CATT LABORATORY

RITIS User Group

Web Meeting | October 20, 2022

In collaboration with THE EASTERN TRANSPORTATION COALITION

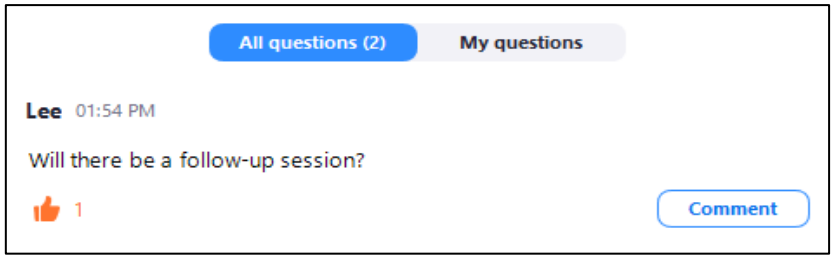
Welcome!

- We are using Zoom **Webinar**
- **AUDIO (Computer):** Use your computer speakers and microphone by clicking the "Join Audio" button at the bottom left of the screen. You will be muted.
- **Alternate Audio (Phone):** Call into the meeting by dialing the phone number based on your location (provided in the confirmation email) and enter the Meeting ID at the prompt. You will be muted.
- **This web meeting is being recorded.**
- **Questions** with the audio or web? Please contact Esther directly via email (ekleit@kmjinc.com)
- The **Chatbox** is not available to participants. Please use the **Q&A box** for questions to the presenters

Asking Questions in the Q&A Box

- Click on the Q&A icon at the bottom of your screen

- The questions in the Q&A box will be monitored and answered either between presentations or at the end of the meeting
- You can keep track of your questions in the “My Questions” tab in the Q&A box

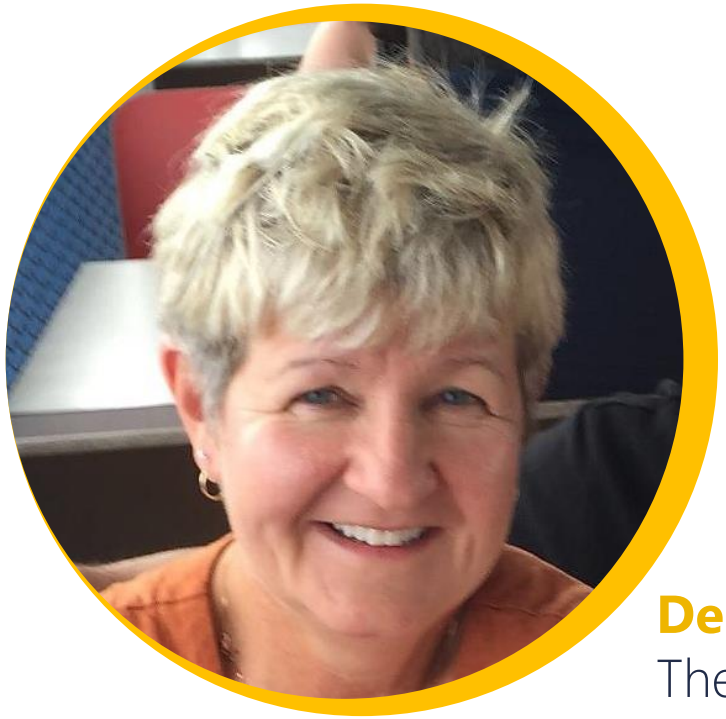


Asking Questions Verbally

- Please raise your hand *(click on the hand icon at the bottom of the screen)* and a host will unmute you.

- Please give your name and agency before asking your question
- **Please mute yourself when you are finished speaking**

Coalition Update



THE EASTERN TRANSPORTATION COALITION

Denise Markow
The Eastern Transportation Coalition
TSMO Program Director

Coalition Update

RECENT

- ✓ **Electric Vehicle Working Group Meeting (*invite only*) - Sept. 15, 2022**
- ✓ **Travel Information Committee Meeting: Scenario Planning & Info Updates (Hybrid) (*invite only*) - Sept. 22, 2022**
- ✓ **All Things ADAS (Advanced Driver Assist Systems) Webinar - Sept. 27, 2022**
- ✓ **Transportation Data Marketplace: Waypoint, Origin-Destination, and Freight Vendor Forums (*invite only*) - Aug. & Sept. 2022**
- ✓ **Potomac HOGs Exchange (In Person) (*invite only*) - Oct. 18, 2022**

UPCOMING

- ➢ **Del-Val HOGs Exchange (In Person) (*invite only*) - Nov. 2, 2022**
- ➢ **Automated Traffic Signal Performance Metrics (ATSPM) Webinar - Nov. 9, 2022**
- ➢ **RITIS Workshop #3 - After Action Templates - Nov. 17, 2022**
- ➢ **Southern HOGs Exchange (In Person) (*invite only*) - Dec. 6-7, 2022**
- ➢ **NHTS Nex Gen Webinar -Jan. 26, 2023**
- ➢ **RITIS User Group Meeting - Feb. 2, 2023**

Transportation Data Marketplace Update

- The new **Transportation Data Marketplace** is live! (as of July 1st)
  - TDM Webpage (https://tetcoalition.org/projects/transportation-data-marketplace/)
  - 6 Data Sets: Travel Time & Speed, Volume, Conflation, Origin Destination, Waypoint, and Freight
  - 12 Vendors
  - New Automated DUA process (https://dua.tdmmarketplace.com/)

Welcome & Introductions

Matt Glasser
National TSMO Account Lead
Arcadis
RITIS User Group Co-chair

Today's Meeting

Welcome and Introductions	Denise Markow, TETC Matt Glasser, Arcadis
New RITIS Tools and Recent Enhancements	Michael Pack
Spotlight Presentation: Ohio DOT's use of RITIS for Travel Time Comparison and Travel Time Delta Ranking	Charlie Fisher, Ohio DOT
Causes of Congestion Tool Update	Mark Franz, UMD CATT Lab
PDA Suite Performance Measures Working Group Update	John Allen, UMD CATT Lab
RITIS Product Enhancement Working Group Update	Bob Frey, Massachusetts DOT
Agency Input Session	All
Wrap Up and Remaining Questions	Matt Glasser

Today's Speakers

Michael Pack
UMD CATT Lab
Director

Charlie Fisher
Ohio DOT
Statewide Traffic Operations Engineer

Mark Franz
UMD CATT Lab
Lead Transportation Analyst

Bob Frey,
Massachusetts DOT
Director of Project-Oriented Planning

John Allen
UMD CATT Lab
Faculty Assistant, Outreach & Education

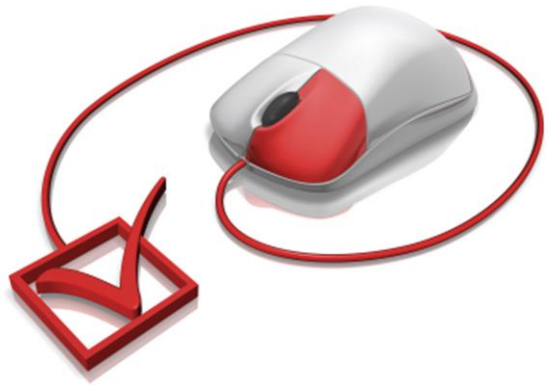
Meeting Participants

Agencies							
AASHTO	City of Charlotte, NC	Florida DOT	JPCL Engineering, LLC	Miami - Dade County	New York City DOT	Rhode Island Division of Statewide Planning	University of Maryland CATT Lab
Alamo Area MPO	City of Eugene, OR	Florida's Turnpike Enterprise	Kapsch TrafficCom USA	Miami Dade TPO	New York State DOT	Rhode Island DOT	University of Nevada-Las Vegas
Arcadis	City of Franklin, TN	Gannett Fleming	Kentuckiana Regional Planning & Development Agency	Michael Baker International	NJTPA	RTC OF SOUTHERN NEVADA	Vermont AOT
Arizona DOT	City of Roswell, NM	Georgia Environmental Protection Division	Kimley-Horn	Michigan DOT	North Carolina DOT	SJTPO	Virginia DOT
Atlanta Regional Commission	City of Sandy Springs, GA	HDR	Knoxville Regional TPO	Mid-America Regional Council	Northern Virginia Transportatin Authority	Southern Georgia Regional Commission	Western Piedmont Council of Governments
AutoReturn	Connecticut DOT	Henry County Government	Louisiana DOTD	Minnesota DOT	Office of Intermodal Planning and Investment	Southwestern Pennsylvania Commission	Westwood Professional Services
Baltimore Metropolitan Council	Corpus Christi MPO	High Street	Maryland DOE	MORPC	Ohio DOT	St Charles County	WILMAPCO
CAMPO (Raleigh)	District DOT	HNTB	Maryland DOT-SHA	MWCOG	Old Colony Planning Council	Tennessee DOT	Wisconsin DOT
Capital Region Planning Commission	DVRPC	Illinois DOT	Maryland Transportation Authority	MWVCOG	Oregon DOT	Texas A&M Transportation Institute	
Central Florida Expressway	Federal Highway Administration	Infosenseglobal	Massachusetts DOT	New Jersey DOT	Pennsylvania DOT	Texas DOT	
Charlotte DOT	Felsburg, Holt, and Ullevig	INRIX	Mead & Hunt	New Mexico DOT	PlanRVA	TRANSCOM	

Poll 1: How often do you attend RITIS User Group Web Meetings?

Answer Options:

a) 1-2 times per year
b) 3-4 times per year
c) This is my first meeting



RITIS | PROBE DATA ANALYTICS SUITE

New RITIS Tools and Recent Enhancements

Michael Pack
UMD CATT Lab
Director

Traffic Map

Added the ability to change the base map to satellite imagery on **RITIS** and **Traffic View** maps.

RITIS Release Notes

Tool Catalog

PDA - Causes of Congestion Graphs

Causes of Congestion Graphs automates the process of identifying and quantifying the causes of congestion in six primary categories: (1) recurrent bottlenecks, (2) weather, (3) work zones, (4) incidents, (5) signal timing, and (6) holidays.

This tool is recommended for analysts seeking to estimate the contribution of each congestion source to delay experienced on user-defined road segments and time ranges.

Added the newly-released Causes of Congestion Graphs to the RITIS Tool Catalog.

RITIS Release Notes

Data Source **Updates**

Updated event lane closure information for Washington, DC

Improved the Maryland Fleet vehicle data feed quality

The API now supports events that have different start and end locations

Added support for Special Event events in Delaware

RITIS Release Notes

RITIS Enhancements

- ✓ Improved Waze event data loading times
- ✓ Improved stability and security of the Traffic Camera video service
- ✓ Added an FAQ to TrafficView explaining that CCTV video is ***not*** recorded
- ✓ Enhanced the quality of error logging to improve RITIS customer support
- ✓ Reduced delay when loading imagery on the Weather Radar layer

RITIS Release Notes

Corrected **Issues**

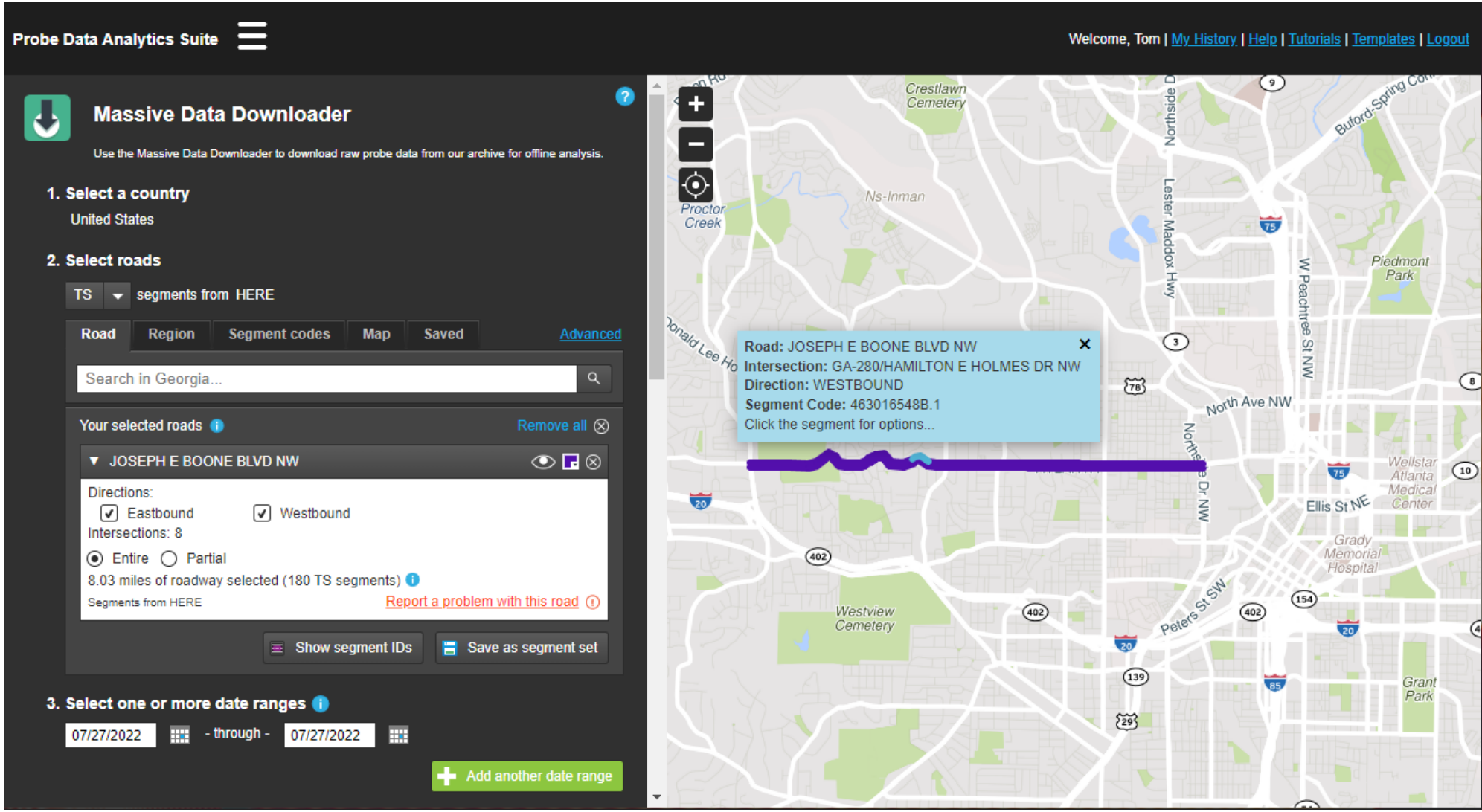
- ✓ Improved the legibility of location labels on the Traffic Map when certain layers are visible
- ✓ Fixed styling for checkboxes when creating an Alert on a work zone profile
- ✓ Fixed minor typo in the account activation email
- ✓ Fixed an issue with reCAPTCHA for TrafficView account registration
- ✓ Fixed the Work Zone Profile link icon on the Future Events Layer event popup window.

RITIS Release Notes

Probe Data Analytics Suite

Topology Subsegments in Massive Data Downloader

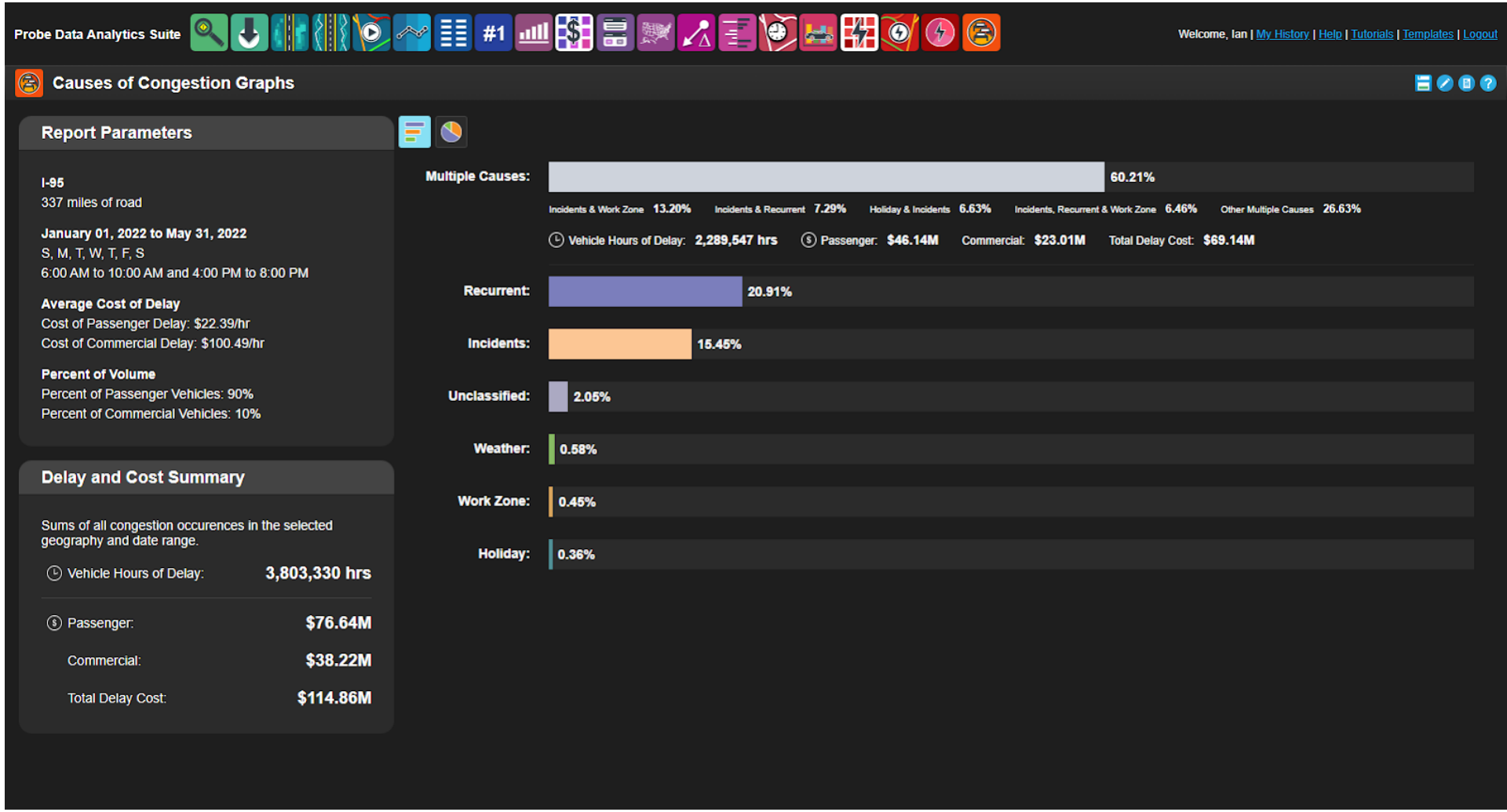
We've added support for **HERE** Topology Subsegments (TS) to the Massive Data Downloader. TSs are a new road segmentation providing finer spatial granularity than TMCs.



Causes of Congestion Graphs

All RITIS/PDA states now have access to CCG—allowing you to **estimate the contribution of each congestion source to delay** experienced on user-defined road segments and time ranges.

You can select a single date range up to one full-year, and up to three different hourly time ranges to display in either a bar chart or pie chart.

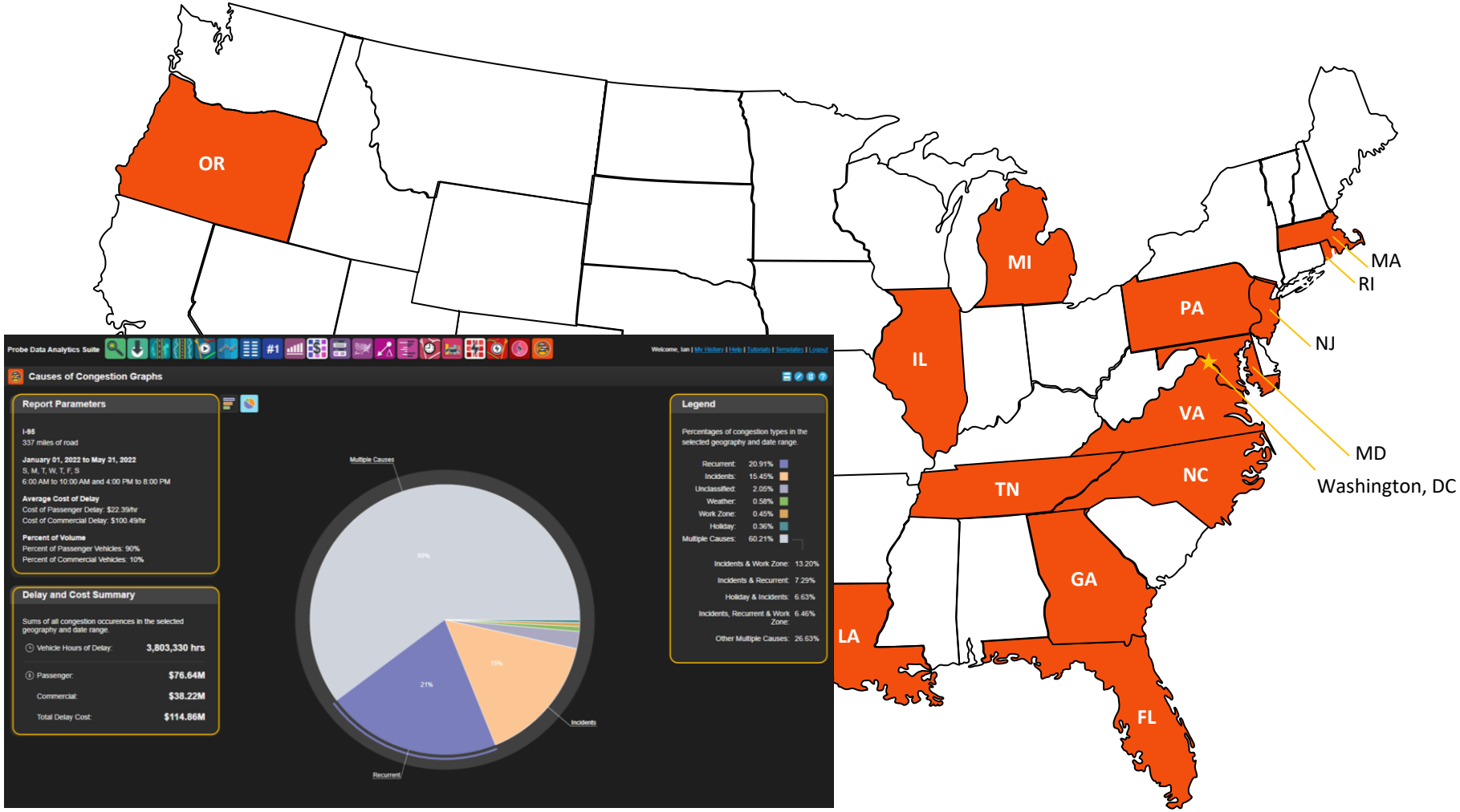


PDA Suite Latest Updates

Causes of Congestion Graphs

We've added coverage for ten new states to Causes of Congestion Graphs. The list of supported states is now:

- Florida (NHS roads only)
- Georgia
- Illinois
- Louisiana
- Maryland
- Massachusetts
- Michigan
- New Jersey
- North Carolina
- Oregon
- Pennsylvania
- Rhode Island
- Tennessee
- Virginia
- Washington DC



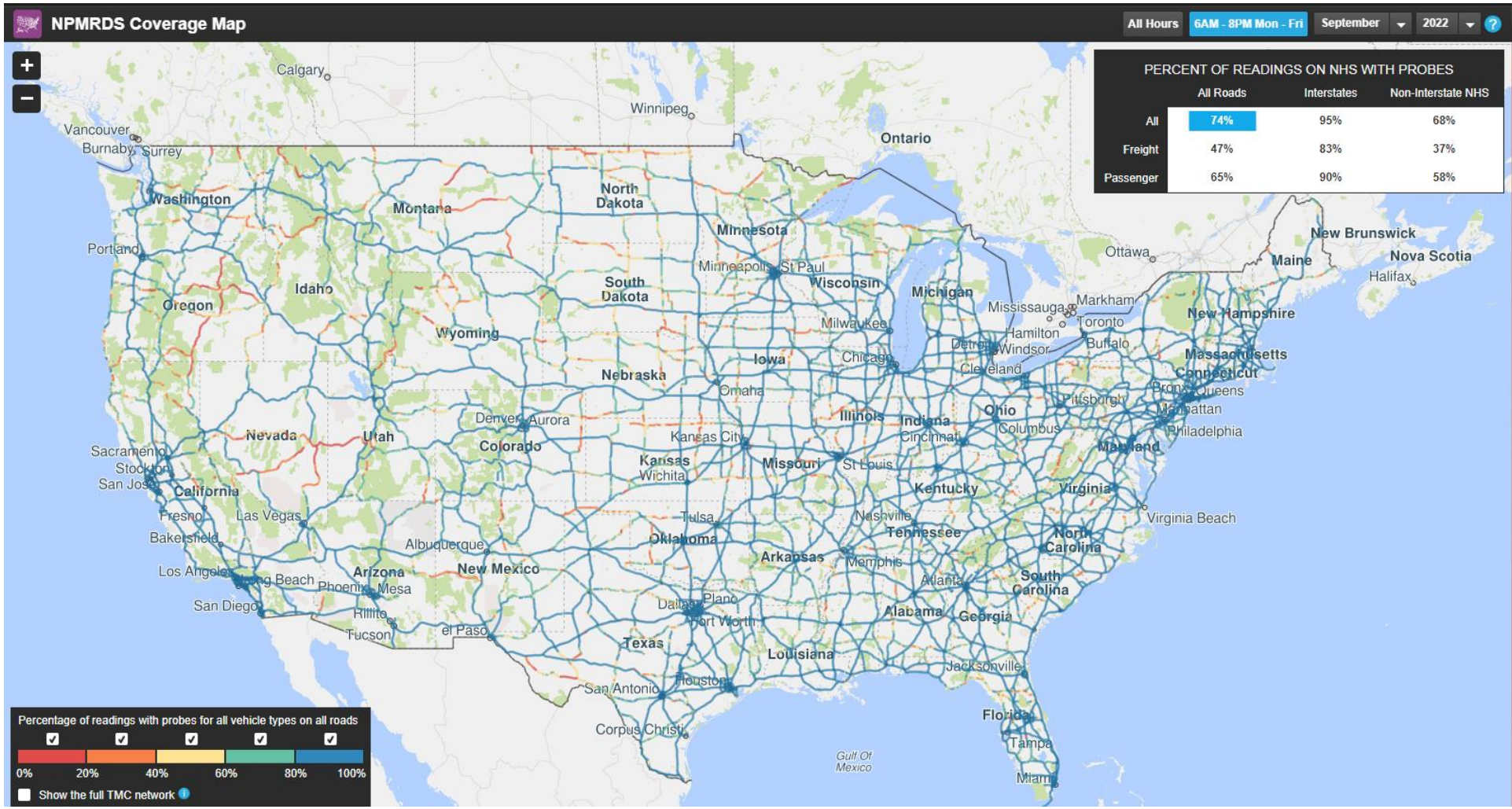
(NOTE: For all states other than Louisiana, data coverage begins on January 1, 2019, and ends July 2022. For Louisiana, coverage begins on May 1, 2019. New data will be made available on a rolling basis.)

