Accessible Transportation Technologies Research Initiative (ATTRI)

Mohammed Yousuf, FHWA
Matthew Lesh, FTA

Technology Solutions for Accessible Transportation

National Rural ITS Conference 2014

August 26, 2014
Agenda

• Background & Objectives  
  *Mohammed Yousuf, FHWA*

• Accessible Transportation Technology Research in the U.S.  
  *Mohammed Yousuf, FHWA*

• Mobility Technology Solutions in Europe: CityMobil2  
  *Matthew Lesh, FTA*

• Accessible Transportation Solutions Activity  
  *Amy Jacobi and Carolina Burnier, Noblis*
    - Instructions
    - Break-out into groups
    - Story board potential travel by ATTRI users
    - Develop Service Concepts

• Report Findings  
  *All*

• Wrap-Up  
  *Mohammed Yousuf, FHWA*
Accessible Transportation Technologies Research Initiative (ATTRI)

• A U.S. DOT Multimodal Research and Development Effort co-led by FHWA and FTA with support from ITS-JPO

• ATTRI aims to maximize benefits from coordinated Federal investment, recent technology innovations, and traveler-focused solutions to solve door-to-door accessible transportation issues for persons with disabilities, including veterans and the older adults

• Key Areas of Focus:
  – Real-time multimodal trip planning
  – Wayfinding and navigation
  – Connected vehicle environment
  – Autonomous vehicles
  – Travel assistance devices

Image Source: Thinkstock/USDOT
Challenges and Opportunities

Technology Focused Solutions

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

Targeted Populations

- Persons with Disabilities
- Veterans with Disabilities
- Older Adults

Types of Disabilities

- Visual
- Mobility
- Hearing
- Cognitive
ATTRI Vision

To enhance the mobility of travelers with disabilities by providing the capability to reliably, safely and independently plan and execute their travel. ATTRI identifies, coordinates, develops, and implements new integrated solutions in advancing such capabilities.
ATTRI Strategic Planning Activities

- Strategic Research Plan under development
  - Shaping ATTRI strategic goals and activities
  - Version 1.0 expected September 2014
  - Input from:
    - Stakeholders
    - Federal Agencies
    - Technologists

- Key Activities:
  - Collaboration with other federal initiatives:
    - NIDRR
    - TARDEC
  - USDOT internal visioning session, January 2014
  - Listening Sessions, May 2014:
    - NACEM 2014
    - General Motors - People with Disabilities Affinity Group
    - TARDEC
  - Expert Panel, May 2014
  - Online Dialogues, May – June 2014
    - 60 ideas and 122 comments
  - RERC Projector Directors Conference, June 2014
  - NRITS, August 2014
  - ITS World Congress, September 2014
Potential ATTRI Application Areas

- Real-time multi-modal trip planning and traveler decision support application
- Wayfinding and navigation applications – Crowd-sourced/real-time
- Integration of travelers with disabilities in the Connected Vehicle environment
- Automated vehicles that enhance independent and spontaneous travel
- Travel assistance device (tablet, smartphone, or wristband) for persons with cognitive disabilities

Image Source: Thinkstock/USDOT
Accessible Transportation User Needs

1. One-stop pre-trip information
2. Door to door direct service
3. Accessible physical environment
4. Accessible en-route traveler information
5. First-mile/last-mile links
6. Streamlined eligibility screening
7. Allow for more spontaneous travel
8. Independent navigation
9. Travel training
10. Affordable transportation options and technological devices
Objectives

• Explore state of the art technology solutions in the U.S. and Europe
• Develop scenarios and technology solutions for accessible transportation
• Gather stakeholder input on needs and solutions for rural users for incorporation in ATTRI’s future efforts
Accessible Transportation Technologies

Examples of Innovative Technology
International Coordination

• Identify current accessible transportation technologies and applications from around the world, especially in the fields of automation and robotics for human transportation
• Coordinate with relevant accessible transportation technology research programs underway in other countries
• Prioritize promising accessible transportation technologies from around the world for further coordination with ATTRI
• Identify and coordinate with on going international efforts, technologies and approaches to address the needs of travelers with specific needs
International Research

Matthew Lesh
International Personal Mobility Efforts

- Green Man + (Singapore)
- Elbee (Czech Republic)
- AERES (Greece)
- CIVITAS Forum (EuroMed)
- CityMobil2 (EU)

Source: www.elbee.cz
Background

• Pilot Program for Automated Road Transport Systems within the European Union
• Follow up to earlier CityMobil project
• Demonstrates the use of Automated Transport Systems in real urban environments
• Provides opportunities for greater research and exploration into the use of autonomous vehicles
Benefits

• Opportunity to enhance existing transportation systems
• Benefits areas with low to medium transportation demands
• Could benefit people with greater mobility needs
• Provides opportunities for last mile service
Examples of Earlier Project Vehicles

-CityMobil: Researched and demonstrated between 2006 – 2011
-Provided fundamental basis for continued research and innovation

