

# Phase 1 Participant Training and Stakeholder Education Plan

Buffalo, NY ITS4US Deployment Project

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<b>16. Abstract</b> <p>The Buffalo NY ITS4US Deployment Project seeks to improve mobility to, from, and within the Buffalo Niagara Medical Campus by deploying new and advanced technologies with a focus on addressing existing mobility and accessibility challenges. Examples of the technologies to be deployed are electric and self-driving shuttles, a trip planning app that is customized for accessible travel, intersections that use tactile and mobile technologies to enable travelers with disabilities to navigate intersections, and Smart Infrastructure to support outdoor and indoor wayfinding. The deployment geography includes the 120-acre Medical Campus and surrounding neighborhoods with a focus on three nearby neighborhoods (Fruit Belt, Masten Park and Allentown) with underserved populations (low income, vision loss, deaf or hard of hearing, physical disabilities (including wheeled mobility device users) and older adults).</p> <p>This document is the Participant Training and Stakeholder Education Plan, which details the education and training that the different stakeholders of the pilot will need to receive to correctly and safely use and operate the different components of the system.</p>			
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# 1 Introduction

Buffalo, New York (NY) is one of five sites selected for U.S Department of Transportation (USDOT) Complete Trip - Intelligent Transportation Systems for Underserved Communities (ITS4US) Deployment Program, which seeks to integrate innovative technologies to improve mobility and accessibility. The Buffalo, NY project plans to deploy an integrated set of travel support services and systems within neighborhoods surrounding Buffalo Niagara Medical Campus (BNMC).

This document, the Participant Training and Stakeholder Education Plan, details the education and training efforts for the remainder of the project lifecycle to ensure the correct and safe use of the pilot by both the users and operators.

## 1.1 Project Background

Buffalo is striving toward a sustainable future at all levels of society, incorporating actions in the community, government, and private entities in the area. Enabling community mobility and access to jobs, healthcare, and services to traditionally underserved populations is the primary motivation for all the regional partners involved in this deployment.

The Complete Trip - ITS4US Deployment Program is an effort led by the Intelligent Transportation Systems Joint Program Office (ITS JPO) and supported by Office of the Secretary, Federal Highway Administration (FHWA), and Federal Transit Administration to identify ways to provide more efficient, affordable, and accessible transportation options for underserved communities that often face greater challenges in accessing essential services. The program aims to solve mobility challenges for all travelers with a specific focus on underserved communities, including people with disabilities, older adults, low-income individuals, rural residents, veterans, and limited English proficiency (LEP) travelers. This program will enable communities to build local partnerships, develop and deploy integrated and replicable mobility solutions to achieve complete trips for all travelers.

As one of the selected sites, the Buffalo, NY ITS4US deployment concept addresses:

1. **Providing transit access to healthcare and jobs** to underserved residents including persons with disabilities and allowing them to share in the economic development in downtown Buffalo.
2. **Leveraging technology to work in support for accessible transportation**, integrating accessible transportation technology, transit, and connected automation to solve a transportation need.
3. **Developing a scalable model** for considering accessibility and universal design in transportation technology projects.

The Buffalo, NY ITS4US project will be completed in three phases: Phase 1- Concept Development, Phase 2- Design and Test and Phase 3- Operation and Evaluation.

## 1.2 Project Overview

The Greater Buffalo-Niagara Regional Transportation Council (GBNRTC) established its vision of the region for 2050 in its “Moving Forward 2050 – A Regional Transportation Plan for Buffalo Niagara” (GBNRTC; University at Buffalo Regional Institute, The SUNY at Buffalo School of Architecture and Planning; Cambridge Systematics; TyLin International, 2018). The plan seeks to guide transportation investments to:

1. Raise the region’s standard of living.
2. Support efficient freight movement.
3. Maximize infrastructure resiliency.
4. Support focused growth in communities (urban, suburban, and rural).
5. Ensure access to opportunities and services.
6. Support healthy and safe communities through targeted transportation investment.
7. Strengthen the fiscal health of local governments.
8. Preserve and protect a healthy environment and accessible open spaces and waterways.
9. Create a fully integrated and seamless transportation environment.

The Buffalo ITS4US project goals directly align with GBNRTC’s goals 1, 4, 5, 6, and 9 by providing innovative tools and services to better enable travelers to make complete trips in and around the BNMC. Furthermore, the proposed system focuses on providing transit access to healthcare and jobs to underserved citizens and allow them to share in the economic development in downtown Buffalo.

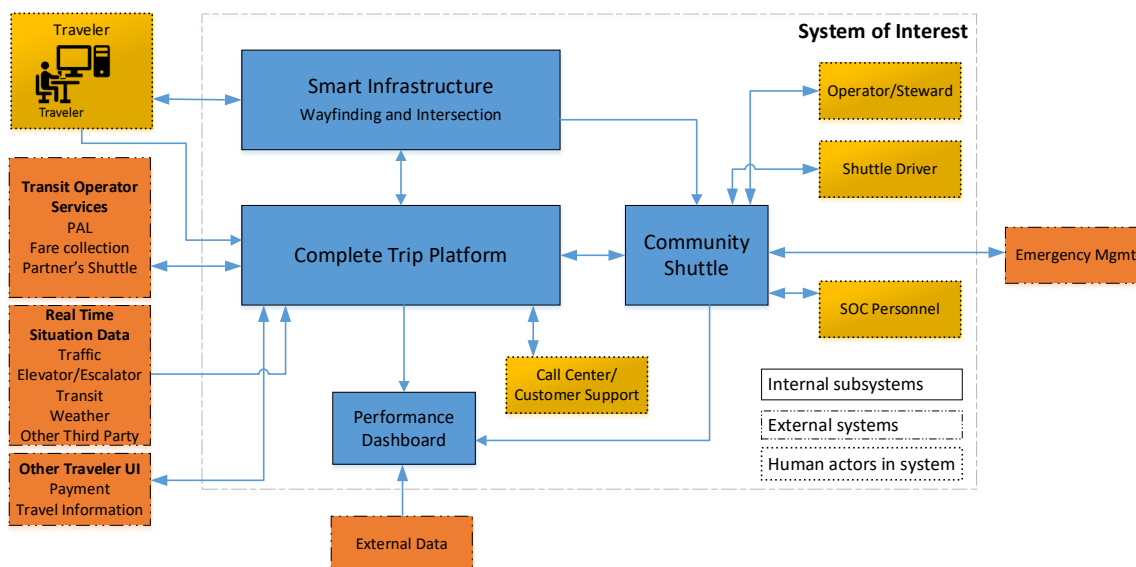
To achieve these goals, the proposed system of interest is made of four major subsystems and a variety of data interfaces between them. The four major subsystems include:

- **Complete Trip Platform** – The complete trip platform (CTP) is the integrated trip planning function for travelers. It includes various modules that allow users to personalize their trip planning, execution, and navigation experience. Specific modules in this subsystem include:

User Profiles	Real-time situation monitoring
Trip Booking	Performance metrics
Trip Planning	Trip history/ledger
Trip Monitoring and Notifications	User Interface (UI): Mobile application
Geolocation and Mapping	UI: Web and Interactive voice response
Navigation	

- Community Shuttle Subsystem** – The Community Shuttle subsystem provides demand-responsive transit services within a specified zone of operations, using a mix of vehicles, including both human-driven (HDS) and self-driving shuttles (SDS). The SDS will operate on a predefined route(s), consisting of a set of streets within the zone and pick-up and drop-off locations, but will be responsive to travelers' demand (e.g., it can skip certain pick-up/drop-off locations if there is no demand). The HDS vehicles will provide door-to-door on demand service within the zone of operation. Modules within this subsystem include both types of vehicles, as well as a Shuttle Operations Center (SOC).
- Smart Infrastructure Subsystem** – The smart infrastructure subsystem includes wayfinding and orientation for indoor and outdoor, provision of navigation and destination finding through information kiosks (Transportation Information Hub), augmented communications technologies (Smart Signs that serves as aiding sensor for wayfinding and navigation), and intersection treatment (PED-X) for hands-free, pedestrian signal requests.
- Performance Dashboard Subsystem** – This subsystem measures and presents the performance of the system to the agency operating the system.

Figure 1 provides a high-level context diagram for the system. The reader is referred to the Phase 1 Concept of Operations (FHWA-JPO-21-860) for more details on the system's components and functions.



Source: Buffalo, NY ITS4US

**Figure 1. High level context diagram for the Buffalo, NY ITS4US System.**

## 1.3 Organization of the Report

The remainder of this document is structured as follows:

- Section 2 lists the different stakeholder groups and their training needs.
- Section 3 describes how participants will be initially screened, recruited, and retained by the project.
- Section 4 details the training objectives, modules, and approaches.
- Section 5 explains how training will be assessed.
- Section 6 provides the training schedule and coordination needed.
- Appendix A defines the acronyms used in this report.
- Appendix B lists the sources references in this report.

## 2 Identification of Participants and Necessary Training

This section presents the different groups of stakeholders that will need education and/or training due to their roles and responsibilities within the deployment. The development, timing, and depth of the training may differ for each group. The training needs stated here are also an initial list and may be modified as the project development progresses in Phases 2-3.

These groups will be referenced throughout the remainder of the report when describing activities and needs in the following sections.

### 2.1 Participant Group 1 – Users of the System and Services

**General Description:** Travelers that use private vehicles and transit to travel to, from, and/or within the BNMC area.

**General Roles and Responsibilities:** The general role of this user group is to use the system and provide feedback on their experience.

**General Training Needs:** This participant group will require education on what the systems is, the different services provided, their limitations and how to safely use the services and system. It is important to note that potential users may fit in one or more of the subgroups detailed below and therefore may have additional training needs. User training needs to accommodate as many combinations as possible to ensure that the training is successful.

#### 2.1.1 Subgroup 1A – Persons with Disabilities

**Description:** A person with a disability is defined by the Americans with Disabilities Act as “a person who has a physical or mental impairment that substantially limits one or more major life activities, a person who has a history or record of such an impairment, or a person who is perceived by others as having such an impairment”<sup>1</sup>. This deployment identifies users with four types of disabilities, listed below.

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<sup>1</sup> Source: <https://www.ada.gov/cguide.htm#anchor62335>

- Mobility – Travelers with various physical disabilities that affect both gross and fine motor skills that may or may not require a personal assistance device (e.g., cane, walker, wheelchair, and scooter).
- Vision – Travelers who are blind or have low vision.
- Cognitive – Travelers with cognitive disabilities.
- Hearing – Travelers who are deaf or hard of hearing.

**Training Needs:** Training needs to be provided in a way that accommodates the trainee’s disability(ies), such as having the training material that is Section 508 compliant, in Braille and in American Sign Language. Other alternate formats will be provided as a reasonable accommodation.

### 2.1.2 Subgroup 1B – Low Income

**Description:** Travelers with annual incomes less than USD \$26K that travel to, from, and/or within the BNMC area.

**Training Needs:** Training needs to accommodate potential barriers, such as limited or no access to internet, computer and/or smartphone.

### 2.1.3 Subgroup 1C – Older Adult

**Description:** Travelers who are over the age of 65 and travel to, from, and/or within the area.

**Training Needs:** Training needs to accommodate potential barriers, such as limited or no technology proficiency and traveling outside peak commute times.

### 2.1.4 Subgroup 1D – Limited English Proficiency

**Description:** Travelers who do not use English as their primary language and have difficulty communicating in English.

**Training Needs:** Training needs to be provided in multiple languages, both written and spoken.

### 2.1.5 Subgroup 1E – Neighborhood Residents

**Description:** Travelers to, from, within the area that are residents of the Fruit Belt, Masten Park, and Allentown neighborhoods surrounding the BNMC.