PDA Suite Latest Updates

NPMRDS data now updated weekly

Under the new NPMRDS contract, we'll release data every week instead of every month.

Each week covers Monday through Sunday local time (following ISO 8601), and we expect to generally release data every Tuesday by 12 noon ET, nine days after the end of each data week.



PDA Suite Latest Updates

PDA Enhancements

- ✓ Updated the popup for roadway incidents in Trend Map, Region Explorer and Bottleneck Ranking to include the associated segment code
- ✓ Enhanced the quality of error logging to improve RITIS customer support
- ✓ Began working on road selection by map click (start and end point)

RITIS Release Notes

Corrected Issues

- ✓ Fixed a bug where links from the Bottleneck Ranking tool to an analysis in another tool sometimes did not work correctly
- ✓ Fixed a bug where some roadway incidents were excluded from results, depending on the type of time period chosen for analysis.
- ✓ Fixed an issue preventing traffic signal icons from appearing on Travel Time Comparison results.
- ✓ Corrected several issues for both Congestion Scan and Corridor Time Comparison:
  - **Improved the labeling logic** for the road diagrams so that these two tools will now more consistently show labels for all exits
  - **Corrected instances for beltways** that would show the data running in reverse order on the right-hand plot of the two tools
  - **Fixed instances where Congestion Scan would be missing data** for certain stretches of road when navigating from Bottleneck Ranking to Performance Charts and then onto Congestion Scan.

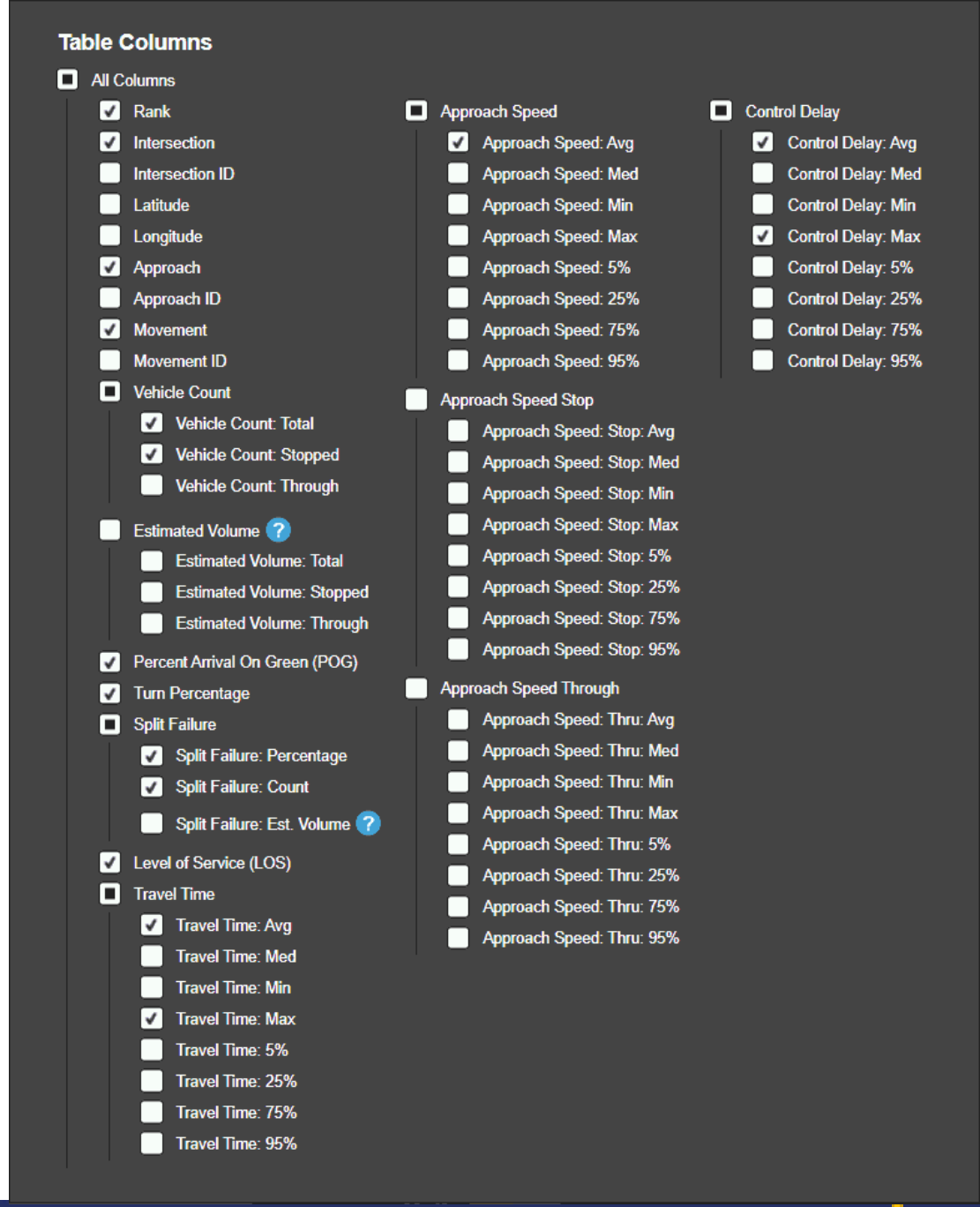
RITIS Release Notes

Signal Analytics

More Available Metrics

We've added **43 new optional metrics** to the Intersection Analysis results table, bringing the total to 60 available metrics. You can choose these metrics by clicking "Display Options" above the table when viewing results for any query.

We've also fixed an issue where sorting by LOS (Level of Service) in Intersection Analysis would not give the correct sort order.



Ohio DOT's use of RITIS for Travel Time Comparison and Travel Time Delta Ranking

Charlie Fisher

Statewide Traffic Operations Engineer

Ohio DOT

Using RITIS for ODOT's Statewide Signal Retiming Project

DEVELOP • IMPROVE • MONITOR • REPORT

Charlie Fisher, PE
Statewide Traffic Operations Engineer
Ohio Department of Transportation, Office of Traffic Operations

October 20, 2022

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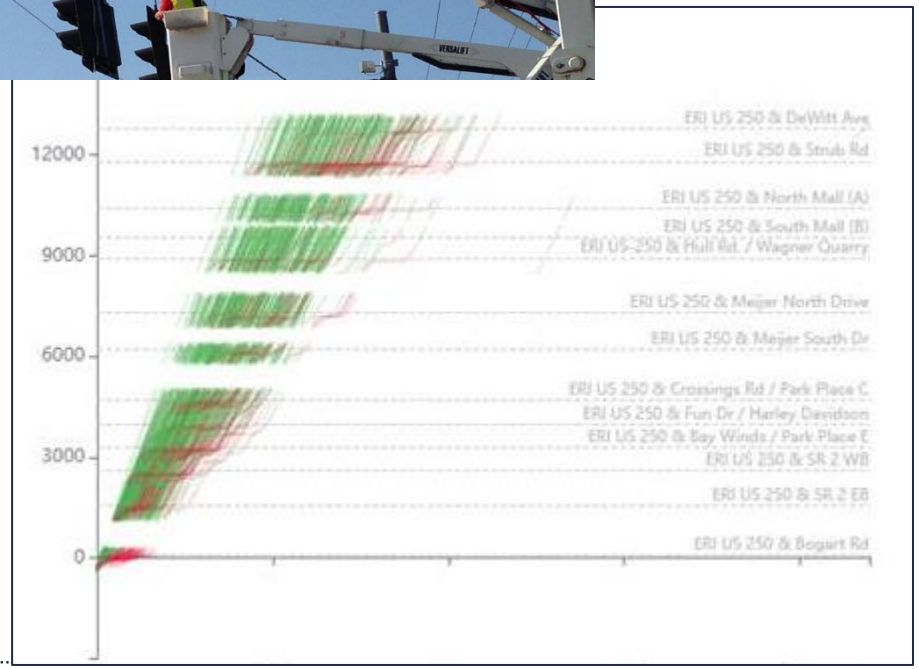
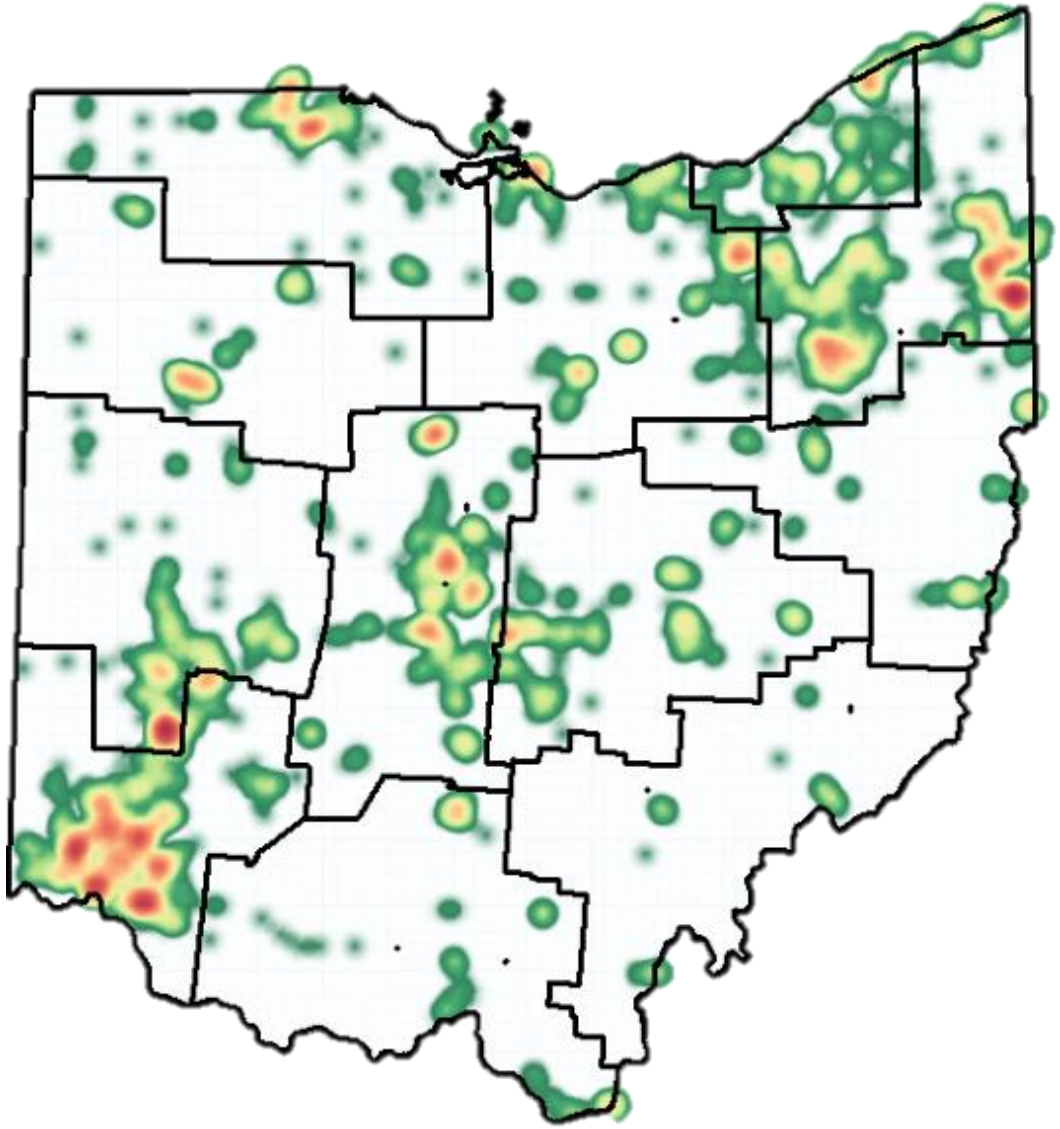
TOPICS

- Ohio overview
- RITIS Tools
  - Region Explorer
  - Travel Time Delta
  - Dashboard
  - Signal Analytics with INRIX Signal Analytics
- Lessons Learned/Next Steps



OHIO OVERVIEW



ODOT Signal Stats

1655 Total Signals
780 Signals in Systems
126 Signal Systems

Challenges

Staffing
Resources devoted to Signal Performance Data
Rising Intersection crashes

ODOT Traffic Operations

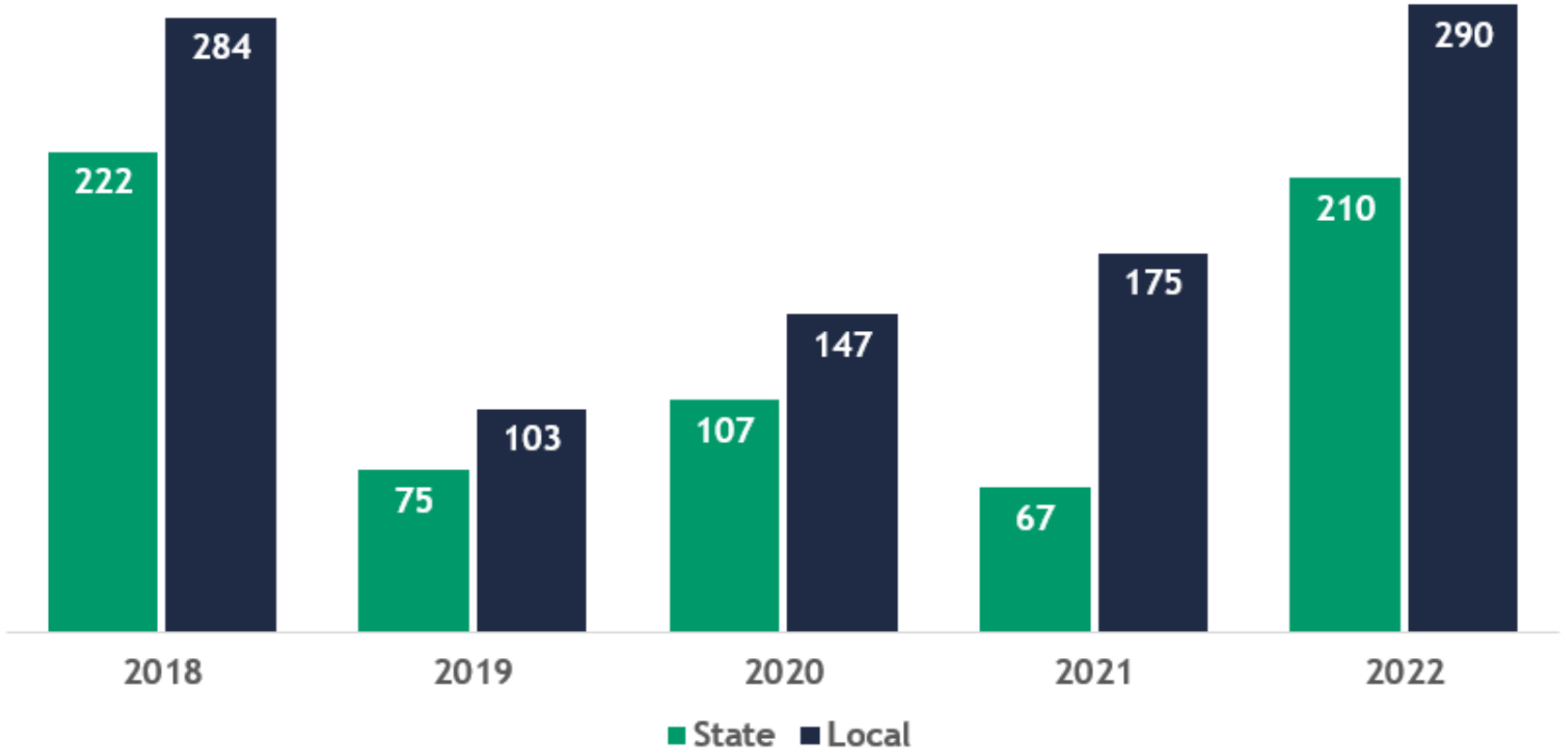
OHIO OVERVIEW

Ohio

Signals Analyzed: 10,012
Signals Analyzed Rank: 7

% Fatalities		
Year	State	Local
2018	44%	56%
2019	42%	58%
2020	42%	58%
2021	28%	72%
2022	42%	58%

Fatalities by Maintaining Agency



Strategic Highway Safety Plan (SHSP) initiatives

- Leverage new technology that makes intersections safer
- Implement proven and low-cost countermeasures
- Educate roadway users of new intersection types and technology
- Develop and implement plan to address LT and Angle crashes
- Develop and implement plan to address Pedestrian and Bicyclist crashes
- Develop and implement plan to address CMV crashes

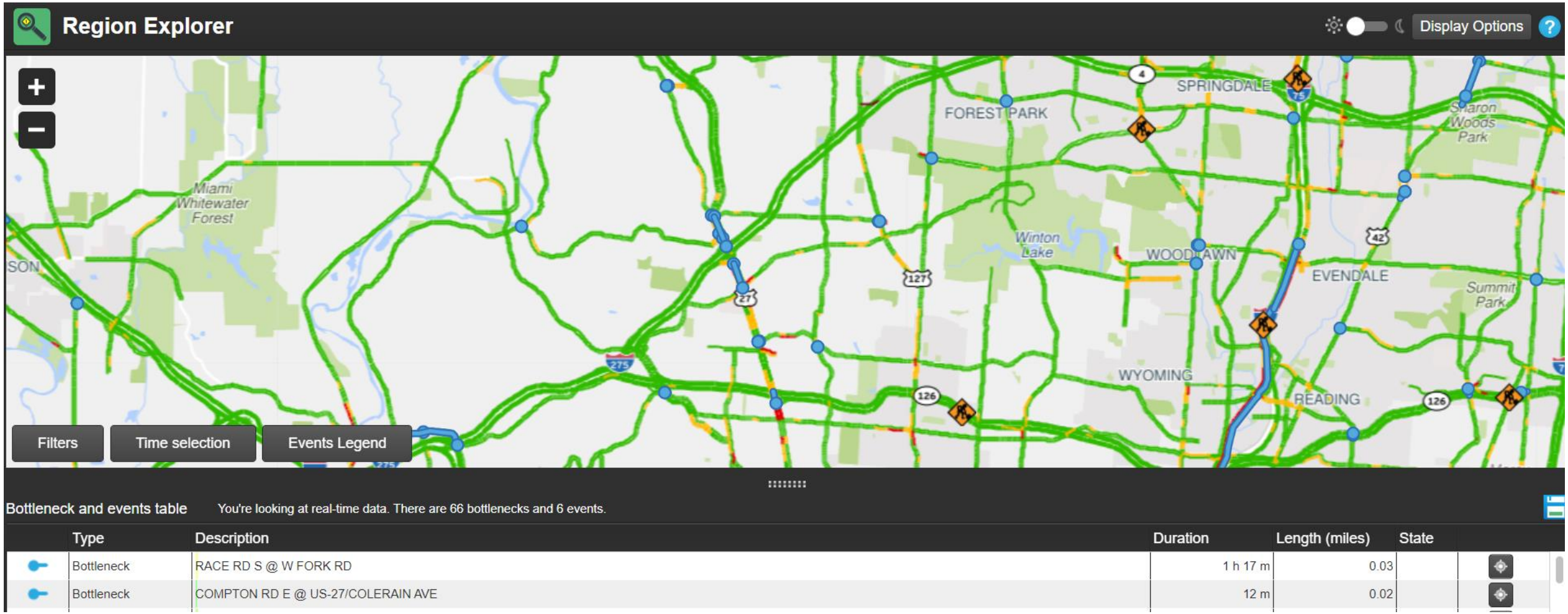
ODOT Signal Timing Program (using PDA Suite)

1. Use **PDA Region Explorer** to help choose which corridors to study
2. Use **PDA Travel Time Delta Ranking** to evaluate and prioritize candidate corridors
3. Use **PDA Travel Time Delta Ranking** to evaluate re-timed corridors (trending better/worse)
4. Use **PDA Dashboard** to monitor performance (in real-time) to identify corridors needing tweaking
5. Use **Signal Analytics** to monitor individual intersection performance to identify those that need adjustments

