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**TRB** TRANSPORTATION RESEARCH BOARD

# TRB Webinar: Utilizing External Data Sources for Maintenance Decision Making

*December 13, 2024*

*1:00 – 2:30 PM*



# PDH Certification Information

1.5 Professional Development Hours (PDH) – see follow-up email

You must attend the entire webinar.

Questions? Contact Andie Pitchford at [TRBwebinar@nas.edu](mailto:TRBwebinar@nas.edu)

*The Transportation Research Board has met the standards and requirements of the Registered Continuing Education Program. Credit earned on completion of this program will be reported to RCEP at RCEP.net. A certificate of completion will be issued to each participant. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the RCEP.*



# AICP Credit Information

1.5 American Institute of Certified Planners Certification  
Maintenance Credits

You must attend the entire webinar

Log into the American Planning Association website to claim your  
credits

Contact AICP, not TRB, with questions

# Purpose Statement

This webinar will explore how state agencies are utilizing external data sources for maintenance decision making. Presenters will discuss how automated vehicle location, crowd sources, and connected autonomous vehicle data can improve maintenance and operations of the transportation network.

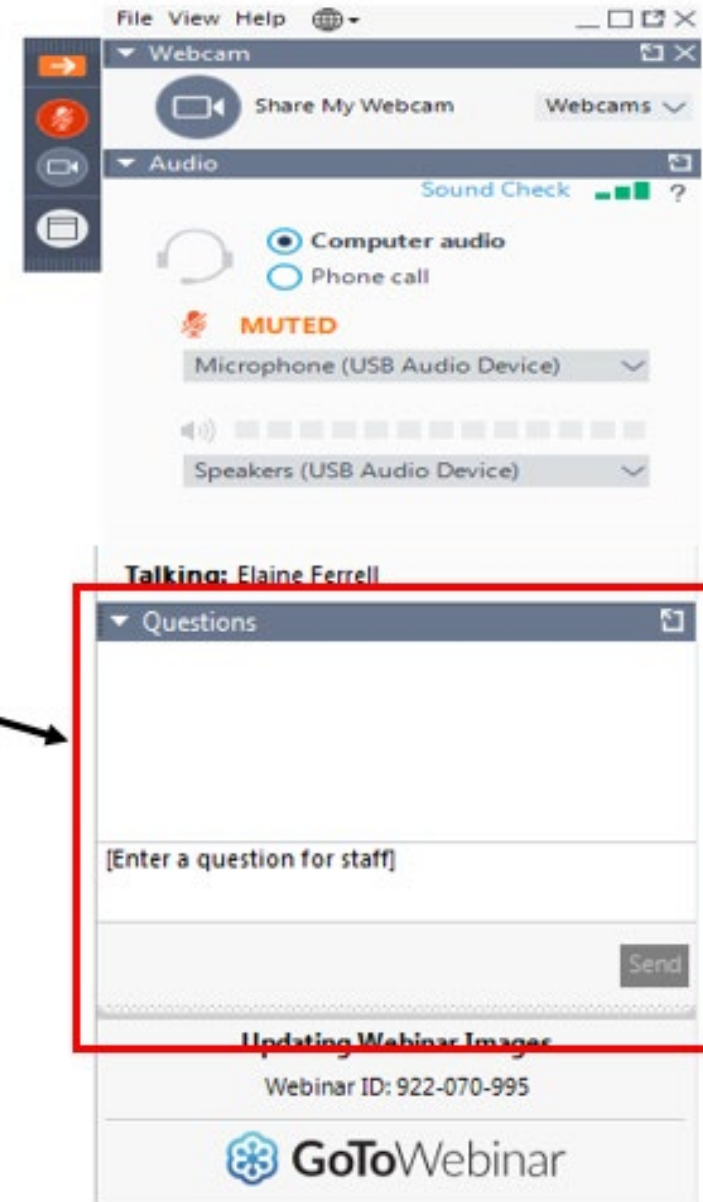
# Learning Objectives

At the end of this webinar, you will be able to:

- (1) Assess different external data sources
- (2) Identify potential scenarios for external data in maintenance and operations
- (3) Evaluate value for external data

# Questions and Answers

- Please type your questions into your webinar control panel
- We will read your questions out loud, and answer as many as time allows



# Today's Presenters



Trisha Stefanski  
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*Minnesota Department of  
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Nick Hegemier  
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*Drive Ohio*



Tracy Nowaczyk  
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*Kentucky Transport Cabinet*



# Transformational Telematics For MnDOT Decision Making

Trisha Stefanski, P.E.

Asset Management Program Office Manager

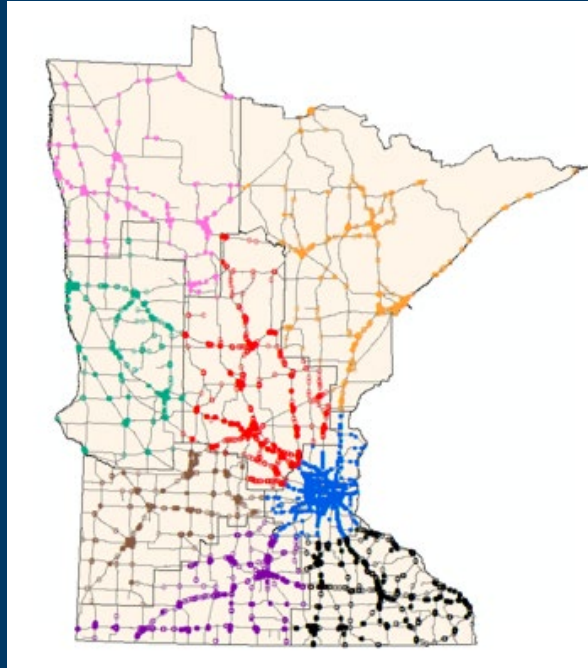
# Telematics

*“the branch of information technology which deals with the long-distance transmission of computerized information.”*





# Minnesota Nice



*5<sup>th</sup> largest Roadway network -12,000 cmi  
20,000 bridges  
3600 employees/8 Districts  
78 Asset Classes*

*“Land of 10,000 Lakes” and “Uffda!”  
MSP Avg 54” snowfall  
Avg 41 degree (47 out of 50 coldest)*



# “Snowbi Wan Kenobi” Snowplow User Interface

The interface displays the following information:

- Header:** QTest (Vehicle Name), 2408 (Activity), ● (Acq), 83 (Road), 87 (Air), 40 (Dew), 19% (Humid), 0.82 (Friction), Dry (Condition), 146, and a gear icon.
- Left Panel:** Cell and GPS status indicators, 10:36 AM, Views button, separator lines, Dry (Road Conditions) and None (Weather Conditions) status, Sleep button, and Jeff Edelstein (Name).
- Main Content Area:** A grid of buttons categorized into four sections:
  - Conditions:** ROAD, WEATHER
  - MDSS by DTN:** CURRENT RADAR, TRUCK RADAR, FORECAST, REC'S, END SHIFT
  - Weather:** WIND, TEMPS, RADAR
  - Functions:** LIVE MAP, CAMERA, TAMS

# “The Truck Formerly Known As Plow” Snowplow User Interface

10:40 AM

Cell

GPS

Z:10

WEA Off

Center On

● **82**

● **87**

**2408**

**146**

Acq
Road
Air
Activity
Count

IN

OUT

Map

Sat

Reset

Done

1	215551
2	207584
3	219580
4	211511
5	216505
6	218583
7	216504
8	212531
9	214519
10	215505
11	213563
12	214521
13	217622
14	218586
--	<b>MORE</b>

25 Trucks

# Business Decisions Using Telematics

- How should MnDOT distribute maintenance and operations funding?
- What is the ROI for snow fence?
- Where are the material application hot spots?
- Is time to bare lane the best indicator of performance?
- Should MnDOT add or move S&I resources around?
- What are granular S&I costs by person, by shop, by route?