**Training Needs:** Training needs to be tailored to their cultural and historical background, make sure it is sensitive to their history with the area and BNMC.

### 2.1.6 Subgroup 1F – General Population

**Description:** Individuals who work, study, visit, and/or receive services on the BNMC campus. Some visitors and patients may travel to the BNMC from outside of the Buffalo area.

**Training Needs:** Training needs to be inclusive for visitors, people that may not know the area or the campus.

### 2.1.7 Subgroup 1G – Caregivers

**Description:** Individuals who take care of others within Group 1.

**Training Needs:** Training needs to account for their particular interactions with the system, such as supporting trip planning and serving as travel companion to others who need to travel. They also need training that provides awareness of the level of assistance operators can and cannot provide during system deployment. Note that training for caregivers may need to be coupled with those they care for.

## 2.2 Participant Group 2 – Operations and Maintenance Staff

**General Description:** Staff of institutions that are members or partners of the project team. This staff has direct contact with the system, its hardware and software.

**General Roles and Responsibilities:** The general role of this user group is to oversee the administration, operations and maintenance (O&M) of the system and services provided through this project.

**General Training Needs:** This participant group will require training on what the systems is, the different services provided and how to use them, as well as their limitations. Specifically, this group will need training on installation, operations, maintenance, data management, troubleshooting and other key aspects of the system. Since many system passengers will likely have disabilities, personnel associated with this deployment must, per the USDOT ADA regulations at 49 CFR 37.173, be “trained to proficiency, as appropriate to their duties, so that they operate vehicles and equipment safely and properly assist and treat individuals with disabilities who use the service in a respectful and courteous way, with appropriate attention to the difference among individuals with disabilities.”

### 2.2.1 Subgroup 2A – HDS Dispatch

**Description:** Staff that manages the dispatch of the HDS. Note that this will be the same staff that dispatches the Paratransit Access Line (PAL).

**Training Needs:** Training to account for interaction with new CTP platform and “spontaneous” trip requests (i.e., trips within the Community Shuttle service area).

### 2.2.2 Subgroup 2B – HDS Drivers

**Description:** Staff that drives the HDS. Note that this will be the same PAL drivers (also known as MetroLink drivers).

**Training Needs:** While no solution is yet defined, it is expected that this group will need training to account for their interaction with the new CTP platform and “spontaneous” trip requests (e.g.,

training on how to operate the new software, app and/or tablet installed in their vehicle). This training will be in addition to existing training for PAL drivers.

### 2.2.3 Subgroup 2C – SDS Dispatch (SOC)

**Description:** This subgroup refers to the personnel who will staff the SOC.

**Training Needs:** This subgroup will need training on how to interact with the SDS fleet management and dispatch software. It is anticipated that the majority of the functions of the SOC will be automated within the fleet management and dispatch software. However, the SOC personnel will need training on how to use the software and how to handle special cases. In addition, the SOC personnel will need appropriate training in how to handle emergencies that arise onboard the SDS and which emergency management agencies to contact, since they will be the ones who would receive such calls. It is important to note here that depending upon the eventual procurement model of the SDS, the SDS vendor may be the one providing the personnel staffing the SOC. In that case, the training of the SOC personnel will be the responsibility of the vendor.

### 2.2.4 Subgroup 2D – SDS Stewards

**Description:** Staff that will serve as the human stewards onboard the SDS. This staff will oversee the safety operation of the SDS and intervene whenever emergencies, or situations that go beyond the safe Operations Design Domain, arise by taking over the manual control of the SDS.

**Training Needs:** This subgroup will need special training in how to operate the SDS, how to take over manual control of the shuttle, and how to provide verbal reports of the situation that necessitated the manual takeover of the shuttle. They will also need training on how to aid passengers of the SDS if needed, including with ramp deployment and wheelchair securement, and on how to respond to emergencies that may arise onboard the shuttle. Once again, the SDS vendor may be the one providing the training for the SDS stewards.

### 2.2.5 Subgroup 2E – SDS Maintenance

**Description:** This subgroup includes the personnel responsible for the regular maintenance needs of the SDS, both software and hardware.

**Training Needs:** The procurement model (e.g., lease or own) for the SDS has not been identified yet. Training of maintenance personnel will be dependent upon this decision. For instance, if the SDS is a lease, then maintenance will be included; but if it is owned, maintenance may not be included. Regardless of the procurement model, it is expected that the vendor will provide training, guidance and support in how to maintain the procured SDS. The maintenance staff will need to take such training.

### 2.2.6 Subgroup 2F – Maintenance Smart Infrastructure

**Description:** This subgroup includes the personnel responsible for the regular maintenance needs of the smart infrastructure and its components (smart signs, transportation information hubs (TIH) and PED-X), both software and hardware.



**Training Needs:** This subgroup will need training on the installation and maintenance of the smart infrastructure components. It is important to note that procurement of some components may also include installation and maintenance. This will be better defined in Phase 2.

### 2.2.7 Subgroup 2G – Customer Service and Call Center

**Description:** This subgroup includes the personnel responsible for providing customer service and call center for phone-based access to the system services.

**Training Needs:** This subgroup needs training on how to address callers, provide services over the phones (e.g., access CTP and make reservations), guide callers through high level troubleshooting, among other training needs. Note that this service could be separated into two different groups (customer service vs call center) and may also be contracted out. In such case, the training will be the responsibility of the vendor/service provider, pending review and approval from the Buffalo team. If either or both services are maintained within NFTA, then the training will be in addition to their established training for customer service. Regardless of the approach, all training for this group should include guidance on how to interact with the targeted population.

### 2.2.8 Subgroup 2H – Data Analyst

**Description:** This subgroup includes team members in charge of analyzing operational and performance data collected and produced by the system and its users.

**Training Needs:** This subgroup will need training on how to securely manage and analyze project data, as well as data limitations. If this subgroup has access to and/or uses data with personal information, then it will also need training for human research provided by the Collaborative Institutional Training Initiative (CITI) Program.

