Complete Trip Deployment in Buffalo, NY

Buffalo, NY

Phase 1 Team Members:
ICF, University of Buffalo,
Open Doors Organization,
RSG, ETCH, BNMC
Introductions
Leads
Summary
Phase 1 Team and Organization
Agency Partners
Project Team Leads

Deepak Gopalakrishna, ICF  
Project Management Lead

Robert Jones, NFTA  
Concept Development Lead

Adel Sadek, University of Buffalo  
Systems Development Lead

Elizabeth Greene, RSG  
Performance Measurement Lead

Jamie Hamann-Burney, BNMC  
Community Engagement and Partnerships Lead

Kate Brangaccio, ICF  
Communications and Outreach Lead
Complete Trip Deployment in Buffalo, NY

Overview of The Complete Trip deployment:

- Location is targeted around the downtown Buffalo area with a focus on travel to and from the Buffalo Niagara Medical Campus (BNMC).

- Includes the 120-acre Medical Campus and surrounding neighborhoods with underserved populations.

- Focuses on two primary trip purposes: employee-related travel and patient/visitor travel to the campus from the three neighborhoods.
Phase 1 Team

ICF
Program Management, Transit Planning, Multimodal Accessible Transportation Standards Expertise

University at Buffalo
Systems Integration, CAV Testing, Self-Driving Shuttle Operations, Inclusive Design

Open Doors Organization
Inclusive design, ADA compliance, universal design, Disability market research

RSG
Performance measurement, evaluations, travel surveys and travel behavior lead

ETCH
Transit trip planning requirements, Open Trip Planner

BNMC
Community and partnership engagement. Transportation access, neighborhoods and housing planning
Team Organization

USDOT CO, COR, TOCOR

ICF Contracts
Hannah Grantham

Project Management Lead
Deepak Gopalakrishna

Concept Development Lead
Rob Jones, NFTA

Public Sector Partners
NFTA
NYSDOT
NITTEC
GBNRTC
City of Buffalo

Project Management Support
Cindy Peck

Performance Measurement Lead
Elizabeth Greene

System Development Lead
Adel Sadek

Community Engagement and Partnerships Lead
Jamie Hamann-Burney

Communications and Outreach Lead
Kate Brangaccio

Accessible Transportation Technology
Jordan Maisel
Victor Paquet
Eric Lipp

Transit Trip Planning
ITS Standards
Polly Okuniewicz
Katie O’Sullivan

Systems Engineering Support
Nayel Urena Serulle

CAV Applications, Data Management
Chunming Qiao
Agency Partners/Stakeholders in Phase 1

The team will also reach out to **critical stakeholders**, which already have strong relationships with BNMC:

- **Neighborhood associations** (The Fruit Belt Coalition, The Masten Block Club Coalition, The Allentown Association).
- The **BNMC Transportation Operations Council**.
- **Medical and Health Care Partners** (Buffalo Hearing and Speech Center, VIA)
- **Community and Human Service Organizations** (Western New York Independent Living, Age Friendly Erie County, People Inc., Aspire of WNY).
Conceptualizing the Complete Trip

Location
Challenges
Target / Underserved Populations
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

Enabling access to jobs, health care services at these partner agencies that directly address populations of interest for complete made BNMC a compelling location
The Challenge

- Improve door to door trip making to populations with mobility challenges seeking to access jobs and health care services
- Connect communities, downtown, Main Street and BNMC seamlessly through transportation services
- Improve local circulation within BNMC
- Create a model for accessible transportation services for Buffalo Niagara region, New York and nationally
### Target Populations

<table>
<thead>
<tr>
<th>Population of Interest</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travelers to BNMC member agencies with mobility challenges</td>
<td>Patients, Visitors and Workers at • <a href="#">Buffalo Hearing &amp; Speech Center</a> • <a href="#">Buffalo Medical Group, PC</a> • <a href="#">ConnectLife</a> • <a href="#">Hauptman-Woodward Medical Research Institute</a> • <a href="#">Kaleida Health</a> • <a href="#">Roswell Park Comprehensive Cancer Center</a> • <a href="#">University at Buffalo</a> • <a href="https://www.vidius.org">VIA</a> (formerly Olmsted Center for Sight)/ <a href="https://ross-eye.org">Ross Eye Institute</a></td>
</tr>
</tbody>
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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.
### Target Populations (Cont.)

