



U.S. Department of Transportation

ITS4US

IT'S TRANSPORTATION FOR ALL OF US

**Georgia Mobility and Accessibility Planner (G-MAP)
The Ins and Outs of Building on Open Source Software (OSS)**

**Georgia Department of Transportation (GDOT) – Safe Trips in a
Connected Transportation Network (ST-CTN)**

August 30, 2023

Webinar Agenda

■ Purpose of this Webinar

- To share the enhancements to the OSS OpenTripPlanner (OTP) core functionality developed to support underserved communities.

■ Webinar Content

- ITS4US Program Overview (Norah Ocel)
- Characteristics and Benefits of OSS (Jon Campbell)
- OTP System Components (Jon Campbell)
- OTP and OSS Governance (Jon Campbell)
- G-MAP Features and Enhancements (Jon Campbell)
- OTP Trip Planner Current Deployments – ATL RIDES (Abby Marinelli)
- Stakeholder Q&A
- How to Stay Connected (Norah Ocel)

■ Webinar Protocol

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

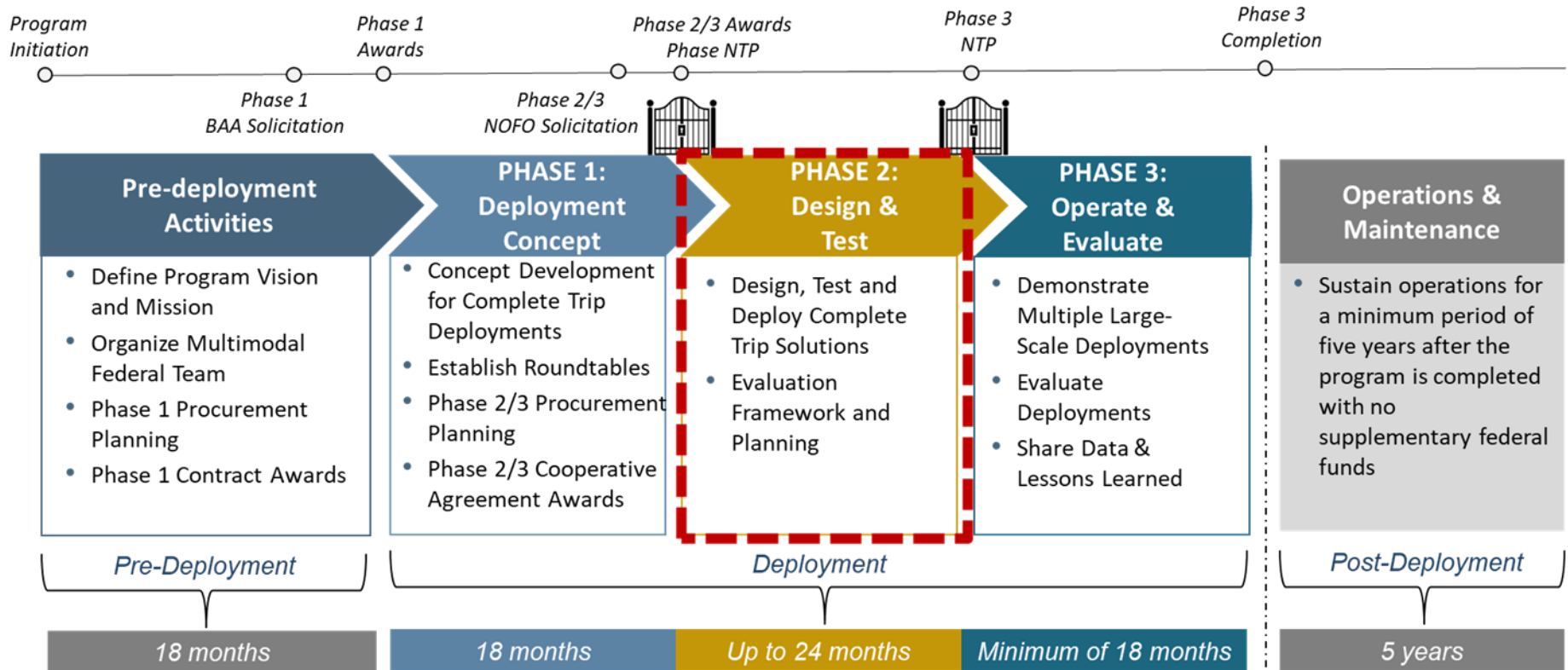
ITS4US Program Overview

- 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

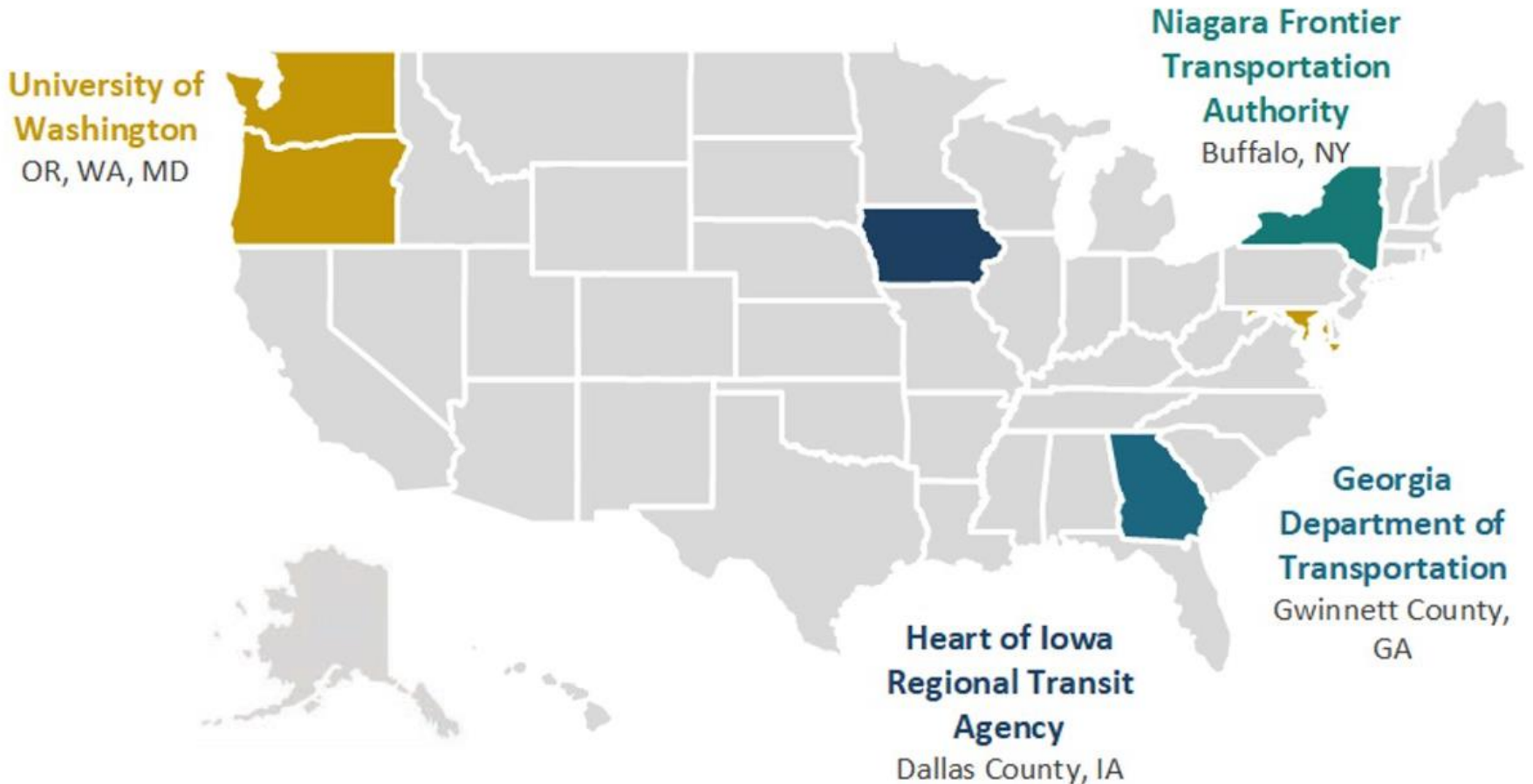


Vision: Innovative and integrated complete trip deployments to support seamless travel for all users across all modes, regardless of location, income, or disability

Deployment Phases



ITS4US Deployment Sites



ITS4US Team Photo Collage





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Open Source Software (OSS) and OpenTripPlanner (OTP)

Jon Campbell, Arcadis IBI Group

Background on Open Approaches

What do we mean when we talk about ‘open’ approaches?

- **Open Data**
- **Open Standards**
- **Open Architecture**
- **Open Source Software**

Open Data

Can be freely used, re-used and redistributed by anyone

Open Standards

Make it easier for people and organizations to publish, access, share and use better quality data.

Allow for the exchange of data within and between organizations and systems using common formats and shared rules, with outputs such as specifications, schemas and templates.

Open Data / Standards

Transit

- GTFS & GTFS-realtime

Micromobility (Bikeshare & eScooters)

- GBFS

Road/Pedestrian/Bike Network

- Open Street Map

Open Architecture

Software that is designed to make adding, upgrading, and swapping components easy.