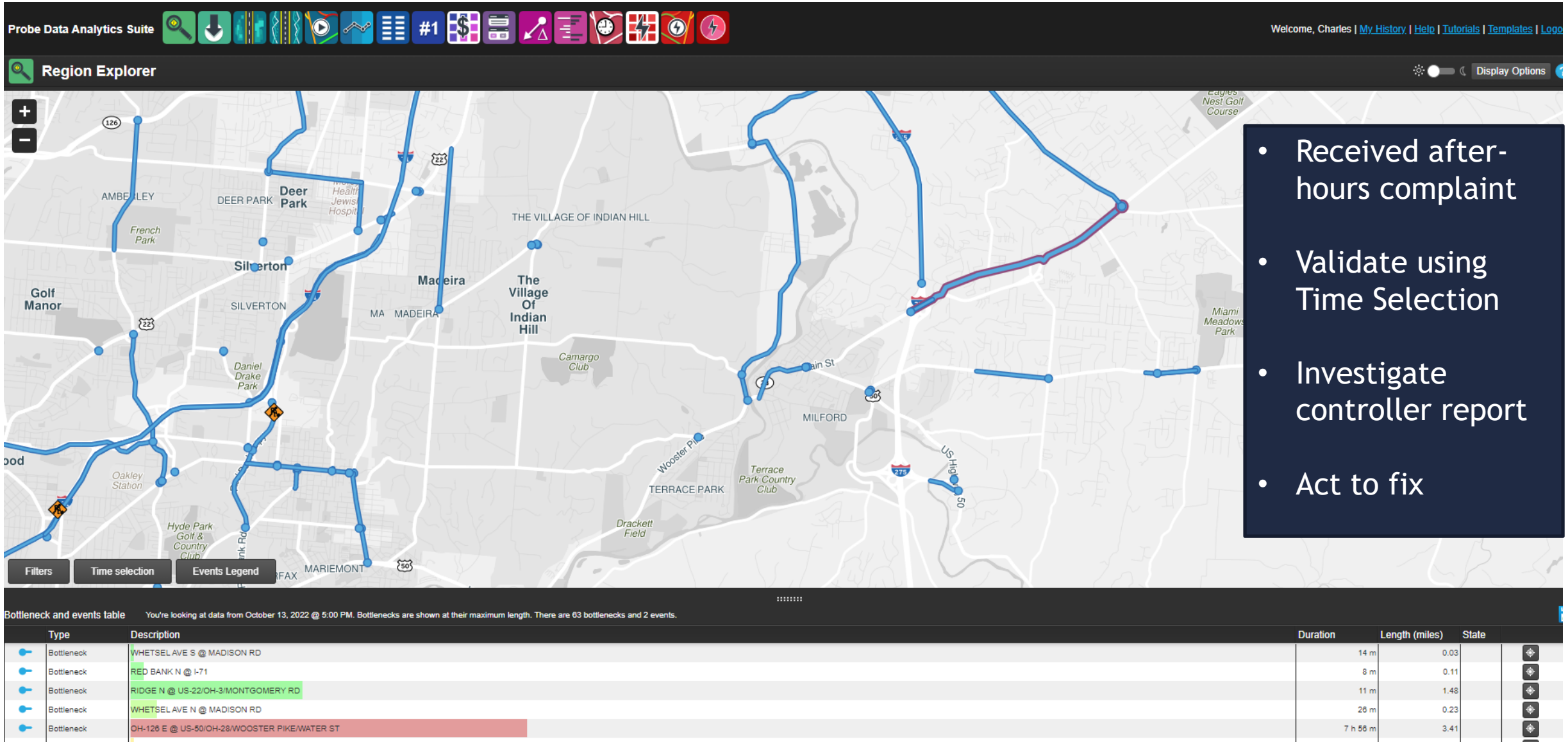
Report outs on results to:

funding managers, upper management and senior leadership, project stakeholders

REGION EXPLORER

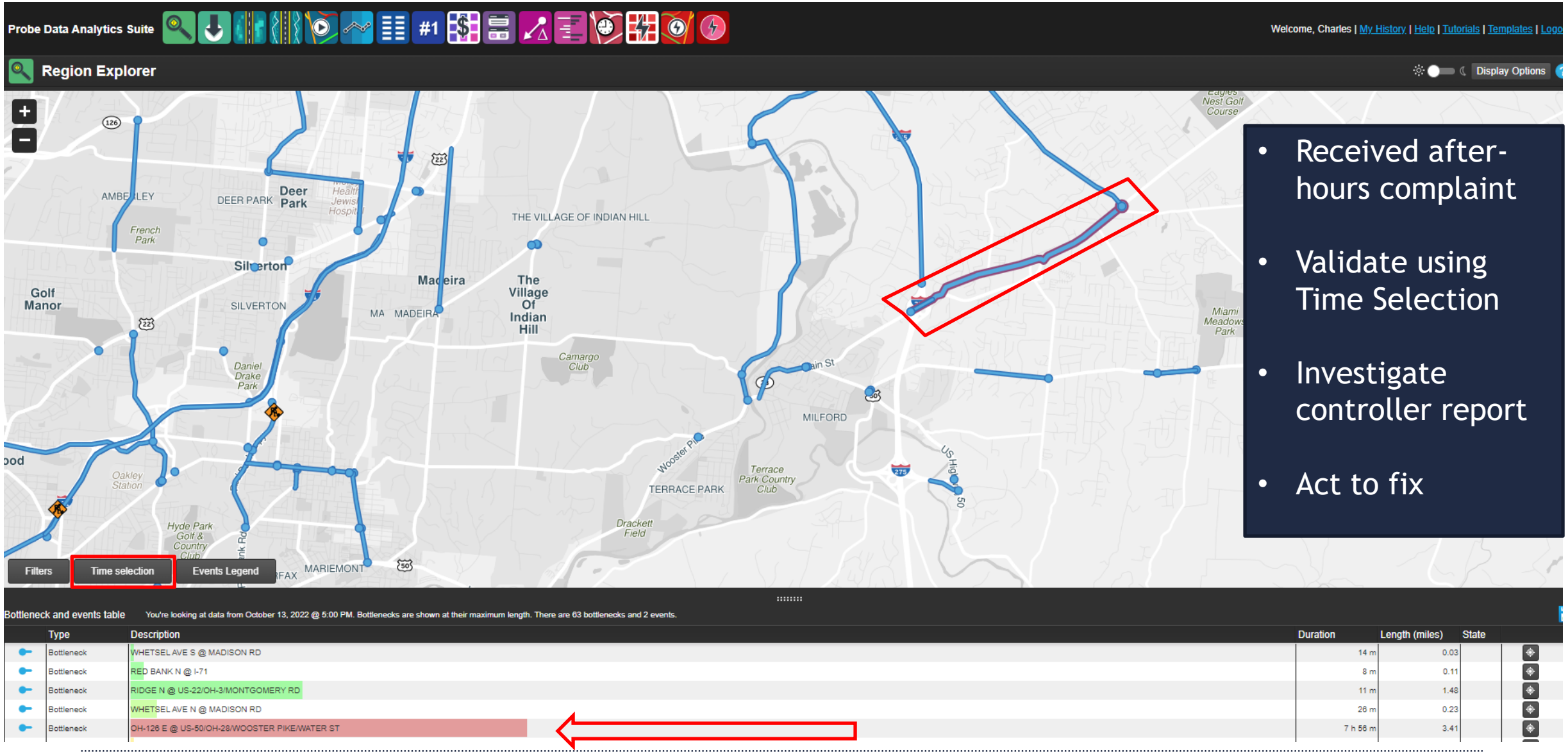


REGION EXPLORER



- Received after-hours complaint
- Validate using Time Selection
- Investigate controller report
- Act to fix

REGION EXPLORER



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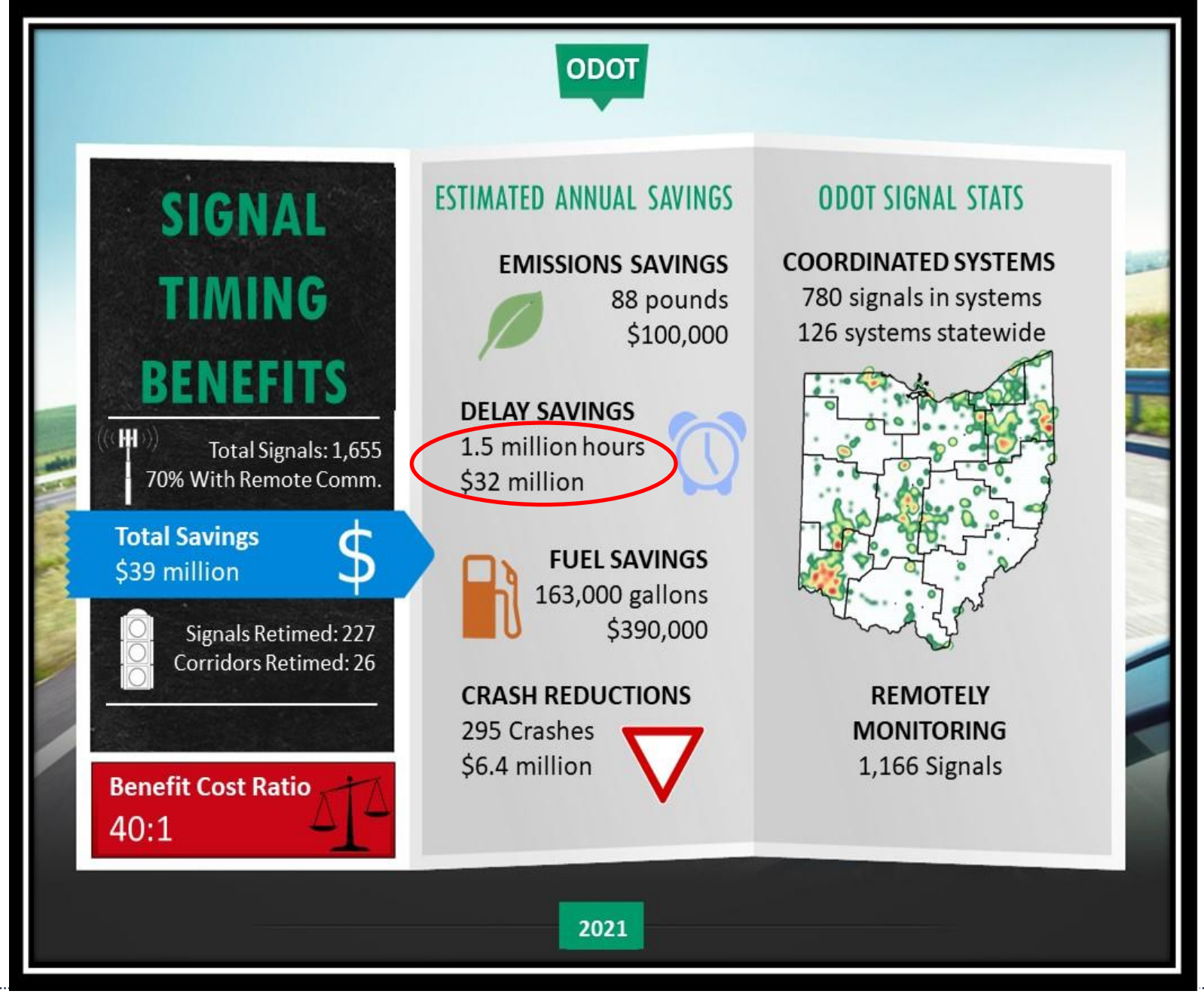
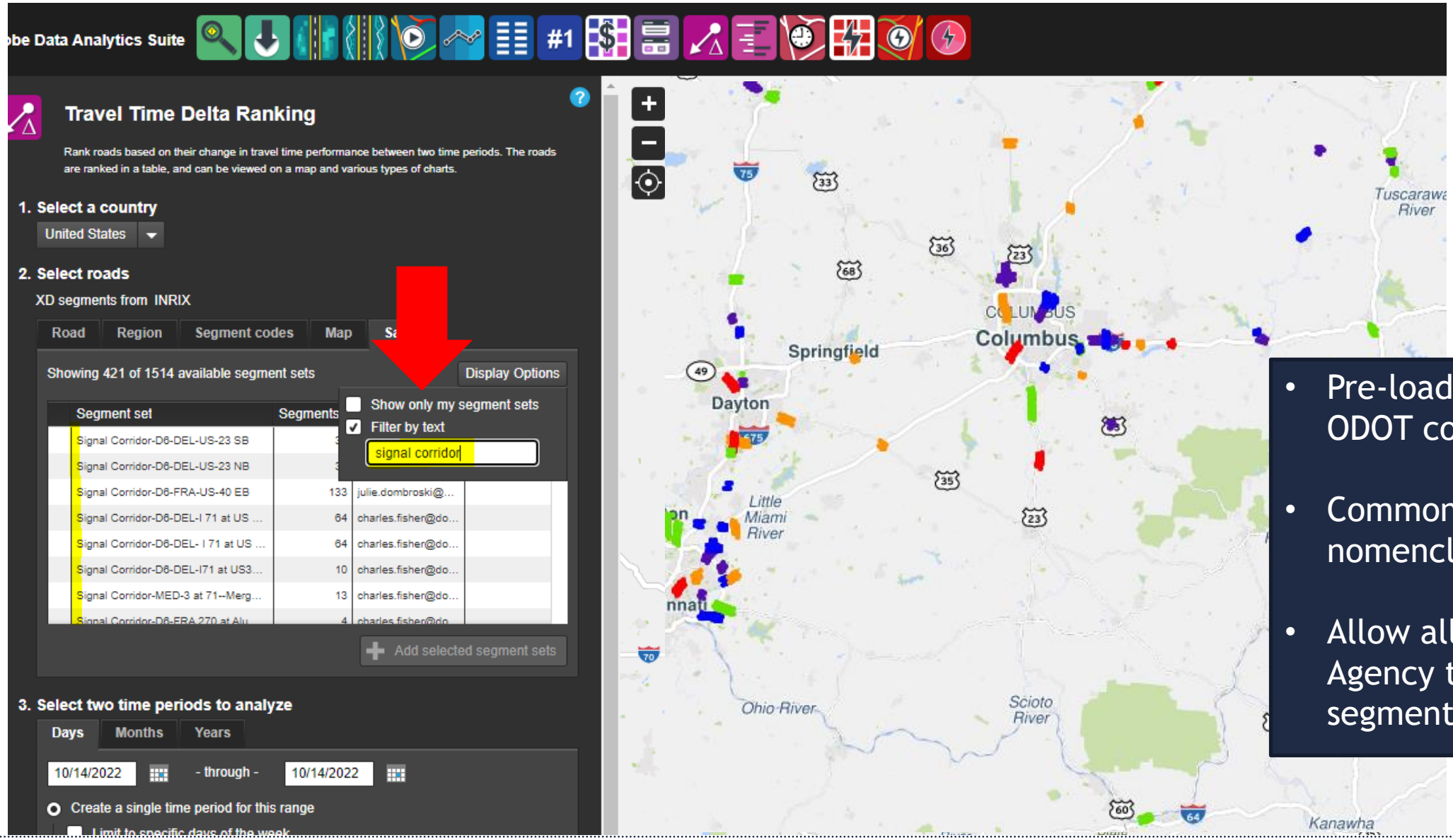

ODOT
SIGNAL TIMING BENEFITS
Total Signals: 1,655
70% With Remote Comm.
Total Savings
$39 million
Signals Retimed: 227
Corridors Retimed: 26
Benefit Cost Ratio
40:1
ESTIMATED ANNUAL SAVINGS
EMISSIONS SAVINGS
88 pounds
$100,000
DELAY SAVINGS
1.5 million hours
$32 million
FUEL SAVINGS
163,000 gallons
$390,000
CRASH REDUCTIONS
295 Crashes
$6.4 million
ODOT SIGNAL STATS
COORDINATED SYSTEMS
780 signals in systems
126 systems statewide
REMOTELY MONITORING
1,166 Signals
2021

How do we choose which corridors to study?

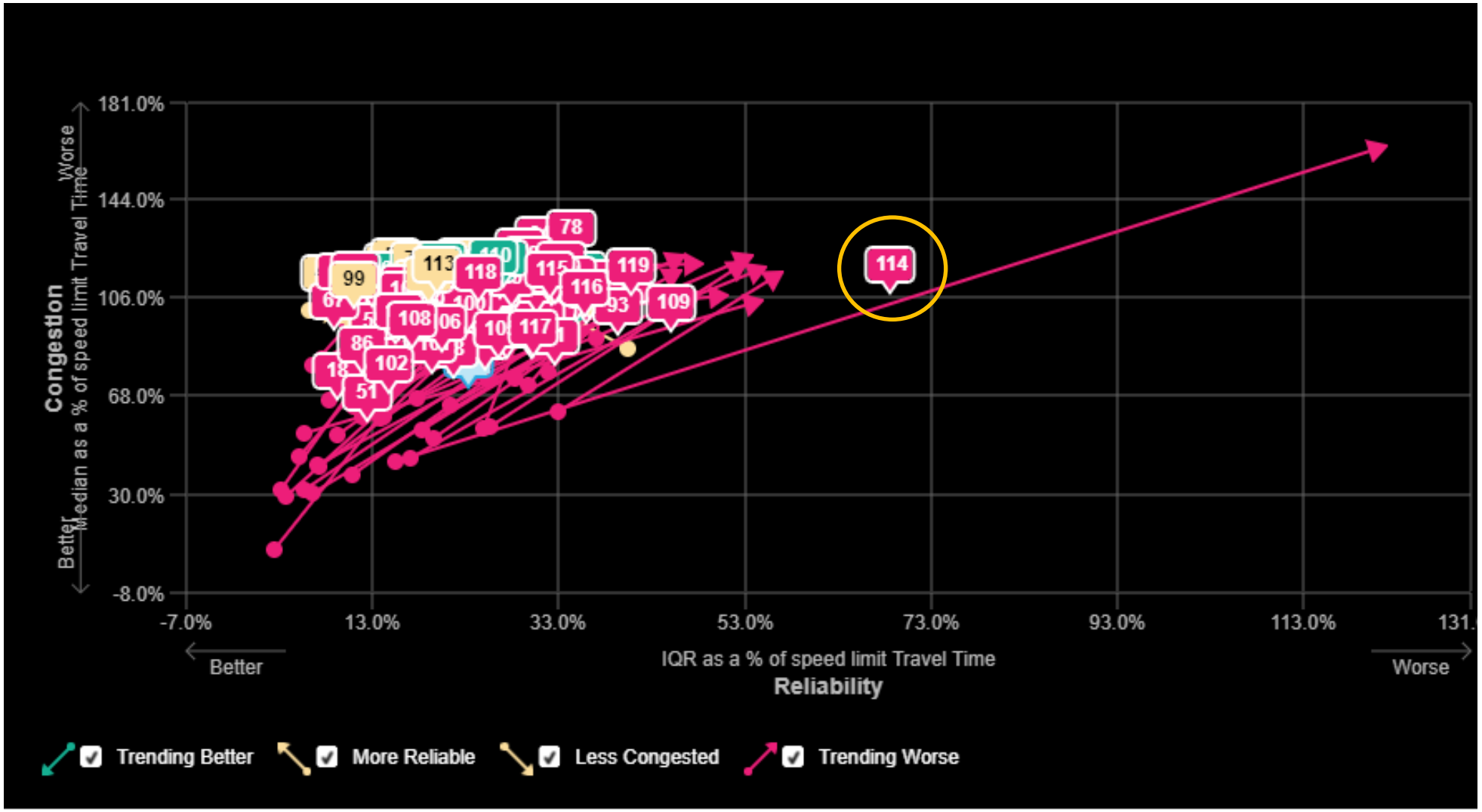
- 5-7 years
- Crash Trends
- Priority on Tier 1 corridors (>25k ADT)
- Volume Growth
- Squeaky Wheel

TRAVEL TIME DELTA RANKING



- Pre-loaded all ODOT corridors
- Common nomenclature
- Allow all in Agency to see segments

TRAVEL TIME DELTA RANKING RESULTS



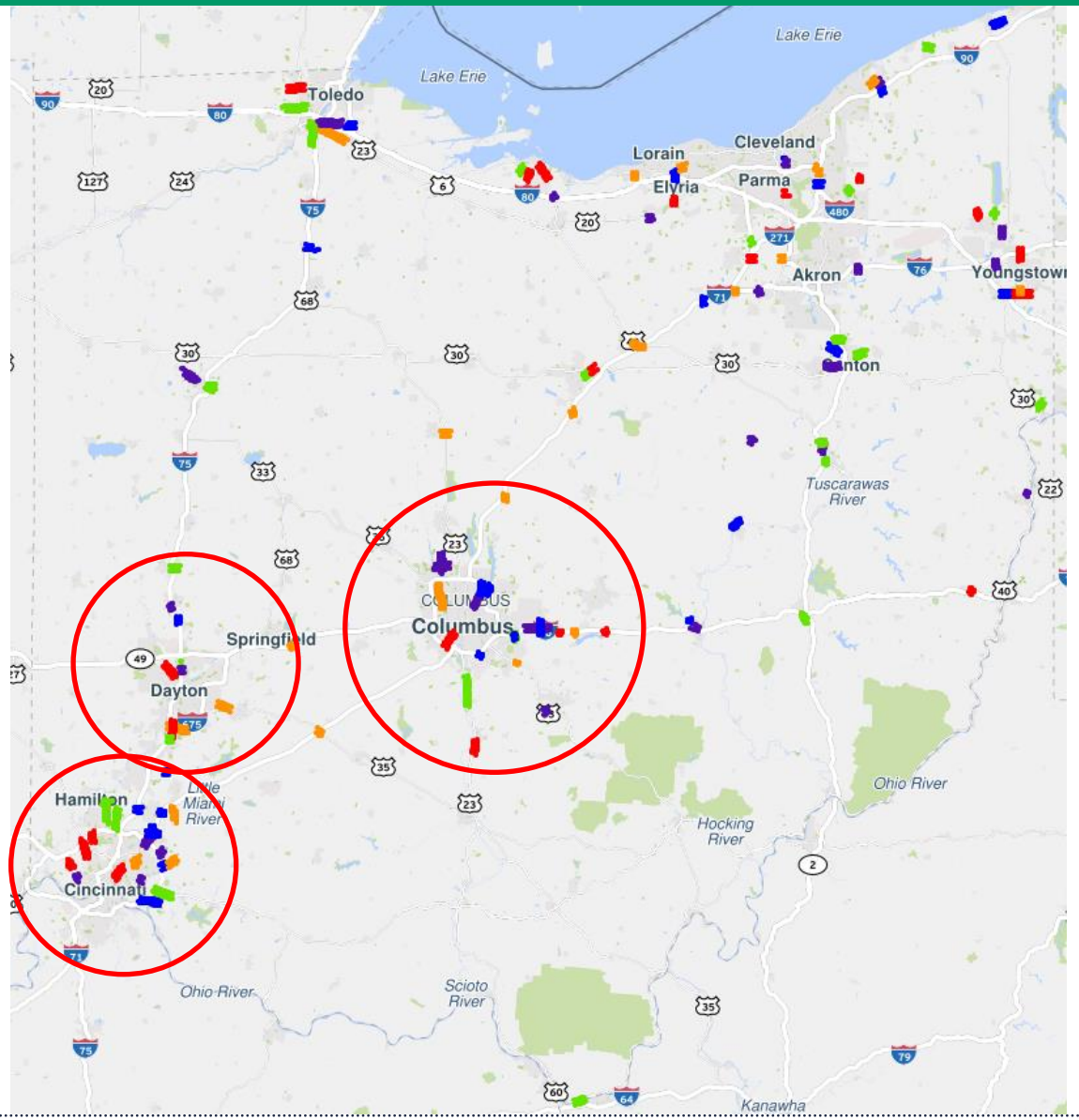
- 126 ODOT corridors evaluated
- Stack and rank corridors based on travel time comparisons
  - Example: 2018 v. 2019
- Normalized data based on corridor size
- Longest/pinkest is performing the worst

