



U.S. Department of Transportation

COMPLETE TRIP

ITS4US

The logo for ITS4US, where the number '4' is stylized as a blue and white graphic with a dashed orange line and two red location pins, suggesting a route or journey.

**Atlanta Regional Commission (ARC)
Phase 1 Performance Measurement and
Evaluation Support Plan Webinar**

November 15, 2021

Agenda

■ Purpose of this Webinar

- To share the submitted Performance Measurement Plan from ARC's Safe Trips in a Connected Transportation Network (ST-CTN) with the stakeholders of the project and ITS4US community.

■ Webinar Content

- Complete Trip – ITS4US Deployment Program Overview (Karen Timpone)
- Site Orientation & Deployment Concept Overview (Maria Roell)
- Performance Measurement and Evaluation Support Plan (Natalie Smusz-Mengelkoch, Randall Guensler)
- Stakeholder Q&A
- How to Stay Connected (Karen Timpone)

■ Webinar Protocol

- Please mute your phone during the entire webinar
- You are welcome to ask questions via chatbox at the Q&A Section
- The webinar recording and the presentation material will be posted on the ITS4US website

Program Overview

Karen Timpone, FHWA, Office of Safety

Program Overview

- A USDOT Multimodal Deployment effort, led by ITS JPO and supported by OST, FHWA and FTA
- Supports multiple large-scale replicable deployments to address the challenges of planning and executing all segments of a complete trip

Vision

*Innovative and integrated **complete trip deployments** to support seamless travel for all users across **all modes**, regardless of **location, income, or disability***

The Complete Trip Concept

Complete Trip: An individual's ability to go from origin to destination reliably, spontaneously, confidently, independently, safely, and efficiently without gaps in the travel chain.



