ACCESSIBLE TRANSPORTATION TECHNOLOGIES
RESEARCH INITIATIVE

ATTRI Project Update Webinar 1 – AbleLink Pre-Trip Concierge & Virtualization

November 7, 2017

U.S. Department of Transportation
Federal Transit Administration

U.S. Department of Transportation
Federal Highway Administration

Navigating Adobe Connect

Shortcuts for navigating pods, menus, and windows		
Result	**Windows**	**Mac OS**
Toggle between notification window and meeting room	F8	F8
Display application menu bar for keyboard navigation	Ctrl+Space	Command+F2
Move focus to next / previous pod	Ctrl+F6 / Ctrl+Shift+F6	Command+F6 / Command+Shift+F6
Display pod menu for keyboard navigation	Ctrl+F8	Command+F8

Image Source: Thinkstock/USDOT

Agenda

- **Welcome and Introductions**
  - Kevin Viita (ITS America)
- **ATTRI Program Overview and Status**
  - Mohammed Yousuf (FHWA)
  - Robert Sheehan (ITS JPO)
- **Pre-Trip Concierge and Virtualization**
  - Steve Stock (AbleLink)
- **Q&A**
  - Kevin Viita (ITS America)

Image Source: Thinkstock/USDOT

ATTRI Vision and Mission

Vision

*ATTRI seeks to remove barriers to transportation by leveraging advanced technology to enable people to travel i**ndependently**, **anytime of the day to any destination**, regardless of their individual abilities.*

Mission

*To transform the mobility of travelers with disabilities by providing the capability to reliably, safely and independently plan and execute their travel **by leveraging principles of universal design and inclusive information and communication technology (ICT)**. ATTRI identifies, **collaborates**, coordinates, develops, and implements **transformative** solutions in advancing accessible transportation and **independent** mobility.*

The Challenge

Persons with Disabilities

- 56.7 million; 19% US population
- Unemployment Rate – 13.2 %; Income: $38,400 ($61,000)
- Poverty: 24.7% (9.0%)
- Rise in Autism: 1 in 150 (2000) to 1 in 68 (2010)
- Fed expenditures: $226 B (2002); $357 B (2008)

Veterans with Disabilities

- 21.4 million Americas are Veterans
- Disability claims: 104,819 (2006) vs. 634,743 (2012)
- 2.6 million deployed in 2012, 45% of eligible Veterans file claims for disability
- Spending: $0.93 billion (2006) vs. $5.95 billion (2012)

Older Adults

- Disability rates rise as people get older
- 43.1 million age 65 + in 2012 or 1 in 7 people
- 28% live alone
- Expected to reach 72.1 million by 2030

Challenges and Opportunities

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

Targeted Populations

- Persons with Disabilities
- Veterans with Disabilities
- Older Adults

Types of Disabilities

- Vision
- Mobility
- Hearing
- Cognitive

Enabling Technologies

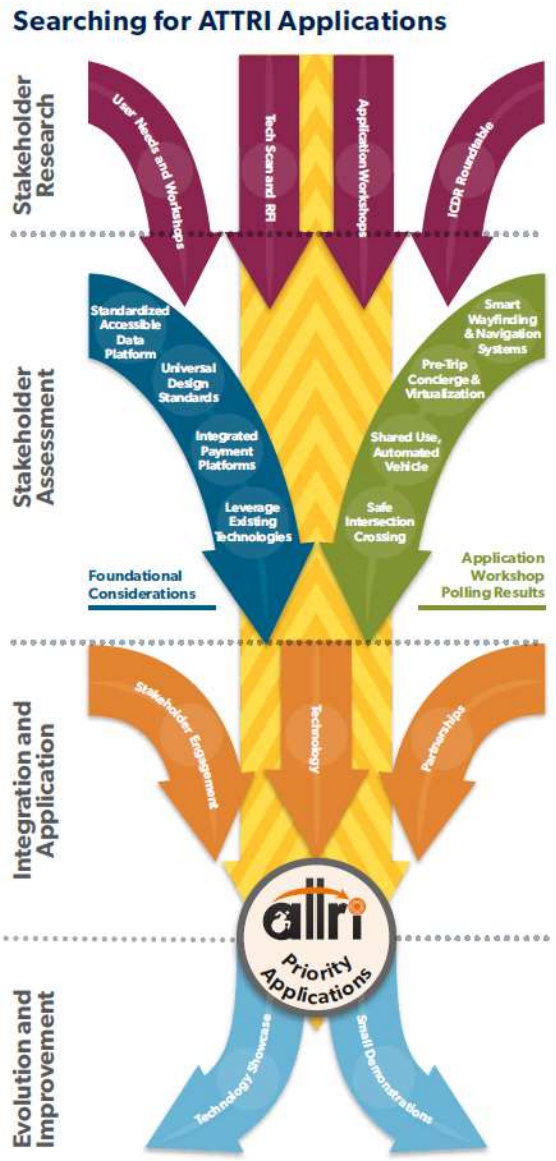
- ITS, Wireless & Sensors
- Connected Vehicles
- Automated Vehicles/ Personal Mobility
- Robotics, Artificial Intelligence
- Accessible Data