RANKING RESULTS ARE EXPORTABLE TO EXCEL

Rank	Corridor	Bearing	TTSL (minutes)	Median Before (%)	Median After (%)	Delta Median	IQR Before (%)	IQR After (%)	Delta IQR
114	Signal Corridor-D8-HAM/WAR Mason Montgomeryâ€"Merged	North	1.3	42.3	164.6	122.3	15.4	121.9	106.5
51	Signal Corridor-D6-FRA Alum Creek at I 270â€"Merged	West	3.4	8.5	99.7	91.2	2.4	22.6	20.2
98	Signal Corridor-D6-FRA Sunbury at SR-161â€"Merged	North	3	31.9	109.4	77.5	5.6	37.9	32.3
105	Signal Corridor-D4-TRU SR-5/Elm at SR-82â€"Merged	North	0.9	41.3	116.3	75	7	46.2	39.2
4	Signal Corridor-D7-MIA SR 55â€"Merged	West	2.9	30.3	103.1	72.8	6.6	40	33.4
8	Signal Corridor-D8-HAM/CLE SR 125â€"Merged	South	5.7	37.4	110	72.6	10.8	39.4	28.6
102	Signal Corridor-D11-BEL US-40 & CR-28Aâ€"Merged	West	5.4	29	100.8	71.8	3.7	25.7	22
81	Signal Corridor-D12-CUY Miles Rd at I-480â€"Merged	North	2.8	43.8	107.9	64.1	17.1	48.2	31.1
93	Signal Corridor-D8-WAR SR 741/Kings Millsâ€"Merged	East	2.1	56	119.5	63.5	25.7	53	27.3
101	Signal Corridor-D8-CLE SR-28 at Guineaâ€"Merged	West	2.6	40.9	104.3	63.4	7.3	31.4	24.1
18	Signal Corridor-D1-ALL SR-309â€"Merged	West	2.9	31.6	93.1	61.5	3.1	15.2	12.1
17	Signal Corridor-D8-WAR SR 122â€"Merged	East	3	63.6	122.3	58.7	11	46.4	35.4
16	Signal Corridor-D8-HAM Harrison Rdâ€"Merged	North	4.5	59.2	116.2	57	13.8	41.1	27.3
86	Signal Corridor-D12-LAK US 20â€"Merged	North	3	44.4	101.4	57	5.2	18.7	13.5
56	Signal Corridor-D6-FRA SR 3 at Parisâ€"Merged	East	4.3	54.7	110.7	56	18.4	43.4	25
116	Signal Corridor-D8-HAM/WAR Fields Ertel at Mason Motâ€"Merged	North	13.3	67.2	122.3	55.1	17.8	53.8	36
25	Signal Corridor-D4-MAH US 224 Boardman--Merged	North	8.5	51.4	105.5	54.1	19.6	40.7	21.1
109	Signal Corridor-D7-MOT Austin Blvdâ€"Merged	South	2.2	61.9	115.6	53.7	33	57	24
117	Signal Corridor-D11-JEF SR 7/213--Merged	South	1.3	53.7	104.9	51.2	5.7	54.8	49.1
21	Signal Corridor-D2-LUC US-20â€"Merged	East	4	53	102.8	49.8	9.3	28.8	19.5
53	Signal Corridor-D4-STA Portage St--Merged	North	7.9	55.6	101.6	46	24.9	29.9	5
108	Signal Corridor-D8-CLE Wards Corners at I-275â€"Merged	North	4.5	60.2	104.7	44.5	11.9	22.6	10.7
38	Signal Corridor-D3-MED SR 3â€"Merged	East	1.3	73.7	117.6	43.9	25.4	55.2	29.8
10	Signal Corridor-D8-HAM US-22/SR-3 at Kenwood Rdâ€"Merged	South	9.3	72	114.5	42.5	29.8	39.9	10.1
106	Signal Corridor-D12-CUY Rockside at I-271â€"Merged	North	2.1	60	101.7	41.7	14.2	26.6	12.4
7	Signal Corridor-D8-HAM US 27â€"Merged	South	5	64.6	105.2	40.6	21.3	41.8	20.5
46	Signal Corridor-D4-STA SR 687--Merged	West	10.5	68.2	102.2	34	13.6	21.6	8
48	Signal Corridor-D1-ALL SR 309 at SR 117â€"Merged	South	2.5	72.2	105.1	32.9	14.6	33.6	19
2	Signal Corridor-D8-HAM 22--Norwood--Merged	North	4.2	69.7	101.7	32	13.1	26.7	13.6
55	Signal Corridor-D4-TRU SR 45 Champion Twp--Merged	North	5.4	66.4	97.1	30.7	8.4	17.8	9.4
107	Signal Corridor-D7-MOT SR 48â€"Merged	North	9.6	70.7	100.6	29.9	10	21.6	11.6
9	Signal Corridor-D8-HAM US 22â€"Merged	West	6.3	77.3	106.5	29.2	31.9	40	8.1
11	Signal Corridor-D8-HAM US-127 at I-275â€"Merged	North	1.8	74.5	102.7	28.2	28.3	36.3	8
75	Signal Corridor-D5-COS US 36--Merged	West	4.8	75.9	100.6	24.7	12.8	21.7	8.9
100	Signal Corridor-D11-COL SR-170â€"Merged	East	3.8	75.9	100.5	24.6	14.9	31.5	16.6
19	Signal Corridor-D2-LUC SR-2â€"Merged	West	8.3	72.6	96.2	23.6	10.5	20.3	9.8
26	Signal Corridor-D4-MAH US 224 Canfield--Merged	North	2.7	85.1	108.6	23.5	16.1	30.6	14.5
27	Signal Corridor-D4-MAH OH 46 Austintown Twp--Merged	North	6.7	71.8	95.2	23.4	15.2	30.1	14.9
12	Signal Corridor-D8-CLE SR-28 at I-275â€"Merged	West	5.8	77.2	99.4	22.2	15.8	22.8	7
115	Signal Corridor-D8-HAM/WAR Fields Ertelâ€"Merged	North	9.2	91.1	111.8	20.7	23.6	40.6	17
91	Signal Corridor-D7-MOT SR 725 (Dayton Mall)â€"Merged	North	6.9	89.4	110	20.6	28.2	40.7	12.5
60	Signal Corridor-D6-FRA US 62â€"Merged	North	13.3	86.1	105.6	19.5	25.7	35.6	9.9
31	Signal Corridor-D2-WOO SR 795 Eâ€"Merged	East	4.3	80.9	99.9	19	9.4	19.2	9.8
67	Signal Corridor-D5-FAI US 22 US 33--Merged	North	3	79.9	98.9	19	6.5	11.4	4.9
43	Signal Corridor-D3-RIC US 42 S of US 30â€"Merged	East	5.1	82.4	100.8	18.4	7.6	18.1	10.5
30	Signal Corridor-D4-TRU SR 193 Liberty Twp--Merged	North	5.7	84.6	101.6	17	15.3	26.4	11.1
68	Signal Corridor-D5-FAI SR 256--Merged	South	3.9	89.8	106.6	16.8	37.1	37.7	0.6
14	Signal Corridor-D8-CLE SR-32â€"Merged	West	14	85.9	102.2	16.3	40.5	32.2	-8.3
58	Signal Corridor-D5-GUE SR 209--Merged	North	8.4	80.9	96.9	16	12.3	20.2	7.9

- Different Data Outputs
- Delta Median used to evaluate and prioritize

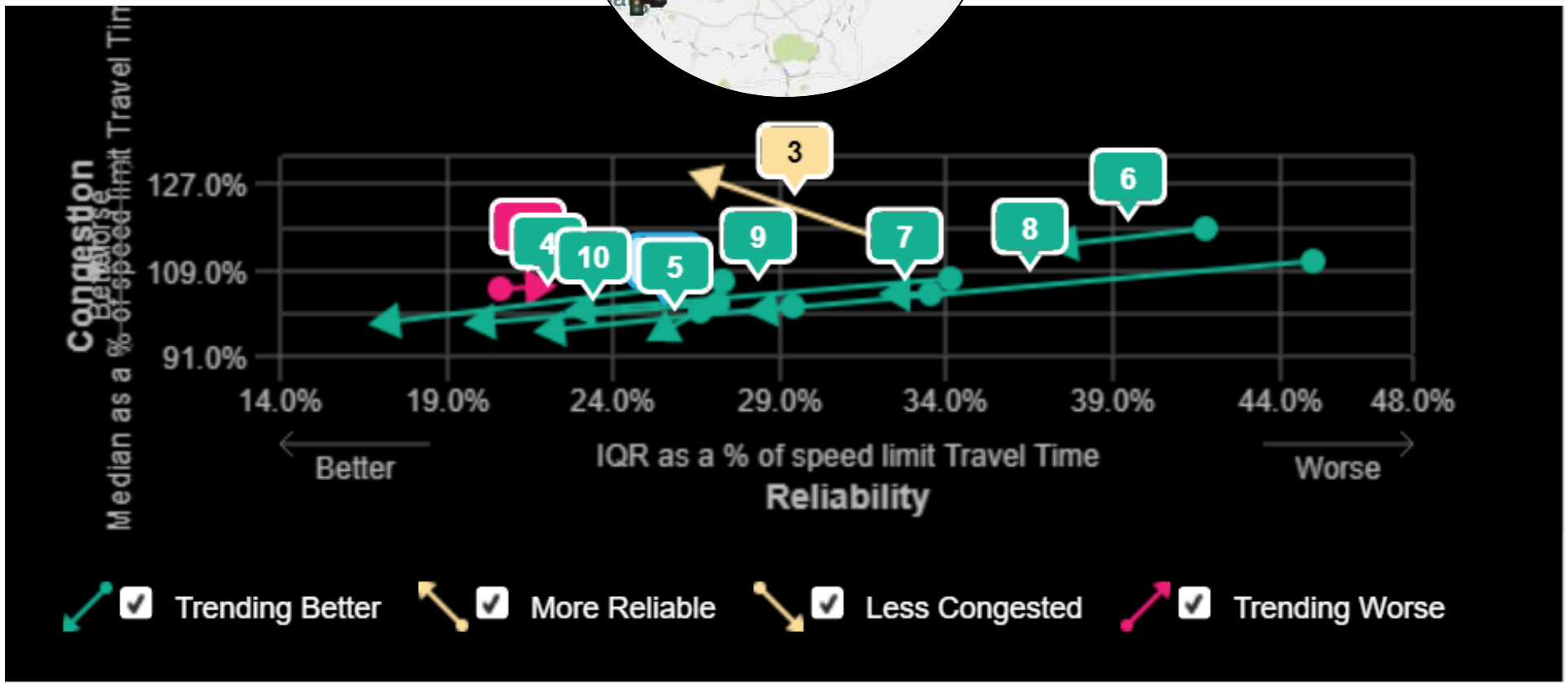
TRAVEL TIME RANKING



- Pre-loaded corridors allow us to evaluate Districts, Cities, MPOs

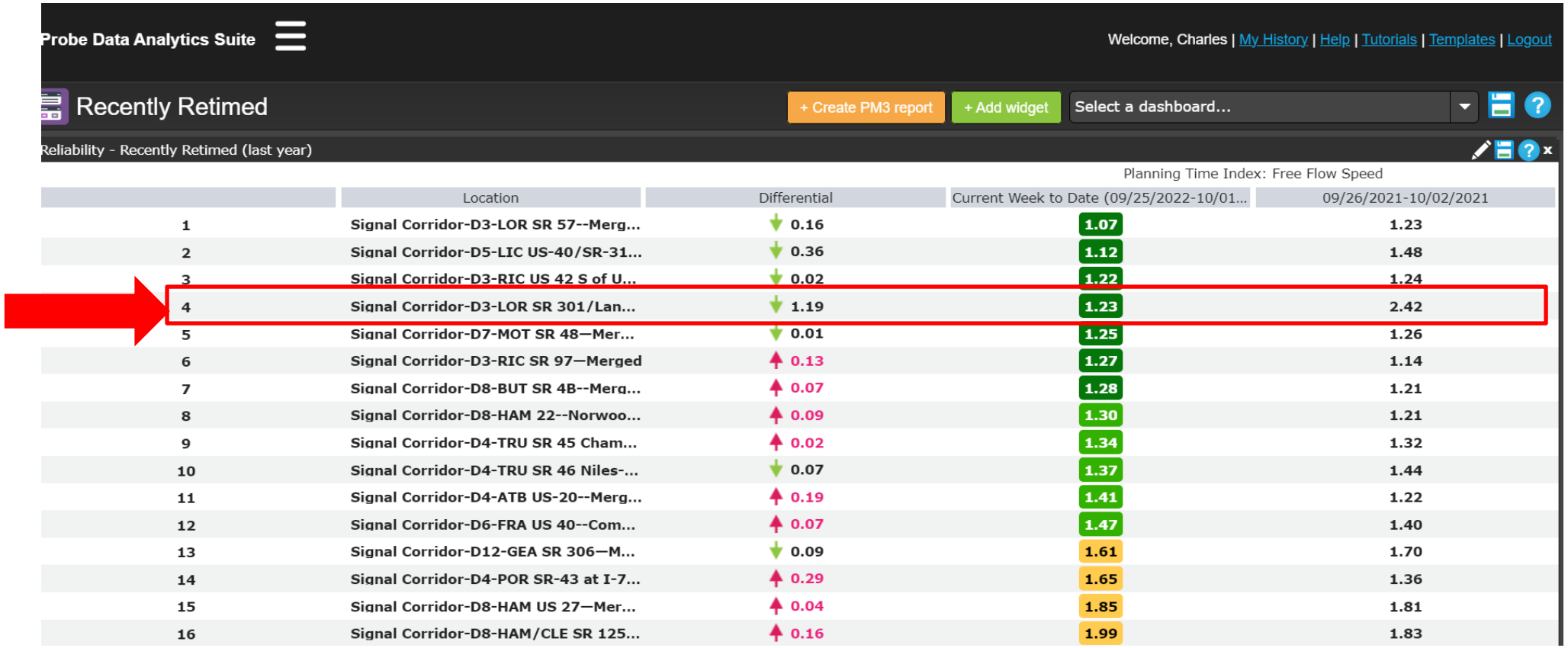
SIGNAL RETIMING SUCCESSES

- Post re-timing
  - Evaluate performances across all corridors re-timed



DASHBOARD: RECENTLY RE-TIMED

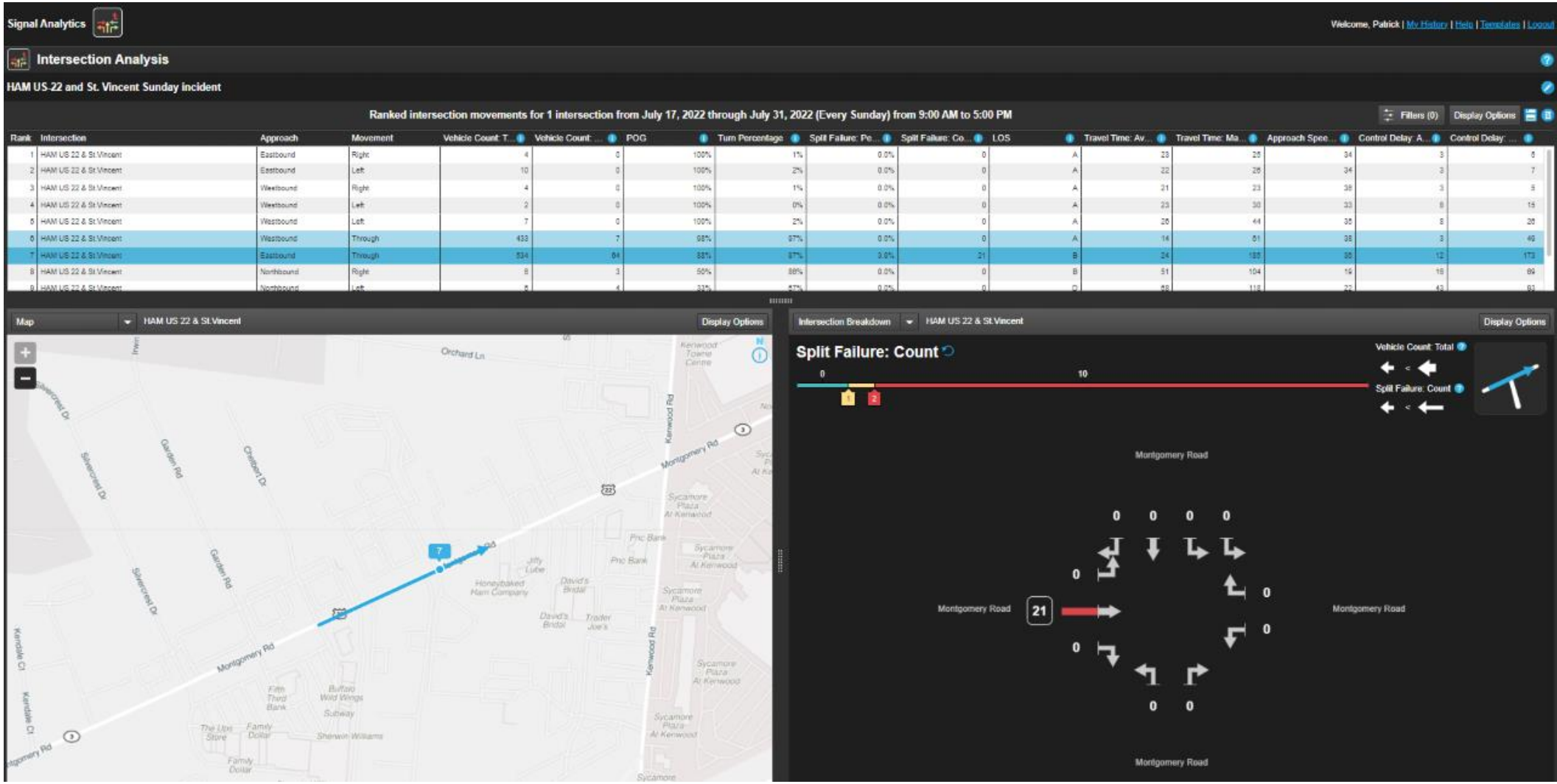
- Set it and forget it
- Planning Time Index
- Post-implementation: tells me quickly if the corridor needs investigation or tweaking



	Location	Differential	Current Week to Date (09/25/2022-10/01...	09/26/2021-10/02/2021
1	Signal Corridor-D3-LOR SR 57--Merg...	0.16	1.07	1.23
2	Signal Corridor-D5-LIC US-40/SR-31...	0.36	1.12	1.48
3	Signal Corridor-D3-RIC US 42 S of U...	0.02	1.22	1.24
4	Signal Corridor-D3-LOR SR 301/Lan...	1.19	1.23	2.42
5	Signal Corridor-D7-MOT SR 48—Mer...	0.01	1.25	1.26
6	Signal Corridor-D3-RIC SR 97—Merged	0.13	1.27	1.14
7	Signal Corridor-D8-BUT SR 4B--Merg...	0.07	1.28	1.21
8	Signal Corridor-D8-HAM 22--Norwoo...	0.09	1.30	1.21
9	Signal Corridor-D4-TRU SR 45 Cham...	0.02	1.34	1.32
10	Signal Corridor-D4-TRU SR 46 Niles-...	0.07	1.37	1.44
11	Signal Corridor-D4-ATB US-20--Merg...	0.19	1.41	1.22
12	Signal Corridor-D6-FRA US 40--Com...	0.07	1.47	1.40
13	Signal Corridor-D12-GEA SR 306—M...	0.09	1.61	1.70
14	Signal Corridor-D4-POR SR-43 at I-7...	0.29	1.65	1.36
15	Signal Corridor-D8-HAM US 27—Mer...	0.04	1.85	1.81
16	Signal Corridor-D8-HAM/CLE SR 125...	0.16	1.99	1.83

SIGNAL ANALYTICS

- Signal Data
  - Arrival on Green
  - Split Failures
  - LOS
  - Delay
- Specific ranges of data
  - i.e., Every Sunday of past 2 wks.



BENEFITS OF USING RITIS TOOLS

- Leverage new technology to improve safety = Meets SHSP
- Information-rich metrics
  - Daily Maintenance: Is the complaint validated?
  - Pre-study: Where to study?
  - Post-study: Is it continuing to perform well?
- Time/resource savings to ODOT
- Easier to communicate the plan by showing visuals of rankings
- More Tools to explore and use (Trend Map, Report Templates)
  - Visual storytelling

Thank You!

For more information

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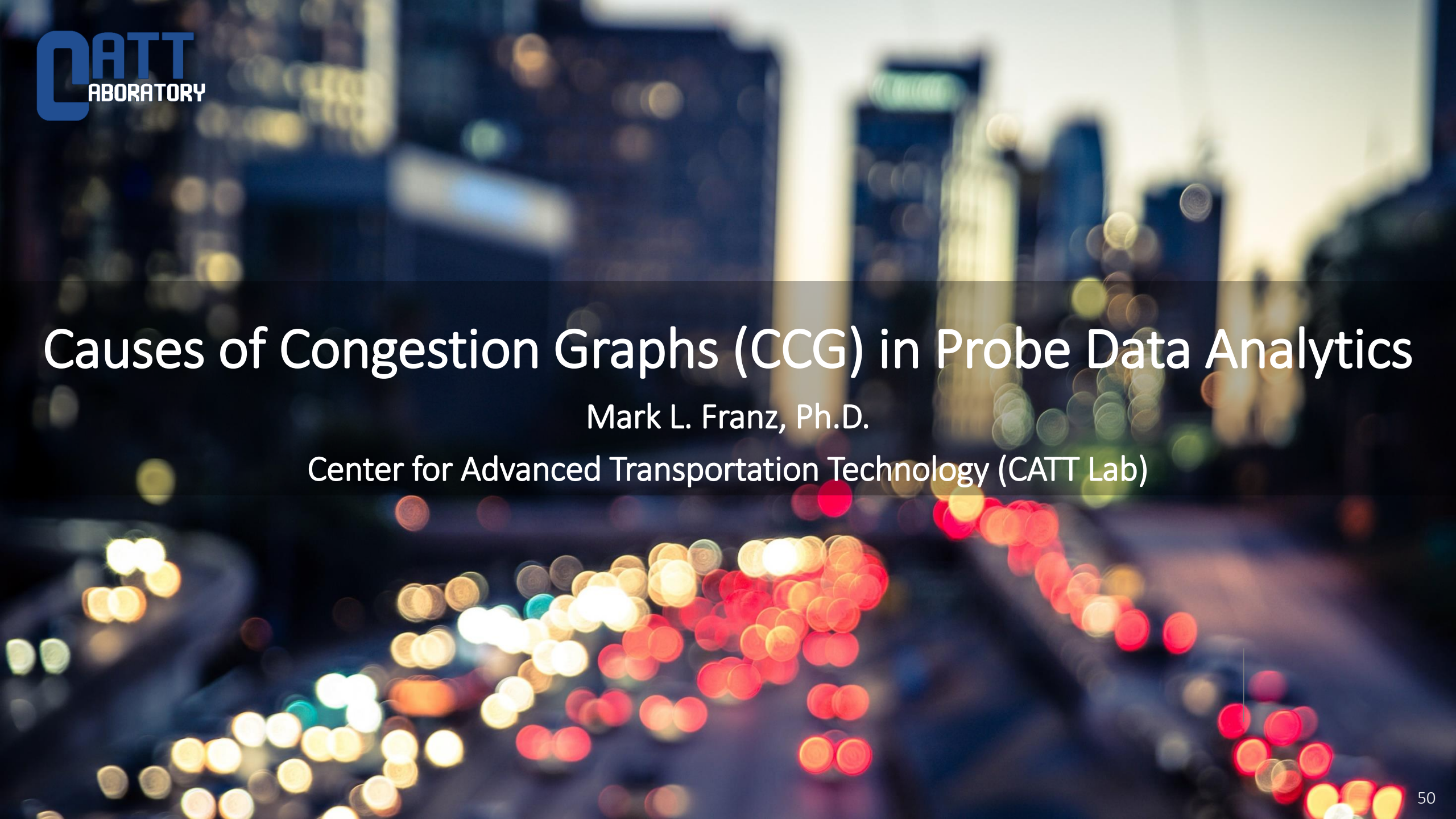
Causes of Congestion Tool Update

Mark Franz

Lead Transportation Analyst

UMD CATT Lab



Causes of Congestion Graphs (CCG) in Probe Data Analytics

Mark L. Franz, Ph.D.