Program Goals



Spur high-impact integrated Complete Trip deployments nationwide



Identify needs and challenges by populations



Develop and deploy mobility solutions that meet user needs

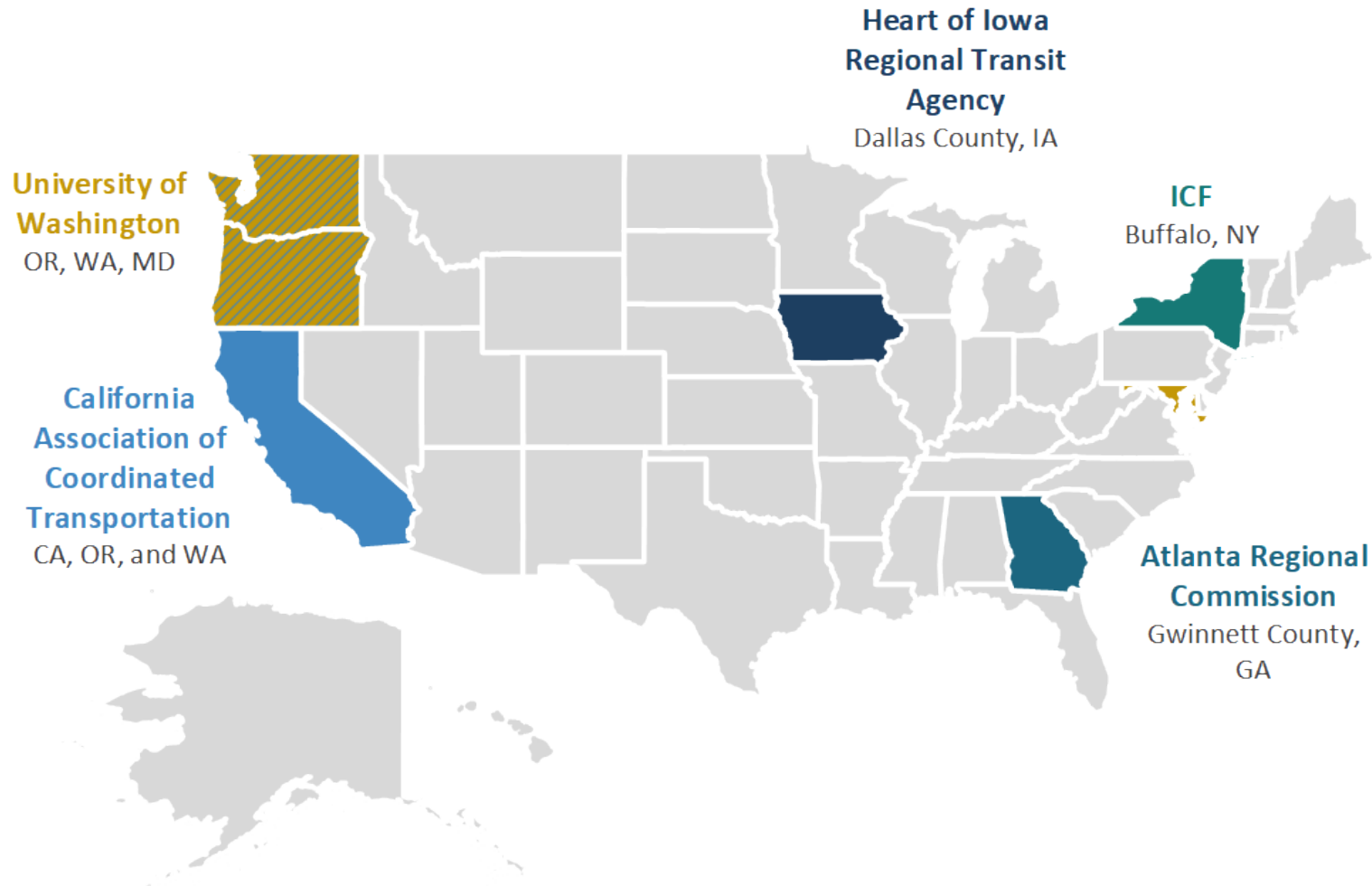


Measure impact of integrated deployments

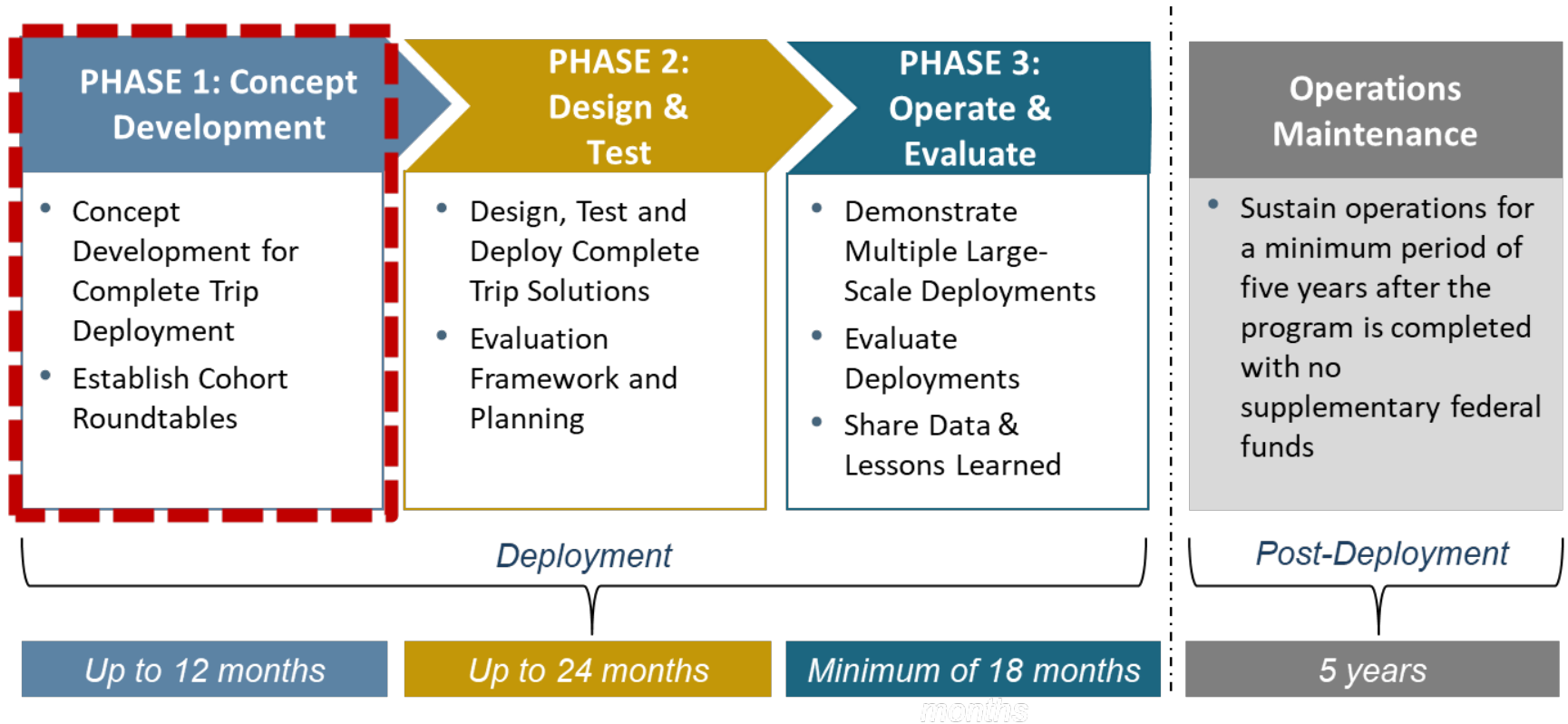


Identify replicable solutions and disseminate lessons learned

Complete Trip Phase 1 Awardees



Deployment Phases



Site Orientation & Deployment Concept Overview

Maria Roell, Concept Development Lead



Project Team and Partners

Partners:

- ARC – Lead
- Gwinnett County
- GDOT
- ATL
- GA Statewide Independent Living Council (SILC)
- Georgia Tech
- Kimley-Horn
- GO Systems and Solutions
- IBI

Executive Management Team:

- Project Management Lead
 - **Kofi Wakhisi (ARC)**
- Deputy Project Manager
 - **Natalie Smusz-Mengelkoch (KHA)**
- Concept Development Lead
 - **Maria Roell (ARC)**
- System Development Lead
 - **Polly Okunieff (GOSS)**
- Community Coordinator Lead
 - **Jordan Hall (SILC)**
- Local Development Lead
 - **Daniel Piotrowski (Gwinnett County)**



