



ACCESSIBLE TRANSPORTATION TECHNOLOGIES
RESEARCH INITIATIVE



CSUN 2016

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Challenge

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

1 Andrea Lubin and Devajyoti Deka, “The Role of Public Transportation as a Job Access Mode: Lessons from a Survey of Persons with Disabilities in New Jersey”, Rutgers The State University of New Jersey, 2011.

Loprest, P., and E. Maag. Barriers to and Supports for Work Among Adults with Disabilities: Results 33 from the NHIS-D. The Urban Institute, Washington, D.C., 2001.



Why is DOL Interested Transportation Technology?

Because...

- A job without a way of getting to it *doesn't work*
- Just as accessible technology is the **great equalizer** for ICT, accessible technology is the **great equalizer** for transportation...*or the great barrier*
- It's cool



The Connected Citizen



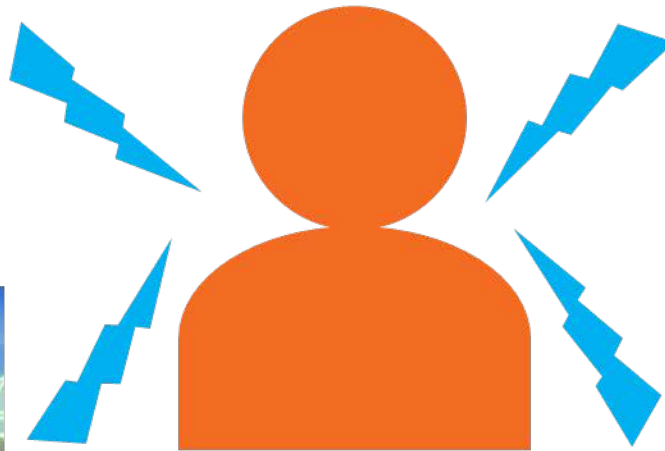
Transportation



Workforce



Home



Healthcare



Changing the Way We Do Business

- **The New Federal Government: *Open, Transparent and Participatory***
- **Expanding Beyond Information Sharing to Policy Development**
- **Information Sharing**
 - Ensuring public better access to agency information Providing opportunities to provide general input
- **Policy Development**
 - Ensuring meaningful citizen engagement and input from critical stakeholders
 - Providing opportunities for stakeholder and interagency collaboration



Open, Transparent, Participatory...

...and Inclusive

- Inaccessible technology can exclude large segments of our constituency
- Educate technology providers about developing accessible products
- Encourage policymakers to demand and use accessible products

Breaking Down Employment Barriers with Accessible Transportation Innovation





online dialo...



ePolicyWorks



Spread the Word   

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Accessibility

Trends from the @ePolicyWorks Twitter Chat

On February 1, 2016 ePolicyWorks hosted its inaugural Twitter Chat on accessible transportation. Participants joined a real-time, interactive discussion on the current state of accessible transportation, shared accessible transportation experiences and provided insights on what improvements must be made.

For a full recap of our ePolicyWorks Accessible Transportation Twitter Chat from February 1st visit: <https://storify.com/ePolicyWorks/accessible-transportation-twitter-chat-epwchat>

Breaking Down Employment Barriers with Accessible Transportation Innovation

Hosted by the **U.S. Department of Labor's Office of Disability Employment Policy (ODEP)** and the **U.S. Department of Transportation's Accessible Transportation Technologies Research Initiative (ATTRI)**, this online dialogue is focused on gathering insight and ideas for the future generation of accessible transportation solutions, including connected and automated vehicles, to further develop and enhance transportation options as an effective employment support for people with disabilities.

Please keep the following trending topics from our recent twitter chat in mind as you [submit your ideas](#) or comment and vote on ideas submitted by others below.

1

1. [Self-driving cars](#)
2. [Real-time transit route updates](#)
3. [Pedestrian accessibility](#)
4. [Expanded availability of apps for accessible transportation](#)
5. [Expenses of accessible transportation](#)

2

6. [Disability training for transportation staff](#)
7. [Use of social media for improvement of accessible travel](#)
8. [Simplify paratransit systems](#)
9. [Improved regulations of private transit providers](#)
10. [Greater availability of accessible taxis](#)

JOIN
the
CONVERSATION

Do you have a
GREAT IDEA?