# Transportation Enterprise Asset Management and Maintenance Management System

Circa 2016

## Breadth of Data

20 Asset Classes – Including Pavement, Geotech, Hydraulics, Electrical Systems, Fleet FY24

5 Modules – Including Damage Reimbursement

2000 Users

## Access To Data

MnDOT Warehouse

Spatial GIS Analytics

GIS Viewer Application

Field Work Manager

## Numerous Interfaces

Linear Referencing System

Timesheets

ITS Operations Database

Document Management System

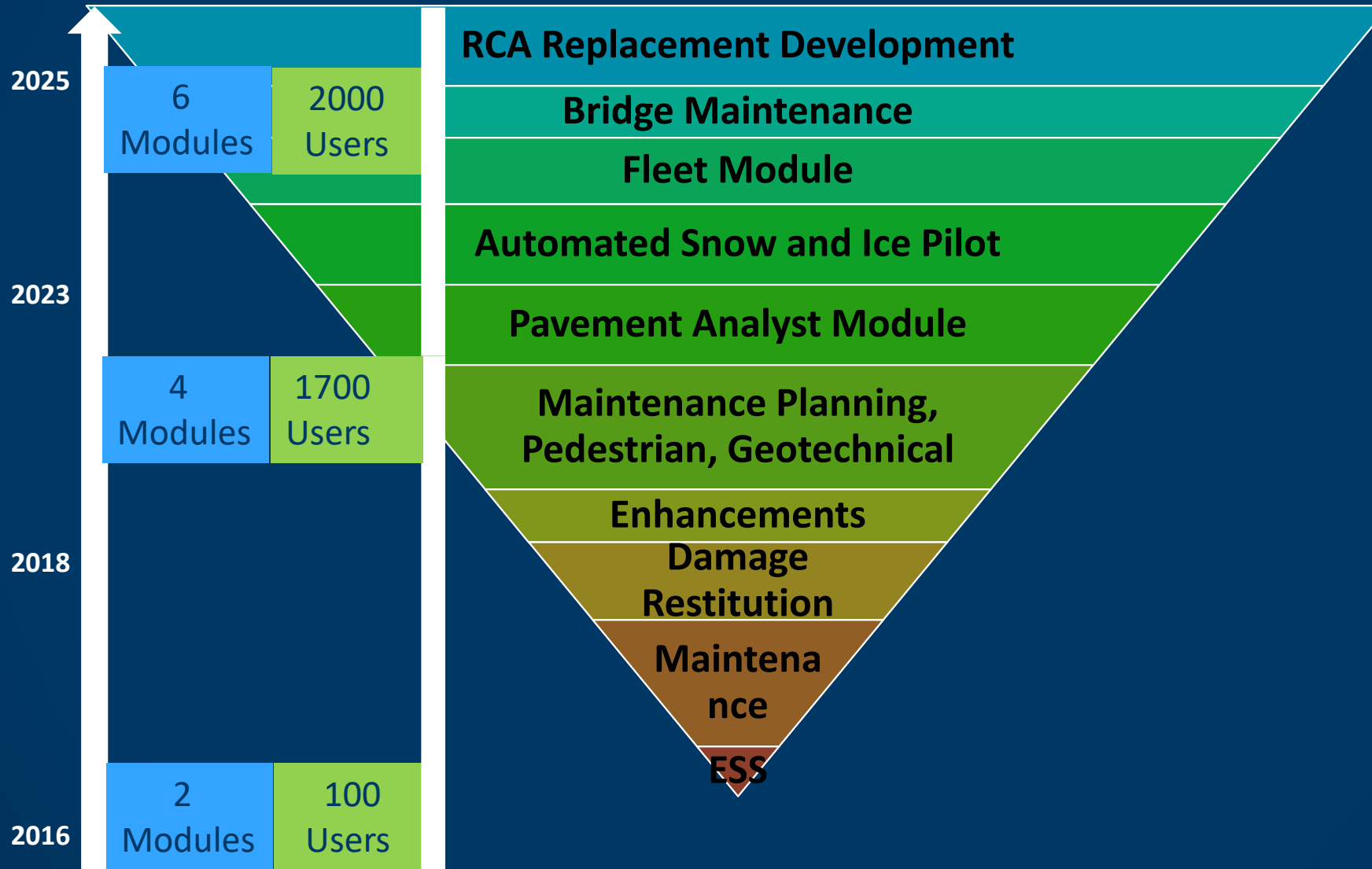
Herbicide Sprayer Controller

Snow and Ice Vehicle Location Data

Planning Data

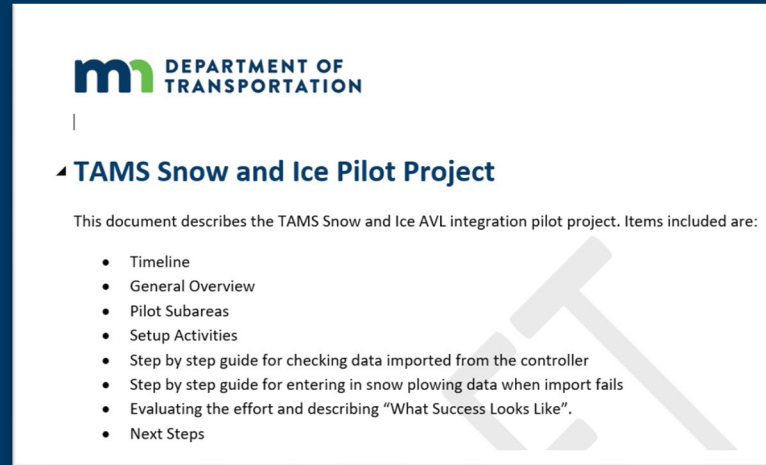
Construction Project Data

# TAMS Growth



# Synergy = Telematics + TAMS

- Commitment from Vendors To Perform Concurrent Development
- Investigate Data and Data Integrations
- Create Business Pilot Project Plan
  - Pilot Areas
  - Partners
  - Timing
  - Training
  - Measuring Success



# Implementation Details

## Fill Initial Data Gaps

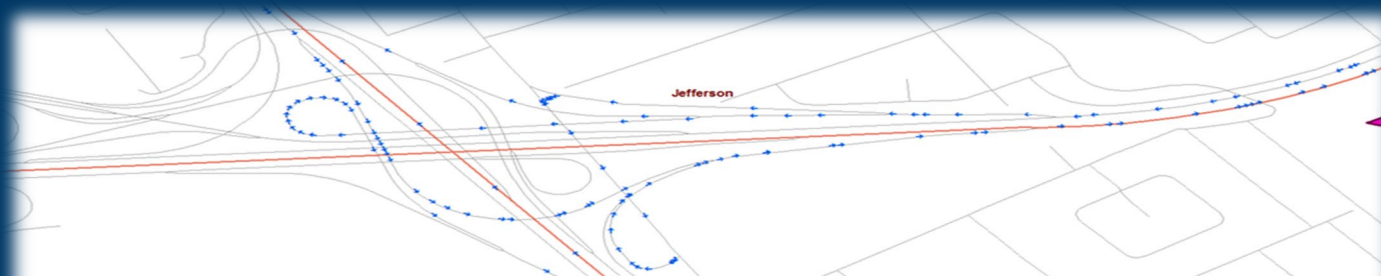
- Plow - Employee Login, Routes
- Plow and TAMS - Material Types
- TAMS - Snowplow Route Inventory
- Database link





# Implementation Details

- TAMS Work Order System Automatically...
  - Assigned To Employee Truck Station
  - Triggered By Date, Activity, Plow Route
  - Material Calculation = Pt. B minus Pt. A
  - If Timeframe is >15 min, tracking Employee Hours and Snowplow Miles
  - Each Individual Material Total is Accumulated Per Work Order
  - Material is Accumulated for Every 0.1 Mile



## Large Amount Of Data

*800 Trucks \* 120 Points/Hour \* 24 hours \* 0.9 Trucks Deployed = 2.3M data points*

# “Plowasaurus Rex” Snowplow User Interface

- Labor Hours Tracked w/ Employee ID
- Large Buttons
- Clear Message

Log-in With Your Badge Id

Your Badge Id

1	2	3
4	5	6
7	8	9
CLR	0	BAK

Check-in by Id Cancel

**TAMS**

Activity

Stockpile

Status

Done

Activity Code Pre-Selection

Will you be working on TAMS RELATED activities?

**YES**

*Snow and Ice Activity*

*This will allow you to assign a snow and ice activity code*

**NO**

*NON Snow and Ice Activity*

*This will skip the assignment of a snow and ice activity code*



# “No More Mr. Ice Guy” Snowplow User Interface

- Limited Number of Activities
- Employee ID Linked to Stockpiles By Truck Station
- Materials Types

**TAMS**

Activity

Stockpile

Status

Done

Please Select an Activity Code

Current Activity: 9999

2403 Anti-Icing

2406 Plowing and Material Application

2408 Road Patrol

2410 Post Storm Cleanup

2412 Road Weather Tech

**TAMS**

Activity

Stockpile

Status

Done

Stockpile: Select Your Location  
(For Sub-Area: 7B)

ROCHESTER WINONA STEWARTVILLE ST CHARLES DRESBACH

BACK

**TAMS**

Activity

Stockpile

Status

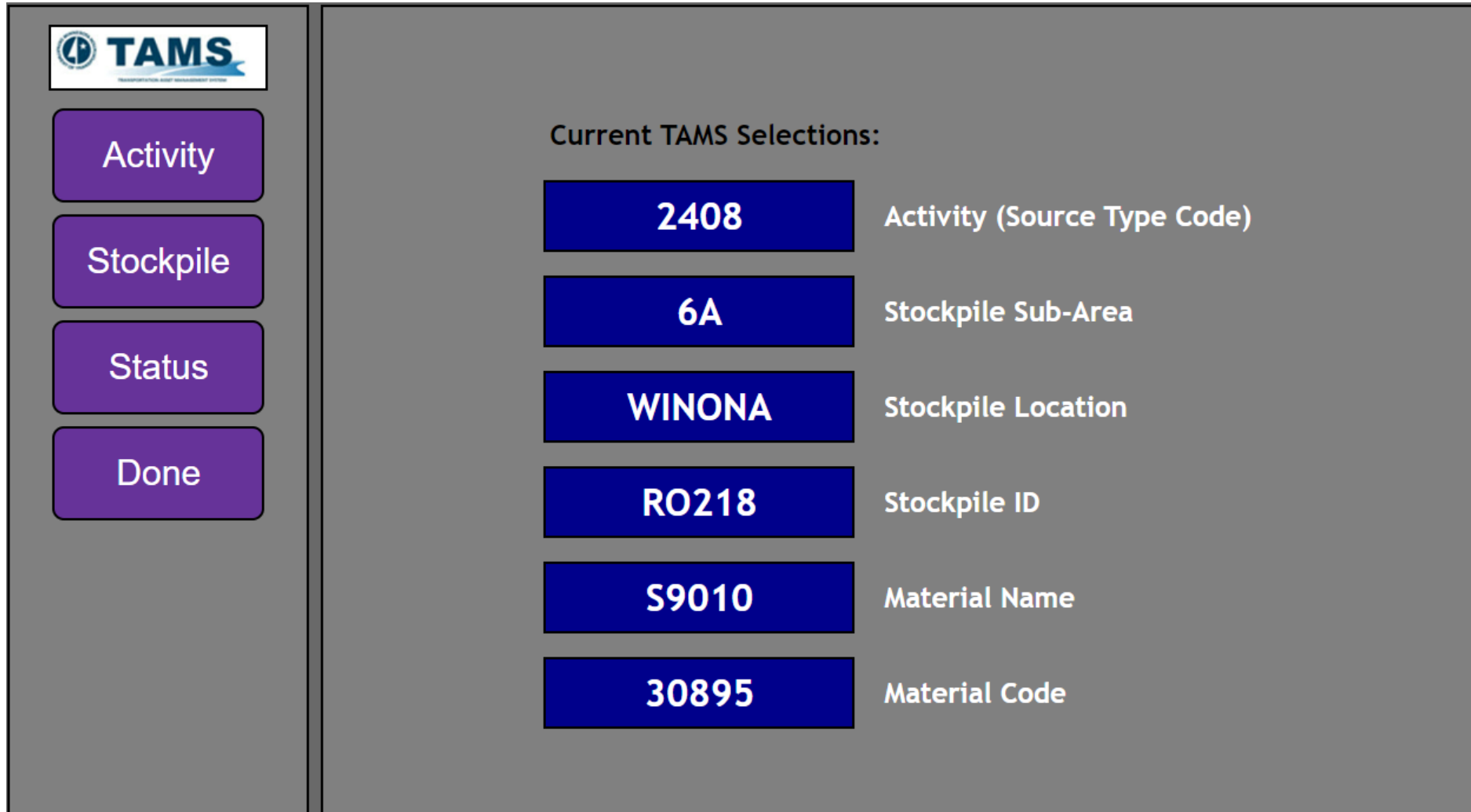
Done

Stockpile: Select Your Material  
(For Sub-Area: 6A, Location: WINONA)

