RITIS

PROBE DATA ANALYTICS SUITE

u s e r g r o u p

Web Meeting – February 14, 2019

I-95 CORRIDOR COALITION

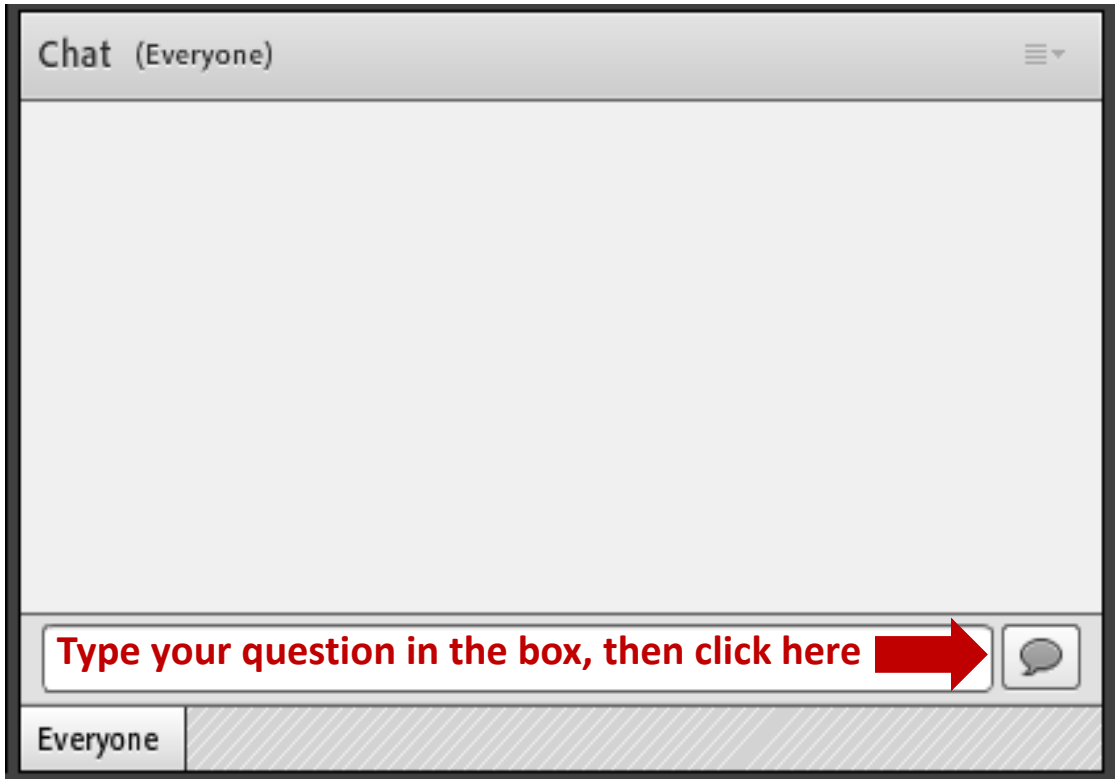
CATT LABORATORY

Webinar & Audio Information

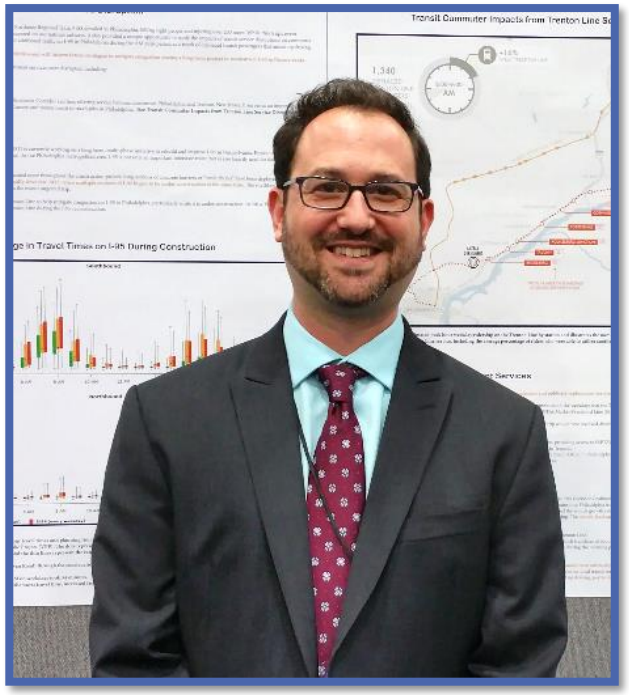
- The call-in phone number is: **1-xxx-xxx-xxxx & enter xxxxxxx# at the prompt**
- **Participants will be in "Listen Only" mode throughout the webinar**
- Please press *0 to speak to an operator for questions regarding audio
- Please call Wayne Gibson at xxx-xxx-xxxx for difficulties with the web or audio application
- This webinar will be recorded
- Presentations will be posted to the I-95 Corridor Coalition website. Participants will receive a link to the presentations after they are posted.

Asking Questions

- Please pose your questions using the **chat box**
- Questions will be monitored then answered by the speakers either at the end of the presentation or at the end of the webinar



Welcome



Jesse Buerk, Delaware Valley Regional Planning Commission

User Group Co-chair

Participating Agencies

Agency			
Arcadis	Florida DOT (HDR)	Montgomery County, MD	Richmond Regional Planning District Commission, VA
Atlanta Regional Commission, GA	Florida Turnpike Enterprise (AECOM)	MWCOG	Rockingham Planning Commission, NH
A&P Consulting Engineers	Georgia DOT	Naugatuck Valley COG, CT	SJTPO
Baltimore Metropolitan Council, MD	I-95 Corridor Coalition	New Jersey DOT	South Carolina DOT
Cambridge Systematics	INRIX	New York City DOT	Southwestern Pennsylvania Commission
City of Atlanta, GA	Iteris	New York State DOT	Tennessee DOT
Collier County, FL	Manatee County	New York State Thruway Authority	TRANSCOM
Central Shenandoah Planning District Commission, VA	Manatee County Public Works Dept	NJTPA	UMD CATT Lab
DAD N ASSOCIATES LLC	Maricopa Association of Governments, AZ	North Carolina DOT (VHB)	University of South Florida/CUTR
Durham-Chapel Hill-Carrboro MPO, NC	Maryland DOT- SHA	Northern Virginia Transportation Authority	University of Virginia
Dover/Kent County MPO, DE	Maryland Transportation Authority & Police	NREL	Virginia DOT
DVRPC	Massachusetts DOT	Pennsylvania DOT (Gannett Fleming)	Wayne State University
FHWA	MetroPlan Orlando, FL	Prince George's County Office of Emergency Mgmt, MD	
Florida International University	Missouri DOT	Rhode Island DOT	

Welcome

Welcome / Introductions	Jesse Buerk, DVRPC & User Group Co-chair
Probe Validation Findings from 2018	Zach Vander Laan, UMD CATT
Dynamic Video Wall and RITIS for Improved Operational Awareness	Daniel Smith, Florida DOT
Using RITIS in Implementation of Arterial Performance Measures	Elio Espino Florida DOT (A&P Consulting Transportation Engineers)
Working Group Updates	Mark Franz, PhD, UMD CATT Laboratory
Update on the EDC 4 TIM Dashboards	Michael Pack, UMD CATT Laboratory
RITIS and PDA Suite Features – What's New & What's Coming	Michael Pack, UMD CATT Laboratory
Agency Input Session – questions, comments…..	All
Wrap Up	Denise Markow, PE, I-95 Corridor Coalition

Introductions

Denise Markow, PE
I-95 Corridor Coalition
Director

Zach Vander Laan
UMD CATT
Faculty Research Assistant

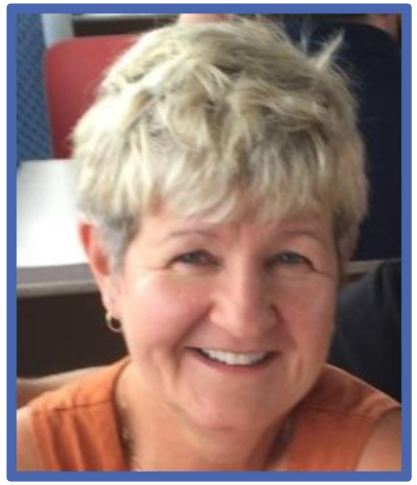
Dan Smith, PMP
Florida DOT
ITS Operations Manager
RTMC District 4

Elio Espino, PhD, PE
Florida DOT
(A&P Consulting Transportation Engineers)
Senior Project Manager

Mark Franz, PhD
UMD CATT Lab
Lead Transportation Analyst

Michael Pack
UMD CATT Lab
Director

Coalition Update



Denise Markow, PE, I-95 Corridor Coalition

TSMO Director

Coalition Update – Recent & Upcoming Events

RECENT

- ✓ CAV Webinar: Member State Roadmaps & CMM – Nov 14, 2019
- ✓ Delaware Valley Highway Operations Peer Exchange – Practices in Heavy Towing – Nov 29, 2018
- ✓ Private Sector Origin-Destination Data TSMO Applications Webinar – Dec 6, 2018