Center for Advanced Transportation Technology (CATT Lab)

Today's topics

- Motivation
- Goals and Objectives
- Data
- Methodology
- Demo, Use Cases, and Results

Motivation

- National study provided a much-needed update
  - Enabled monthly breakdowns of National, State, and County causes of congestion
  - Spatial Coverage: National Highway System (NHS)
  - Temporal Coverage: 2019
- Still a need to:
  - Enhance spatial coverage (i.e. non-NHS segments)
  - Enhance temporal coverage (2019 – present with recurring updates)
  - Enable customized spatial and temporal analyses
    - Specific dates and hours of day
    - Specific road segments
  - Include agency incident and work zone data
  - Determine and display the top multi-cause categories for each query

Goals and Objectives

Develop a causes of congestion deep-dive tool that:

1. Includes non-NHS segments
2. Includes agency incident and work zone data
3. Enables additional (and more recent) temporal coverage
4. Provides functionality to drill down to specific dates, hours of day, and road segments
5. Provides access to updated results on a regular basis

We also modified the volume limiting equations in the UDC algorithm, which proved to produce more accurate volume estimates

Congestion Causes and Data Sources

Temporal Coverage: CY 2019 – July 2022*
Spatial Coverage: Any segment with 1-minute probe data and volume (only available to full RITIS partnering states
Each state provided a volume prioritization strategy

Data Item	Data source
Congestion/Disruption	1-minute probe data (INRIX)
Recurrent Congestion	1-minute probe data (INRIX)
Incidents	Waze + **Agency data**
Weather	NOAA radar and Waze
Work Zones	Waze + **Agency data**
Holiday Travel	Holiday Calendar (including travel days before/after holiday)
Signals	OSM Traffic Signal Database
Multiple Causes	Combination of above
Unclassified Disruption	NA

* August + September will be available in the upcoming weeks. Recurrent and automated updates are being developed

Increased Spatial Coverage by State

State	# NHS TMCs	# Non NHS TMCs	# Full Network TMCs
DC	1,079	2,546	3,625
FL	15,670	35,789	51,459
GA	11,197	19,837	31,034
IL	14,217	22,404	36,621
LA	4,787	6,740	11,527
MA	9,493	11,685	21,178
MD	6,735	11,793	18,528
MI	13,755	12,214	25,969
NC	9,660	21,962	31,622
NJ	9,929	17,215	27,144
OR	5,147	7,390	12,537
PA	15,541	20,316	35,857
RI	2,062	2,900	4,962
TN	7,975	8,345	16,320
VA	8,374	11,315	19,689

All TMCs require volumes to be available in CCG

Methodology Summary

Step1: Identify

Discover when and where congestion occurs

Step 2: Quantify

Estimate the severity of congestion

A modified UDC process is used in the deep-dive tool

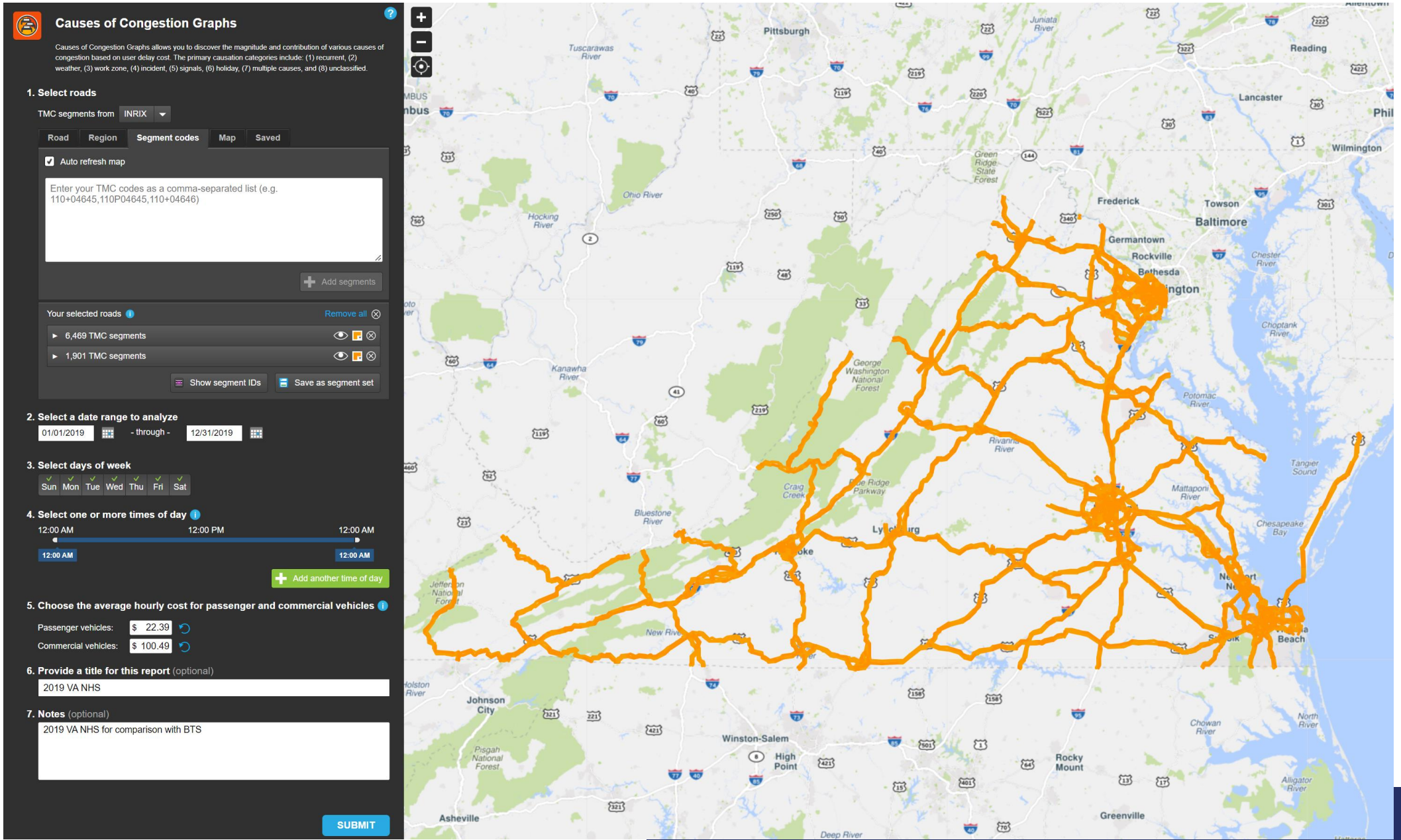
Step 3: Categorize

Match congestion to a specific cause

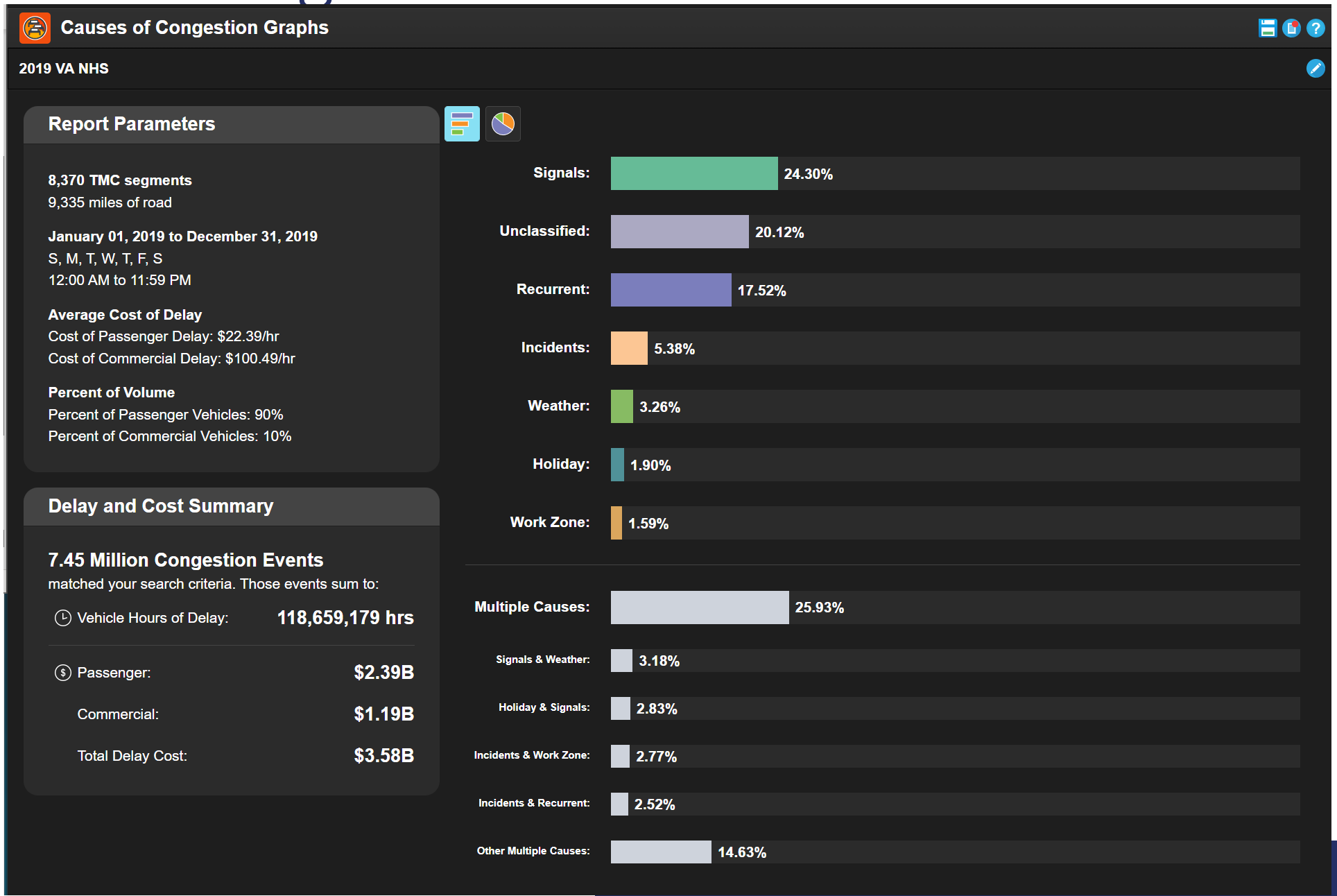
Agency incident and work zone data are included

Demo of Causes of Congestion Graphs (CCG) Tool

CCG Query Page



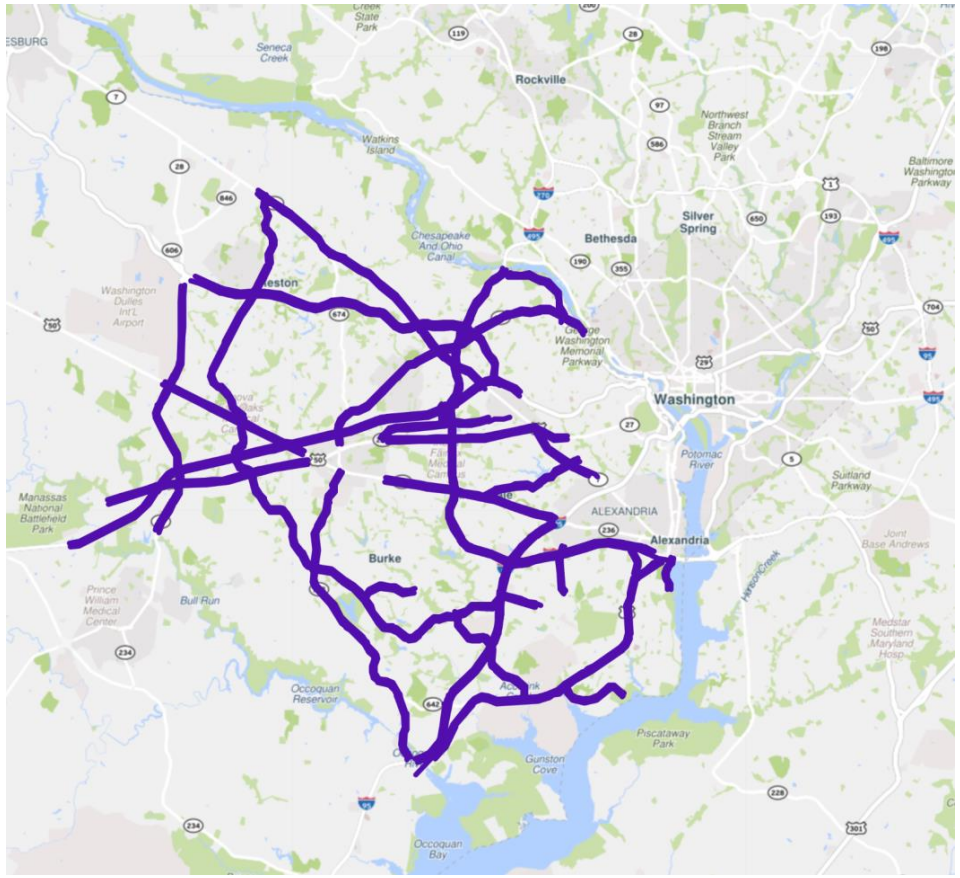
CCG Results Page



Use Case 1: Assess impact of agency incident + WZ data

Research Question: How does the addition of agency incident and WZ data change the results?

- Compare results for Fairfax County, VA in National Tool versus CCG Tool
  - Temporal Coverage: 2019, all days of week and all hours
  - Spatial Coverage: Fairfax County, VA NHS segments (841 TMCs)



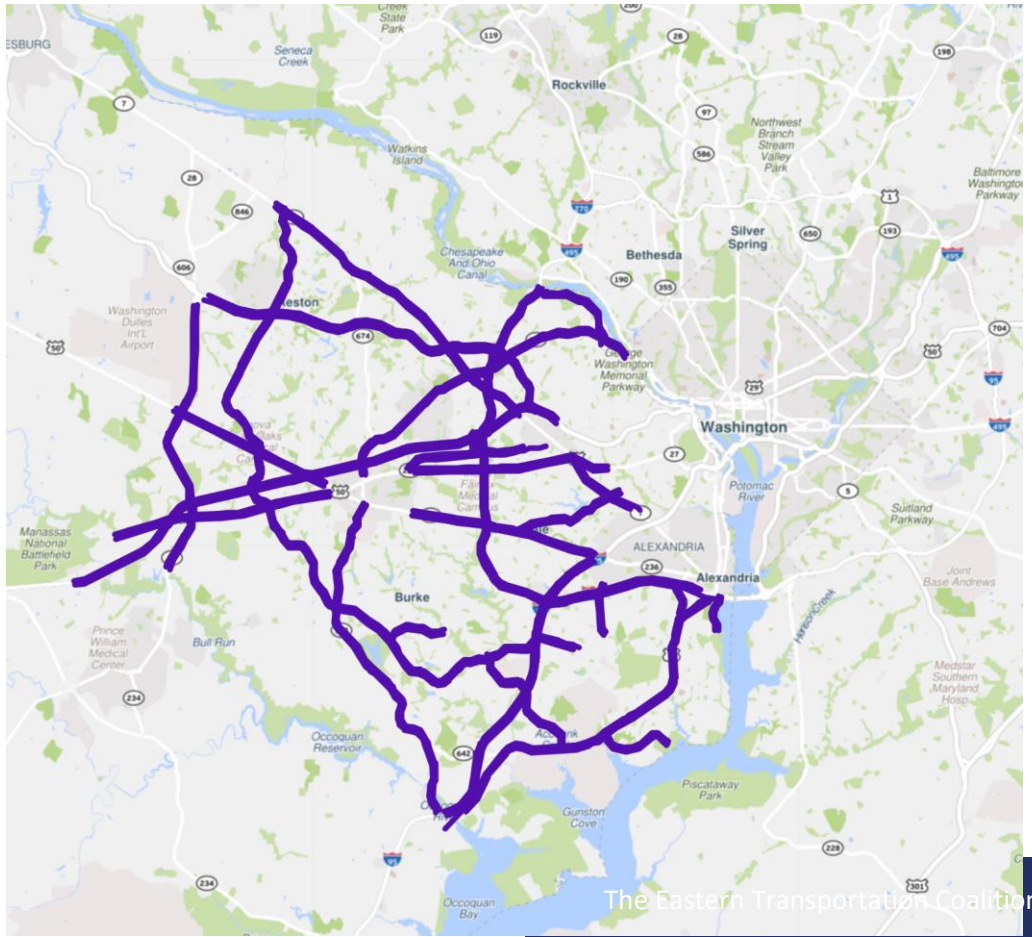
Use Case 1: Assess impact of agency incident + WZ data

Cause	National Study Percent	CCG Percent	Difference
Recurrent	42.1%	30.4%	-11.6%
Signals	10.4%	17.6%	7.2%
Unclassified	13.7%	12.0%	-1.7%
Incidents	6.3%	6.3%	0.1%
Weather	2.0%	1.7%	-0.3%
Work Zone	0.7%	1.3%	0.6%
Holiday	1.3%	1.0%	-0.3%
Incidents & Recurrent	2.2%	4.3%	2.1%
Incidents & Work Zone	2.1%	3.7%	1.6%
Recurrent & Unclassified	Included in other multiple categories	2.7%	NA
Signals & Weather	1.5%	2.4%	0.9%
Incident & Weather	2.4%	Included in other multiple categories	NA
Other Multiple Causes	15.4%	16.6%	1.2%

Use Case 2: Compare Results by Various Temporal Filters

Research Question: How do results differ when I filter for weekdays and daylight hours (7am-7pm)?

- Compare results for
  - All Days + All Hours VS Weekdays + All Hours VS Weekdays + 7am-7pm
    - Temporal Coverage: 2019
    - Spatial Coverage: Fairfax County, VA NHS segments (841 TMCs)



Use Case 2: Compare Results by Various Temporal Filters

Cause	All Days All Hours Percent	Weekdays All Hours Percent	Weekdays 7am-7pm Percent
Recurrent	30.4%	33.5%	37.5%
Signals	17.6%	16.0%	14.6%
Unclassified	12.0%	10.8%	7.8%
Incidents	6.3%	6.1%	5.7%
Weather	1.7%	1.4%	1.3%
Work Zone	1.3%	1.2%	0.7%
Holiday	1.0%	0.8%	0.5%
Incidents & Recurrent	4.3%	4.6%	5.2%
Incidents & Work Zone	3.7%	3.7%	3.3%
Recurrent & Unclassified	2.7%	2.9%	3.2%
Incidents, Recurrent & Weather	NA	NA	2.3%
Signals & Weather	2.4%	2.2%	NA
Other Multiple Causes	16.6%	16.9%	18.1%

Use Case 3: Discover Causes of Congestion for top bottleneck in MA

Research Question: What is the underlying cause of congestion for the top interstate bottleneck in MA?

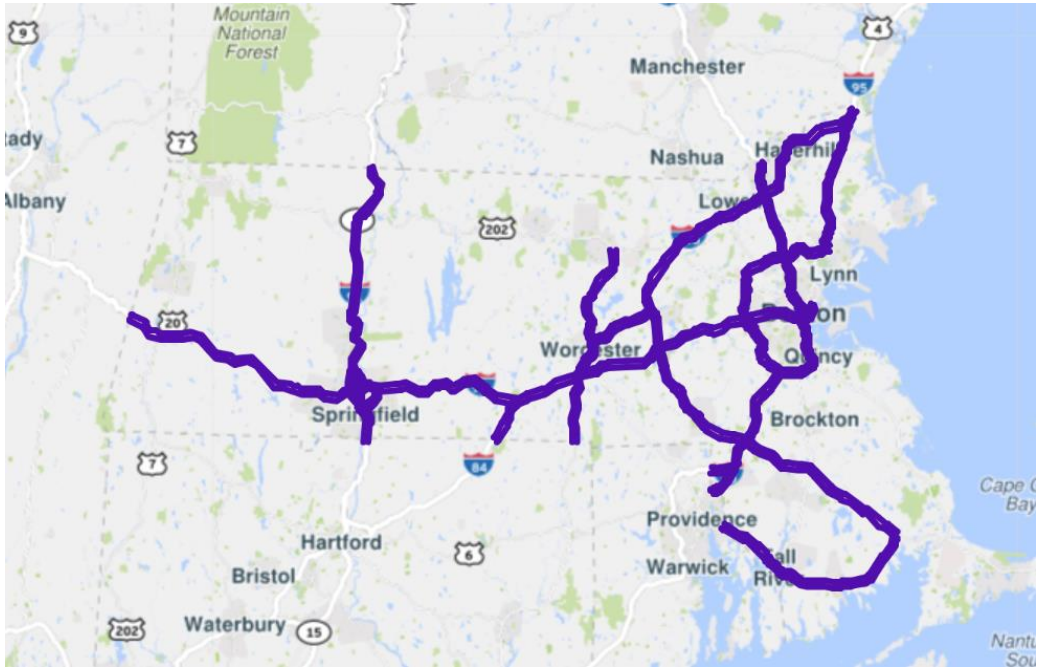
- Temporal Coverage: April 2022
- Spatial Coverage: All MA Interstates (841 TMCs), then focus on top bottleneck + queue (25 TMCs)

Process:

Step 1: Bottleneck ranking for MA Interstates in April 2022

- Identify bottleneck of interest
- Extract bottleneck + queue TMCs

Step 2: CCG query on bottleneck + queue TMCs for April 2022



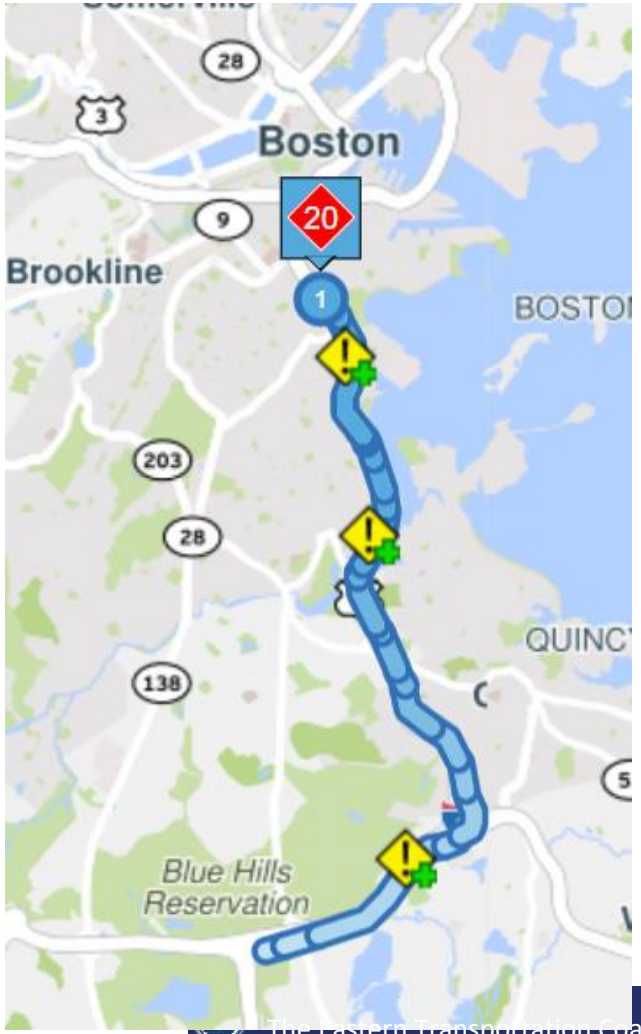
Use Case 3: Discover Causes of Congestion for top bottleneck in MA

Step 1: Bottleneck ranking for MA Interstates in April 2022

Top Bottleneck Head Location

Rank	Map	Head Location
1	☑	I-93 N @ SOUTHAMPTON ST/EXIT 16

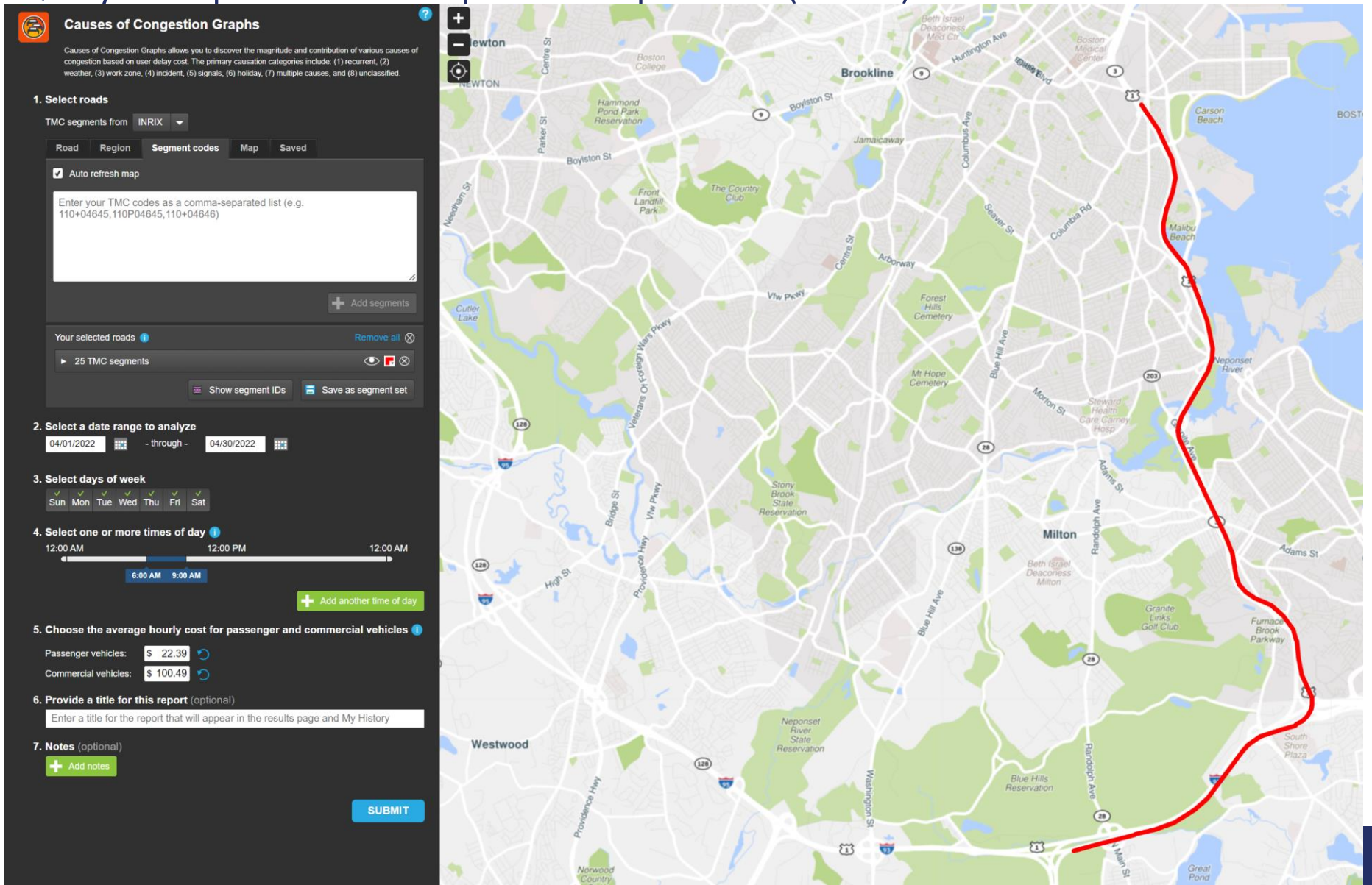
Top Bottleneck Map (including queue)



