



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.

**UW ITS4US Deployment Project
Phase 1 Integrated Complete Trip
Deployment Plan Webinar**

April 26, 2022, 2:00-3:30 PM EST

Agenda

■ Purpose of this Webinar

- To share the submitted Integrated Complete Trip Deployment Plan from University of Washington with the stakeholders of the project and ITS4US community.

■ Webinar Content

- Complete Trip – ITS4US Deployment Program Overview (*Kate Hartman*)
- Site Orientation & Deployment Concept Overview (*Dr. Anat Caspi*)
- Integrated Complete Trip Deployment Plan (*Dr. Anat Caspi & Mark Hallenbeck*)
- Stakeholder Q&A
- How to Stay Connected (*Kate Hartman*)

■ Webinar Protocol

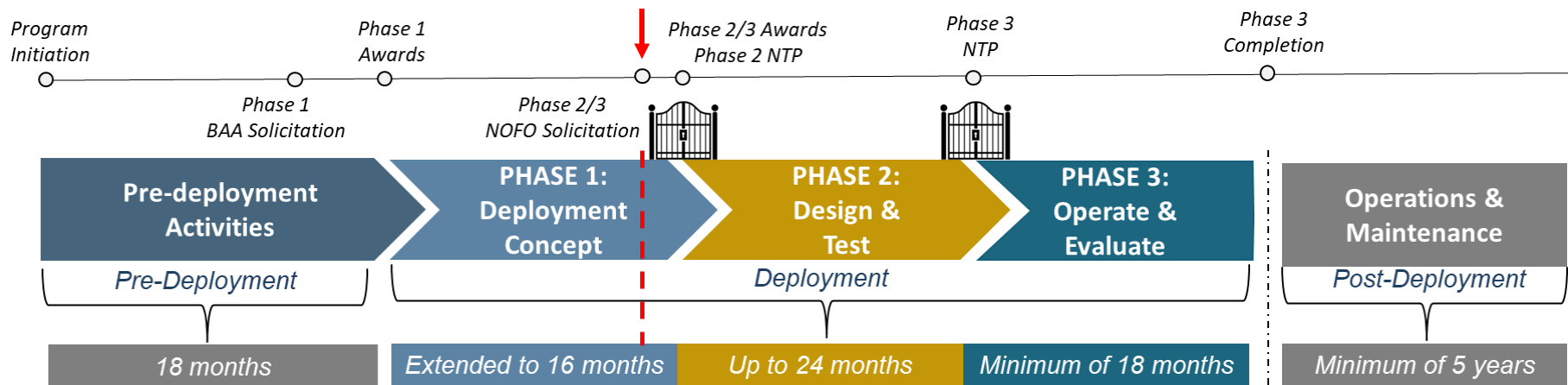
- You are welcome to ask questions via chatbox
- The webinar recording and the presentation material will be posted on the ITS4US website