Allows for modular systems in which different components/functions are served by different vendors.

Open Architecture (continued)

Deep Link

- Takes a customer to another application and prepopulates information.

Application Program Interfaces (APIs)

- Enables and defines interactions between software systems.

Software Development Kits (SDKs)

- Set of software tools and programs that help developers to build applications for a specific purpose.

Open Source Software (OSS)

Software with source code that anyone can inspect, modify, and enhance.

License grants users the rights to use, study, change, and distribute the software to anyone and for any purpose.

Open Source Software (continued)

Trip Discovery and Planning

OpenTripPlanner (OTP)

Real-time Transit Information

One Bus Away

Trip Booking and Payment

To be determined

OTP System Components

TRANSIT-data-tools for Data Management and Aggregation

IBI

Home

Notifications

User

Settings

Filter feed sources on **Latest** version

Search by name Sort By

All **8** Active **7** Expiring **0** Expired **1** Future **0** Actions

Feed Info	Deployed Version	Latest Version		
	Status	Status	Dates Valid	Issues
Community Transit Last updated Apr 1, 2022 https://picsapi.commtrans.org/download... Auto fetch Deployable Private	Active Valid for another 2 months (Jun 11, 2022)	Same as Deployed Last updated 1 week ago	Mar 25, 2022 - Jun 11, 2022	83
Everett Transit Last updated Apr 5, 2022 https://gtfs.sound.obaweb.org/prod/... Auto fetch Deployable Private	Active Valid for another 2 months (Jun 18, 2022)	Active Last updated 3 days ago	Mar 13, 2022 - Jun 18, 2022	22
King County Metro Last updated Apr 5, 2022 http://metro.kingcounty.gov/gtfs/go... Auto fetch Deployable Private	Active Valid for another 2 months (Jun 10, 2022)	Same as Deployed Last updated 3 days ago	Apr 4, 2022 - Jun 10, 2022	27842

Community Transit (Puget Sound) summary

Number of feeds: 8

Total errors: 670425

Total service: 0 hours per weekday

What is a feed source?

A feed source defines the location or upstream source of a GTFS feed. GTFS can be populated via automatic fetch, directly editing or uploading a zip file.

Labels

Add a new label

There are no labels in this project.

