Operational Readiness Plan (ORP)

Buffalo, NY ITS4US Deployment Project

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Final Report — July 31, 2025
FHWA-JPO-23-103

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16. Abstract

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 challenges. Examples of the technologies to be deployed are electric and self-driving shuttles, a trip planning app that is customized for user-tailored travel, intersections that use tactile and mobile technologies to enable travelers with disabilities 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 (Allentown, Fruit Belt and Masten Park) with underserved populations (low income, vision impaired, deaf or hard of hearing, wheeled mobility device users and older adults).

This document, the Operational Readiness Plan (ORP), describes both tests and demonstrations of the systems. The ORP contains, as sub-sections, the Operational Readiness Test Plan (ORTP) and the Operational Readiness Demonstration Plan (ORDP).

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NFTA	June 24, 2024	2	Update based on Walkthrough Notes	Kelly Dixon
NFTA	July 31, 2025	3	Updated based on new dates	Robert Jones

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1 Introduction

1.1 Project Background

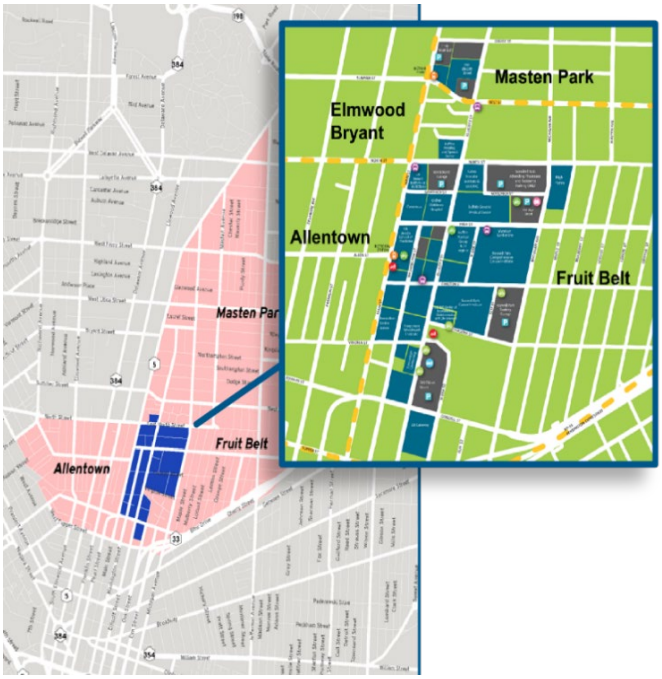
Buffalo is moving toward a sustainable future at all levels of society, incorporating actions in the community, government, and private entities in the area. Providing access to the City's underserved populations to jobs and healthcare is the primary motivation for all the regional partners involved in this deployment. A lack of public transportation that adequately addresses "first/last mile" challenges is a major problem for community mobility, especially for people with disabilities. This often leads to compromised healthcare (e.g., rescheduled or missed appointments, delayed care) and/or dependence on paratransit service, which is much costlier for transit agencies and can be burdensome for riders. The Complete Trip Deployment concept proposed here directly addresses these concerns by:

1. **Focusing on providing transit access to healthcare and jobs** to underserved residents or persons and allowing them to share in the economic development in downtown Buffalo.
2. **Putting technology to work in support of accessible transportation**, bringing leading edge researchers in accessible transportation, transit, and connected automation to solve a transportation need.
3. **By developing a scalable model** for considering accessibility and universal design in transportation technology projects.

The deployment location is targeted around the downtown Buffalo area with a focus on travel to and from the Buffalo Niagara Medical Campus (BNMC). The deployment 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—see Figure 1.

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. The demographics of the surrounding neighborhoods (see Table 1) are emblematic of a broader socioeconomic and racial divide in Buffalo along Main Street, which this deployment seeks to bridge. In Allentown (west of Main Street), the percentage of traditionally underserved populations is significantly less than other neighborhoods east of Main Street, namely Fruit Belt and Masten Park. Table 1 indicates percentages for Allentown that are far below average for the Metropolitan Statistical Area (MSA) in many categories, and percentages for Fruit Belt and Masten Park that are above average for the MSA.

While the Allentown neighborhood is not characterized by underserved populations, it contains a high concentration of transit service and commercial activity, including health care offices. Allentown hosts several significant bus lines (including the #20-Elmwood, the #25-Delaware, the #11-Colvin, and the #8-Main) that connect the BNMC and Downtown Buffalo with neighborhoods to the north, carrying over 10,500 riders on an average weekday.



Source: Buffalo, NY ITS4US

Figure 1. Buffalo Niagara Medical Campus relative to the neighborhoods of focus: Allentown, the Fruit Belt, and Masten Park.

Table 1. Demographics of Targeted Neighborhoods.

Geography (ACS 2018tracts)	Percent 0-vehicle households	Percent population 65+	Percent poverty	Percent Black	Percent Hispanic / Latino	Percent limited English ability	Percent income <$25k	Percent with a disability (18 to 65 yrs old)	Percent veteran	Percent commute by transit	Total households	Total population
Fruit Belt	**47.0%**	**21.9%**	28.0%	77.0%	8.9%	4.2%	**39.5%**	**20.0%**	**6.7%**	**16.1%**	**976**	**2,435**
Allentown	**18.4%**	6.2%	28.8%	7.2%	6.6%	0.0%	17.4%	8.0%	7.8%	4.8%	1978	3,143
Masten Park	**35.0%**	18.5%	34.7%	89.7%	3.1%	2.9%	38.9%	15.2%	6.6%	11.7%	1496	3,208
Buffalo MSA	**36.6%**	**12.0%**	**31.1%**	**36.6%**	**11.6%**	**4.8%**	**30.7%**	**9.7%**	**5.7%**	**11.5%**	**11,0701**	**255,423**

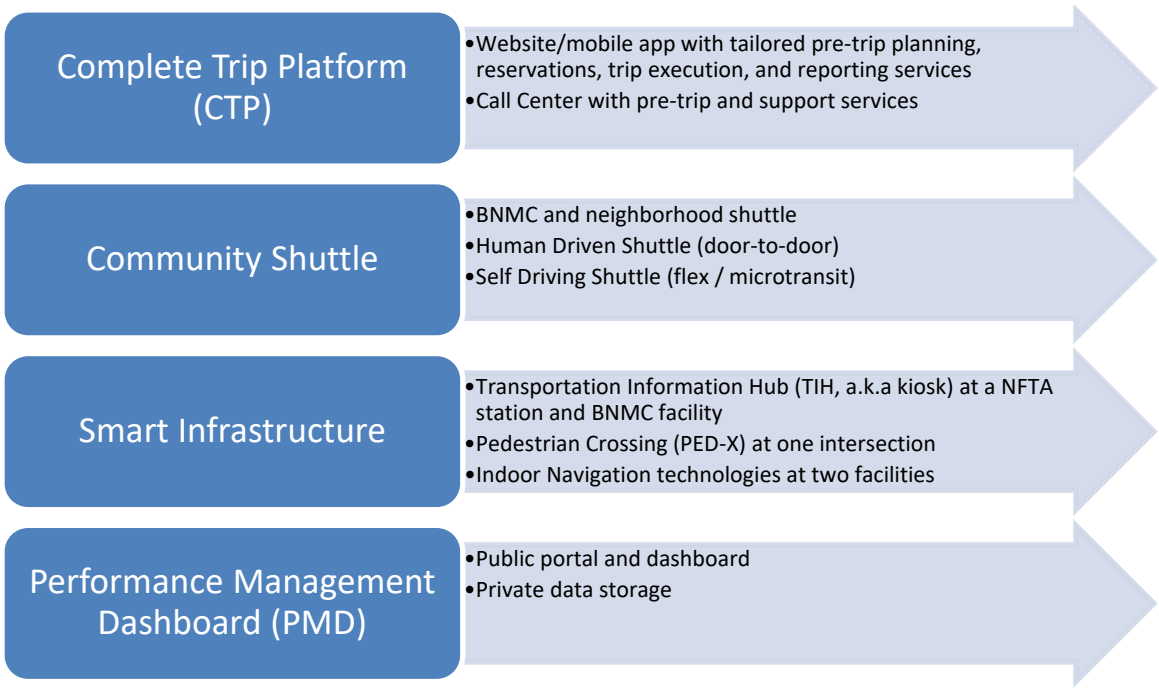
BNMC sits adjacent to the Fruit Belt neighborhood, which has a poverty rate of 28%, and 47% zero-car households. Several community and social services are found within the neighborhood, which is relatively close to the wider array of services and jobs offered in downtown Buffalo. Several bus lines serve the area, although headways are relatively infrequent, ranging between ½ hour and one hour. Access to dispersed jobs in the suburbs via public transportation tends to be difficult. Although accessible to the Fruit Belt residents, the Niagara Frontier Transportation Authority (NFTA) Metro Rail station is 0.25 – 0.75 miles away, a distance that becomes amplified during the winter and for travelers with physical difficulties. While BNMC continues to improve pedestrian accessibility, sidewalk quality and intersection crossings still are a challenge for wheelchair users and users with audible or visual impairments. The Fruit Belt struggles with aging

infrastructure and infrastructure management issues, issues that have been consistently noted in community forums over the years.

This project seeks to improve transportation access for this population and utilize an innovative approach to find the most effective approaches for supporting trip-making. BNMC's user population makes it an ideal location to test accessibility designs for safety and usability. The Complete Trip Deployment in Buffalo focuses on two primary trip purposes: employee-related travel and patient/visitor travel to the campus from the three neighborhoods.

1.2 Project Scope

The project seeks to deploy an integrated suite of technologies chosen to address identified needs of users and gaps within the systems and services provided. These technologies include a Complete Trip Platform (CTP), Community Shuttle with a human drive shuttle (HDS) and a self-driven shuttle (SDS), Smart Infrastructure, and Performance Measure Dashboard (PMD). Figure 2 provides an overview of each of these components.



Source: Buffalo, NY ITS4US

Figure 2. Components of the Buffalo, NY ITS4US System.

1.3 Intended Audience

The intended audience for this document is peer agencies that seek to plan and execute demonstrations of similar systems, as well as the United States Department of Transportation (USDOT) to review our approach to demonstrating the functionalities of the proposed system.

1.4 Purpose of the Operational Readiness Plan

The Operational Readiness Plan (ORP) provides an overview of both a comprehensive set of tests and supporting demonstration that will together establish operational readiness of the system as it stands today. Therefore, this version of the ORP covers the system in its current version.

The ORP is divided into two key parts, the Operational Readiness Test Plan (ORTP) and the Operational Readiness Demonstration Plan (ORDP).

The ORTP discusses testing of the system and how it is used to verify that the system performs according to documented requirements in the System Requirements Specifications (SyRS), FHWA-JPO-21-883 (Okunieff, et al., 2022). These tests are documented in the System Test Plan (STP), not yet published (Okunieff & Weibler, TBD). Additional tests needed to support the assessment of operational readiness are documented in the ORTP.

The ORDP discusses the demonstrations used to show that the system performs as expected in key use cases and scenarios. Demonstrations are different from tests in that they are intended to exhibit a set of selected end-to-end system capabilities central to the deployment concept of operations—see Phase 1 Concept of Operations (ConOps) – Buffalo NY ITS4US Deployment Project, FHWA-JPO-21-860 (Gopalakrishna, et al., 2021).

2 Operational Readiness Test Plan (ORTP)

2.1 ORTP Introduction

The Operational Readiness Test Plan (ORTP) details the plan to validate the readiness of the Buffalo, NY ITS4US Deployment Project for transitioning from development phase to operational phase. The ORTP builds upon the System Test Plan (STP) to describe the testing processes and outcomes.

2.1.1 Objectives

The ORTP provides a summary of the set of tests and supporting demonstrations that together establish operational readiness. The ORTP also describes both the testing and validation processes that are used, the methods used to record and capture test results, test metrics that are tracked, and processes used for reporting any defects identified.

The ORTP focuses on Pre-production / System Integration Testing. In certain contexts, within the ORTP, this is also referred to as “Alpha” Testing.

System integration testing performs “black box” testing to verify end-to-end testing results based on expected outcomes for various scenarios. During the Agile process, each system component has been tested in a simulated environment using a range of scenarios that test boundary conditions, anomalies and functionality. During System Integration testing, operations and performance were tested to ensure that the system produces the expected results across all systems.

The ORTP includes System test cases drafted into a formal set of system test procedures. Each test procedure follows a consistent naming convention that ties the test procedure to the specific system requirement being tested; many test procedures will be dependent on a set of “pre-conditions” that must exist prior to following the testing procedure (for example, a test procedure to “Generate a Trip Plan” may have as a pre-requisite that a user account already exists in the CTP system; “Creating an Account” would be covered by another test procedure).

Each test procedure is executed on the Platform(s) relevant to the testing being performed. Note that not all tests are applicable to all platforms. For instance, Web platforms are not applicable to test procedures that involve “Executing a Trip Plan” but are relevant to “Generating a (future) Trip Plan”. The platforms included in ORTP testing include:

- Web – Web browsers include: Edge, Safari, Chrome, and Firefox.
    - Edge, Chrome and Firefox are tested on Windows Operating System

    - Safari is tested on Apple macOS Operating System
    - Note: Mobile Web is not supported in the ORTP, but many/most Web features may work on Mobile Web

- Mobile – Mobile platforms include iOS (iPhone) and Android (phone)
    - Note: the Tablet mobile platform is not supported in the ORTP, but many/most Mobile features may work on Tablet mobile platform(s)

- TIH – the kiosks were installed in May 2024.

The ORTP does not cover the Agile Development and Testing processes. The reader is referred to the System Test Plan (STP) Buffalo, NY ITS4US Deployment Project for information on this.

2.1.2 Background

The STP details the testing procedures of all subsystems and system components of the Buffalo, NY ITS4US Deployment Project. The STP describes the system test phases and processes, the types of testing that each subsystem / application include, the methods used to verify adherence to needs and requirements, and the documentation and artifacts produced and stored through the testing processes.

The system test plan, shown in Figure 3, includes three major testing phases:

- Agile Development and Testing – unit and integration testing of software that is under development using an Agile methodology. The Agile development generates a pre-production staged version that is used for Alpha testing (in the pre-production testing phase). There are four releases that are progressed to the next phase.

- System Integration / Pre-production Testing – consists of two types of testing for the SDS, CTP releases and integration elements, and Smart Infrastructure:
    - Hardware inspection, demonstration and field testing of procured or turnkey systems including the TIH, Ped-X, indoor navigation (beacons) and SDS.
    - Controlled and formal pre-production testing of software and software integrated with service elements from hardware or software as a service application (e.g., indoor navigation, traffic management gateway, community shuttle operations). This includes formal testing of each CTP software release.