Program Overview

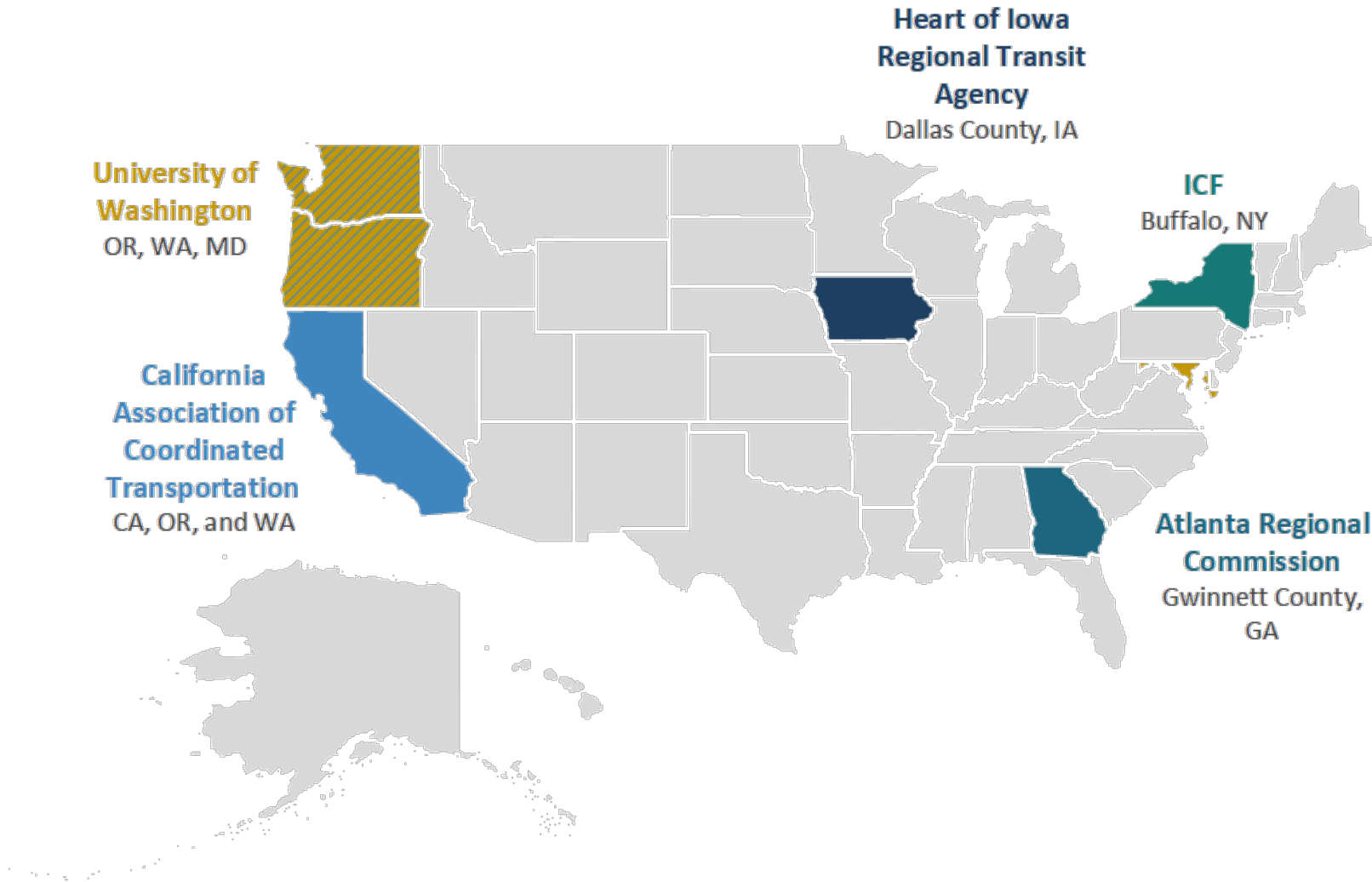
Kate Hartman, USDOT, Site COR

ITS4US Deployment 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



Complete Trip Phase 1 Awardees

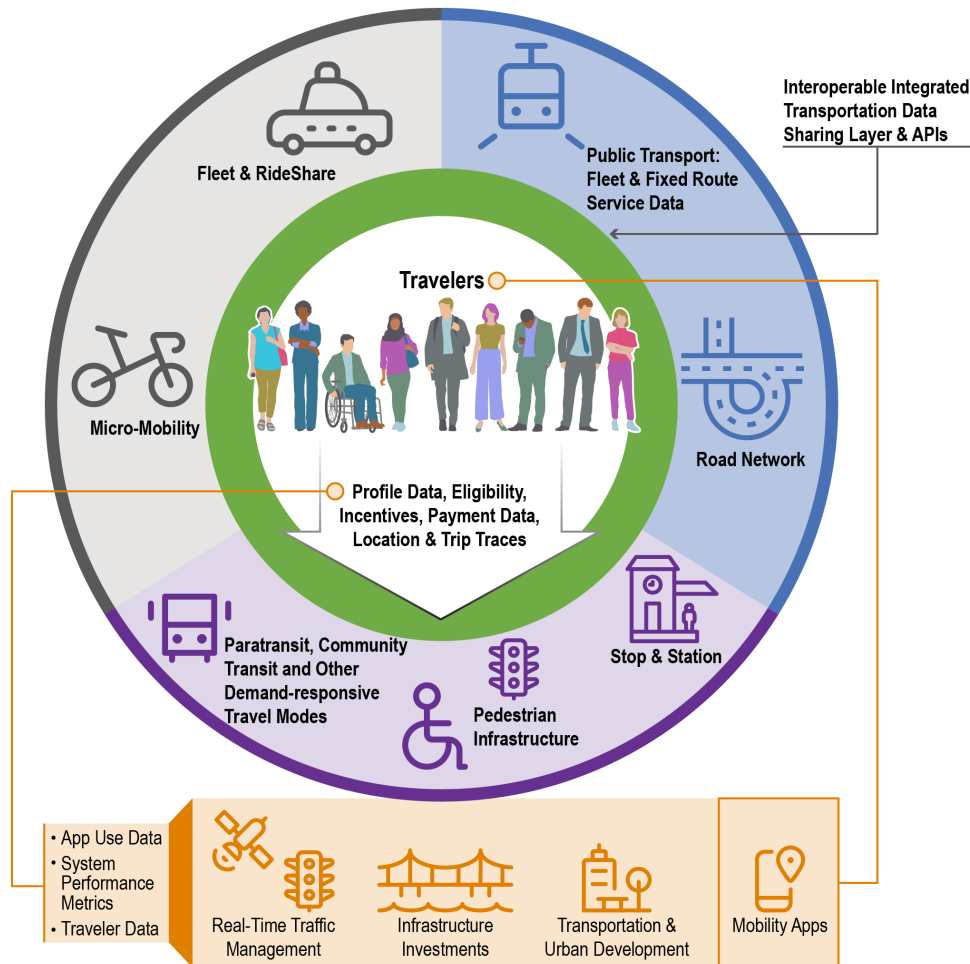


Summary of Phase 1 Deployment Concept

**Dr. Anat Caspi, UW, Deployment
Development Lead**

Transportation Data Equity Initiative Overview

All travelers need useful travel data they can trust.



Complete Trip Information Gaps



Main Project Goals

This project is designed to create, modify and improve data standards and data integration, validation and maintenance tools necessary for modern applications to provide mobility benefits more equitably.



Coordinate collaborative releases of data standards

OpenSidewalks

GTFS-Pathways

GTFS-Flex

Publish and maintain interoperable data infrastructure

Data Collection

Data Vetting

Data Provisioning Services

Deploy and sustain three accessible mobility applications

Multimodal AccessMap

Soundscape

Digital Twin

Complete Trips Informed by Data Standards

Data Standards and Data Infrastructure:

- Multimodal data: sidewalks, travel environments, on-demand transit
- Digitization
- Semi-automated collection
- On-demand and API-based mobility services
- Data pipeline integration
- Data interoperability
- Data sharing
- Open source



Source: Shutterstock: Superstar

Stakeholders

Data Generators

- Municipal infrastructure Owner-Operators
- Private-sector pedestrian-built environment owner-operators
- Elevation Data Provider

