
- Multiple communication formats (visual, audible, haptic)

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Smart Wayfinding & Navigation Systems
- Smartphone-based navigation systems for indoor & outdoor use
- Wearable technologies
- Community navigators

Pre-Trip Concierge & Virtualization
- Pre-trip and in-route traveler information
- Crowd-sourcing
- Virtual caregiver help for pre-trip planning and in-route support

Shared Use, Automation & Robotics
- Automated Robotic Characterization of Pedestrian Zones
- Machine and robotic crosswalk assistant
- Slow-speed automatic vehicles

Safe Intersection Crossing
- Automated intersection crossing assistance
- Pedestrians interface with traffic signal and vehicles receive alerts
- Multiple communication formats (visual, audible, haptic)
The Way Forward…

- ATTRI applications RFPs
- ATTRI state of the practice and innovation webinar
Thank You!

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