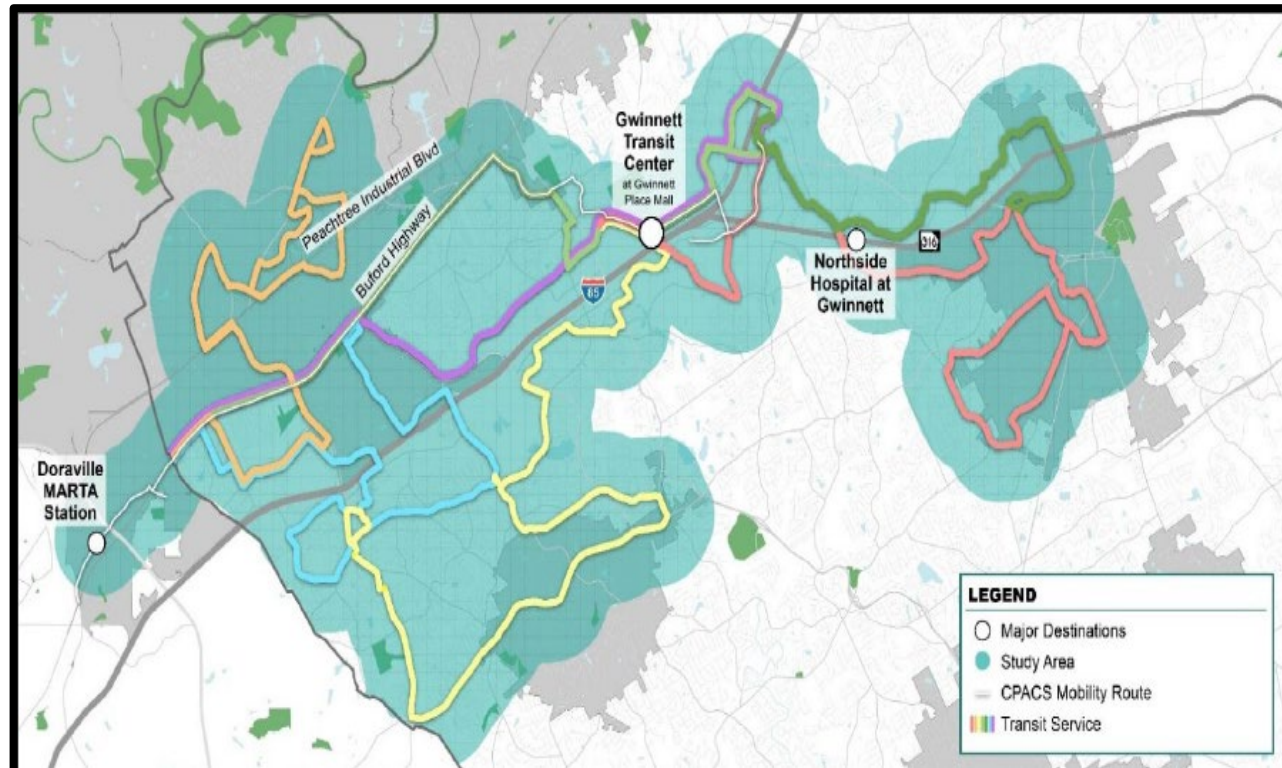
Project Challenges

- Challenge 1 – Lack of knowledge of inadequate pedestrian infrastructure can lead to lengthy detours or inaccessibility.
- Challenge 2 – Lack of transit reliability and added exposure while waiting.
- Challenge 3 – Safety concerns at intersections.

