Transportation Performance Management Webinar Series

Case Studies - Identifying Data Gaps and Developing New Data Collection Processes to Inform Decision-Making

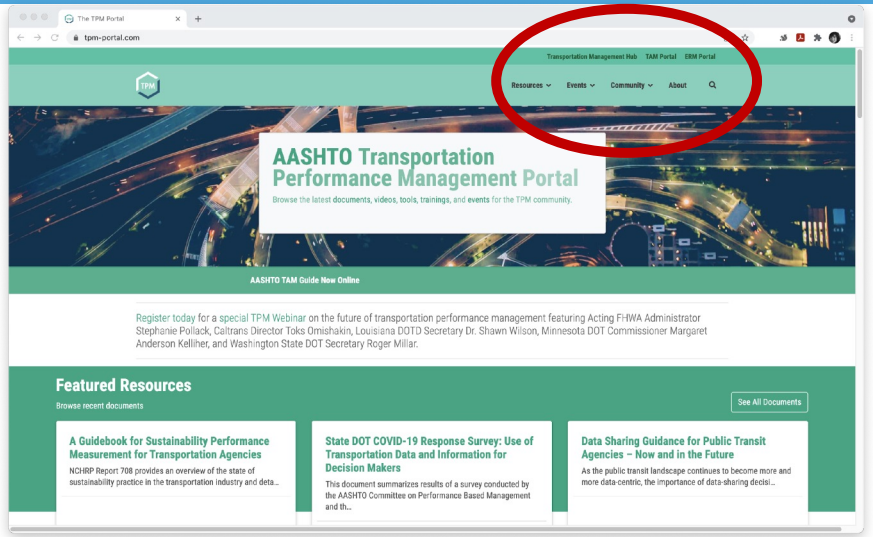
Sponsored by AASHTO and FHWA

Wednesday, March 19, 2025

TPM Webinar 25

Transportation Performance Management Webinar Series

- Our TPM webinar series is held every two months, on topics such as communications, system performance management, data sources, and many more to come!
- Today is the 25th webinar in our bi-monthly series
- We welcome ideas for future webinar topics and presentations
- Use the webinar chat panel during the webinar
  - Submit questions for today's presenters
  - Submit ideas for future webinar topics



Find us on the AASHTO TPM Portal
https://www.tpm-portal.com

Webinar Agenda

2:00 Introduction, Agenda, & Other Updates

- Christos Xenophontos, Rhode Island DOT, Chair, AASHTO CPBM.

2:05 AASHTO Perspective

- Anna McLaughlin, AASHTO.

2:15 Planning for Destination Accessibility: Resources to Inform Decision-Making

- Liz Williams, Massachusetts DOT.

2:35 Leveraging Centralized Citizen Issue Data to Help Drive Decision-Making

- Stephen Kut, Rhode Island DOT.

2:55 Enhancing Data Management and Utilization for Decision-Making

- John Hoang, Contra Costa Transportation Authority.

Webinar Agenda

3:15. Panel Q&A

- Christos Xenophontos, Rhode Island DOT, Chair, AASHTO CPBM.

3:30 Wrap-Up.

- Christos Xenophontos, Rhode Island DOT, Chair, AASHTO CPBM.

NCHRP Project 23-35 Survey

- **NCHRP is partnering with Cambridge Systematics on NCHRP Project 23-35 ”A Guide for Program Level Risk Management Performance Metrics."**

- **A questionnaire for DOTs will establish practices, gaps, and potential areas for improvement in the measurement and management of program risk.**

- **Please complete 15-minute survey (one per state DOT) by March 28, 2025:** https://www.surveymonkey.com/r/programriskmetrics

- **Any questions or issues with survey, please contact Joe Zissman at** jzissman@camsys.com

TPM

U.S. Department of Transportation Federal Highway Administration

AASHTO The Voice of Transportation

AASHTO Perspective

Anna McLaughlin

AASHTO

Upcoming Meetings

AASHTO Spring Meeting
May 12 – 15, 2025
Hartford, Connecticut
https://web.cvent.com/event/f7fb6a23-d66d-4e8c-819f-d38550e38bef/summary

15th National Conference on Transportation Asset Management
August 25 – 28. 2025
Chicago, Illinois
https://ctre.iastate.edu/events/tam-conference-15/

CPBM Annual Meeting and Peer Exchange
Save The Date: September 23-25, 2025
Baltimore, Maryland

Planning for Destination Accessibility

Liz Williams

Massachusetts DOT

massDOT Office of Transportation Planning

Planning for destination accessibility

Resources to inform decision-making

March 19, 2025 | AASHTO TPM Webinar 25

Agenda

01 MassDOT's experience

02 Upgrading efforts

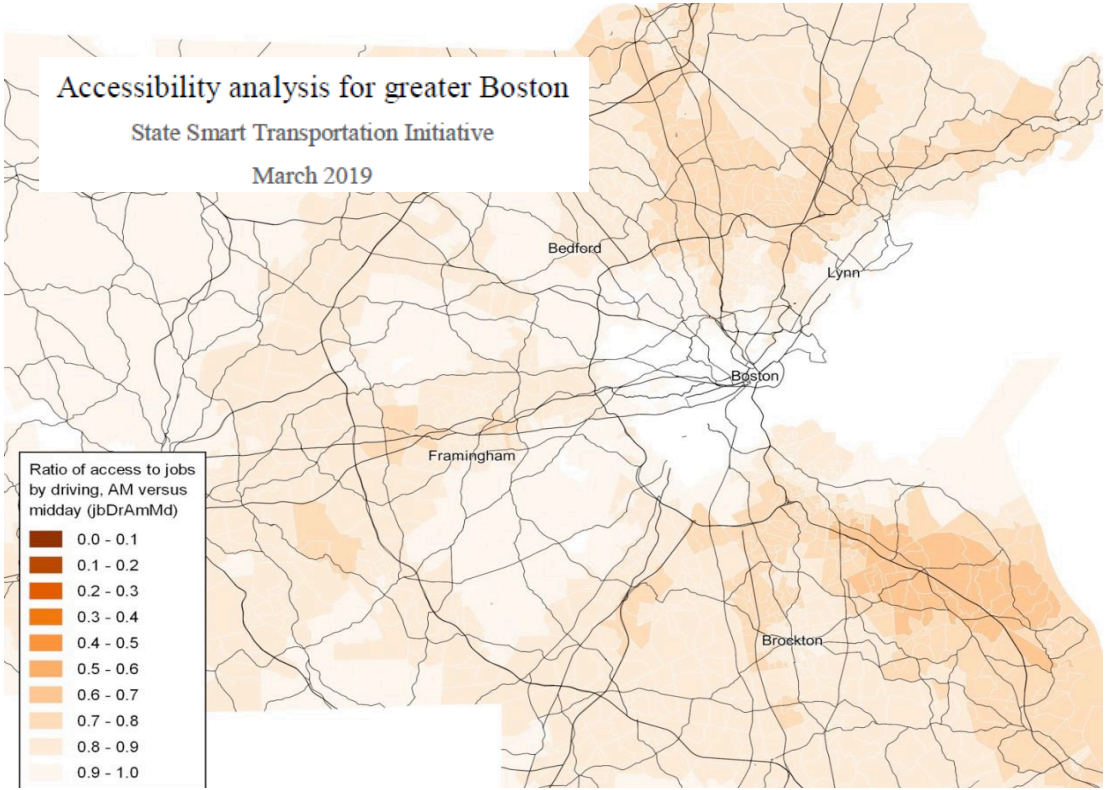
03 Guidance documents

04 Recent applications

massDOT Office of Transportation Planning

MassDOT's Experience

- 2018: Began working with Sugar Access (later CUBE, now ?)
  - Research projects with SSTI
- 2019: Began participating in FHWA National Accessibility Evaluation Pooled Fund Study
  - Provided with GIS files reflecting multimodal, temporally-specific job access
  - Created public-facing dashboard
- 2020: Procured Conveyal software



massDOT Office of Transportation Planning

Upgrading efforts

- 2022: Began developing statewide long range transportation plan, Beyond Mobility
- Initial identification of six priority areas included destination connectivity

Beyond Mobility
Massachusetts 2050 Transportation Plan

Upgrading efforts

- 2022: Began developing statewide long range transportation plan, Beyond Mobility
- Initial identification of six priority areas included destination connectivity
- (ongoing) MassDOT participation in several peer exchanges with other state DOTs and MPOs
- 2023: initiated development of Conveyal user guide for Office of Transportation Planning

Destination Connectivity

VISION

By 2050, due to targeted investments that have expanded access to everyday destinations for transit-critical and traditionally underserved communities statewide, there will be significantly more modal options, more equitable travel times, increased transportation choices, and far fewer first- and last-mile gaps for these communities.

VALUES

MassDOT believes that the primary purpose of the transportation system is to **connect people to the places that they need and want to go**.

MassDOT believes in the importance of measuring how **people, rather than just vehicles**, pass through the transportation system.

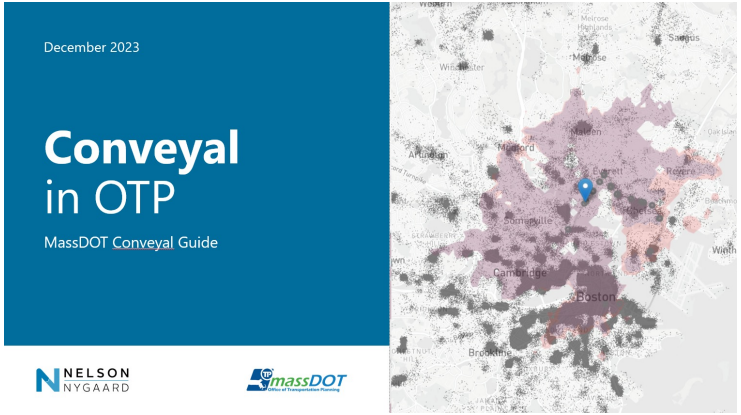
MassDOT is committed to the principle that a "**regional rail**" system with expanded service throughout the day is critical to building a stronger and more inclusive state economy.

MassDOT is committed to supporting **robust on-demand transit services** using dedicated drivers and vehicles across the Commonwealth, especially in communities served by Regional Transit Authorities (RTAs) that may not have and/or lack the density to support fixed-route service.

massDOT Office of Transportation Planning

Guidance Documents

- 2023: retained Nelson/Nygaard for an on-call study to help identify opportunities to use Conveyal in the traditional planning study process
- Deliverables included an introductory guide to Conveyal including when and how to use it, as well as an accompanying technical guide to help interpret analysis parameters and results



CONVEYAL IN MASSDOT OTP: TECHNICAL USER MANUAL

Overview: What Is This Document?

This document provides **technical guidance on how to use Conveyal to conduct accessibility analyses for MassDOT OTP planning projects.** It will cover the following topics:

1. Scoping
2. Starting A Project
3. Setting up Modifications and Scenarios
4. Conducting Analyses
5. Interpreting, Exporting, and Visualizing Results

This guide is intended to **supplement and contextualize Conveyal's existing documentation, not replace it**. The step-by-step guidance for using Conveyal is well-documented in their official User Manual and will be referred to throughout this document. The official Conveyal User Manual provides relevant screenshots and images to easily follow the step-by-step guidance.

If this is your first time using Conveyal, please review these three important resources before going through this manual:

- Conveyal at MassDOT User Guide: This guide gives a non-technical overview of Conveyal, including what it is and how it can be used in MassDOT projects. It is maintained internally by MassDOT.
- Conveyal Glossary: This is part of Conveyal's official documentation and defines key terminology used throughout the Conveyal platform. We will reference these terms throughout this manual, so it is important to become familiar with them.
- Conveyal Demo: An introductory video to Conveyal's capabilities.

Key terms and tips will be indicated throughout this document as follows:

- Key Conveyal-related terms will be **bolded and highlighted in blue**.
- Tips will be indicated with a blue star: ★
- Sections that supplement official Conveyal guidance have instructions *italicized* at the beginning. Notes and considerations will also be *italicized* throughout the document.

massDOT Office of Transportation Planning

*~ break for **Conveyal in OTP** slides*
~

Technical Assistance Guide

CONVEYAL IN MASSDOT OTP: TECHNICAL USER MANUAL

Overview: What Is This Document?