UPCOMING

- ✓ I-95 CC Strategic Planning Sessions for Intermodal & TSMO (by invitation) – March 6, 2019
- ✓ Summit on Traveler Information Strategies during Emergency Operations – March 7, 2019
- ✓ UAS Programs - Agency Presentations from Massachusetts & Delaware – March 21, 2019
- ✓ Drone Peer Exchange (NE Highway Operations) - UAS – I have one . . . now what do I use it for? – April 11, 2019

In the spotlight…

Probe Validation Findings from 2018

Zach Vander Laan
UMD CATT
Faculty Research Assistant

Vehicle Probe Project (VPP)

Vehicle Probe Project (VPP):

- Provides I-95 Corridor Coalition members with reliable travel time and speed data across roadways without needing sensors
- The basis for travel time data in the PDA suite

Phase 1 (2008-2014)

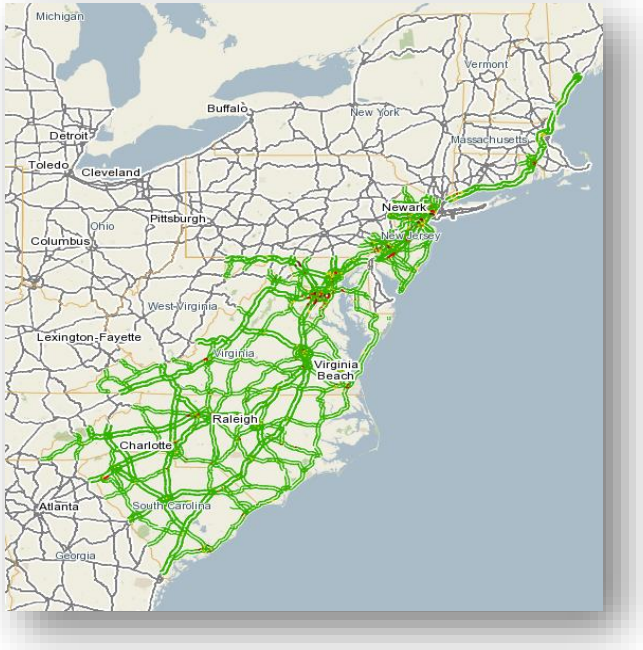
- Single vendor: INRIX
- Data subject to regular validation by University of Maryland

Phase 2 (2014-present)

- "Traffic Probe data marketplace"
- 3 highly qualified vendors selected: HERE, INRIX, TomTom
- Member agencies can select vendor that best meets needs
- All vendors' data regularly validated by University of Maryland

Coverage statistics

- 7 states with full coverage ("all-in"), 1 with partial coverage
- Over 9k freeways miles, 79k arterial miles



"The use of the marketplace results in a savings of 55 - 62% per lane mile from free market pricing" depending on vendor.

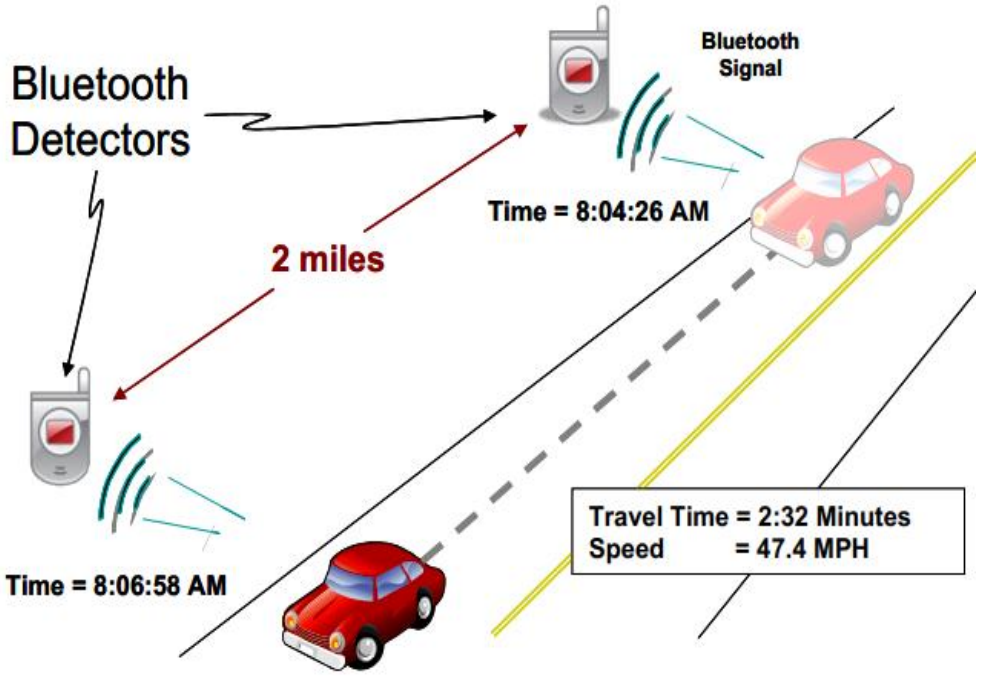
VPP Validation Overview

Main idea

- Collect ground truth speed data and use it evaluate VPP speeds reported in PDA suite
- Produce regular data quality reports to document performance
  - *VPPI:* 40+ reports
  - *VPPII*: 18 reports

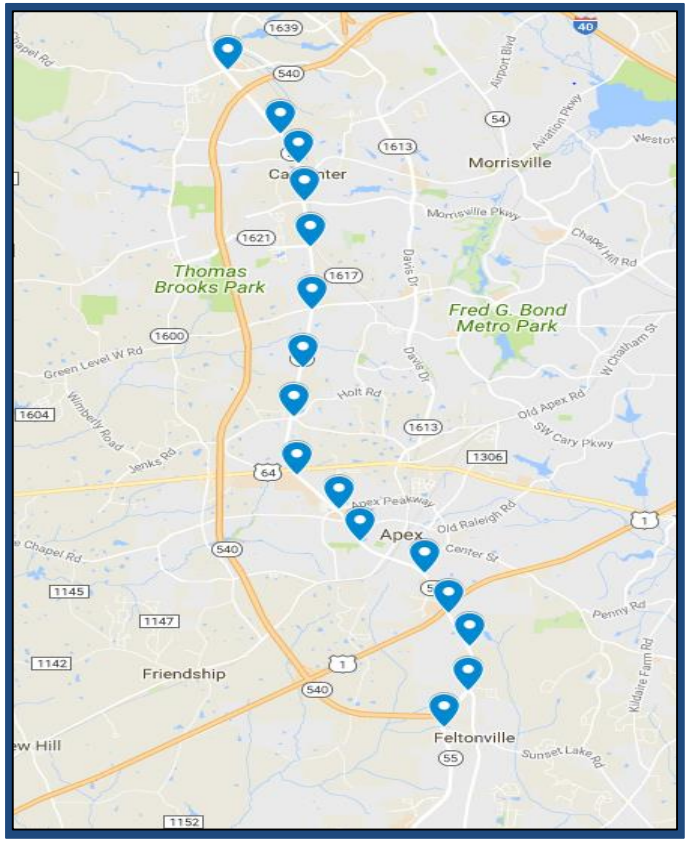
How are ground truth speeds obtained?

- Deploy Bluetooth / Wi-Fi sensors along road segments
- Re-identify vehicles traveling along road at multiple locations to obtain travel time (speed) records
- Construct 95% confidence interval (CI) for ground truth speeds over 5-minute intervals