OpenTripPlanner (OTP) Routing Engine

Trip Directions Start Over

Enter a stop, station, address, or landmark

- Univ of Washington Station x
- Space Needle, Broad Street, Lov x

Set departure or arrival time Options

3 Trips

Trip 1
26m 1:38 PM to 2:05 PM
Walking Distance: 0.15 miles

1-Line → 33 →

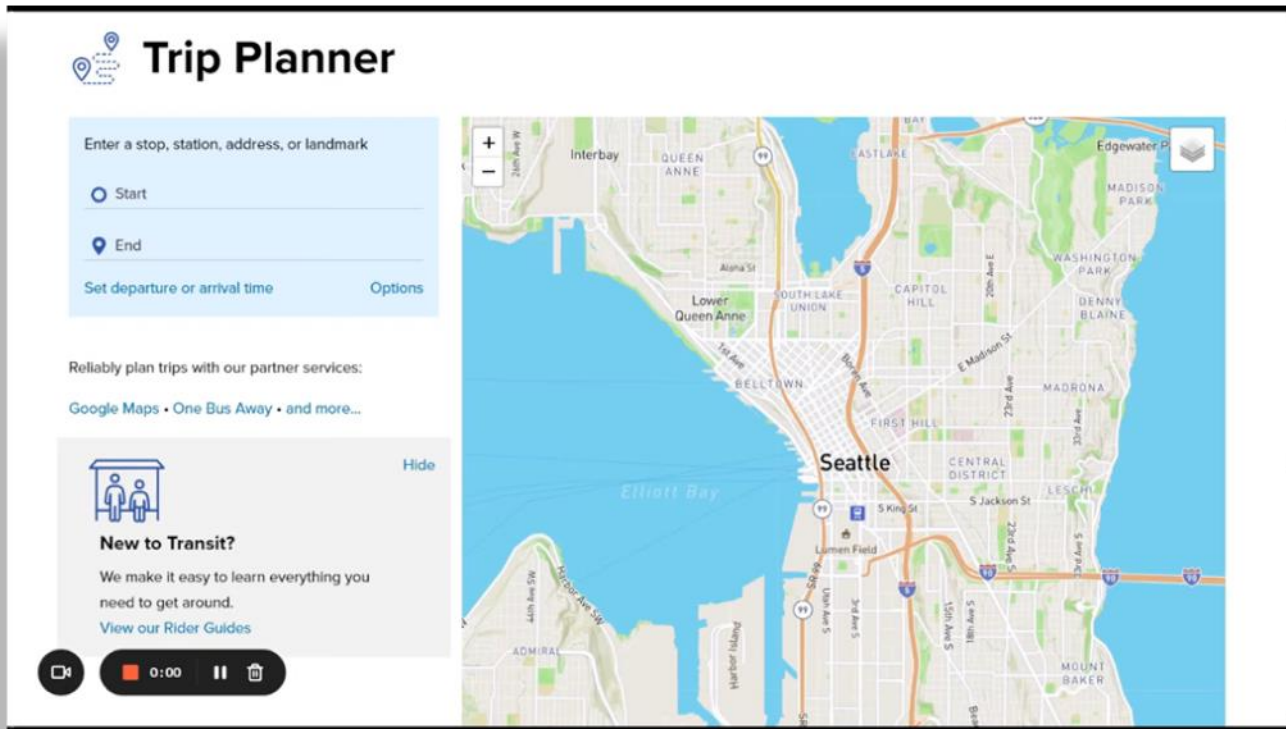
Cash: \$4.75, ORCA: \$2.50 (Adult)

Trip 2

Ingests GTFS, GTFS-realtime, GTFS-flex, GBFS, OSM, and operator API data.

Provides trip planning and passenger information APIs.

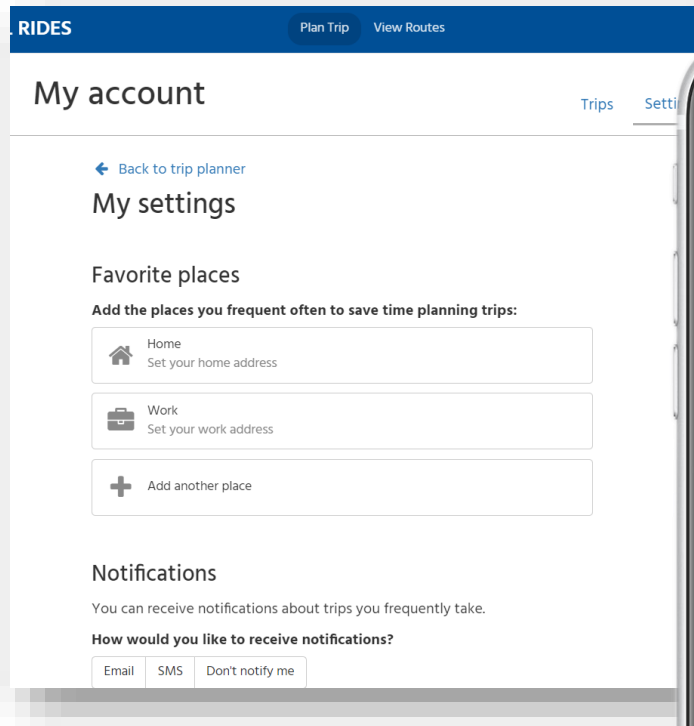
OTP Places



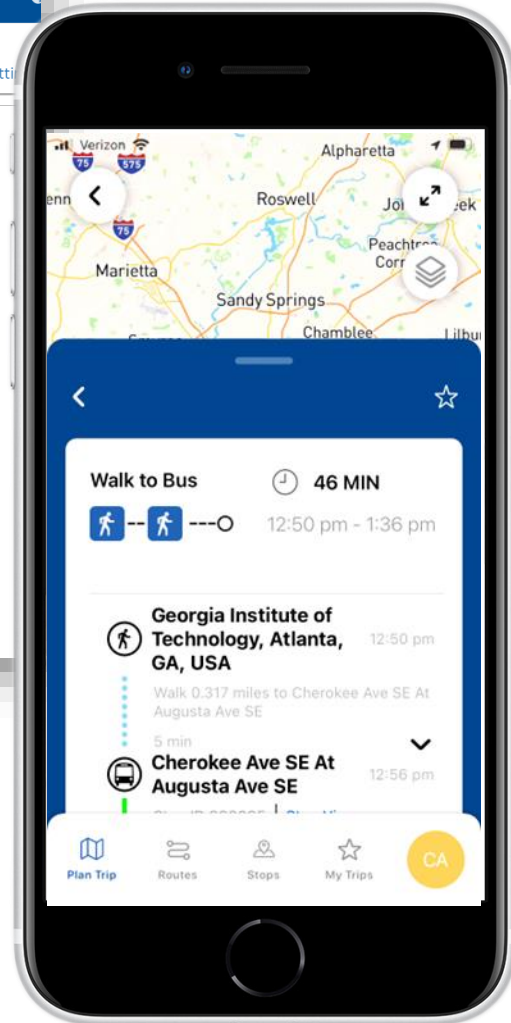
Better geocoding which integrates GTFS and custom landmarks index.

Better handling for shared stops.