This document provides **technical guidance on how to use Conveyal to conduct accessibility analyses for MassDOT OTP planning projects.** It will cover the following topics:

1. Scoping
2. Starting A Project
3. Setting up Modifications and Scenarios
4. Conducting Analyses
5. Interpreting, Exporting, and Visualizing Results

This guide is intended to **supplement and contextualize Conveyal's existing documentation, not replace it**. The step-by-step guidance for using Conveyal is well-documented in their official User Manual and will be referred to throughout this document. The official Conveyal User Manual provides relevant screenshots and images to easily follow the step-by-step guidance.

If this is your first time using Conveyal, please review these three important resources before going through this manual:

- Conveyal at MassDOT User Guide: This guide gives a non-technical overview of Conveyal, including what it is and how it can be used in MassDOT projects. It is maintained internally by MassDOT.
- Conveyal Glossary: This is part of Conveyal's official documentation and defines key terminology used throughout the Conveyal platform. We will reference these terms throughout this manual, so it is important to become familiar with them.
- Conveyal Demo: An introductory video to Conveyal's capabilities.

Key terms and tips will be indicated throughout this document as follows:

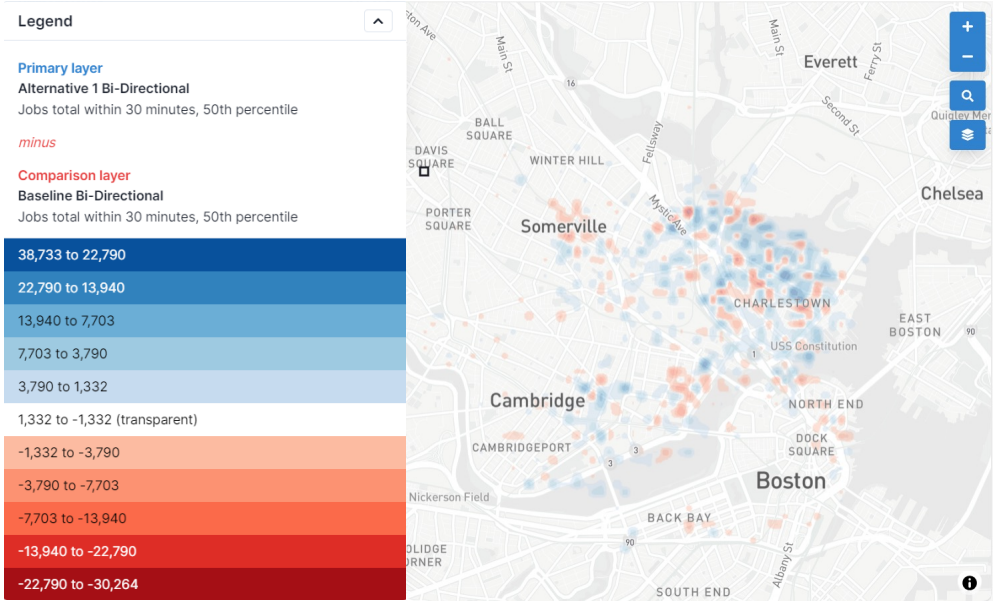
- Key Conveyal-related terms will be **bolded and highlighted in blue**.
- Tips will be indicated with a blue star: ★
- Sections that supplement official Conveyal guidance have instructions *italicized* at the beginning. Notes and considerations will also be *italicized* throughout the document.

massDOT Office of Transportation Planning

Recent Applications

- Gilmore Bridge transit planning study
  - considers the impact of different bus route types on job access, primarily in the areas of Cambridge, Somerville, and Charlestown
    - Alt. 1: dedicated lane
    - Alt 2: BRT
      - Bi-directional vs east/west-bound only

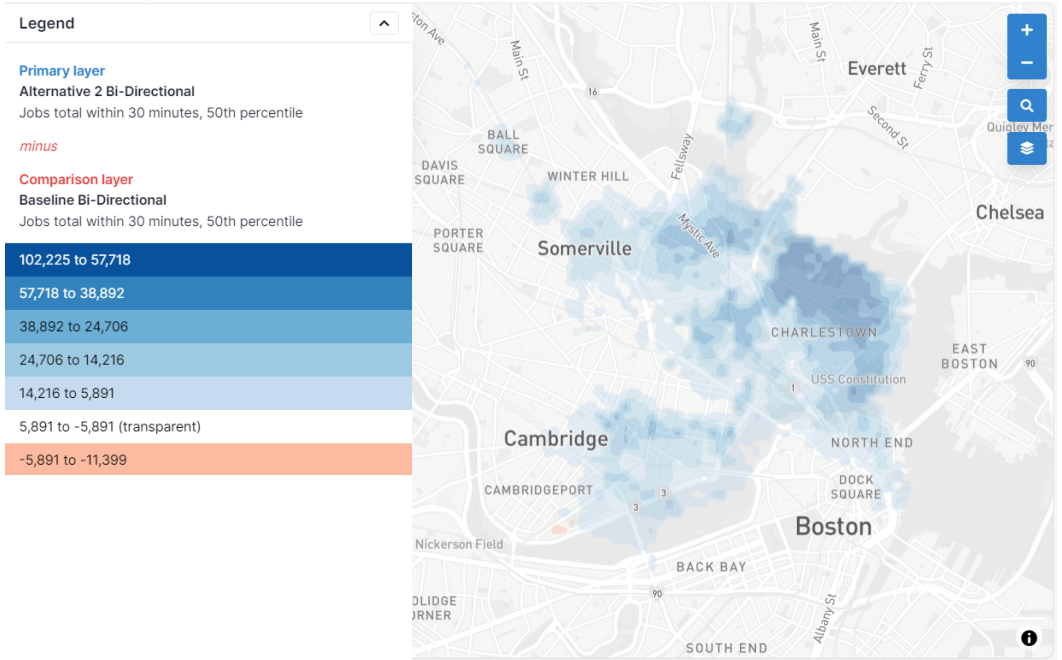
Map 1.1: REGIONAL ANALYSIS – Alternative 1 (Dedicated Gilmore Bus Lane) Bi-Directional vs Baseline Bi-Directional.



Recent Applications

- Gilmore Bridge transit planning study
  - considers the impact of different bus route types on job access, primarily in the areas of Cambridge, Somerville, and Charlestown
    - Alt. 1: dedicated lane
    - Alt 2: BRT
      - Bi-directional vs east/west-bound only

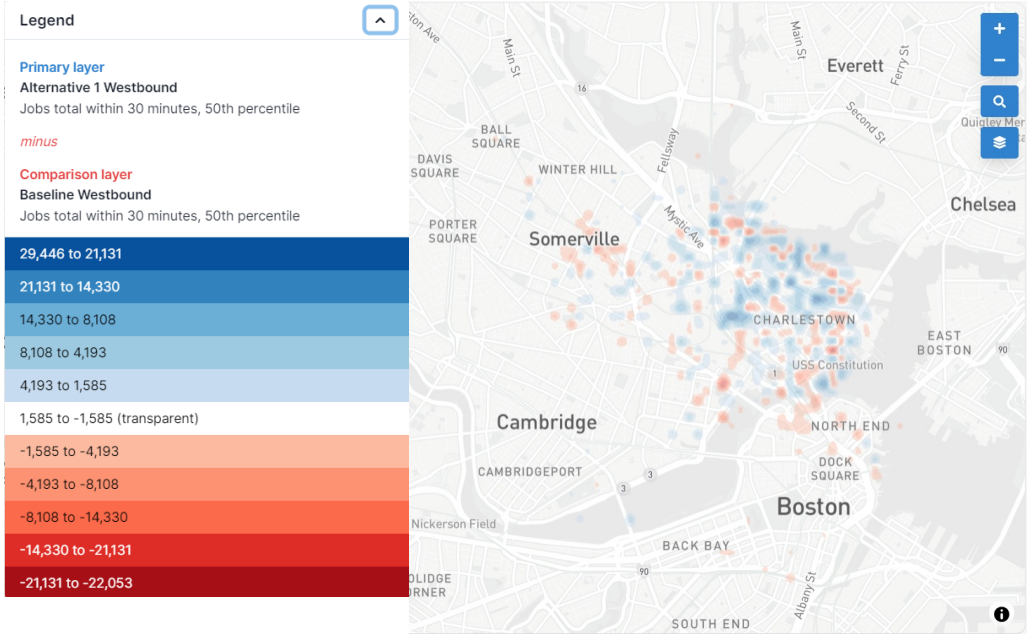
Map 1.2: REGIONAL ANALYSIS – Alternative 2 (Dedicated Bus Lane for Whole Route) Bi-Directional vs Baseline Bi-Directional.



Recent Applications

- Gilmore Bridge transit planning study
  - considers the impact of different bus route types on job access, primarily in the areas of Cambridge, Somerville, and Charlestown
    - Alt. 1: dedicated lane
    - Alt 2: BRT
      - Bi-directional vs east/west-bound only

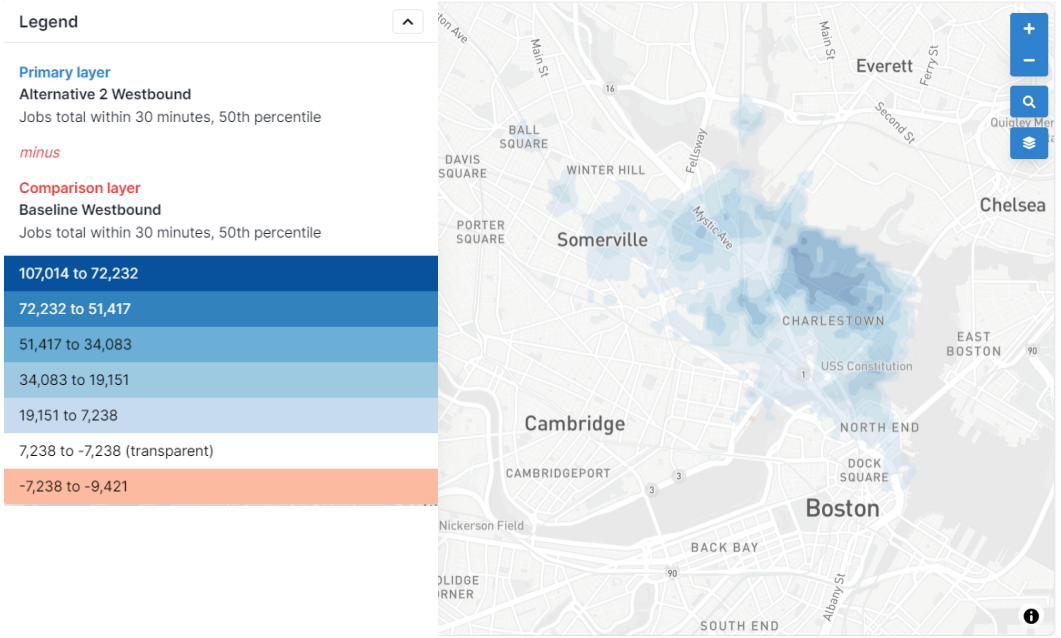
Map 2.1: REGIONAL ANALYSIS – Alternative 1 (Dedicated Gilmore Bus Lane) Westbound Only vs Baseline Westbound Only.