Button to copy bottleneck + queue TMCs

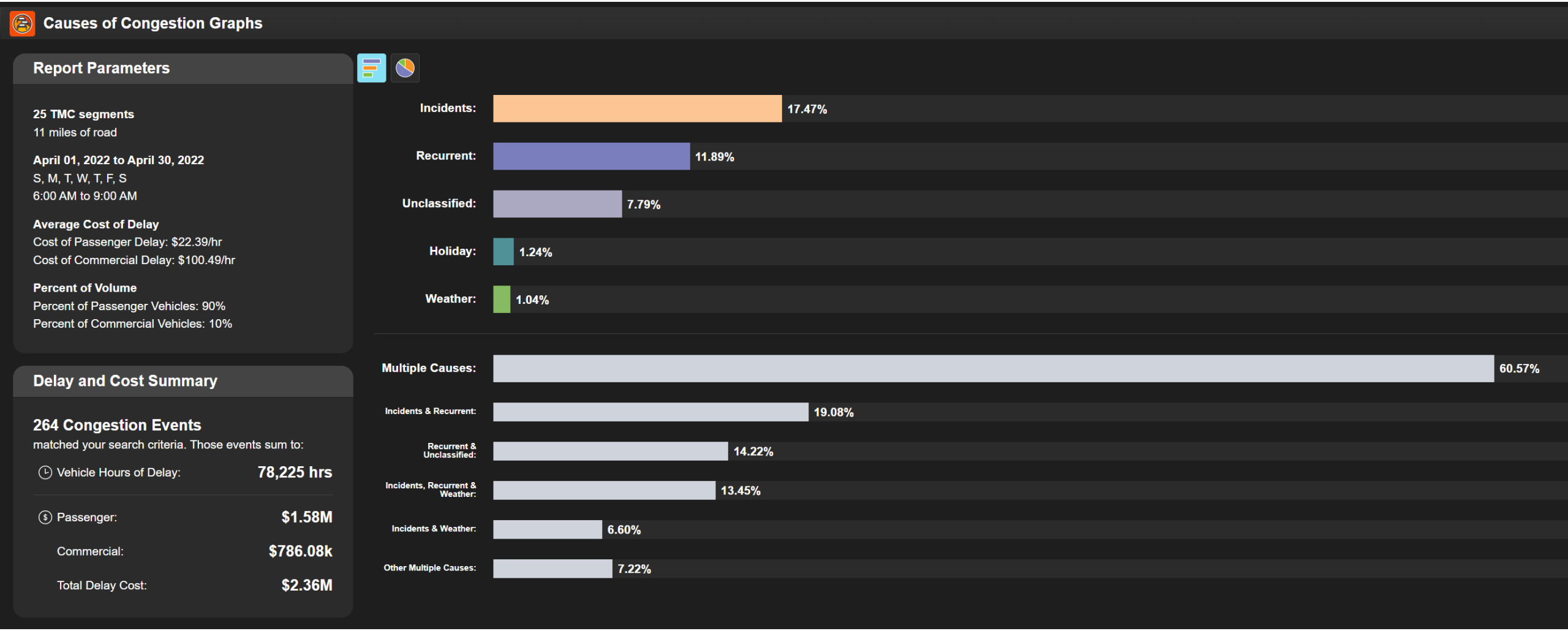
Use Case 3: Discover Causes of Congestion for top bottleneck in MA

Step 2: CCG Query for top bottleneck + queue for April 2022 (6-9am)

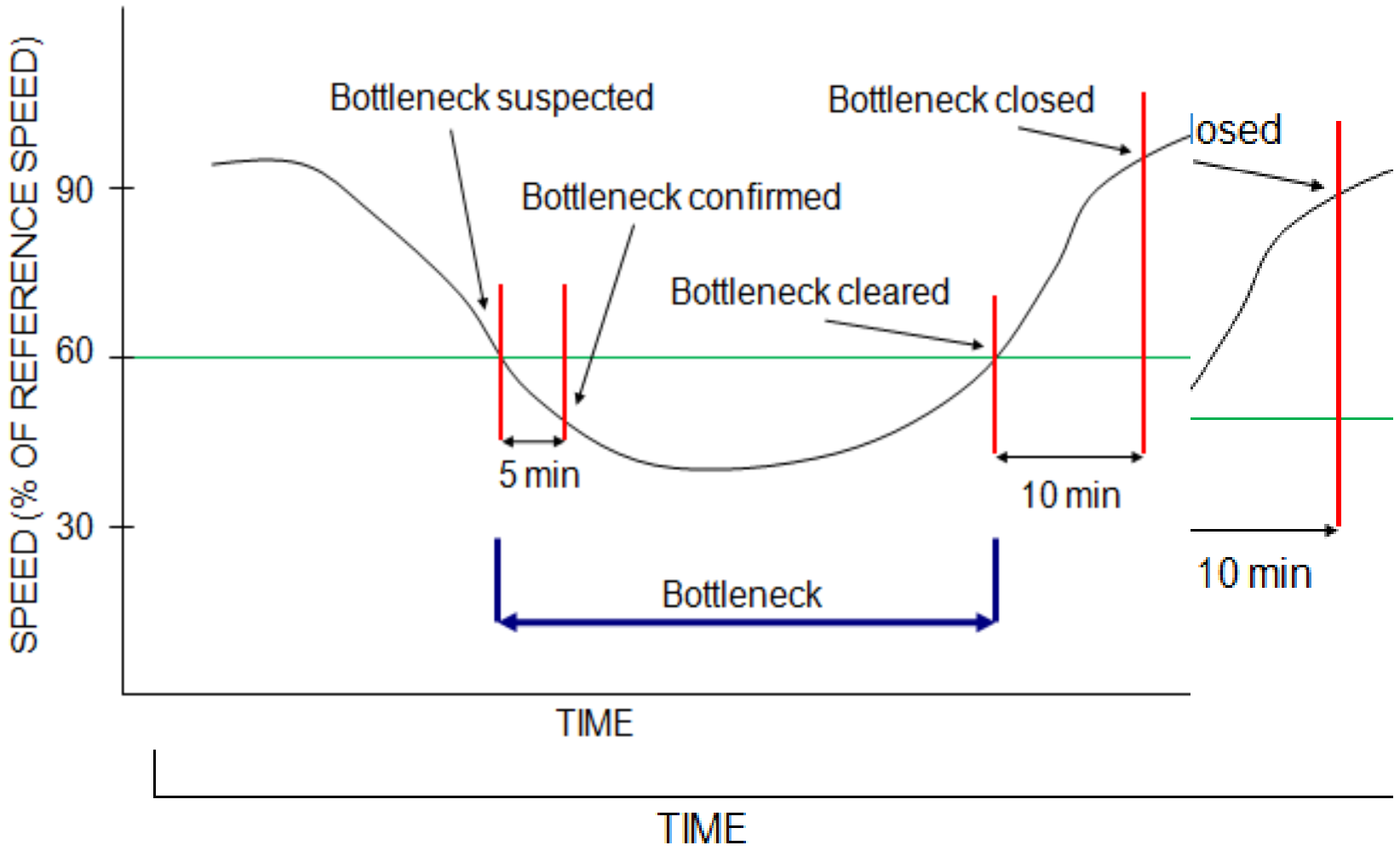


Use Case 3: Discover Causes of Congestion for top bottleneck in MA

CCG Results

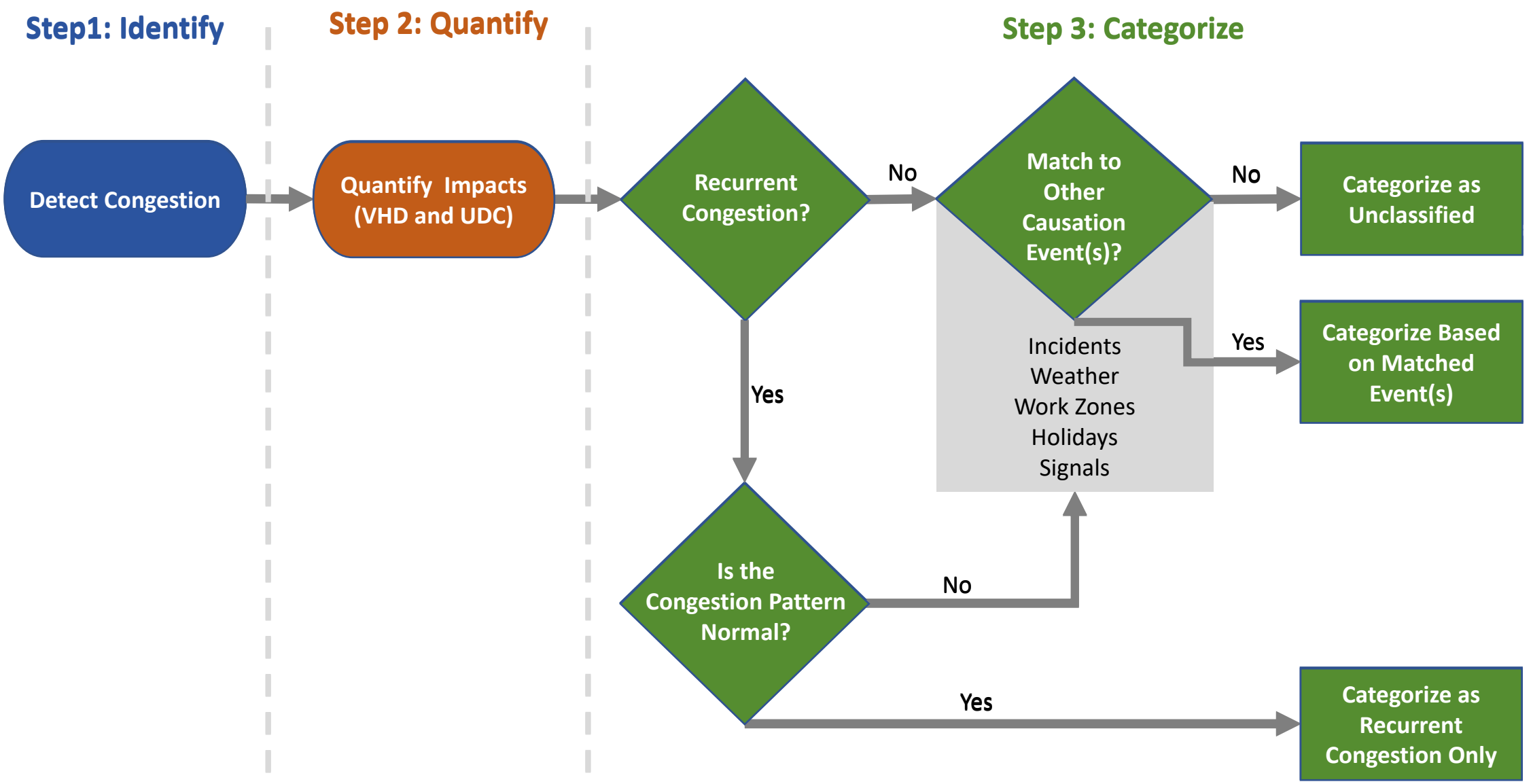


Methodology: Detecting Congestion



Lund, A., Pack, M.L., Plaisant, C., and Franz, M.L. Algorithms for Identifying and Ranking Bottlenecks Using Probe Data. Transportation Research Board 96h Annual Meeting. Washington, D.C. 2017.

Methodology Logic



Reminder to Update CCG Volumes

- Deadline to include updated volumes is October 1st every year

Questions?

Mark L. Franz, Ph.D.

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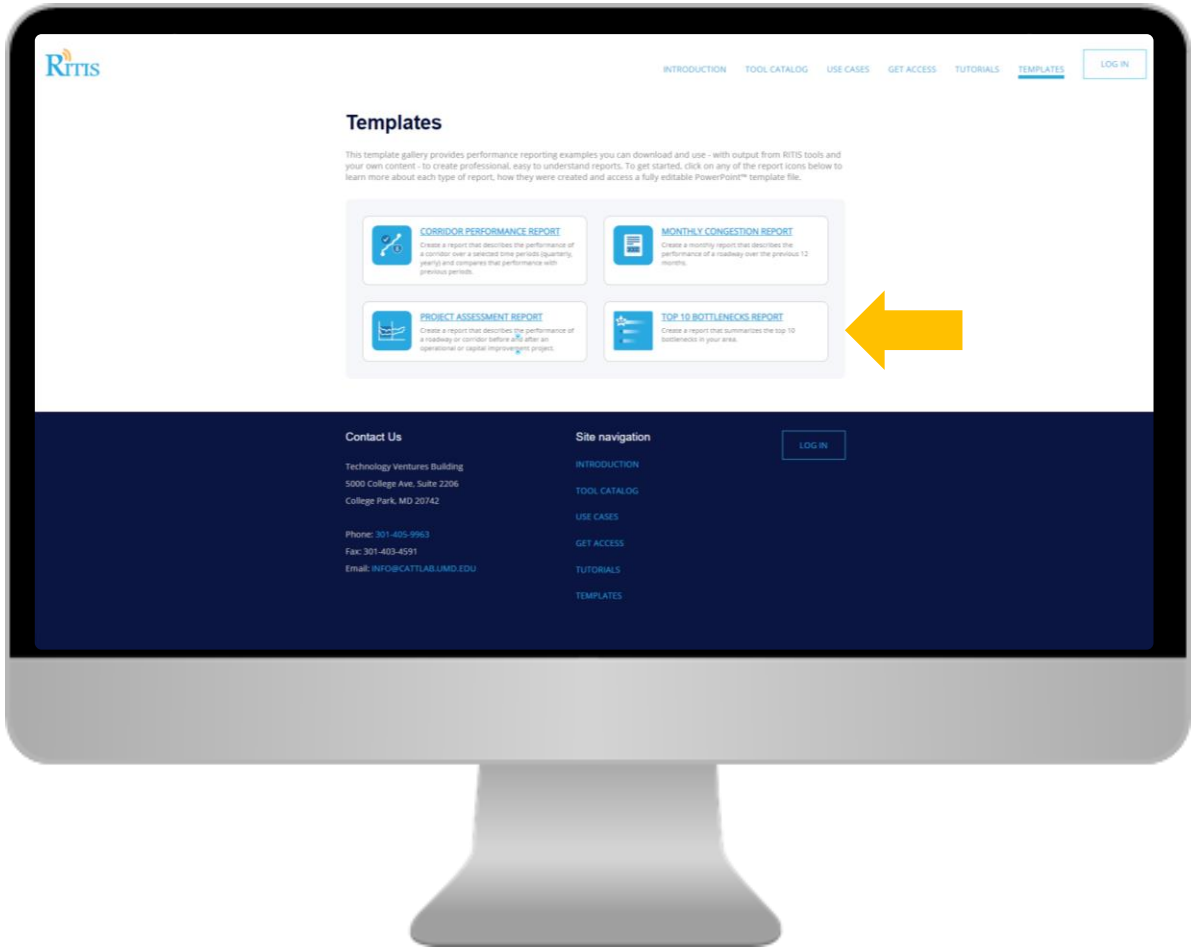
RITIS | PROBE DATA ANALYTICS SUITE

PDA Suite Performance Measures Working Group

John Allen
Faculty Assistant, Outreach & Education
UMD CATT Lab

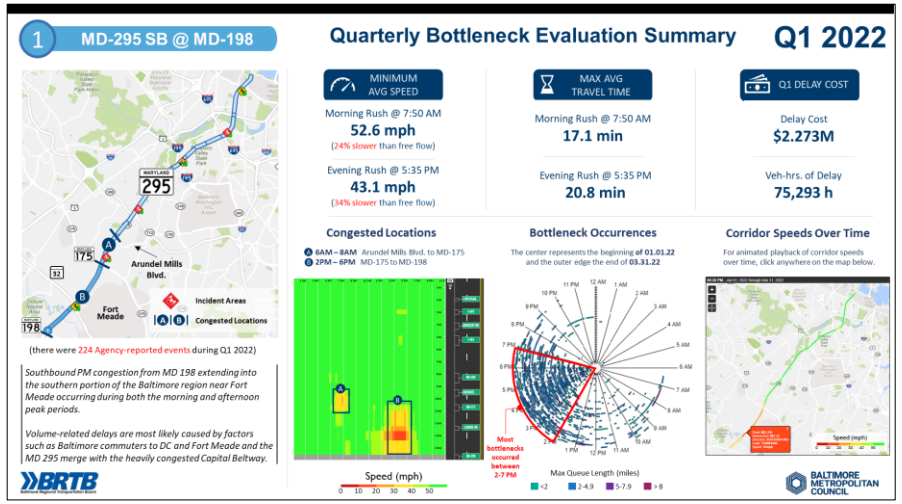
Performance Reporting **Templates**

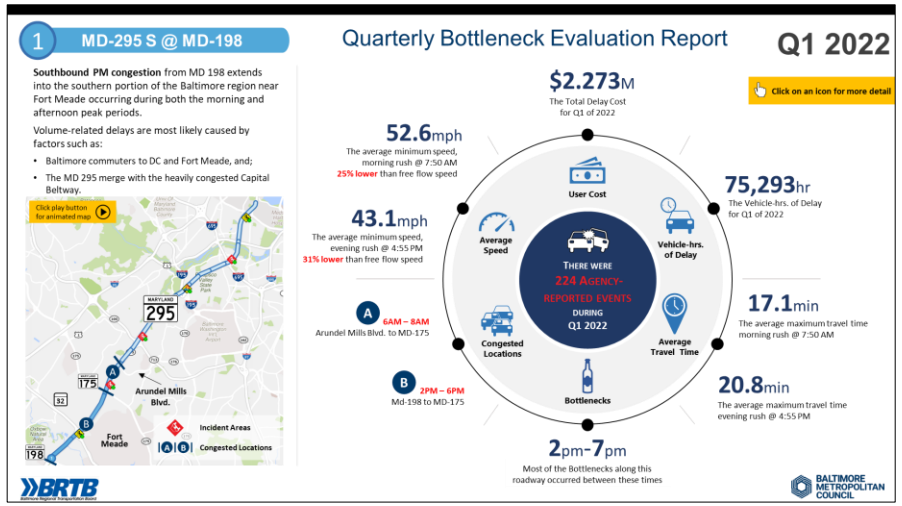
The Top 10 Bottlenecks package is now available on the RITIS Templates page…

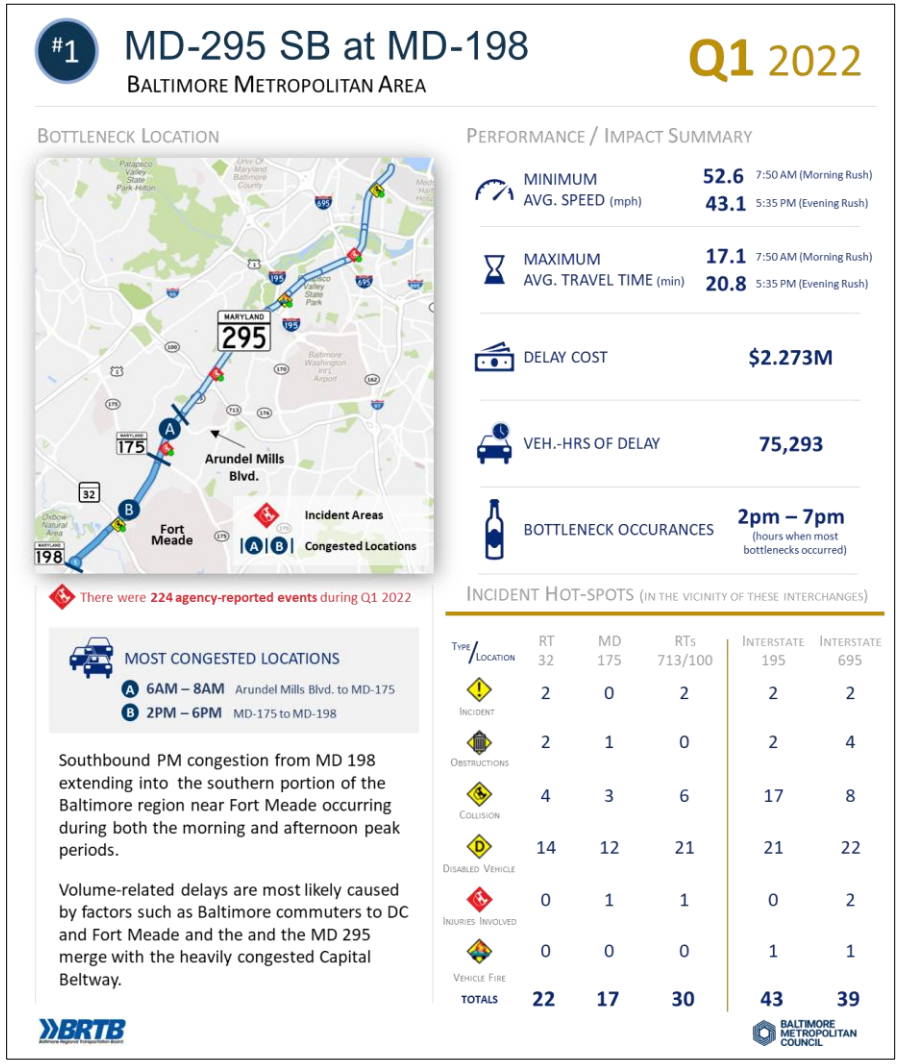


Performance Reporting **Templates**

There are several different options for creating a report best suited to your needs…







Type / Location	RT 32	MD 175	RTs 713/100	Interstate 195	Interstate 695
Incident	2	0	2	2	2
Obstructions	2	1	0	2	4
Collision	4	3	6	17	8
Disabled Vehicle	14	12	21	21	22
Injuries Involved	0	1	1	0	2
Vehicle Fire	0	0	0	1	1
TOTALS	22	17	30	43	39

Performance Reporting **Templates**

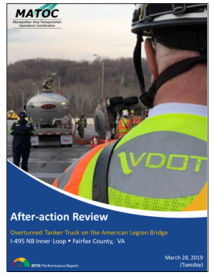
There are two template packages in the pipeline…

After-Action Review

After-action Review Report

Use this template package along with RITIS tool results to create an after-action review report, including front and back covers, an event high-level summary page and an impact evaluation page that graphically depicts mainline and regional impacts, delay costs, vehicle hours of delay, key takeaways, and more. There are also several use case examples with varying levels of event complexities and some more technical-oriented report examples.