### 2.2.9 Subgroup 2I – System Administrators

**Description:** This subgroup includes personnel that will deal with security monitoring, data privacy, data curation, operations monitoring, patches and updates. This group includes ITS and Information Technology departments from the partner agencies.

**Training Needs:** This subgroup will need training on the data governance defined for the system, the different kinds of data/system management tools they will need/use to fulfill their role, software configuration, and other skills needed to successfully administer the system. If this group has access to and/or uses data with personal information, then it will also need training for human research provided by the Collaborative Institutional Training Initiative (CITI) Program.

## 2.3 Participant Group 3 – Trainers

**Description:** This group accounts for those who will be training the participants for their role in the pilot. These may include specific Niagara Frontier Transportation Authority (NFTA), BNMC, University of Buffalo (UB), vendor staff, community representative and other partners of the pilot.

**Training Needs:** While instructors may be experts in their field, they will still need to be trained in general and/or specific aspects of the pilot. Each trainer will receive proper training on their

particular responsibilities, such as how to best define the system to others and how to assess training success and request feedback.

## 2.4 Participant Group 4 – Additional Actors

This group entails additional actors that interact with the system but operate from outside of the system. This group includes internal team members and external actors.

### 2.4.1 Subgroup 4A – Internal Team Members

**Description:** This subgroup includes the internal team member that may interact with the system but are not part of the system. Specifically, internal team members would entail the system development and human research team—i.e., those with direct access to human subjects and the data collected and produced by the system.

**Training Needs:** Per Institutional Review Board (IRB) guidance, this subgroup will need training for human research provided by the Collaborative Institutional Training Initiative (CITI) Program.

### 2.4.2 Subgroup 4B – External Actors

**Description:** This subgroup includes the external actors that may interact with the system but are not part of the system. Specifically, this includes personnel that may respond to emergency calls, such as law enforcement, emergency medical technician, and fire fighters.

**Training Needs:** General training on the system and services. Emergency personnel will need specific training on how the SDS works, its safety features and how to interact with it in case of emergencies.

# 3 Participant Eligibility, Recruitment, Selection, and Retention

## 3.1 Eligibility and Recruitment

This subsection describes how participants will be initially screened and recruited by the project to participate during the Phases 2 and 3.

### 3.1.1 Eligibility and Recruitment Group 1 – Users of the System and Services

The project serves all travelers to/from/within the BNMC, with a specific focus on underserved communities, including people with disabilities, older adults, low-income individuals, and people with LEP—defined in Section 2.1. Note that the Community Shuttle service serves employees, visitors, and patients at the BNMC and residents of surrounding neighborhoods Fruit Belt, Masten Park, and Allentown. Based on this diversity, eligibility criteria to participate on the project is flexible.

Despite a broad eligibility criterion, participants will need to be recruited to participate in the study using a screening interview/survey to make sure the target population receives proper representation. Screening also provides some up-front information on significant behaviors such as whether travel to the BNMC has been undertaken, with what frequency and for what purpose as well as expectations of future travel to the BNMC.

Recruitment will occur early in Phase 2 and continue until prior to the point of the full deployment in Phase 3. Three types of non-probability sampling approaches will be used to recruit participants.

- **Convenience sampling:** We will station interviewers at various entrances to the BNMC campus and have them administer the short screening questionnaire in English/Spanish to determine whether they fit a target population and if so, to describe the research opportunity and the incentive structure and then to invite them to participate in the evaluation study. By design, this sampling approach will capture BNMC workers, patients and visitors.
- **Voluntary response sampling:** We will place English/Spanish door hangers on homes in the Fruit Belt, Masten Park, and Allentown neighborhoods that describe the research opportunity and the incentive structure and invite people to volunteer themselves for the evaluation study. The hangers will also be printed in Braille. A toll-free phone number and a web link will be offered for people to contact the research team. This strategy may include some level of “snowball” sampling, in which recruited participants invite eligible friends or colleagues to participate for a “finder’s fee.” By design, this sampling approach will capture people who live in nearby neighborhood to the BNMC.

- **Targeted outreach:** Recruitment will be done via community-based organizations and leveraging the partners' list-serves for outreach. These include organizations based in the neighborhoods surrounding the BNMC, particularly the Fruit Belt neighborhood, as well as regional organizations such as ASPIRE of Western NY (WNY), WNY Independent Living Center, Inc., or the New York State offices of vocational rehabilitation. The project team also expects to sample NFTA paratransit (PAL) customers through the service's database. In addition, designated research staff may access the IDEA Center's database of participant contact information from past studies to recruit participants for the study.

For all three sampling approaches, there will be no way to know if the resultant samples are statistically representative of the target populations; however, there will be credible information about the outcomes of the deployment for target population groups because of the use of an experimental design. The target range of participant for this deployment project is between 300-500 people.

More details on the sample size, eligibility and recruitment of the potential users of the system can be found in the Performance Measurement and Evaluation Support Plan (FHWA-JPO-21-878).

### **3.1.2 Eligibility and Recruitment Group 2 – Operations and Maintenance Staff**

It is expected that all Phase 2 staff will be selected from existing NFTA, BNMC and UB pool of employees. While no additional hire for partner agencies is envisioned at this stage in the project, the procurement process may add additional staff from the vendors. As testing and deployment scales up, additional staff may be needed for Phase 3. At this early stage, the range of staff is expected to be between 10-50 people—this will be determined during Phase 2.

It is important to note that, except for drivers/stewards, many of the staff will not focus 100% of their time on this project. Instead, they will simply add this project to their current responsibilities—e.g., NFTA PAL dispatch will continue to take on non-pilot related travel requests.

Recruitment will take place internally. The first step will engage managers of the departments that will be impacted by the project (e.g., dispatch and maintenance) to assess bandwidth of staff and, if needed, hand select personnel best suited to perform the activities for each subgroup listed in Section 2.2.