Search your idea here first and if it hasn't already been posted, submit a new one!

Search Ideas

Submit New Idea

How does it work? [+]

Usage statistics [-]

51 Ideas Posted

181 Comments 337 Votes
295 Users

[View the Leaderboard](#)

Topics

All Ideas

Connected and Automated Vehicles
On-Demand Operations
Virtual Concierge Travel
Assistance
Robotics
Visualization and Alternate Reality
Shared Mobility
Personal Mobility Vehicles
Big Data
Smart Cities

[[Manage Topics](#)]





Accessible Transportation Dialogue

- **Hosted from Nov 2, 2015 to Feb 14, 2016**
- **Questions Posed:**
 - What new technologies should be developed in response to these issues?
 - What existing (or new) APIs, Open Source code and other accessible data sets could be used/are needed to create new transformative accessible transportation applications to deal with these issues?
- **Campaigns/Categories:**
 - Connected and Automated Vehicles, On-Demand Operations, Virtual Concierge Travel Assistance, Robotics, Visualization and Alternate Reality, Shared Mobility, Personal Mobility Vehicles, Big Data and Smart Cities.

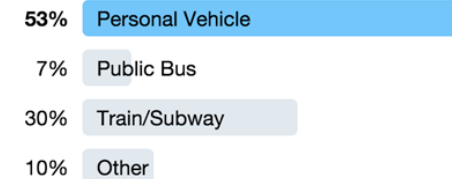


Twitter Chat Questions Asked

- Based on your experience, what might improve the accessibility of your travel? Any suggestions specific to transportation to work?
- Do you have any suggestions for strategies that might improve access to public transportation across county or state lines?
- Do you use any mobile apps to assist you in finding or using accessible transportation? If so, what are they?
- How can technology be used to enhance transportation options for people with disabilities?
- Any specific suggestions for people w/cognitive disabilities? Wounded Warriors? Older Americans?
- How can #BigData and #InternetOfThings be used to enhance future accessible transportation solutions?
- What advancements in technology do you envision for the future of accessible transportation?



Q1: What is your preferred mode of transportation? #ePWchat



89 votes • Final results



Twitter Chat Topics

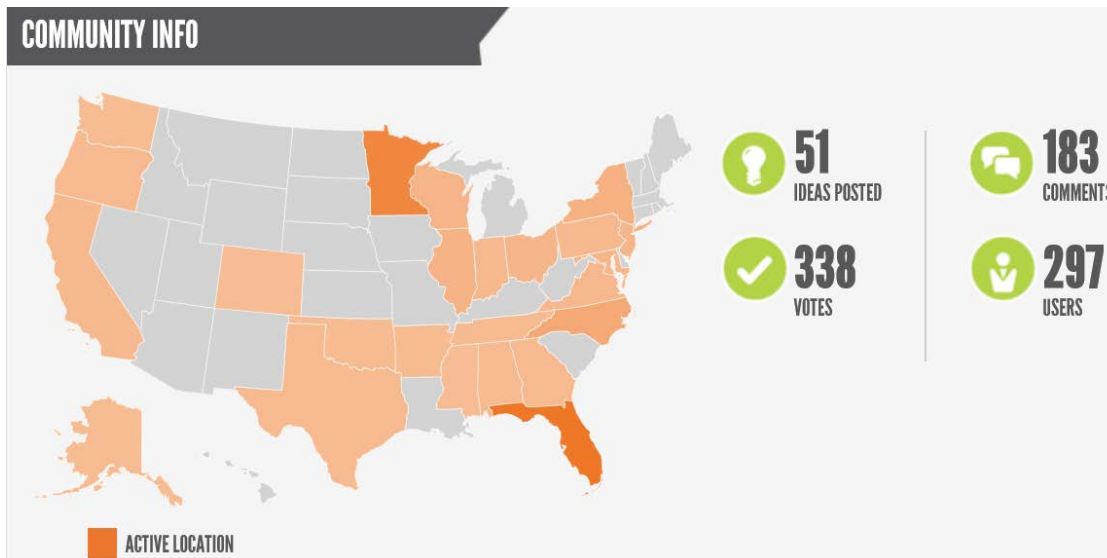
- Self-driving cars
- Real-time transit route updates
- Pedestrian accessibility
- Expanded availability of apps for accessible transportation
- Expenses of accessible transportation
- Disability training for transportation staff
- Simplify paratransit systems
- Improved regulations of private transit providers
- Use of social media for improvement of accessible travel
- Greater availability of accessible taxis