Select	Name	Code	Stock
Select	MIX WINTER 10% SALT 90% SAND (S9010)	30895	RO218
Select	ROCK SALT (SALT)	17416	RO218

BACK

# “Duck Duck Orange Truck” Snowplow User Interface



The screenshot displays the TAMS Snowplow User Interface. On the left side, there is a vertical menu with four purple buttons: "Activity", "Stockpile", "Status", and "Done". The top left corner features the TAMS logo. The main area on the right is titled "Current TAMS Selections:" and lists six selections in blue boxes, each with a corresponding label to its right:

Selection	Label
2408	Activity (Source Type Code)
6A	Stockpile Sub-Area
WINONA	Stockpile Location
RO218	Stockpile ID
S9010	Material Name
30895	Material Code

# TAMS System User Interface

Maintenance Management | Asset Inventory | Asset Performance | Planning | Operations | GIS & Reports | Utilities | ZIMM1T...

Maintenance Management > Operations > Work Orders (Simple) | Save | Reload

Work Orders Actions

Highway	WR#	WO#	Activity	Comments	Asset Type	Subactivity	DR?	ICR #	Start Date	Responsible Crew	Functional
		181728	Plowing and Material Application (Lane Mile)	SNOW_ROUTE-TP3F0254 ACTI...	Section	000: No Subactivity	<input checked="" type="checkbox"/>		12/5/2021		
		181832	Plowing and Material Application (Lane Mile)	SNOW_ROUTE-TP3G0253 ACTI...	Section	000: No Subactivity	<input type="checkbox"/>		12/5/2021		
		181868	Plowing and Material Application (Lane Mile)	SNOW_ROUTE-TP3F3711 ACTI...	Section	000: No Subactivity	<input type="checkbox"/>		12/5/2021		
		181645	Plowing and Material Application (Lane Mile)	SNOW_ROUTE-TP3F0274 ACTI...	Section	000: No Subactivity	<input type="checkbox"/>		12/5/2021		
		181860	Plowing and Material Application (Lane Mile)	SNOW_ROUTE-TP3F0104 ACTI...	Section	000: No Subactivity	<input type="checkbox"/>		12/6/2021		

<< 19 of 293 total rows >>

Labor | Equipment | Material | Non-Inventoried Material | Location/Asset | Direct Costs | Contract and PO Cost

Work Target Actions

Approved	Asset Name	* Accompli...	* Work Date	Route ID	BMP	End Meas...	Material Stock	Sand Amount	Salt Amount	Brine Amount
<input checked="" type="checkbox"/>	MN 25   RP 117+00.123 - 132+00.377	1	12/5/2021	03000000000000...	127.1843	131.0232	BA468 - L Falls TS - SALT,ROCK,CRUSHED,BULK - 17416 (Ton)	0		0
<input type="checkbox"/>	MN 25   RP 117+00.123 - 132+00.377	1	12/5/2021	03000000000000...	130.9949	131.2421	BA468 - L Falls TS - SALT,ROCK,CRUSHED,BULK - 17416 (Ton)	0		0
<input type="checkbox"/>	MN 25   RP 117+00.123 - 132+00.377	1	12/5/2021	03000000000000...	130.9659	131.1557	BA468 - L Falls TS - SALT,ROCK,CRUSHED,BULK - 17416 (Ton)	0		0
<input type="checkbox"/>	MN 25   RP 117+00.123 - 132+00.377	1	12/5/2021	03000000000000...	116.1835	131.1765	BA468 - L Falls TS - SALT,ROCK,CRUSHED,BULK - 17416 (Ton)	0.5		0
<input type="checkbox"/>	MN 25   RP 117+00.123 - 132+00.377	1	12/5/2021	03000000000000...	116.0552	117.1807	BA468 - L Falls TS - SALT,ROCK,CRUSHED,BULK - 17416 (Ton)	0		0
<input type="checkbox"/>	MN 25   RP 117+00.123 - 132+00.377	1	12/5/2021	03000000000000...	116.8358	117.1807	BA468 - L Falls TS - SALT,ROCK,CRUSHED,BULK - 17416 (Ton)	0		0
<input type="checkbox"/>	MN 25   RP 117+00.123 - 132+00.377	1	12/5/2021	03000000000000...	116.6731	116.8358	BA468 - L Falls TS - SALT,ROCK,CRUSHED,BULK - 17416 (Ton)	0		0
<input type="checkbox"/>	MN 25   RP 117+00.123 - 132+00.377	1	12/5/2021	03000000000000...	116.5662	116.6962	BA468 - L Falls TS - SALT,ROCK,CRUSHED,BULK - 17416 (Ton)	0		0
<input type="checkbox"/>	MN 25   RP 117+00.123 - 132+00.377	1	12/5/2021	03000000000000...	116.4587	127.3005	BA468 - L Falls TS - SALT,ROCK,CRUSHED,BULK - 17416 (Ton)	0.3		0
<input type="checkbox"/>	MN 25   RP 117+00.123 - 132+00.377	1	12/5/2021	03000000000000...	127.1652	127.3005	BA468 - L Falls TS - SALT,ROCK,CRUSHED,BULK - 17416 (Ton)	0		0

<< 1 of 22 total rows >>

# TAMS System User Interface

Maintenance Management - Asset Inventory - Asset Performance - Planning - Operations - GIS & Reports - Utilities - ZIMM1T...

Maintenance Management > Operations > Work Orders ☆ Save Reload

Insert Insert Like Make Daycards Complete Copy

Highway	W...	WO #	I...	DR?	* Activity	Description/Comments	Start Date	Finish Date	Work Order Status	Resp
		181689		<input type="checkbox"/>	Plowing and Material Applic...	SNOW_ROUTE-TP3F0105 ACTIVITY-2406 WORK_DATE-2021/12/03	12/3/2021	12/3/2021	(Active) Not Assigned	
		181627		<input type="checkbox"/>	Plowing and Material Applic...	SNOW_ROUTE-TP3F0276 ACTIVITY-2406 WORK_DATE-2021/12/03	12/3/2021	12/3/2021	(Active) Not Assigned	
		181630		<input type="checkbox"/>	Plowing and Material Applic...	SNOW_ROUTE-TP3F0104 ACTIVITY-2406 WORK_DATE-2021/12/05	12/5/2021	12/5/2021	(Active) Not Assigned	
		181915		<input checked="" type="checkbox"/>	Plowing and Material Applic...	SNOW_ROUTE-TP3F0275 ACTIVITY-2406 WORK_DATE-2021/12/05	12/5/2021	12/5/2021	(Active) Not Assigned	
		181706		<input type="checkbox"/>	Plowing and Material Applic...	SNOW_ROUTE-TP3B0255 ACTIVITY-2406 WORK_DATE-2021/12/05	12/5/2021	12/5/2021	(Active) Not Assigned	
		181879		<input type="checkbox"/>	Plowing and Material Applic...	SNOW_ROUTE-TP3F0276 ACTIVITY-2406 WORK_DATE-2021/12/05	12/5/2021	12/5/2021	(Active) Not Assigned	

<< 16 of 293 total rows >>

Labor Equipment **Material** Non-Inventoried Material Location/Asset Direct Costs Contract and PO Cost

App...	* Material Stock	* Work Date	* Amount	Measurement Unit	Total Cost	Date approve	User approve
	BA468 - L Falls TS - SALT,ROCK,CRUSHED,BULK - 17416 (Ton)	12/5/2021	33.7	TON - Ton			

<< 1 of 1 total rows >>

# TAMS System User Interface

AgileAssets | m DOT

Maintenance Management > Operations > Daily Log ☆

Effective Date: 12/21/2022

Save Reload

WO#	Valid Acct	Activity	Comments	Administrative Unit	Start Date	Finish Date	User Update	Date Update	HAS DATA	Sta
219828	<input checked="" type="checkbox"/>	Plowing and Material Application (Lane Mile)	SNOW_ROUTE-TP7R071A ACTIVITY-2406 WORK_DATE-2022/12/21 OWNER_ID-3840	TS - Windom	12/21/2022	12/21/2022	AVL Interface	12/21/2022	0	
219831	<input checked="" type="checkbox"/>	Plowing and Material Application (Lane Mile)	SNOW_ROUTE-TP7R060D ACTIVITY-2406 WORK_DATE-2022/12/21 OWNER_ID-3840	TS - Windom	12/21/2022	12/21/2022	AVL Interface	12/21/2022	0	
219963	<input checked="" type="checkbox"/>	Plowing and Material Application (Lane Mile)	SNOW_ROUTE-TP7R060E ACTIVITY-2406 WORK_DATE-2022/12/21 OWNER_ID-3840	TS - Windom	12/21/2022	12/21/2022	AVL Interface	12/21/2022	0	
220104	<input checked="" type="checkbox"/>	Plowing and Material Application (Lane Mile)	SNOW_ROUTE-TP7R060F ACTIVITY-2406 WORK_DATE-2022/12/21 OWNER_ID-3840	TS - Windom	12/21/2022	12/21/2022	AVL Interface	12/21/2022	0	
220155	<input checked="" type="checkbox"/>	Plowing and Material Application (Lane Mile)	SNOW_ROUTE-TP7R071C ACTIVITY-2406 WORK_DATE-2022/12/21 OWNER_ID-3840	TS - Windom	12/21/2022	12/21/2022	AVL Interface	12/21/2022	0	