OTP Personas



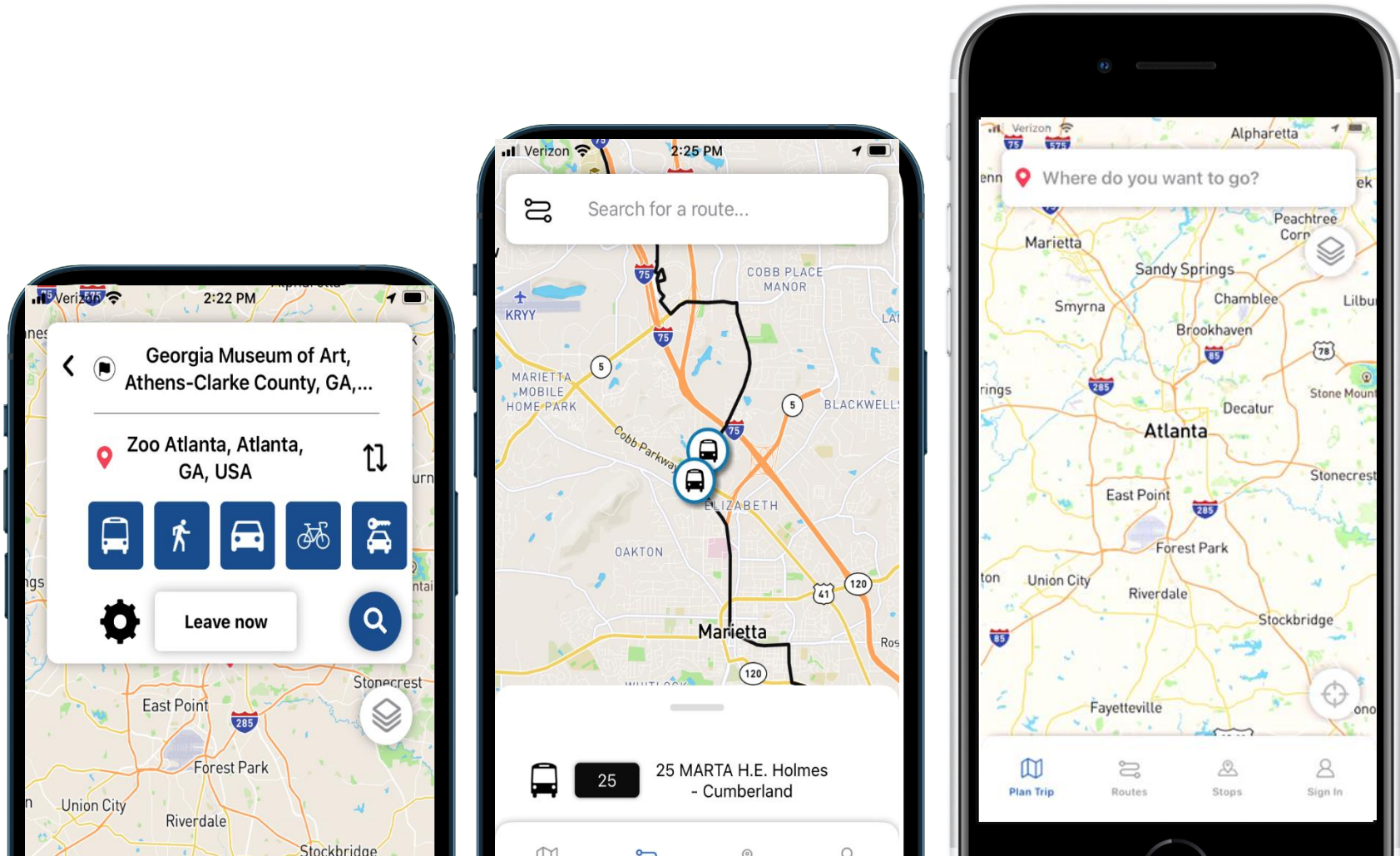
User accounts and subscriptions.