Overview



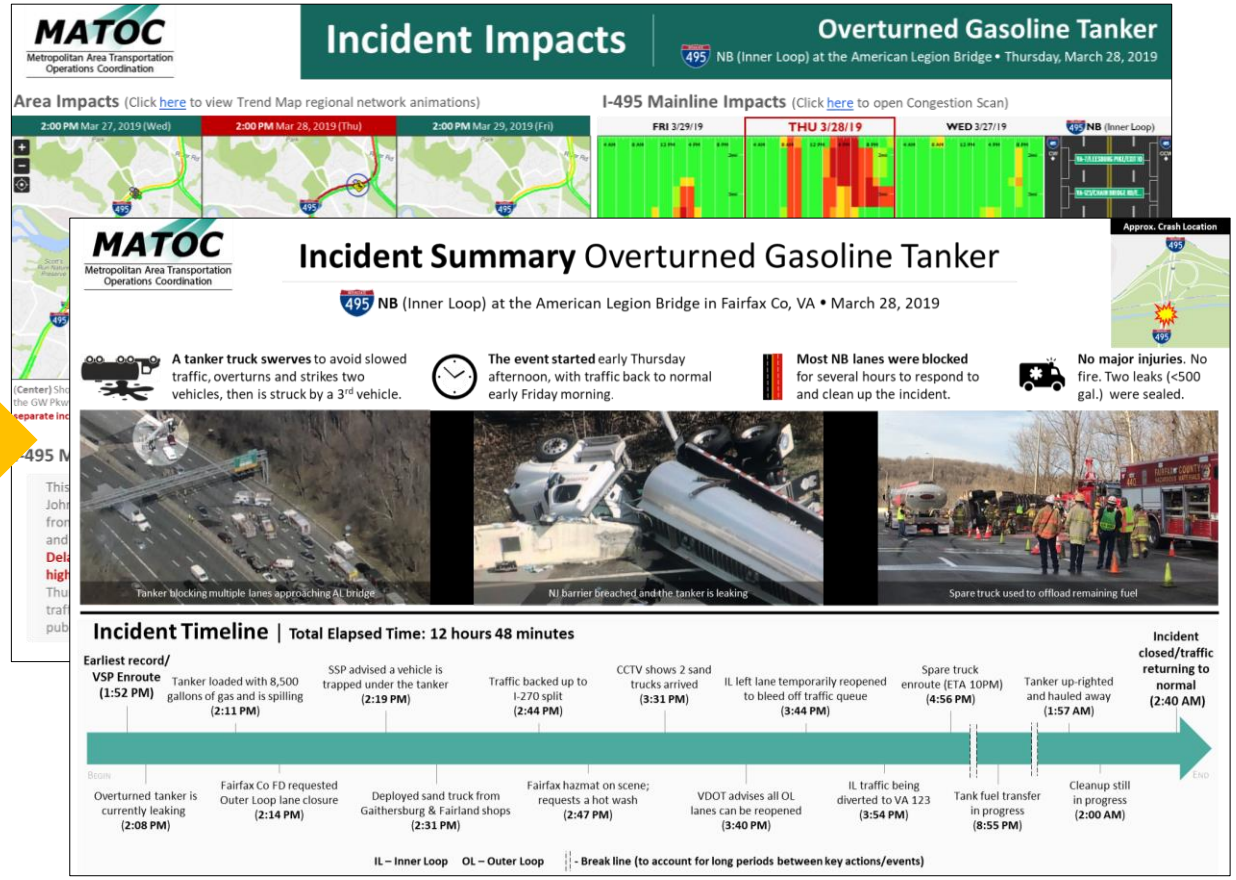
1. **Click to download the PowerPoint template** to create a report that presents an evaluation summary of the top 10 bottlenecks in a region. Additional design resources are also available.

Download Template | Download Design Resources

2. **Download Agency Use Case examples** below to see how other agencies have used these templates or have created similar reports using content from RITIS:

- **MATOC** Overturned Tanker Truck on the American Legion Bridge (using this template)
- **GDOT** I-75 Pedestrian Fatality (executive-level template)
- **MATOC** Vehicle Collision and Truck Fire on the Woodrow Wilson Bridge (1 technical, 3 executive templates)
- **massDOT** Truck Bridge Strike I-95 SB at Exit 30B (incudes Trend Map animation)

3. **Scroll down to learn how to create this report** or click on the 'How To Create Report' in the navigational menu.



Performance Reporting **Templates**

Holiday Travel Forecasts

Holiday Travel Forecast Infographic

Use this template package along with RITIS tool results to create a holiday travel forecast infographic to share with the traveling public during major holidays with high levels of traffic, such as Thanksgiving and Labor Day. These infographic-style templates help communicate vital advisory information such as which hours are likely to be most congested, specific roadways that could be significantly impacted or higher than average accidents occurring on a particular day. These infographics, along with agency safety tips and travel service apps (like 511) can help provide drivers with a safer, more relaxing travel experience.

Overview

1. **Click to download the PowerPoint template** to create a report that presents a travel forecast infographic for a region. Additional design resources are also available to help build your document.

Download Template | Download Design Resources

2. **Download Agency Use Case examples** below to see how other agencies have used these templates or have created similar reports using content from RITIS:

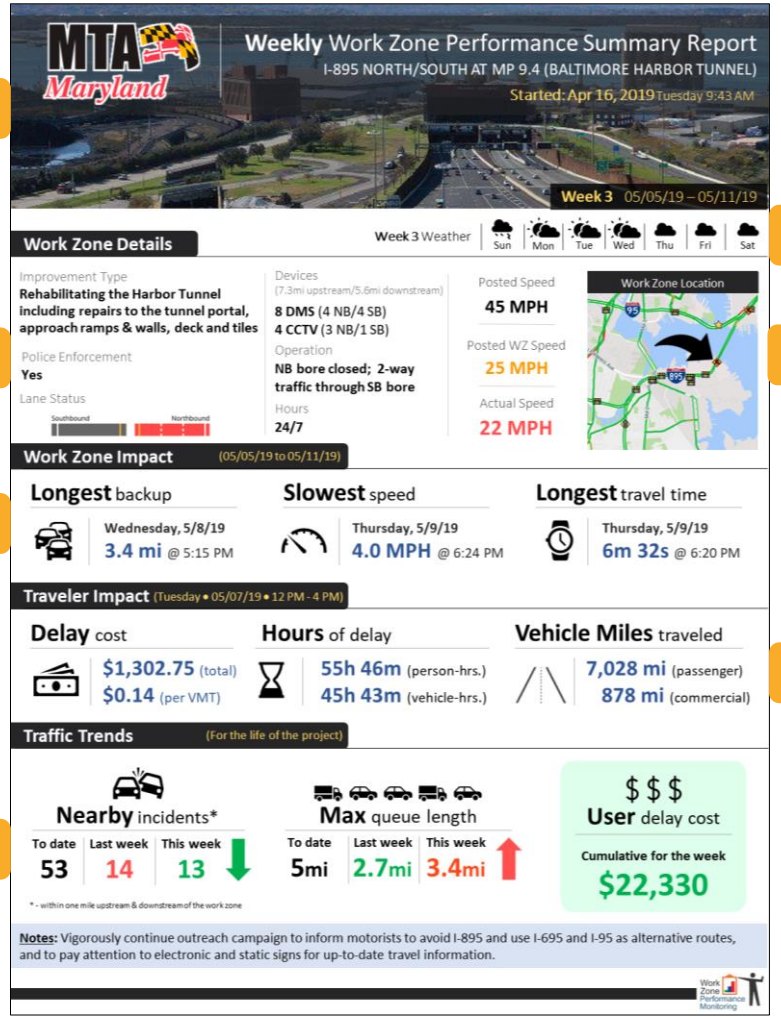
- **MDOT** 2022 Labor Day Travel Forecast (6-day infographic, using this template)
- **MDOT** 2022 Labor Day Travel Forecast (6-day infographic)
- **MDOT** 2022 4th of July Travel Forecast (5-day infographic)
- **MDOT** 2022 Memorial Day Travel Forecast (6-day infographic)
- **GDOT** 2021 New Year's Eve Travel Forecast (7-day infographic)
- **GDOT** 2021 Thanksgiving Travel Forecast (7-day infographic + public messaging)
- **MDOT** 2021 Thanksgiving Travel Forecast (6-day infographic
- **Baltimore Metropolitan Council** 2016 Thanksgiving Travel Forecast (7-day infographic + public messaging)
- **Baltimore Metropolitan Council** 2016 Labor Day Travel Forecast (webpage messaging)
- **Regional Transportation Commission of Southern Nevada** – multiple holiday travel forecast examples

3. **Scroll down to learn how to create this report** or click on the 'How To Create Report' in the navigational menu.

Performance Reporting **Templates**

We will be scheduling a Performance Reporting Working Group meeting to…

- Review/approve the Holiday Travel Forecast template package content
- Work on developing a Work Zone templates package
- Brainstorm other template ideas



Reminder | RITIS **Workshop**

RITIS Workshop

Session 3 | Creating an Effective **After-action Review Report**

When: November 17, 2022 • 1:00 pm to 2:15 pm (ET)

Register for this workshop at: https://t.e2ma.net/click/8kftax/s4br02cc/cwmlv7f

RITIS | PROBE DATA ANALYTICS SUITE

RITIS Product Enhancement Working Group

Bob Frey,
Director of Project-Oriented Planning
Massachusetts DOT

Enhancement Priorities through June 2023

RITIS Enhancement Working Group Funds will support:

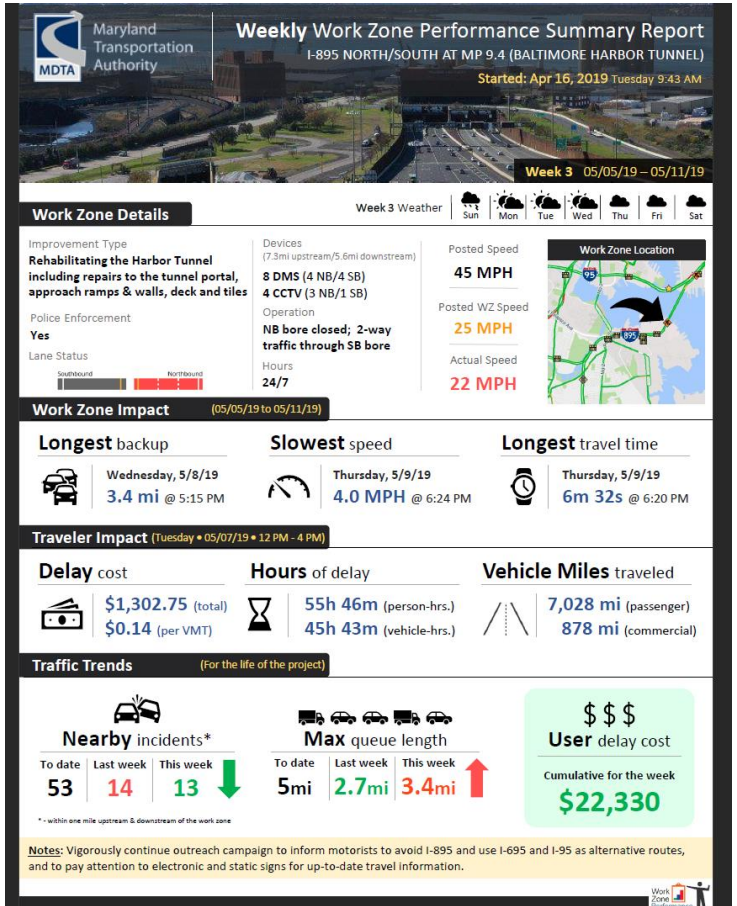
Enhancement	Estimated Cost
Sharing of Dashboard Reports	$125k
Automated Work Zone Reports Scoping	$25k
Aerial Photography in RITIS Maps	$10k
Additional Reporting Templates	$35k
Speed Tile Layers	$30k
Causes of Congestion Enhancements	$50k
Total =	$275k

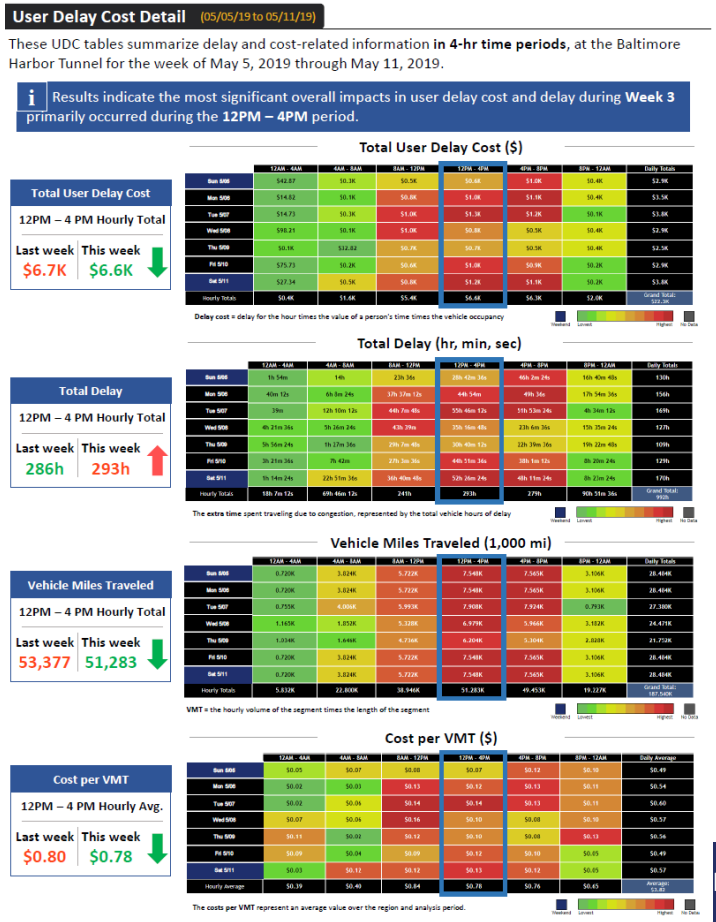
Other funds (grants) will support

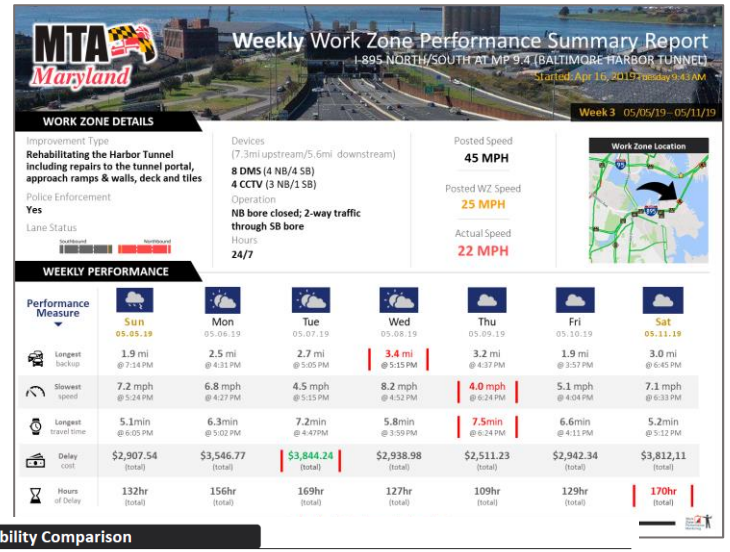
Enhancement	Estimated Cost
Freight Movement & Safety Avoidance Analytics	$1M+
Safety Analytics (police crash reports) Partially funded	~$250k
Signal Analytics Enhancements	$TBD
Trips Analytics Enhancements	$TBD
Energy Analytics Geographic Expansion	TBD
Speed Bins Visualization (time permitting)	$75k
Total =	$$$

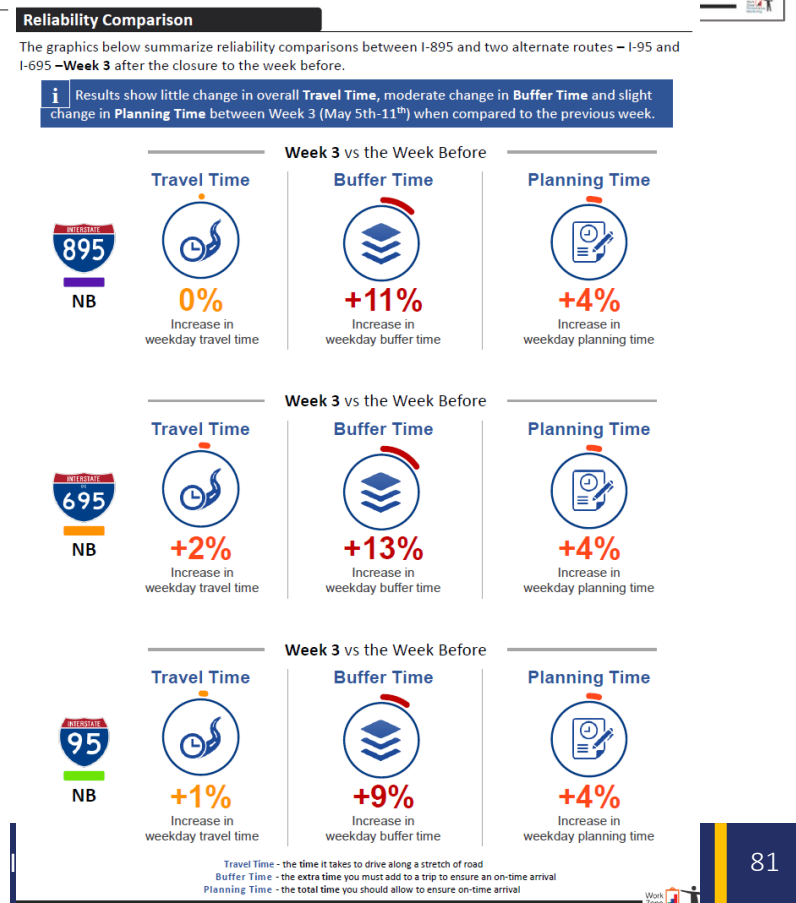
Automated Work Zone Reporting

- Range of complexities and possibilities for automation
- Will produce designs with UX team and then develop LOE.



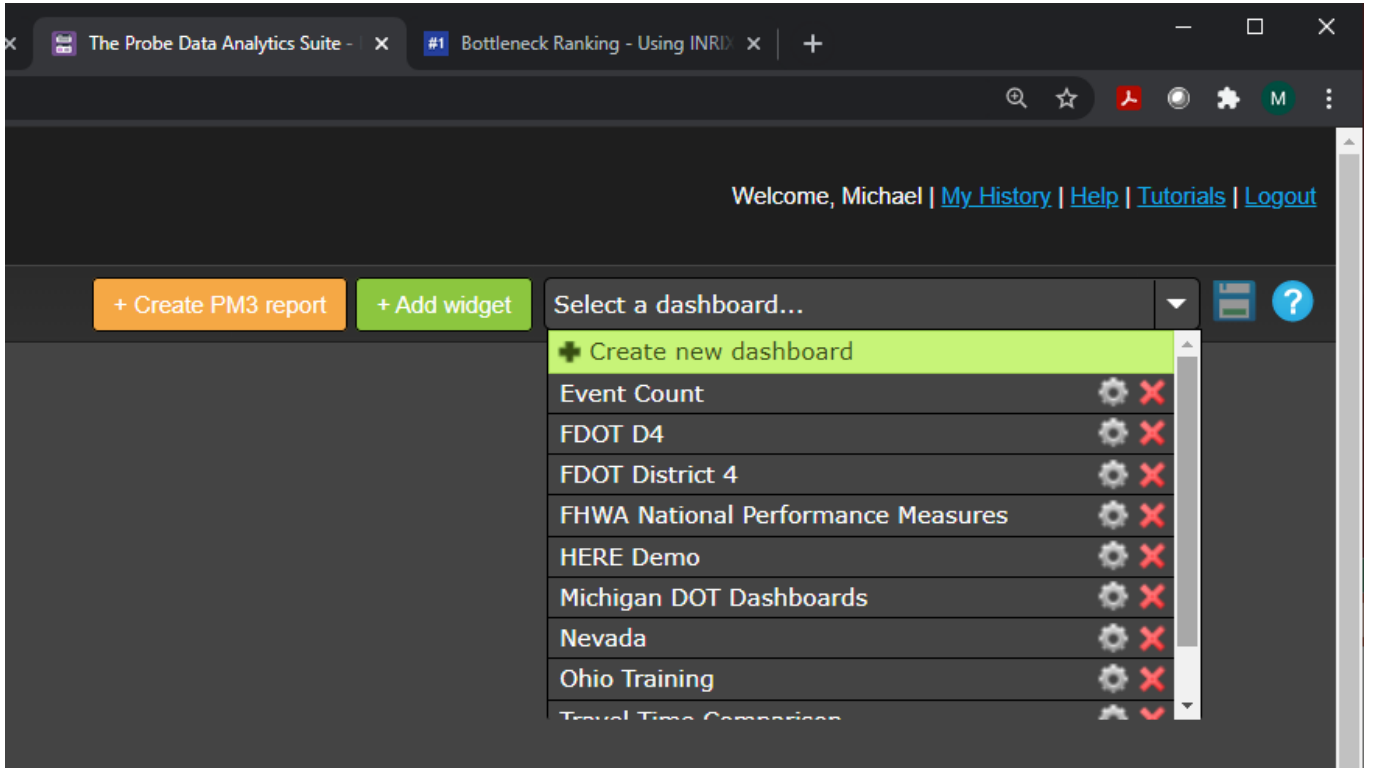






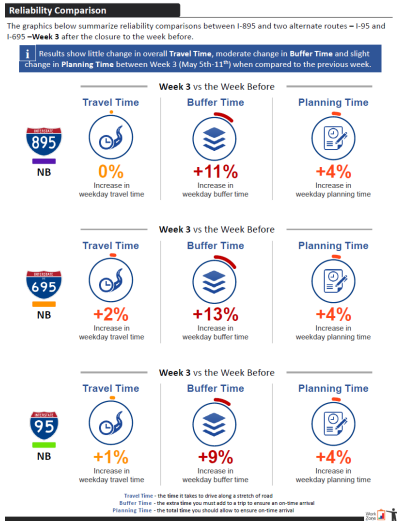
Sharing of Dashboards and Reports

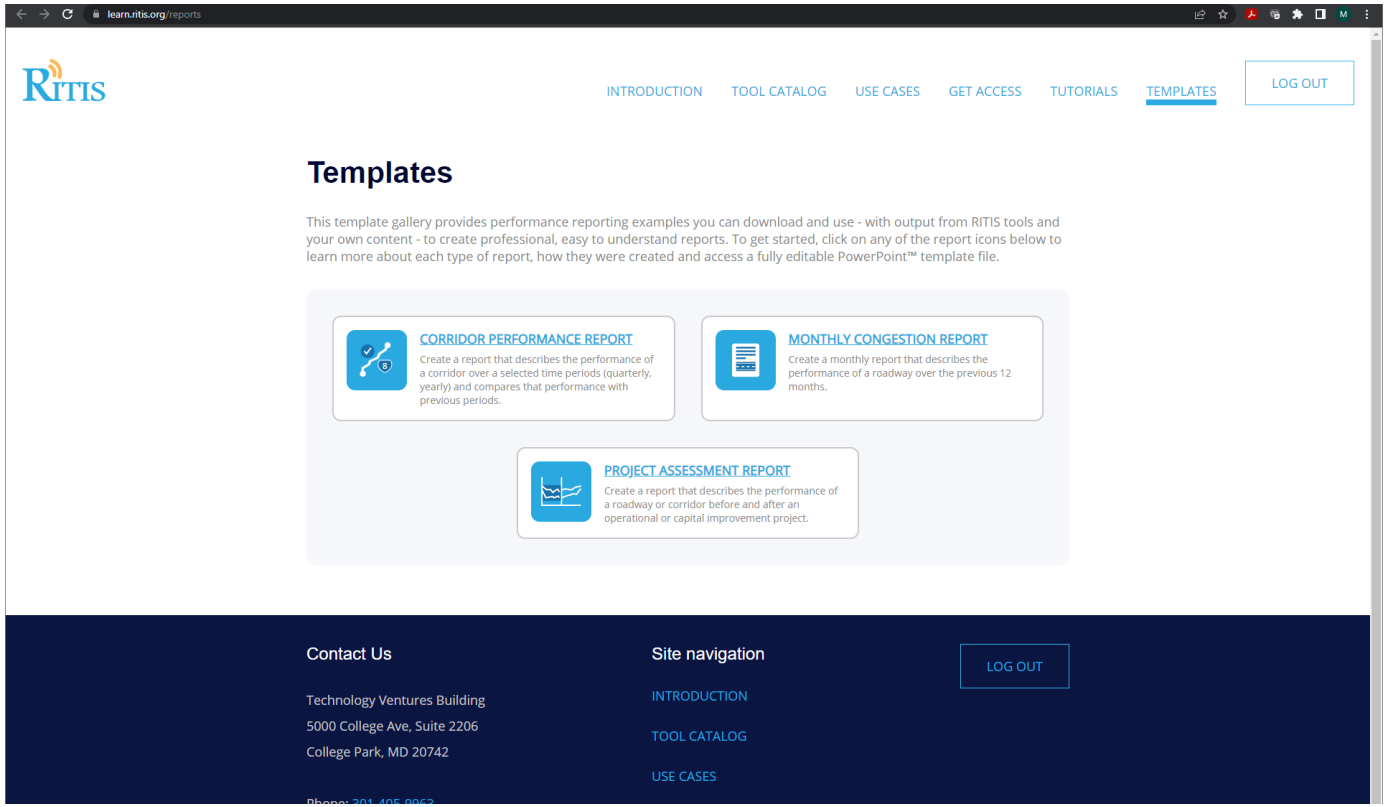
- Sharing with members of your organization