<< 1 of 6 total rows >>

Labor Equipment Material Location/Asset

Equipment #	219828 Hours	219828 MIs	219831 Hours	219831 MIs	219963 Hours	219963 MIs	220104 Hours	220104 MIs	220155 Hours	220155 MIs	220260 Hours	220260 MIs	Hours Shown	Total MIs
207589													0	0
208572	1.72	3.8			0.34	4.2			1.79	84.1			3.85	92.1
210509													0	0
219545	0.3	8.8											0.3	8.8
211565			1.67	52.5									1.67	52.5
217572							1.2	31.8					1.2	31.8
218579	1.65	2.4									1.77	79.8	3.42	82.2

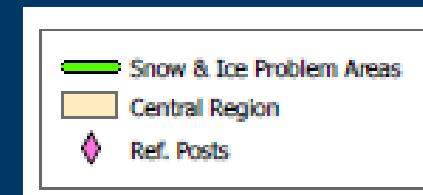
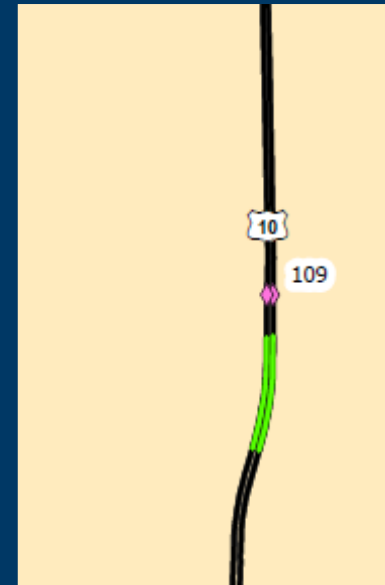
*This Project Has Been Successful Because of the Amazing Project Team. A Special Thank You To: Tom Zimmerman, Joseph Huneke, Matt Krueger, Cameron Gjovik (MnDOT), Mike Reynolds (MnIT), Faris Alsaedi (MnIT), & Jeff Edelstein (Ameritrak).*

# Change Happens

MnDOT is moving to new technology solution provider for Automated Vehicle Information.

- New Hardware
- Interface Changes
- MARCUS (RCA Replacement)
- Conceptual → Pilot is Good.
  - Understand requirements for TAMS
  - Snowplow Interfaces work for users (simple is better)
  - Simplify TAMS Approval Screens

Next Plow Name “Snow It All”?







# Using External Data Sources for Maintenance Decision Making

December 13, 2023

# Agenda

- Ohio DOTs Data Platform
- Future Vision
- Roadway Data Pilot





Event Streaming Platform

# The problem

A hand is shown typing on a laptop keyboard. The background is a blurred cityscape at night with lights. Overlaid on the image is a network of white and blue nodes connected by thin lines, representing data or connectivity.

Transportation leaders lack visibility into surging geospatial data, hampering their decision support capabilities. Fragmented systems and teams cannot manage the real-time event data's exponentially rising volumes.

This prevents organizations from harnessing the geospatial insights it contains.



# Why it matters

## Challenges

Keeping up with rapidly growing geospatial data demands more from operations teams.

Because these aging systems are disconnected, transportation needs to integrate geospatial data across systems and teams.

## Negatives

As transportation organizations face mounting pressure to react swiftly to situations, decision-makers can't access and analyze critical real-time geospatial data across disparate systems to guide operations teams.

Optimization, emergency management and public guidance suffer.

# The problem in numbers

**20%**

Expected growth of  
geospatial event data per  
year \*ScienceDirect

**\$81B**

Lost time and revenue due  
to congestion \*Govtech

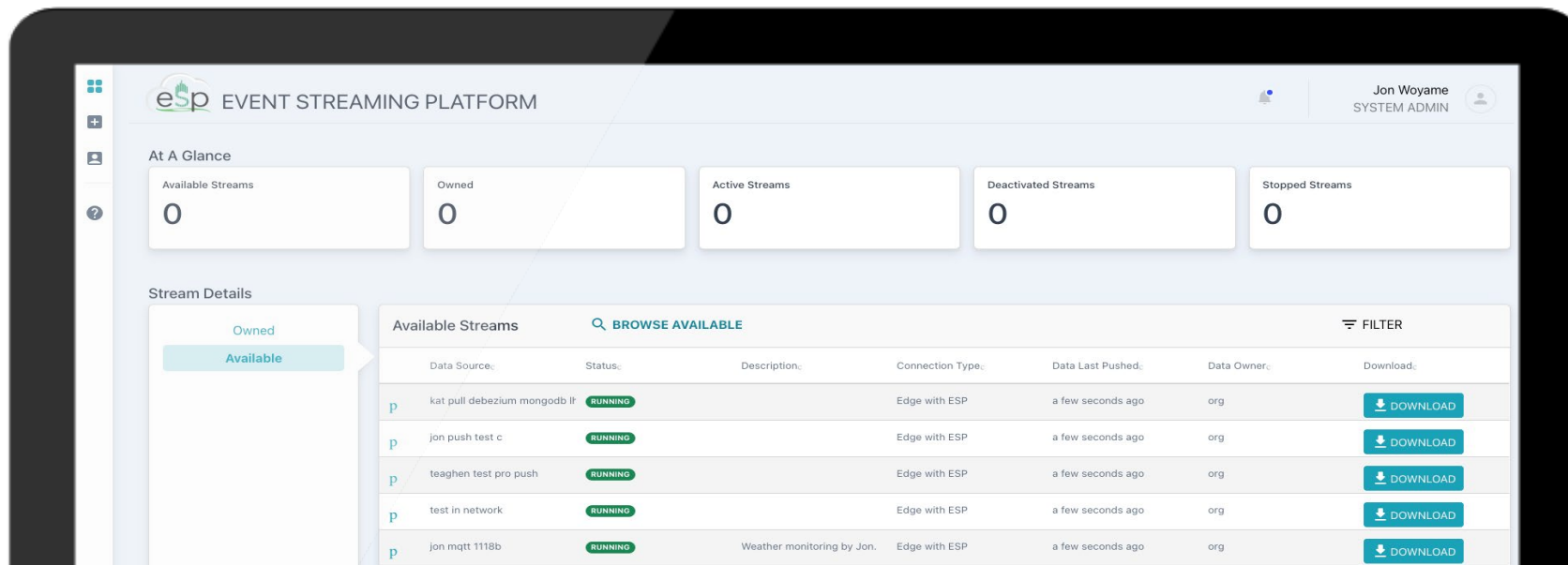
**51 1**

hours lost every year in  
traffic for the typical US  
driver \*Inrix

# The solution

ESP fuses rich geospatial content with traditional transportation data from disparate systems and sources at tremendous speed and scale.

This enables transportation leaders to foster enrichment and collaboration for data-driven decision making.



A hand holding a smartphone is the central focus, with various data visualization charts overlaid on a blue background. The charts include a donut chart, a bar chart, a line graph, and a grid of data points. The background is filled with glowing blue lines and numbers, creating a high-tech, data-driven atmosphere.

# Analytics and decision support

With flexible and seamless ingestion capabilities, ESP empowers organizations to aggregate dispersed data silos into an integrated environment. It can ingest and combine data from diverse sources to enrich understanding of events.

Advanced analytics and visualization tools unlock deep insights from fused data to inform critical decisions across transportation operations and planning.



# Collaboration and orchestration

By chaining together actions across multiple systems, it enables the orchestration of repetitive tasks like ticket handling and alert prioritization.

The platform provides the flexibility to build custom playbooks that coordinate tools to carry out complex transportation operational use cases.