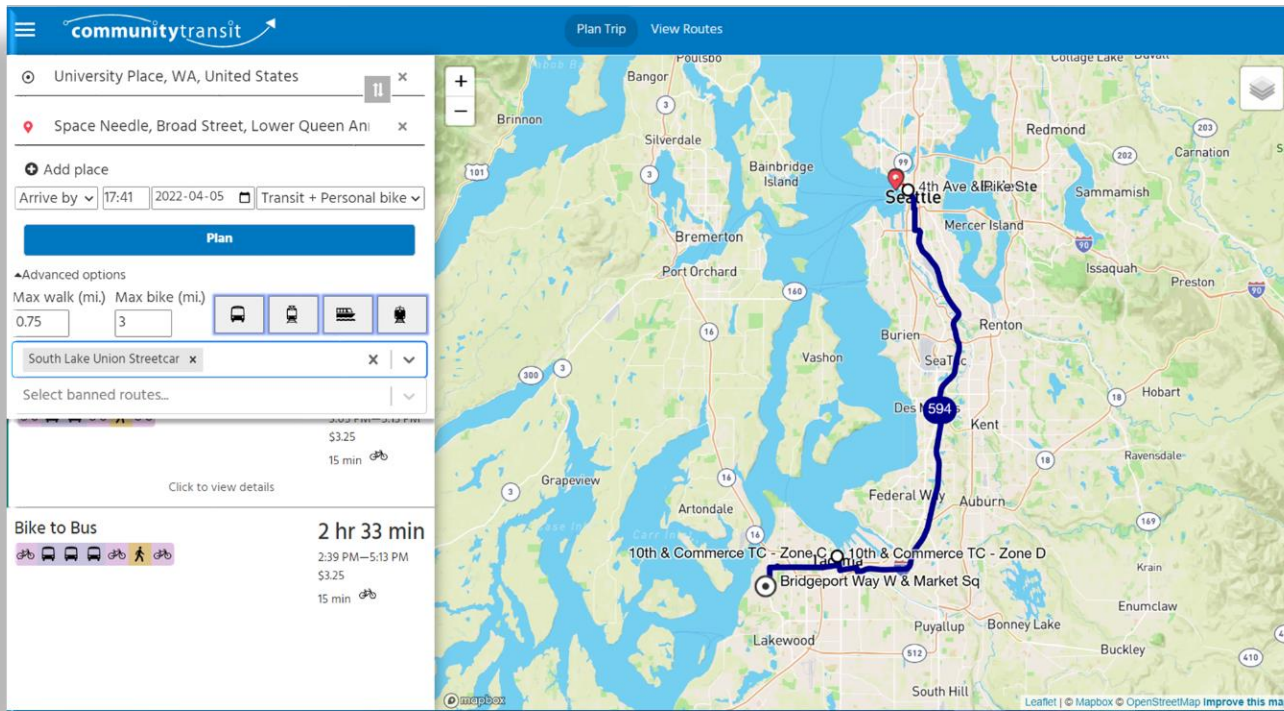
Web App

The screenshot displays the Sound Transit web application interface. At the top, there are navigation options: 'Plan Trip' and 'View Routes'. The main header features the Sound Transit logo and a menu icon. Below the header, the origin and destination are set to '24th Ave NW & NW 61st St' and 'Pike Place Market, Pike St, Pike Marke' respectively. A sidebar on the left contains icons for various transit modes: bus, wheelchair, car, bicycle, and smartphone, all with checkmarks. Below these are settings for 'Today' and 'Leave now', and a search icon. The main content area shows a map of Seattle with a blue route line for the D Line. The route starts at the origin, goes to '15th Ave NW & NW 60th St', and then continues to '3rd Ave & Pike St'. The estimated travel time is 44 minutes, with a scheduled departure at 1:47 PM and arrival at 1:57 PM. The fare is \$2.25. The route details include a 17-minute walk from the origin to the bus stop, followed by a 11-minute bus ride to the destination. The D Line is identified as 'D Line' and 'to Downtown Seattle Uptown', with a note that the service is operated by Metro Transit and takes 27 minutes over 16 stops.

iOS and Android Apps



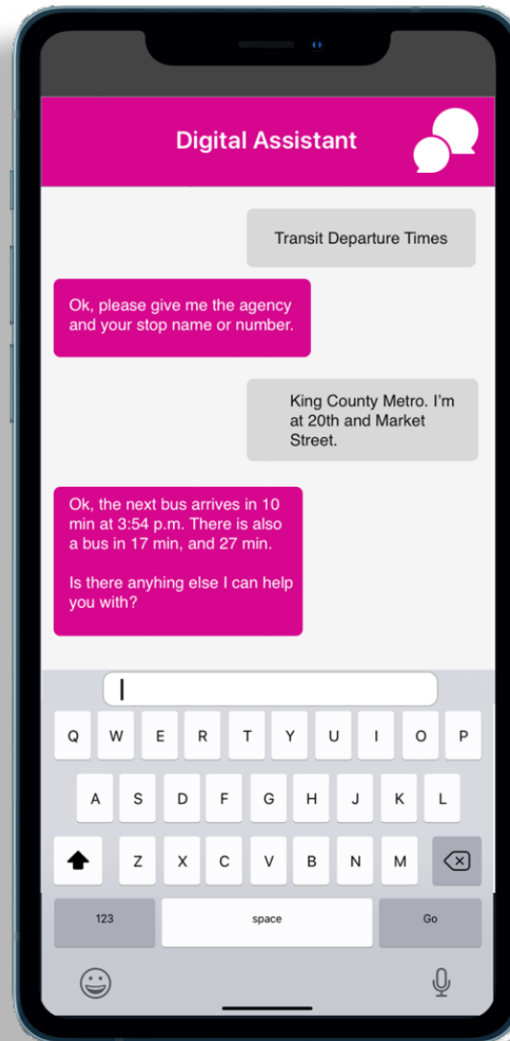
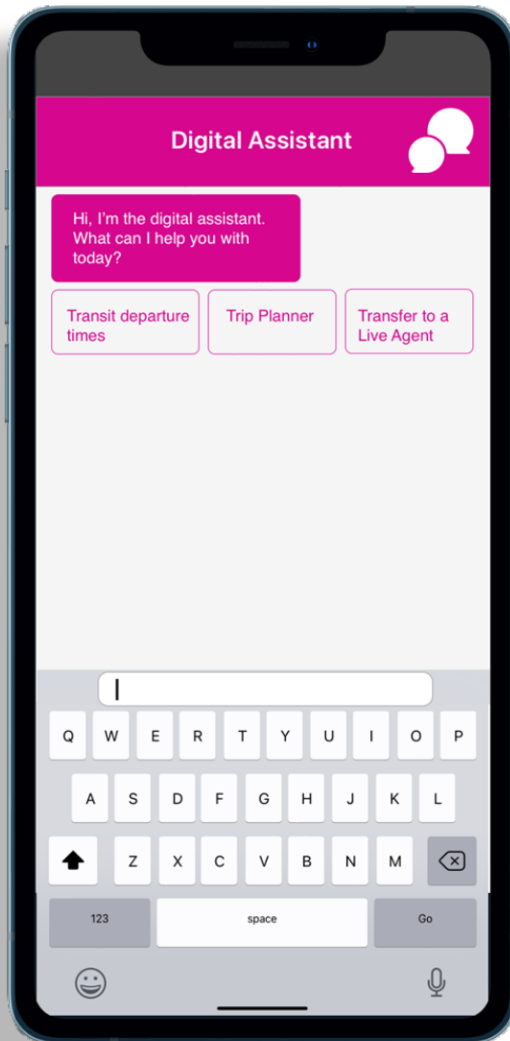
Customer Service and Support UI



IVR + Calltaker integration

Allows support agents insight into caller issue

AI-enabled Chatbot and Interactive Voice Response (IVR) for Customer Information



Integrated with OTP APIs.

Also provides a FAQ.

Forwards to customer service staff.

OpenTripPlanner and Open Source Software (OSS) Governance

OTP and OSS Governance

The screenshot shows the GitHub repository for OpenTripPlanner. At the top, there's a navigation bar with 'Code', 'Issues 94', 'Pull requests 48', 'Actions', 'Projects 1', 'Wiki', 'Security', and 'Insights'. Below this, the repository name 'OpenTripPlanner' is displayed as 'Public' with a 'Watch 150' button. The current branch is 'dev-2.x', with '130 branches' and '398 tags' listed. A 'Code' button is highlighted in green. The main content area shows a recent merge pull request by 'leonardehrenfried' (#5271) from 'R-OV-NL/feat/mode-...' merged 8 hours ago, with 21,046 commits. Below this, a list of files and folders is shown with their commit messages and dates:

File/Folder	Commit Message	Time
.github	Make illustration look prettier	last month
.idea	style: Arrange all fields and methods	last year
doc-templates	Merge pull request #5271 from R-OV-NL/feat/mode-documentation...	8 hours ago
docs	Merge pull request #5271 from R-OV-NL/feat/mode-documentation...	8 hours ago
src	Merge pull request #5271 from R-OV-NL/feat/mode-documentation...	8 hours ago
test/performance	Set transit service periods for speed tests	2 weeks ago

Formal OTP Governance Process applies to back-end routing engine.