### **3.1.3 Eligibility and Recruitment Group 3 – Trainers**

Eligibility and recruitment of trainers will be better defined in Phase 2 once vendors are selected, but are expected to be between 5-20 people—this number will be revised in Phase 2. Furthermore, a “train the trainer” approach is expected to be included as part of the overall deployment. Some trainers are expected to come from vendors, and additional “trainers in training” will most likely be staff from Group 2 and will follow that group's eligibility and recruitment criteria.

### **3.1.4 Eligibility and Recruitment Group 4 – Additional Actors**

Eligibility and recruitment of additional actors will be better defined in Phase 2. For Subgroup 4A (internal team members), eligibility and recruitment will automatically take place upon Phase 2 award, given their membership to the development and research team—these are expected to range between 20-40 people. For Subgroup 4B (external actors), it is expected that each external agency, such as emergency respondents, will manage selection internally without any major role from the project team. The range of people for 4B will be dependent on the external agency's policies on service coverage and frequency for the deployment area. This will be better defined in Phase 2.

## **3.2 Retention**

### **3.2.1 Retention Group 1 – Users of the System and Services**

Ideally in Phase 3, any remaining participants will be recruited within the first six months, and then each participant would remain in the study until the end of Phase 3 and provide at least a full 12 months of data. In practice, there will certainly be some amount of attrition, with some participants no longer participating by the time that Phase 3 ends. If attrition were a purely random unbiased process, it would not present an issue for analysis. However, there is a possibility that some bias will be involved, with those users who use the CTP least often and/or who find it to be the least useful being the most likely to stop participating in the study.

One way of mitigating this factor will be to prevent attrition as much as possible by keeping participants engaged through frequent contact and by providing incentives for participation that are based on the length of time that people remain in the study. For this study, Group 1 (Users) members will receive \$25 for each survey they complete as users of the system.

### **3.2.2 Retention Group 2 – Operations and Maintenance Staff**

At this time, the project team does not foresee any special retention efforts related to this group. As discussed in Section 3.1.2, staff for this group are expected to be selected from existing pool of NFTA, BNMC, UB staff and vendors (if needed). As such, this group will be subject to their respective agency's existing employee retention practices. The project team will work with the leading agencies in this group to train the people they consider is needed, and to schedule any additional training in the event of personnel turnover.

### **3.2.3 Retention Group 3 – Trainers**

Trainers are expected to be subject to their respective agency's existing employee retention practices. At this time, the project does not foresee any special retention efforts related to this group. The project team will work with the leading agencies in this group to train the people they consider is needed, and to schedule any additional training in the event of personnel turnover.

### **3.2.4 Retention Group 4 – Additional Actors**

Additional actors are expected to be subject to their respective agency's existing employee retention practices. At this time, the project does not foresee any special retention efforts related

to this group. The project team will work with the leading agencies in this group to train the people they consider is needed, and to schedule any additional training in the event of personnel turnover.

# 4 Training Methodology

The pilot team's systems experts will work with curriculum developers, which may include system/hardware vendors, to provide information and training to instructors. The systems experts and curriculum developers will work with the instructors to make sure that the modules are designed in a way that ensures the highest knowledge retention rates possible. The modules should be designed to work with a variety of learning styles to engage the trainees, accommodate their specific needs, and keep a positive learning environment. If needed, training may also serve as an opportunity to obtain any necessary (or pending) consent from project participants.

The following subsections detail the training objective and approach for each group. Note that there might be common training objectives and topics across and within groups and subgroups.

## 4.1 Training Group 1 – Users of the System and Services

All users of the system and services have the same training objectives, as detailed below.

- Understand the purpose and limitations of the system and services—i.e., know what to expect from the system. It is of utmost importance that all users have a clear understanding of how the Community Shuttle, the CTP interfaces (app, website and call center) and the Smart Infrastructure (smart signs, TIH and PED-X) will work and the proper way to interact with them.
- Be able to identify all physical equipment (e.g., TIH) and their location.
- Understand the visual, auditory, and haptic elements and announcements of the system interfaces as applicable to each participant.
- Have sufficient knowledge of the information they could receive and proper (re)actions to notifications—e.g., preparing to board upon notification of shuttle arrival.
- Clarify the data being shared and address key privacy and security concerns.
- Know how to act in case of emergencies and how to engage with emergency respondents, such as law enforcement and emergency medical technician.

## 4.2 Training Group 2 – Operations and Maintenance Staff

The training objectives for the subgroups within the Operations and Maintenance Staff group are as follows:

- **HDS Dispatch**
  - Understand the type of equipment software and, if needed, hardware being used in the HDS service.
- **HDS Driver**
  - Understand the type of equipment software and, if needed, hardware being used in the HDS service.
- **SDS Dispatch (SOC)**
  - Understand the type of equipment and software being used in the SDS.
- **SDS Stewards**
  - How to interact with the system, including actions to acknowledge and act upon a specific message from SOC.
  - Have a high-level understanding of the SDS and its components.
  - Can perform minor trouble shooting—e.g., rebooting system and taking control to help it park.
  - Understand how to act in case of emergencies and how to engage with emergency respondents, such as law enforcement and emergency medical technician.
  - Have a clear understanding of the system in order to provide high-level support to riders who may have issues with the SDS (e.g., securement) or other parts of the deployment.
- **SDS Maintenance**
  - Understand installation and maintenance procedures, including software updates and data acquisition.
- **Smart Infrastructure Maintenance**
  - Understand installation and maintenance procedures for all vendors (if multiple are used), including software updates and data acquisition.
- **Customer Service and Call Center**
  - Understand any updates on their client interaction plans/procedures. For instance, how to interact with users within the different user types (i.e., subgroups 1A through 1G).
  - In depth understanding of the system, with the ability to guide users through minor trouble shooting.



- **Data Analyst**
  - Understand how to collect, store, analyze and, if needed, scrub the data produced and collected by the system.
- **System Administrators**
  - Understand all aspects of data governance, software configuration, data/system management and the tools they will need/use to successfully administer the system.