# Impact where it matters

## DOT Operations

Optimize freeways and mobility transitions

## Private Sector

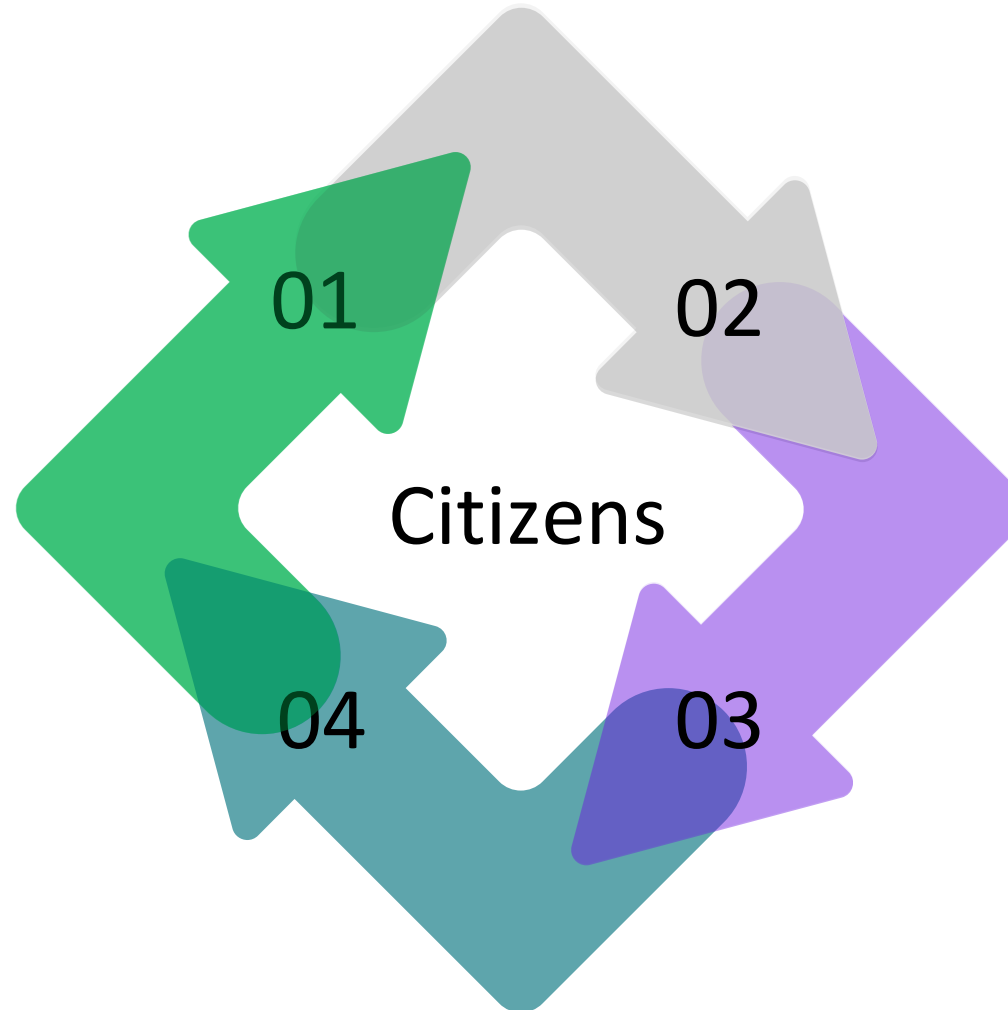
Opportunities for transportation innovation and decisioning

## City Management

Enables data-driven optimization of city operations

## Transit

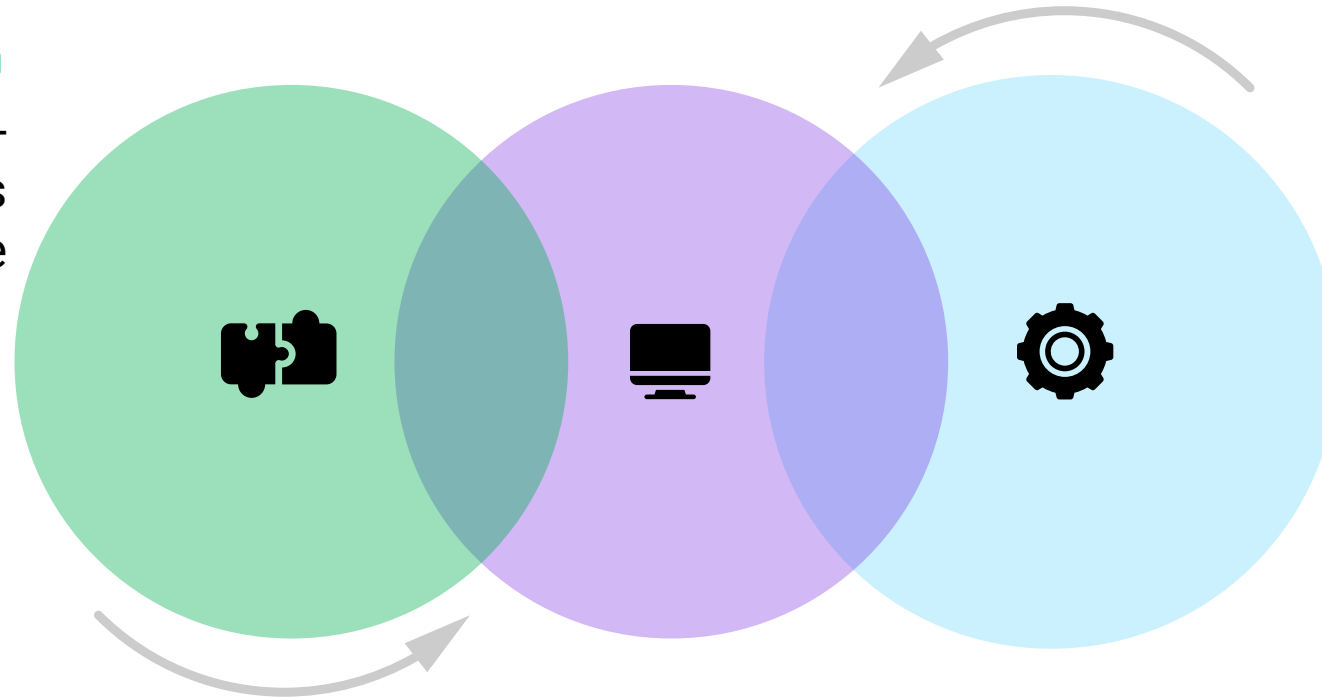
Forecasts for current and expected future conditions



# ESP Empowers Collaboration and Proactive Decision Support

## Flexible Platform

Scalable, flexible, open-source with integrations and orchestration engine

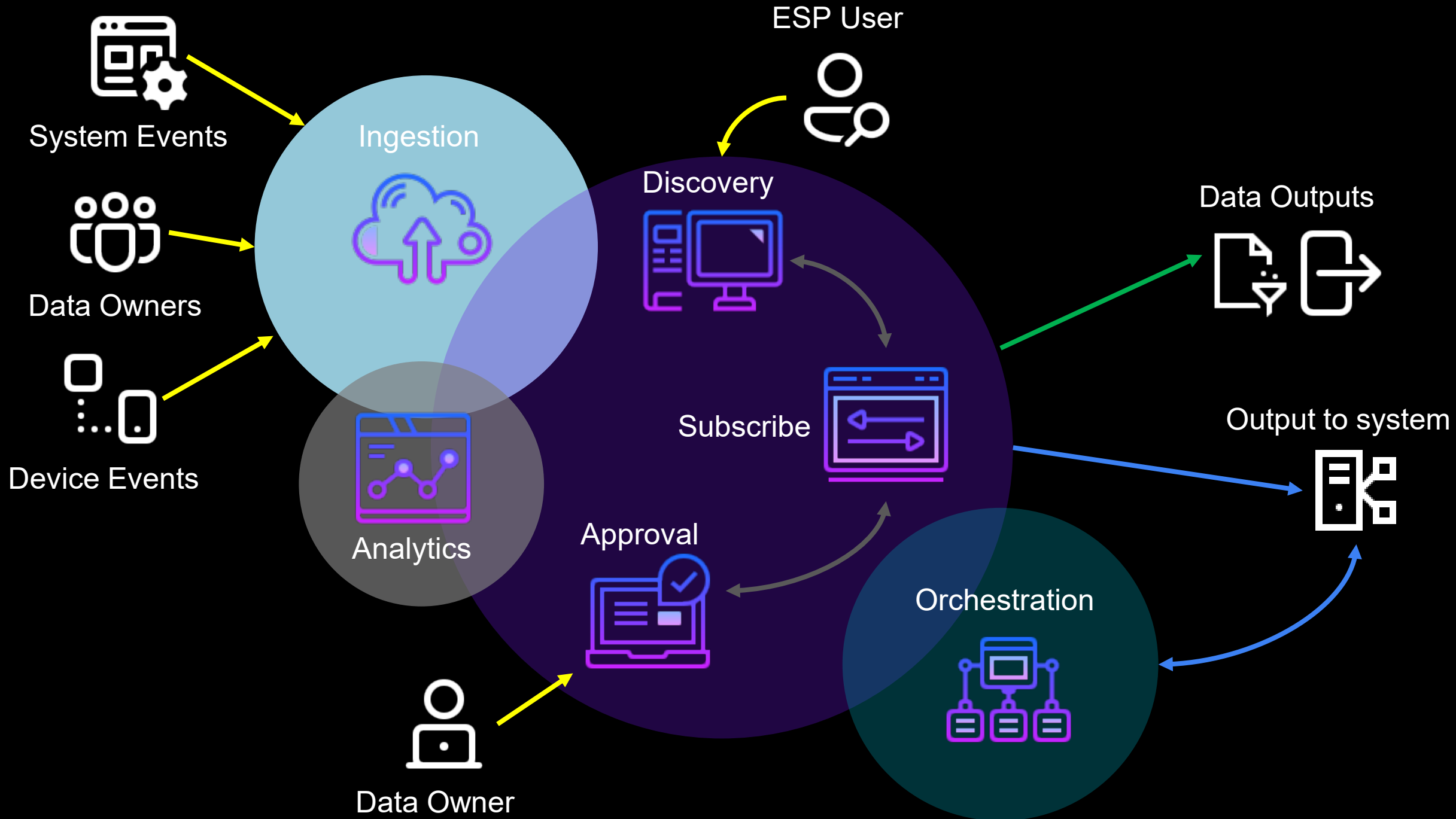


## Informed Decision Making

Action-based analytics  
driven dashboards

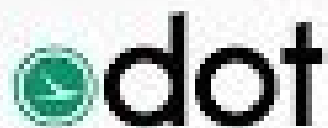
## Data as a Service

Rich repository of data  
with opportunities for  
added value



An aerial photograph of a car driving on a road, with a semi-transparent white box containing text overlaid in the center. The background shows a suburban street with green lawns and trees.

# A Drive Into the Future



A decorative pattern of overlapping, semi-transparent hexagons in various shades of orange and white, arranged in a horizontal line across the top of the page. The hexagons are interconnected by thin white lines, creating a network-like structure.