- User Acceptance Testing – the final release will consist of Full System Integration Testing for all the system components including SDS, CTP, community shuttle scheduling, dispatch and operations, pedestrian crossing operations, indoor navigation, TIH, and performance measurement dashboard (analysis, presentation, and data access). Testing conducted by trained stakeholders and volunteers in a less formal way.

The updated High Level Test Program Schedule is included as Table 2 for reference.

Table 2. High Level Test Program Schedule.

Test Phase	Description	Subsystem/ Applications	Release Dates
Agile Testing for the CPT	Agile testing includes three-weeks of development, test and integration cycles. Testing during each sprint includes unit and integration testing. Near the end of each release, version testing is conducted before the code is locked down and progressed to a staged, pre-production environment. The first three releases generated new code for the CTP software and integration with key applications (e.g., indoor navigation, reservations—both SDS and HDS, Ped-X and TIH). All software development is implemented using Agile Development Methodology.	CTP integrated with the following modules: • Indoor Navigation APIs • Reservations APIs for HDS, SDS and PAL • Ped-X APIs • TIH remote access	Release 1 (MVP): April 2023 Release 2: October 2023 Release 3: April 2024 Release 4: June 2024
Agile Testing for the PMD	Agile testing includes three-week development, test and integration cycles. Testing during each sprint includes unit and integration testing. Near the end of each release, version testing is conducted before the code is locked down and progressed to a staged, pre-production environment. There are three releases scheduled for the PMD that are coincident with the CTP. This streamlines the pre-production testing phases so that CTP output could feed and verify the PMD integration, operations and performance.	PMD integrated with the following elements: • CTP • Community shuttle • Ingestion from external sources • Outputs to external sources including Independent Evaluators	Release 1: October 2023 Release 2: April 2024 Release 3: June 2024

Test Phase	Description	Subsystem/ Applications	Release Dates
System Integration / Pre-production Testing for the-SDS	System integration / pre-production testing for the SDS includes: • **Inspection** (e.g., Bench Testing) of the SDS components including operations center software and vehicles. • **Demonstration** of the performance and safety of the operations software and vehicles. • **Field Testing** in the UB proving grounds and BNMC designated travel path and pickup locations. In addition, system integration testing will be conducted to verify and validate reservations APIs are exchanged between the CTP and SDS.	SDS without passengers: • Tactical or maneuvering behavior • Operational Design Domain • Object detection and collision avoidance • Fail mode behavior	Release 5 onwards, starting on Jan 2025
System Integration / Pre-product Testing for the HDS Reservation-Scheduling-Dispatch (RSD)	System integration / pre-production testing for the HDS RSD includes: • Demonstration of the performance and safety of the operations software and vehicles (the dispatch and operator modules). • As part of **Release 2 system integration testing**, the CTP was integrated with the HDS RSD and controlled testing was conducted to test every function of the integrated and configured functionality.	RSD: • Demonstration of dispatch and operator modules • System integration with CTP reservations (including end-to-end testing)	April 2024

Test Phase	Description	Subsystem/ Applications	Release Dates
System Integration / Pre-production Testing for the TIH	System integration / pre-production testing for the TIH includes: • **Inspection** of the TIH equipment to inspect the hardware and software components. • As part of **Release 3 system integration testing**, the CTP was integrated with the TIH and controlled testing (also called alpha testing) was conducted to test every function of the integrated and configured functionality.	TIH: • Equipment inspection (bench testing) • Installation and activation • System integration with CTP	April 2024
System Integration / Pre-production Testing for the Ped-X	System integration / pre-production testing for the Ped-X includes: • **Inspection** of the Ped-X equipment to inspect the hardware and software components. The installation procedures review the configuration parameters, integration and monitoring of the Miovision equipment with the signal controller. These procedures are described in the Comprehensive Installation Plan (CIP) for the MioVision equipment. In addition, demonstration procedures review configuration of the MioVision cloud services. • As part of **Release 3 system integration testing**, the CTP was integrated with the Ped-X and controlled testing was conducted to test every function of the integrated and configured functionality.	Ped-X Cloud Services: • System integration with CTP Ped-X intersection equipment: • Equipment inspection (bench testing) • Installation and activation • System integration with signal system and cloud services	April 2024

Test Phase	Description	Subsystem/ Applications	Release Dates
System Integration / Pre-production Testing for the Indoor Navigation	System integration / pre-production testing for the Indoor Navigation elements includes: • **Inspection** of the Bluetooth beacons to ensure that they work properly prior to installation in the facilities. Following the initial inspection, and during installation, the beacons were tested for proper operations and signal strength to ensure that the coverage is consistent among the beacons that were installed. This step is not necessary for Kaleida Health General Hospital since the facility is already outfitted with beacons. • As part of **Release 3 system integration testing**, the CTP was integrated with the Indoor Navigation software development kit (SDK). The SDK was piloted with the CTP in two controlled environments before it is tested in the two facilities in BNMC.	Indoor Navigation Beacons: • Equipment inspection (bench testing) • Installation and activation Indoor Navigation Cloud Services: • Beacon mapping (in cloud mapping services) • System integration with CTP	April 2024
System Integration / Pre-production Testing for the full system integration	By the CTP fourth (4th) software release all the systems are operational. To that end, comprehensive system integration testing is conducted to ensure that all systems operate as expected, meet system requirements and demonstrate user and safety needs. System integration testing was conducted to ensure that the releases are integrated with other modules and applications and that testing is conducted on mobile and web user interfaces.	All systems and subsystems	June 2024

Test Phase	Description	Subsystem/ Applications	Release Dates
User Acceptance Testing (UAT)	UAT (also called beta testing) was conducted by a select group of trained staff and volunteers to exercise the elements of the system that passed the pre-production phase.	Started in May 2024, all the subsystems and applications were deployed including passenger testing the HDS community shuttle services—SDS will be tested started on Jan 2025	May 2024 – July 2025

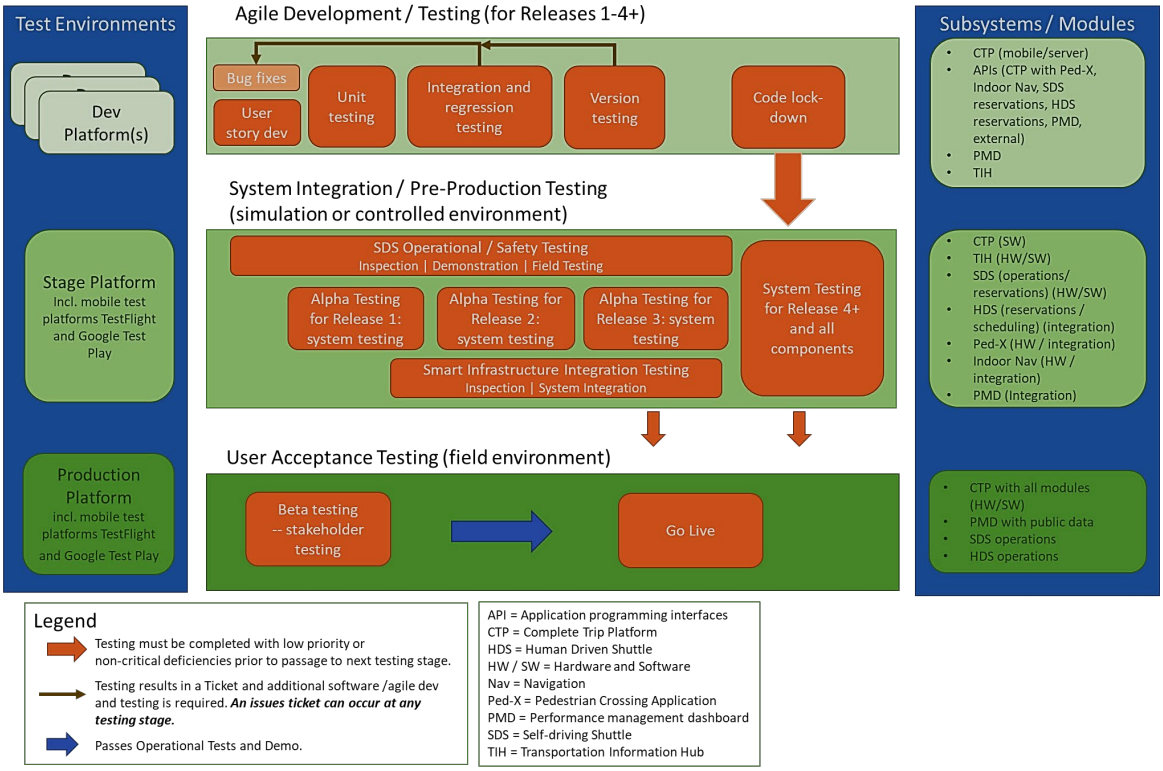
2.2 Approach

The approach for the Operational Readiness Test Plan follows the following workflow:

- For each System Requirement:
    - Identify the Verification Method appropriate for validating the System meets the Requirement. Verification Methods include: Inspection, Demonstration, Analysis, (Functional) Test. Each verification method is described in Section 2.2.1.1
    - Create appropriate procedural steps (per the verification method) to confirm the System meets the requirement (Templates are presented in Sections 2.2.5.1 through 2.2.5.3). Whenever possible, each step should include the “Expected Result” (in qualitative or quantitative form, as is most appropriate for the step)
    - Perform the Verification Method, per the procedural steps
    - Record / Document results for each procedural step
    - Confirm “Pass/Fail” or “Partial Failure” for each procedural step
    - Upon completion, submit completed Template for the System Requirement for record in the “ITS4US – Buffalo – Master Test Tracking” Excel spreadsheet

2.2.1 Overall Test Strategy

As described in Section 2.1.1 Objectives, the ORTP focuses on the “System Integration / Pre-Production Testing” using the Stage Platform. Specifically excluded from the ORTP include the Agile Development / Testing and User Acceptance Testing (field environment).



Source: Buffalo, NY ITS4US

Figure 3. Testing Phases and Associated Testing Environments.

Included subsystems / modules are:

- CTP (SW)
- TIH (HW/SW) (pending installation and Agile Development completion for TIH)
- HDS (reservations / scheduling) (integration)
- Ped-X (HW / integration)
- Indoor Nav (HW / integration)
- PMD (integration)

At each release of the CTP, testing has been conducted to verify expected outcomes based on release functionality (including regression testing of prior released functionality). CTP Release R3 (April 2024) includes all subsystems / modules detailed above and are fully integrated, so that comprehensive system integration testing was conducted during Alpha Testing for Release 3. Release 4 onward (starting on June 2024) comprises bug fixes, adjustments to the full system and integration of the SDS.

2.2.1.1 Verification Methods

To verify adherence to needs and requirements, the ORTP uses four verification methods that show how a requirement was met. These include:

- **Inspection** – Where the requirement is verified by visual inspection or review of software code. Most of the interface requirements are assigned an inspection method.

- **Demonstration** – Where the requirement is verified by demonstrating a specific capability or action. Demonstration is usually verified during the execution of the test itself; you witness the capability accomplishing the requirement. These types of methods are assigned to SDS features such as wheelchair securement and seatbelts.

- **Analysis** – Where the requirement is verified by an analysis method. As an example, Mean Time Between Failure (MTBF) requirements are usually verified by analysis since it may not be feasible to wait months for a potential failure of a component.

- **Functional Test** – Where the requirement is verified by a test that is run and then later analysis is conducted on the data collected during the test. Many times, performance requirements are verified by test as it may not be immediately obvious if a performance requirement was met until analyzing logs to determine the precise times when events occurred.

2.2.2 Defect Tracking

All identified defects / issues are tracked in the Defect Tracking Log spreadsheet. The following information will be tracked:

- **Index**: unique number used to track the defect.
- **Date Detected**: date when defect was detected.
- **Description**: summary of the defect that describes the impact of the defect.
- **Test type**: the type of test conducted that detected the defect (Alpha, Beta, operations Phase 3).
- **Component**: the component where defect was detected (i.e., CTP android, CTP iOS, CTP web, CTP call center, CTP kiosk, INS, Ped-X, PMD, etc.).
- **Comment (beta test form)**: URL to a form reported by the users.
- **Test Procedure / Case / Line (alpha test procedure)**: URL for the test report summary.
- **Categorization**: System level priority category (see **Table 3**).
- **Impact**: impact to the system (open content).
- **Assigned to**: person or team to which this defect was assigned.
- **Date Assigned**: date defect was assigned.
- **Status**: detected, opened, assigned, in-progress, closed, cancelled and reopened.
- **Remedy**: short summary of the defect solution.
- **Date Closed**: Date when defect was closed.

2.2.3 Defect / Deficiently Categorization and Impacts on Testing

The defect and deficiency categorization will mirror the Agile process ticket types (see **Table 3**). The tickets will be expanded to incorporate priorities related to safety and hardware elements.

The system level tickets correspond to all defects and deficiencies that occur in the Pre-production or production testing phases, as well as those identified during production and operations. The ticket type descriptions apply to all subsystems and components of the system.

Table 3. System Level Defect/Deficiency Categories.

Ticket Type	Priority	Description
S1	Critical	System is not responding; system outage or system malfunction poses safety risk. **Unscheduled downtime.**
S2	High Priority	Major component, feature or functionality within the system is not working. Causing a critical disruption for users. **Must be fixed immediately.**
S3	Medium to High Priority	Key defect or functionality that should be working in the short term (next sprint or release). These are tickets that are identified during or before pre-production testing. **Will be incorporated into an interim release or version prior to, or during production testing.**
S4	Normal Priority	Defect or deficiency in functionality that should be reported to appropriate developer, implementer or integration team to resolve. **Work items will be prioritized by the respective development team.**

2.2.4 Test Identifier

The Test Identifiers provide a unique way to identify each test. The test identifier numbering scheme may be unique to each subsystem; therefore, tests maintained by vendor/partners may not follow the same test identification scheme that will be used by project developed components.