Transportation Service Providers

- Transit Agencies
- Community Transit

Data Service Providers

- Crowdsourced Sidewalk Reporters
- Mapping Services
- Weather Data Provider

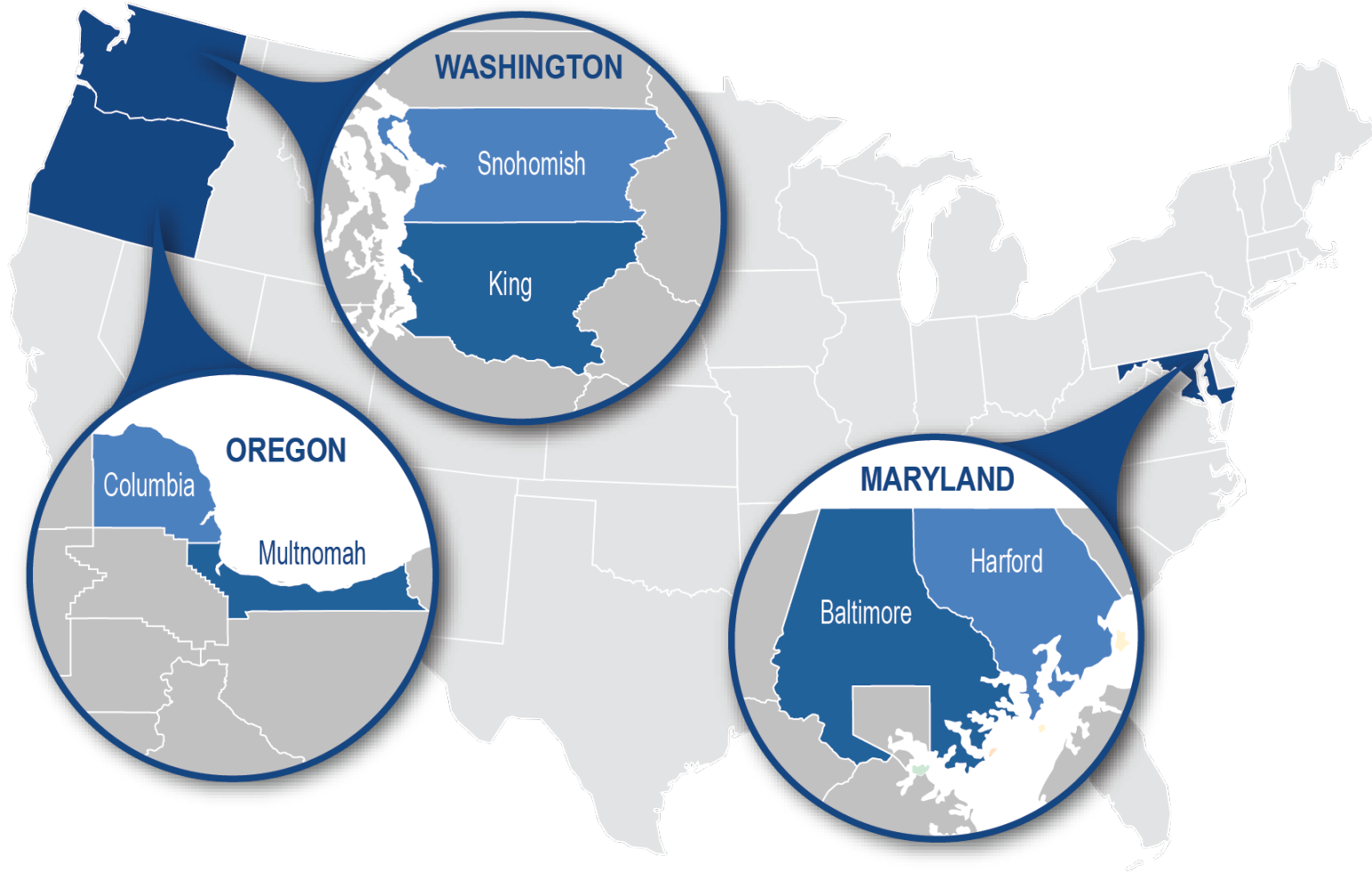
Application Developers

- AccessMap Developers
- Soundscape Developers
- Digital Twin Developers
- Third-Party Application Developers