Major Steps in the Validation Process

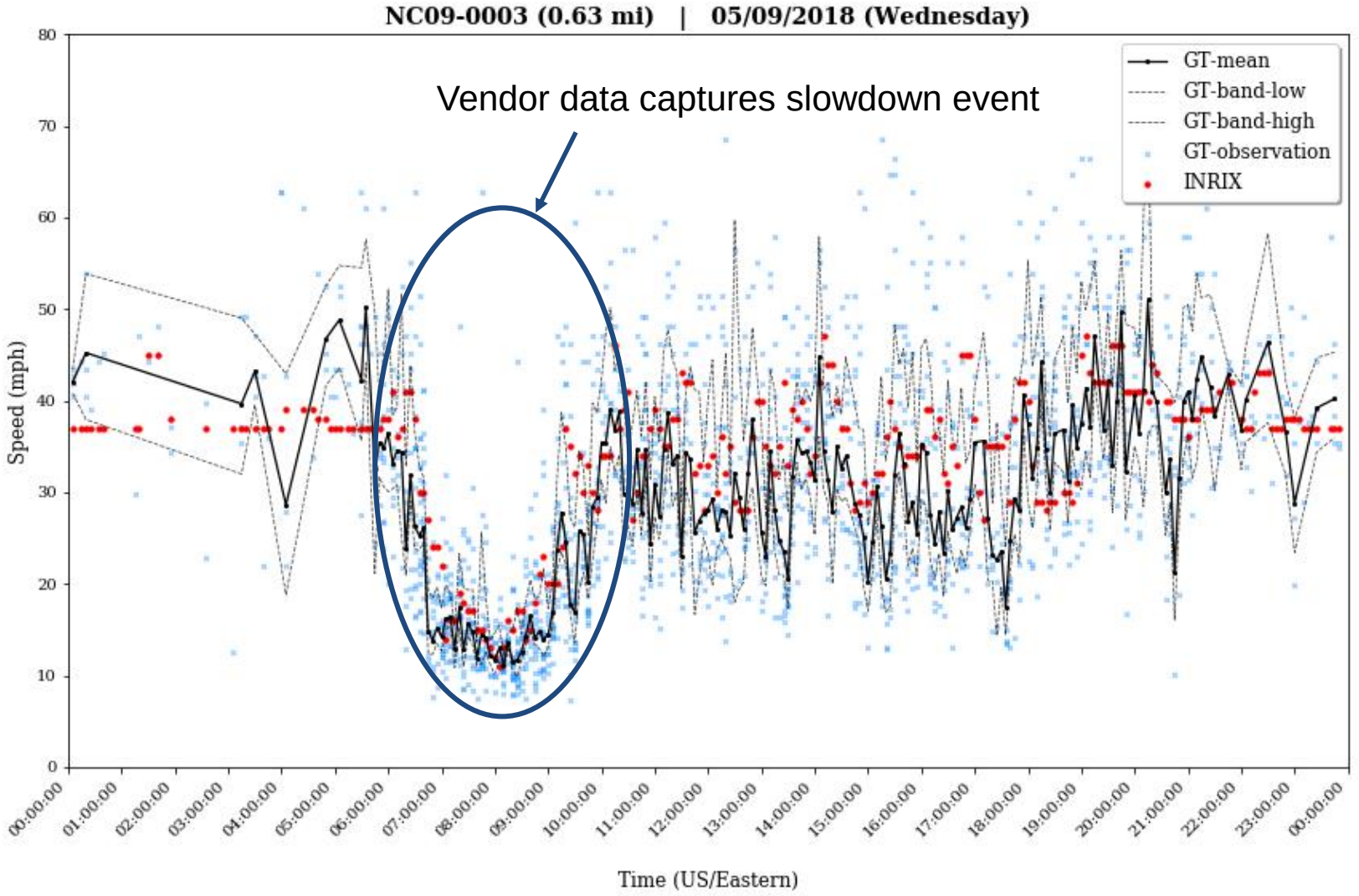
Select study area & get necessary approval	**Deployment Planning**
TrafficCast sets out sensors & collects data	Re-id Data Collection
Data is sent to UMD for processing	Re-id Data Processing
Probe Vendors provide data to UMD	Probe Data Processing
UMD publishes the final report	Report Production



Sample Segment – North Carolina

- Bluetooth / Wi-Fi ground truth observations
- Vendor
- Ground truth mean and confidence interval

➢ Error metrics computed by comparing ground truth to vendor data for each 5-min period



2018 Validation Reports

State	Route	Road Type	Comments	Report Completed
Georgia	I-75	Freeway		February
New Jersey	US 1/ US 9	Arterial		April
Maryland	US 40	Arterial	During signal re-timing	June
North Carolina	NC 55	Arterial	Parallel corridor analysis	September

- Focus on arterials (more challenging than freeways)
- Consistent, strong performance from all three vendors (INRIX, HERE, TomTom)
- Work with states to choose locations and times where data can serve multiple purposes – e.g. signal re-timing, parallel corridor study, freight routes, holiday travel

* Reports can be found under the Data Validation tab at https://i95coalition.org/projects/vehicle-probe-project/

2019 Planned Validation Reports

State	Route	Road Type	Comments	Estimated Report Date
Georgia	SR-21 / 80	Arterial	Important freight routes near port	February
Pennsylvania	US-22	Arterial	Holiday travel	April
New Jersey	TBD	TBD	TBD	TBD
Arterial Report*	N/A	Arterial		TBD

- Continue to focus on arterials and work with states to find useful places to validate
- Work with vendors and states to streamline validation process
- **Arterial Validation Report***

Arterial Validation Report

Original Validation Report

- Published in 2015
- Investigated quality of INRIX probe data on **arterials** over a number of validations
  - AADT & Signal density “rules of thumb”

Updated Validation Report

- To be completed in 2019 instead of a standard validation
- Provide an update to the original report, tracking trends validation metrics
- Include results from additional two vendors (HERE and TomTom)

* Original arterial validation report can be found at:
https://i95coalition.org/wp-content/uploads/2015/02/I-95_Arterial_Validation_Report_July2015-FINAL.pdf?x70560

Questions?

Denise Markow, I-95 Corridor Coalition

- (301) 789-9088
- dmarkow@i95coalition.org

Zach Vander Laan, University of Maryland CATT

- zvanderl@umd.edu

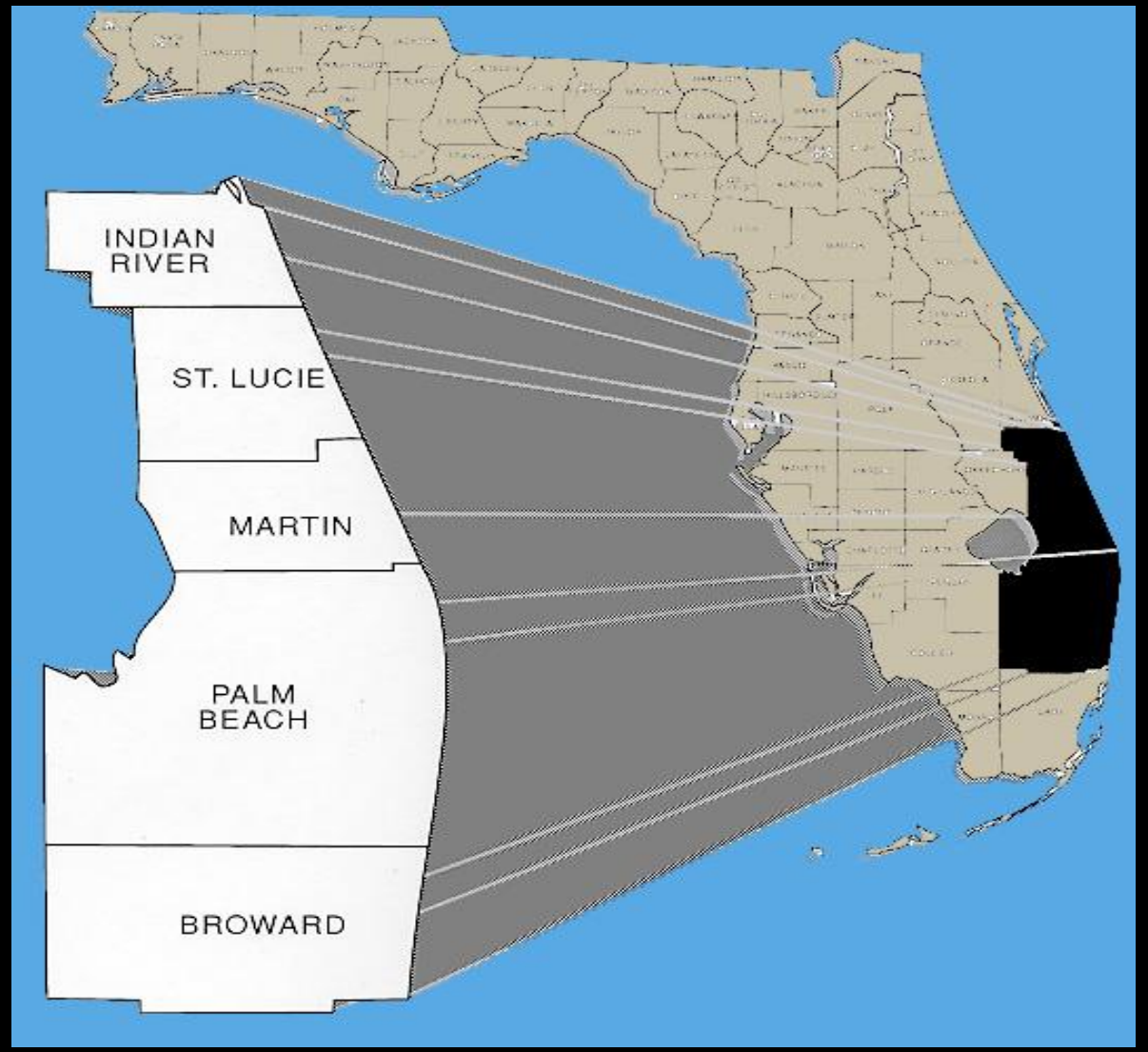
In the spotlight…

Dynamic Video Wall and RITIS for Improved Operational Awareness

Daniel A. Smith
FDOT
ITS Operations Manager

FDOT District 4 Fast Facts

- **Major cities:** Fort Lauderdale, Boca Raton, West Palm Beach Fort Pierce, Hollywood
- 5,000 Square miles
- 3.6 million residents
- 52 million miles driven daily