Accessible Transportation Dialogue

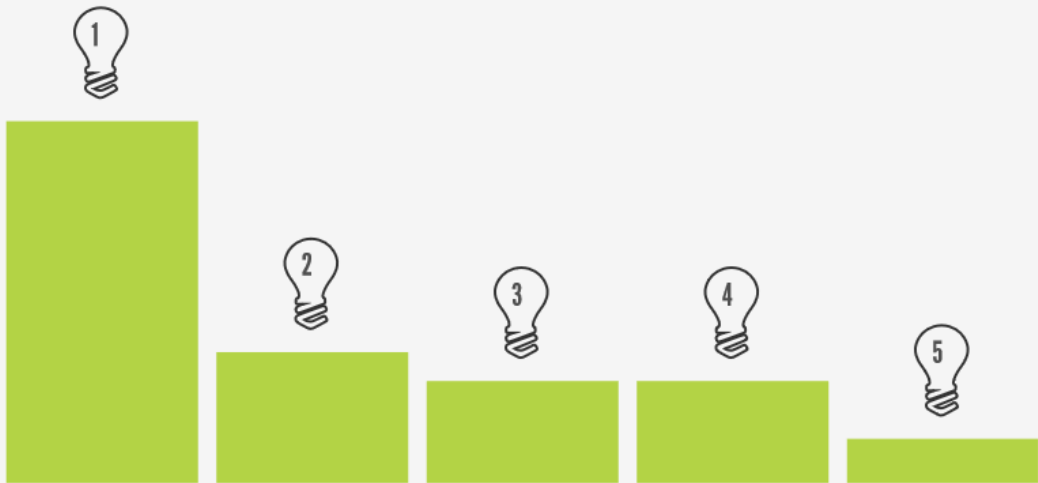
- **1,208 total registrants**
 - Transportation Professional: 19%
 - Developer or IT Professional: 3%
 - Researcher: 15%
 - Travelers with disabilities: 18%
 - Caregiver or Family Member of someone with disabilities: 14%
 - Other: 31%