2.2.4.1 CTP Test Identifiers

Test identifier for CTP subsystem testing:

[System Requirement]-[Description]-[Verification Method]-[Test Cycle]-[Test Platform]-[Version]

[System Requirement] = System Requirement ID

[Description] = Short Description of the Requirement

[Verification Method] = one of:

DEMO = Demonstration

ANALYSIS = Analysis

INSPECT = Inspection

FUNCT = (functional) Test

[Test Cycle] = Test Cycle. One of:

R1 = CTP R1 Release Test Cycle

R2 = CTP R2 Release Test Cycle

Alpha = CTP R3 Release Test Cycle

Beta = CTP R4 Release Test Cycle

Regression = CTP R4 Onward Regression Test Cycle

[Test Platform] = one of (if applicable, not required):

TIH = Traveler Information Hub

iPhone = Apple iOS Platform

Android = Google Android Platform

Web-Chrome = Chrome Web Browser (running on Microsoft Windows operating system

Web–Edge = Edge Web Browser (running on Microsoft Windows operating system

Web-Firefox = Firefox Web Browser (running on Microsoft Windows operating system

Web-Safari = Safari Web Browser (running on Apple macOS operating system

[Version] = Version of the test document

Example: Req-CTP-009-Pre-Populate Preferences-INSPECT-Alpha-iPhone-v1.0

Req-CTP-009: indicates this test identifier is to system requirement 009 of the CTP subsystem

“Pre-Populate Preference”: short description of the requirement

INSPECT: Verification Method = Inspection

Alpha: Alpha test cycle

iPhone: Test for the iPhone platform

v1.0: Version v1.0 of the test (inspection) procedure

2.2.4.2 SDS Test Identifiers

This section will contain the test identification scheme for the SDS testing and verification methods. For each SDS-subsystem requirement, one of four verification methods was identified: Inspection, Demo (Demonstration), T (involves a Test procedure), and A (analysis). The full SDS-related verification matrix is attached to this report.

Test identifier for CS integration testing with the CTP mobile app:

[System Requirement]-[Description]-[Verification Method]-[Test Cycle]-[Test Platform]-[Version]

[System Requirement] = System Requirement ID

[Description] = Short Description of the Requirement

[Verification Method] = one of:

FUNCT = (functional) Test

[Test Cycle] = Test Cycle. One of:

Alpha = CTP R3 Release Test Cycle

[Version] = Version of the test document

Example: Req-CS-036 – SDS on-demand routing and Dispatch-FUNC-Alpha-v1.0

Req-CS-036: indicates this test identifier is to test requirement 036 of the CS subsystem

“on-demand routing and Dispatch”: short description of the requirement

FUNC: Verification Method = (functional) Test

Alpha: Alpha test cycle

v1.0: Version v1.0 of the test procedure

2.2.4.3 PMD Test Identifiers

Test identifier for PMD subsystem testing:

[System Requirement]-[Description]-[Verification Method]-[Test Cycle]-[Test Platform]-[Version]

[System Requirement] = System Requirement ID

[Description] = Short Description of the Requirement

[Verification Method] = one of:

DEMO = Demonstration

ANALYSIS = Analysis

INSPECT = Inspection

FUNCT = (functional) Test

[Test Cycle] = Test Cycle. One of:

R1 = CTP R1 Release Test Cycle

R2 = CTP R2 Release Test Cycle

Alpha = CTP R3 Release Test Cycle

Beta = CTP R4 Release Test Cycle

Regression = CTP R4 or R5 Regression Test Cycle

[Version] = Version of the test document

Example: Req-PMD-008-Data Aggregation-FUNC-Alpha-v1.0

Req-PMD-008: indicates this test identifier is to test requirement 008 of the PMD subsystem

“Data Aggregation”: short description of the requirement

FUNC: Verification Method = (functional) Test

Alpha: Alpha test cycle

v1.0: Version v1.0 of the test procedure

2.2.5 Subsystem Test Stages

The following templates are used for documenting the procedure and results of the subsystem tests. The location of each set of test procedure templates and results by test grouping is provided in each subsection.

2.2.5.1 Functional Test Procedure Template

The following template is used for Functional Test procedures. The person executing the test procedure documents the following sections – all other information is pre-populated, including the “Test Step / Requirement” and “Expected Result”.

Tester populated fields:

- Header Section:
    - Test Date: Date the test was performed
    - Tested by: Name of the person performing the test
    - Test Result: Pass / Partial Fail / Fail, depending on the overall result of the test:
        - Pass: indicates all Test Steps / Requirements produced the “Expected Result”
        - Partial Fail: indicates that the test was able to meet the “Test Case / System Requirement Description”, but with minor issues (work arounds found by the tester)
        - Fail: indicates that the Test Steps / Requirements were unable to meet the expected result and subsequently were unable to satisfy the Test Case / Requirement
    - Tested Platform:
        - Device Make: make of the device
            - iPhone: Apple iPhone (for mobile platform tests)
            - Android: Google Android (for mobile platform tests)
            - Windows: for Web browser tests including Web-Chrome, Web-Edge, Web-Firefox tests
            - macOS: for Web-Safari tests
        - Device Model: model of the test device
            - When Device Make is iPhone, this field is the iPhone Model (Settings -> General -> Model Name)
            - When Device Make is Android, <tbd>
            - When Device Make = Windows, this field describes the hardware running the Windows operating system (ex: Dell Laptop)
            - When Device Make = macOS, this field is the combination of the Mac model + Chip (ex: MacBook Pro – Apple M1 Max) (obtained from “About This Mac”)
        - Operating System: version of the operating system used

- When Device Make is iPhone, this field is the iOS Version (Settings -> General -> iOS Version)
- When Device Make is Android, <tbd>
- When Device Make = Windows, this field describes the Windows Edition of the Windows operating system (Settings -> System -> Windows Specification -> Edition)
- When Device Make = macOS, macOS Version (obtained from "About This Mac" -> macOS)

- Subsystem Version:
  - CTP: version of the CTP App (obtain from the version information shown in TestFlight (iOS) or GooglePlay (Android))
  - HDS: No entry required - potential future use
  - SI-TIH: No entry required - potential future use
  - SI-INS: No entry required - potential future use
  - SI-PEDX: No entry required - potential future use
  - PMD: No entry required - potential future use

- Procedures Section:
  - Complete "Tester Comments / Entries Actually Entered" for each Test Step / Requirement row of the table. Provide as much detail as possible – this detail can be used in the event of Partial Fail / Fail test conditions to attempt to reproduce the issue and help identify root cause.

2.2.5.1.1 Functional Test Procedure Template

Table 4. Functional Test Procedure Template – Header Section.

Test ID:	**Req-CTP-**	**-**
Test Date:	-	-
Tested by:	-	-
Test Result:	-	-
Tested Platform:	Device Make:	-
-	Device Model:	-

-	Operating system: (IOS Version, Android OS, Web Browser)	-
Subsystem Version:	CTP (version provided in TestFlight / GooglePlay)	-
-	HDS	No entry required – potential future use
-	SDS	No entry required – potential future use
-	SI-TIH	No entry required – potential future use
-	SI-INS	No entry required – potential future use
-	SI-PEDX	No entry required – potential future use
-	PMD	No entry required – potential future use

Introduction:

Test Case / System Requirement Description:

"As a <>, I should be able to <>" -or- System Requirement Description

References:

Related System Requirement(s)

- **Req-**

Test Procedures and Results:

Pre-Conditions:

- <item>
- **Apple**: <item>
- **Android**: <item>

Procedures:

Table 5. Functional Test Procedure Template – Procedures Section.

Test Step / Requirement	Expected Result	Tester Comments / Entries Actually Entered	Pass / Fail
1. Step	Expected Result	-	pass/fail
2. Step	Expected Result	-	pass/fail
3. Step	Expected Result	-	pass/fail

Revision History:

Update the revision history table upon each update to this test plan. The summary of changes is to be descriptive for future updates.

Table 6. Functional Test Procedure Template – Revision History Section.

Name	Date	Version	Summary of Changes	Approver
[FirstName LastName, Company/Agency]	2024/<x>/<x>	1.1	• Change log	-
-	-	-	-	-
-	-	-	-	-

2.2.5.2 Analysis Test Procedure Template

The following template is used for Analysis verification procedures. The person executing the analysis procedure will complete the same template entries as for the Functional Test Procedure (described above)—all other information will be pre-populated, including the "Analysis Procedures" and "Analysis Notes / Comments". Note, not all template fields will apply to all Analysis verification procedures.

2.2.5.2.1 Analysis Test Procedure Template

Table 7. Analysis Test Procedure Template – Header Section.

Analysis ID:	Req-CTP-	-
Analysis Date:	-	-

Analyzed by:	-	-
Analysis Result(s):	-	-
Platform Version(s):	Device Make:	-
-	Device Model:	-
-	Operating system: (IOS Version, Android OS, Web Browser)	-
Subsystem Version:	CTP (version provided in TestFlight / GooglePlay)	-
-	HDS	No entry required – potential future use
-	SDS	No entry required – potential future use
-	SI-TIH	No entry required – potential future use
-	SI-INS	No entry required – potential future use
-	SI-PEDX	No entry required – potential future use
-	PMS	No entry required – potential future use

Introduction:

Test Case / System Requirement Description:

"As a <>, I should be able to <>"

References:

Related System Requirement(s)

- **Req-**

Analysis Process and Results:

Pre-Conditions:

- <item>

- **Apple**: <item>
- **Android**: <item>

Analysis Rational:

<describe the rational for the Analysis approach (why it makes sense as a validation of the requirement)>

Data Sources:

<describe the data to be used in the analysis>

Analysis Outcomes:

Table 8. Analysis Test Procedure Template – Outcomes Section.

Analysis Procedures	Expected Result	Analysis Notes / Comments	Pass / Fail
-	Expected Result	-	pass/fail
-	Expected Result	-	pass/fail
-	Expected Result	-	pass/fail

Revision History:

Update the revision history table upon each update to this inspection plan. The summary of changes is to be descriptive for future updates.

Table 9. Analysis Test Procedure Template – Revision History Section.

Name	Date	Version	Summary of Changes	Approver
[FirstName LastName, Company/Agency]	2024/<x>/<x>	1.1	• Change log	-
-	-	-	-	-
-	-	-	-	-

2.2.5.3 Inspection Procedure Template

The following template is used for Inspection verification procedures. The person executing the Inspection procedure will complete the same template entries as for the Functional Test Procedure (described above)—all other information will be pre-populated, including the "Inspection Procedures" and "Inspection Notes / Comments". Note, not all template fields will apply to all Inspection verification procedures.

2.2.5.3.1 Inspection Test Procedure Template

Table 10. Inspection Procedure Template – Header Section.

Inspection ID:	**Req-CTP-**	**-**
Inspection Date:	-	-
Inspected by:	-	-
Inspection Result(s):	-	-
Platform Version(s):	Device Make:	-
-	Device Model:	-
-	Operating system: (IOS Version, Android OS, Web Browser)	-
Subsystem Version:	CTP (version provided in TestFlight / GooglePlay)	-
-	HDS	No entry required – potential future use
-	SDS	No entry required – potential future use
-	SI-TIH	No entry required – potential future use
-	SI-INS	No entry required – potential future use
-	SI-PEDX	No entry required – potential future use
-	PMS	No entry required – potential future use

Introduction:

Test Case / System Requirement Description:

"As a <>, I should be able to <>"

References:

-

Related System Requirement(s)

- **Req-**

Inspection Procedures and Results:

Pre-Conditions:

- <item>
- **Apple**: <item>
- **Android**: <item>

Procedures:

Table 11. Inspection Procedure Template – Procedures Section.

Inspection Procedures	Expected Result	Inspection Notes / Comments	Pass / Fail
1. Step	Expected Result	-	pass/fail
2. Step	Expected Result	-	pass/fail
3. Step	Expected Result	-	pass/fail

Revision History:

Update the revision history table upon each update to this inspection plan. The summary of changes is to be descriptive for future updates.

Table 12. Inspection Procedure Template – Revision History Section.

Name	Date	Version	Summary of Changes	Approver
[FirstName LastName, Company/Agency]	2024/<x>/<x>	1.1	• Change log	-
-	-	-	-	-

Name	Date	Version	Summary of Changes	Approver
-	-	-	-	-

2.2.5.4 CTP and Integration Component Test Stages and Formats

CTP Test Procedures and results are stored in a location publicly available that will persist (minimally) for the duration of the project—the specific location to be updated in this document by the end of project Phase 2. The directory structure follows the following convention:

CTP/[System Requirement]-[Description] - directory

[One or More Test Scripts] – typically MS Word documents, following the Test Identifiers naming convention in Section 2.2.4.1)

TestResults – subdirectory containing test results documents, organized by CTP release

Alpha – directory containing test results from CTP release R3/Alpha

Release-R1 – directory containing test results from CTP release R1 (note, not all Req-CTP features were included in Release-R1 testing, so subdirectory may be empty)

Release-R2 – directory containing test results from CTP release R2 (note, not all Req-CTP features were included in Release-R2 testing, so subdirectory may be empty)

Example (for demonstration purposes only):

```
CTP

├── Req-CTP-014-Multimodal Trip Planner

│   ├── Req-CTP-014-Multimodal Trip Planner-FUNCT-Alpha-Android-
v1.0.docx

│   ├── Req-CTP-014-Multimodal Trip Planner-FUNCT-Alpha-Web-
Chrome-v1.0.docx

│   ├── Req-CTP-014-Multimodal Trip Planner-FUNCT-Alpha-Web-Edge-
v1.0.docx

│   ├── Req-CTP-014-Multimodal Trip Planner-FUNCT-Alpha-Web-
Firefox-v1.0.docx

│   ├── Req-CTP-014-Multimodal Trip Planner-FUNCT-Alpha-Web-
Safari-v1.0.docx
```

```
│   ├── Req-CTP-014-Multimodal Trip Planner-FUNCT-Alpha-iPhone-
v1.0.docx

│   └── TestResults

│       ├── Alpha

│       ├── Release-R1

│       └── Release-R2

├── Req-CTP-015-Updating Trip Plan

│   ├── Req-CTP-015-Updating Trip Plan-FUNCT-Alpha-Android-
v1.0.docx

│   ├── Req-CTP-015-Updating Trip Plan-FUNCT-Alpha-Web-Chrome-
v1.0.docx

│   ├── Req-CTP-015-Updating Trip Plan-FUNCT-Alpha-Web-Edge-
v1.0.docx

│   ├── Req-CTP-015-Updating Trip Plan-FUNCT-Alpha-Web-Firefox-
v1.0.docx

│   ├── Req-CTP-015-Updating Trip Plan-FUNCT-Alpha-Web-Safari-
v1.0.docx

│   ├── Req-CTP-015-Updating Trip Plan-FUNCT-Alpha-iPhone-
v1.0.docx

│   └── TestResults

│       ├── Alpha

│       ├── Release-R1

│       └── Release-R2

├── Req-CTP-016-Save Trip Information

│   ├── Req-CTP-016-Save Trip Information-FUNCT-Alpha-Android-
v1.0.docx

│   ├── Req-CTP-016-Save Trip Information-FUNCT-Alpha-Web-Chrome-
v1.0.docx

│   ├── Req-CTP-016-Save Trip Information-FUNCT-Alpha-Web-Edge-
v1.0.docx
```

```
│   ├── Req-CTP-016-Save Trip Information-FUNCT-Alpha-Web-
Firefox-v1.0.docx

│   ├── Req-CTP-016-Save Trip Information-FUNCT-Alpha-Web-Safari-
v1.0.docx

│   ├── Req-CTP-016-Save Trip Information-FUNCT-Alpha-iPhone-
v1.0.docx

│   └── TestResults

│       ├── Alpha

│       ├── Release-R1

│       └── Release-R2

├── Req-CTP-017-Multimodal Data

│   ├── Req-CTP-017-Multimodal Data-INSPECT-Alpha-v1.0.docx

│   └── TestResults

│       ├── Alpha

│       ├── Release-R1

│       └── Release-R2
```

2.2.5.5 SDS Test Stages

Two broad categories are identified for the verification and testing of the SDS-related requirements. First, requirements pertaining to standalone SDS functionalities (e.g., autonomous driving, stopping at bus stops, motor technology, etc.) are to be verified by inspection and demonstration, as is defined in the SDS requirements verification matrix included with this report. On the other hand, the verification of those requirements focused on the integration of the Buffalo All Access or CTP app with the SDS, will follow the templates and stages of the functional and analysis test procedures previously defied for the CTP and integration components in the previous subsections.