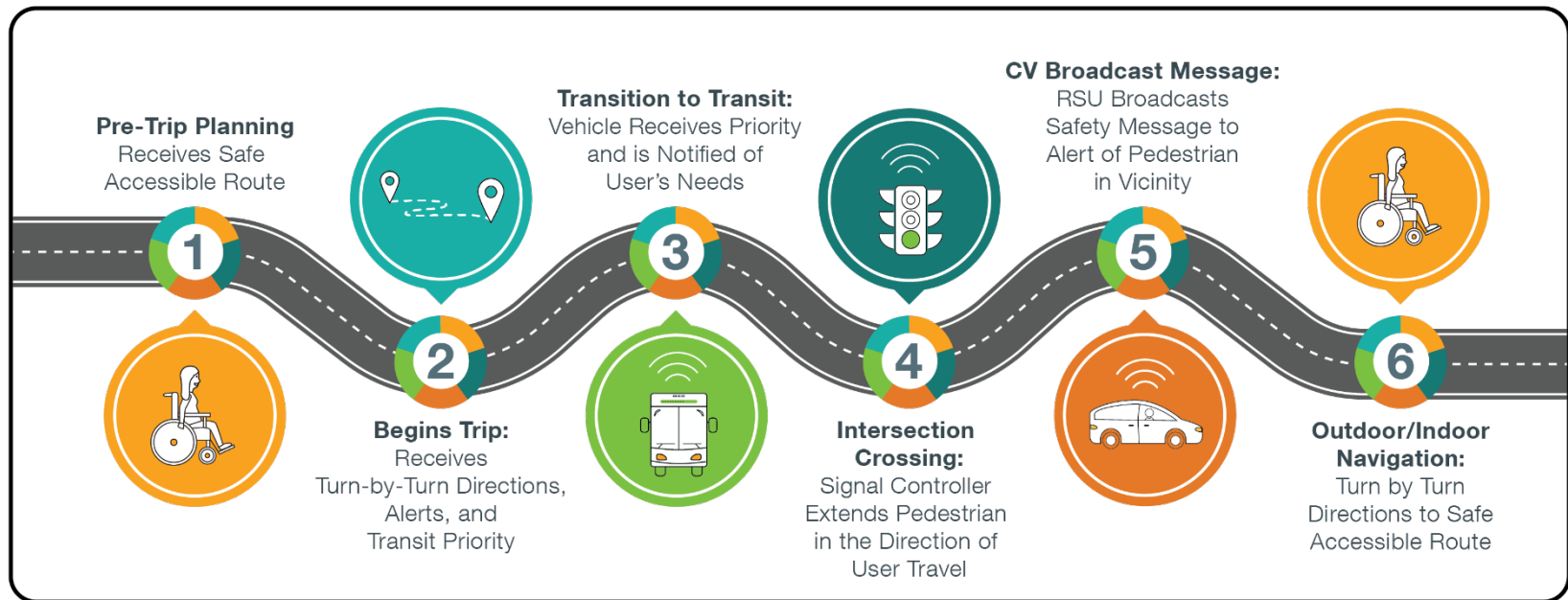


Project Site - Gwinnett County

- Diverse area
- 280,000 residents
- Major transit hubs
- Suburban land use
- Wide and high-speed roadways
- Inconsistent pedestrian infrastructure



Use Case – Wendy’s Complete Trip



Performance Measurement Plan Overview

Natalie Smusz-Mengelkoch &
Randall Guensler



Goals and Objectives: 1

Goal 1: Enhance the traveler's multimodal complete trip experience with the ST-CTN system functions and features, particularly for underserved communities.



- *Objective 1.1* – Provide safe and accessible ST-CTN system functions and features.
- *Objective 1.2* – Increase traveler confidence and independence.
- *Objective 1.3* – Enhance seamless and flexible travel.



Goals and Objectives: 2

Goal 2: Enhance safety for ST-CTN system users, particularly for underserved communities.



- *Objective 2.1* – Reduce transportation-related pedestrian incidents.
- *Objective 2.2* – Reduce transportation-related incidents and near-misses at signalized intersections.
- *Objective 2.3* – Increase driver awareness of pedestrians crossing a signalized intersection.
- *Objective 2.4* – Increase pedestrian awareness of connected and emergency vehicles near intersections.



Goals and Objectives: 3

Goal 3: Improve reliability for system users, particularly for underserved communities.



- *Objective 3.1* – Enhance transit reliability.
- *Objective 3.2* – Reduce traveler transit wait times.
- *Objective 3.3* – Increase transportation system reliability.



Goals and Objectives: 4

Goal 4: Improve mobility and accessibility for system users, particularly for underserved communities.



- *Objective 4.1* – Improve transit travel times as part of on-going TSP operations.
- *Objective 4.2* – Increase traveler knowledge of accessible routes.
- *Objective 4.3* – Increase accessibility at signalized intersections.
- *Objective 4.4* – Implement transit stop requests based on a traveler's planned route.
- *Objective 4.5* - Increase accessibility with infrastructure enhancements.

Performance Measures and Targets (CT-PM-1)

CT-PM-1: Enhance Traveler Experience: Goal 1

Measure of the travelers' ability to program and complete trips using the ST-CTN application. Performance of ST-CTN route and system accessibility; system functions and features; and traveler complete trip experience will be measured.

CT-ME-1.1: Did the system enhance the travelers' complete trip experience?

- ✓ Survey respondents indicate a 5% increase in positive traveler experience.

CT-ME-1.9: Did traveler's access to new destinations increase?

- ✓ Number and variety of destination types accessed increases 2% annually per user.

Performance Measures and Targets (CT-PM-2)

CT-PM-2: Improve Accessibility with ST-CTN: Goals 1 & 4

Measure of the travelers' ability to access employment and other types of trips and how use of the system may impact the traveler's quality of life.