Recent Applications

- Gilmore Bridge transit planning study
  - considers the impact of different bus route types on job access, primarily in the areas of Cambridge, Somerville, and Charlestown
    - Alt. 1: dedicated lane
    - Alt 2: BRT
      - Bi-directional vs east/west-bound only

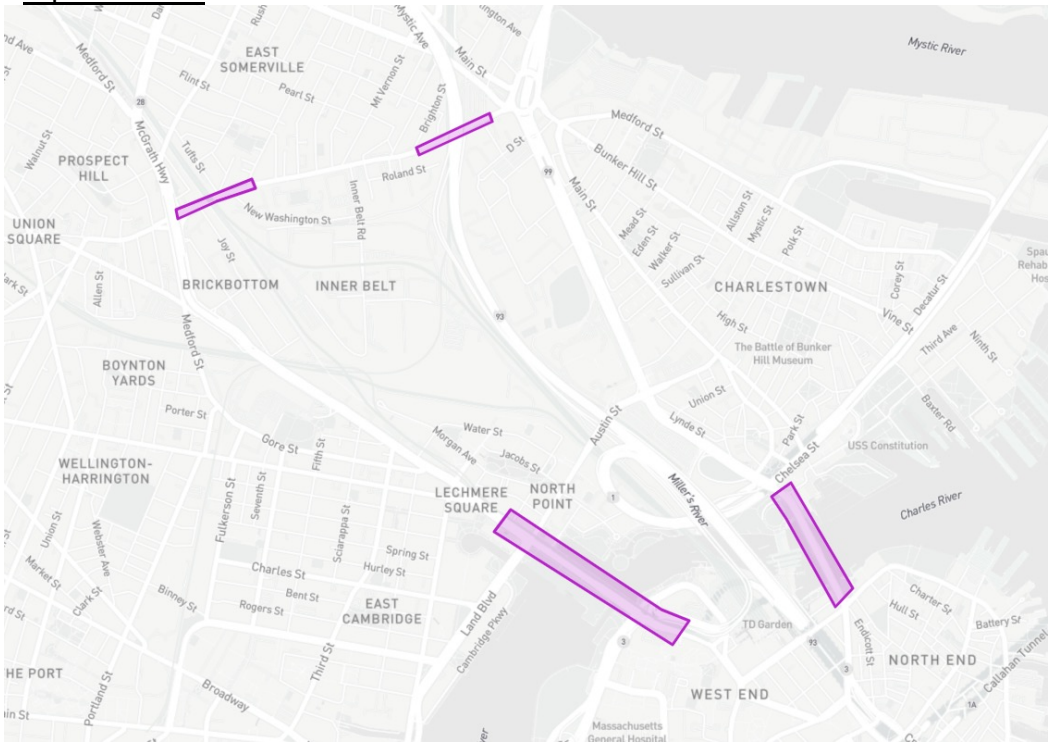
Map 2.2: REGIONAL ANALYSIS – Alternative 2 (Dedicated Bus Lane for Whole Route) Westbound Only vs Baseline Westbound Only



Recent Applications

- Gilmore Bridge transit planning study
  - considers the impact of different bus route types on job access, primarily in the areas of Cambridge, Somerville, and Charlestown
    - Alt. 1: dedicated lane
    - Alt 2: BRT
      - Bi-directional vs east/west-bound only
    - **Slow zones added by hand to approximate impact to drivers**

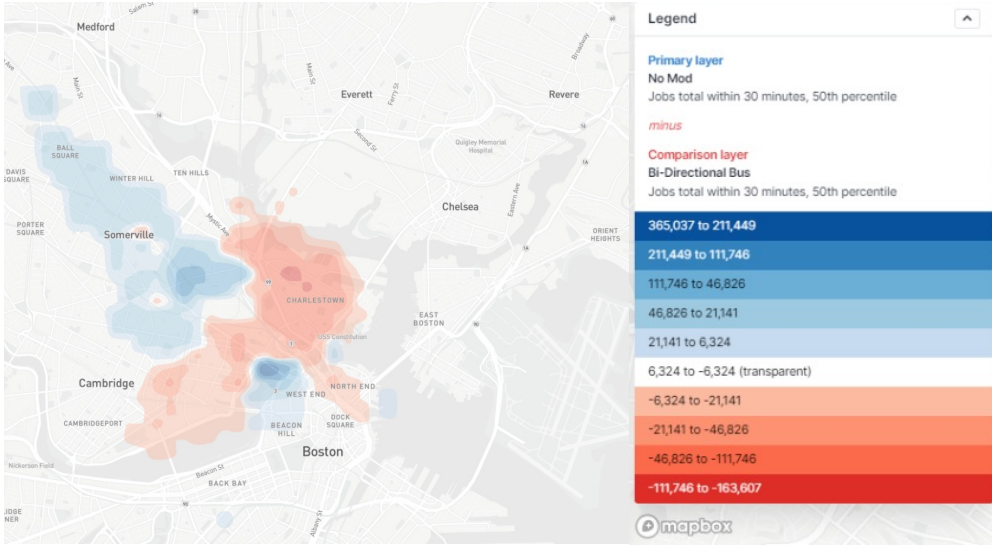
Map 2.2: Slow Zones



Recent Applications

- Gilmore Bridge transit planning study
  - considers the impact of different bus route types on job access, primarily in the areas of Cambridge, Somerville, and Charlestown
    - Alt. 1: dedicated lane
    - Alt 2: BRT
      - Bi-directional vs east/west-bound only
    - **Slow zones added by hand to approximate impact to drivers**

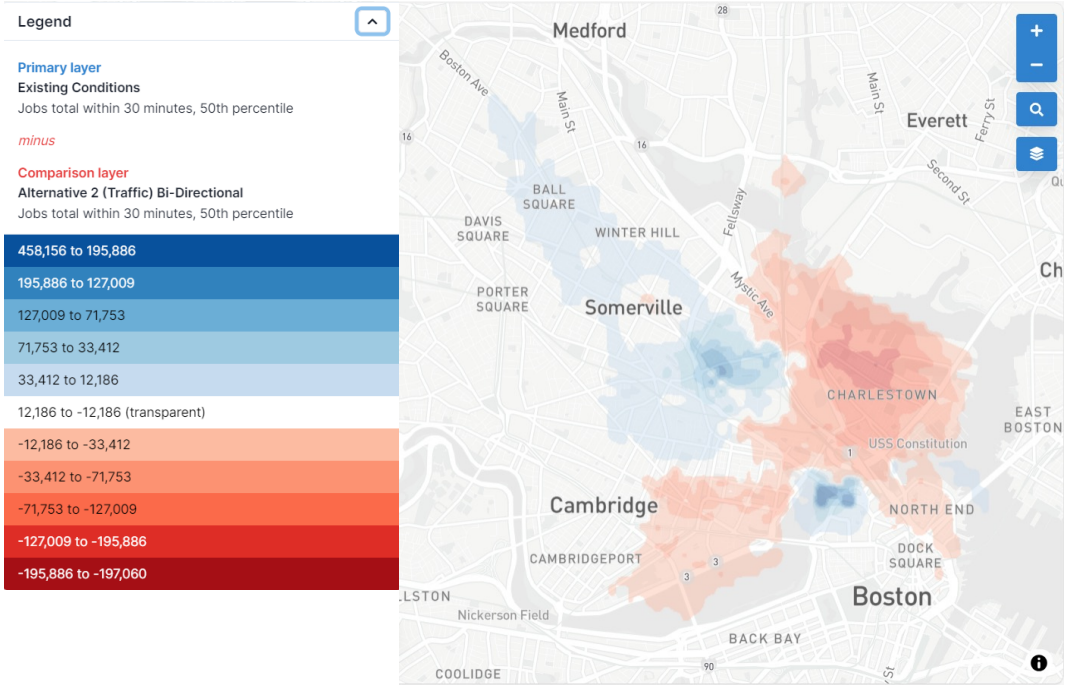
Map 3.2: REGIONAL ANALYSIS - Existing Conditions vs Alternative 1 (Dedicated Gilmore Bus Lane) Bi-Directional



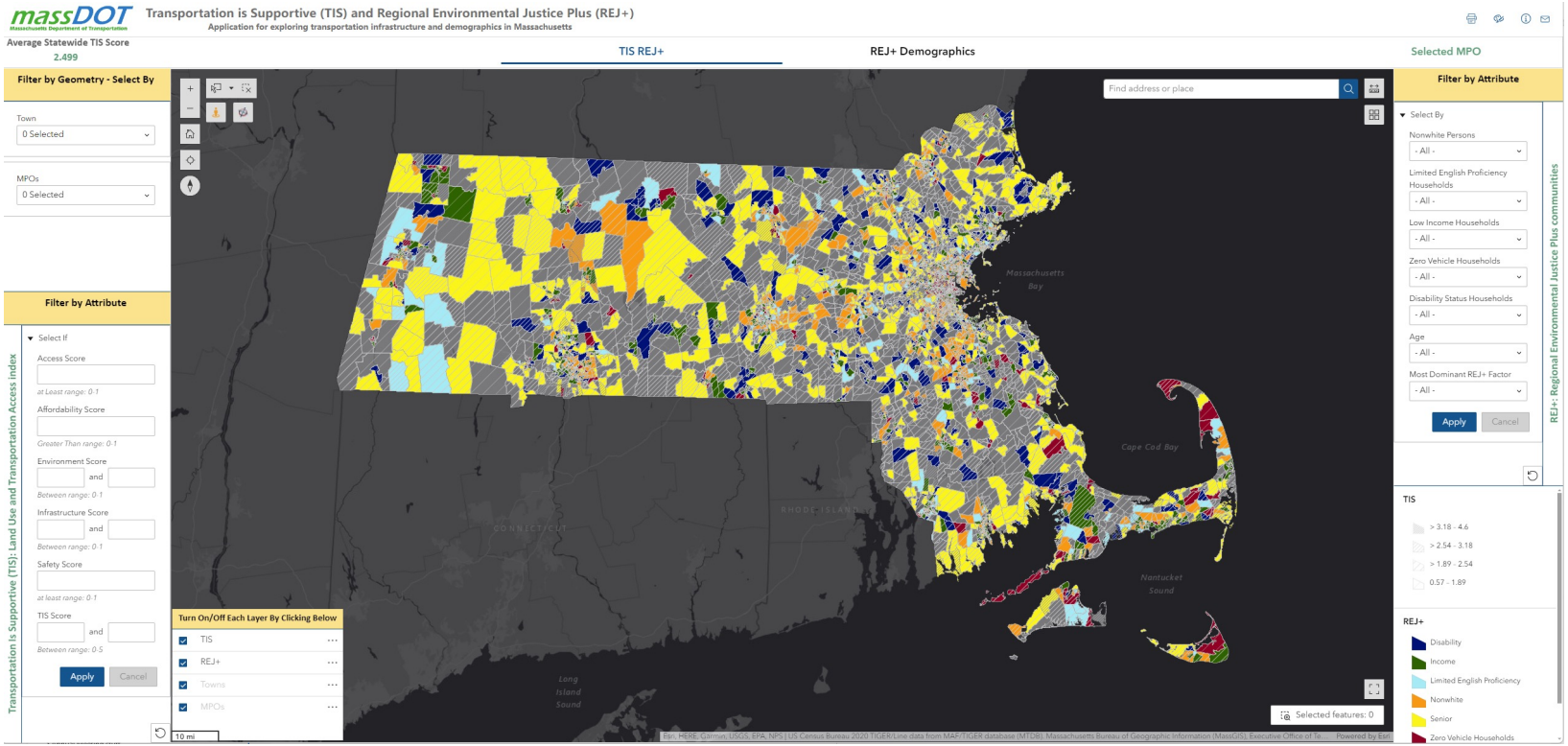
Recent Applications

- Gilmore Bridge transit planning study
  - considers the impact of different bus route types on job access, primarily in the areas of Cambridge, Somerville, and Charlestown
    - Alt. 1: dedicated lane
    - Alt 2: BRT
      - Bi-directional vs east/west-bound only
    - **Slow zones added by hand to approximate impact to drivers**

Map 3.3: REGIONAL ANALYSIS – Existing Conditions vs Alternative 2 (Dedicated Bus Lane for Whole Route) Bi-Directional