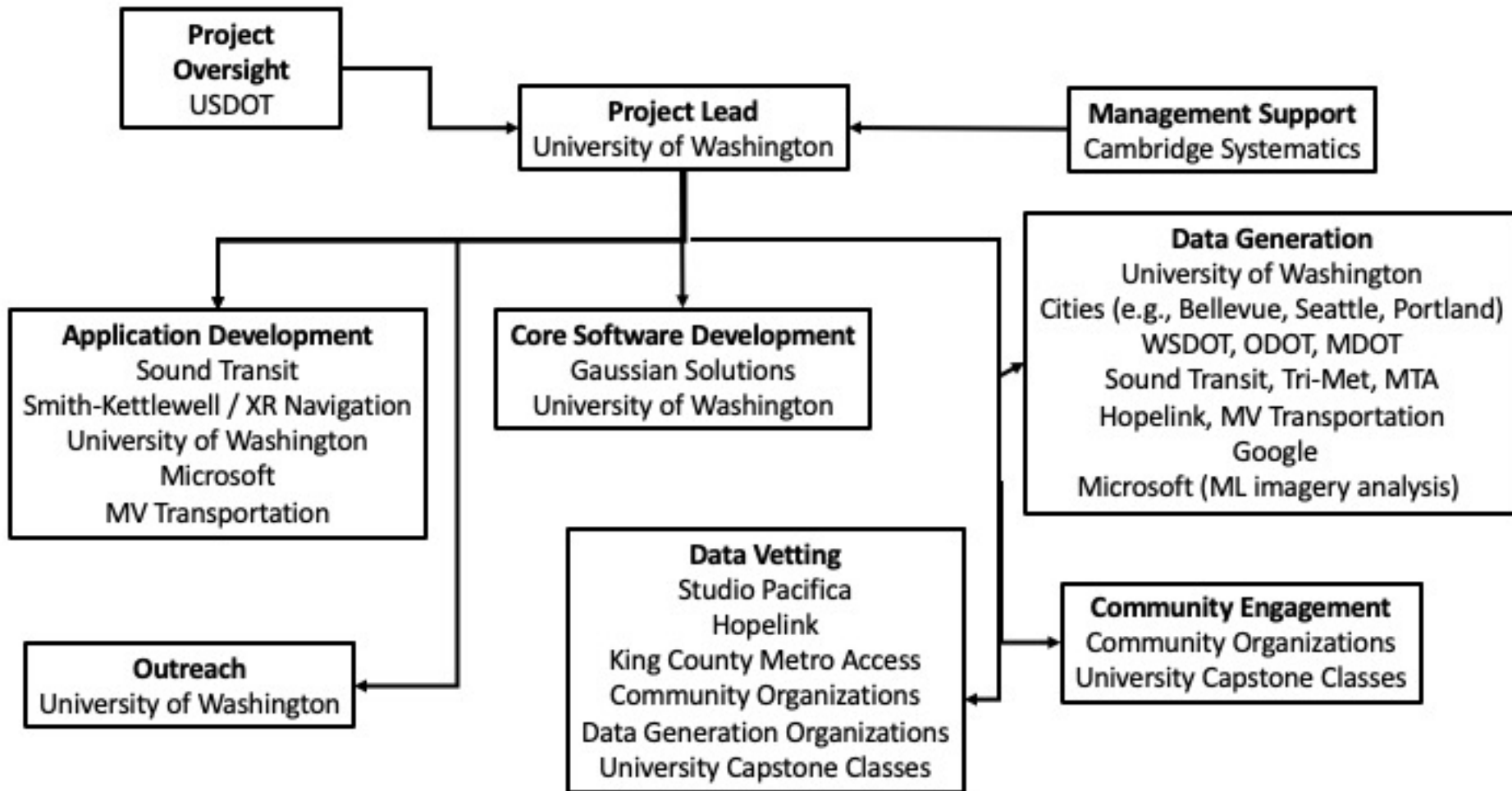
Digital Device End Users

- Wheelchair Users
 - Older Adults
 - Low-Income Users
 - Rural Transit Users
 - Veterans
 - Multi-Lingual, Multi-Cultural Travelers
- Travelers With Disabilities:
- Vision
 - Hearing
 - Mobility