FDOT D4 RTMC Video Wall

Real Time Speed Profile

Rolling 1 minute average, updated every 20 seconds

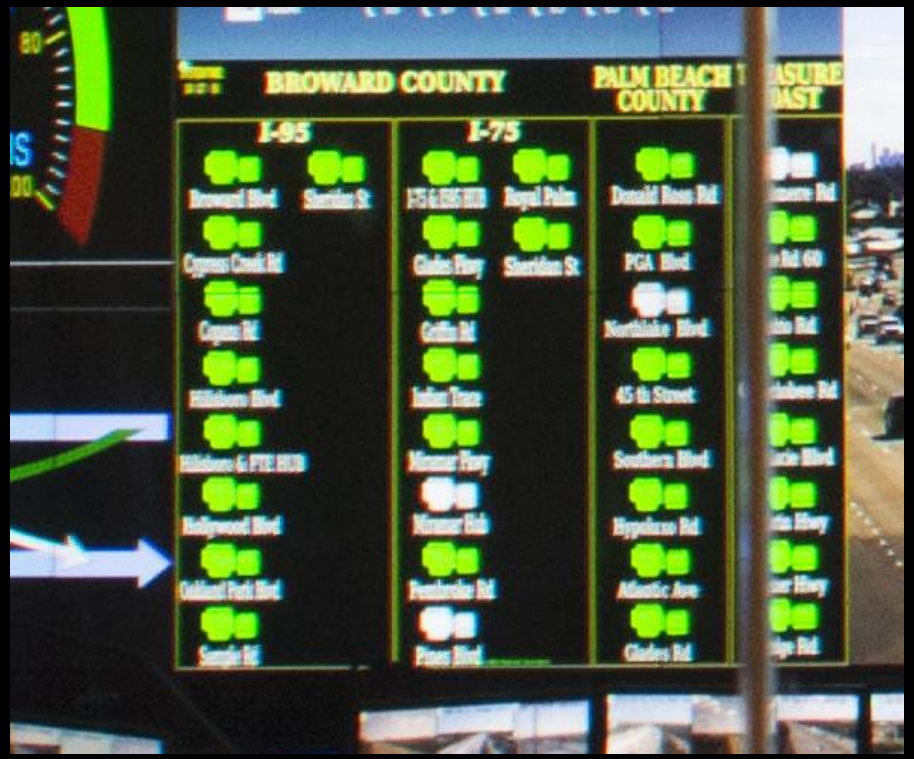
Speed (mph)
I-95
35629 events
51 mins
65 mins
595 EXPRESS