### 4.3 Training Group 3 – Trainers

The training objectives for the Trainers group are as follows:

- Gain the required skills and knowledge about the system to deliver an effective training to participants based on their individual needs.
- Understand how to collect training-related performance data and evaluate the trainees.

### 4.4 Training Group 4 – Additional Actors

The training objectives for the Additional Actors are as follows:

- **External Actors**
  - High level understanding of the system and its components.
  - Understand how to interact with the system, specifically the SDS, in case of emergencies—for instance, best way to open doors from the outside.
- **Internal Team Members**
  - Know proper data management/governance to ensure quality assurance and secure processing and analysis.
  - Comply with IRB requirements.

### 4.5 Training Formats and Materials to be Used

The project team envisions a range of approaches for the training and education of participants, tailored to each group and subgroup as needed. When possible, the project team will leverage existing training developed by vendors and partners of the pilot by integrating new material within them—for instance, integrating HDS trips within general PAL Dispatch training and NFTA's Title VI practices/strategies.

The following subsections describe each of the training modules and approaches, and links them to each participant group.

### 4.5.1 Training Modules

Below is a preliminary list of training modules available to participants to educate them on aspects of the pilot. These modules will be available in different accessible formats, addressing the needs of expected participants and users of the system.

- General Module
- Complete Trip Platform Module
- Community Shuttle Module
- Smart Infrastructure Module
- Call Center Module
- Installation and Maintenance Module
- Train the Trainer Module
- Additional Actors Module
- Data Governance and System Administration Module

The content of each module will be in line with the training objectives described in previous subsections. Note that, depending on their roles, participant may need to take multiple modules to achieve their training objectives. The project team understand that this is an evolving list of modules and content. As such, more may need to be added and the information provided on each module may need to be refined as Phase 2 progresses. Detailed scope and content on each module will also be better defined in Phase 2. Table 1 through Table 4 link the training modules to each user group and subgroup.

**Table 1. Training Modules for User Group 1 – Users of the System and Services.**

(Sub)Group	General	CTP	Shuttle	Smart Infra.	Call Center	Install & Maint.	Train the Trainer	Add. Actors	Data and Admin.
Persons with Disabilities	X	X	X	X					
Low Income	X	X	X	X					
Older Adult	X	X	X	X					
Limited English Proficiency	X	X	X	X					
Neighborhood Residents	X	X	X	X					

(Sub)Group	General	CTP	Shuttle	Smart Infra.	Call Center	Install & Maint.	Train the Trainer	Add. Actors	Data and Admin.
BNMC Employees, Visitors and Patients	X	X	X	X					
Caregivers	X	X	X	X					

**Table 2. Training Modules for User Group 2 – Operators.**

(Sub)Group	General	CTP	Shuttle	Smart Infra.	Call Center	Install & Maint.	Train the Trainer	Add. Actors	Data and Admin.
PAL Dispatch	X		X						
PAL Driver	X		X						
SDS Dispatch (SOC)	X		X						
SDS Steward	X	X	X						
SDS Maintenance	X					X			
Maint. Smart Infrastructure	X					X			
Customer Service and Call Center	X	X			X				
Data Analyst	X								X
System Administrators	X								X

**Table 3. Training Modules for User Group 3 – Trainers.**

(Sub)Group	General	CTP	Shuttle	Smart Infra.	Call Center	Install & Maint.	Train the Trainer	Add. Actors	Data and Admin.
Trainers	X						X		

**Table 4. Training Modules for User Group 4 – Additional Actors.**

(Sub)Group	General	CTP	Shuttle	Smart Infra.	Call Center	Install & Maint.	Train the Trainer	Add. Actors	Data and Admin.
External Actors	X							X	
Internal Team Members	X							X	X

#### **4.5.1.1 General Module**

This module serves as an introduction to the pilot. It provides an overview of the pilot, describing its components, scope and objectives. This module will also help to obtain any consent necessary from participants to be part of the pilot.

#### **4.5.1.2 CTP Module**

Describe the app and website. This module will be different for User and Operators groups, as specified below:

- For Group 1 – Users of the System and Services, the module will focus on how to register, set preferences and use the functions.
- For Group 2 – Operators, the module will focus on how to use the CTP to provide offline services, such as helping callers register and request services, provide assistance and trouble-shoot accessibility features.

#### **4.5.1.3 Community Shuttle Module**

Describe the community shuttle and its different types of services (HDS and SDS). This module will be different for User and Operators groups, as specified below:

- For Group 1 – Users of the System and Services, the module will focus on how to book services and what to do when boarding and alighting the vehicles. This module may be divided into three parts, one per service type.
- For Group 2 – Operators, the module will focus on the operation and dispatch of the shuttle services.

Note that user groups that entail maintenance, trainers and external actors will have their own training module, which may leverage the content developed for this one.

#### **4.5.1.4 Smart Infrastructure Module**

Explain what it is and how it works, how to enable indoor/outdoor wayfinding. Decompose into three parts: TIH, Smart Signs and PED-X.

#### **4.5.1.5 Customer Service and Call Center Module**

This module will leverage the information provided in other modules, such as the CTP Module for Operators. This module will also provide other training information on how to interact with other participants and how to use other aspects of the system.

#### **4.5.1.6 Installation and Maintenance Module**

Provide installation and maintenance related information, including hardware and software. This module will be divided into different parts to cover all aspects of the pilot.

#### **4.5.1.7 Train the Trainer Module**

This module is specific for trainers and will be a combination of selected modules described above. This module will also include training tactics and approaches, as well as proper means to obtain feedback from participants.

#### **4.5.1.8 Additional Actors Module**

This module focuses on matters that concern internal and external actors only, and is expected to be different for each subgroup. For instance, internal team members would focus more on data management and CITI Program Training, whereas external actors would focus on aspects related to regulations, such as proper operations of SDS on the road and emergency response.

#### **4.5.1.9 Data Governance and System Administration Module**

This module focuses on all matters of data governance and system administration, such as the internal policies to collect, store, process, and dispose of all data collected and produced by the pilot. This module also covers software configurations and other knowledge needed to correctly manage the system. Finally, this module also links the user with the training provided by the CITI Program, per IRB requirement.