Application Development

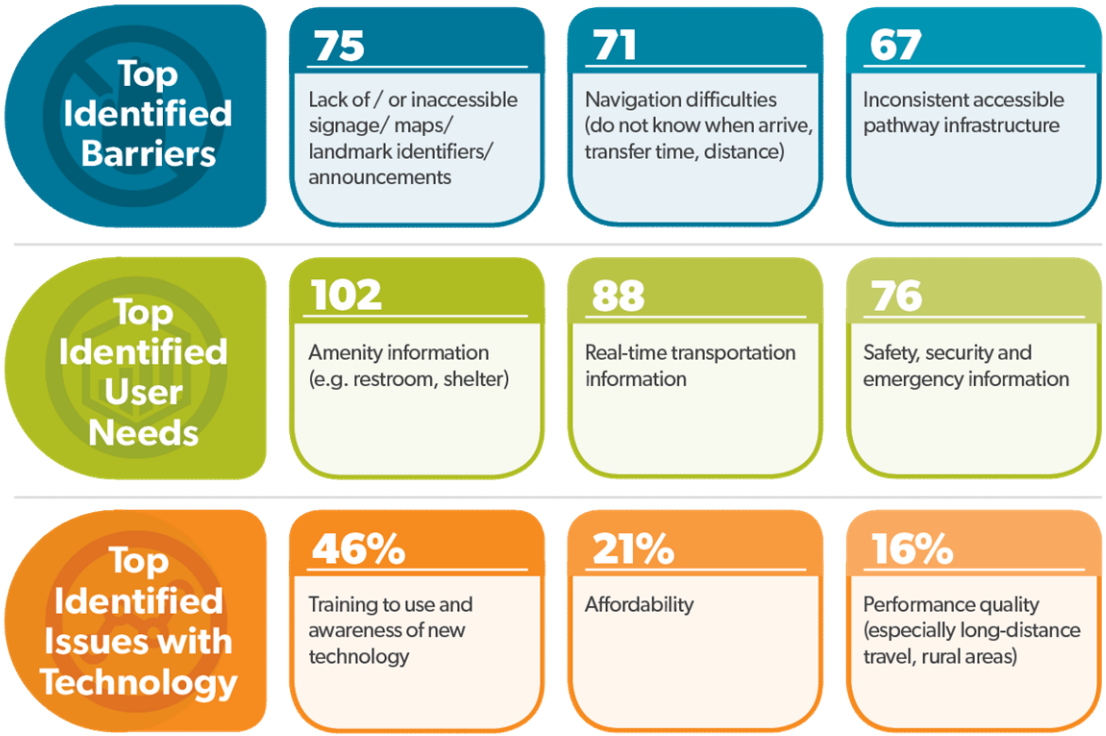
- Stakeholder Engagement and User Needs Assessment
- Technology State of Practice and Innovation Scan
- ICDR Roundtable
- RFI
- Applications Workshop

- Foundational Considerations
- Priority Application Areas
- Partnerships
- USDOT BAA & NIDILRR FOA

- Application Development
- Prototyping & Testing
- Technology Showcases and Demonstrations



Documenting User Needs



User Needs Final Report Available on the ATTRI Website:
http://www.its.dot.gov/research_archives/attri/index.htm

Technology Recommendations

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

Links to Final Reports

Application Priorities

Foundational Considerations

- Standard Accessible Data Platform
- Universal Design Standards
- Integrated Payment
- Leverage Existing Technologies

Smart Wayfinding & Navigation Systems

- Wayfinding and navigation systems for indoor and outdoor use
- Wearable technologies
- Community navigators

Pre-Trip Concierge & Virtualization

- Pre-trip and in-route traveler information
- Connected travelers
- Virtual caregiver help for pre-trip planning an on route support