Video Wall General Specifications

- Installed in 2016
- Barco software
- 44 Cubes
- 56’ wide, 12’ tall, 672sf

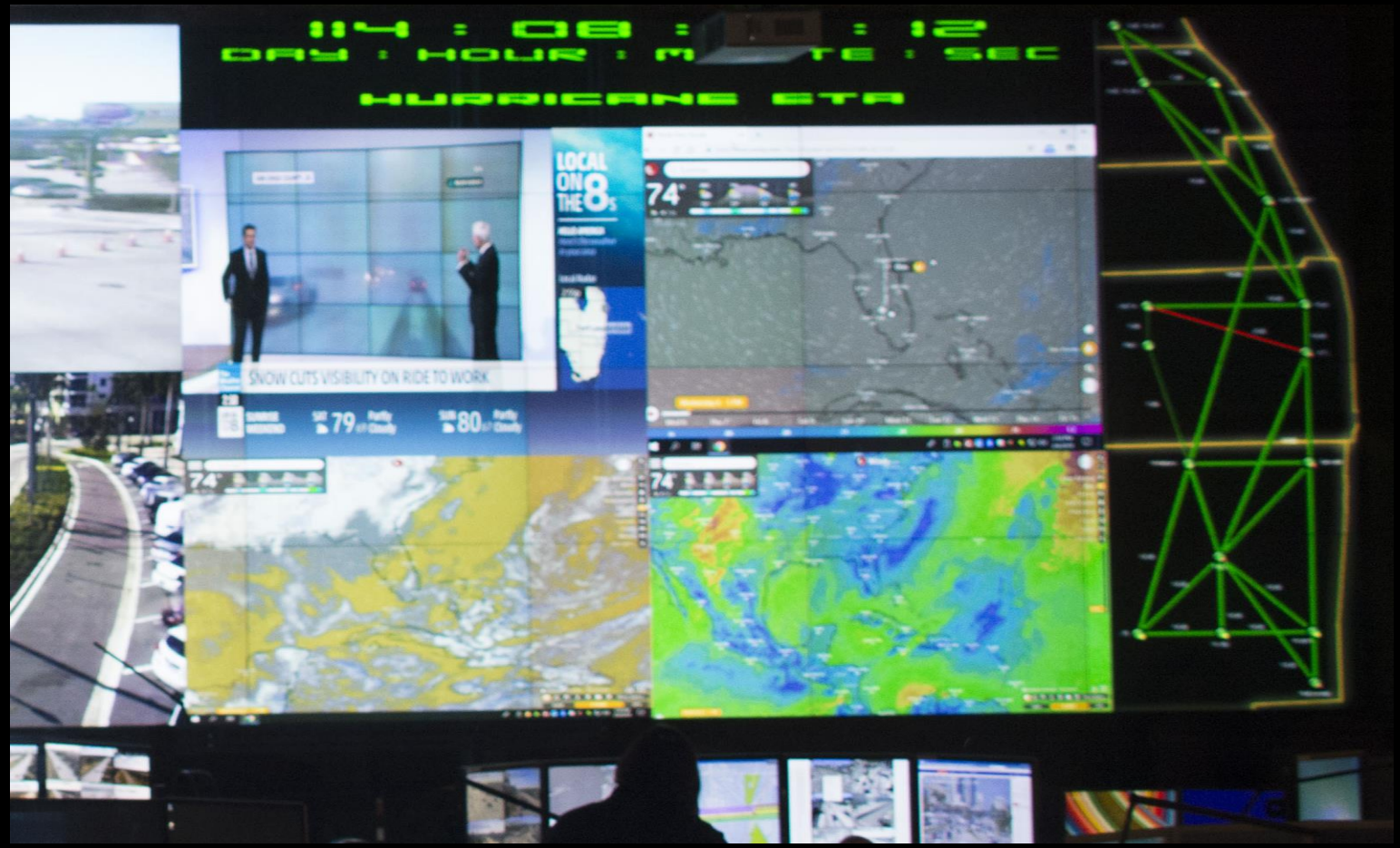
Real Time Performance Measures

Real Time Event Monitoring

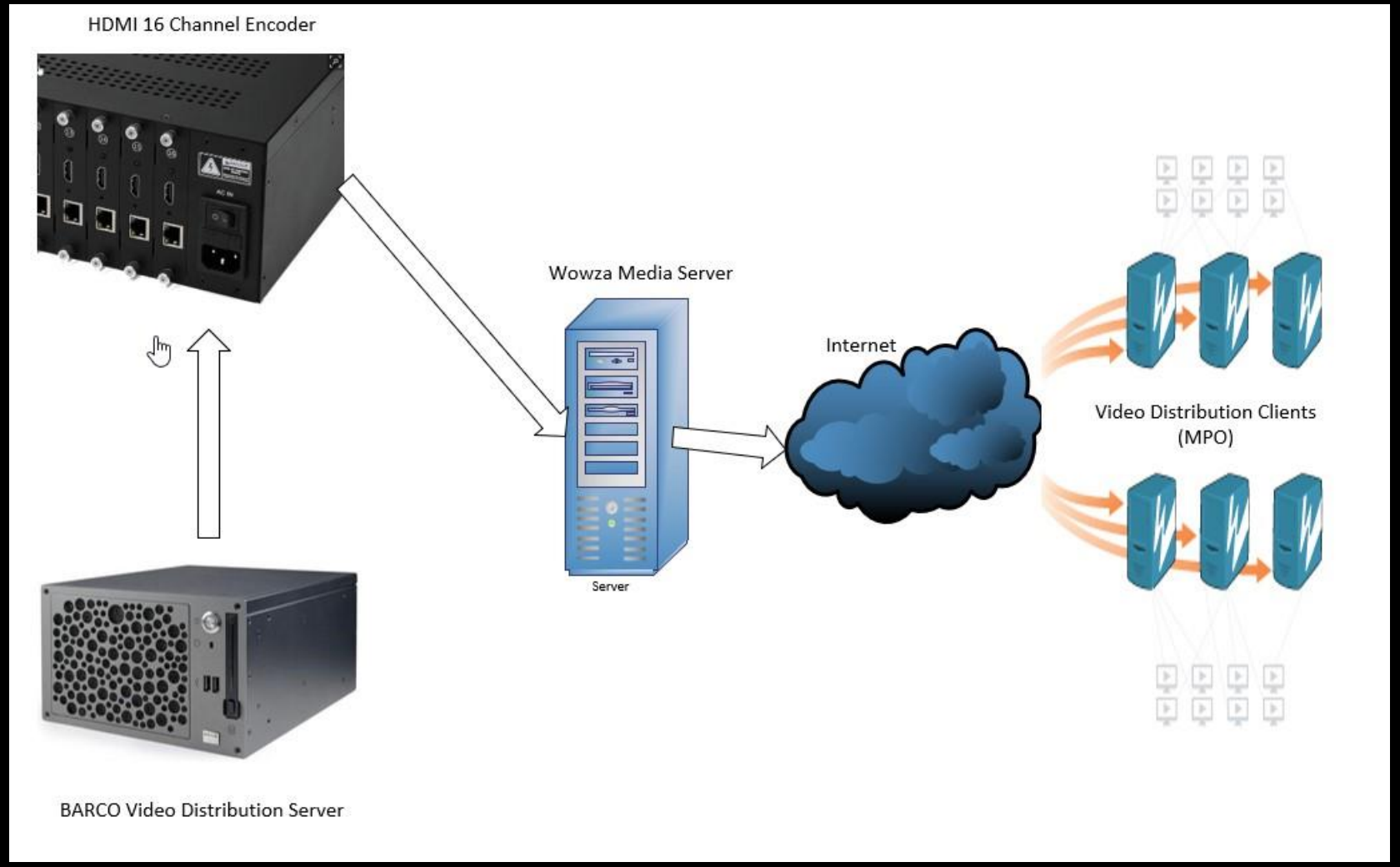


Use of RITIS on the Video Wall

Video Wall Hurricane Mode



Internet Video Distribution



Questions?

Daniel Smith
Florida DOT
Daniel.Smith@dot.state.fl.us

Poll Question #1

1

What type of information are you showing on your video wall?

(you may select more than one response)

___ **CCTV**

___ **Signal Timing Systems**

___ **Speed Maps**

___ **Media**

___ **Other**

___ ***I am not sure***

___ ***Our agency does not have a video wall***

In the spotlight…

Using RITIS in Implementation of Arterial Performance Measures

Elio Espino, P.E., PhD

Traffic Engineering and Transportation Planning Department Head
A&P Consulting Transportation Engineers
FDOT District IV & VI Consultant

Background/Previous Projects

- Began using RITIS in 2015
- First used for Districtwide Signal Re-timing Project

GOALS

To perform signal retiming for 1/3 of the traffic signals in the District within a year.

OBJECTIVES

To improve arterial mobility by monitoring arterial performance for peak and off-peak times of the day

PERFORMANCE/MEASURES

Travel Time, Travel Speed, Buffer Time, and Incidents Log

- Monitoring of Corridors for Travel Time Reliability (Buffer/Planning Time)
- Before/After Comparisons w/Development of Dashboards
- MOT Support/Detour Evaluations

Arterial Performance – Signal Retiming

- Evaluation of TOD Plans along a Signal Section
- Before & After Comparison
  - Reduction in Travel Time
  - Reduction in Peak Period Duration

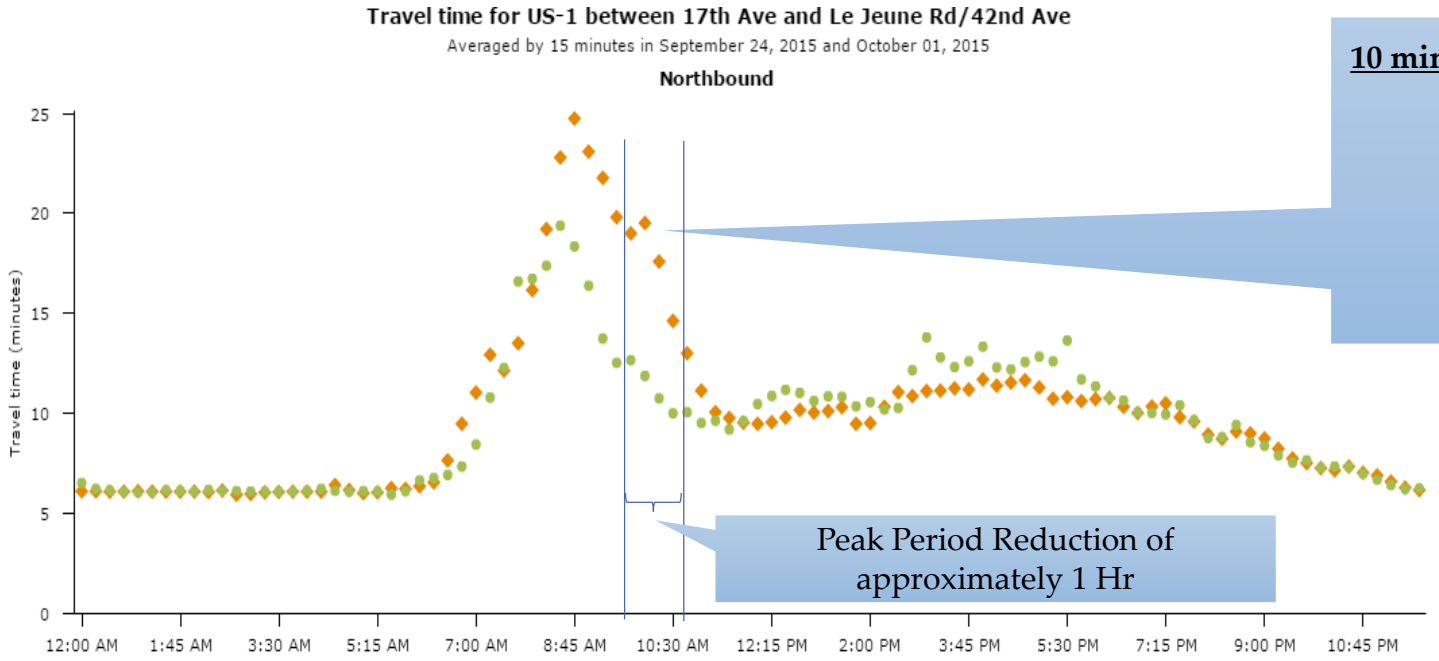
Time of Day Plan Before

Plan 3	Plan 6	Plan 11	Plan 12
6:00 AM – 9:30 AM	9:30 AM – 3:00 PM	3:00 PM – 4:00 PM	4:00 PM – 7:00 PM
180 Cycle SWB Left Omitted	160 Cycle	180 Cycle NEB Left Omitted	190 Cycle NEB Left Omitted

Additional TOD plan to accommodate post peak recovery

Time of Day Plan After

Plan 3	Plan 4	Plan 5	Plan 6	Plan 11	Plan 12
6:00 AM – 7:30 AM	7:30 AM – 9:30 AM	9:30 AM – 11:00 AM	11:00 AM – 3:00 PM	3:00 PM – 4:00 PM	4:00 PM – 7:00 PM
180 Cycle	190 Cycle	180 Cycle	160 Cycle	180 Cycle NEB Left PP *SW 17th Ave* *SW 22nd Ave* *SW 27th Ave*	190 Cycle NEB Left PP *SW 17th Ave* *SW 22nd Ave* *SW 27th Ave*

