



ACCESSIBLE TRANSPORTATION TECHNOLOGIES  
RESEARCH INITIATIVE

## Trilateral Accessible Transportation Subgroup Meeting

# ATTRI Program Update

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U.S. Department of Transportation  
Federal Transit Administration



U.S. Department of Transportation  
Federal Highway Administration



U.S. Department of Transportation  
Office of the Assistant Secretary for Research and Technology





# ATTRI Review



**Persons with Disabilities**



**Veterans with Disabilities**



**Older Adults**

- 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



# Challenges & Opportunities



- 76% people with disabilities say adequate transportation is important to their job search
- 29% consider it a significant problem in accessing jobs <sup>[1]</sup>

## Targeted Populations



Persons with Disabilities



Veterans with Disabilities



Older Adults

## Types of Disabilities



Vision



Mobility



Hearing



Cognitive

## 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



## 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

# ATTRI Foundational Considerations



## 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**

**Universal  
Design  
Standards**

**Integrated  
Payment**

**Leverage  
Existing  
Technologies**



### 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 on route support



### Shared Use, Automation & Robotics

- Automated Robotic Characterization of Pedestrian Zones
- Machine and robotic cross-walk 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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