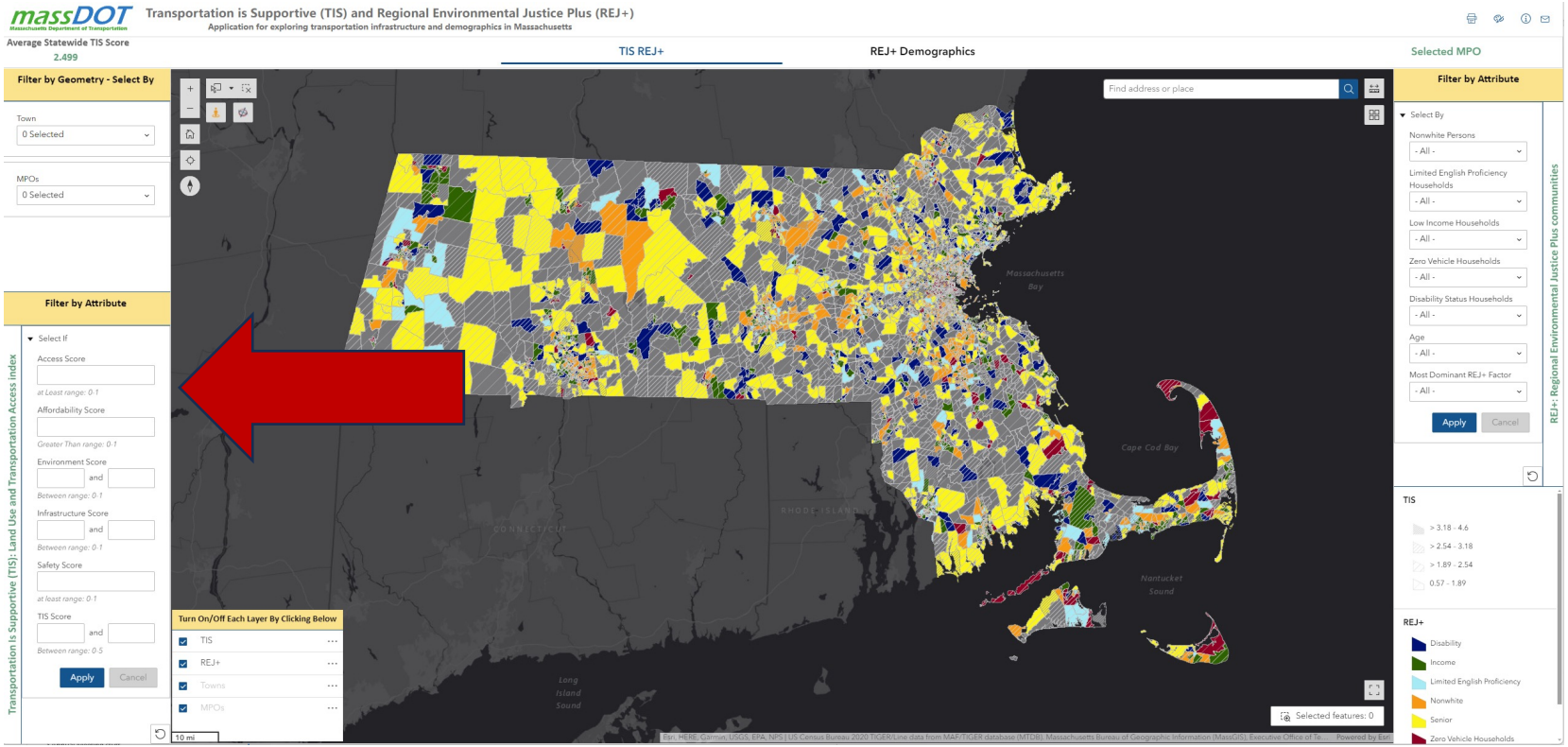


Recent Applications



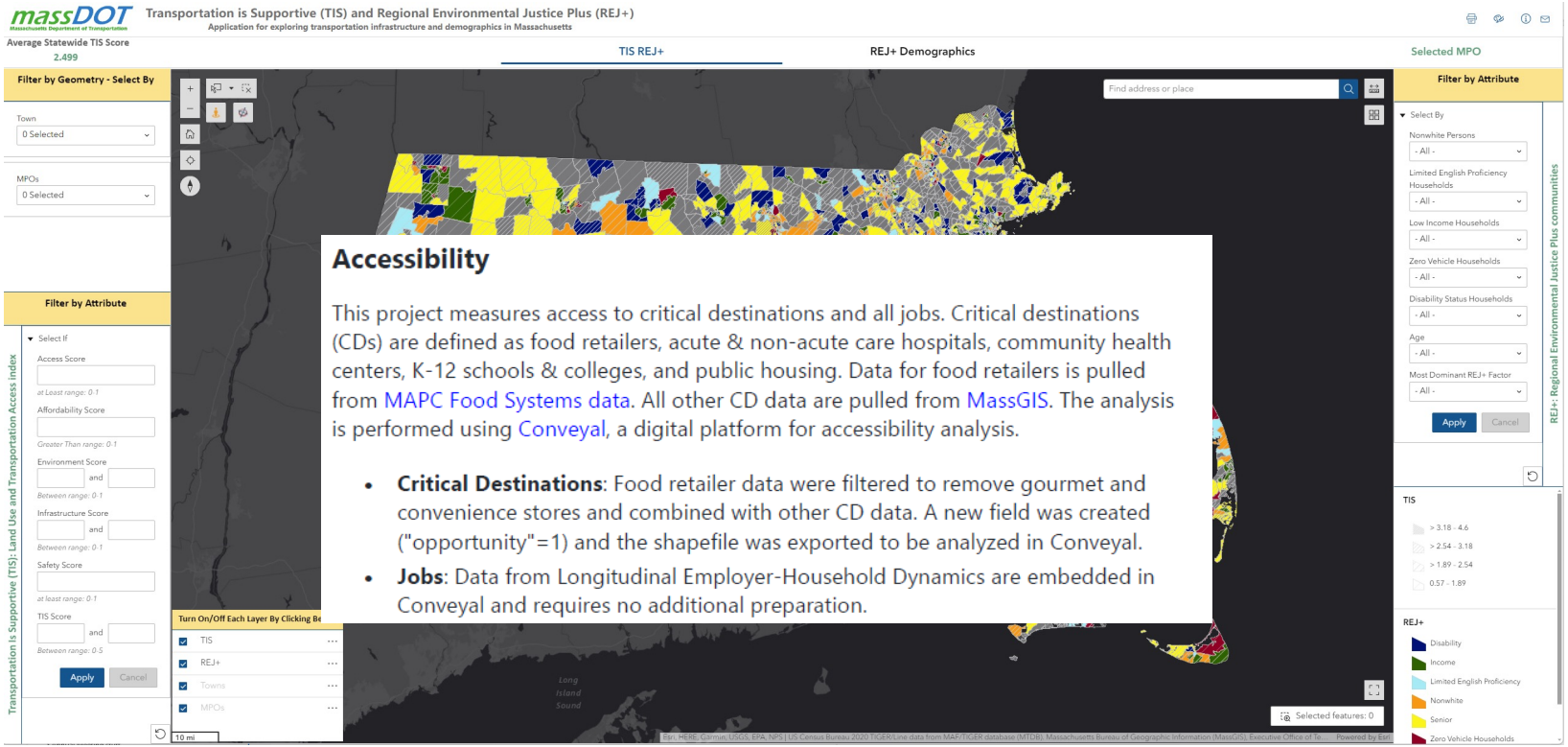
massDOT Office of Transportation Planning

Recent Applications



massDOT Office of Transportation Planning

Recent Applications



massDOT Office of Transportation Planning

massDOT Office of Transportation Planning

Thank You

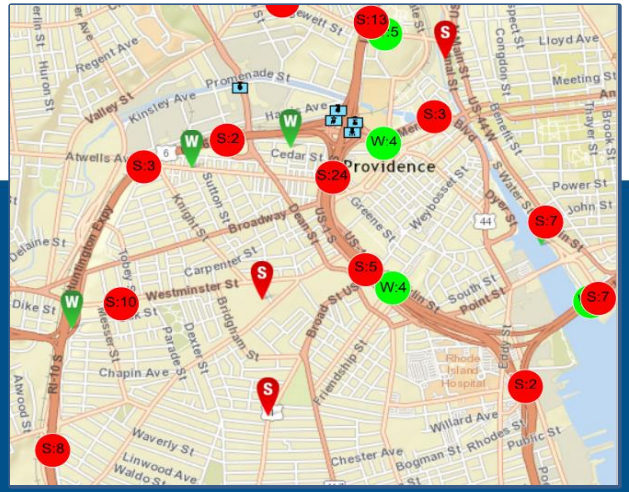
liz.williams@dot.state.ma.us

Leveraging Centralized Citizen Data to Help Drive Decision-Making

Stephen Kut

Rhode Island DOT

Leveraging Centralized Citizen Issue Data to Help Drive Decision Making



3/19/25

Rhode Island DOT

Establish a Centralized System for Capture Issues and Complaints

- Replace the 6 or more systems for tracking issues.
  - Redundant
  - No way to report or analyze
  - Non spatial

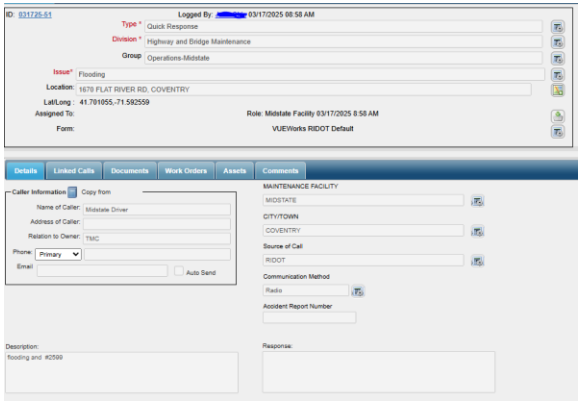
- Immediately track responses to complaints logged by our

  Communications and Customer Service Unit Citizens
  - Governor's Office
  - Legislature
  - Cities/Towns
- Expanded to include
  - Traffic Management Center (TMC)
    - 24/7 Quick Response Calls (Dispatch)

RI dot
Driven to get you there

Standardized Input

- Training on input of issues into proper category
- Accurate location key to analyzing the data
  - Link to asset data where possible - Signs, Lighting, Guardrail, Striping, Walls, Catch Basins, Manholes, Signals, Bridges
  - Link to address or milepost if asset not identified
  - Location description derived from GIS asset link



Issue Occurred	Location	Issue
03/17/2025 09:32 AM	Intersection of TOWER HILL RD and COL. RODMAN HWY in NORTH KINGS	Called into TMC
03/17/2025 09:25 AM	38 1/2 DEAN AVE, JOHNSTON	Drainage
03/17/2025 09:20 AM	Intersection of TAUNTON AVE and GOLDSMITH AVE in EAST PROVIDENCE	Work Zone Issue
03/17/2025 09:10 AM	Intersection of RI 1 A (NEWPORT AV) and WHITTIER RD in Pawtucket	Called into TMC
03/17/2025 09:05 AM	Intersection of RI 177 (BULGARMARSH RD) and RESTFUL VALLEY AV in Ti	Flooding
03/17/2025 09:03 AM	Intersection of RI 1 A (NEWPORT AV) and WHITTIER RD in Pawtucket	Pothole
03/17/2025 08:58 AM	1670 FLAT RIVER RD, COVENTRY	Flooding
03/17/2025 08:54 AM	295 North @ Route 114 North & South (Diamond Hill Road) - Cumberland Exit	Pothole
03/17/2025 08:51 AM	Intersection of RI 114 (DIAMOND HILL RD) and HILLSIDE RD in Cumberland	Flooding
03/17/2025 08:45 AM	Intersection of BRONCO HWY and DOUGLAS PIKE in BURRILLVILLE , Signa	Traffic Signal On Flash
03/17/2025 08:41 AM	692 WARREN AVE, EAST PROVIDENCE	Accident
03/17/2025 08:31 AM	Intersection of WEST MAIN RD and HOME DEPOT in MIDDLETOWN , Signal	Traffic Signal On Flash
03/17/2025 08:28 AM	295 North @ I 295 South to Route Greenville Ave Johnston Exit Number 10	Light Pole Down
03/17/2025 08:14 AM	206 E MAIN RD, PORTSMOUTH	Traffic Control
03/17/2025 08:11 AM	Intersection of NEWPORT AVE and ARMISTICE BLVD in PAWTUCKET , Sign	Traffic Signal On Flash
03/17/2025 08:08 AM	206 E MAIN RD, PORTSMOUTH	Tree Issue
03/17/2025 08:02 AM	170 MENDON RD, CUMBERLAND	Flooding
03/17/2025 07:51 AM	445 PUTNAM PIKE, SMITHFIELD	Sign Down
03/17/2025 07:43 AM	28 GRISWOLD AVE, BRISTOL	Tree Issue
03/17/2025 07:28 AM	195-5 I-195 W @ Washington Bridge	Camera No Video/Poor Video
03/17/2025 07:04 AM	Intersection of ROUTE 10 and PARK AVE in CRANSTON , Signal No. 207	Flooding
03/17/2025 06:23 AM	Intersection of WATERMAN AVE and JAMES ST in EAST PROVIDENCE , Sig	Traffic Signal On Flash
03/17/2025 06:19 AM	95_38.0_S_CAM - Orms St	Camera No Video/Poor Video
03/17/2025 05:52 AM	95 North @ Providence Place Mall Exit Number 37D	Debris
03/17/2025 05:16 AM	Intersection of US 6 (HARTFORD PK) and RI 116 (W GREENVILLE RD) in Sc	Tree Issue
03/17/2025 05:14 AM	Intersection of 333 DIAMOND HILL RD and NATE WHIPPLE RD in Cumberla	Tree Issue
03/17/2025 05:10 AM	95 South @ Atwells Avenue Exit Number 37A	Guardrail Repair
03/17/2025 04:59 AM	95 South @ RI-2 N & S (Quaker Lane) - West Warwick/East Greenwich Exit N	Flooding
03/17/2025 12:02 AM	Intersection of GEORGE WASH. HWY and OLD RIVER RD in LINCOLN , Sig	Traffic Signal Timing Issue
03/16/2025 10:42 PM	515 KINGSTOWN RD, RICHMOND	Tree Issue