### **4.5.2 Training Approaches**

The following subsection describe the three key training approaches for this project: real time e-training, field demonstration / in person workshops, and online / offline training. Regardless of the approach, all training (content and approach) will have the following characteristics:

- Be compliant with ADA and Title VI regulations. This includes leveraging NFTA's and applicable team members' existing practices and strategies to develop and provide training in a manner and format that address the needs of all user groups.
- To the extent possible, trainings will be incorporated into existing training. For instance, pilot-related training could be included into the training already provided by NFTA to PAL users or as part of professional development training for NFTA or BNMC staff.
- To the extent possible, follow a structure of train the trainer. For this, the pilot will rely on the expertise of member stakeholders to ensure that the training content, format, and approach are the right one to address the needs of each training groups (and subgroups). NFTA will also work with such experts to, when possible, have them lead the training. Table 5 provides a summary of the training approach for each group. It is important to note that further assessment will be needed in Phase 2 to determine the proper content and refine the approach for training people that fall within multiple subgroups of users (e.g., users who are blind and with limited hearing).

**Table 5. Summary of Training Approach**

Trainees Groups	Approach to Training
Users	<p>Trainers will be selected based on their expertise with the target subgroups. The following agencies are envisioned to support/lead the content development and training of this group:</p> <ul style="list-style-type: none"> <li>• Visually Impaired Advancement's (VIA) for users who are blind or with limited visibility.</li> <li>• Buffalo Hearing &amp; Speech Center's (BHSC) for users who are deaf or with limited hearing and low-to-mild cognitive difficulty.</li> <li>• NFTA for older adults, wheelchair users, and others who need travel support.</li> </ul>
HDS Drivers and Dispatch	<p>NFTA plans to leverage its training approach for PAL drivers and dispatch. Note that the HDS could be contracted out. In this case, NFTA would leverage the service provider's training approach, which would be required to be ADA and Title VI compliant.</p>
SDS Stewards and Dispatch	<p>This service will be contracted out. NFTA plans to leverage the service provider's training approach, which would be required to be ADA and Title VI compliant.</p>
Call Center / Backoffice	<p>NFTA plans to leverage its training approach for call center / backoffice training approaches. Note that the call center could be contracted out. In this case, NFTA would leverage the service provider's training approach, which would be required to be ADA and Title VI compliant.</p>
Maintenance	<p>NFTA plans to leverage existing NFTA and vendors training staff, guidance, and protocols. Depending on the services procured, some aspect of maintenance could fall within the vendor's responsibilities (e.g., SDS and Smart Infrastructure).</p>
Data Analyst, System Administrators, and Internal Team	<p>NFTA plans to leverage UB's IRB guidance and data/human research training requirements, such as training provided by the Collaborative Institutional Training Initiative (CITI) Program.</p>

#### **4.5.2.1 Real Time E-Training**

These will be training to be taken in real time through an accessible, online platform. This approach will be available to all groups. Note that these sessions will be scheduled and most likely limited to a certain number of occurrences. They may be recorded and made available to all groups through the pilot's website as part of the online/offline trainings.

This approach will have several versions, tailored to each subgroup to address their training needs and objectives, detailed in previous sections. However, all participants will be trained on the pilot project, its goals and basic system components, and their role within the pilot.

Once content is set, the project team will assess the need to make this mandatory for all or some participants of Groups 2-4.

#### **4.5.2.2 Field Demonstration / In-Person Workshops**

These will be hands on approaches to training, allowing participants to interact with the system while accompanied by a designated trainer. Participants will include people without access to internet and people with disabilities, including wheelchair users and people who are blind that require accessible technology, along with LEP individuals. Field demonstrations and test drives at the UB-BNMC facility(ies) could be used to provide training to drivers on the various system components, namely the SDS and the smart infrastructure (including intersections). These field demonstrations can showcase in a controlled environment the functional concepts, capabilities, and appropriate required responses of the system and its applications. Field demonstrations under real file conditions may also be included but will be defined in Phase 2.

In-Person Workshops could be used to complement field demonstrations when needed, mainly for more complex trainings. During these, participants will receive hands-on training on how to interact with the system and its components, including how to install and troubleshoot malfunctioning systems as well as updating the hardware and software if needed.

These two approaches may be reserved for specific user subgroups, such as operators, drivers and maintenance personnel—to be defined once content is developed in Phase 2.

#### **4.5.2.3 Online/Offline Training**

This approach will provide general understanding of the system and how to use it. This will include information available on the CTP App and downloadable/printable training content, which may include simple PowerPoints, frequently asked questions, and user guides. The project team will have available and printed user guides to provide to users for free upon request. In some cases, this module will also server to provide refreshers and support more complex trainings—such as installation guides.





# 5 Training Assessment

This section describes how the project team will assess the efficacy of the training and how participants will be able to provide feedback on how the training could be improved.

## 5.1 Knowledge Assessments After Training

The project team will assess each trainee after each training session to ensure an optimum knowledge attainment and that the training objectives for each subgroup were met. Different evaluation approaches will be utilized depending on the training methodology.

Participants that are trained through Field Demonstration / In-Person Workshops would be assessed in place through hands on tests (e.g., SDS Steward to take control and maneuver the SDS), oral assessment and post-training questionnaire.

For all other training modules, randomized quizzes will be performed at the end of the module. The quizzes will be available to take through the CTP website and mobile app. Oral assessment will also be utilized for participants that do not have access to smart and/or connected devices and for those with visual disabilities.

All assessments, including approach and pass criteria, will be determined in Phase 2 once vendors are selected and the system itself is more advanced in its development.