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| Residents of Fruit Belt, Masten Park communities | • Fruit Belt neighborhood: poverty rate of 25%, and 47% zero-car households.  
• Percentage of zero vehicle households and population that over the age of 65, with a disability, a veteran, and incomes of less than $25,000 is above the average for th MSA |

BNMC seeks to be a national model for how an urban campus and economic development engine can effectively develop and grow in conjunction with surrounding neighborhoods for the benefit of the greater community.
Solution-ing the Complete Trip

Elements
Integration
## Existing Assets and Initiatives

### Transit Services
- Fixed route buses
- Paratransit
- Bike share
- Light Rail

### Planning Studies
- Four Neighborhoods, 1 Community
- Main Street Smart Corridor Plan
- GBNRTC & NFTA Transit Oriented Development (TOD) Study

### Mobility Management
- Go BNMC TMA
- Statewide 511NY Rideshare Program
- NFTA Fare System Upgrade
- NYS Open Trip Planner

### R&D
- Automated Electric Vehicle Campus Demonstration,
- IDEA Center’s RERC – APT & RERC on Universal Design (RERC-UD)
Proposed Solutions

Mobility Needs Addressed by the Deployment:

- Improving the ability to make efficient and accessible transit trips, especially for employees and visitors to BNMC.

- Improve ability of employees and travelers with disabilities to make multimodal connections.

- Create new ways of supporting first and last mile services, focusing on trips within the BNMC campus (e.g., between various hospital and medical facilities).

- Improve pedestrian movement and safety around key intersections with significant use by travelers with disabilities.
Proposed Solutions (Cont.)

Proposed Deployment Area

- Core Deployment Area (BNMC Campus and adjoining streets)
  - Self-Driving Shuttle Route
  - Outdoor wayfinding services
  - Sidewalk improvements
  - Indoor navigation at partner facilities

- Universal Design for Intersections – improvements at Main & Best, Ellicott and High

- Light rail station connections to BNMC

- 500 target residents/participants of Complete Trip Deployment App
Proposed Solutions (Cont.)

Proposed Technologies

- **Device-based applications**
  - Trip planning app provides turn-by-turn direction based on accessible preferences

- **AV/ADS**
  - Self-driving shuttles on the campus provide flex-route services for travelers and integrated with the app

- **Infrastructure devices**
  - Universally designed intersections will include physical roadside units as well mobile communications connectivity

- **Multi-channel communications**
  - LTE, Wifi, Bluetooth, C-V2X technologies will be integrated with mobile app
Proposed Solutions (Cont.)

Complete Trip Planning App

- **Account Management**
  - Real Time Alerts
  - Real Time Routing/Booking

- **Transit Data Repository**
  - GTFS
  - GTFS Realtime

- **OTP Engine OSM**
  - PROW (entrances, pickup locations, sidewalk conditions)
  - Connected Locations (Bluetooth or RFID)

- **Mobile App**
  - Trip Plan w/turn by turn
  - Hailing for AV shuttle

- **Performance Tracking**
  - Trip-level Trajectory Data
  - Tracking Turned On

- **Facility/Transit stop “Color-Coated” Signs Connected Location**

**Key**
- Privacy Issues, PCI, HIPPA
- OSS and API
- Open Data Format

**Access Channels**
- Traveler Types

**Images**
- 27 Rail Cars
- 323 Buses
Proposed Solutions (Cont.)

First and Last-Mile Self-Driving Electric Shuttle with accessibility features on/around BNMC Campus
### Proposed Solutions (Cont.)