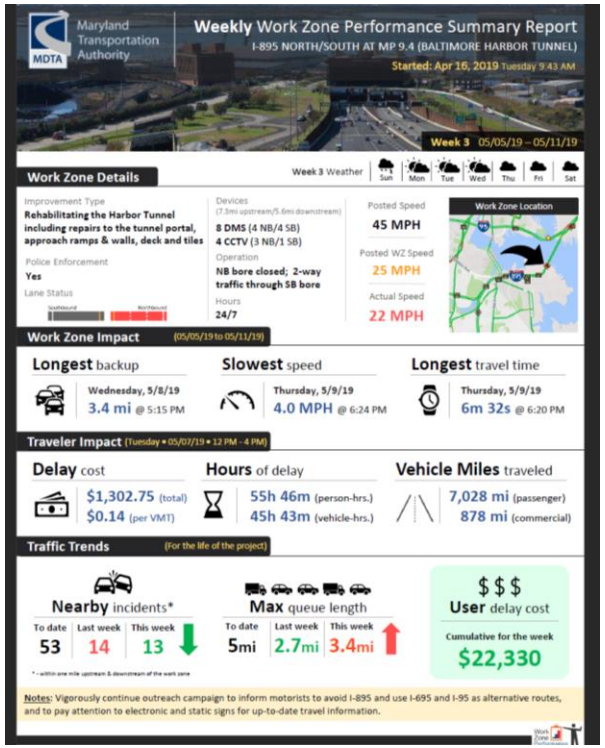


Build additional Reporting Templates

- Build-out of new templates (and detailed creation tutorials) for a wide range of DOT/MPO needs.
- In-progress

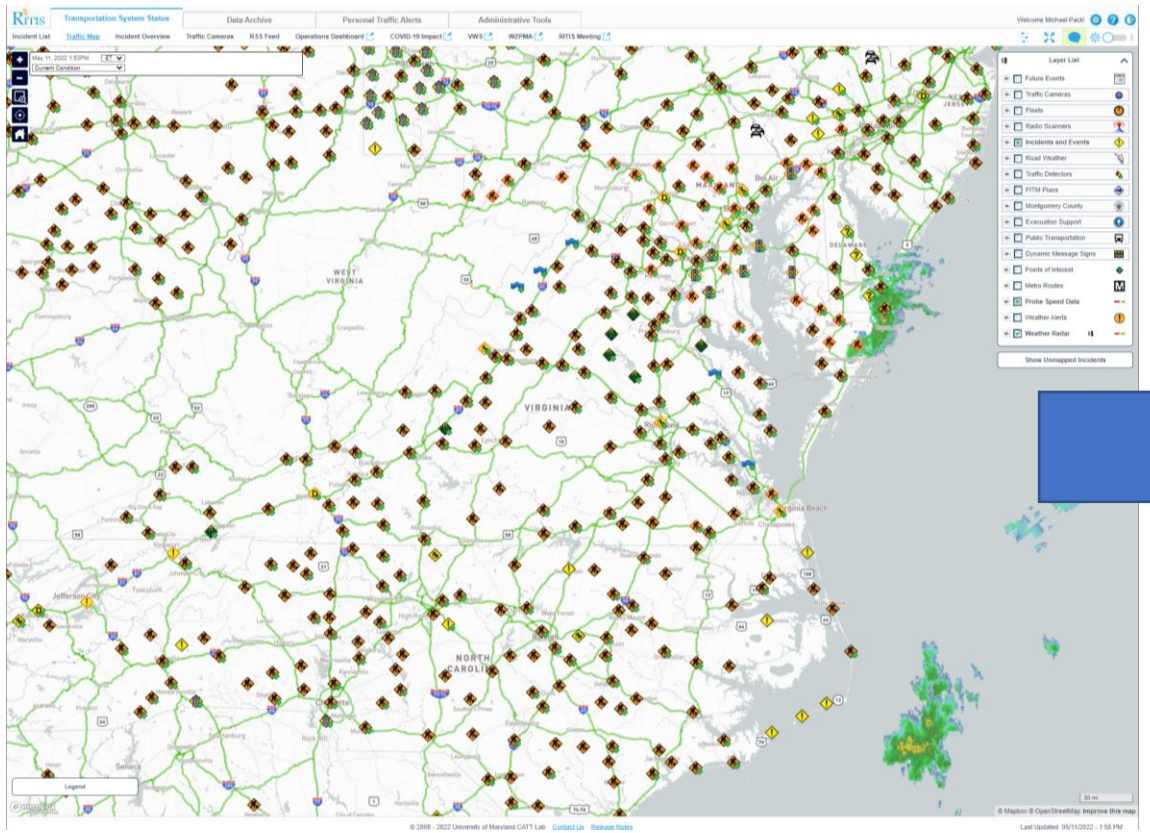






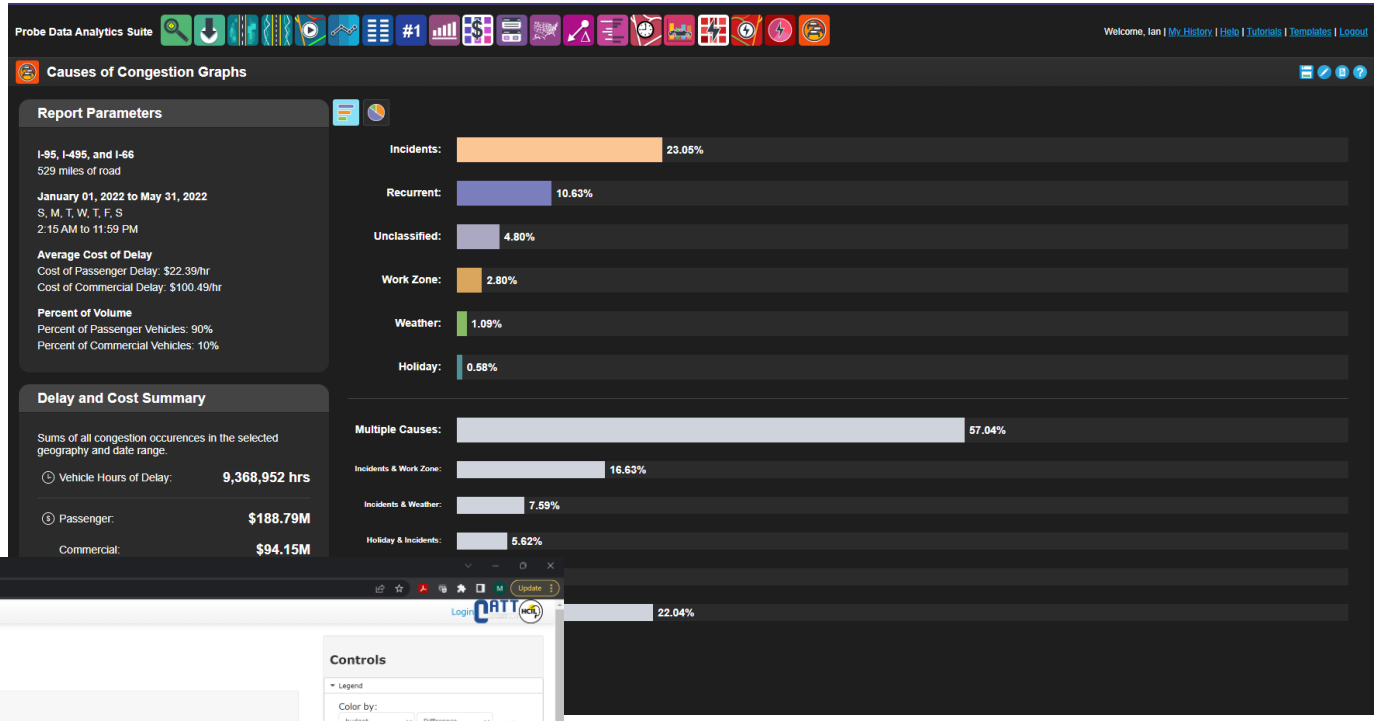
Aerial Photography in RITIS Maps

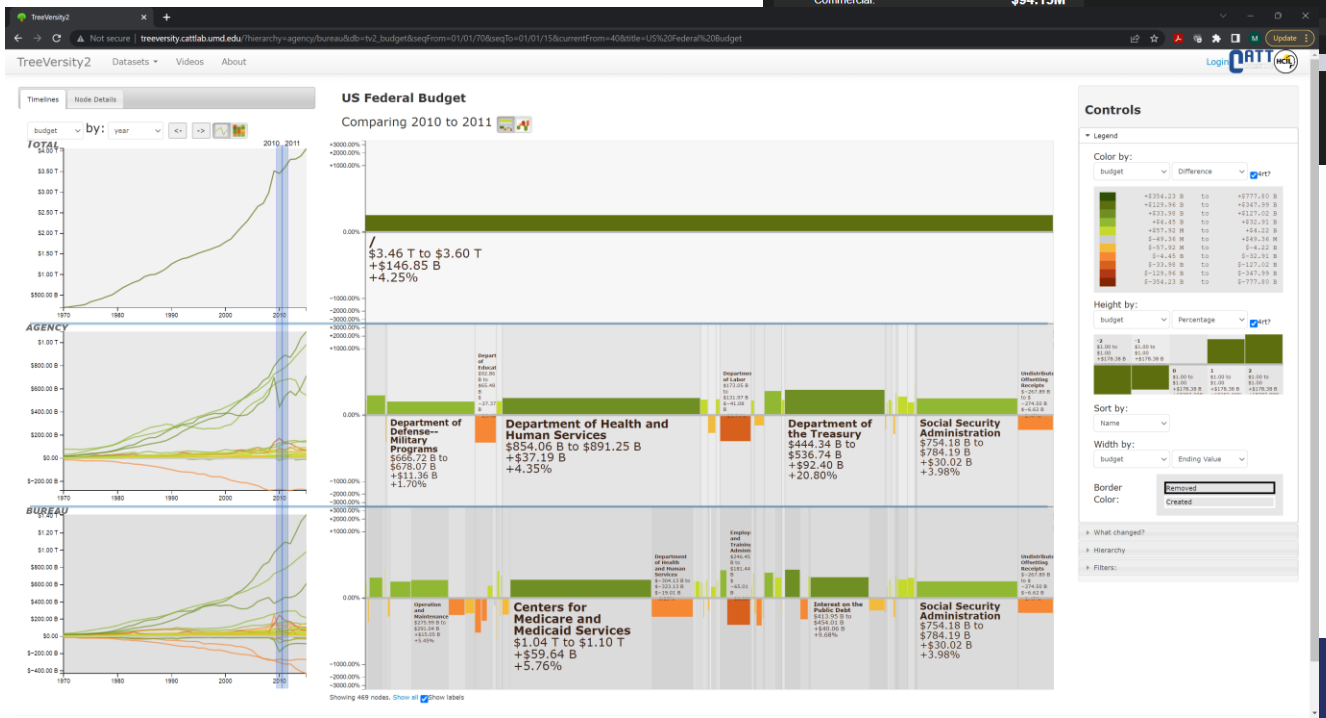
- Deployed 9/20/22



Causes of Congestion: Enhancements & Analysis

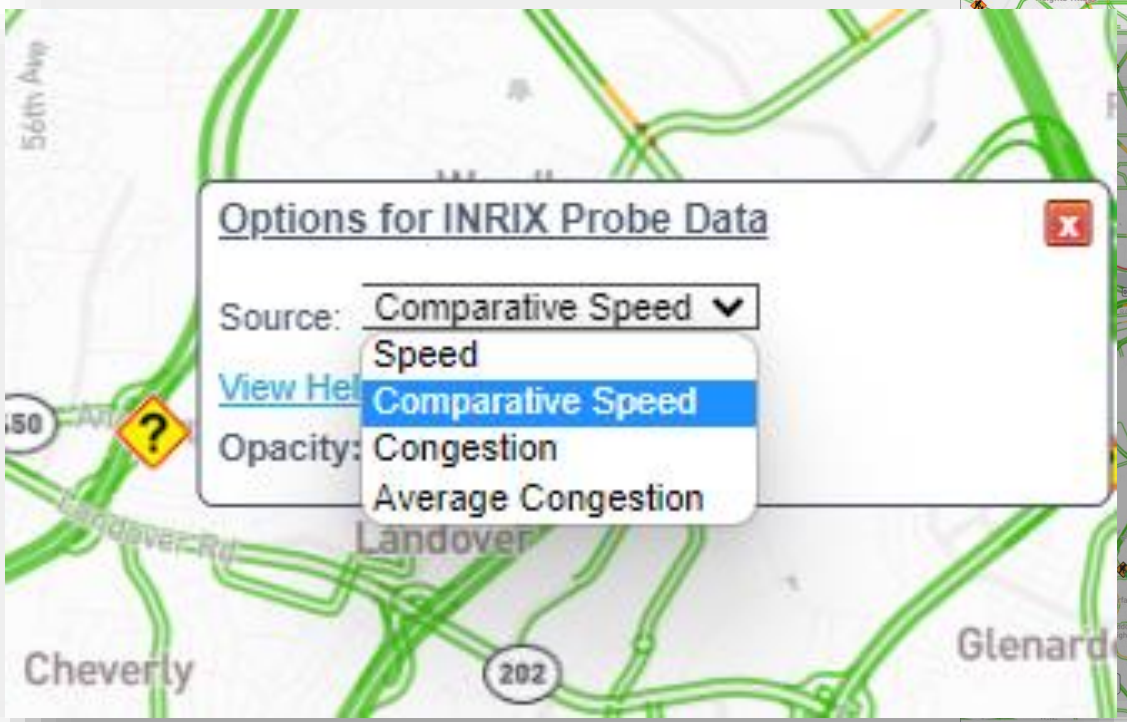
- Additional Filtering & Drill-down Capabilities
- Better Visualizations for Trend Analysis / Comparison
- In-progress

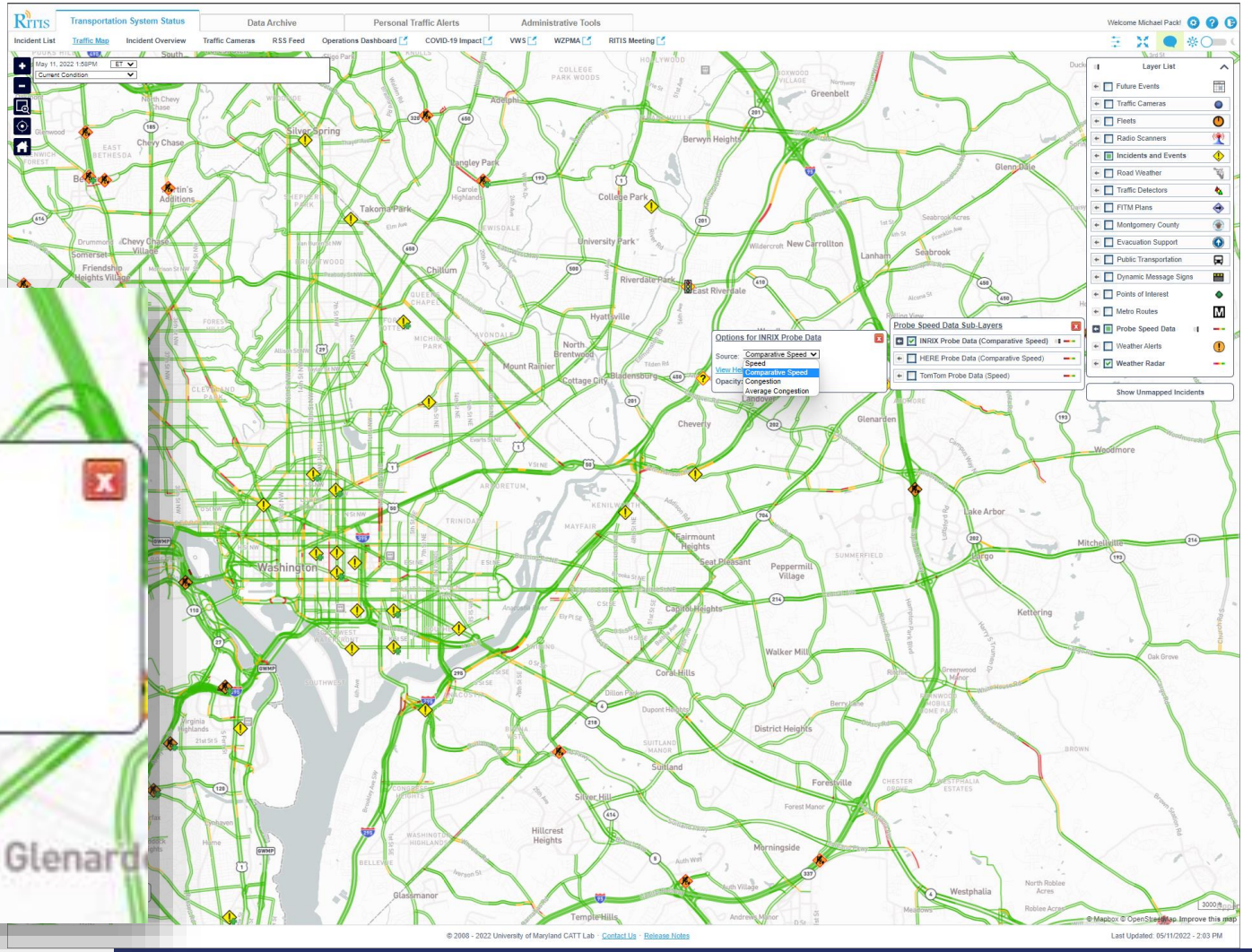




New Speed Tile Layer Options:

1. Only show congestion (hide green)
2. Only show bottlenecks
3. Only show high speeds





Enhancement Priorities through June 2023

RITIS Enhancement Working Group Funds will support:

Enhancement	Estimated Cost
Sharing of Dashboard Reports	$125k
Automated Work Zone Reports Scoping	$25k
Aerial Photography in RITIS Maps	$10k
Additional Reporting Templates	$35k
Speed Tile Layers	$30k
Causes of Congestion Enhancements	$50k
Total =	$275k

Other funds (grants) will support

Enhancement	Estimated Cost
Freight Movement & Safety Avoidance Analytics	$1M+
Safety Analytics (police crash reports) Partially funded	~$250k
Signal Analytics Enhancements	$TBD
Trips Analytics Enhancements	$TBD
Energy Analytics Geographic Expansion	TBD
Speed Bins Visualization (time permitting)	$75k
Total =	$$$

RITIS | PROBE DATA ANALYTICS SUITE

Agency Input Session

Matt Glasser
National TSMO Account Lead
Arcadis
RITIS User Group Co-chair

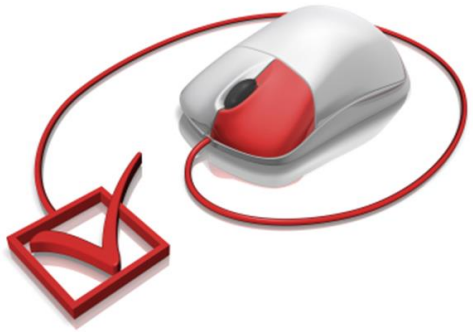
Agency Input – Polling and Open Discussion

Please type your answers under each question in the pop-up box.

Poll 2 - What frustrates you the most with using RITIS tools (including PDA, Trip Analytics or Signal Analytics)?

Poll 3 - What do you like the best about using RITIS tools?

Poll 4 - What features or functionality, if added to RITIS, would make your life easier?

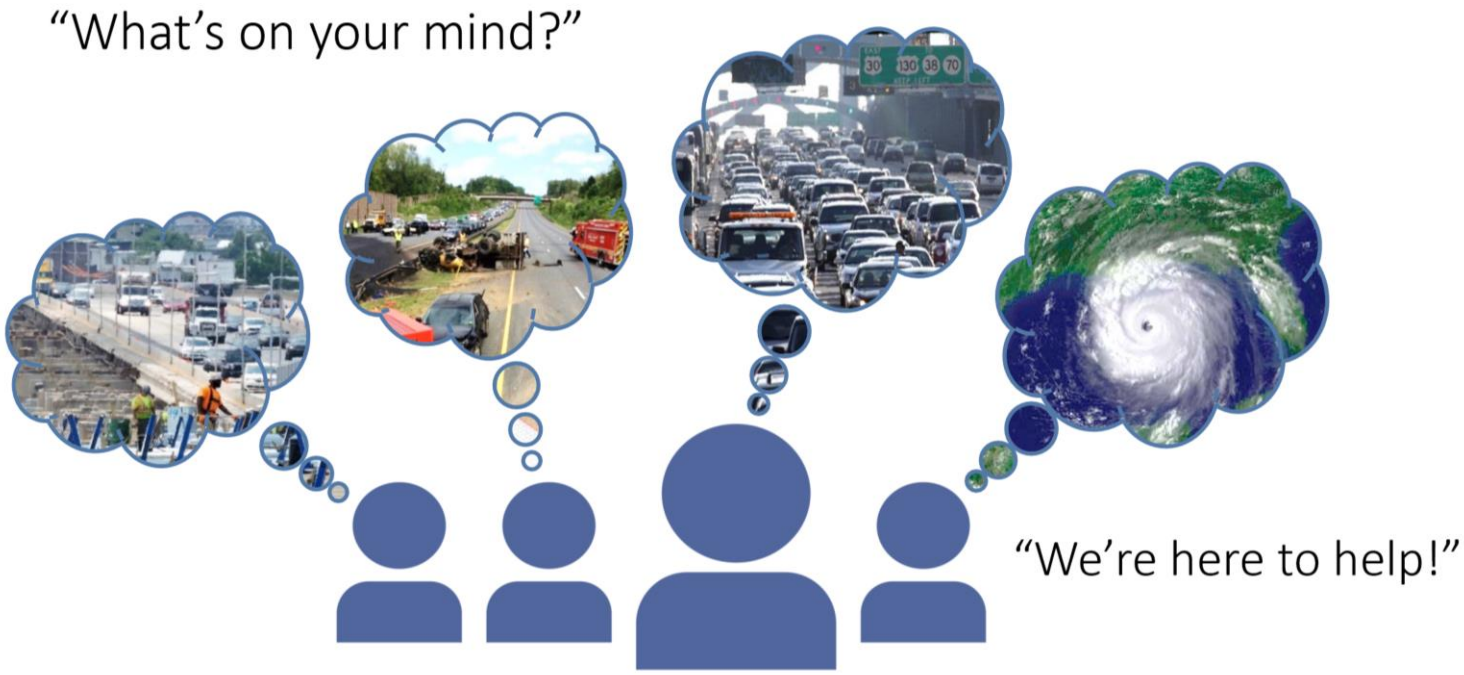


Poll 5 - What kinds of things are you currently doing with RITIS - Planning/Ops, presentations, project/funding justification, etc.- that you'd be willing to share at a future meeting?

Poll 6 - What are some examples of important things your agency wants to know, that you wish RITIS could help answer?

We want to hear from you!

- All features and functionality are driven by state/mpo users.
- You are welcome to join any of our User Groups / Working Groups / Listening Sessions to brainstorm/define these new features and functionality.
- You can also type your comments to us today either in the Q&A box or with an email to support@ritis.org



Wrap Up

Matt Glasser
National TSMO Account Lead
Arcadis
RITIS User Group Co-chair

Questions?



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Thank you!

CATT LABORATORY

THE EASTERN TRANSPORTATION COALITION