Sources: http://www.idiadromi.gr/2014/02/citymobil2.html
CityMobil2 Project

• CityMobil2 selected various cities to conduct demonstrations on implementation
• Project will last 4 years
• Cities submitted bids to host events
• Various types of demonstrations:
  – 3 Large scale demonstrations
  – 4 Small scale demonstrations
  – 3 Short “showcase” events
CityMobil2 Demonstration Sites

- Large Scale Demonstrations:
  - Milan
  - Saint-Sulpice
  - La Rochelle

- Small Scale Demonstrations:
  - Oristano
  - Vantaa

- Showcase Events:
  - León
  - CERN

Map of Europe showing demonstration sites.
CityMobil2 Vehicles

- Developed by Robosoft (France)
- Converted electric minibuses
- Fully Automated
- Seats up to 12 passengers or 10 with a wheelchair
- Maximum Speed 45 km/h (28 mph)

Sources: CityMobil2, www.Si24.it
CityMobil2 Video

CityMobil2 Demonstration:
Oristano, Italy
7/9/2014

https://www.youtube.com/watch?v=1aeRIEcU5KY
Applicability to the U.S. and ATTRI

- Learn from peers who are already demonstrating the technology
- Technical and Regulatory standardization
- Increased research and information on Automated Transport Systems
  - Legal Issues
  - Land use policies
  - Behavioral aspects
Accessible Transportation Solutions Activity

• **Introduction** (10:45 – 10:50)
  – Break-out into groups
  – Choose a note taker and speaker

• **Identify the scenario to storyboard** (10:50 – 10:55)

• **Storyboard the Scenario** (10:55 – 11:05)

• **Develop service concepts for each of the steps of the storyboard** (11:05 – 11:35)

• **Walkthrough Scenarios and Technology Concepts** (11:35 – 11:55)
Scenario: Get Ready for Work

Storyboard:
- Wake up
- Get out of bed
- Shower
- Get Dressed
- Comb Hair
- Brush Teeth
- Eat Breakfast
- Pack Lunch

Service Concepts:
- Very loud and annoying alarm clock that always wakes me up
- Develop a system of pre-selected outfits
- Use a fancy electric toothbrush so my teeth get cleaner
- Use a cooler that can be packed the night before and stay cold all day
Food for Thought

• What is a challenge that some of my customers may face when trying to travel? Do they have special needs?

• What would they have to do next? Is there something else they would have to do in between those two steps?

• How would this work if it was magic?
Accessible Transportation Solutions Activity

• **Introduction** (10:45 – 10:50)
  – Break-out into groups
  – Choose a note taker and speaker

• **Identify the scenario to storyboard** (10:50 – 10:55)

• **Storyboard the Scenario** (10:55 – 11:05)

• **Develop service concepts for each of the steps of the storyboard** (11:05 – 11:35)

• **Walkthrough Scenarios and Technology Concepts** (11:35 – 11:55)
Wrap-up

• Each group has 5 minutes to debrief the room
  – Describe the scenario chosen
  – Read off the storyboard
  – Pick 2 or 3 service concepts to highlight
Thank You!

Mohammed Yousuf  
Research Transportation Specialist  
Federal Highway Administration  
[Email] Mohammed.Yousuf@dot.gov  
[Phone] (202) 493-3199

Matt Lesh  
Transportation Program Specialist  
Federal Transit Administration  
[Email] Matthew.Lesh@dot.gov

Bob Sheehan  
Transit Program Manager  
ITS Joint Program Office  
[Email] Robert.Sheehan@dot.gov

Jeff Spencer  
ITS Program Manager  
Federal Transit Administration  
[Email] Jeffrey.Spencer@dot.gov
Back up slides
Accessible Transportation User Needs

1. One-stop pre-trip information
2. Door to door direct service
3. Accessible physical environment
4. Accessible en-route traveler information
5. First-mile/last-mile links
6. Streamlined eligibility screening
7. Allow for more spontaneous travel
8. Independent navigation
9. Travel training
10. Affordable transportation options and technological devices
Online Dialogues
Top Five Technology Solutions for ATTRI

- **Technology that helps people feel more secure about riding transit / Travel Assistance Device**
  - Mobile application that uses GPS technology to prompt riders with real-time audio messages, visual images, and vibration alerts to prompt a rider to take action
  - Alerts can be given for arrival of transit, upcoming stops, time to pull stop request cord, and arrivals at final destinations

- **Crowdsourcing Application**
  - Mobile application that crowdsources routes and associated data to and from transit stops and locations

- **Integrated Transportation Clearinghouse**
  - Smart phone application that uses location services to display all local transportation information. The application would connect the user to a database of all public and private transportation services

- **Crosswalks for those with limited mobility**
  - Crosswalks with accessible information about the length of time to cross, remaining time to cross, and which direction can be crossed at any given time.
  - Pedestrian walk times need to also better accommodate all types of people

- **Shared Rides with Ride Scheduling / Alert System**
  - Use technology to enable riding sharing program that matches disabled people with organizations providing rides