Deployment Sites



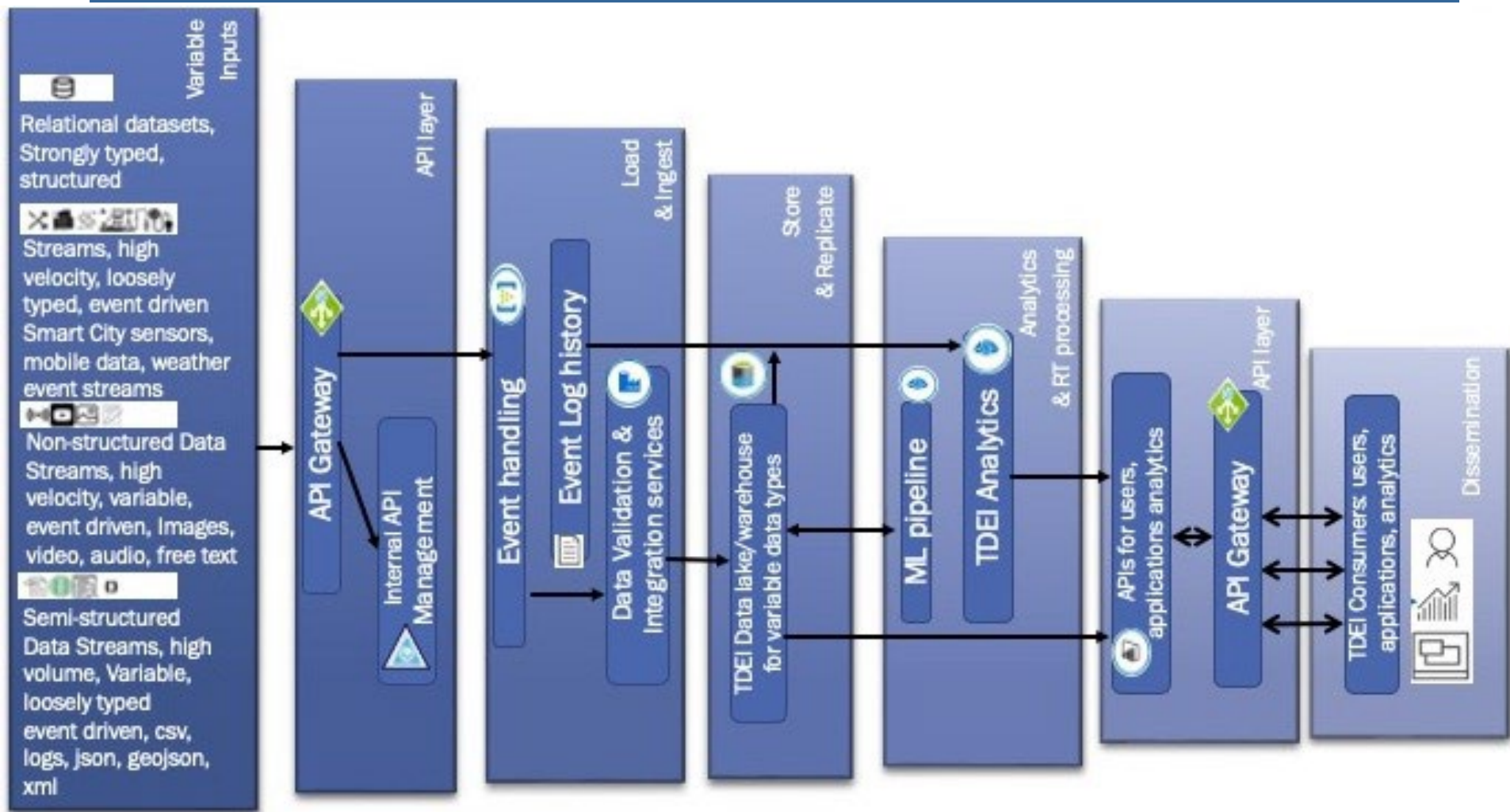
Team Organization



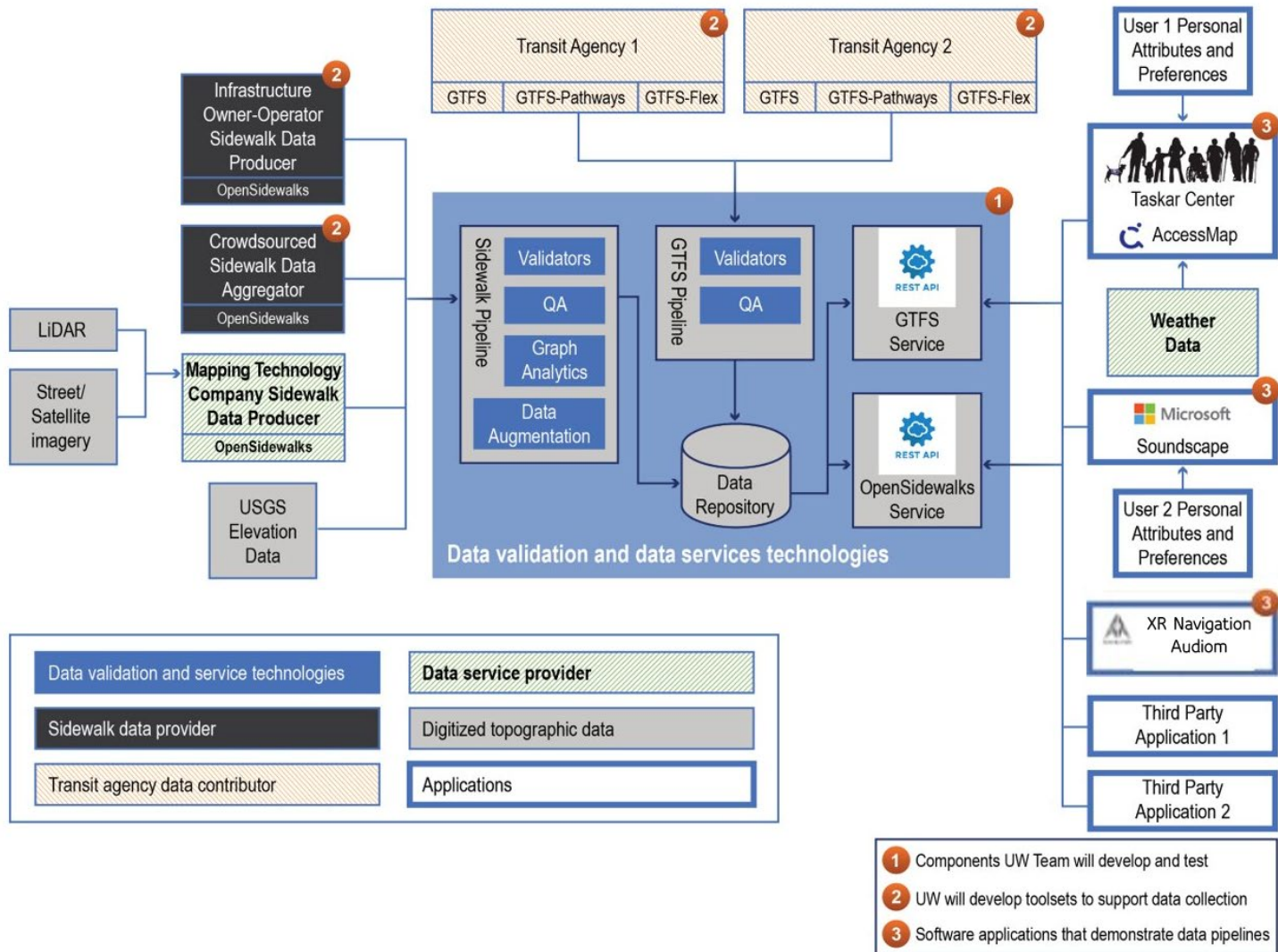
Summary of Phase 2 and 3 Technical Approach