2.2.5.6 PMD Test Stages and Formats

PMD Test Procedures and results are stored in a location publicly available that will persist (minimally) for the duration of the project—the specific location to be updated in this document by the end of project Phase 2. The directory structure follows the following convention:

PMD/[System Requirement]-[Description] - directory

[One or More Test Scripts] – typically MS Word documents, following the Test Identifiers naming convention in Section 2.2.4.3)

TestResults – subdirectory containing test results documents, organized by PMD release

Alpha – (empty)

Release-R1 – directory containing test results from PMD release R1 (note, not all Req-PMD features were included in Release-R1 testing, so subdirectory may be empty)

Release-R2 – directory containing test results from PMD release R2 (note, not all Req-PMD features were included in Release-R2 testing, so subdirectory may be empty)

Example (for demonstration purposes only):

```
PMD
├── Req-PMD-002-Quality checking data
│   ├── Req-PMD-002-Quality checking data-INSPECT-Alpha-v1.0.docx
│   └── TestResults
│       ├── Alpha
│       ├── Release-R1
│       └── Release-R2
├── Req-PMD-003-Anonymizing data
│   ├── Req-PMD-003-Anonymizing data-INSPECT-Alpha-v1.0.docx
│   └── TestResults
│       ├── Alpha
│       ├── Release-R1
│       └── Release-R2
├── Req-PMD-005-Metadata
│   ├── Req-PMD-005-Metadata-INSPECT-Alpha-v1.0.docx
│   └── TestResults
│       ├── Alpha
```

```
│       ├── Release-R1
│       └── Release-R2
```

2.2.5.7 System Integration Test Formats

System Integration Test Procedures will be stored in a location publicly available that will persist (minimally) for the duration of the project – the specific location to be updated in this document by the end of project Phase 2. The directory structure follows the following convention:

Sy/[System Requirement]-[Description] - directory

[One or More Test Scripts] – typically MS Word documents, following the Test Identifiers naming convention in Section 2.2.4.3)

TestResults – subdirectory containing test results documents; note System Integration tests become relevant at/after CTP Release 3 (Alpha release)

Alpha – directory containing test results from CTP release R3/Alpha

Release-R4

Example (for demonstration purposes only):

```
Sy
├── Req-Sy-001-Web browser support
│   ├── Req-Sy-001-Web browser support-ANALYSIS-Alpha-v1.0.docx
│   └── TestResults
│       ├── Alpha
│       ├── Release-R4
├── Req-Sy-005-Vehicle Accessibility Information Collection
│   ├── Req-Sy-005-Vehicle Accessibility Information Collection-
INSPECT-Alpha-v1.0.docx
│   └── TestResults
│       ├── Alpha
│       ├── Release-R4
├── Req-Sy-006-Trip History and Unique Reference Identifier
│   ├── Req-Sy-006-Trip History and Unique Reference Identifier-
INSPECT-Alpha-v1.0.docx
```

```
|   └── TestResults
|       ├── Alpha
|       ├── Release-R4
```

2.2.5.8 System Verification

The System Requirements Verification Method Table tracks the verification method for every System Requirement. At least one (1) Verification Method is identified for each System Requirement. The verification methods are described in Section 2.2.1.1.

The System Requirements Verification Table ensures the completeness of the ORTP.

The System Requirements Verification Table is a living document. Once finalized, it will be included on the ORTP as a link to an external table.

2.3 Operational Readiness Test Deliverables

This section includes an index of all the tests conducted and the stages when they were conducted (including their schedule). The tests deliverables are grouped by subsystem and internal grouping (e.g., release). They are linked to the Test Results section wherein they will be found. At a minimum the tests include:

- Test procedure / case descriptions
- Test data
- Test results
- Test Bug Report and Response (defect log)

The test index includes the following information in a table format:

Table 13. Template for Test Index.

Test ID	Req'ts	Test Name	# times conducted	Test Stage	Pass / Fail
-	-	-	-	-	-

This information summarizes the individual subsystem / component Master Test Matrices and results.

- **Test ID** refers to the test identifier (as described in Section 2.2.2.1). Each version, subsystem and test platform are identified in the test ID.
- **Requirement** refers to one or more requirements covered by the test.
- **Test name** describes the name of the test.
- **# times conducted** refers to the number of times the test was conducted. Notes in the pass/fail column will identify if the test failed and was resubmitted.

- **Test Stage** identifies the grouping of when the test was conducted, for example R1 refers to release 1. Stages include CTP releases, PMD releases, field testing for SDS, and HDS. Individual component testing results are not included in this section (e.g., CTP unit testing, INS beacon testing, Miovision / signal control, etc.).
- **Pass / Fail** includes a scale for Pass / Fail and the result grade (described by issue priority in STP). If the test was conducted multiple times, then a notation will be included to identify which result was generated for each test.

A table will include test data sets used for field and simulation testing, if appropriate.

A table will summarize the test bug report and log file. This will be an external table.

2.4 Responsibilities

Identified Roles and Responsibilities are included in Table 14, along with names (when known). Roles and Responsibilities are divided by subsystems / components of the overall solution (CTP and integration elements, SDS, HDS, and PMD).

Table 14. ORTP Responsibilities

Role	Name (s)	Responsibilities
Tester – CTP Release 1	Kayla English Jacob Frye Polly Okunieff Nayel Urena Serulle Darren Weibler John Wiens	• Developing Test Procedures for CTP Release 1 • Executing Test Procedures • Documenting Test Results from executing test procedures • Providing overall feedback (defects / observations / suggestions for improvement) for CTP Release 1

Role	Name (s)	Responsibilities
Tester – CTP Release 2	Kayla English Jacob Frye Darren Weibler John Wiens	• Updating Test Procedures developed for CTP Release 1 • Developing new Test Procedures for CTP Release 2 (new Release 2 functionality) • Executing Test Procedures (Regression testing of CTP Release 1 features + new CTP Release 2 features) • Documenting Test Results from executing test procedures • Providing overall feedback (defects / observations / suggestions for improvement) for CTP Release 2
Tester – CTP Alpha (Release 3)	Shania Julia Anunciacion Jamie Hamann-Burney Kayla English Jacob Frye Harmony Griffin Madison Mack Sam Marrazzo Maria Morreale Katie O'Sullivan Darren Weibler John Wiens	• Updating Test Procedures developed for CTP Releases 1 and 2 • Developing new Test Procedures for CTP Release 3 (new Release 3 functionality) • Executing Test Procedures (Regression testing of CTP Releases 1 and 2 features + new CTP Release 3 features) • Documenting Test Results from executing test procedures • Providing overall feedback (defects / observations / suggestions for improvement) for CTP Release 3
Tester – CTP Release 4 onward	Katie O'Sullivan Shania Julia Anunciacion	• Test proper functionality of the CTP based on added features for Release 4 onwards. • Documenting Test Results from executing test procedures

Role	Name (s)	Responsibilities
HDS Field Tester	Katie O'Sullivan Shania Julia Anunciacion	• Test proper functionality of the HDS. • Documenting Test Results from executing test procedures.
CTP Test Designer	Darren Weibler Jacob Frye John Wiens	• Test the CTP during development and prior to each release as part of the Agile process.
PMD Test Designer	Kyeongsu Kim	• Test proper functionality of the PMD. • Documenting Test Results from executing test procedures.
SDS Test Designer	Adel Sadek Vendor Staff	• Documenting Test Results from executing test procedures.
Stage (Release) Approval	Robert Jones (primary) Nayel Urena Serulle (secondary) Polly Okunieff (secondary)	• Approve stage tests
Site installation Approval	Brian DeCicco (Kaleida Health) Ray Zylinski (VIA) Robert Jone (NFTA)	• Provide oversight and approval of equipment installation at the respective facility. • Verify installation meets site requirements
Test Witness Validation	Adel Sadek (SDS) Chumming (SDS) Jamie Hamann-Burney Robert Jones Kelly Dixon	• Validate tests.

Role	Name (s)	Responsibilities
Beta Testers	Kelly Dixon Ray Zylinski (VIA) Shania Julia Anunciacion Jamie Hamann-Burney Robert Jones	• Test proper functionality of the All Access system. • Documenting Test Results from executing test procedures.

2.5 Staffing and Training Needs

The Staffing and Training needs identified in the following subsections are specific to testing and verification of the system components. Staffing and training needs are divided by subsystems / components of the overall solution (CTP and integration elements, SDS, HDS, and PMD).

Cross-subsystem training required for all system components include:

- Processes and Procedures for Documenting Test Results
- Procedures for Reporting Defects
- Procedures for providing non-defect feedback to development and/or vendor team(s)

2.5.1 Staffing and Training Needs for ORTP – CTP (and Integration Elements)

No additional training requirements required for ORTP – CTP (and Integration Elements) above the Cross-subsystem training requirements noted above. Table 15 lists the staffing need for training.

Table 15. Staffing Needs for ORTP – CTP (and Integration Elements)

Requirement(s)	Qty (Minimum)
• iPhone Mobile Device Users	2
• Android Mobile Device User	2
• Mac OS – Safari Users	1
• Windows OS (Chrome, Edge, Firefox)	1

2.5.2 Staffing and Training Needs – SDS

No additional training requirements required for ORTP – SDS as this is a turnkey service solution.

2.5.3 Staffing and Training Needs – HDS

No additional training requirements required for ORTP – HDS above the Cross-subsystem training requirements noted above. Table 16 list the staffing need for training.

Table 16. Staffing Needs for ORTP – HDS

Requirement(s)	Qty (Minimum)
• iPhone Mobile Device Users	2
• Android Mobile Device User	2
• Mac OS – Safari Users	1
• Windows OS (Chrome, Edge, Firefox)	1

2.5.4 Staffing and Training Needs – PMD

Additional training requirements required for ORTP – PMD may include:

- Training on executing R scripts
- Access to the UB hosted environment storing Project Data

Table 17 lists the staffing need for training.

Table 17. Staffing Needs for ORTP – PMD

Requirement(s)	Qty (Minimum)
• Users with access to UB databases hosting Project Data • Basic R programming / script execution skills	1

2.5.5 Staffing and Training Needs – TIH

Additional training requirements required for ORTP – TIH may include:

- Training on functionalities of the kiosks and its buttons.

Table 18 lists the staffing need for training.

Table 18. Staffing Needs for ORTP – TIH

Requirement(s)	Qty (Minimum)
• Kiosk	1
• iPhone Mobile Device Users	1
• Android Mobile Device User	1

2.6 Risks and Contingencies

Table 19 lists the known risks and contingency plans for the ORTP emphasizing operational readiness testing. This table pertains to testing and excludes other project risks.

Table 19. ORTP Risks.

ID	Risk	Contingency
ORTP-R-001	Delivery of system components may delay ORTP deliverables	Coordinate with vendors and developers to adapt testing timeline as needed
ORTP-R-002	Most ORTP testers are remote to Buffalo	Enlist volunteers from local teams – try to minimize impacts on their team to the extent possible
ORTP-R-003	Time required to address any identified defects may delay other test activities	Ensure dependencies are known and visible to project leadership

2.7 Approvals

The ORTP Approvals table tracks approval of tests performed during the project (as described above) and by whom. This is intended to trace acceptance that the test has been executed and the required documentation exists (per this plan). By approving these tests, the approver confirms that all tests associated with the subsystem have been completed. Note that individual procedure testing is submitted by the tester and considered a confirmation that the individual test was completed.

Table 20. ORTP Approval Template

Date	Tested Subsystem	Test Result Approver	Notes
-	CTP – R1	-	-

Date	Tested Subsystem	Test Result Approver	Notes
-	CTP – R2	-	-
-	CTP – Alpha (R3)	-	-
-	CS – SDS	-	-
-	CS – HDS	-	-
-	TIH	-	-
-	PED-X	-	-
-	PMD	-	-

3 Operational Demonstration Readiness Plan (ORDP)

This section of the ORP presents information regarding the demonstration of the Buffalo ITS4US system. The demonstration will be done through scenarios that exhibit a set of selected integrated, end-to-end system capabilities based on key use cases of the system, as defined in the ConOps. These demonstration scenarios will be conducted live and through simulations, if needed.

3.1 ORDP Introduction

The Operational Readiness Demonstration Plan (ORDP) details the Buffalo ITS4US team's plan for demonstrating the capabilities of the system. As such, the ORDP:

- Defines the demonstration approach.
- Identifies the types of demonstrations and the project items to be demonstrated.
- Identifies the resources to support the demonstrations, as well as the constraints.
- Defines roles and responsibilities.

The ORDP is based on the use cases presented in the ConOps, technical and performance requirements detailed in the SyRS, and test procedures explained in the STP. The following subsections provide more detail on the demonstration approach, logistics, challenges, schedule and other factors that could impact the demonstration event.

3.2 Schedule

The demonstration will take places across a 3-day events, September 9-11, 2025—a proposed agenda is provided in Appendix C. Table 21 provides the expected start and end dates for conducting the operational readiness testing, capturing key activities and milestones.

Table 21. ORDP Schedule.

Event	Activity	Start	Stop	Dependency
Pre-Demo	Complete system testing of all components, except the SDS, ensuring that they are working properly and fully integrated into the All Access system.	April 15, 2024	July 31, 2025	Successful delivery, installation, and integration of all available components.
Demo	Demonstrate all the components of the system, including the capabilities of the SDS, through the demonstration events listed in Section 3.4.	Sept 9, 2025	Sept 11, 2025	Successful pre-demo testing.