RI DOT
Driven to get you there

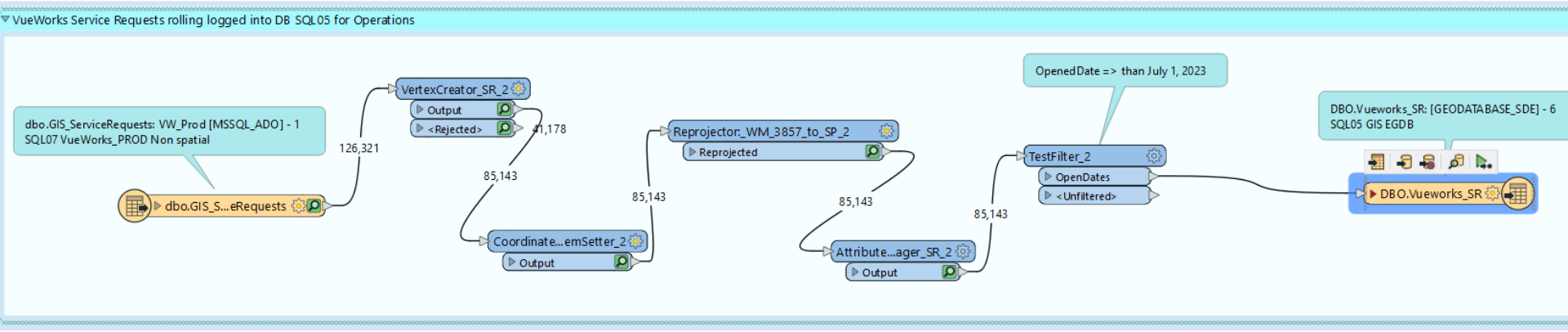
Operational Units responding to Issues

- Robust data set of over 120,000 Service Requests
  - Seven Maintenance Districts responding to service requests
    - Over 1000 issues logged from Customer Service Unit and TMC Monthly
    - Approximately 95% turns into work performed by Maintenance
    - Pavement, flooding, washouts, sweeping, debris, spills
  - Traffic Maintenance Unit
    - Highway lighting, traffic signals, & traffic signs
  - Bridge Maintenance Unit
    - Bridge joints, potholes on decks, railing issues, debris
  - Roadside
    - Trees, Mowing, Graffiti, Trash Issues
  - Safety Maintenance Contracts
    - Guardrail, Fence, Attenuators
  - Project Management
    - Project Issues
  - Drainage Maintenance
    - Flooding Issues

RI dot
Driven to get you there

Prepare Data for Analysis

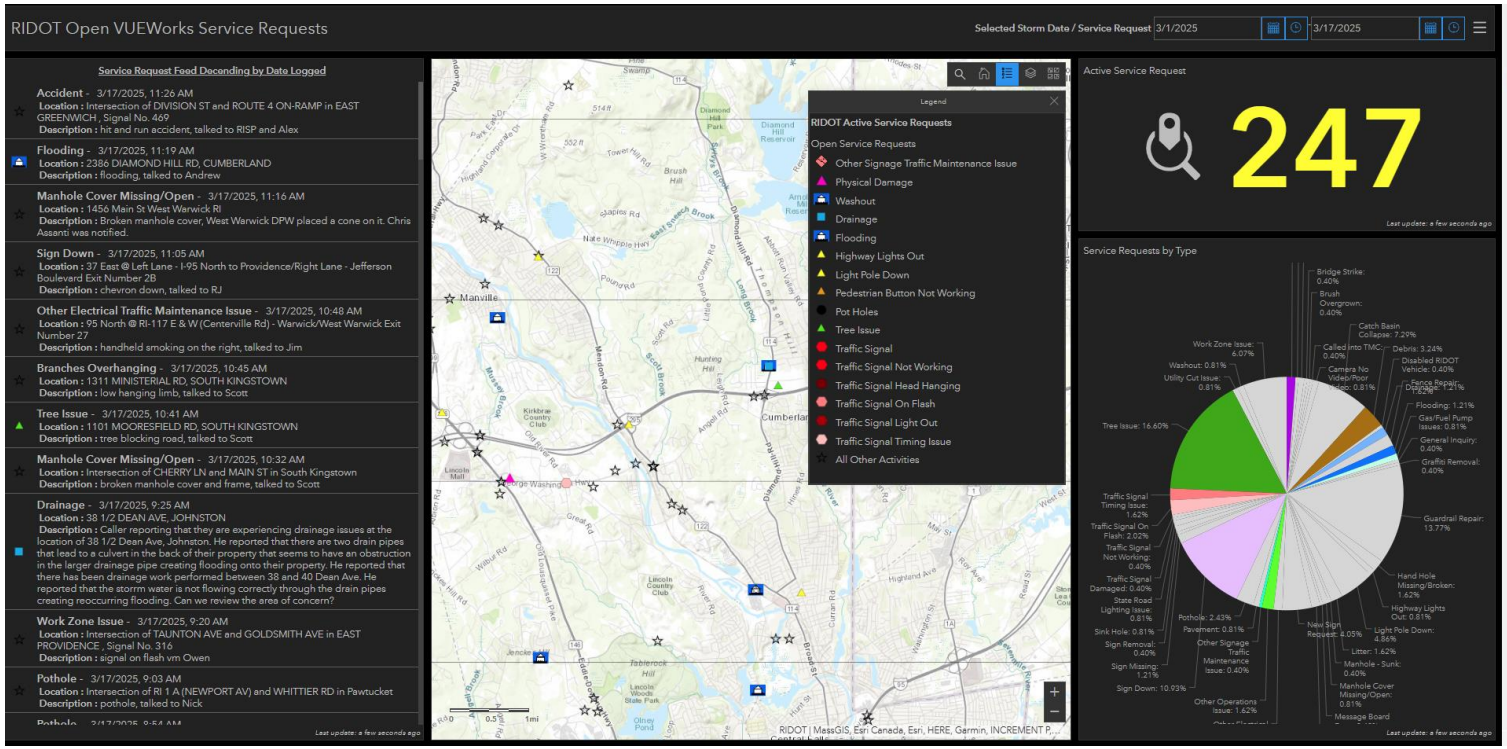
- ETL data from SR System to Enterprise GIS for sharing and analysis
  - Data uses for operational dashboards and for project development



RI DOT
Driven to get you there

Maintenance Operations

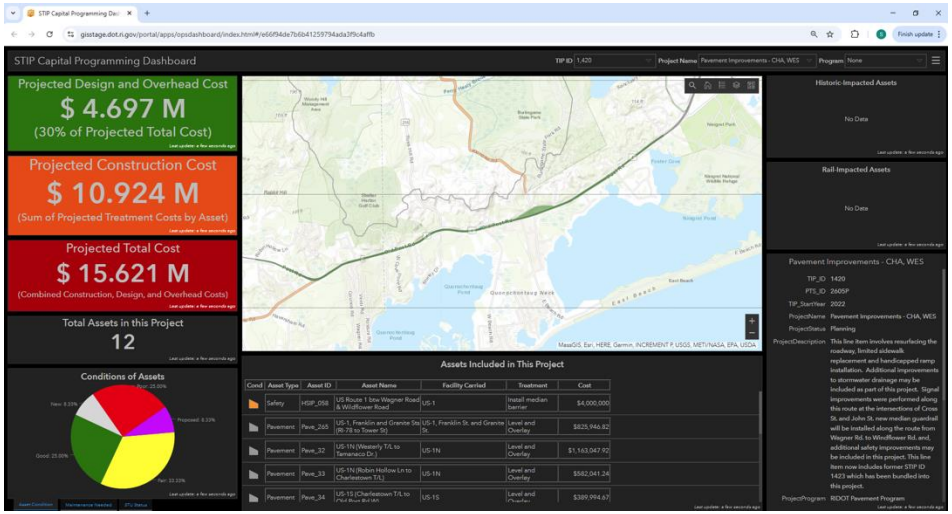
- Operations Dashboards During Major Events
  - Prioritize Resources
  - Flooding, Traffic Signal, Tree Damage

