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

CTAA Expo 2023

May 24, 2023
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

Program Initiation

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

Phase 1 BAA Solicitation

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

Phase 2/3 NOFO Solicitation

Deployment

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

Minimum of 18 months

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

Phase 3 NTP

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

Phase 3 Completion

18 months

18 months

Up to 24 months

5 years
SCRUM In the Vee Diagram

- Regional Architecture(s)
- Feasibility Study/Concept Exploration
- Concept of Operations
- System Requirements
- High-Level Design
- Detailed Design
- Operations and Maintenance
- Changes and Upgrades
- Retirement/Replacement

Decomposition and Definition

- Software Release Planning
- Increment Planning

Product Backlog
- Client prioritized product features
- Sys reqs
- H. design
- Detailed design

Sprint Backlog
- Features assigned to sprint
- Estimated by team
- Team commitment

Backlog Tasks

Sprint Planning Meeting
- Review product backlog
- Estimate sprint backlog
- Commit

Daily Scrum Meetings
- Done since last meeting
- Plan for today
- Roadblocks/accelerators?

Sprint Review Meetings
- Demo features to all
- Retrospective on the sprint adjustments

Time-boxed Test/Develop

Working Code Ready for Deployment

Implementation Development Process

Time Line
ITS4US Deployment Sites

University of Washington
OR, WA, MD

Niagara Frontier Transportation Authority
Buffalo, NY

Georgia Department of Transportation
Gwinnett County, GA

Heart of Iowa Regional Transit Agency
Dallas County, IA
ITS4US Team Photo Collage
Niagara Frontier Transportation Authority (NFTA)
BuffALLo All Access

Elina Zlotchenko, ITS4US Program Manager
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
BuffALLLo 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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**IT4US**

**U.S. Department of Transportation**

**ITS Joint Program Office**
At-Scale Deployment Summary

<table>
<thead>
<tr>
<th>Deployment Element</th>
<th>Estimated Number</th>
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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. 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. SDS Vehicles: 1-2 (note: the number will depend on the procurement) 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>
</tr>
<tr>
<td></td>
<td>1 Performance Dashboard.</td>
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University of Washington
ITS4US Deployment Project: Transportation Data Equity Initiative

Elina Zlotchenko, ITS4US Program Manager
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
All travelers need useful travel data they can trust
Provide More Equitable Mobility Benefits

Create, modify and improve data standards
- OpenSidewalks
- GTFS-Pathways (transit stations)
- GTFS-Flex (on-demand transit)

Tools to collect, store and share the data
- Data Collection
- Data Vetting
- Data Provisioning Services

Demonstrate the value of the data
- Multimodal AccessMap
- Soundscape
- Audium
Deployment Sites

- **WASHINGTON**
  - Snohomish
  - King

- **OREGON**
  - Columbia
  - Multnomah

- **MARYLAND**
  - Harford
  - Baltimore
Georgia Department of Transportation (GDOT)
Safe Trips in a Connected Transportation Network (ST-CTN)

Kofi Wakhis, AICP, ARC
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 – 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
Technical Approach – Context Diagram

System of Interest

Data Input
- Sidewalk Inventory Collection Tools
- Static Data
- Real-Time Data

Trip Routing Platform
- Private PMD
- Public PMD

Connected Vehicle

OTP for G-MAP

Connected Vehicle Enabled
- Gwinnett Transit
- USDOT Performance Data Repository
- End User

No Change to Data Exchange
New or Upgraded Data Exchange
Heart of Iowa Regional Transit Agency (HIRTA)
Health Connector for the Most Vulnerable: An Inclusive Mobility Experience from Beginning to End

Heidi Guenin, AICP, IBI Group
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
ITS4US Site Contact Information

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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