3.3 Approach

The demonstration event will showcase how users would interact with the Buffalo All Access system. The demonstration focuses on end-to-end operations of its features, showing how the system provides physical and data safety and security. The end-to-end testing is critical to manage time for this event, covering the high-level goals of the project and allows for the inclusion of each technical component.

The focus of the demonstration event is to do a live showcase of the system functions, operations and capabilities including reservation, notification, pickup/dropoff of community shuttles (i.e., SDS, HDS), capabilities and accessible features of CTP, intersection crossing support (PED-X), indoor/outdoor navigation with turn-by-turn directions, kiosks, call center, trip planning, amongst other capabilities. However, some aspects of the demonstration, mainly safety-related, will need to be shown through simulations or presentations either as results from our test plan or, if possible, through video-taped simulated tests.

Live and simulated demonstrations will be complemented with more targeted presentations to ensure that all demonstration elements are covered, particularly as they pertain to specific components. For instance, the SDS demonstration will provide additional information to specify how safety, security and privacy of its riders will be ensured.

3.3.1 Use Cases-Based Demonstration

The ConOps identifies ten use cases to describe the functions for which the deployment technologies (i.e., CTP, community shuttle service, smart infrastructure) are expected to have the greatest benefits for underserved groups. The ORP is based on the updated use cases, as understood at the end of Phase 2. These use cases are described below and illustrated in Figure 4.

Complete Trips Platform Use Cases

1) **Register Profile and Preferences** - This use case describes the processes and interactions with travelers to set up a user account. The function enables the account holder to select their travel preferences for types of navigation triggers, wayfinding notifications and alert communications. The functions also enable users to identify their preferences for mode and accessibility needs within their CTP account.

2) **Generate Trip Plan and Book a Trip -** This use case consists of functions for a traveler to plan a trip by inserting their origin and destination. They may customize this trip by selecting general preferences (e.g., modes, maximum walking distance, shortest trip, fewest transfers), or if they log in to their account use an existing trip plan or set of preferences for travel and notification. The traveler can also adjust their trip preferences and save the updated trip plan. In addition, as an account holder authorized to use registered mobility services, the traveler can generate a complete trip plan with a trip leg that includes reservations and confirmation with the mobility service.

3) **Public Transport Services -** This use case describes the information provisions associated with accessing public transit mode options. These include NFTA bus, light rail, and PAL, as well as the Community Shuttle options that are included in these services. The services consist of hailing, boarding, traveling in and alighting these public transport vehicles.

4) **Navigation -** This use case describes wayfinding and navigation on pathways to complete a trip. This use case consists of the use of the CTP when traveling including crossing intersections, traversing sidewalks, wayfinding to and through indoor facilities.

5) **Reporting and History -** This use case describes information provided to the traveler on the CTP that is available for account holders about trips they completed. In addition, the traveler can submit a feedback form in which they detail their experience, including trip obstacles and suggested improvements. This provides a crowd-source approach to collecting information on service satisfaction and accessibility status.

Community Shuttle Service Use Cases

6) **Alternate Trip Planning and Shuttle Service Reservation and Dispatch -** This use case focuses on the alternates ways to plan trips, including the transportation information hubs (kiosks). This use case also describes the processes and functions of the reservation and dispatch systems of the community shuttle, particularly those applied and activated when receiving a traveler request for service by the shuttle system.

7) **Passenger Pick-up, Securement, and Drop-off via the SDS -** This use case describes several of the processes and functions of the Community Shuttle which will be applied and activated when a traveler boards a SDS, secures themselves onboard the vehicle, travels on the SDS, and finally gets off the SDS at their final or intermediate destination.

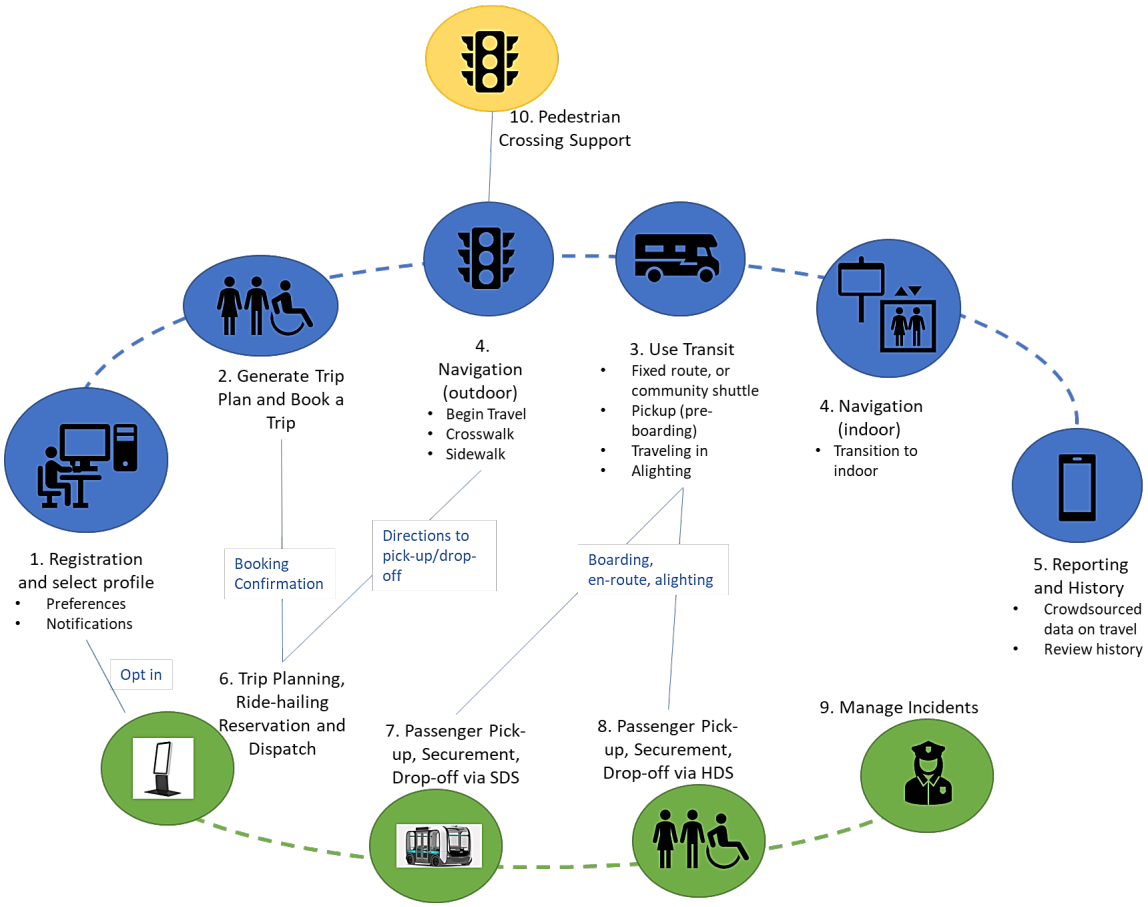
8) **Passenger Pick-up, Securement, and Drop-off via the HDS -** This use case describes several of the processes and functions of the Community Shuttle, which will be applied and activated when a traveler boards an HDS, has his/her mobility aid mechanism secured, travels on the shuttle, and finally gets off at their final destination.

Incident Management

9) **Manage Incidents -** This use case describes the processes and functions that will be activated by the different subsystems to manage incidents. Incidents may involve inclement weather, malfunction of one or more components of the system, trip plan disruptions, accidents, amongst others.

Smart Infrastructure Use Case

10) **Intersection Pedestrian Crossing (PED-X) Request -** This use case describes the transmission of a PED-X request message from the CTP to the traffic signal controller. This use case supports the intersection crossing system.



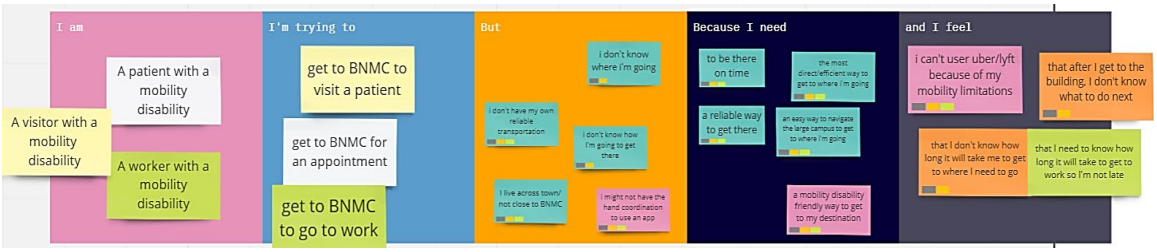
Source: Buffalo, NY ITS4US

Figure 4. Use Cases of the Buffalo ITS4US Deployment.

3.3.2 Persona Development

The demonstration scenarios are developed with different personas in mind to address a range of needs and capabilities of the target population of this project. This mimics the Agile development process implemented in this project when crafting user stories.

Each persona is created following a structure that provides insight into five key characteristics: 1) I am, 2) I'm trying to, 3) but, 4) because I need, 5) and I feel. Figure 5 provides a screenshot of the persona development structure for a traveler with a mobility disability. Other examples of personas include a person using wheelchair, with low vision or blind, traveling with companion, with auditory disability or deaf, and/or without smart phone (or low data).



Source: Buffalo, NY ITS4US

Figure 5. Example of the Persona Development Structure.

3.3.3 Locations

The live and simulated/presentation scenarios will take place in different locations across the BNMC campus. Key locations for the demonstration include:

- Innovation Center (as the "headquarters") – where presentations will take place and will be the start and end point of some demonstration events.
- Visually Impairment Advancement (VIA) – where we will demonstrate indoor navigation capabilities.
- Summer-Best Metro Rail Station – a recurrent stop of travelers, close to VIA and one of the PED-X enabled intersections and will also host one of the kiosks.
- Ellicott & High intersection – intersection equipped with our PED-X solution.
- Buffalo General Medical Center (BGMC) – a partner agency that has several of its buildings equipped with indoor navigation technology and will also host a kiosk.

It is important to note that some locations and components of the system have limited capacity to support big group sizes—for instance the hospitals and shuttles. Based on this, the project team will plan several tours/rounds of each demonstration scenario and to conduct them in dynamic manner as needed to ensure that all participants have an opportunity to experience the services if they desire to.

3.4 Demonstration Events

The demonstration will consist of ten (10) live events (with simulcasting when possible) and a set of simulated/presentation scenarios. Each scenario will demonstrate one or more use cases

through the perspective of different personas, allowing us to demonstrate one or more accessibility features for people with different abilities.

The demonstration scenarios will be structured in a way that ensures an efficient use of the time and a smooth transition between scenarios. The demonstration scenarios are detailed in Table 22 through Table 31.

NOTE - Test Procedures: Each demonstration scenario provides a high-level description of its procedure. Detailed step-by-step instructions of all tests associated with a scenario are provided in the individual Test Cases associated with each User Case, and therefore each scenario. Appendix B provides a traceability matrix between System Requirements, Test Cases and Use Cases.

3.4.1 Demonstration Scenario #1 – Registration and User Management Functions

Table 22. Demonstration Scenario #1 – Registration and User Management Functions.

Description	This scenario demonstrates how a user can access the All Access platform by downloading it into a smartphone or through the All Access website. Furthermore, this scenario shows how to register, as well as the app/website capabilities and accessibility features.
Presenters	**Team Member**: A representative from the All Access app development team.
Logistics	• Demonstration will take place at conference room within the Innovation Center. • Simulcasting process in screens. • The demonstration will be done on all available platforms (website and iOS/Android mobile app).
Objectives	• Show the availability of the application in the different app stores. • Demonstrate the registration process and trip making/editing capabilities, including Coordinator profiles. • Highlight the accessibility features of the application, particularly how the app intakes the user's capabilities, needs and preferences. • Show integration of mobility alternatives with the All Access app.
Use Cases Covered	• **Use Case #1:** Register Profile and Preferences

Demo Procedure	1. **All Access App/Website:** Download the application for both Android and IOS platforms and reach the registration page. The same will be done through the website. 2. **Registration and Terms and Conditions:** Sign up and review Terms and Conditions page. Receive MFA code to complete registration. 3. **Set Up Account:** Set up profile of the user by adding contact information, home address, primary coordinator information, enhanced mobility options. 4. **Profile Account:** Access the profile page and review each account option. o Profile Information – edit profile information. o Coordinators –manage coordinators. o Favorites - manage favorite places/locations. o PAL – access the link to PAL and indicate how PAL users can access their PAL account. o Feedback – provide feedback for a random category. o Terms and Conditions – review the terms and conditions. o Help – access help site. o Log Out – Log out of the app (log back in before Step 5). 5. **Settings**: Access the settings alternatives and review each alternative. o Trip Preferences – preferences in terms of wheelchair accessibility, service animal, walking distance, number of transfers, and modes of transportation. o Accessibility – review accessibility features, such as sound (voiced) navigation directions, language, and modes of alerts (push, SMS or phone). o Notifications – review the categories of traveler notifications, such as trip start, shuttle arrival, or delays. o Password – replace current password.
Notes	-

3.4.2 Demonstration Scenario #2 – Generate Trip Plan and Book a Trip

Table 23. Demonstration Scenario #2 – Generate Trip Plan and Book a Trip.

Description	This scenario demonstrates how the All Access platform generates trip plans that integrate existing transit modes (e.g., metro and bus).
Presenters	**Team Member**: A representative from the All Access app development team.
Logistics	• Demonstration will take place at conference room within the Innovation Center. • Schedule mock trips from/to locations across the covered area. • Simulcasting trips scheduling process on screens (or show pre-recorded video). • The demonstration will be done on available mobile platforms (iOS/Android mobile app).
Objectives	• Showcase area covered. • Demonstrate integration with existing transit services. • Create trip plans, with at least one using the Natural Language Service (NLS) – a chat assistant for users with visual impairments built on top of the OpenAI platform. • Showcase notifications (trip status, etc.) based on the user's preferences.
Use Cases Covered	• **Use Case #2:** Generate Trip Plan and Book a Trip • **Use Case #3:** Public Transport Services

Demo Procedure	1. **Open All Access App/Website:** Open All Access mobile app and log in. 2. **Explore Mode:** move map around to update available routes based on current location. 3. **Schedule Mock Trip 1:** Schedule a trip from the Innovation Center to VIA. o Hit the “Schedule New trip” button at the top and input desired origin, destination and time of trip (e.g., leaving now). o Save address into profile as a favorite and provide a nickname. o Select preferred mode(s) of transportation. Note that the default is walking. o Select desired trip itinerary from list of choices. o Validate selection by clicking “schedule trip”. o Schedule trip is now available on the “Upcoming Trips” and “Trip History” pages. o Click into the trip plan and cancel the trip. 4. **ALTERNATE Schedule Mock Trip 2:** Schedule the same trip from the Innovation Center to VIA, this time through the chat assistant feature. o Hit the “Schedule New trip” button at the top. o Hit the NLS icon at the top right and then click the blue icon to initiate. o Once green (or after the sound and haptic notification), provide the details of the desired trip. o Follow instructions to complete scheduling the trip.
Notes	-

3.4.3 Demonstration Scenario #3 – Navigation (Outdoor / Indoor)

Table 24. Demonstration Scenario #3 – Navigation (Outdoor / Indoor).