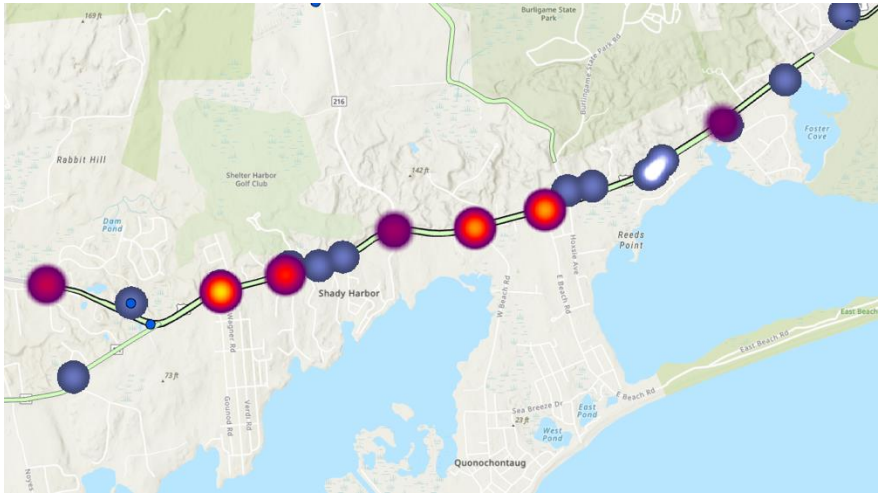


RI DOT
Driven to get you there

Project Development

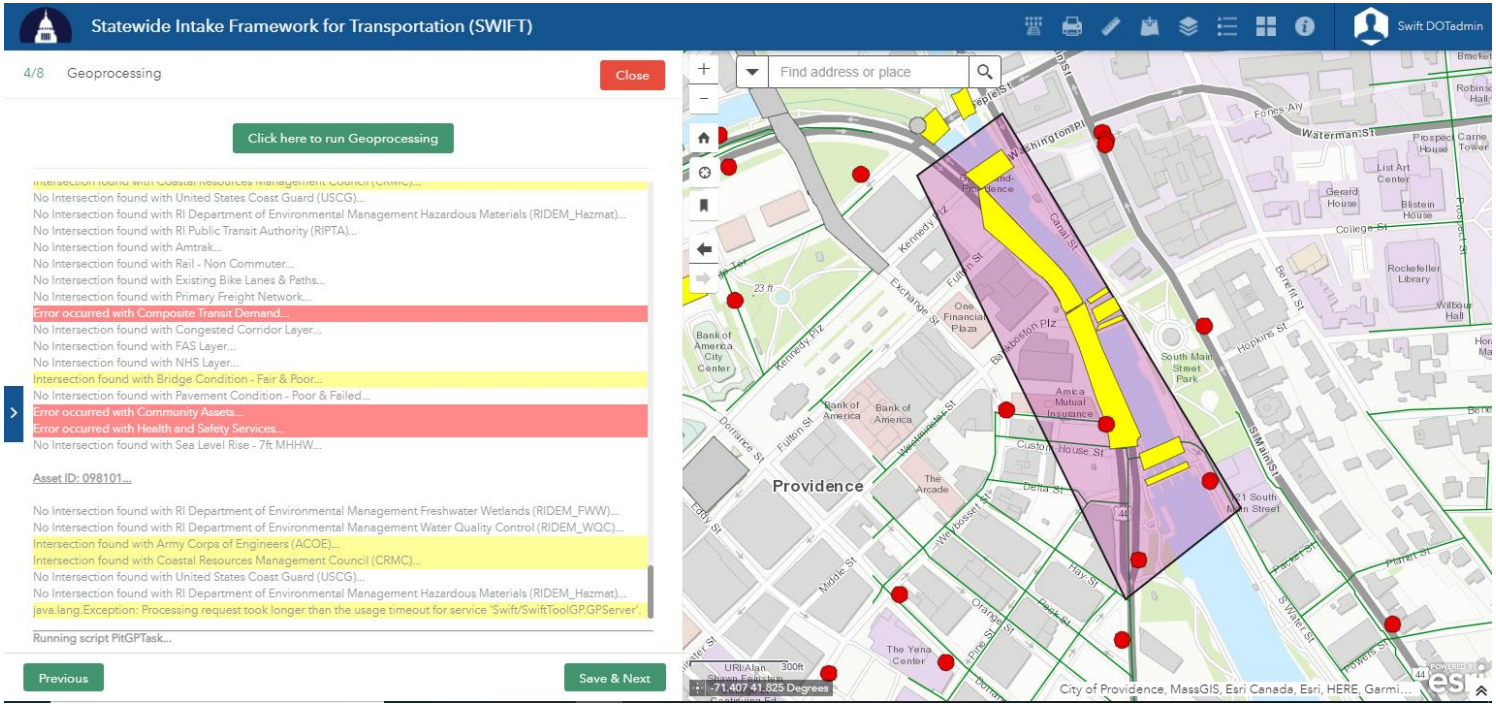
- Summary of issues within and near Project ZOD
  - Helps to validate asset condition data
  - Used to identify additional scoping items to projects





Next Steps – Include Issue Data in Project Geoprocessing Engine

- Automate the summarization of data by project
  - Statistics of issue type by project area
  - Flexibility to rerun as projects limits change



Next Steps - Post Project Analysis

- Did we meet our goals of the project?
  - Reduce the number complaints within the area identified
    - Flooding
    - Pavement
    - Traffic Signals
  - Reduced impacts during major weather events

RI dot
Driven to get you there

Enhancing Data Management and Utilization for Decision-Making

John Hoang

Contra Costa Transportation Authority

CONTRA COSTA
transportation
authority

Enhancing Data Management and Utilization for Decision-Making

AASHTO/FHWA TMP WEBINAR 25

March 19, 2025

John Hoang
Director, Planning
Contra Costa Transportation Authority

Who We Are

- CCTA is a public agency formed by voters in 1988 to manage the county's transportation sales tax program and to lead transportation planning efforts.

- CCTA is responsible for maintaining and improving the county's transportation system by delivering critical transportation infrastructure projects to safely and efficiently, get people where they need to go.

What We Do

PEDESTRIAN
Improvements to sidewalks, crosswalks, trails, and paths

LOCAL STREETS
Smooth traffic flow on major roads and make surface improvements such as pothole repairs

BUSES
Invest in a reliable, comfortable and convenient bus network

SAFE ROUTES TO SCHOOLS
Focus on programs and projects aimed at bicycle and pedestrian safety for K-12 students

FERRIES
Expand ferry system by looking to ferries as an alternate commute method between West County and San Francisco

BICYCLE
Invest in safe routes and infrastructure improvements for bicyclists

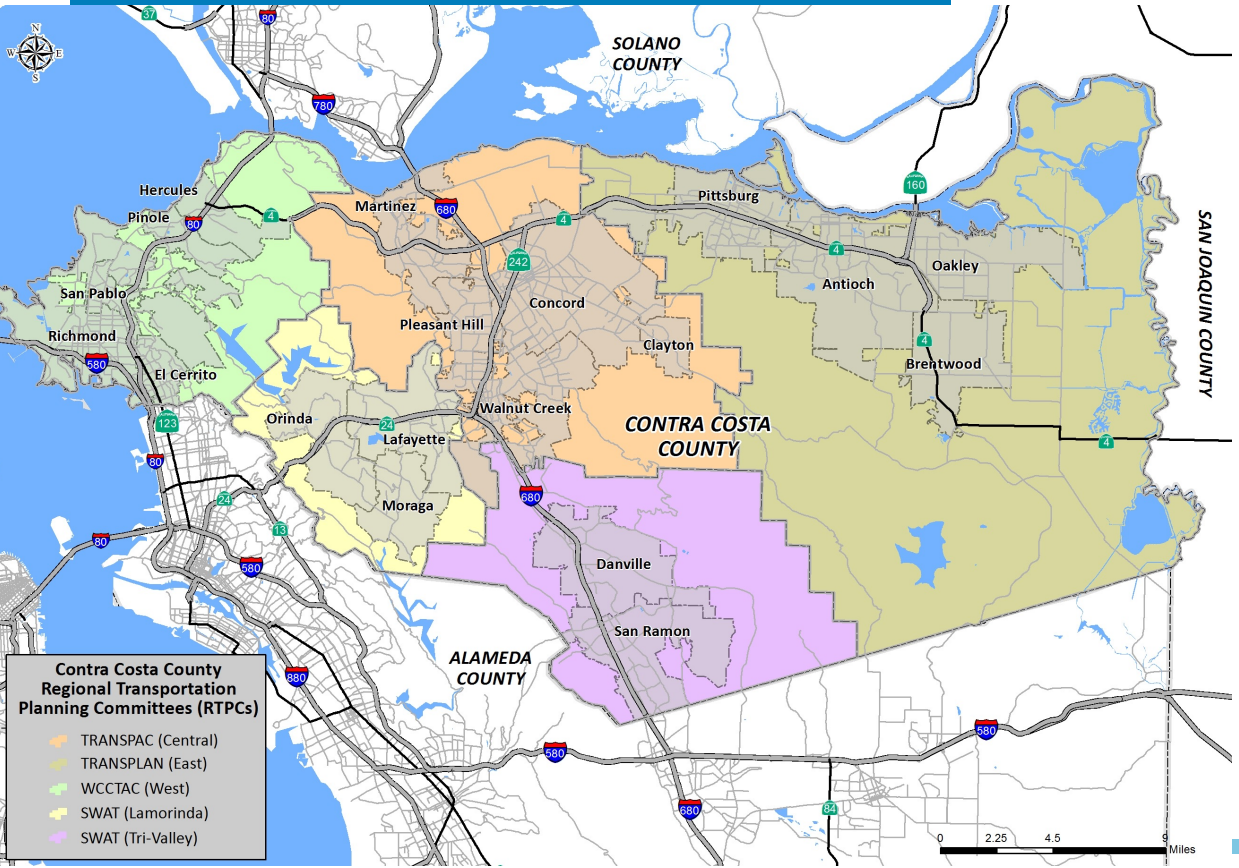
BART
Improve BART service and stations, extend routes and increase parking

HIGHWAYS
Complete Contra Costa's highway system, and improve air quality and noise protection along corridors

INNOVATIVE SOLUTIONS
Implement smart transportation infrastructure to reduce congestion and encourage greener travel

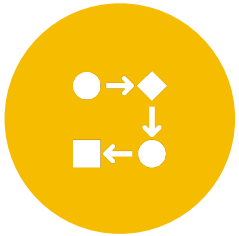
PROGRAMS FOR SENIORS AND DISABLED
Enhance transit options to improve mobility for seniors and people with disabilities

Contra Costa County



- *1.155 million residents (2023)*
- *19 incorporated Cities/Towns*
- *3,200 miles of roadway*
- *5 transit providers + Amtrak*

CCTA Data Initiative



VISUALIZE DATA

PROVIDE INSIGHTS

TELL A STORY

TARGETED AUDIENCE

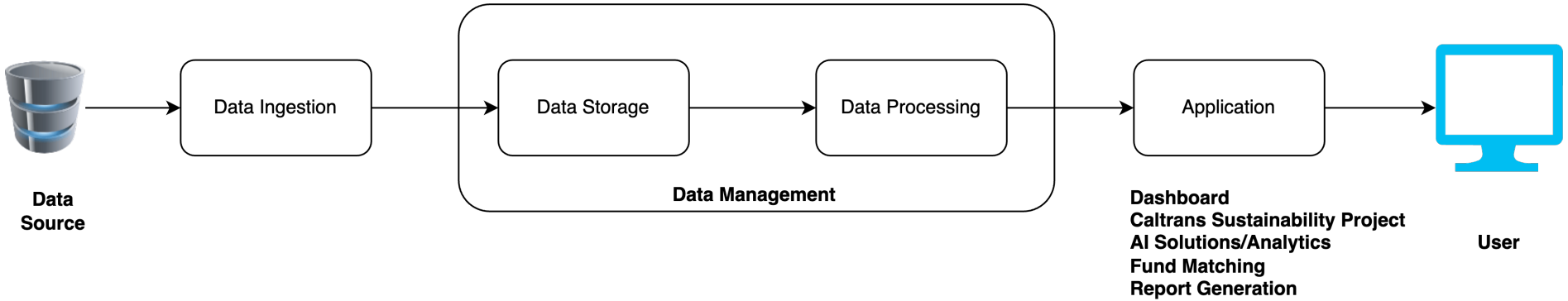
Disconnected Data, Disconnected Decisions: Overcoming the Silo Effect

Data is just data—until you connect, analyze, and act on it. Only then does it become actionable information.

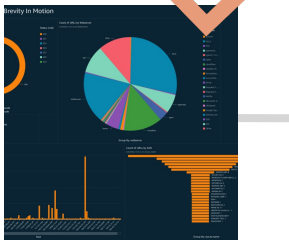
Data Fabric: The Foundation for Data-Driven Solutions

Data Fabric is an architectural approach that connects and integrates all data sources, empowering organizations to efficiently utilize their data across various environments.

Data to Action

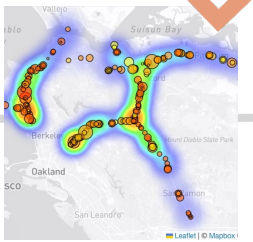


CCTA Multi-Year Data Plan



2022- Phase I

Demonstrated cloud capabilities as a Proof Of Concept.



2023 – Phase II

Analytics dashboard utilizing data available: Inrix planning speed and incident data, PeMS, and Streetlight.