Online Dialogue Top Ideas

TOP IDEAS BY VOTE

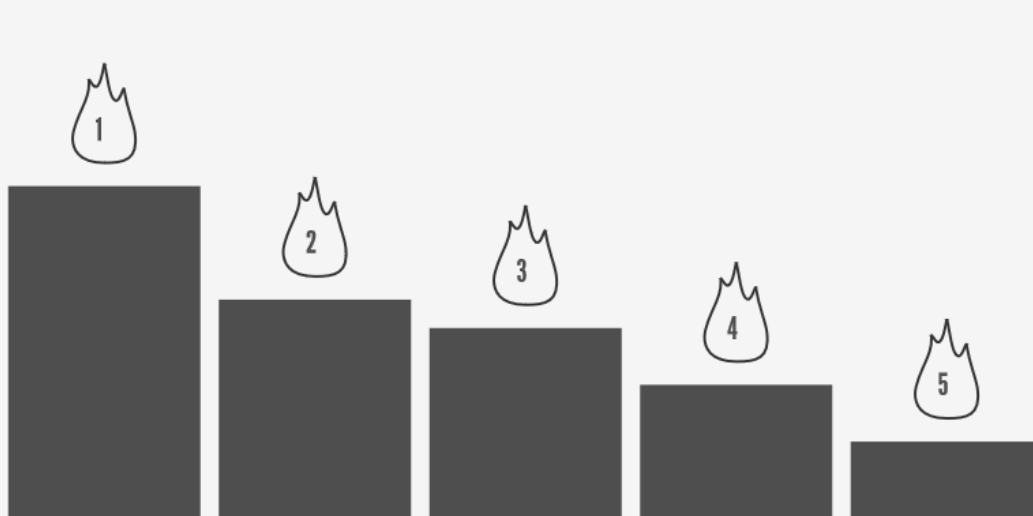


- 1 Measuring Accessibility
- 2 Shared Mobility - Collaborative Mobility
- 3 Coordinate with Local Agencies So No Penalty For Crossing Jurisd
- 4 Hire People With Disabilities
- 5 Ridesharing app for friends of travelers with disabilities



Online Dialogue Top Ideas

MOST ACTIVE IDEAS NOVEMBER 2014 TO FEBRUARY 2016



- 1 Hire People With Disabilities
- 2 Measuring Accessibility
- 3 Shared Mobility - Collaborative Mobility
- 4 Coordinate with Local Agencies So No Penalty For Crossing Jurisd
- 5 New kiosks at street corners in connected cities



Online Dialogue Top Ideas

TRENDING IDEAS NOVEMBER-2014 TO FEBRUARY-2016



- 1 Autonomous Vehicles (AVs), Accessibility, and the Workplace
- 2 ICT Enhanced Transportation can Improve Employment Opportunities
- 3 Penalties for late service
- 4 ACCES-VR Manager, Legislative & Community Affairs
- 5 Promote private fixed route transportation options like Uber hop



Turning Input into Action

Dialogue



Results/Data



Analysis



Action

Documenting User Needs



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 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



Technology Scan Final Reports: Due Spring 2016

Request for Information (RFI)



- To gain insight on technology applications and obtain informed views to document opportunities and challenges to technology development was published on Feb 19, 2015.
- USDOT received 20 responses.

- **Key Takeaways**

- Technology areas rely on one another
- Proposed technology solutions can benefit multiple user groups
- Technology solutions vary greatly in size, scope, and complexity
- More foundational research is necessary to advance proposed solutions
- Integrated technology solutions are necessary to match the diverse needs of all travelers to be affective