Front-end applications (web and mobile) tend to also be open source but are managed / maintained by the organization / individual developer.

Sandbox for new/custom features isolated from core routing engine code.

OTP and OSS Governance Groups

Project Leadership Committee

Responsible for maintain the routing engine codebase.

Comprised of individuals, not organization representatives.

At least two PLC members review all new code before merging into main codebase.

Developers Group

Regular meetings open to any developers working on OTP.

Resource for coordination, capacity-building, collaboration.

New feature design, bug investigation, future planning.

Gitter chat for coordination between meetings.

Product Owners Group

Comprised of business-side representatives.

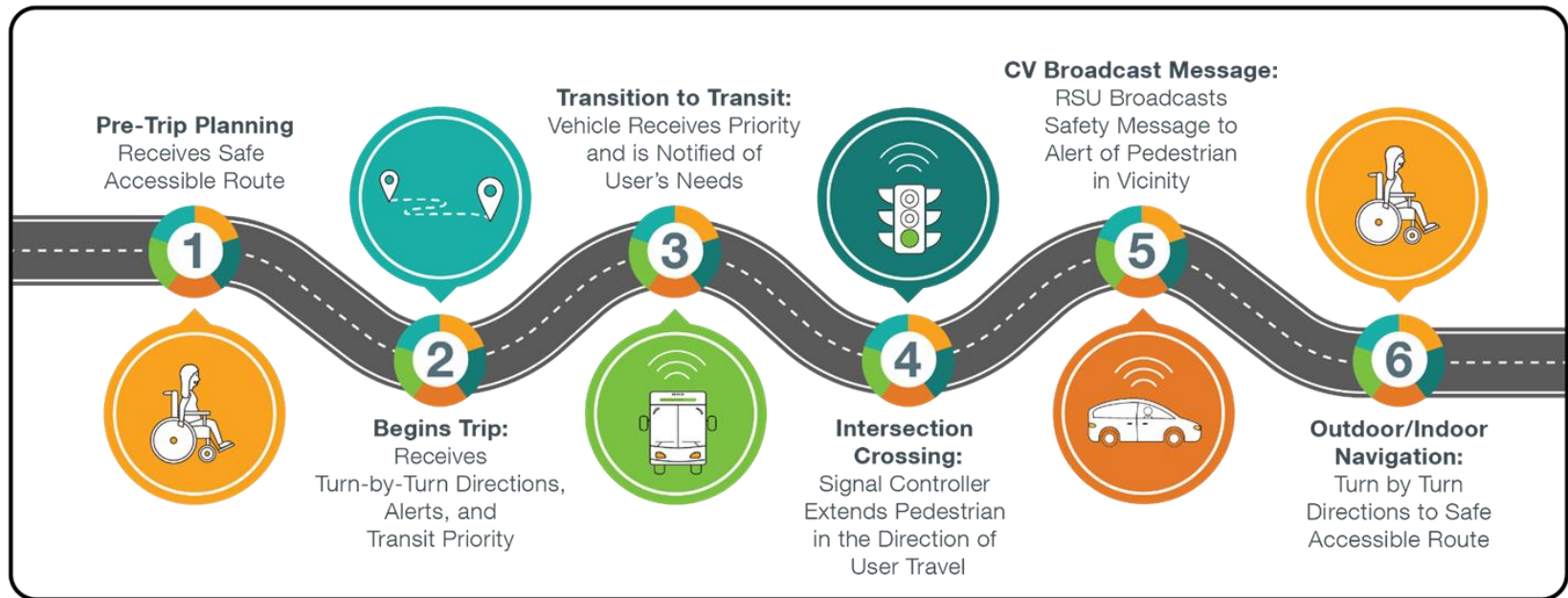
Shared roadmap coordination/planning.

Discussion of shared resources (website, documentation, etc.).

Early planning for funding the open-source project.

Developing the Georgia Mobility and Accessibility Planner (G-MAP)