2024 –Phase III

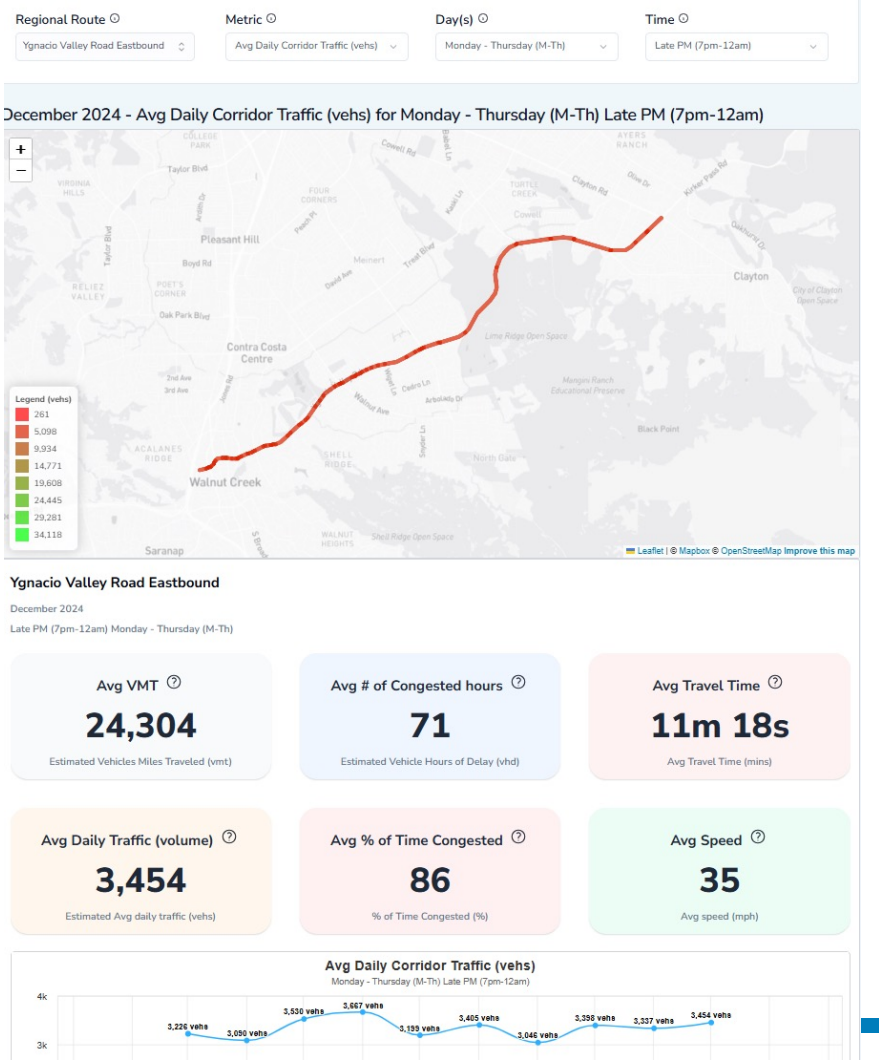
- CCTA Data Repository
- Gen-AI
- Predictive analytics
- Project Central Platform

2025 & after – Phase IV

- Large-scale knowledge-base
- Enhanced AI Features
- Scaled real-time data ingestion and export

CCTA Data Portal: Transportation Insight Reimagined

data.ccta.net

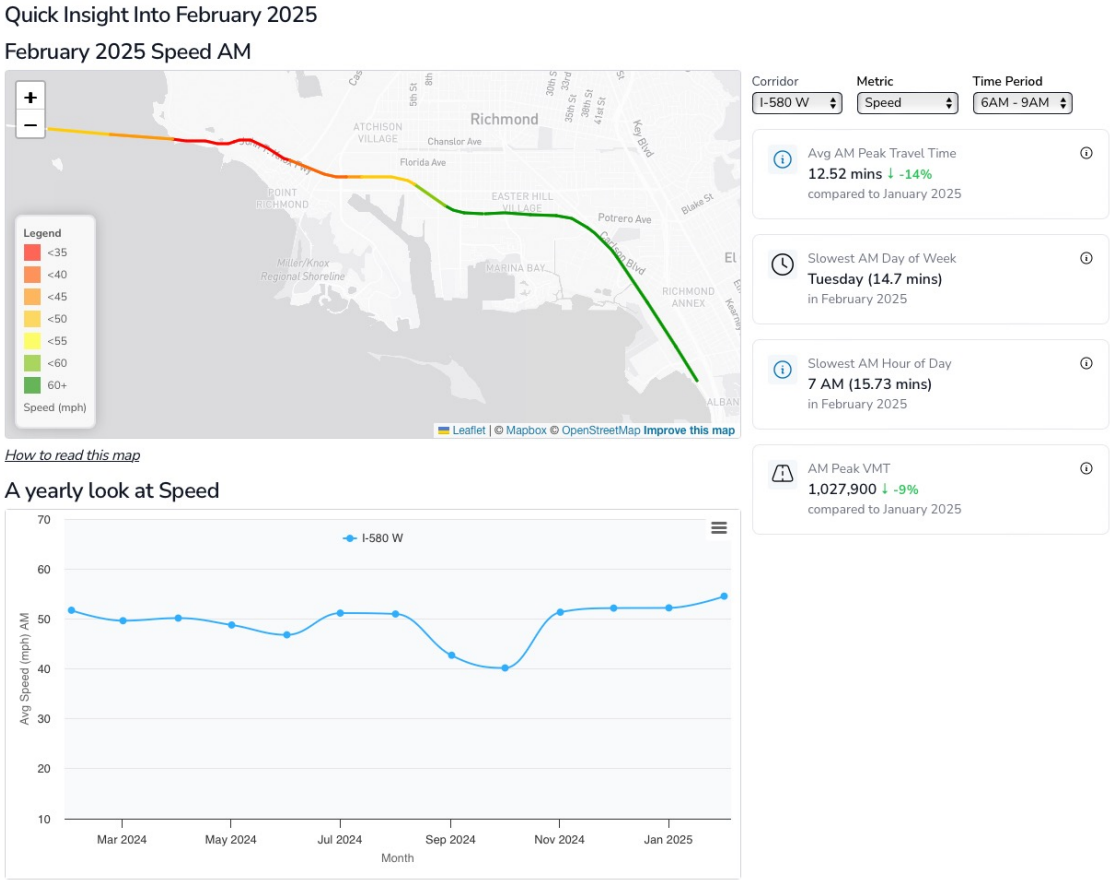


Data Collection

- Speed
- Volume
- Traffic Congestion
- Road Safety/Collision
- Pedestrian and Bicycle Crash
- Realtime & Historical Data
- Transit

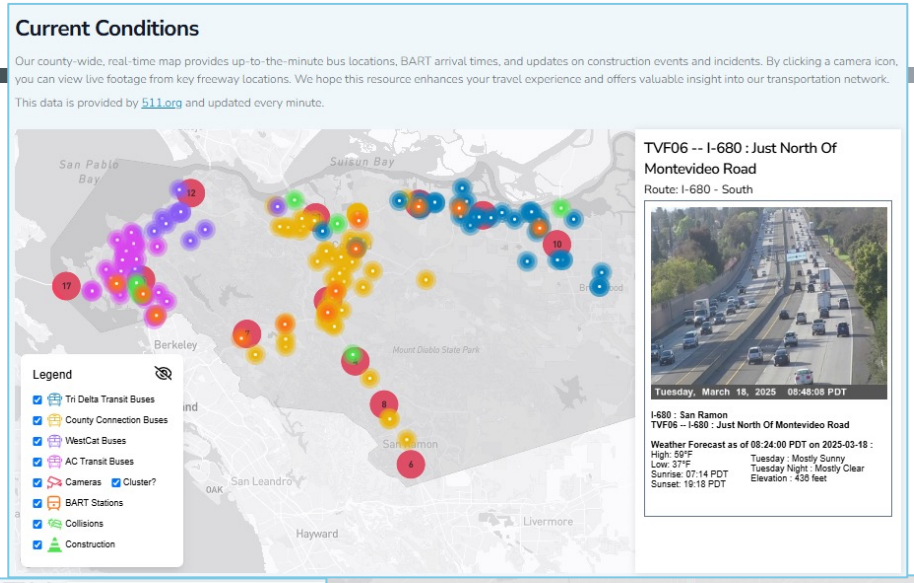
Data Sources

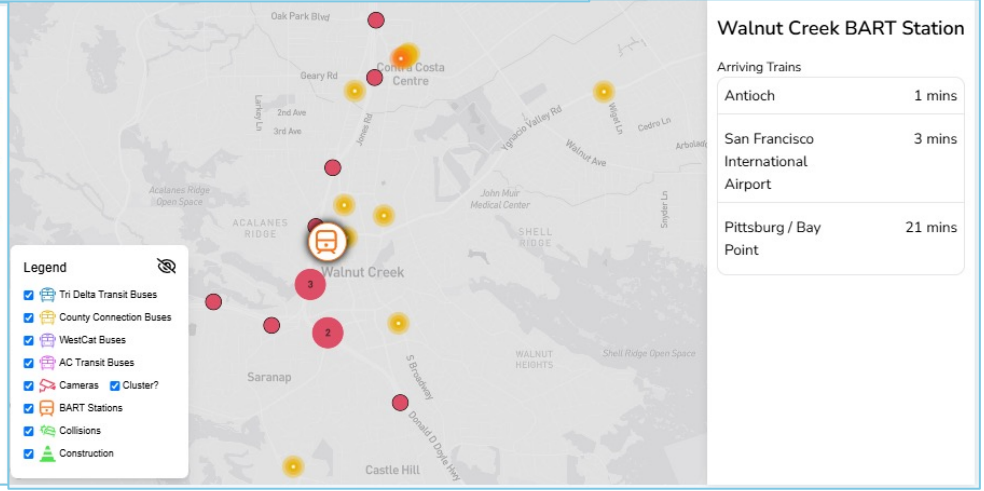
- Inrix: Highway congestion and incidents
- Performance Measurement System (PeMS): highway VMT
- StreetLight: Routes of Regional Significance VMT, speed, delay
- BART: BART ridership
- Caltrans: CCTV
- CCTA Internal Data: Projects, documents, and reports



Realtime Data

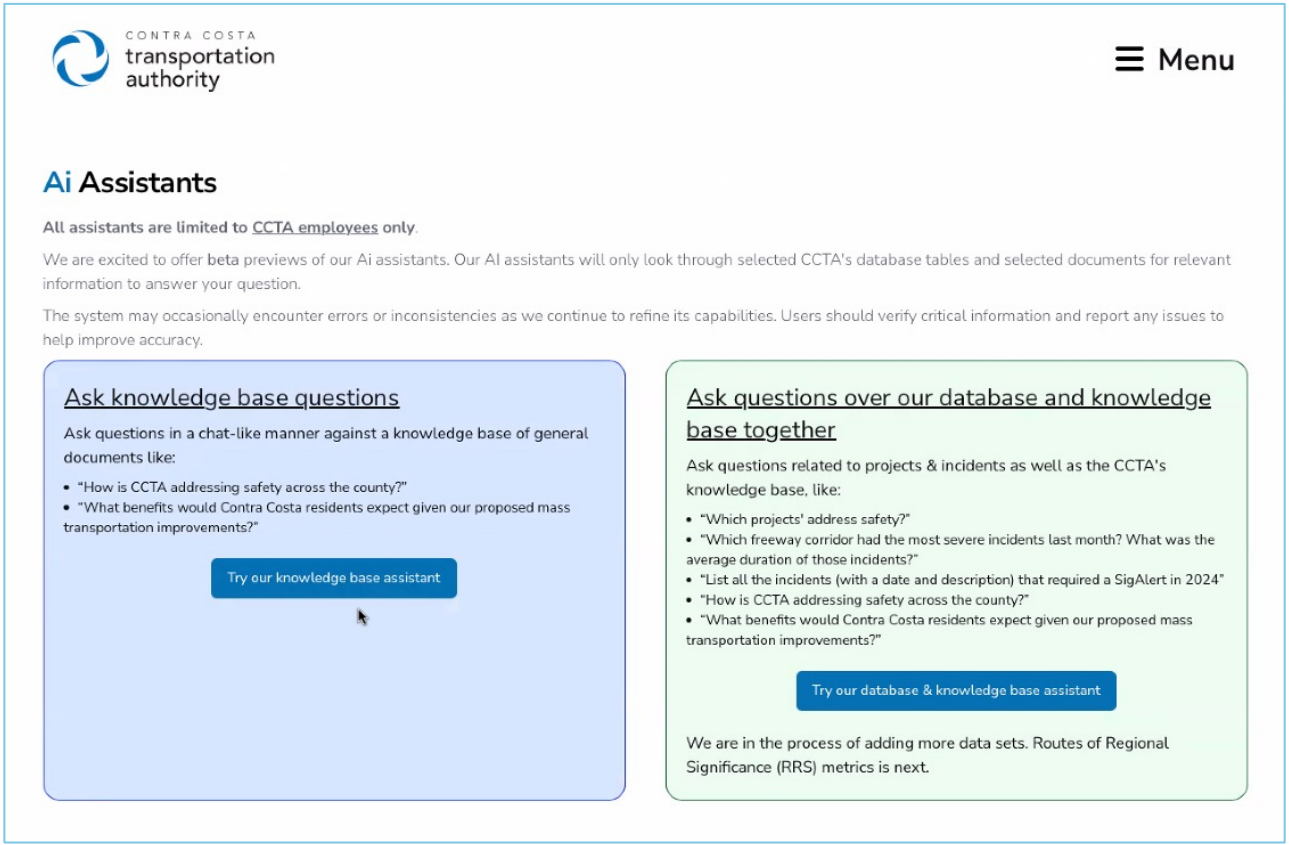
- 511.org: Real-time bus, BART, highway accidents and construction
- Caltrans