CT-ME-2.1: Did the system enhance the travelers' ability to access destinations (i.e., employment, education, social activities, healthcare, shopping, etc.)?

- ✓ Survey respondents indicate a 5% increase in access to destinations.

CT-ME-2.3: Did travelers access a variety of trip purposes?

- ✓ 10% increase in monthly average number of trips not related to employment or commuting.

Performance Measures and Targets (CT-PM-3)

CT-PM-3: Enhance Complete Trip Pedestrian Safety: Goal 2

Measure of the ST-CTN system impact to pedestrian safety. Analysis of ST-CTN system user perception and pedestrian routing will be done in order to evaluate the system.

CT-ME-3.2: Did travelers deviate from the ST-CTN system recommended routes while crossing signalized intersections (i.e. are travelers receiving the benefits of the ST-CTN intersection crossing features)?

- ✓ Variance between recommended routes and ST-CTN system travel routes decreases over time.

CT-ME-3.4: Did the ST-CTN system enhance the travelers' ability to avoid pedestrian related incidents within the project study area?

- ✓ Decrease of 0.5% in average number near-miss pedestrian related incidents reported by survey response over time.

Performance Measures and Targets (CT-PM-4)

CT-PM-4: Enhance Fixed-Route Transit: Goals 1, 3, & 4

Measure changes in fixed route ridership due to the ST-CTN system.

CT-ME-4.1: Did the ST-CTN system impact fixed-route transit ridership?

- ✓ Increase in average number of fixed-route riders in the ST-CTN project area by 2% over the first eighteen months.

CT-ME-4.4: Did the ST-CTN system enhance fixed-route transit service?

- ✓ Travelers indicate a perception of enhanced fixed-route transit service, particularly to safety, reliability, mobility, and/or accessibility.

Performance Measures and Targets (CV-PM-1)

CV-PM-1: Enhance Safety and Awareness with Connected Vehicles: Goal 2

Measure of pedestrian safety and enabled connected vehicle awareness for pedestrians using the ST-CTN system at signalized intersections. Analysis of travelers' perception of safety, number of completed crossings within walk time, and enabled connected vehicle speeds during PSM broadcast messages will be used for evaluation.

CV-ME-1.3: Did the ST-CTN system improve (reduce) enabled connected vehicle speeds during PSM broadcast messages?

- ✓ The 95th percentile speed will be reduced during a PSM broadcast vs the average speed prior to message broadcast.

Performance Measures and Targets (CV-PM-2)

CV-PM-2: Improve Transit Reliability

Measure of transit reliability to determine the impact of the ST-CTN system.

CV-ME-2.2: Did the ST-CTN system improve transit schedule reliability within the project area?

- ✓ The average distribution of OTP with TSP is narrowed by +/-5%.

CV-ME-2.4: Did the ST-CTN system improve transit traveler missed connections?

- ✓ The number of transit traveler missed connections decrease by 5% within the project area during the first eighteen months.

Performance Measurement Constraints



- **Quality**

- Quality of data while collected, processed, and analyzed

- **Availability**

- Measures reliant on unavailable data were eliminated
- Survey participation
 - Mitigation strategies: incentivizing survey participation, limiting survey questions, and varying survey requests by user.

- **Duration**

- Before-and-after analysis constrained by expedited schedule
- Analysis methodology will accommodate a limited timeframe
- Monitoring and evaluation will continue beyond the initial deployment phases



Confounding Factors

1. Changes in Regional Economy

- COVID-19: potential shutting down of businesses, etc.
- Unemployment

2. Changes to Regional Population and Demographics

- Housing market changes can cause shifts in populations

3. Changes in Regional Travel Behavior

- Working from home trends
- Construction

4. Disruptions in Travel due to Weather

- Extreme heat
- Winter weather

Evaluation Design



Survey

- Short form application feedback requests immediately following their trip.
- Long form feedback requests periodic sent to users