#### Outdoor/Indoor Navigation Services
- Target BNMC campus and partner Buildings
- Strategies include
  - identified sidewalk treatments
  - indoor navigation maps,
  - RFID beacons
  - Bluetooth readers that are necessary to complete the last leg of the journey

#### Universally Designed Intersections
- In cooperation with Main St project
- Intended to help visually impaired pedestrians to locate the crosswalk, align themselves and safety navigate to their desired destinations
- May also integrate with mobile app
- Primary target location - Main St and Summer/Best intersection
Integrated Deployment

Integrated through a multimodal accessible travel planning app

Pre-Trip Planning
- Turn by Turn guidance to bus or rail stop focusing access
- 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 self-Driving Shuttle (through app)
- Universal design & pedestrian safety applications at high-traffic intersections around campus
- Outdoor wayfinding, sidewalk improvement for pedestrians

Inside Building
- Paths through partner buildings for visually impaired
Delivering the Deployment

User engagement
Target performance measures
Risks
User Engagement Approach by Phase

1. Phase 1 – Planning
   • Identify 50-60 early users of the complete trip deployment through IDEA Center, ODO and BNMC Partner connections during ConOps development. (Concept Development Pool).
   • Conduct preliminary travel behavior data collection and needs assessment with early users.
   • Incentivize engagement of early users through regular interactions through BNMC.

2. Phase 2 – Design and Deployment
   • Expand user pool by collaborating with the medical institutions to about 100 while maintaining early users (Pre-Deployment Pool).
   • Pre-deployment users will try and provide data/feedback on beta versions and early releases of app, test out self-driving operations, wayfinding and intersections.

3. Phase 3 – Demonstration
   • Leverage IDEA center and BNMC to identify a population sample for Phase 3. Minimum of 500 participants of the app gathered through address-based sampling or social media sampling.
   • Incentivize participation in Phase 3.
   • Maintain pre-deployment pool for continued engagement during Phase 3 allowing for longitudinal behavior change assessment.
**Target Performance Measures**

- Phase 1 will establish the foundation of performance measurement for the deployment by defining the logic model that associates our deployment initiatives to outcomes.
## Target Performance Areas

<table>
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<tr>
<th>BAA Goals</th>
<th>Performance Areas</th>
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| Spur high impact integrated complete trip deployments nationwide | • Proven business models for accessible use of self-driving shuttles  
• Improved ability to integrate accessibility related information on transit planning apps |
| Identify needs and challenges by populations | • Improved access to healthcare for older travelers and travelers with disabilities at BMNC  
• Improved access to jobs using transit for underserved populations near BNMC |
| Develop and deploy mobility solutions that meet user needs | • Successful deployment of accessible complete trip planning app to a minimum of 500 users  
• Successful operations of 5 self-driving shuttles that support access by travelers with disabilities on BNMC campus |
| Measure the impact of integrated deployments | • Measurable improvements in trip making behavior (use of transit, trip duration, connections, completed trips) in target population (at least 500 users of the app)  
• Improved awareness and satisfaction sentiment by individual population groups part of the deployment. |
| Identify replicable solutions and disseminate lessons learned | • Successful integrated system to harness intelligent feedback loops for continual system improvements  
• Expansion of complete trip deployment concepts to other locations in Buffalo and within New York State |
Challenges & Risks

- Phase 1 Challenges and Risks
  - Gathering end-user input and feedback during pandemic
  - Connecting timelines of various ongoing initiatives and deployments in and around BNMC campus
  - Standards for Multimodal Accessible Transportation are still in flux and product development is still in infancy both for mobile app as well as AV shuttles planned in the deployment
  - Management of several overlapping activities and deliverables in Phase 1
  - Setting up for successful and seamless transition to Phase 2 lead for our region
  - Unknowns in data needs may impact data collection/management plan development
  - Harmonizing on transit trip specifications between grantees especially around complete trip elements that are being defined in this project
    - A real opportunity as well!