Robotics & Automation

- Assistive and collaborative robotics to enhance mobility
- Ability to plan and execute trips, associated services
- Transformative transportation alternatives

Safe Intersection Crossing

- Intersection crossing assistance for all travelers
- Pedestrians interface with traffic signals, vehicles and nomadic devices
- Guidance, notifications and alerts for optimization

ATTRI Complete Trip

ATTRI - THE COMPLETE TRIP

After his doctor's appointment, Andy decides to take a spontaneous trip to meet a friend at a coffee shop in an unfamiliar part of town. Using ATTRI's **pre-trip concierge**, **wayfinding and navigation**, **robitics and automation**, and **safe intersection crossing** applications, Andy can travel with confidence throughout his trip.

1. Plan and Book a Trip

Andy uses a **pre-trip concierge application** to plan and book his trip from the doctor's office to the coffee shop.

2. Travel to Transit Station

An **automated shuttle** (rideshare service) is dispatched to take Andy to the transit station based on his booked trip. Once there, an **assistive robot** helps Andy to his bus platform.

3. Ride the Bus

While on the bus, Andy receives direction on when to pull the Stop Request cord from his **wayfinding and navigation application**. After he departs the bus, the application provides Andy with turn-by-turn walking directions to the coffee shop.

4. Cross the Street

As Andy approaches an intersection, his **safe intersection crossing application** communicates with the traffic signal to ensure sufficient time for him to safely cross the street, and notifies him when it is safe to begin crossing. The application also communicates with nearby cars to notify them of Andy's presence in the intersection.

5. Arrival at Destination

Andy safely arrives at his destination, while the **pre-trip concierge application** plans his return trip home.

Broad Agency Announcement (BAA)

The objective of ATTRI BAA is to put contracts in place that will:

- Develop applications in three of the ATTRI priority application areas:
  - Aimed to advance the current knowledge and state-of-the-art in the sciences and technologies employed in the planning, design, construction, operation, maintenance and management of accessible transportation
  - Application development will include prototyping, demonstration and evaluation
- Collaborate with other application development areas under the ATTRI program

Acquisition Approach

- USDOT BAA:
  - Application development for:
    - Wayfinding and Navigation,
    - Pre-Trip Concierge and Virtualization, and
    - Safe Intersection Crossing
- NIDILRR/HHS FOA
  - Application Development for:
    - Robotics and Automation for Accessible Transportation

Prototype Awards

Application Area	Contractors	Description
Pre-Trip Concierge and Virtualization	**AbleLink**	Create a suite of assessment, self-directed learning, and trip execution technologies to support pre-trip planning needs
Wayfinding & Navigation	**AbleLink**	Oen wayfinding media standard and the infrastructure for creation of geographically specific cloud-based libraries of routes
Wayfinding & Navigation	**City College of New York**	Smart Cane for Assistive Navigation (SCAN) integrated with a Smart Phone application
Wayfinding & Navigation	**Pathway Accessibility Solutions, Inc.**	Wayfinding tool for wheelchair users and people with visual impairment, providing routes tailored to the preferences of the user.
Wayfinding & Navigation	**TRX**	Smart Wayfinding and Navigation system to obtain real-time location, en-route assistance and situational awareness
Safe Intersection Crossing	**Carnegie Mellon University**	Connect pedestrian travelers with disabilities to the traffic signal infrastructure to develop assistive services for safe intersection crossing and increased traveler mobility.

ACCESSIBLE TRANSPORTATION TECHNOLOGIES
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AbleLink Smart Living Technologies

Leveraging Innovative Technology to Develop the Smart Travel Concierge System to Facilitate Pre-Trip Planning and Virtualization for Individuals with Cognitive Disabilities