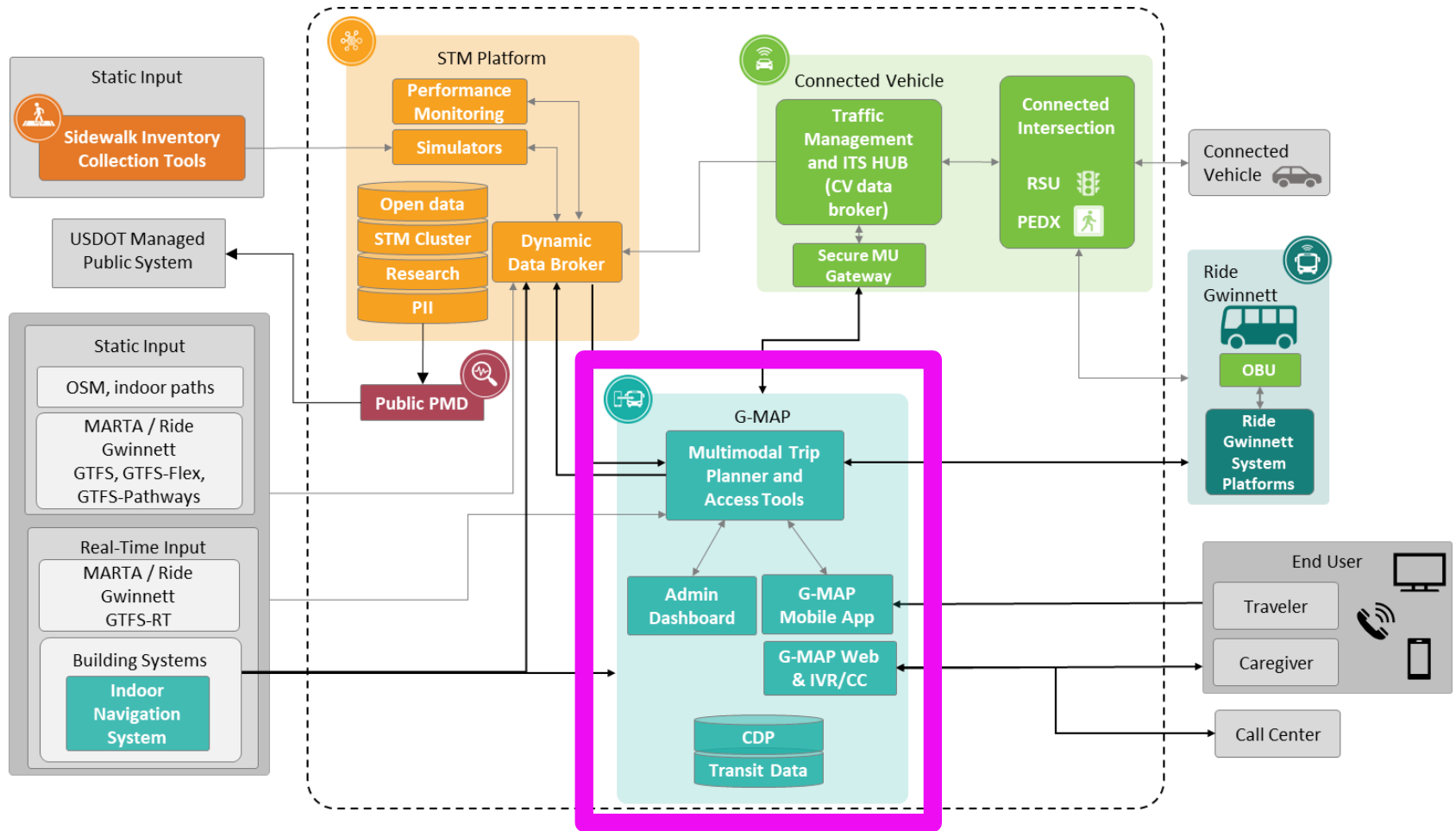
G-MAP Concept



Door to door planning and in-trip support.

Enhanced mobility profiles and custom routing based on a user's accessibility and/or mobility assistance needs.

G-MAP System



G-MAP: New Features for OTP

OTP Routing Engine

Ability to consume custom routing costs from STM system.

Custom routing based on user's mobility profile.

OTP-Personas

Enhanced user profiles for saved preferences and mobility profile definition.

In-trip support based on user's current location.

Ability for assisters/approved third-parties to manage accounts.

Support for group travel profiles.

Web and Mobile Apps

Questionnaire to define and manage mobility profiles.

UI for in-trip support
Robust notifications (push, audio, haptic).



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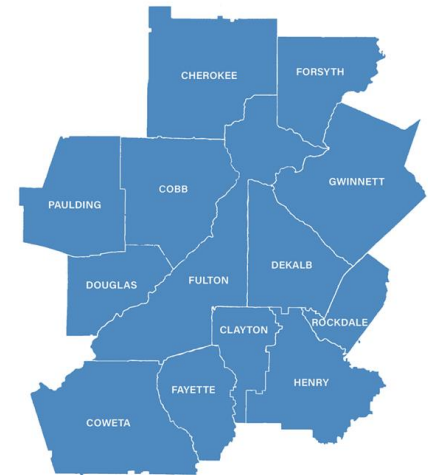
ATL RIDES

Abby Marinelli, ATL

ATL RIDES

ATL RIDES is the Atlanta region's first multi-agency trip planning app that provides real-time arrival information.

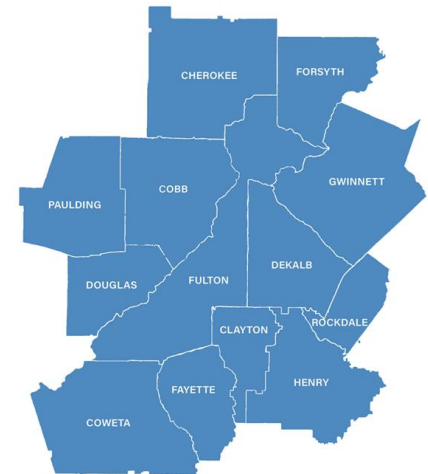
- Demand for a robust, cross-jurisdiction trip planner that included key customer-focused tools like real-time arrival and departure data led to a partnership among the region's transit agencies.
- The ATL RIDES project began in 2019 when ATL applied for an Integrated Mobility Innovations (IMI) grant.
 - ATL partnered with IBI Group to develop the app and with local transit agencies and GDOT to provide data to the app.



ATL RIDES Sponsorship

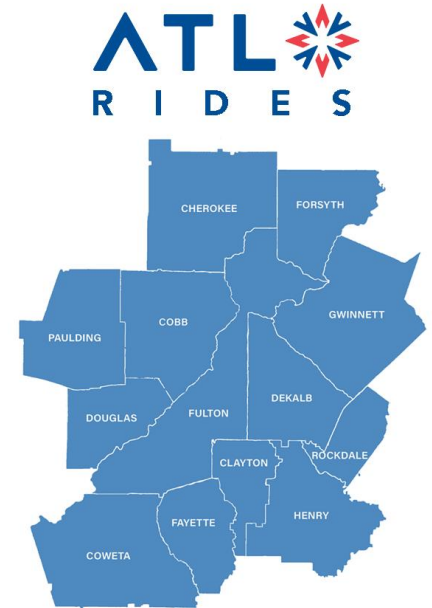
Integrated Mobility Innovations (IMI) Grant

- Applied in 2019.
- Named partners in the grant applications:
 - Held an informal RFP process prior to submitting the application.
 - Naming partners sped up the kick-off time for the project by reducing the post-award process length.
 - Involved parties had a good understanding of the project because of the involvement in developing the initial application.