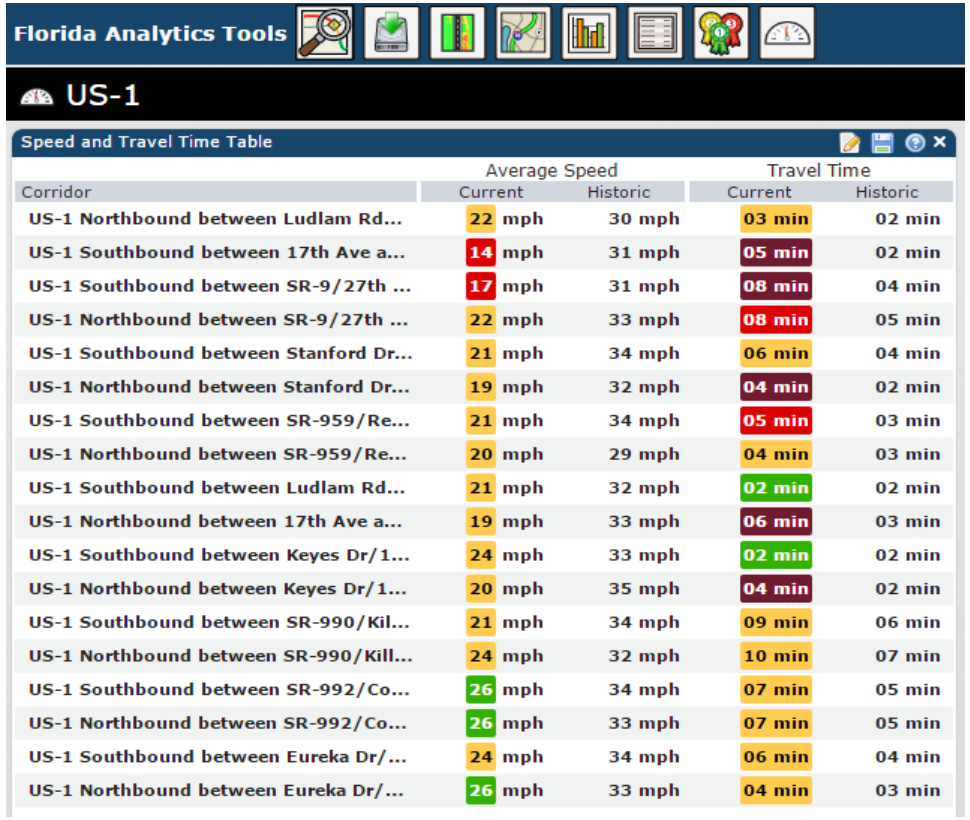


10 minutes travel time Improvement NB

- **NEW TOD Plan**
  - **Plan 4 (7:30-9:30AM)**
  - **Plan 5 (9:30-11:00)**
- **Offset Optimization**
  - **SW 17th Ave SW 22nd Ave**
  - **SW 27th Ave SW 40th SW**
  - **SW 37th Ave**

Arterial Performance – Signal Retiming

- Dashboards with congestion and speed heat maps
- Identification of Bottlenecks along arterial



Corridor	Average Speed Current	Average Speed Historic	Travel Time Current	Travel Time Historic
US-1 Northbound between Ludlam Rd...	22 mph	30 mph	03 min	02 min
US-1 Southbound between 17th Ave a...	14 mph	31 mph	05 min	02 min
US-1 Southbound between SR-9/27th ...	17 mph	31 mph	08 min	04 min
US-1 Northbound between SR-9/27th ...	22 mph	33 mph	08 min	05 min
US-1 Southbound between Stanford Dr...	21 mph	34 mph	06 min	04 min
US-1 Northbound between Stanford Dr...	19 mph	32 mph	04 min	02 min
US-1 Southbound between SR-959/Re...	21 mph	34 mph	05 min	03 min
US-1 Northbound between SR-959/Re...	20 mph	29 mph	04 min	03 min
US-1 Southbound between Ludlam Rd...	21 mph	32 mph	02 min	02 min
US-1 Northbound between 17th Ave a...	19 mph	33 mph	06 min	03 min
US-1 Southbound between Keyes Dr/1...	24 mph	33 mph	02 min	02 min
US-1 Northbound between Keyes Dr/1...	20 mph	35 mph	04 min	02 min
US-1 Southbound between SR-990/Kil...	21 mph	34 mph	09 min	06 min
US-1 Northbound between SR-990/Kill...	24 mph	32 mph	10 min	07 min
US-1 Southbound between SR-992/Co...	26 mph	34 mph	07 min	05 min
US-1 Northbound between SR-992/Co...	26 mph	33 mph	07 min	05 min
US-1 Southbound between Eureka Dr/...	24 mph	34 mph	06 min	04 min
US-1 Northbound between Eureka Dr/...	26 mph	33 mph	04 min	03 min

Speeds of less than 10 mph for over an hour in the post AM peak period

Section 1
Thursday, Sptermber 3, 2015

NAME	6:30 AM	6:45 AM	7:00 AM	7:15 AM	7:30 AM	7:45 AM	8:00 AM	8:15 AM	8:30 AM	8:45 AM	9:00 AM	9:15 AM	9:30 AM	9:45 AM	10:00 AM	10:15 AM	10:30 AM	10:45 AM	11:00 AM	11:15 AM	11:30 AM
Stanford Dr/Augusto St	34.27	29.85	25.6	23.69	17.18	16.05	15.8	14.71	15.16	11.7	10.73	8.05	9.16	7.78	8.41	10.07	13.81	15.28	20.72	23.79	20.45
Caballero Blvd	35.53	30.7	26.82	27.44	21.35	18.58	16.27	15.5	16.77	13.9	7.25	9.06	9.48	9.38	9.42	10.42	13.59	13.9	23.16	25.6	25.81
SR-959/Red Rd/57th Ave	26.91	23.31	21.56	21.36	19.58	18.44	16.14	16.3	17.11	11.7	7.25	11.13	10.95	10.18	11.89	12.6	10.04	12.32	14.55	16.68	18.07
SW 70th St/SW 58th Ave	27.44	21.99	20.13	19.24	20.54	18.28	18.57	17.71	16.38	15.68	12.66	12.39	8.76	13.16	12.9	11.1	12.28	16.03	19.21	21.83	24.78
SR-986/Sunset Dr/72nd St	27.79	22.69	18.7	18.87	19.72	17.9	19.47	17.9	16.13	16.35	14.9	15.02	10.1	12.39	10.66	13.4	17.92	17.16	21.77	22.21	26.05
SW 73rd St/Ed Corley Dr	29.17	23.86	19.25	17.19	16.7	13.84	15.67	18.15	16.64	16.67	11.56	9.04	8.07	10.6	9.26	11.77	15.7	15.81	23.01	25.36	26.24
Davis Rd/80th St	24.99	25.04	21.18	20.12	15.53	15.32	15.89	16.41	15.42	16.85	11.5	10.81	10.53	15.72	13.41	14.89	18.66	19.19	19.85	23.56	20.58
Ludlam Rd/67th Ave	14.11	16.8	13.45	13.27	11.9	10	9.22	8.8	9.03	11.32	10.64	9.04	8.71	11.71	10.89	14.25	16.77	17.56	16.39	16.96	19.35
SR-878/Snapper Creek Expy	21	19.44	15.2	9.62	7.31	8.16	6.55	5.52	5.24	5.51	5.82	4.86	6.08	7.06	7.77	12.02	14.13	14.73	20.3	21.04	21.46
SR-94/Kendall Dr/88th St	27.04	21.5	22.51	21.02	18.59	19.21	12.17	12.65	9.11	9.64	15.62	14.39	13.42	13.66	14.21	18.82	20.72	25.38	29.73	26.82	21.17
SR-94/Kendall Dr/88th St	27.04	21.5	22.51	21.02	18.59	19.21	12.17	12.65	9.11	9.64	15.62	14.39	13.42	13.66	14.21	18.82	20.72	25.38	29.73	26.82	21.17

Section 1
Thursday, October 1, 2015

NAME	6:30 AM	6:45 AM	7:00 AM	7:15 AM	7:30 AM	7:45 AM	8:00 AM	8:15 AM	8:30 AM	8:45 AM	9:00 AM	9:15 AM	9:30 AM	9:45 AM	10:00 AM	10:15 AM	10:30 AM	10:45 AM	11:00 AM	11:15 AM	11:30 AM
Stanford Dr/Augusto St	32.48	28.68	25.29	23.63	20.26	18.07	17.65	13.08	14.17	11.91	12.42	12.45	19.27	21.27	23.71	25.42	24.27	24.39	25.45	23.96	26.16
Caballero Blvd	30.03	29.91	25.18	23.97	18.86	19.72	17.94	15.47	14.59	14.51	15.23	10.19	17.18	22.92	27.73	28.51	24.76	26.33	22.62	25.37	27.97
SR-959/Red Rd/57th Ave	24.58	20.04	17.24	18.79	18.54	14.57	10.77	15.9	18.25	18.9	13.76	10.05	14.88	16.23	18.76	19.73	19.91	20.04	15.29	12.85	14.63
SW 70th St/SW 58th Ave	18.49	18.86	12.25	16.46	17.44	16.86	16.5	16.56	16.94	18.5	16.74	12.73	15.24	19.81	24.99	24.21	26.08	25.79	24.13	19.63	19.61
SR-986/Sunset Dr/72nd St	19.76	17.63	18.43	16.49	16.16	16.87	17.23	16.85	17.24	14.91	17.26	11.7	13.42	18.66	22.68	23.57	25.03	25.21	23.28	18.33	22.14
SW 73rd St/Ed Corley Dr	22.3	17.67	17.36	15.52	12.49	14.35	16.29	14.91	16.2	18.79	19.93	11.55	18.48	22.76	24.95	27.85	24.91	25.07	25.91	24.8
Davis Rd/80th St	25.82	22.91	16.6	17.7	14.3	16.83	17.55	17.4	14.84	18.18	16.1	15.5	12.99	19.79	20.54	24.88	19.88	21.82	20.82	24.18
Ludlam Rd/67th Ave	22.06	13.71	12.06	12.56	10.41	9.54	9.87	8.8	11.29	12.42	10.95	14.82	10.72	12.29	14.34	13.31	13.8	12.67	12.38	12.22
SR-878/Snapper Creek Expy	23.68	12.09	7.46	7.9	5.56	6.54	6.57	7.06	8.96	9.63	14.29	21.18	19.01	17.71	16.82	10.19	7.97	9.87	9.8	7.79
SR-94/Kendall Dr/88th St	29.35	18.74	10.84	10.08	10.39	14.03	18.34	19.65	18.88	17.7	22.92	24.49	23.05	25.32	25.44	24.18	21.86	24.22	23.55	21.41
SR-94/Kendall Dr/88th St	29.35	18.74	10.84	10.08	10.39	14.03	18.34	19.65	18.88	17.7	22.92	24.49	23.05	25.32	25.44	24.18	21.86	24.22	23.55	21.41

Speeds during same time period in after conditions ranged between 13 – 23 mph

- Active Monitoring

ARTERIAL PERFORMANCE – TANGIBLE BENEFITS/PRESS

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FRONT PAGE NEWS OPINION CALENDAR ARCHIVES

Front Page » Transportation » Adaptive signal technology reducing Miami driving times

Congestion fell significantly on both, she said, adding that the flow-adjustable signals cut drive times regardless of whether school was in session or not.