2017 ATTRI Application Development Awardee

ATTRI Complete Trip

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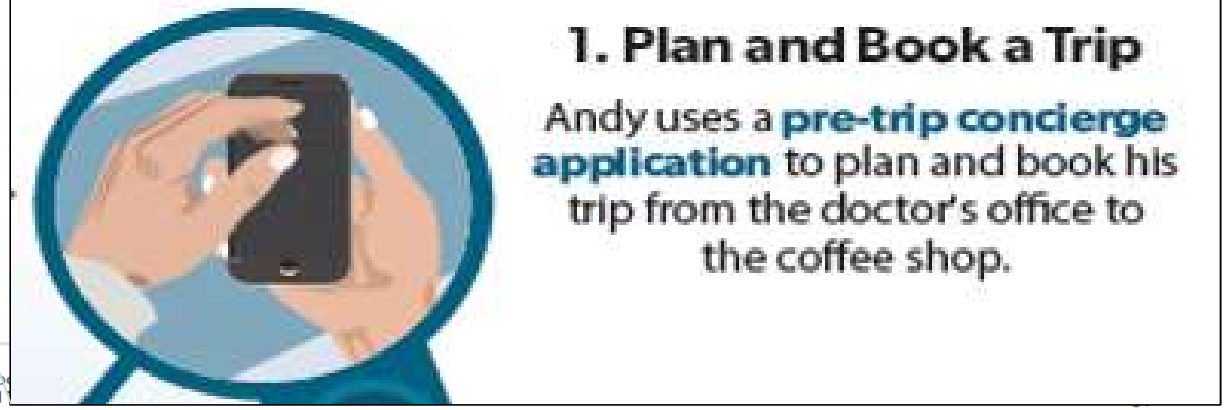
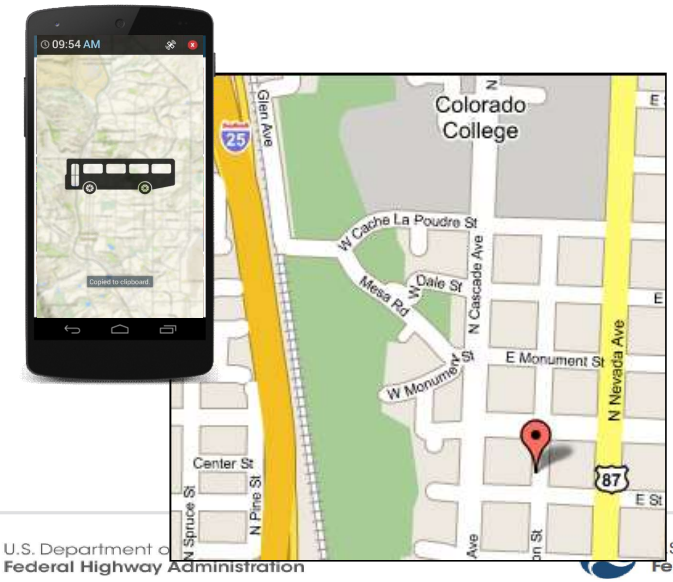
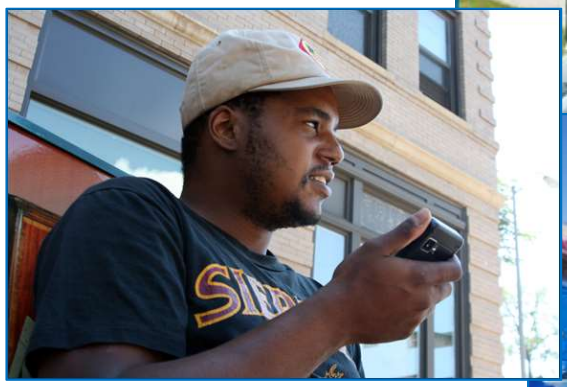


Smart Travel Concierge System

Supporting Safe and Independent Public Transportation Use for Individuals with Cognitive Disabilities

Project Objective: To develop the *Smart Travel Concierge System* (STCS), a suite of technologies for assessment of transportation readiness, pre-trip planning and execution, and trip virtualization activities specifically for individuals with cognitive disabilities to allow them to take fixed route transportation independently and reduce their need to use costlier paratransit services.





Partnerships

AbleLink Smart Living Technologies is the prime contractor for the *Smart Travel Concierge System* project with support from:

- *The ARC of Albuquerque (ARCA) -- participating as a project partner to support system development and pilot testing*
- *Black Hills Works, serving individuals with disabilities in Western South Dakota; will also support system development activities and pilot testing*
- *Project Steering Committee – Composed of 25 wide-ranging stakeholders from around the country with expertise in transportation issues and supports for individuals with cognitive disabilities*

Innovative Claims

- The *Smart Travel Concierge System* will help individuals acquire the necessary skills for travelling independently as well as perform the pre-trip preparation activities necessary for successful use of public transportation.
- Cognitive design strategies will be used to develop or repurpose each of the technologies that will be incorporated into the *Smart Travel Concierge System,* including ATLAS, Endeavor and Visual Impact, and will also guide the design of the new virtualization technologies and transportation specific content that will be developed in this project.
- The *Smart Travel Concierge System* will include trip virtualization capabilities that will help enable individuals to simulate a specific travel trip, including first mile/last mile, sites that will be passed during the trip, when the individual will need to notify the driver to stop the bus or which train stop to get off at, and other pertinent information about the trip that may be relevant.