## 5.2 Participant Feedback

Feedback from the participants will be solicited after each training session and early on in Phase 2 after each version of the system is operational. Feedback will be collected via in-person, online and oral (e.g., through phone calls) survey questionnaires, as well as other accessible / 508 compliant means, and will focus on the accuracy of the training they received (in comparison to their real world usage of the system) and their roles in the pilot. Future training will be updated as needed to incorporate participants' feedback. This may include updating the depth and breadth of the information provided, confusions about the system capabilities or operations that might have been introduced in the original training, the way the learning materials were provided, and introducing new approaches to provide the training.



## 6 Planning and Coordination of Training Activities

This section identifies the coordination with other entities needed for the successful training of all participants in this project. While a detailed schedule for implementing this plan will be developed during Phase 2, Table 6 provides a high level schedule for the training activities. Note that training, and the development of training materials, will be performed in coordination with the release plan for the system’s Agile development processes—see the System Engineering Management Plan (FHWA-JPO-21-918). In general terms, the release plan divides the development into three releases: Release 1 (months 6-12 of Phase 2), Release 2 (months 12-18) and Release 3 (months 18-24)—ranges may be slightly different for some components.

It is expected that most materials will be completed by the end of Phase 2 (during release 3); however, some materials may need to be updated in Phase 3 to account for system updates pushed during the demonstration phase.

**Table 6. Training Schedule**

Activity	Anticipated Due Date	Notes
Drafting Training Materials	Coordination will start sometime within Release 2.  Drafting of materials will take place in Release 3.	Drafting start date will depend on the agile development schedule for each component of the system. This schedule will be refined in Phase 2.
Finalizing Training Materials	Finalization of training materials will need to be done by the “go-live” date of each component, which for most would be the start of Phase 3.	It is possible that some materials be updated in Phase 3.
Group 1 (Users) Training	Most of the training will happened as users are recruited in Phases 2-3.	Some training may take place late in Phase 2 (within Release 3), in order to obtain user feedback while performing test and stabilizing the system.
Group 2 (O&M) Training	Training should take place late in Phase 2, as systems and applications become ready to go live and around 3-4 weeks prior when they are expected to start their responsibilities.	HDS Drivers and SDS Stewards will follow different training schemes given their roles. Coordination will be needed with NFTA and the SDS vendors to establish this.

Activity	Anticipated Due Date	Notes
Group 3 (Trainers) Training	Training should take place late in Phase 2 (within Release 3), as systems become ready to go live.	Trainers should have the materials 2-3 weeks prior to their training session in order to educate themselves.
Group 4 (Additional Actors) Training	Training will take place late in Phase 2	Depending on when the training takes place, a refresh may be needed in Phase 3 (e.g., refresher of CITI training for internal actors).

## 6.1 Coordination for Recruitment and Training

The project team will need to coordinate with partner agencies, community leaders, and relevant non partner regional and local agencies for outreach and recruitment efforts. This coordination is needed to ensure participation on the project from all groups and subgroups. For instance, coordination with community leaders is needed to expand the reach of the recruitment efforts. Similarly, coordination is needed with partner agencies that will help complete the staff roster needed for the operations and maintenance of the project (i.e., personnel for the Operations and Maintenance user group). Coordination efforts would entail virtual and in-person meetings, as well as email and phone conversations.

Once recruited, coordination may be needed to reduce the impact of training on participants daily schedules. Particularly for members of the Operations and Maintenance group, the project team will coordinate as possible to avoid impacting work responsibilities and to include training into regular working hours and/or incorporate training into existing training efforts.

## 6.2 Coordination for Training Facilities

The project team will need to coordinate with partner agencies that will provide the facilities and equipment for training. This effort will also entail obtaining the proper guidance through the process to obtain any permits necessary to hold recruitment and training in public and private places. For instance, the project team will coordinate with BNMC and UB to perform on-site demonstrations and host workshops. The specific list of equipment needed will be determined in Phase 2.

## 6.3 Coordination for Training Materials Development

The project team will need to coordinate with partner agencies and vendors in charge of developing the many training materials, including making sure the content is accessible for all participants. This coordination effort also includes obtaining any necessary approval to make the materials available, such as NFTA's public affairs approval.

# Appendix A. Acronyms

Table 7 list the acronyms used in this document.

**Table 7. Acronyms**

Acronym	Meaning
BNMC	Buffalo Niagara Medical Campus
CITI	Collaborative Institutional Training Initiative
CTP	Complete Trips Platform
FHWA	Federal Highway Administration
GBNRTC	Greater Buffalo-Niagara Regional Transportation Council
HDS	Human-Driven Shuttles
IRB	Institutional Review Board
ITS4US	Intelligent Transportation Systems for Underserved Communities
ITS	Intelligent Transportation Systems
JPO	Joint Program Office
LEP	Limited English Proficiency
NFTA	Niagara Frontier Transportation Authority
NY	New York
PAL	Paratransit Access Line
SDS	Self-Driving Shuttles
SOC	Shuttle Operations Center
TIH	Transportation Information Hubs
UB	University of Buffalo
UI	User Interface
USDOT	U.S Department of Transportation
WNY	Western New York



# Appendix B. References

GBNRTC; University at Buffalo Regional Institute, The SUNY at Buffalo School of Architecture and Planning; Cambridge Systematics; TyLin International. (2018). *Moving Forward 2050 – A Regional Transportation Plan for Buffalo Niagara*. Buffalo, NY: Greater Buffalo-Niagara Regional Transportation Council.

Gopalakrishna, D., et al. (2021). *Phase 1 Concept of Operations (ConOps) – Buffalo, NY ITS4US Deployment Project (FHWA-JPO-21-860)*. Federal Highway Administration.  
<https://rosap.ntl.bts.gov/view/dot/57571>.

Gopalakrishna, D., et al. (2021). *Phase 1 System Engineering Management Plan (SEMP) – Buffalo, NY ITS4US Deployment Project (FHWA-JPO-21-918)*. Federal Highway Administration.

Gopalakrishna, D., et al. (2021). *Phase 1 Performance Measurement and Evaluation Support Plan (PMESP) – Buffalo, NY ITS4US Deployment Project (FHWA-JPO-21-878)*. Federal Highway Administration.

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