**Dr. Anat Caspi, UW, Deployment
Development Lead**

Functional View of TDEI Core Components



Concept Framework for Data Infrastructure

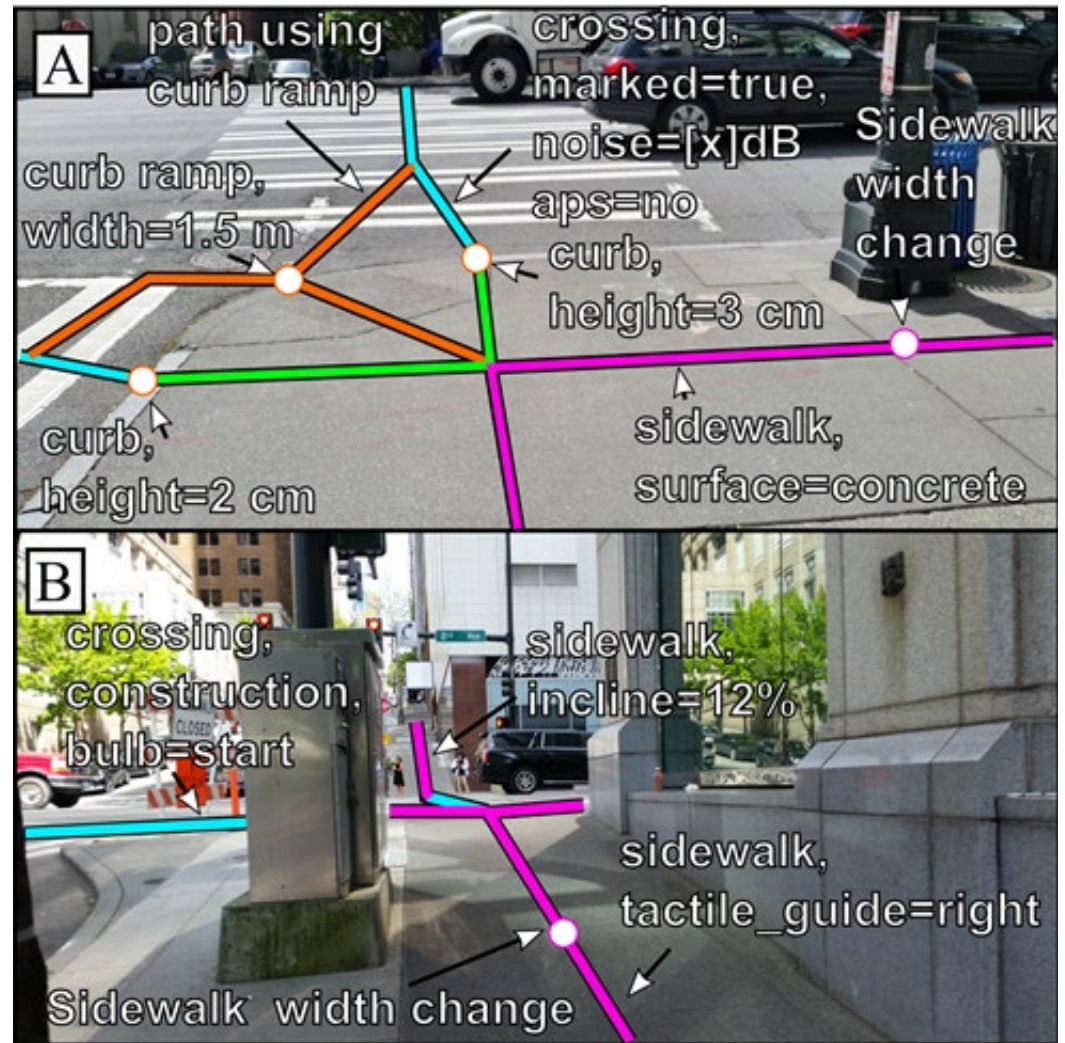


Application / Data Collection & Management

What data do we need for routing?

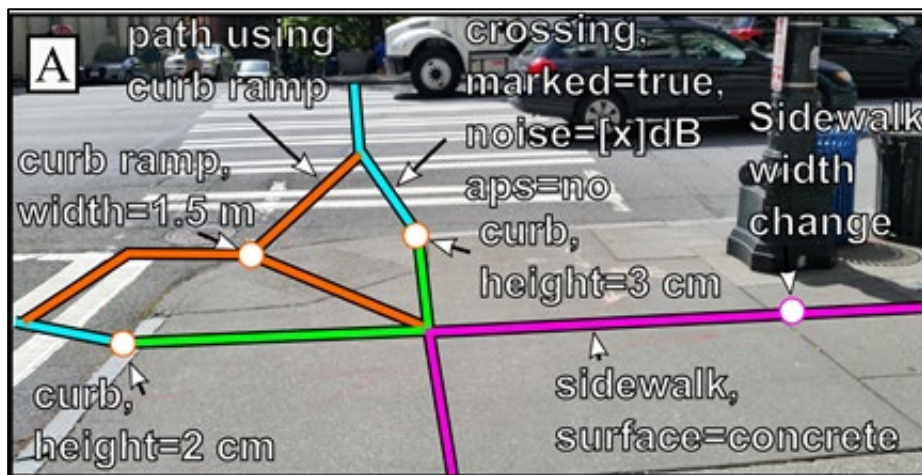
The minimal (US-centric) set of urban pedestrian paths are:

- Street crossings
- Sidewalks
- The connections between them (we call these 'links')
- Curbs (kerbs) at crossings



Essential (US-centric) Urban Pedestrian Network Requirements

- Street crossings
- Sidewalks
- Links (connections)

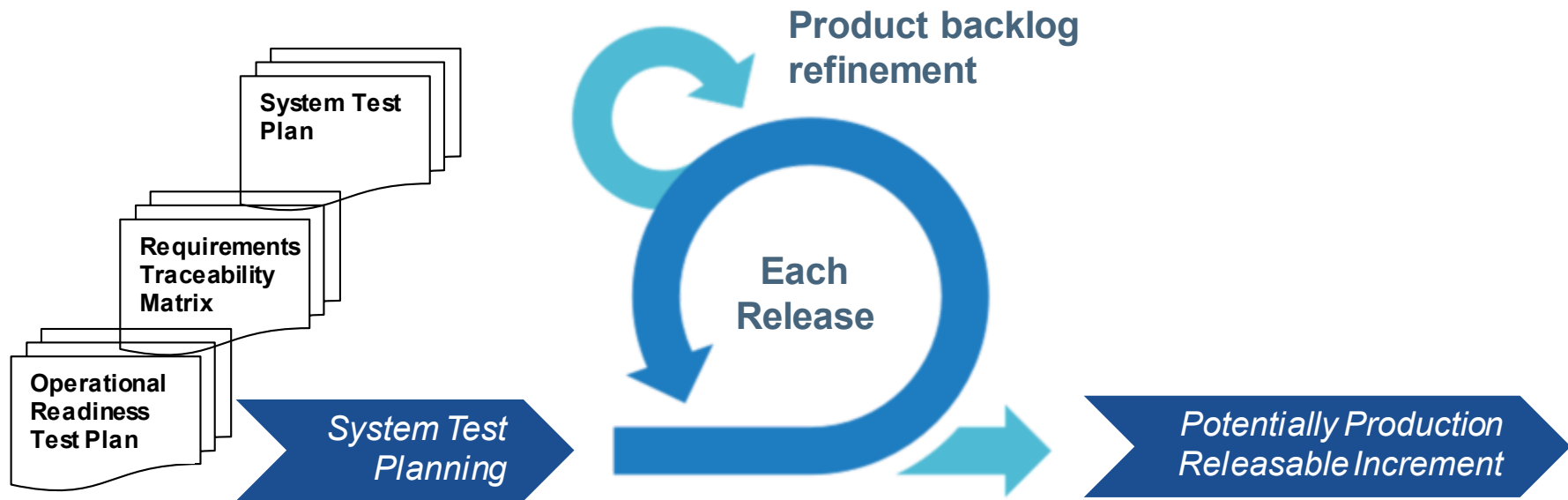


Data to be collected by TDEI:

Sidewalk data, on-demand transit data, data about traversing transit stations

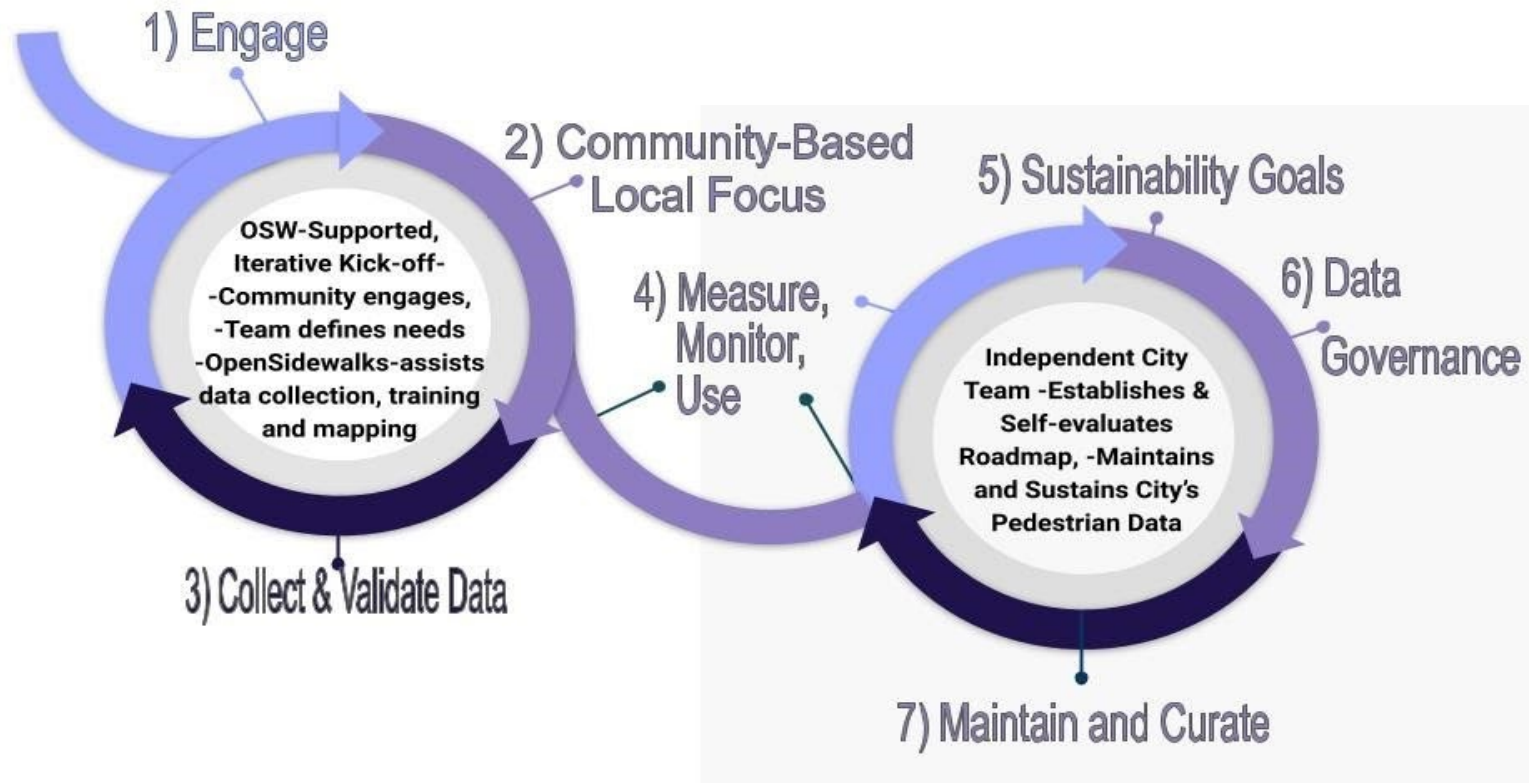
System Testing & Safety

- Demonstrate successful user stories tied to **system requirements**.
- Three separate TDEI environments to verify safety:
 - Sprints undergo tests in the **Development** or Testing environments
 - Releases undergo system verification in the **Test Environment**
 - Fully tested features are released to the **Production Environment**



Stakeholder Involvement

- Path to community stewardship



Measuring Success - Objectives & Performance Measures

Goal	Example Metrics	Example Data
Data Generation	<ul style="list-style-type: none"> OSW Data in the TDEI GTFS-Pathways data in the TDEI GTFS-Flex data in the TDEI 	<ul style="list-style-type: none"> Number of lane-miles of sidewalks Percentage of center-line roadway miles examined for sidewalks Number of stations with Pathways data Number of transit agencies providing Flex data
Data Quality	<ul style="list-style-type: none"> Errors reported in the vetting process 	<ul style="list-style-type: none"> Number & percentage of sidewalk segments with errors
Data System Performance	<ul style="list-style-type: none"> API response times System availability 	<ul style="list-style-type: none"> API response times System uptime
External Involvement	<ul style="list-style-type: none"> Number of organizations participating 	<ul style="list-style-type: none"> Number of jurisdictions, transit agencies contributing data Number of 3rd party developers
Demonstration Application Benefits	<ul style="list-style-type: none"> Quantitative and qualitative measures of user navigation outcomes 	<ul style="list-style-type: none"> Observations of user navigations; Quantity of user navigation successes