**How are we working  
toward that future?**

A decorative pattern of overlapping, semi-transparent hexagons in various shades of orange and white, arranged in a horizontal line across the bottom of the page. The hexagons are interconnected by thin white lines, creating a network-like structure.

# Vehicle-Based Roadway Data Pilot

- Determine whether roadway condition data from vehicles can support maintenance and asset management



# Roadway Deficiency Data

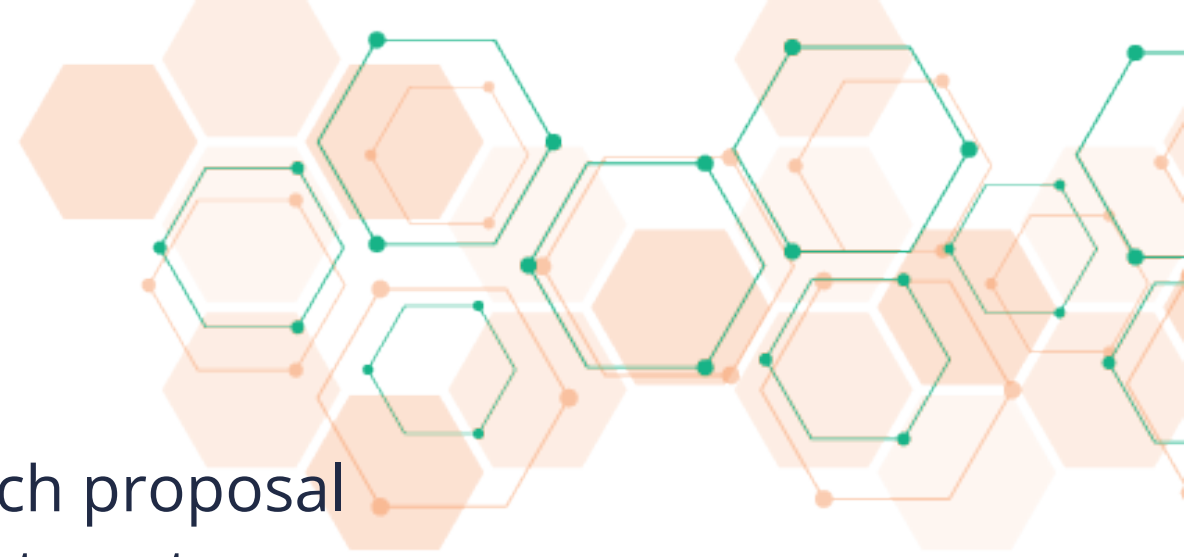
- OEM Vehicle Detection of the following roadway elements
  - Location and size of Potholes
  - Location and change detection of Signage
    - Damaged or missing
  - Location and change detection of Barrier
    - Cable Barrier vs. Guardrail
  - Measurement of Berm Dropoff
    - Greater than 1.5 inches
  - Road Rideability (Roughness Index)
  - Location and Quality information for Lane Markings





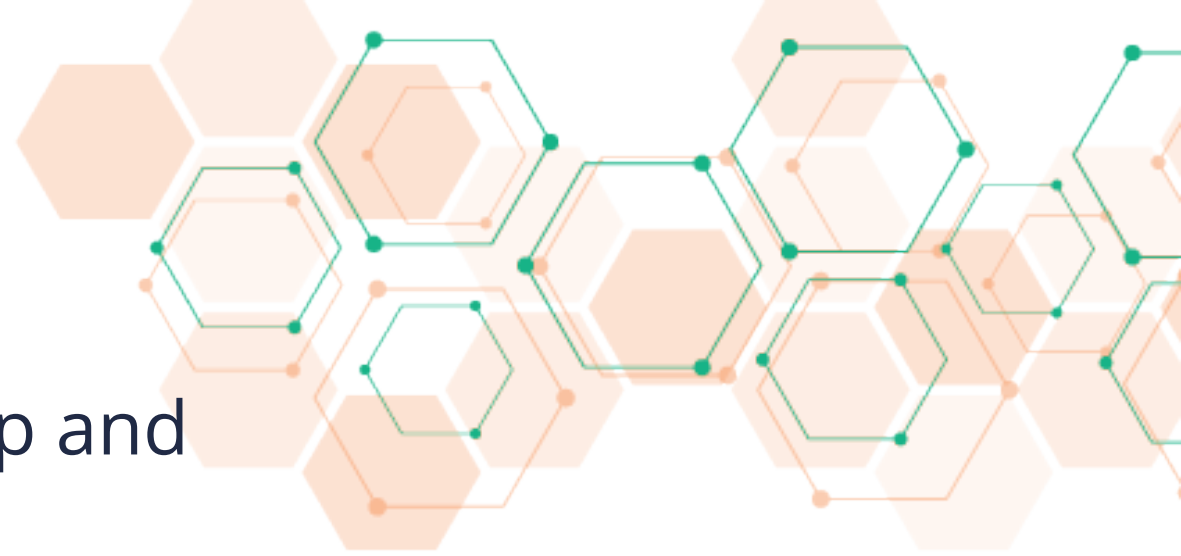
# Project Selection

- Ohio DOT received 4 proposals
  - Requirement for OEM partner on each proposal
  - Selection and award was made to a team led by Honda American Motor Co.
  - Project partners include:
    - Parsons
    - University of Cincinnati
    - i-Probe



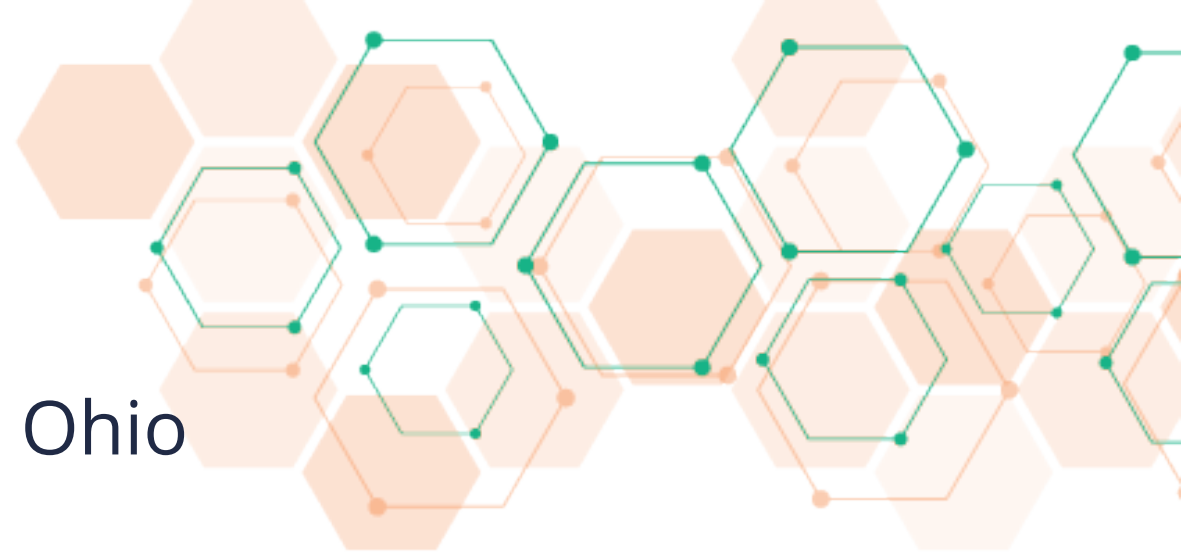
# Project Elements

- Two Research Vehicles to develop and test detection applications
  - Examine what can be done with existing vehicle technology vs. what will require new or enhanced technology
- Cloud-hosted solution
- DOT would only receive alerts when a deficiency is detected



# Project Locations

- Ohio DOT District 10 – Southeast Ohio
  - Very Rural, Hilly Roadway Terrain
- Ohio DOT District 6 – Central Ohio
  - Flat, Straight Roadways
- a solution that works everywhere



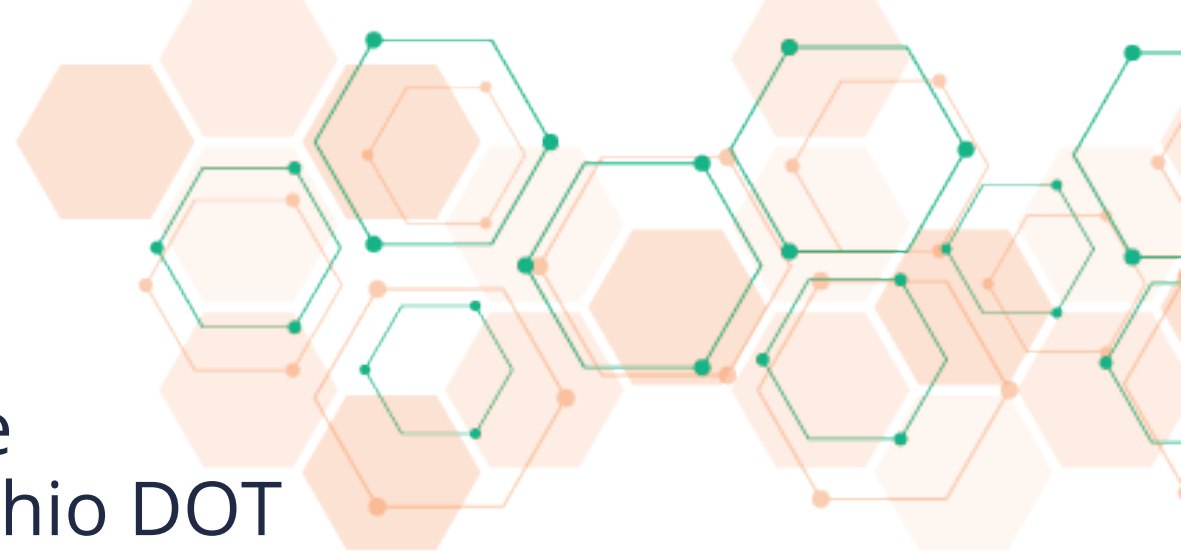
# Project Timeline

- The pilot will perform over a 2-year timeline.
  - Initial Technology Development (prioritize applications)
  - Data Collection and Analysis
  - Subsequent Development
    - Based on lessons learned during data collection and analysis step
  - Data Collection and Analysis
  - Business Development Lessons Learned
    - Measuring the benefits



# Project Goals

- Research what data can easily be provided by vehicle to support Ohio DOT needs
- Measure the benefits of related vehicle data
- Determine related business models representative of data costs
  - How do we scale to production vehicles?
  - How do we convince public to share the data?



