ITS for Underserved Communities: An Overview of the U.S. DOT’s ITS4US Deployment Program

April 24, 2023, 2:15 p.m. - 3:45 p.m.
ITS4US Program Overview

- A USDOT Multimodal Deployment effort, led by ITS JPO and supported by OST, FHWA and FTA
- Supports multiple large-scale replicable deployments to address the challenges of planning and executing all segments of a complete trip

Vision: Innovative and integrated complete trip deployments to support seamless travel for all users across all modes, regardless of location, income, or disability
Deployment Phases

Pre-deployment Activities
- Define Program Vision and Mission
- Organize Multimodal Federal Team
- Phase 1 Procurement Planning
- Phase 1 Contract Awards

PHASE 1: Deployment Concept
- Concept Development for Complete Trip Deployments
- Establish Roundtables
- Phase 2/3 Procurement Planning
- Phase 2/3 Cooperative Agreement Awards

PHASE 2: Design & Test
- Design, Test and Deploy Complete Trip Solutions
- Evaluation Framework and Planning

PHASE 3: Operate & Evaluate
- Demonstrate Multiple Large-Scale Deployments
- Evaluate Deployments
- Share Data & Lessons Learned

Operations & Maintenance
- Sustain operations for a minimum period of five years after the program is completed with no supplementary federal funds

Program Initiation
Phase 1 BAA Solicitation
Phase 2/3 NOFO Solicitation
Phase 1 Awards
Phase 2/3 Awards
Phase NTP
Phase 3 NTP
Phase 3 Completion

Pre-Deployment
18 months
Deployment
18 months
Up to 24 months
Minimum of 18 months
Post-Deployment
5 years
Systems Engineering “Vee” Diagram
ITS4US Deployment Sites

University of Washington
OR, WA, MD

Niagara Frontier Transportation Authority
Buffalo, NY

Heart of Iowa Regional Transit Agency
Dallas County, IA

Georgia Department of Transportation
Gwinnett County, GA
Safe Trips in a Connected Transportation Network (ST-CTN)

• Deployment area: Gwinnett County, Georgia

• Uses a mobile application with ability for users to:
  • Create personalized trip plans based on needs and preferences
  • Receive alternative trip routes

• Comprised of an integrated set of advanced transportation technologies including:
  • Connected vehicles
  • Transit signal priority
  • Machine learning
  • Predictive analysis
Deployment Concept – Phase 2/3 Project Team

- USDOT
  - GDOT
    - ARC
      - Kimley-Horn
      - GOSystems
      - ICF
      - GA Tech
      - IBI
      - Gwinnett County
    - HNTB
    - 360ns
    - SILCGA
    - GTRI
    - Avail
Deployment Concept – Project Overview

Safe Trips in a Connected Transportation Network

1. Pre-Trip Planning
   Receives Safe Accessible Route

2. Begins Trip:
   Receives Turn-by-Turn Directions, Alerts, and Transit Priority

3. Transition to Transit:
   Vehicle Receives Priority and is Notified of User’s Needs

4. Intersection Crossing:
   Signal Controller Extends Pedestrian in the Direction of User Travel

5. CV Broadcast Message:
   RSU Broadcasts Safety Message to Alert of Pedestrian in Vicinity

6. Outdoor/Indoor Navigation:
   Turn by Turn Directions to Safe Accessible Route
Heart of Iowa Regional Transit Agency (HIRTA) - Health Connector for the Most Vulnerable: An Inclusive Mobility Experience from Beginning to End

Elina Zlotchenko, ITS4US Program Manager
Health Connector for the Most Vulnerable

- Deployment area: Dallas County, Iowa
- Implement a scalable and replicable solution enabling transportation access to healthcare for all underserved populations and their caregivers
  - Use advanced technologies to resolve barriers
- Include information and wayfinding services to guide each step of user’s trip
- Provide enhanced access to healthcare options for all travelers in Dallas County, a mostly rural county
HIRTA and Dallas County Overview

- HIRTA provides demand response services to population in 7 county areas, including Dallas County
- Dallas County grew 36% in the last decade
- Coordination of medical transportation services for underserved a major challenge
Dallas County Underserved Population

- Older adults: 12%
- Persons w Disabilities: 4%
- Persons w Low Income: 5%
- Veterans: 4%
- LEP: 11%
- Other Populations: 64%
High-Level Findings from Stakeholders

• Lack of awareness on transportation options
• Lack of integrated booking and trip management experience
• Limited capabilities in current modes to meet the needs of underserved
• Limited wayfinding capabilities
• Service management challenges with return trips
• Same day and after hour service issues
• Limited data sharing and reporting to measure the performance of healthcare transportation
Niagara Frontier Transportation Authority (NFTA)
BuffALLo All Access

Polly Okunieff, ICF
Deployment Objectives

**Consistent, continuous trips** to, from, and within the BNMC area.

**Online and offline** ways to receive real time information on services, and infrastructure usability and accessibility.

Trip paths that are **safe, accessible, and compatible** with user-defined preferences and capabilities.