Phase 2 and Phase 3 Deployment Schedule & Cost Estimate

Kristin Tufte, UW, Data Management
Architect and Lead

Phase 2 Schedule Milestones

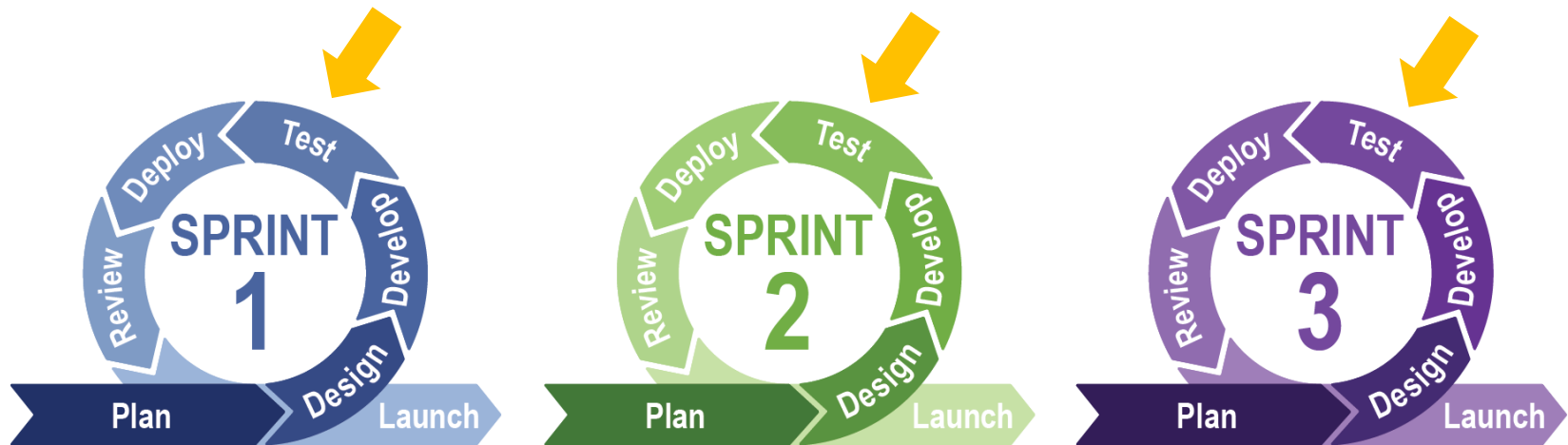
	Year 1				Year 2			
Milestone	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Agreement on Data Standards and Formats	X	X	X	X	-	-	-	-
Development of APIs (OSW, Flex, Pathways)	-	-	X	X	X	X	-	-
Microservices architecture for data collection & aggregation	-	-	X	X	X	X	-	-
Readiness of Demonstration Applications	-	-	-	-	-	X	X	X
System Acceptance (iterative and complete)	-	-	-	-	-	-	-	X

Phase 2 Deployment Milestones

Milestone		Year 1				Year 2			
		Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Data Formats & APIs	20% - OSW Format	-	X	-	-	-	-	-	-
	50% - OSW API, Flex Format	-	-	X	-	-	-	-	-
	80% - Flex API, Pathways Format	-	-	-	X	-	-	-	-
	100% - Pathways API	-	-	-	-	-	X	-	-
TDEI Data Infrastructure & Acceptance	20% - OSW Data Validation	-	-	X	-	-	-	-	-
	50% - Flex, Pathways validation, OSW ingest/egress	-	-	-	X	-	-	-	-
	80% - Flex ingest/egress	-	-	-	-	X	-	-	-
	100% - Pathways ingest/egress	-	-	-	-	-	X	-	-
Demonstration Applications & Acceptance	20% - Access Map Beta	-	-	-	-	X	-	-	-
	50% - Access Map Release	-	-	-	-	-	X	-	-
	80% - Audiom	-	-	-	-	-	-	X	-
	100% - Soundscape	-	-	-	-	-	-	-	X

Phase 2 Acceptance Testing

- Software development and integration is anticipated to occur during Months 5-24.
- At the end of each release, acceptance testing will be conducted to demonstrate that the feature is performing as expected. This will need to occur for **all releases**.
 - Testing includes features and user stories pertaining to release
 - By completion of release schedule (near end of Phase 2), all features and user stories will have been tested.



	Year 1				Year 2				Year 3				Year 4	
Milestone	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q5	Q6
P2: Data Formats & API Development	X	X	X	X	X	X	-	-	-	-	-	-	-	-
P2: Microservices architecture development	-	-	X	X	X	X	-	-	-	-	-	-	-	-
P2: Demonstration Applications	-	-	-	-	-	X	X	X	-	-	-	-	-	-
P2: System Acceptance	-	-	-	-	-	-	-	X	-	-	-	-	-	-
P2 & P3: Stakeholder Outreach	-	-	-	-	-	X	X	X	X	X	X	X	-	-
P2 & P3: Performance Measurement	-	-	-	-	-	X	X	X	X	X	X	X	-	-
P3: System Operations and Maintenance	-	-	-	-	-	-	-	-	X	X	X	X	X	X
P3: Post-Deployment Transition Planning	-	-	-	-	-	-	-	-	-	-	X	X	-	-

Phase 2 Cost Estimate

	Task	Cost Share	Federal Share	Total
2-A	Program Management	\$ 73,000	\$ 433,951	\$ 506,951
2-B	System Architecture and Design	\$ 100,000	\$ 502,331	\$ 602,331
2-C	Data Management Planning	\$ -	\$ 301,019	\$ 301,019
2-D	Acquisition and Installation Planning	\$ 100,000	\$ 193,030	\$ 293,030
2-E	Software Development and Integration	\$ 1,013,680	\$ 2,820,885	\$ 3,834,565
2-F	Participant and Staff Training	\$ -	\$ 521,360	\$ 521,360
2-G	System Test Planning	\$ 200,000	\$ 878,352	\$ 1,078,352
2-H	Installation and Operational Readiness Testing	\$ 163,320	\$ 777,965	\$ 941,285
2-I	Maintenance and Operations Planning	\$ 200,000	\$ 291,353	\$ 491,353
2-J	Stakeholder Outreach	\$ 50,000	\$ 388,825	\$ 433,825
2-K	Performance Measurement and Independent Evaluation Support	\$ 50,000	\$ 277,464	\$ 327,464
2-L	Participation in Standards Development	\$ 50,000	\$ 277,464	\$ 327,464
Phase 2 Subtotal		\$ 2,000,000	\$ 7,659,000	\$ 9,659,000

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Phase 3 Cost Estimate

Task	Cost Share	Federal Share	Total
3-A Program Management	\$ 27,000	\$ 363,514	\$ 390,514
3-B System Operations and Maintenance	\$ 473,000	\$ 424,078	\$ 897,078
3-C Stakeholder Outreach	\$ -	\$ 324,768	\$324,768
3-D Performance Measurement and Independent Evaluation Support	\$ -	\$ 297,782	\$ 297,782
3-E Post-Deployment Transition Planning	\$ -	\$ 295,016	\$ 295,016
3-F Participation in Standards Development	\$ -	\$ 294,842	\$ 294,842
Phase 3 Subtotal	\$ 500,000	\$ 2,000,000	\$ 2,500,000
Phase 2 & 3 Total	\$ 2,500,000	\$ 9,659,000	\$12,159,000

Summary

The uses we see occurring with our data; starting with navigation, but continuing with planning and management are limited only by your imagination.



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