On Miami Gardens Drive between Northwest 67th and 87th avenues, travel times improved 5.3% when school was in and 8.4% when out.

Improvements were even greater along the other corridor, US 1 from Southwest 16th Avenue to Southwest 98th Street, where **congestion decreased 11.5%** in school hours and 7.8% at other times.

Transportation personnel got those totals using the **Regional Integrated Transportation Information System**, developed and run by the Center for Advanced Transportation Technology Laboratory at the University of Maryland.

In 2012, the Florida Department of Transportation contracted with the university to use that system, which it describes as "an automated data sharing, dissemination and archiving system."

"We want to use [these findings] as a benchmark [and] couple that with field observations to determine if further refinements [are needed]," Ms. Bravo said. **"We want to continue to improve it to maximize [its benefits].**

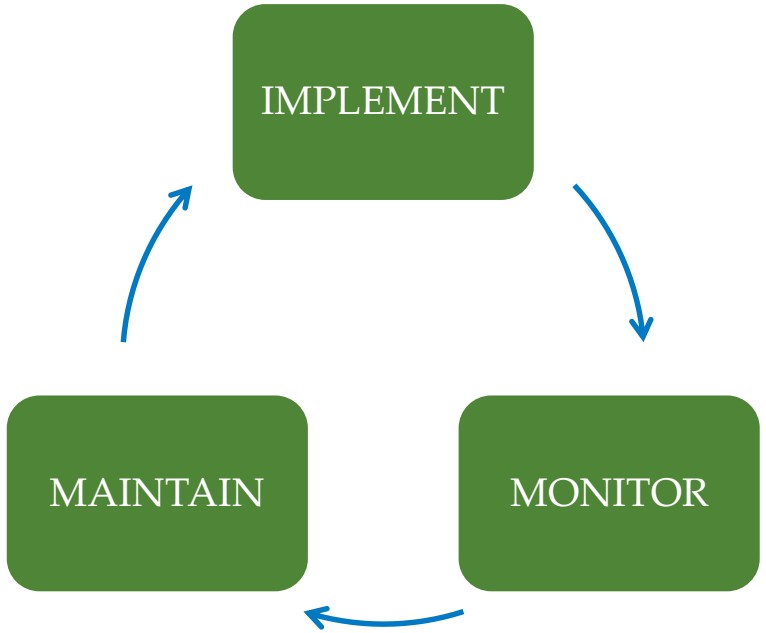
Adaptive signal technology reducing Miami driving times

Written by Jesse Scheckner on January 15, 2019

Source: https://www.miamitodaynews.com/2019/01/15/adaptive-signal-technology-reducing-miami-driving-times/

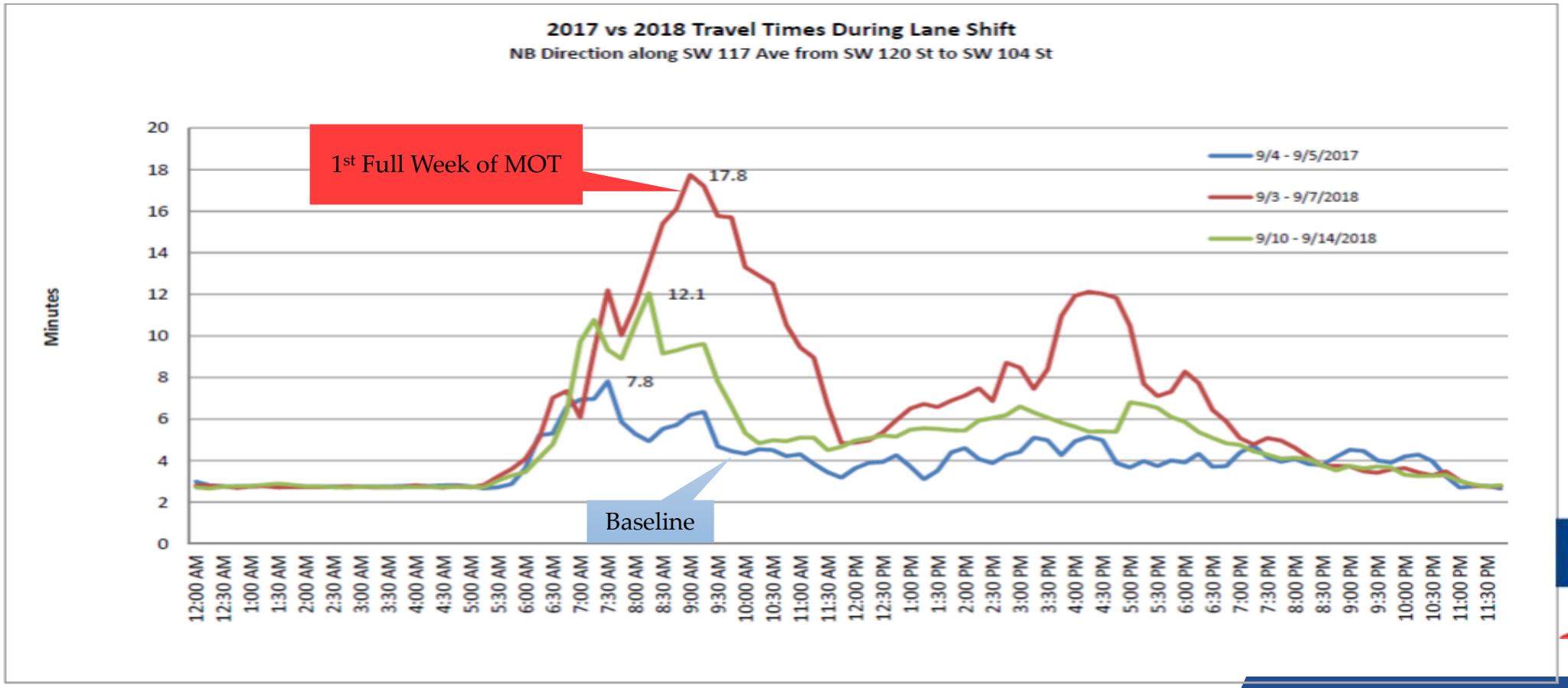
Arterial Performance – Maintenance of Traffic (MOT)

- **MOT Support & Work Zone Traffic Monitoring**
  - TCP/MOT Review & Analysis
  - Temporary Signal Operation and Timing Development
  - Alternate Route/Detour Route Signal Timing Modification
  - MOT Monitoring – Videos and RITIS Data



Arterial Performance – Maintenance of Traffic (MOT)

- Temporary Signalization/ Coordination along Detour Route Identification & Evaluation
- Monitoring/ Impacts due to capacity reduction and lane shifts
- Support for Public Information Officer (PIO)/Citizen Complaints

