Buffalo All Access Project
ITS-NY Annual Meeting & Technology Exhibition

Saratoga Springs, NY
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GBNRTC
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 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
ITS4US Deployment Sites

Source: USDOT
BuffALLo All Access
Complete Trip Deployment
Project Overview
Buffalo 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
The Location

- Buffalo Niagara Medical Campus
- 120-acre campus
- Adjacent to downtown and Main St.
- 9 million sq. ft.
- 8 member institutions
- 150+ private companies
- Social, technology incubator
- Transportation innovation lab

More than 16,000 people work or study at the BNMC and more than 1.5 million visit each year for health care and other services, generating significant transportation demand for the area, its visitors, and its employees.
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.
System Overview

- Trips Platform: Mobile app, website, and call center for travelers to plan trips.
- Performance Dashboard: Measures and presents the performance of the system.
- Community Shuttle: Shuttle system providing scheduled and on-demand connections to Metro Rail, BNMC, and surrounding neighborhoods.
- Smart Infrastructure: Technology and supporting infrastructure for wayfinding for indoor and outdoor orientation, navigation and destination confirmation.
Deployment Summary Concept

A Complete Trip Scenario from a Traveler’s Perspective

Integrated through a multimodal accessible travel planning app

Pre-Trip Planning
- Turn by turn guidance to and from bus and rail stops
- Availability of various transportation services
  — Bus, Rail, Paratransit

Transit to Campus
- App-enabled location tracking, alerts, access preferences (voice, text, haptic alerts) and real-time arrival information
- App includes paths through stations, stops and buildings (elevators, stairs, walkways, escalators)

Within and Around Campus
- Hail accessible human or self-driving shuttle (through app)
- Universal design & pedestrian safety applications at high-traffic intersections around campus
- Outdoor wayfinding, sidewalk improvement for pedestrians with and without disabilities

Inside Building
- Paths through partner buildings for all
<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 system and its components. 300-500 participants total in Phase 3 (include Phase 2 participants). Outreach and recruitment efforts will focus on obtaining highest and more diverse number of participants possible.</td>
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<tr>
<td>Beacons/Smart Signs</td>
<td>Under 100 devices. The final number is unknown at the time and will be determined once facilities are measured.</td>
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<td>Touch Models</td>
<td>1 model as part of this pilot (location tbd in Phase 2). Note that pilot will leverage efforts of an external study that is placing another model at the BNMC Innovation Center.</td>
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<tr>
<td>Transportation Information Hub (TIH)</td>
<td>2 hubs with locations determined in Phase 2.</td>
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<tr>
<td>PED-X Intersections</td>
<td>2 intersections, Main &amp; Best Streets and Ellicott &amp; High Streets. 2 National Transportation Communications for Intelligent Transportation System Protocol (NTCIP). Supported Miovision platform to serve as a communications border/gateway (one per intersection, total number: 2).</td>
</tr>
<tr>
<td>Vehicles</td>
<td>A max of 4 in terms of a combination of Human Driven Shuttles (HDS) and Self-Driving Shuttles (SDS). Phase 2 will start with 2 shuttles for testing and integration efforts and additional shuttle(s) will be added in Phase 3. SDS Vehicles: 1-2 (note: the number will depend on the procurement) HDS Vehicles – 1-2 depending on the service plan and demand.</td>
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<tr>
<td>Online/Offline Platforms</td>
<td>1 Complete Trip Platform (CTP) website and 1 mobile application. 1 Performance Measurement Dashboard (PMD)</td>
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Buffalo All Access Phase 2 Timeline

- **October 2023**
  - App & Performance Dashboard Release

- **Mar-Apr 2024**
  - Train Beta Testers

- **April 2023**
  - All Access App Minimum Viable Product Release

- **Jan-Apr 2024**
  - Shuttle and Smart Infrastructure Testing

- **Apr-Jun 2024**
  - Beta Testing (Full System) App & Performance Dashboard Release

- **June 2024**
  - Operational Readiness Demo

**Implementation Phase**
All Access App (aka Complete Trip Platform)

CTP Mobile App
- Navigation
- Trip Tracking
- Traveler Trip Planning
- Pathway Waypoint Control

Complete Trip Platform
- Registration & User Profiles
- Trip Booking
- Trip Planning
- Trip Monitoring / Notification
- Geocoder and Mapping
- RT Situational Monitoring
- Performance Metrics
- Trip History/Ledger

User Interface: Mobile Application

User Interface: Web

Data Broker

BNMC Facility Beacon

CoB Ped-X
OpenStreetMap
HDS
SDS
NFTA Station
BNMC Facility
NFTA Mgmt Center
CoB Sidewalk Workzone

External System Interface
Internal System Interface

Blue boxes – CTP Subsystems
Green boxes – CS Subsystem
Orange boxes – External system
Blue-gray boxes – Smart Infrastructure
Gray boxes – PMD
Smart Infrastructure

Transportation Info Hub
Buffalo General Medical Center and NFTA Main St. & Best St. MetroRail Station

Pedestrian Signal Actuation (PED-X)
Main & Best Streets and Ellicott & High Streets
Source: Miovision

Indoor Navigation
Real-time Location System
Indoor Mapping Platform
Buffalo General Medical Center and Visually Impaired Association (VIA)
Source: CXApp
Community Shuttle Sub-System

- Operate mixed demand-responsive and micro-transit fleet consisting of:
  - Human-driven Shuttles (HDS)
  - Self-Driving Shuttles (SDS)

- Why a mixed fleet of HDS and SDS?
  - HDS provide alternate mode when conditions go beyond SDS operating environment, to travelers who cannot get to SDS pick-up & drop-off locations
  - Contrast the pros and cons of AVs vis-à-vis human-driven vehicles.
  - Insight into the business case for using Avs
  - Offer an educational opportunity for the community to learn about AVs
  - Lower the risk of this subcomponent of our project
Community Shuttle Service Area

SDS Pilot Service Area
Partnership Program

Use Technology to Address Transportation Challenges

Partners

The BuffALo All Access project is led by the Niagara Frontier Transportation Authority (NFTA) in partnership with the BNMC and University at Buffalo (UB), with funding from the U.S. Department of Transportation (USDOT).

Get Involved
Interested in becoming a partner?

CONTACT US →
Addressing Sustainability & Equity Goals of Buffalo All Access Project

- Integrated, flexible, demand-responsive and end-to-end Transit
- Addressing the First- and Last- mile challenge & Transit Service Gaps
- Preference to Electric Shuttles
- Accessibility Requirements
- Support Independent Travel
- Serving under-served Neighborhoods
Stay Connected

For more information please contact:

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Visit the ITS4US Deployment Program Website:
https://its.dot.gov/its4us/

ITS4US Deployment Program Video
https://youtube/pztl1IRyXAc
THANK YOU

Visit bnmc.org/allaccess to learn more!