Description	This scenario demonstrates the All Access capability to provide wayfinding guidance, both outdoor and indoor. This scenario will also demonstrate the intersection crossing support system (PED-X) on designated locations.

Presenters	**Team Member**: A representative from the All Access app development team. **Persona:** Local Co-presenter.
Logistics	• More than one trip may be needed to demonstrate both outdoor and indoor navigation. • Ensure trip path passes through a PED-X enabled intersection.
Objectives	• Demonstrate PED-X actuation. • Showcase notifications (turn-by-turn wayfinding indoor and outdoor). • Successful transition from outdoor to indoor navigation.
Use Cases Covered	• **Use Case #2:** Generate Trip Plans • **Use Case #4:** Navigation • **Use Case #10:** Pedestrian Crossing Support
Demo Procedure	1. **Open All Access App/Website:** Open All Access mobile app and log in. 2. **Schedule Trip:** Schedule a trip from the Innovation Center to a location within BGMC. o Hit the “Schedule New trip” button at the top. o Used the saved addresses in the profile to input desired origin. Select a location within BGMC as the destination (potentially the kiosk) and specify the time of trip (e.g., leaving now). o Do not select a mode(s) of transportation to obtain a walking itinerary. o Validate selection by clicking “schedule trip”. 3. **Execute Trip**: Initiate your scheduled trip to reach the destination. o Select your planned trip and hit “GO” to start. o Follow wayfinding guidance. o Once near the Ellicott & High intersection, click on the (PED-X) prompt on the screen to request the pedestrian signal phase. o Continue to follow directions until reaching the destination. 4. **Provide Feedback**: When prompted, provide a star rating between one and 5 based on experience.

Notes	**-**

3.4.4 Demonstration Scenario #4 – Transportation Information Hubs

Table 25. Demonstration Scenario #4 – Transportation Information Hubs.

Description	This scenario demonstrates the All Access platform as it operates within the TIH (kiosk), as well as their accessibility and other characteristics.
Presenters	**Team Member**: A representative from the All Access app development team. **Persona:** Local Co-presenter.
Logistics	• There are two locations with kiosks. This scenario will be demonstrated at the BGMC, with a visit to the Summer/Best Station later (before Scenario #5). • Each kiosk acts as a fixed location, so shuttle requests always have the kiosks as the origin location. • The user of the kiosk needs to be an account holder to book a community shuttle.
Objectives	• Visit locations of kiosks (within Summer Best Station and BGMC). • Demonstrate kiosk's accessibility features and capabilities. • Create trip plans and explore transit options with the kiosk.
Use Cases Covered	• **Use Case #2:** Generate Trip Plans • **Use Case #6:** Alternate Trip Planning and Shuttle Service Reservation and Dispatch

Demo Procedure	1. **Open All Access App/Website:** Open All Access app within the kiosk and verify identity to initiate session. 2. **Explore Mode**: Move map around to update available transit routes based on current location. 3. **Schedule a HDS Trip:** Schedule a HDS trip from BGMC to Library. o Press the “NFTA Community Shuttle" button at the top. o Enter destination (Library - 1324 Jefferson Ave, Buffalo, NY 14208) and select trip plan. o Press “Summon Shuttle” and enter PIN and phone number when prompted. 4. **Take HDS:** Ride the shuttle to Library to complete trip. Feedback can be provided from the smartphone only, not the kiosk.
Notes	-

3.4.5 Demonstration Scenario #5 – Trip Plan Disruption

Table 26. Demonstration Scenario #5 – Trip Plan Disruption.

Description	This scenario demonstrates how the platform deals with disruptions in trip plans, such as missing bus, delays to bus or missing a turn.
Presenters	**Team Member**: A representative from the All Access app development team. **Persona:** Local Co-presenter.
Logistics	• Parallel trip plans may be needed to demonstrate more than one disruptive action. • Group will need to walk from VIA to Sumer-Best Station. • Trip path may not pass through a PED-X enabled intersection if the origin-destination pair does not include one of the equipped intersections.
Objectives	• Demonstrate real-time tracking and adaptive capability of the All Access platform. • Showcase notifications (turn-by-turn wayfinding indoor and outdoor). • Successful transition from outdoor to indoor navigation.

Use Cases Covered	• **Use Case #2:** Generate Trip Plans • **Use Case #4:** Navigation • **Use Case #9:** Manage Incidents
Demo Procedure	1. **Open All Access App/Website:** Open the All Access mobile app and log in if needed. 2. **Schedule Trip:** Schedule a trip from the current location to Innovation Center. o Request HDS from mobile app. o HDS will drop group off at the Ellicott and Carlton Streets intersection. o Use the “current location” as the origin and select the Innovation Center as the destination. Specify the time of the trip (e.g., leaving now). o Select the “walk” mode of transportation to obtain path alternatives. o Validate selection by clicking “Schedule Trip”. 3. **Execute Trip**: Initiate your scheduled trip to reach the destination. o Select your planned trip and hit “GO” to start. o Follow wayfinding guidance. o Disrupt the trip plan: ▪ Rather than walking south and straight down Ellicott Street, the group will walk east on Carlton Street and turn south down Washington Street towards the Innovation Center. o Continue to follow directions until reaching the Innovation Center. 4. **Provide Feedback**: when prompted, provide a star rating between one and 5 based on experience.
Notes	**-**

3.4.6 Demonstration Scenario #6 – Human Driven Shuttle

Table 27. Demonstration Scenario #6 – Human Driven Shuttle.

Description	This scenario demonstrates the reservation of a HDS and how passenger pick-up, securement, and drop-off takes place.
Presenters	**Team Member**: A representative from the All Access app development team. **Persona:** Local Co-presenter.
Logistics	• HDS have a max capacity of 25 people, including two wheelchair spaces 8 seating spaces, with the remaining riders standing.
Objectives	• Demonstrate the reservation of the HDS and rapid dispatch to comply with request. • Showcase notifications (trip status, arrival of shuttle, ETA to destination). • Demonstrate HDS functional and operational capabilities—similar to PAL service. • Demonstrate safety features. • Successful guidance and transition to indoor navigation (within VIA) from outdoor (dropoff area). • Successful completion of trip.
Use Cases Covered	• **Use Case #2:** Generate Trip Plans • **Use Case #4:** Navigation • **Use Case #6:** Alternate Trip Planning and Shuttle Service Reservation and Dispatch • **Use Case #8:** Passenger Pick-up, Securement, and Drop-off via the HDS

Demo Procedure	1. **Open All Access App/Website:** Open the All Access mobile app and log in if needed. 2. **Schedule Trip:** Schedule a trip from the library to VIA. o Hit the “Schedule New trip” button at the top. o Use the “current location” as the origin and select the Innovation Center as the destination. Specify the time of the trip “Leaving Now”. o Select the “Community Shuttle” mode of transportation to obtain shuttle itineraries. o Select desired itinerary and validate selection by clicking “Schedule Trip”. 3. **Execute Trip**: initiate your scheduled trip to reach the destination. o Select your planned trip and hit “GO” to start. o Monitor notification on status of shuttle. o Follow guidance to travel from within VIA to pick up location and embark shuttle upon arrival for pickup. o Disembark shuttle upon arrival to the destination. 4. **Provide Feedback**: When prompted, provide a star rating between one and 5 based on experience.
Notes	-

3.4.7 Demonstration Scenario #7 – Coordinator

Table 28. Demonstration Scenario #7 – Coordinator.

Description	This scenario demonstrates the coordinator profile and its capability to monitor trips of travelers associated with them.
Presenters	**Team Member**: A representative from the All Access app development team. **Persona:** Several personas within the traveling group with similar trip plans and associated with the same Coordinator.

Logistics	• Set up profile at conference room within the Innovation Center, before assigned travelers begin their trips. • Simulcasting process in screens. • Demonstration will take place live as participants (travelers) travel through the different trips plans based on Scenarios 3, 5 and 6.
Objectives	• Demonstrate the registration process for Coordinators. • Demonstrate the Coordinator's capabilities.
Use Cases Covered	• **Use Case #1:** Register Profile and Preferences
Demo Procedure	1. **Open All Access App/Website:** Open the All Access mobile app or website and log in if needed. 2. **Enter Coordinator View:** Complete security and verification protocol to view trips from associated travelers. 3. **Follow Assigned Travelers:** o Review list of travelers assigned to the Coordinator. o Monitor each trip plan and notifications as each trip progresses. Note that no actions can be taken other than calling the traveler or mobility provider directly if the Coordinator detects an issue with the trip.
Notes	**-**

3.4.8 Demonstration Scenario #8 – Performance Measurement Dashboard

Table 29. Demonstration Scenario #8 – Performance Measurement Dashboard.

Description	This scenario demonstrates how data is collected from travelers, both trip-related data and user satisfaction/feedback data. This scenario also illustrates how the data is ingested, analyzed and visualized. Note that the three main data are pre-deployment survey, post-deployment survey and CTP trip data. The dashboard is created via RShiny platform. This demonstration will show how to access a secure server, show the data collected and apply the routine scripts. The demo will also show how the dashboard is updated with the new data. The dashboard is open to anyone via a url.
Presenters	**Team Member**: A representative from the All Access - PMD development team.
Logistics	• Ensure that feedback is provided throughout previous scenarios. • Download data and feedback from all trips made during previous Scenarios. • Demonstration will take place at conference room within the Innovation Center.
Objectives	• Demonstrate how users can provide feedback through in-app forms and links to customer satisfaction surveys. • Showcase the PMD’s capability to visualize data and performance measures.
Use Cases Covered	• **Use Case #5:** Reporting and History

Demo Procedure	1. **Open All Access app:** Open the All Access mobile app or website and log in if needed. 2. **Review Trips Taken:** Review trips from Scenarios 3, 5, and 6. 3. **(As Presenter) Review How to Provide Feedback** o Show the customer satisfaction rating prompt. o Demonstrate how to provide ratings through the app. o Present the feedback forms from the app. o See trip history from web/mobile app. o Show how to provide feedback on previous trips. o Review the post-deployment survey. 4. **(As Presenter) Open PMD:** Illustrate the dashboard and its capabilities. o Show how to access a secure server, show the data collected and apply the routine scripts. o Show how the dashboard is updated with the new data. o Present performance measures in figures and tables in the dashboard. o Demonstrate the function of downloading surveys and CTP trip data in the UB server and then processed into a metric in the dashboard. o Show how many records are attributed from surveys and CTP trip data. Note that currently and temporarily the PMD is located at rsginc.shinyapps.io/BuffaloAccess-PM-Dashboard/, with no login credentials required. Later on, the dashboard will be migrated to an UB IT Secure server where only PMD development team members with approved log-in credentials can access, process and update the data and dashboard using the process routine scripts.
Notes	-

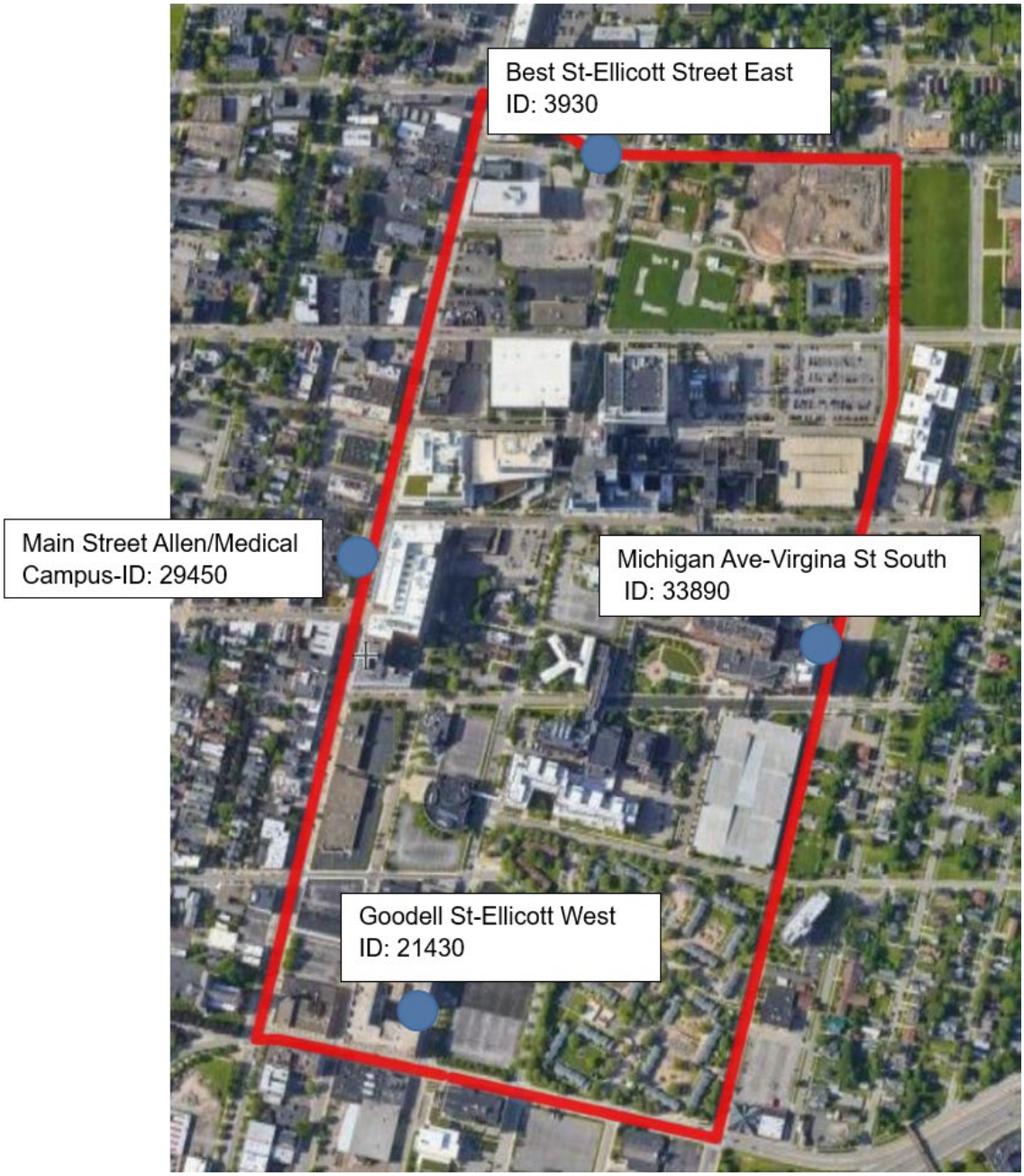
3.4.9 Demonstration Scenario #9 – Self Driven huttle

Table 30. Demonstration Scenario #9 – Self Driven Shuttle.