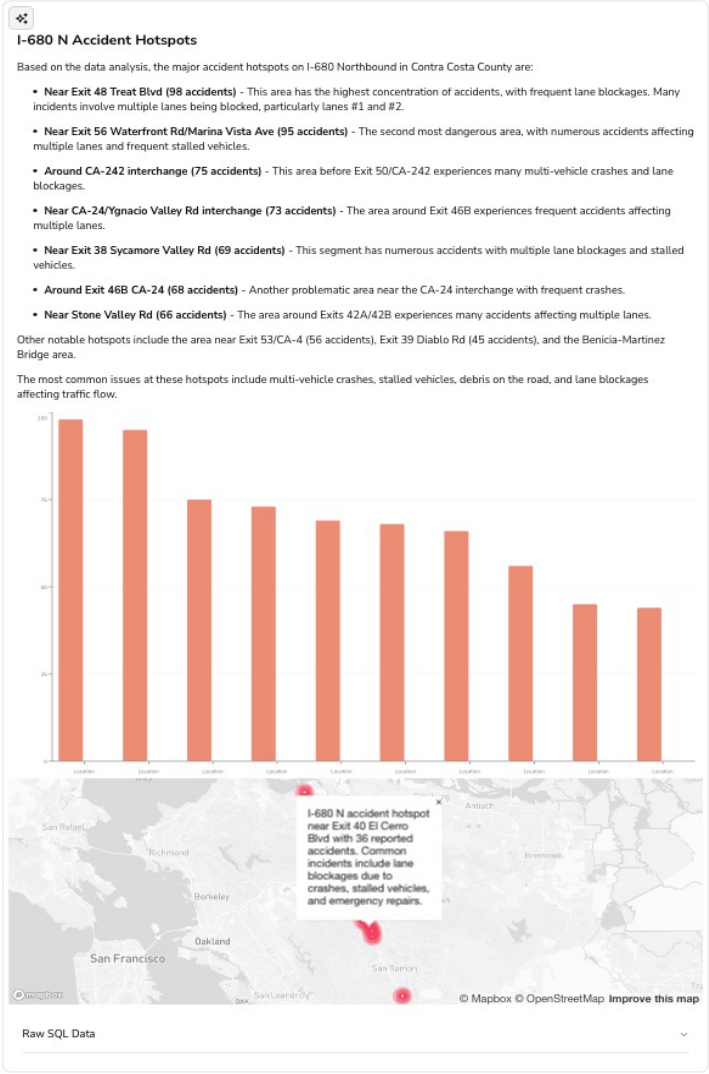
Ai

- Database
- Knowledge Based



Features of CCTA Data Portal

- Centralized CCTA Knowledge Base
- Custom Dashboards & Reports
- AI-Driven Insights
- Real-Time Traffic Monitoring
- Project Impact Analysis
- Grant & Policy Support

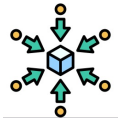


Utilization?

- Network Monitoring
- Performance Measures
- Vision Zero
- Public awareness
- Analytics and decision making
- Board of directors
- Fund allocation and grant applications
- Project prioritization
- Monthly and quarterly performance reports
- Top management quick access to performance metrics

Benefits

Faster, Data-Driven Decision Making

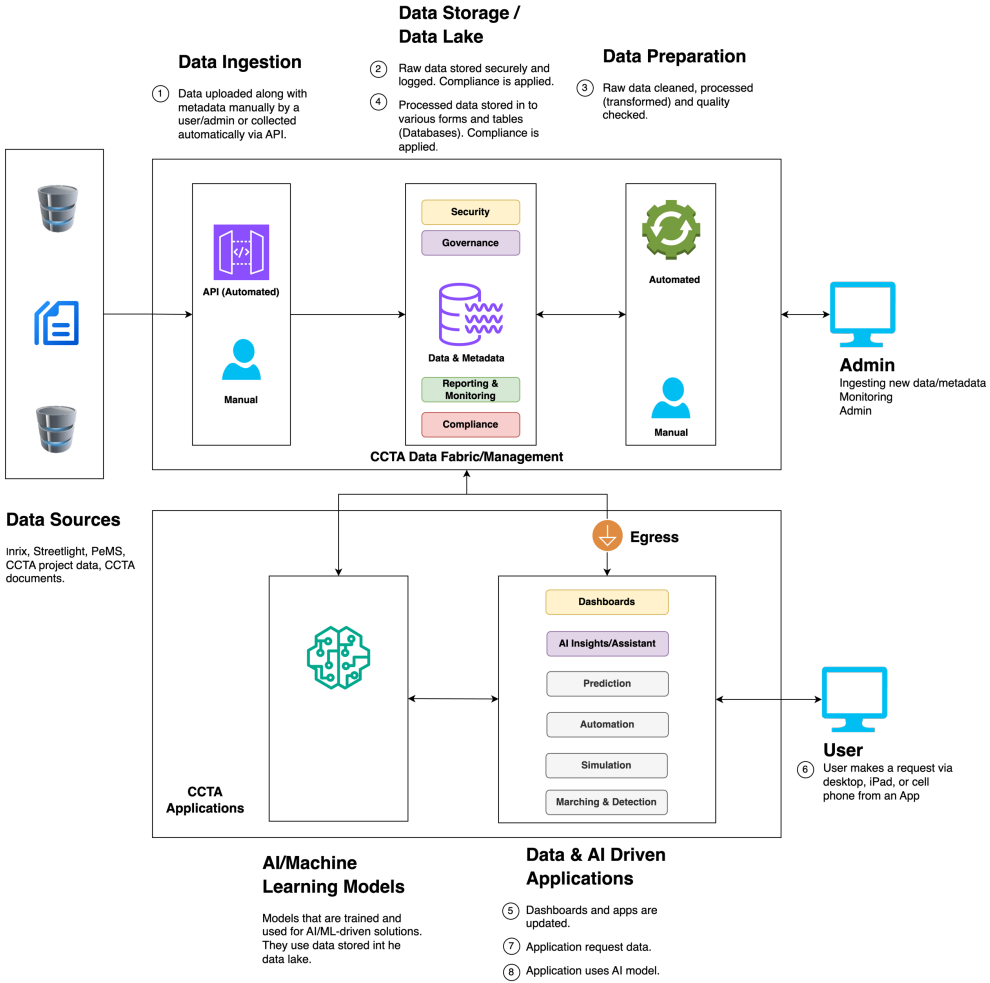


Comprehensive & Centralized Insights

Enhanced Efficiency & Accuracy

Improved Traffic & Safety Planning

Greater Public Transparency & Engagement


Data Storage / Data Lake
Data Ingestion
1 Data uploaded along with metadata manually by a user/admin or collected automatically via API.
2 Raw data stored securely and logged. Compliance is applied.
4 Processed data stored in to various forms and tables (Databases). Compliance is applied.
Data Preparation
3 Raw data cleaned, processed (transformed) and quality checked.
API (Automated)
Manual
Security
Governance
Data & Metadata
Reporting & Monitoring
Compliance
Automated
Manual
CCTA Data Fabric/Management
Admin
Ingesting new data/metadata
Monitoring
Admin
Data Sources
Inrix, Streetlight, PeMS, CCTA project data, CCTA documents.
Egress
Dashboards
AI Insights/Assistant
Prediction
Automation
Simulation
Marching & Detection
CCTA Applications
User
6 User makes a request via desktop, iPad, or cell phone from an App
AI/Machine Learning Models
Models that are trained and used for AI/ML-driven solutions. They use data stored int he data lake.
Data & AI Driven Applications
5 Dashboards and apps are updated.
7 Application request data.
8 Application uses AI model.

How are we doing it?

Continuous Delivery

Iterative and Gradual Development

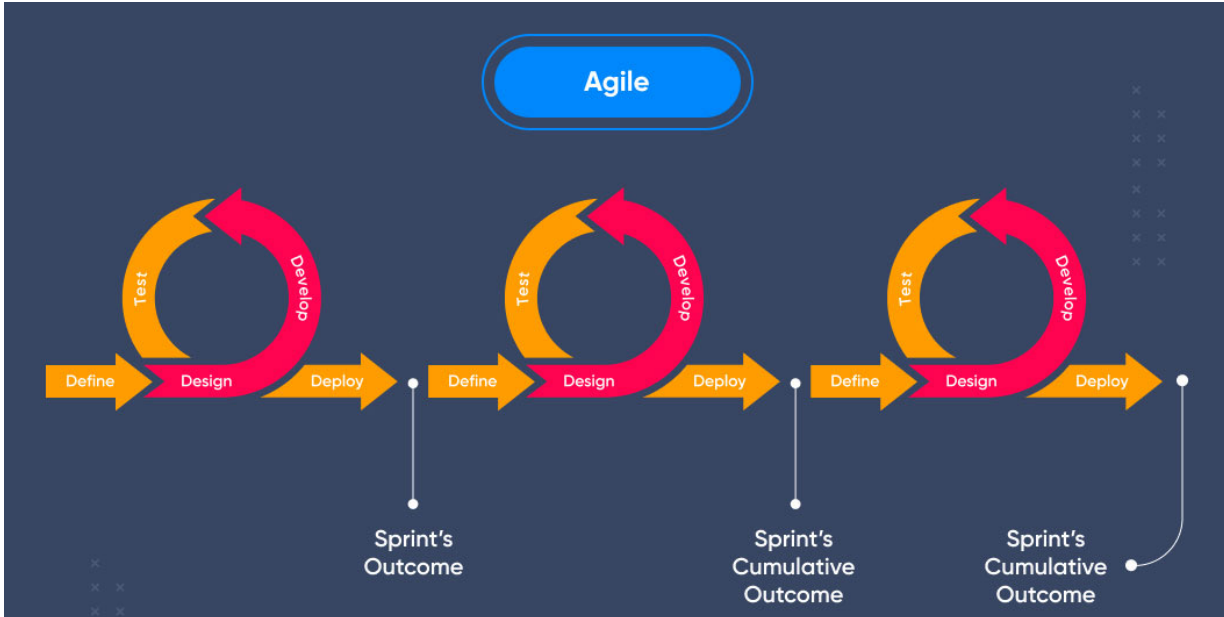
Low Risk

Flexible

Adaptability to Uncertainty

Fail Fast, Correct Fast

Faster Time-to-Market



Enhancing Data Management and Utilization for Decision-Making

CONTRA COSTA
transportation
authority

Panel Q&A

Christos Xenophontos

Rhode Island DOT

- **All TPM Webinars: https://www.tpm-portal.com/event-directory/tpm-webinars/**

Save the Dates!

May 21, 2025 – TPM Webinar #26: Case Studies in Telling a Story – How to Leverage Collaboration and Communication in Performance Management

July 16, 2025 – TPM Webinar #27: Evaluating Post-Project Outcomes

October – Date TBD – TPM Webinar #28: Proceedings from the CPBM Annual Meeting and Peer Exchange

November 19, 2025 – TPM Webinar #29: Implication of AV and Shared Mobility to Transportation Performance Management

Webinars Typically Begin at 2:00 PM Eastern Time

Federal Highway Administration

AASHTO THE VOICE OF TRANSPORTATION

For more information or to register:
TPM-Portal.com