Wayfinding
& Navigation



Data
Integration



Automation
& Robotics



ITS &
Assistive
Technologies



Enhanced
Human Service
Transportation

Application Development



Foundational Considerations



•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 and on route support



•Shared Use, Automation & Robotics

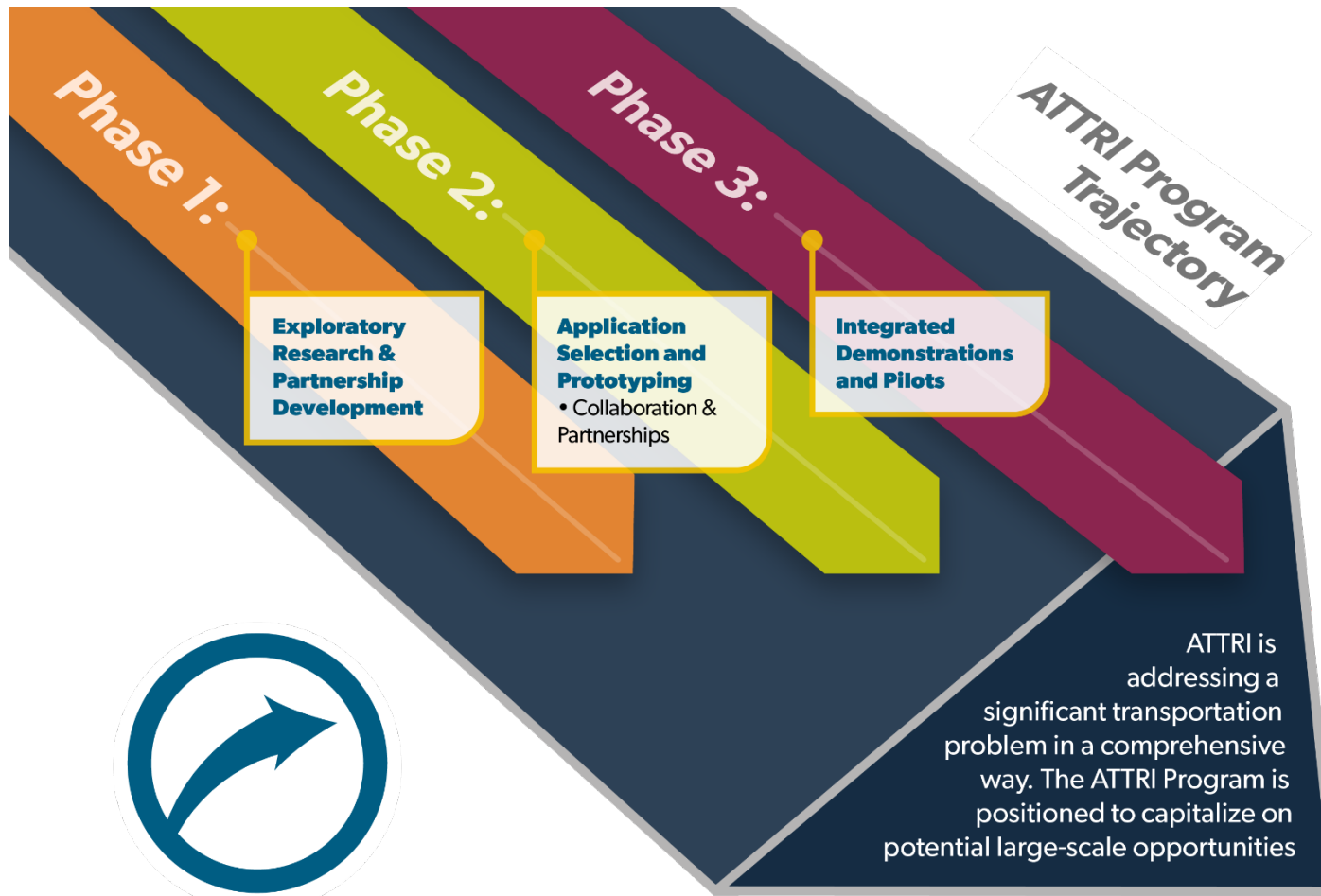
- Assistive and collaborative robotics to enhance mobility
- Ability to plan and execute trips, associated services
- Transformative transportation alternatives



•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 Program Trajectory



**Exploratory
Research &
Partnership
Development**

**Application
Selection and
Prototyping**
• Collaboration &
Partnerships

**Integrated
Demonstrations
and Pilots**

**ATTRI Program
Trajectory**

ATTRI is addressing a significant transportation problem in a comprehensive way. The ATTRI Program is positioned to capitalize on potential large-scale opportunities

Be on the Lookout!



- Spring 2016 Procurements
 - Application Development in 4 focus areas:
 - Smart Wayfinding & Navigation Systems
 - Pre-Trip Concierge & Virtualization Technologies
 - Shared Use, Automation & Robotics
 - Safe Intersection Crossings

Would it Be Possible???



- For a robot to greet me at the airport, understand my needs and offer services including help with wayfinding and navigation, transfer of my luggage or securing a boarding pass, either on my assistive device or a shared resource at the airport?
- For a traveler to borrow a shared resource robot (similar to bikeshare) at the transportation hub, be it a metro/bus stop to navigate to the next destination, and leave that resource for the next passenger?



Help Us Answer These Questions



- What existing or new application program interfaces (APIs), open source code and other accessible data sets could be used/are needed to create new transformative accessible transportation applications?
- What new technologies should be developed to enhance personal mobility and independent living for people with disabilities?





Impact Your Future



“The best way to predict your future is to create it.”

~Abraham Lincoln



Thank You



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