A decorative pattern of overlapping, semi-transparent hexagons in various shades of orange and white, arranged in a horizontal line across the top of the slide.

**More to learn over the  
next 2 years!**

A decorative pattern of overlapping, semi-transparent hexagons in various shades of orange and white, arranged in a horizontal line across the bottom of the slide.

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# Utilizing Crowdsourced and Real-Time Data for Snow and Ice Decision Making

TRB Webinar: Utilizing External Data Sources for Maintenance Decision Making

Presentation by Randi Feltner

December 13, 2023



# Crowdsourcing, Other Real-Time Sources

- Waze
- Social Media
- Our Own Users
- Free Public Info
  - CoCoRahs
  - NWS Chat (Slack)
- HERE
- AVL



# Camera Coverage

← ↻ 🔒 https://goky.ky.gov

Facebook Twitter TRIMARC Truck Parking Waze HERE ITS (Intranet) ITS Data Studio

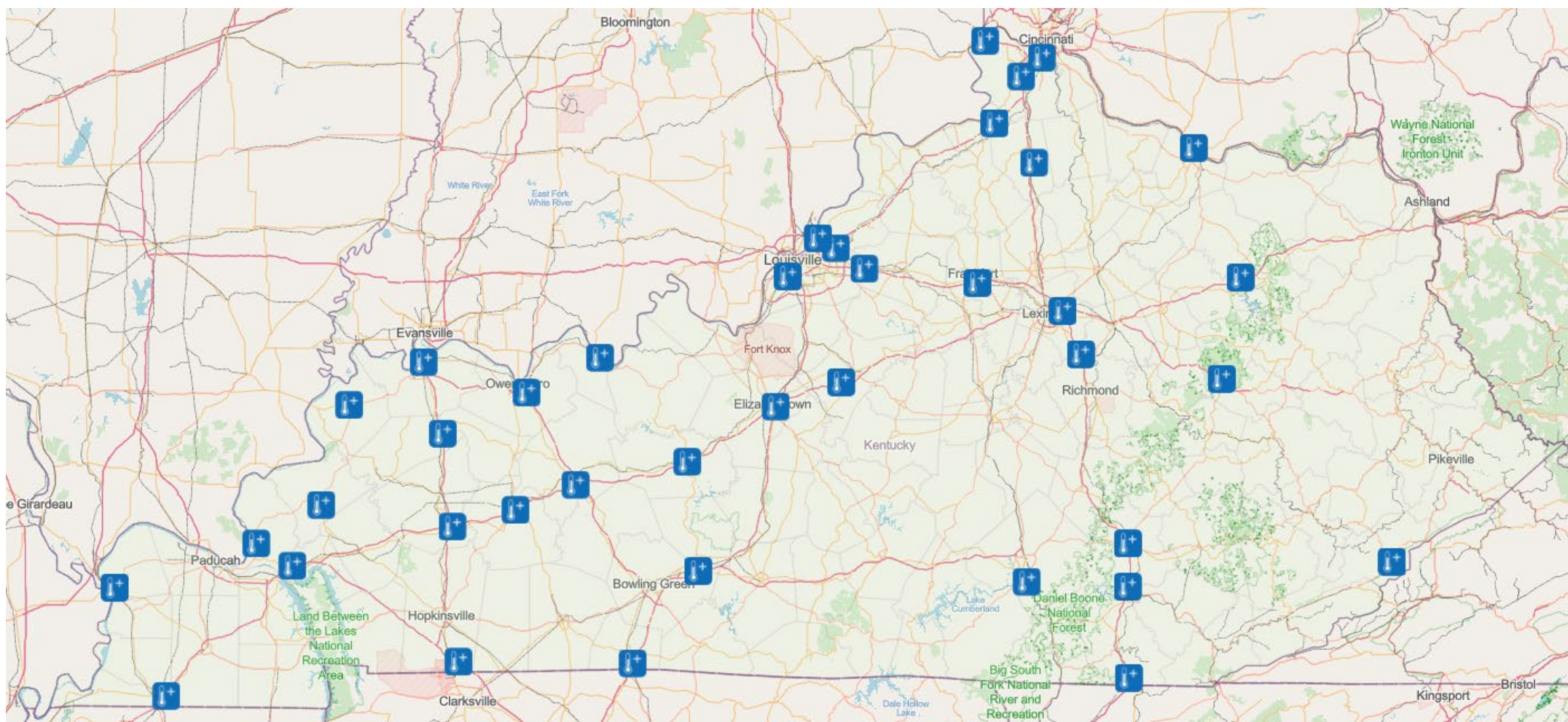
### Information Summary

- Crash (8) v
- Traffic (1454) v
- Work Zones**
- KYTC (140) v
- Waze (27) v
- Incidents**
- Traffic (0)
- Hazard (37) v
- Weather (0)
- Digital Sign (86)
- Traffic Cam (308)
- Snow & Ice (0)

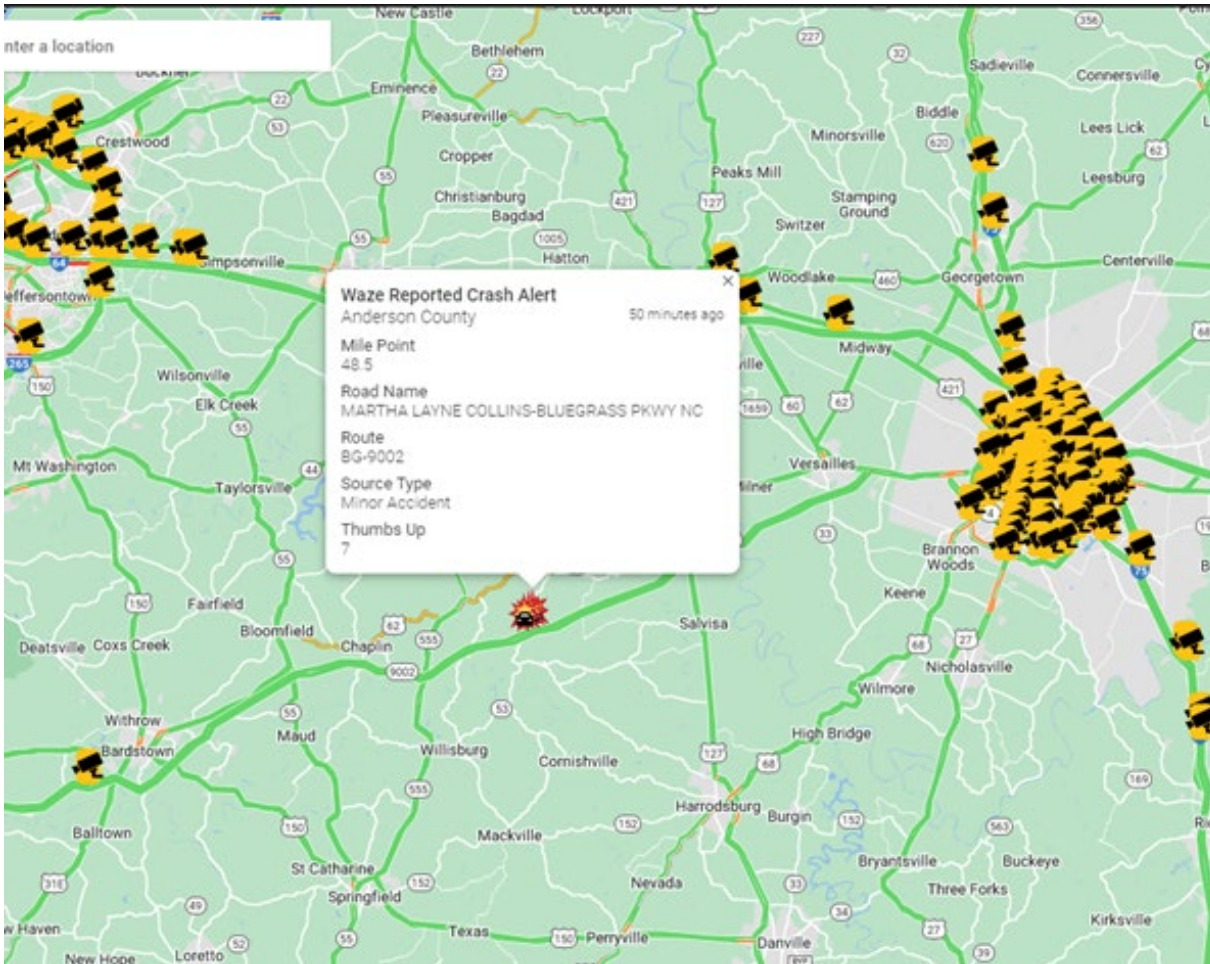
Map Satellite Location Enter a location

The map displays camera coverage across Eastern Kentucky. Yellow and black icons representing camera locations are distributed across the region, with a high concentration in the Nashville area and along major interstate corridors like I-75 and I-77. The map interface includes a search bar, map controls, and a sidebar with various traffic and incident data filters.