ATL RIDES Benefits

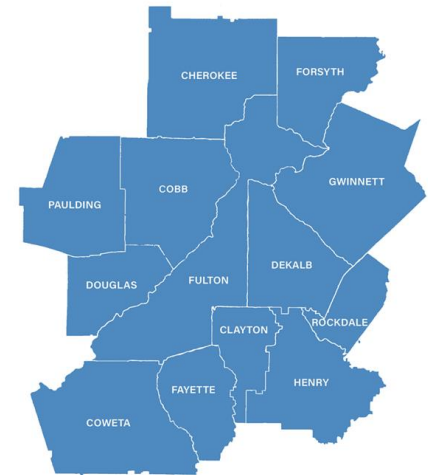
	ATL RIDES	Popular Trip Planning App
Trips across agencies	✓	✓
Multi-modal options	✓	✓
Multiple language support	✓	✓
Automatic fare calculation	✓	✗
Real-time reliability information	✓	✗



- ATL hosted GTFS-Real Time development workshops with partner agencies to prepare for feed consumption by ATL RIDES.
- Region committed to a shared stop library.

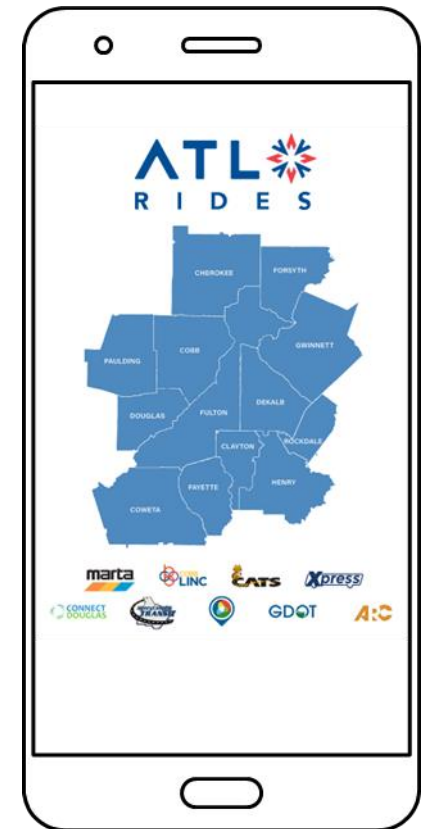
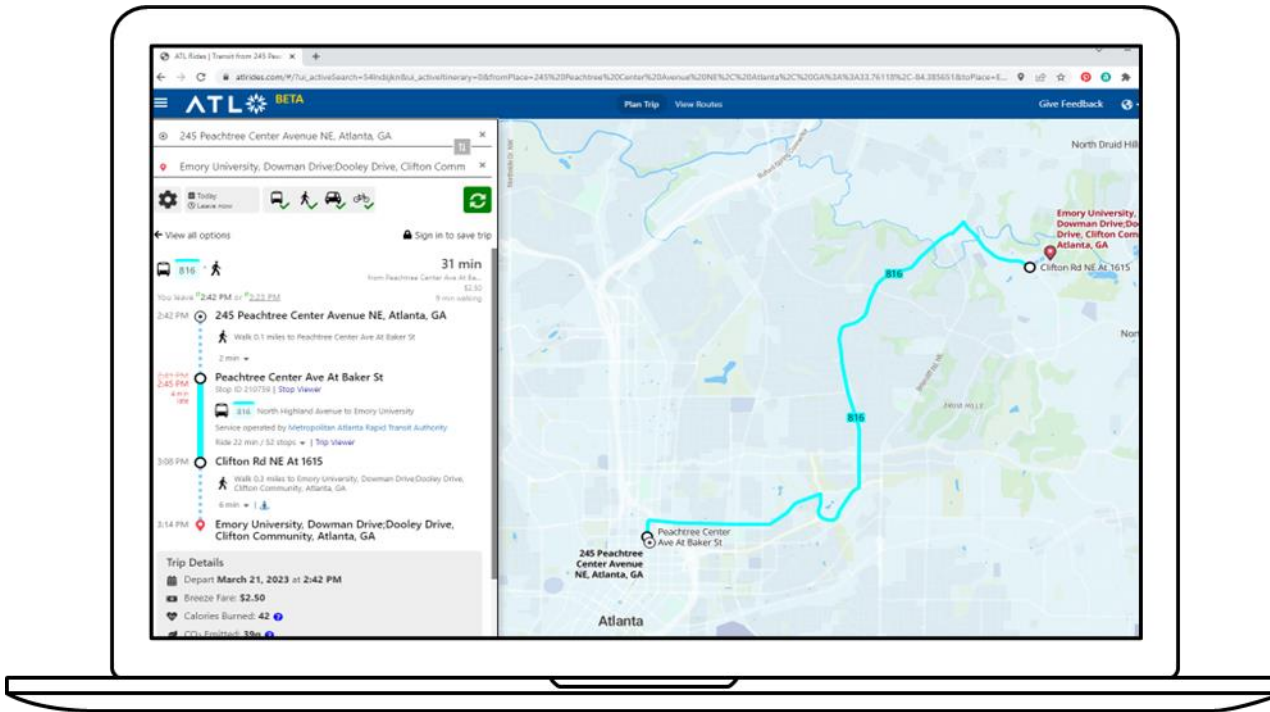
ATL RIDES is now in Beta Testing

- ATL RIDES opened for beta testing on March 1, 2023.
- Project partners, transit advocacy groups, and other IMI grantees across the US were invited to test ATL RIDES.
- User feedback is being incorporated into ongoing updates.
- The full launch of ATL RIDES will occur in Fall 2023.



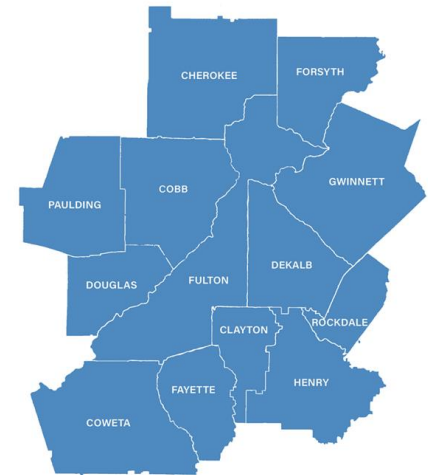
Get Access to the Beta Test

- In a browser, go to www.atlrides.com
- Request access to the ATL RIDES app.



Lessons Learned

- Seek out project partners prior to Federal awards.
- Prepare for budget and schedule overruns if you are doing something for the first time.
- Keep lines of communications open even with staff changes.



Stay Connected

For more information:

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Visit the ITS4US Deployment
Program Website:

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

ITS4US Deployment Program Video

<https://youtu.be/pzt1IRyXAc>

Visit the Georgia-MAP

<https://georgia-map.com/>

Questions and Answers