Description	This scenario is intended to demonstrate the Operations of the Self-Driving Shuttle (SDS) while in an Autonomous Driving Mode, and the integration between the SDS and the Buffalo All Access app. It includes several elements including the ability for the SDS to stop at the pick-up and drop-off location, the opening and closing of the doors, the deployment of the ramp for any mobility-challenged passengers to get on or off the shuttle, the ability of the SDS to detect vehicles, pedestrians and other obstacles, the ability to drive in mixed traffic, the ability to use the app to reserve a trip on the SDS, and the receiving of ETA of the SDS from both the app, as well as the SDS passenger information system.
Presenters	**Team Member:** A representative from the ADASTEC team and a representative from the Buffalo All Access team overseeing the deployment of the SDS.
Logistics	• The SDS has a max seating capacity of 25 people, including two wheelchair spaces. • Travelers will make a reservation for a trip on the SDS, with a pick-up location at the Main Street-Allem/Medical Campus stop, while at the Innovation Center (IC) building. They will then walk to the Man Street-Allen/Medical Campus stop to get on-board the bus. • Following the conclusion of the SDS presentation made by the Buffalo All Access and ADASTEC team members in the IC building, the participants will head out to board the SDS. • Participants will have the opportunity to inspect the different subsystems and components of the SDS.

Objectives	• Demonstrate SDS functional and operational capabilities as it relates to safe autonomous driving within mixed traffic and the ability to stop and pull off at the designated bus stops. • Demonstrate the ability of the SDS to be driven both autonomously as well as manually. • Showcase safety and accessibility features of the SDS, including the wheelchair ramp and securement system, the handrails, emergency buttons, etc. • Showcase SDS passenger information system capabilities. • Showcase the integration between the SDS and the Buffalo All Access app.
Use Cases Covered	• **Use Case #7:** Passenger Pick-up, Securement, and Drop-off via the SDS

Demo Procedure	1. **Hail SDS.** Summon the SDS from the Innovation Center to Main Street-Allen Medical Station, and walk over to the Main Street-Allen Medical Campus stop. 2. **SDS arrives at SDS Stop, Open SDS Doors and Deploy Ramp if needed:** Upon arriving at the Main Street-Allen/Medical Campus stop, the SDS opens the doors and deploys the ramp, if needed, for participants to alight. 3. **Close SDS Doors and Secure any wheelchair passenger:** After all participants get on the SDS, the SDS closes the doors and, if needed, the Safety Steward helps secure any wheelchair passenger. 4. **Execute Autonomous Driving Trip, with origin O1 (Main Stret-Allen Medical Campus), and Final Destination, D1 (Goodell-Ellicott Street stop)**: o The SDS starts the autonomous driving trip starting at O1, and final destination, D1. o Throughout the autonomous trip, the participants will get the opportunity observe the ability of the SDS to: 1) drive autonomously in mixed traffic; 2) detect vehicles, pedestrians and other obstacles; 3) obey traffic rules; 4) stop at bus stops, open and close SDS doors; and 5) utilize the passenger information systems onboard the SDS including the ability to observe upcoming stops, ETA to the next stop as well as the onboard SDS announcement systems. 5. **Switch back to Manual Driving and drive back to IC Building**: Upon the arrival of the SDS at the final destination stop for the autonomous driving trip and the opening and closing of the doors at the final destination, the safety steward will switch back to manual driving and drive the SDS back to the IC building where the participants will get off the bus.
Notes	**-**



Source: Buffalo, NY ITS4US

Figure 6. Map showing the Self-Driving Shuttle's Route for Demonstration Scenario #9.

3.4.10 Demonstration Scenario #10 – Call Center

Table 31. Demonstration Scenario #10 – Call Center.

Description	This scenario demonstrates how the Call Center staff can assist with creating an All Access account for users.
Presenters	**Team Member**: A representative from the All Access app development team.
Logistics	• Demonstration will take place at conference room within the Innovation Center. • Simulcasting trips scheduling process on screens.
Objectives	• Showcase area covered. • Demonstrate call center staff interaction with traveler with internet or mobile devices access but cannot create All Access account. • Showcase steps to assist traveler successfully create All Access account.
Use Cases Covered	• **Use Case #2:** Generate Trip Plan and Book a Trip • **Use Case #3:** Public Transport Services • **User Case #6:** Alternate Trip Planning and Shuttle Service Reservation and Dispatch
Demo Procedure	1. **Open Call Center NFTA Dispatch Software:** Open NFTA Dispatch Software website (user will already be logged in as call center staff). • **Mimic Use Case:** perform verbal steps that call center staff must take to collect name, phone number, and email. • Call center staff confirms that user does have access to email. • Call center staff creates a new user and instructs traveler how to confirm new account. o Show confirmation of account creation for traveler account.
Notes	-

3.5 Demonstration Presentations

Some demonstrations will be in the form of presentation, as they are not conducive to real world demonstration. Examples of these are the description of security and safety protocols in case of attacks or major incidents, such as a crash. The project team plans to discuss the procedures to deal with the following cases:

- **Monitoring Capabilities of the CTP** – showcase how the All Access platform deals with components being down or out of order.
- **Community Shuttle Incident** – explain how NFTA deals with incidents (SDS and HDS), including disruptions to trip plans.
- **Data Privacy and Security** – detail the protocols in place strip personally identifiable information (PII) data and securely store data.
- **Call Center Capabilities** – demonstrate through mock scenarios the key capabilities of the call center, such as providing general support and step-by-step guidance on how to install the mobile app, register as a user, and troubleshoot.
- **Hardware Maintenance** – showcase the maintenance procedures associated with each hardware.

3.6 Responsibilities

Table 32 lists the roles and responsibilities for everyone who will be part of the operational readiness demonstrations.

Table 32. ORTP Responsibilities

Name	Responsibility	Training Needs
Robert Jones	Demonstration Co-Lead NFTA Concept Lead	None – already familiar with the All Access platform.
Jamie Hamman-Burney	Demonstration Co-Lead BNMC Project Delivery Manager	None – already familiar with the All Access platform.
Kelly Dixon	Demonstration Co-Lead GBNRTC Project Management Lead	None – already familiar with the All Access platform.
Development Team	Ensure the system works as intended. Serve as Coordinator in Scenario 7 and as Call Center in Scenario 10.	None – already familiar with the All Access platform.
Tester (Driver)	Drive NFTA's HDS	Driver will be trained on how to view new requests from the All Access app.

Name	Responsibility	Training Needs
Tester (TBD)	IOO and User Group Representative - VIA	Trained in how to use the All Access platform and accessibility features.
Tester (TBD)	IOO and User Group Representative - BGMC	Trained on how to use the All Access platform and accessibility features.
USDOT/Noblis	Witness / Participants	Trained on test cases and acceptance criteria. As participants in the demonstrations event, trained on how to use the All Access Platform.

3.7 Risks and Contingencies

Table 33 list of all known risks and contingency plans, with emphasis on the operational readiness demonstrations.

Table 33. ORDP Risks

ID	Risk	Contingency
ORP-1	System Component Down	The team is actively testing all components of the system and how well integrated they are. There is a continuous complete system test ongoing to ensure that all components are working properly. The team expects that in the event of a malfunction, the demonstration could go on as long as it does not critically affect the functionality of the All Access platform.
ORP-2	System Component Not Installed	Except for the SDS, which is a turnkey solution that does not need installation, all key system-level components of the systems are fully developed. Installation of the PED-X system. Kiosks, and indoor beacons are complete. The project team sees a very low risk in not having all available equipment installed for the first demonstration date.
ORP-3	Insufficient Data	Both quantity and quality of data need to be satisfactory for a successful test and demonstration. The Agile development process has allowed us to constantly test for both data criteria at a system operation level. The risk lies in not obtaining sufficient quality data from participants. To address this, the project team will train participants in the demonstration on how to provide data and will remind them every time a trip is concluded to provide their input.

ID	Risk	Contingency
ORP-4	Environmental Condition Not Appropriate	The demonstration is expected to take place during September 9-11, 2025 when it is not typical to experience severe weather. The project team will monitor for rain and will adapt the demonstration scenarios as needed.
ORP-5	No Access to Envisioned Locations	The team is closely working with all partners to ensure that access to the different sites within the project area are available for the demonstration and throughout the project. It is important to note that all of our hardware is moveable, so in case of extreme circumstances, the project team can evaluate the alternative to move them to an alternate location—e.g., move kiosks from one station to another.

3.8 Approvals

Table 34 provides the template for the approval sheet of the tests performed during the demonstration event in this section or in this document.

Table 34. Template for Approval Sheet.

Approver Name	Approver Signature	Approval Date
Test	-	[MM/MM/YYYY]
Tester Lead	-	[MM/MM/YYYY]
Witness	-	[MM/MM/YYYY]

4 References

Gopalakrishna, D., Urena Serulle, N., Peck, C., Sadek, A., Jones, R., Maisel, J. L., . . . Shi, Y. (2021). *Phase 1 Concept of Operations (ConOps) – Buffalo NY ITS4US Deployment Project - FHWA-JPO-21-860.* Washingon, DC: Federal Highway Administration. doi:https://doi.org/10.21949/1527520

Okunieff, P., & Weibler, D. (TBD). *System Test Plan - Buffalo, NY ITS4US Deployment Project .* Washington, DC: Federal Highway Administration.

Okunieff, P., Gopalakrishna, D., Urena Serulle, N., Peck, C., Sadek, A., Jones, R., . . . O'Sullivan, K. (2022). *Phase 1 System Requirements Specification (SyRS) – Buffalo NY ITS4US Deployment Project.* Federal Highway Administration. doi:https://doi.org/10.21949/1527560

Appendix A. Definitions, Acronyms, and Abbreviations

Table 35 lists the acronyms used in this document.

Table 35: Acronyms.

Acronym	Description
API	Application Programming Interface
BNMC	Buffalo Niagara Medical Campus
CAV	Connected Automated Vehicles
CoB	City of Buffalo
ConOps	Concept of Operations
CPT	Complete Trip Platform
CS	Community Shuttle
CTP	Complete Trip Platform aka Buffalo All Access App
DOT	Department of Transportation
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GBNRTC	Greater Buffalo-Niagara Regional Transportation Council
HDS	Human-Driven Shuttle
ICD	Interface Control Document
ID	Identification

Acronym	Description
IE	Independent Evaluator
iOS	iPhone Operating System
ITS JPO	Intelligent Transportation Systems Joint Program Office
ITS4US	Intelligent Transportation Systems for Underserved Communities
MTBF	Mean Time Between Failure
MVP	Minimum Viable Product
NFTA	Niagara Frontier Transportation Authority
ORP	Operational Readiness Plan
ORTP	Operational Readiness Test Plan
OST	Office of the Secretary
PAL	Paratransit Access Line
Ped-X	Pedestrian Signal Request
PII	Personally Identifiable Information
PM	Performance Measure
PMD	Performance Measurement Dashboard
PROW	Public Right of Way
RSD	Reservation-Schedule-Dispatch
RSG	Resource Systems Group
RTM	Requirements Traceability Matrix
SaaS	Software as a Service
SDK	Software Development Kit

Acronym	Description
SDS	Self-Driving Shuttle
SI	Smart Infrastructure
SOC	Shuttle Operations Center
SOI	System of Interest
STP	System Test Plan
SyRS	System Requirements Specification
TBD	To Be Determined
TIH	Transportation Information Hub
UAT	User Acceptance Testing
UB	University at Buffalo
UI	User Interface
URL	Uniform Resource Locator
USDOT	United States Department of Transportation

Appendix B. Traceability of Requirements, Tests and Demo Scenario

Table 36 highlights the link between the system requirements, the test cases for each requirement, and the demonstration scenario associated with each requirement. There are some important aspects to note, in no particular order:

1. Not all requirements can be associated to a scenario due to their project/system-oriented nature—for instance, those related to maintenance or data management. To the extent possible, these requirements will be covered through presentations.

2. Most parent requirements are addressed by the addressing traceability of their child requirement, and therefore may not have an assigned test or be linked to a particular set of use cases.

3. This list focuses on Demonstration and Test verification methods. Inspection and Analysis appraoches will be showcased either through a presentation or walkthrough of the equipment.

Table 36. Traceability of Requirements, Tests and Use Cases.