# RWIS Coverage

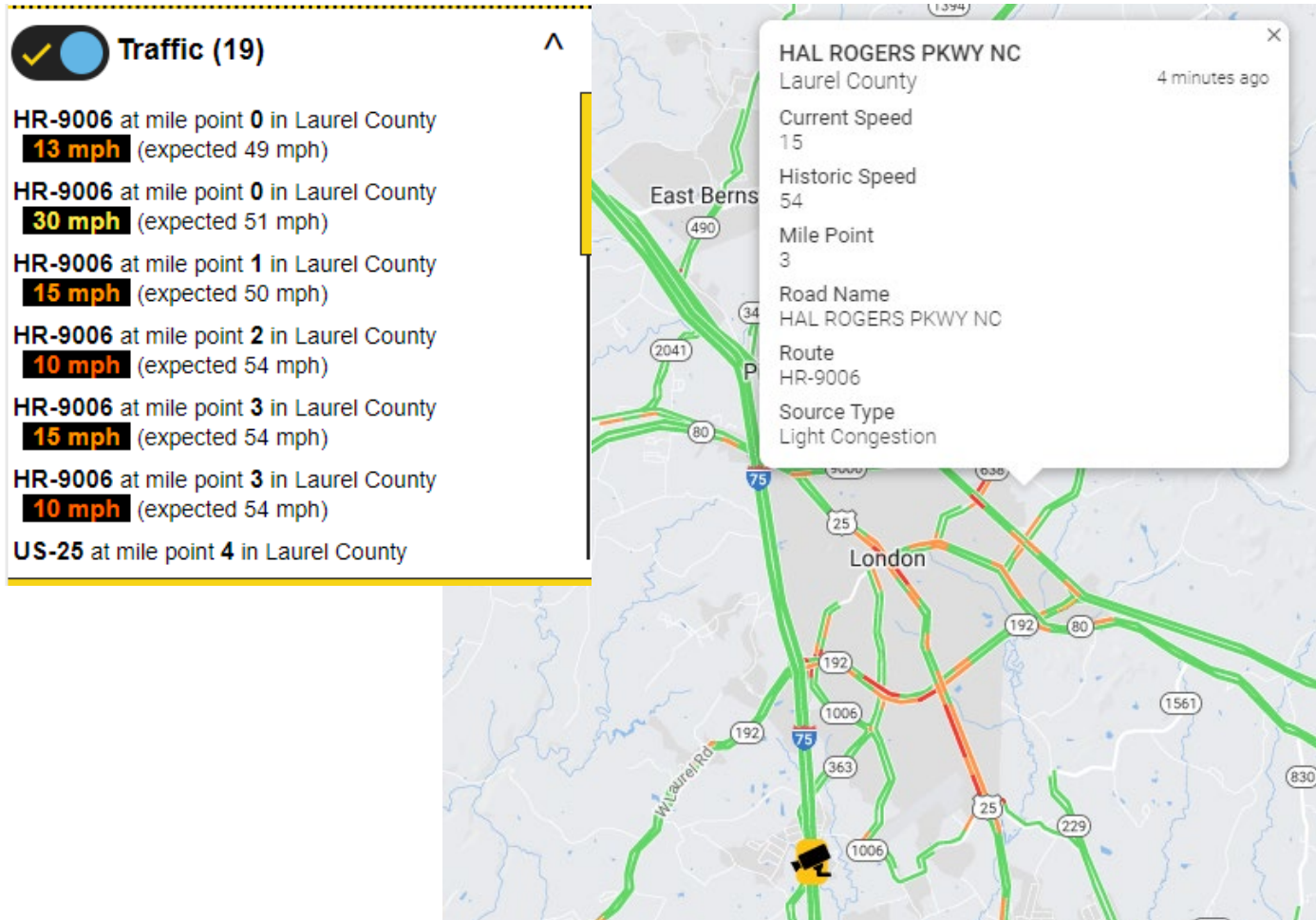


# Waze Data



- Waze user has reported a crash
- In this screenshot, there are 7 'thumbs up' which means 7 other users agree with the report.
- Only Waze reports with at least 1 'thumbs up' will report – validating the report in the quickest way
- Rural area – no cameras nearby

# HERE Data



- HERE data shows non-recurring congestion in a small city
- One camera available in the screenshot but on the other side of town on the interstate



# What Real-Time Data Is, and Is Not

- Real-Time Data can provide insight to areas lacking camera or coverage with other hardware.
- Provides 'clues' into what the roadway conditions are beyond what you're able to get reports from or observe.
- Another tool for an experienced employee to make decisions during operations
- Real-Time Data is not a decision-making tool itself





transportation.ky.gov

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# Today's Presenters



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# Upcoming events for you

**December 14, 2023**

Diversity, Equity, Inclusion and Health  
Equity Commitments: Experiences from  
the Field: A Webinar

**January 7-11, 2024**

TRB Annual Meeting

[https://www.nationalacademies.org/trb/  
events](https://www.nationalacademies.org/trb/events)

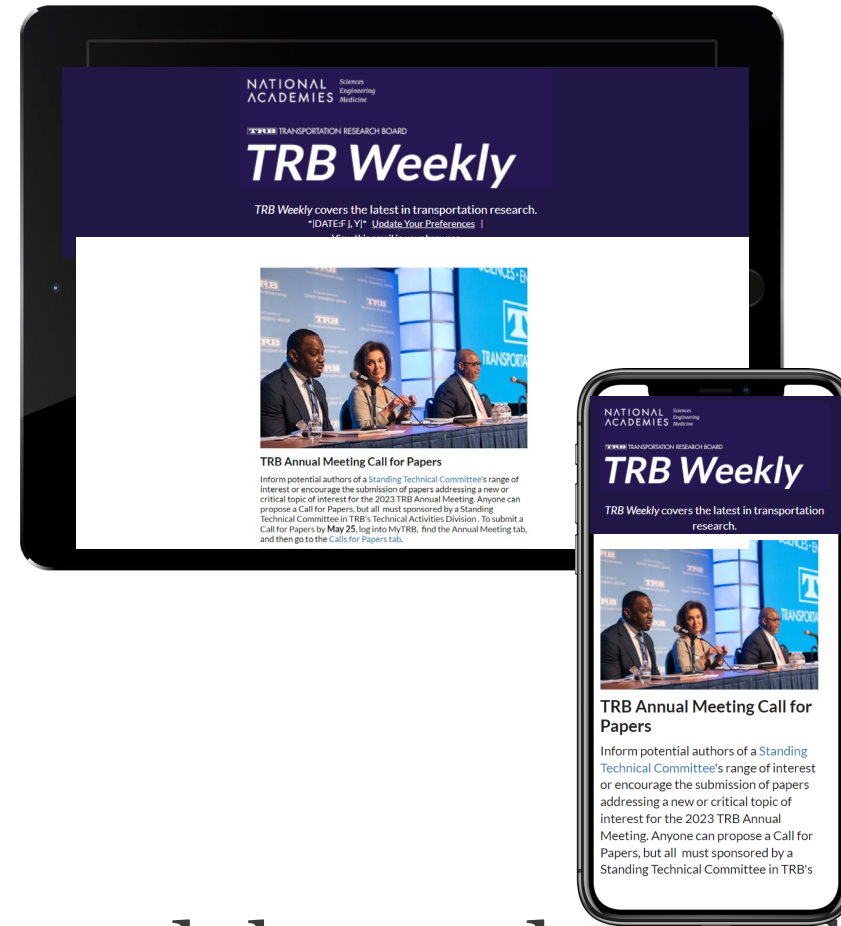


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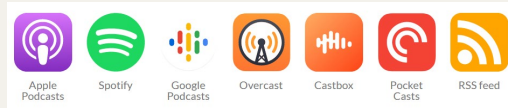
<https://www.nationalacademies.org/trb/get-involved>

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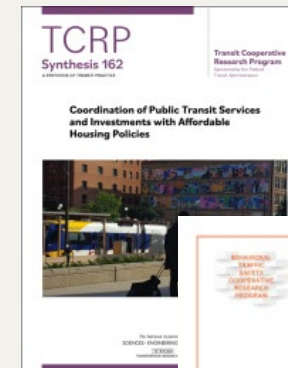
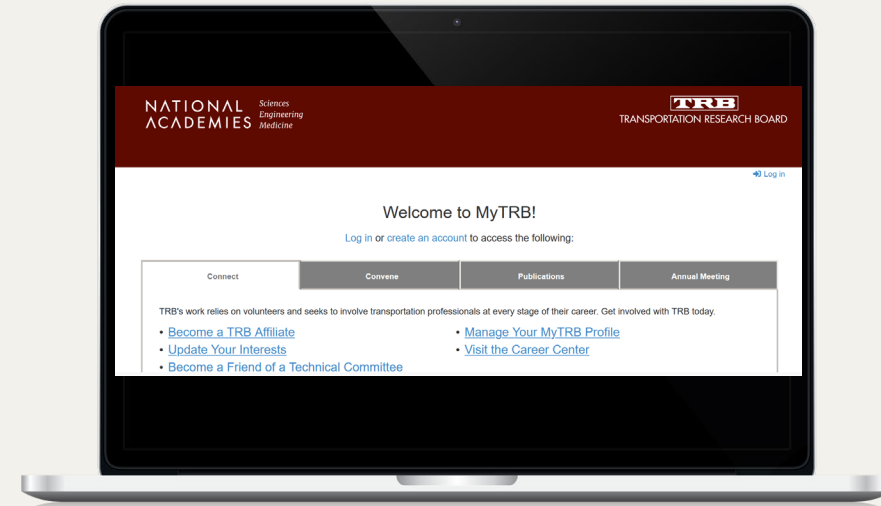
Network and pursue a path to Standing Committee membership

- **Work with a CRP**

- **Listen to our podcast**



<https://www.nationalacademies.org/podcasts/trb>



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