Technical Approach and Rationale

STCS is a suite of technologies that will work together to support necessary assessment, self-directed training, pre-trip planning and virtualization activities developed specifically for individuals with cognitive disabilities to support independent use of fixed route public transportation and to reduce the need to use costlier paratransit services.

- ***Transportation Readiness Assessments*** *- Series of cognitively accessible tools operating on the ATLAS platform to enable self-assessment of important skill areas to evaluate transportation readiness and areas where training is needed.*
- ***Transit Skills Training System*** *- Development of a universally designed learning curriculum focused on skill areas relevant to using public transportation presented via AbleLink's Visual Impact system.*
- ***Schedule Support App*** *- Cognitively accessible time-based prompting technologies for pre-trip preparation and maintaining travel schedules utilizing the Endeavor system.*
- ***Pre-Trip Virtualization*** *- Will allow individuals to view computer animated scenarios of the upcoming transportation event prior to leaving for a trip to provide a virtual experience to help orient the user as to what to expect during his or her trip.*

Together, these tools will advance ATTRI objectives by providing individuals with a range of cognitive disabilities hands-on tools to support transportation readiness and individualized training to prepare themselves for independent use of fixed route transit systems and reduce reliance on specialized transportation services.

Expected Impacts*
(see research references at end of PowerPoint)

- *We expect to see a 50% increase in use of fixed-route services by individuals with cognitive disabilities*
- *We expect to see a 25% decrease in traditional paratransit services for individuals with cognitive disabilities.*
- *Satisfaction surveys of travelers with cognitive disabilities and their support network will report increased ease of use of the transportation system.*
- *Transit agencies will experience reduced costs for providing paratransit services and increased ridership for customers with cognitive disabilities.*

Outreach Activity

- *AbleLink has presented on this ATTRI Research project at the State of Tennessee's Technology Summit Sponsored by the Tennessee Department of Intellectual and Developmental Disabilities in Nashville TN, August 2017*
- *AbleLink has presented on this project to families, individuals with intellectual disabilities and staff of Rocky Mountain Human Services at a series of sessions from August to October, 2017*
- *AbleLink will present on this project at the 2017 Coleman Institute Conference on Cognitive Disability and Technology in Denver Colorado, November 2017*

Additional Information

- *Video from Previous WayFinder research*

"Riding the Bus Independently Using AbleLink's WayFinder"
https://www.youtube.com/watch?v=iNYfFpzjqyU

- *Video summarizing the ARC of Albuquerque's Smart Travel Program*

ARCA's Smart Travel Program Featuring WayFinder
"Riding the Bus Independently Using AbleLink's WayFinder"
https://www.youtube.com/watch?v=YShStpwD9j0

- *For additional information on Cognitive Support Technologies, visit AbleLink Smart Living Technologies at:*

http://www.ablelinktech.com

Research References

- *Stock, S.E., Davies, D.K., Hoelzel, L.A. and Mullen, R.J. (2013). Evaluation of a GPS-Based System for Supporting Independent Use of Public Transportation by Adults with Intellectual Disability, Inclusion, Vol. 1, No. 2, pp. 133-144.*

- *Stock, S.E., Davies, D.K., Wehmeyer, M.L. and Lachapelle, Y. (2011). Emerging new practices in technology to support independent community access for people with intellectual and cognitive disabilities, NeuroRehabilitation, Vol. 28, No. 3, p. 167-308; May, 2011.*

- *Mullen, R.J. and Hoelzel, L.A. (2012). SMART Travel Program: Using Smart Phones and WayFinder to Increase Independent Mobility of Adults with Developmental Disabilities, The ARC of Albuquerque (ARCA) White Paper, July 24, 2012.*

- *Davies, D.K., Stock, S.E., Holloway, S. and Wehmeyer, M.L. (2010). Evaluating a Cognitively Accessible GPS-Based Transportation Assistance PDA to Enable Independent Bus Travel for People with Intellectual Disability, Intellectual and Developmental Disabilities; Vol. 48, No. 6, pp 454-463.*

Stay Connected

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Stay Connected

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