Time Based Assessments

- Before-and-After Study
 - Baseline and final dataset comparisons
- Time Series Study
 - Continuous data analysis of trends

Data Collection, Sharing and Reporting Plan

Randall Guensler & Angshuman Guin



Deployment Data Collection

Data Collected *Through* Deployment System

Trip Feedback Reports	GTFS-Realtime GCT
Traverse Data	PSM
Mobile App Logs	PED-X

Data Collected *Outside* Deployment System

GCT Complaint Log	SPaT
Fixed-Route Transit Ridership	NaviGator
Connection Protection	Roadway Operating Condition



Deployment Data Collection (contd)

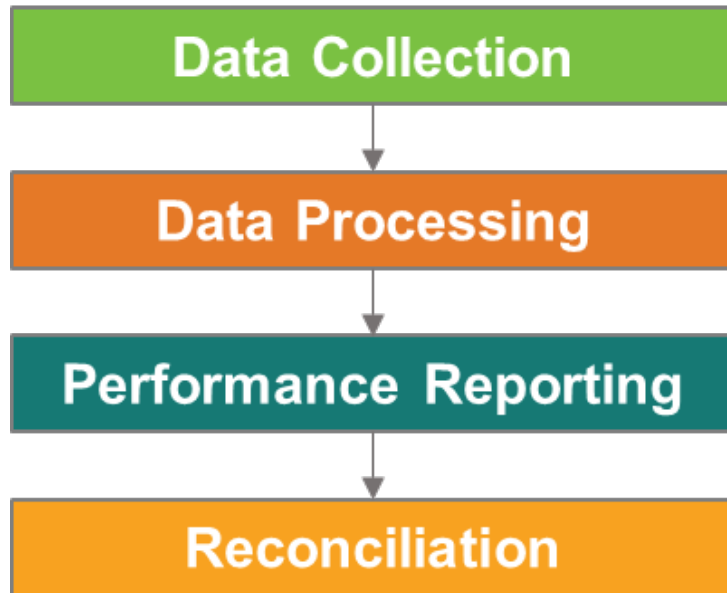
Data Collected Through *Survey/Interview*

- Complete trip traveler experience
- Rating of ST-CTN system features and functions
- Traveler's rating of how the ability to access support from caregiver (if applicable)
- Travelers' rating of access to support from call center
- Number and variety of destination types
- Travelers' rating of destination accessibility
- Travelers' quality of life rating
- Near miss experiences at signalized intersections
- ST-CTN user's perception of safety
- ST-CTN user's perception of fixed-route transit



Deployment Data Quality

Data Quality Management Process



- Data Owner collects and does initial continuity check
- Data Steward receives/ and performs standard continuity check
- Performance Reporter reviews and verifies reasonableness and consistency
- Performance Reporter works with Data Owners and Stewards to resolve errors and issues

Data Sharing

Based on Security Level

- Open Data
 - Pushed to USDOT server
 - Available to Independent Evaluator

- Proprietary Data
 - Available as stipulated in purchase contract

- Personal Identifiable Information
 - IRB Protocols followed
 - Independent Evaluator may access at Secure Data Lab located at Georgia Tech

Reporting

Project Dashboard

- Semi-static Metrics
 - Collected, analyzed and published as available
- Dynamic Metrics
 - Continuously updated to the dashboard

Analysis Code

- Analysis will be reported to the Independent Evaluator

Next Steps

Maria Roell, Concept Development Lead

Next Steps



Phase 2 Performance Measurement Plan Update

- Refine metrics and targets
- Refine survey design
- Refine evaluation design

Coordinate with Independent Evaluator

Stakeholder Q&A

- Please keep your phone muted
- Please use chat box to ask questions
- Questions will be answered in the order in which they were received

Stay Connected

For more information please contact:

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Visit the Complete Trip - ITS4US Deployment Program Website and FAQs:

<https://its.dot.gov/its4us/>

https://www.its.dot.gov/its4us/its4us_faq.htm