Req ID	Req Title	Test ID	Verification Method	Demo Scenario
Req-CS-001	Manual and Autonomous Driving	-	D	9
Req-CS-003	HVAC System	-	D	9
Req-CS-005	Manual Control	-	D	9
Req-CS-007	Automatic Doors	-	D	9
Req-CS-007.1	Automatic Doors - Open	-	D	9
Req-CS-007.2	Automatic Doors - Close	-	D	9
Req-CS-007.3	Automatic Doors - Malfunction	-	D	9
Req-CS-008	Ramp / Lift	-	D	9
Req-CS-009	Wheelchair Securement	-	D	9
Req-CS-013	Multiple Redundant Communication Radios	-	D	9
Req-CS-014.5	Localization	-	D	9

Req ID	Req Title	Test ID	Verification Method	Demo Scenario
Req-CS-015	Passenger Communication Equipment	-	D	9
Req-CS-017	Onboard Persistent Storage	-	D	9
Req-CS-018	CS Vehicle Health Monitoring	-	D	9
Req-CS-018.1	SDS Sensor Health Monitoring	-	D	9
Req-CS-018.2	SDS Communication Health Monitoring	-	D	9
Req-CS-018.3	SDS Safety Asset Health Monitoring	-	D	9
Req-CS-024	Detect, classify, measure and Interpret Objects	-	D	9
Req-CS-024.1	Detect Vehicles	-	D	9
Req-CS-024.2	Detect Pedestrians	-	D	9
Req-CS-024.3	Classify Objects	-	D	9
Req-CS-024.4	Driving Rule Compliance	-	D	9
Req-CS-025	Motion Planning Algorithm	-	D	9
Req-CS-026	Operations in Mixed traffic	-	D	9
Req-CS-026.1	ODD Rule Set Compliance	-	D	9
Req-CS-026.3	Driving During Inclement Weather	-	D	9
Req-CS-026.4	Avoid Conflicts with Other Vehicles	-	D	9
Req-CS-026.5	Avoid Conflicts with Pedestrians'	-	D	9
Req-CS-026.6	Avoid Fixed Objects	-	D	9
Req-CS-026.7	Avoid Moving Objects	-	D	9
Req-CS-026.8	Navigate with Minimum Clearance	-	D	9
Req-CS-028	Emergency Stop Actions	-	D	9
Req-CS-029	Designated Pickup/Drop off Stops	-	D	9
Req-CS-036.1	SDS on-demand routing and Dispatch	-	D	2, 9
Req-CS-036.2	HDS on-demand routing and Dispatch	-	D	6
Req-CS-041	SDS User Interface Channels	-	D	9
Req-CS-041.1	SDS UI Channel - in-vehicle status audio	-	D	9

Req ID	Req Title	Test ID	Verification Method	Demo Scenario
Req-CS-041.2	SDS UI Channel - in-vehicle status visual	-	D	9
Req-CS-041.3	SDS UI Channel - in-vehicle situational awareness audio/visual	-	D	9
Req-CS-041.7	SDS UI Channel - External announcements and visual cues	-	D	9
Req-CS-041.8	SDS UI Channel - Connection to CTP mobile app	-	D	9
Req-CS-042	Communicate SDS Status	-	D	2, 3, 6, 9
Req-CS-043.1	Track SDS Performance	-	D	9
Req-CS-049.1	SDS Scheduling and Routing	-	D	2, 9
Req-CS-049.2	HDS Scheduling and Routing	-	D	6
Req-CS-050	Monitoring SDS Environment	-	D	9
Req-CS-053	Monitor Passenger Safety	-	D	9
Req-CS-054	Emergency Communications to Passengers	-	D	2, 6, 9
Req-CS-056.1	SDS Update CTP on Trip Management	-	D	2, 3, 9
Req-CS-056.2	HDS Update CTP on Trip Management	-	D	6, 3
Req-CS-058	Driving Rules / MUTCD	-	D	9
Req-CS-060	Low Speed Shuttle	-	D	9
Req-CS-061	Pick-up/Drop Off Location Announcement	-	D	2, 9
Req-CS-064	No trip booking available	-	D	2, 6, 9
Req-CS-068	Pick-up, Drop-off location occupied	-	D	9
Req-CS-069	Delay or missed stop caused by re-route (SDS)	-	D	9
Req-CS-079.1	SDS Multiple Passenger routing	-	D	2, 9
Req-CS-079.2	HDS Multiple Passenger routing	-	D	6

Req ID	Req Title	Test ID	Verification Method	Demo Scenario
Req-CS-080.1	Monitor SDS travel anomalies	-	D	9
Req-CS-080.2	Monitor HDS travel anomalies	-	D	6
Req-CS-087	Accommodations for Service Animals	-	D	2
Req-CS-88.1	Report SDS Operating Status to CTP	-	D	2, 3, 9
Req-CS-88.2	Report HDS Operating Status to CTP	-	D	6, 3
Req-CS-90	3D Map Updates	-	D	9
Req-CS-93	CS Estimated Time of Arrival Service Level	-	D	6, 9
Req-CTP-001	Reservation Planning Services	Req-CTP-001: Check / Book / Confirm / Change / Cancel / View Community Shuttle	T	2, 6, 9
Req-CTP-001.1	Reservations -- check service	Req-CTP-001.1: Check Service Availability	T	2, 6, 9
Req-CTP-001.2	Reservations -- booking service	Req-CTP-001.2: Request / Book Reservations	T	2, 6, 9
Req-CTP-001.3	Reservations -- confirm service	Req-CTP-001.3: Confirm Reservations in CTP	T	2, 6, 9
Req-CTP-001.4	Reservations -- change service	Req-CTP-001.4: Change Reservations in CTP	T	2, 6, 9
Req-CTP-001.5	Reservations -- cancel service	Req-CTP-001.5: Cancel Reservations in CTP	T	2, 6, 9
Req-CTP-001.6	Reservations -- view service	Req-CTP-001.6: View Reservations in CTP	T	2, 6, 9
Req-CTP-009	Pre-populate Trip Mode Preferences	Req-CTP-009: Pre-Populate Preferences	T	1
Req-CTP-010	Pre-populate Trip Location (Origin)	Req-CTP-010: Incorporate Device Location in Trip Plan	T	1
Req-CTP-011	Buffalo and NFTA Service Coverage	Req-CTP-011: Verify NFTA Service Information	T	2
Req-CTP-012	Data of Mobility Services in Project Region	Req-CTP-012: Shared Mobility Options	T	2
Req-CTP-014	Multimodal Trip Planner	Req-CTP-014: Trip Plan Utilizes User Preferences	T	2
Req-CTP-015	Updating Trip Plan	Req-CTP-015: Update Trip Preferences During Trip Planning	T	2
Req-CTP-016	Save Trip Information	Req-CTP-016: Save Trip Information	T	2
Req-CTP-019.1	Integrated Trip Planning -- NFTA fixed route	Req-CTP-019.1: NFTA Travel Options	T	2

Req ID	Req Title	Test ID	Verification Method	Demo Scenario
Req-CTP-019.2	Integrated Trip Planning -- NFTA PAL options	Req-CTP-019.2: NFTA Paratransit Options Available for Trip Plan	T	1
Req-CTP-019.4	Integrated Trip Planning -- CS HDS	Req-CTP-019.4: Integrate CS HDS Options in Trip Planning Mode	T	2
Req-CTP-023	Trip plan optimization for different traveler groups	-	D	2
Req-CTP-028.1	Account settings -- mode	Req-CTP-028.1: Select Mode Preferences	T	1
Req-CTP-028.2	Account settings -- accessibility and support services	Req-CTP-028.2: Accessibility and Support Service Preferences	T	1
Req-CTP-028.3	Account settings -- language	Req-CTP-028.2: Accessibility and Support Service Preferences	T	1
Req-CTP-028.4	Account settings -- notifications	Req-CTP-028.4: Select Notification Preferences	T	1
Req-CTP-028.5	Account settings -- automated request	Req-CTP-028.4: Select Notification Preferences	T	1
Req-CTP-028.6	Account settings -- navigation instructions	Req-CTP-028.6: Navigation Instructions Preferences	T	1
Req-CTP-028.7	Account settings -- communications channels	Req-CTP-028.7: Select Trip Plan Update Notification Methods	T	1
Req-CTP-028.8	Account settings -- favorite places	Req-CTP-028.8: Select Favorite Places	T	1
Req-CTP-028.9	Account settings -- user interface methods	Req-CTP-028.9: Select Methods to Receive Notifications	T	1
Req-CTP-037	CTP Registration	Req-CTP-037: Setup Account, Establish Profile, Select Preferences, Save Trip Plans	T	1
Req-CTP-039	CTP Account user name and password	Req-CTP-039: Reset Password, Retrieve User Name/Password	T	1 (and security)
Req-CTP-041	Assistive Technology Compatibility	Req-CTP-048: Validate PROW Navigation / Wayfinding Information	T	2, 7
Req-CTP-045	Transit and mobility service status information	Req-CTP-045: Verify NFTA / CS Arrival ETA Notification	T	3
Req-CTP-046	Continuous trip planning	Req-CTP-046: Verify Trip Plan Updates Adher to Mobility Preferences	T	3
Req-CTP-047	Rerouting trip plan	Req-CTP-048: Validate PROW Navigation / Wayfinding Information	T	3

Req ID	Req Title	Test ID	Verification Method	Demo Scenario
Req-CTP-049	Indoor Pathway features	Req-CTP-049: Indoor Pathway features	T	3
Req-CTP-050	Geolocate traveler near intersection	Req-CTP-050-Geolocate traveler near intersection-Functional	T	3
Req-CTP-051	Generate PED-X request message	Req-CTP-051-Generate PED-X request message-Functional	T	3
Req-CTP-060	Trip Notification Triggers	Req-CTP-060: Planned Time/Location based Notifications	T	3
Req-CTP-061	Trip Notification of Trip Anomalies	Req-CTP-061: Travel Delay / Change Notifications	T	3
Req-CTP-062	Trip notification to preferred user interface	Req-CTP-062: Notifications via Text / Voice / Haptic	T	3
Req-CTP-063	Trip notification preferences	Req-CTP-063: Notification Preferences	T	1
Req-CTP-066	Trip Planning and mobility options	Req-CTP-066: Rank Order Trip Plans	T	2
Req-CTP-069	CTP User Interface method	-	D	3
Req-CTP-071	CTP language notification selection	-	D	1
Req-CTP-072	CTP language planning selection	-	D	1
Req-CTP-077	Caregiver Designation	-	D	1
Req-CTP-079	Mobility operator service animal policies	Req-CTP-079: Trip Planning Adheres to Service Animal Allowances for Mobility Partners	T	1
Req-CTP-078	Traveling with a service animal	Req-CTP-078: Enable Service Animal for Trip Plan	T	2
Req-CTP-080	Traveler feedback form	Req-CTP-080-Traveler feedback form-Functional	T	3
Req-CTP-102	Test for accuracy		T	3
Req-CTP-118	Reservation accommodating traveler assistive devices	Req-CTP-118: Community Shuttle Assistive Device Information Available for Trip Planning	T	2, 3, 6, 9
Req-CTP-120	Reservation accommodating traveler preferences	Req-CTP-120: Community Shuttle Traveler Assistive Request	T	2, 3, 6, 9
Req-CTP-122	PAL vs. System Responsibility	Req-CTP-014:Multimodal Trip Planner	I	2

Req ID	Req Title	Test ID	Verification Method	Demo Scenario
Req-CTP-123	Contradictory preferences	Req-CTP-123: Trip Plan Conflict Notification with Traveler Preferences	T	2
Req-CTP-125	Trip plan alternatives	Req-CTP-125: Inform Traveler of Alternatives when Trip Plan Cannot be Generated	T	2
Req-CTP-126	Reservations process	Req-CTP-126: Book Trip on Community Shuttle	T	2, 3, 6, 9
Req-CTP-127	No-show vehicles	Req-CTP-127: Community Shuttle Help Number for No-Show	T	2, 10
Req-CTP-134	Account Closure and Removal	Req-CTP-134: Option to Close Account	T	1
Req-CTP-135	Traveler PII Data Removal Request-CTP	Req-CTP-135: Option to Close Account	T	8
Req-CTP-137	Preferences for Caregivers	Req-CTP-037: Setup Account, Establish Profile, Select Preferences, Save Trip Plans	T	7
Req-PMD-001	Ingesting data	Req-PMD-001: Ingesting data	T	8
Req-SI-008	Bluetooth Beacon durability	-	D	3
Req-SI-009	Bluetooth Beacon power	-	D	3
Req-SI-011	Smart Signs -- BLE Beacons	-	D	3
Req-SI-029	TIH environmental conditions	-	D	4
Req-Sy-001	Web browser support	-	D	
Req-Sy-008	Call Center	-	D	2, 10
Req-Sy-009.1	Access to SDS Mobility Services via CTP	-	D	3
Req-Sy-009.2	Access to HDS Mobility Services via CTP	-	D	3
Req-Sy-018	Accessible Vehicles	-	D	6, 9
Req-Sy-032	Mode of Operation -- Normal	-	D	All
Req-SI-035	TIH ADA Compliance	-	D	4

Appendix C. Agenda for the Demonstration Event

ITS4US Buffalo All Access Agenda for Operational Readiness (OR) Demonstration – Tuesday, September 9, 2025

Time (ET)	Topic	Description	Location
8:30-9:30am	Introduction	• Intro of the Team • Review of the OR Purpose and Objective • Review of Agenda • Overview of All Access System and Components	• Innovation Center
9:30-10am	Testing	• Overview of Testing Approach	• Innovation Center

10am – 12pm	Live Demonstrations (1)	• Scenario 1 – Registration and User Functions
		• Scenario 2 – Trip Planning
		• Scenario 7 – Coordinator (1)
		  ○ Overview of capabilities
		• Scenario 8 – Performance Dashboard (1)
		  ○ Overview of survey
		  ○ How to provide feedback
			• Innovation Center
			•

12-1pm	**Lunch Break**		
1-4pm	Live Demonstrations (2)	• Scenario 3 – Trip Execution w/ Coordinator Monitoring • Scenario 4 – Kiosk • Scenario 6 – HDS • Scenario 5 – Trip Disruptions	• BNMC Streets • Buffalo General Medical Ctr. • Frank E. Merriweather Jr Library • Visually Impaired Advancement • Innovation Center
4-4:30pm	Debrief Day 1	• Review of day 1	• Innovation Center

Agenda for Operational Readiness (OR) Demonstration – Wednesday, Sept 10, 2025

Time (ET)	Topic	Description	Location
8-9am	Day 1 Reruns (if needed)	• Rerun of Day 1 Scenarios (if needed)	• Ad hoc
9-10am	Presentation Demonstrations (1)	• Monitoring Capabilities of the CTP • Call Center Capabilities	• Innovation Center
10-11am	Live Demonstrations (3) & Presentation (2)	• Scenario 8 – Performance Dashboard (2) • Data Privacy and Security	• Innovation Center
11-11:30am	Presentation (3)	• Community Shuttle Incident	• Innovation Center
11:30am – 12:00pm	Presentation (4)	• Hardware Maintenance	• Innovation Center
12:00 – 12:30pm	**Lunch Break**		

12:45 – 2:45pm	Self-driven Shuttle Demo (1)	• Bus Sensor & Inspection Walk-Around w/Steward
		  ○ board bus, tour inside and outside of bus
		  ○ includes sensors, doors, safety features, customer systems.
		• Automated Driving (see Demo Scenario #9)
			• Outside Innovation Center
			• Route for Demo Scenario #9

2:45-3pm	**Break to Assemble back at Innovation Center for Hybrid Sessions**		
3-4:45 pm	Self-driven Shuttle Demo (2)	• Operations (ODD Route Selection) • Steward Operation and Safety • Incident Management • Maintenance	• Innovation Center
4:45-5pm	Closing	• Summary of the demonstration event and next steps	• Innovation Center

Agenda for Operational Readiness (OR) Demonstration – Thursday, Sept 11, 2025

Time (ET)	Topic	Description	Location	Presenter(s)
9am-12pm	Day 1-2 Reruns (if needed)	• Rerun of Day 1-2 Scenarios (if needed)	• Ad hoc	• TBD

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