**Integrated, flexible, demand-responsive, end-to-end transit options** for the community.
BuffALLo All Access

- Deployment area: Buffalo Niagara Medical Campus
- Deploys new and advanced technologies to address existing mobility and accessibility challenges
- Integrates accessible trip planning tool with
  - Current transit services
  - Indoor/outdoor wayfinding
  - On-demand shuttle service
  - Intersection pedestrian safety technologies
- Factors in travelers’ preferences and accessibility-related needs for comprehensive trip planning
BuffALLo ALL Access System Overview

- **Trips Platform**: Integrated trip planning function for travelers.
- **Performance Dashboard**: Measures and presents the performance of the system.
- **Community Shuttle**: Shuttle system provides fixed and on-demand transit services within a specified zone of operations. Includes a combination of vehicle types and services.
- **Smart Infrastructure**: Includes the technology and supporting infrastructure for wayfinding for indoor and outdoor orientation, navigation and destination confirmation.
# Deployment Concept Summary

**A Complete Trip Scenario from a Traveler’s Perspective**

Integrated through a multimodal accessible travel planning app

<table>
<thead>
<tr>
<th>Pre-Trip Planning</th>
<th>Transit to Campus</th>
<th>Within and Around Campus</th>
<th>Inside Building</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Turn by turn guidance to and from bus and rail stops</td>
<td>• App-enabled location tracking, alerts, access preferences (voice, text, haptic alerts) and real-time arrival information</td>
<td>• Hail accessible human or self-driving shuttle (through app)</td>
<td>• Paths through partner buildings for all</td>
</tr>
<tr>
<td>• Availability of various transportation services</td>
<td>• App includes paths through stations, stops and buildings (elevators, stairs, walkways, escalators)</td>
<td>• Universal design &amp; pedestrian safety applications at high-traffic intersections around campus</td>
<td></td>
</tr>
<tr>
<td>— Bus, Rail, Paratransit</td>
<td></td>
<td>• Outdoor wayfinding, sidewalk improvement for pedestrians with and without disabilities</td>
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</tbody>
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22

U.S. Department of Transportation
ITS Joint Program Office
## At-Scale Deployment Summary

<table>
<thead>
<tr>
<th>Deployment Element</th>
<th>Estimated Number</th>
</tr>
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<tbody>
<tr>
<td>Participants</td>
<td>100 participants during Phase 2 to support development and testing of the system and its components. 300-500 participants total in Phase 3 (including Phase 2 participants). Final number will be dependent on the number of people interested in participating. Outreach and recruitment efforts will focus on obtaining the highest and most diverse number of participants possible.</td>
</tr>
<tr>
<td>Beacons/Smart Signs</td>
<td>Under 100 devices. The final number is unknown at the time and will be determined once the facilities are measured.</td>
</tr>
<tr>
<td>Touch Models</td>
<td>1 model as part of this pilot (location to be determined in Phase 2). Note that pilot will leverage the efforts of an external study that is placing another model at the Innovation Center on the BNMC.</td>
</tr>
<tr>
<td>TIH</td>
<td>2 hubs, with location to be determined in Phase 2.</td>
</tr>
<tr>
<td>PED-X Intersections</td>
<td>2 intersections, Main St. &amp; Best St. and Ellicott St. &amp; High St.</td>
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<tr>
<td></td>
<td>2 National Transportation Communications for Intelligent Transportation System Protocol (NTCIP) Supported MioVision platform to serve as a communications broker / gateway (one per intersection, total number: 2).</td>
</tr>
<tr>
<td>Vehicles</td>
<td>A maximum of 4 shuttles, a combination of SDS and HDS. Phase 2 will start with 2 shuttles for testing and integration efforts, and 2 additional shuttles will be added in Phase 3.</td>
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<tr>
<td></td>
<td>SDS Vehicles: 1-2 (note: the number will depend on the procurement)</td>
</tr>
<tr>
<td></td>
<td>HDS Vehicles: 2-3 depending on the service plan and demand.</td>
</tr>
<tr>
<td>Online/Offline Platforms</td>
<td>1 CTP website and mobile application.</td>
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<td></td>
<td>1 Performance Dashboard.</td>
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University of Washington
ITS4US Deployment Project: Transportation Data Equity Initiative

Suresh Devalapalli, Gaussian Solutions
Transportation Data Equity Initiative (TDEI)

Tools for data sharing and interoperability to provide equitable navigation options for all travelers irrespective of location, income, or disability
“Using a tool like directions on Google Maps doesn’t really help me get around. Actually sometimes this does more harm than good. I’m sent down streets I can’t cross, or up inclines that are impossible to climb. It can be deeply frustrating.”
All travelers need useful travel data they can trust
Provide More Equitable Mobility Benefits

<table>
<thead>
<tr>
<th>Create, modify and improve data standards</th>
<th>Tools to collect, store and share the data</th>
<th>Demonstrate the value of the data</th>
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</thead>
<tbody>
<tr>
<td>OpenSidewalks</td>
<td>Data Collection</td>
<td>Multimodal AccessMap</td>
</tr>
<tr>
<td>GTFS-Pathways (transit stations)</td>
<td>Data Vetting</td>
<td>Soundscape</td>
</tr>
<tr>
<td>GTFS-Flex (on-demand transit)</td>
<td>Data Provisioning Services</td>
<td>Audium</td>
</tr>
</tbody>
</table>

[Transportation Data Equity]

an initiative by TCAT & UW TRAC

TCAT The Taskar Center for Accessible Technology

U.S. Department of Transportation
ITS Joint Program Office
Deployment Sites

WASHINGTON
- Snohomish
- King

OREGON
- Columbia
- Multnomah

MARYLAND
- Harford
- Baltimore
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Visit the ITS4US Deployment Program Website:
https://its.dot.gov/its4us/

ITS4US Deployment Program Video
https://youtu.be/pztl1lRyXAc
ITS4Equity Program

- USDOT's focus on Equity and lessons learned from ITS4US points to the opportunity of furthering research and technology development to address gaps in transportation equity

- In 2023 USDOT launched a new multimodal deployment effort, led by ITSJPO and supported by OST, the ITS4Equity Deployment Program

- The ITS4Equity Deployment Program aims to reduce inequities through ITS solutions to promote safe, affordable, and accessible multimodal access to opportunities and services to communities.
Questions & Answers