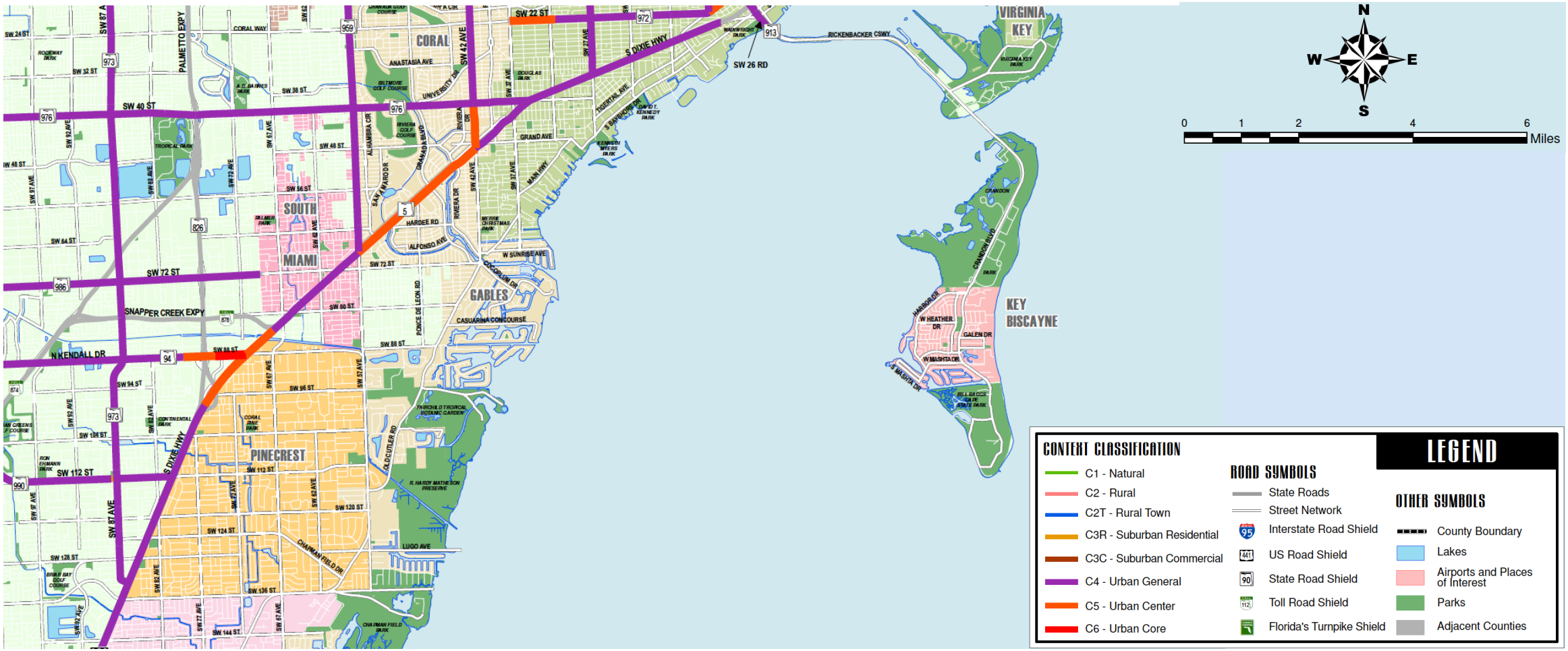


LOOKING FORWARD : ARTERIAL SIGNAL SYSTEM MANAGEMENT

ARTERIAL PERFORMANCE MEASURES

- Evaluate performance of all system users and establishes user priorities
- Monitor and assess the effectiveness of a signal timing plan
- Assess and evaluate requests for signal timing changes

LOOKING FORWARD : ARTERIAL SEGMENTATION



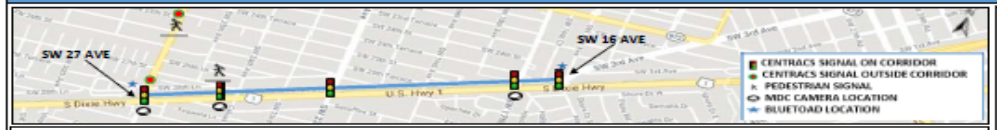
- Proportion of turning vehicles
- Corridor directionality
- Peaking characteristics
- Lane usage
- Weekday and weekend characteristics
- Typical and atypical trends (i.e., incident, crash, construction, game, concert, shift change, convention)
- Origin-destinations.

Looking Forward : Arterial Performance Measures

Travel Time % Change / Weather Conditions

Incidents/Event Log, Construction Activity, Detection/Communication Failures, Complaints

SEGMENT 1 - SR 5/US 1 FROM SR 9/SW 27 AVENUE TO SW 16 AVENUE
February 06, 2019



Coordinated Section (s)	Users	Key Feature	Operational Objectives	Performance Measures
Centracs Adaptive Link-SW 16 Ave/Le Jeune Rd 5 On-Corridor Signals 2 Off-Corridor Signals 2 Pedestrian Signals	Ped/Bike Vehicles	I-95 Connection Majority Residential Vizcaya Museum MetroRail Stations	Vehicle Mobility: Capacity Allocation Vehicle Mobility: Corridor Progression	Travel Time (TT)

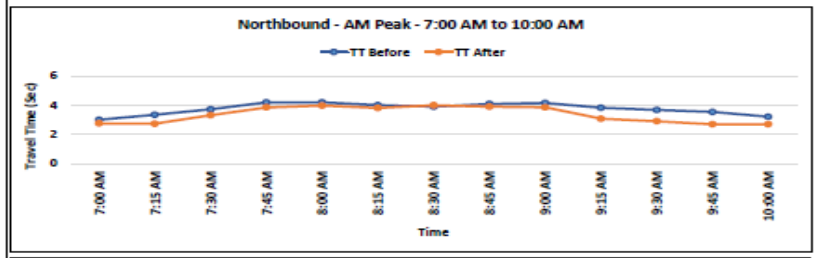
Reported Incidents/Events
No reported incidents

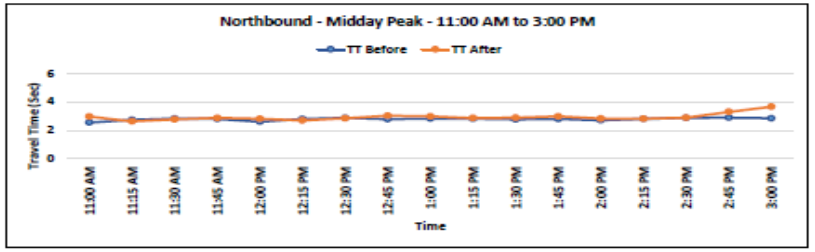
Centracs Failures
2180-SR 5/SW 17 Ave Phase 1 & 6 camera detector is faulted (Dispatched to Econolite)

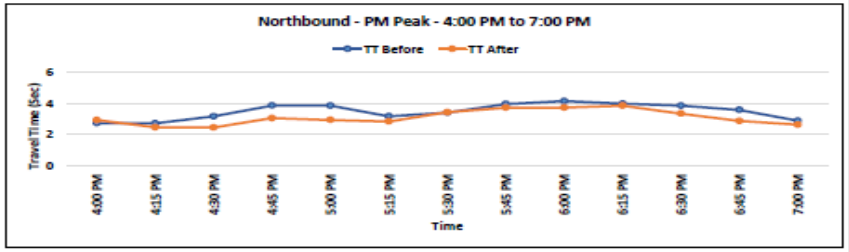
Projects Within Vi

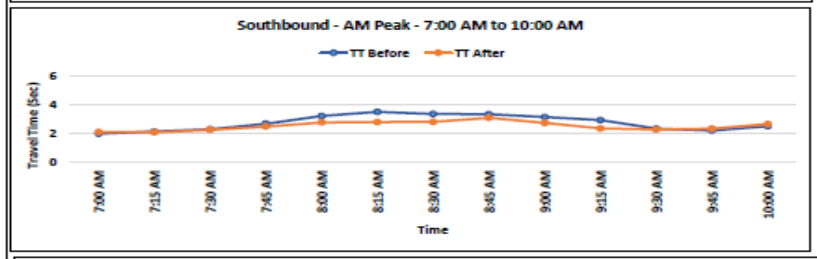
Volume	Before-N	After-N	Diff-N	Before-S	After-S	Diff-S	Data Source
Morning	11422	11647	2%	10102	9735	-4%	Regional Integrated
Midday	10324	11824	15%	10407	11484	10%	Transportation Information
Afternoon	N/A	N/A	N/A	N/A	N/A	N/A	System (RITIS)

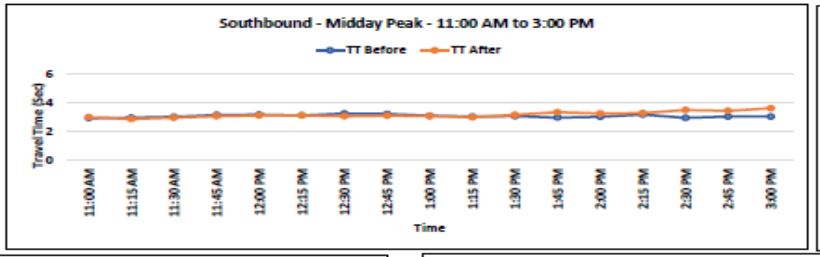
Northbound (TT)	Before	After	Change in TT	Before Data
Morning :	3.75	3.34	-11%	January 30, 2019
Midday :	2.78	2.92	5%	After Data
Afternoon :	3.50	3.11	-11%	February 06, 2019
Southbound (TT)	**Before**	**After**	**Change in TT**	**Weather Condition**
Morning :	2.76	2.54	-8%	Dry
Midday :	3.06	3.16	3%	**Special Events**
Afternoon :	4.30	4.75	10%	No events

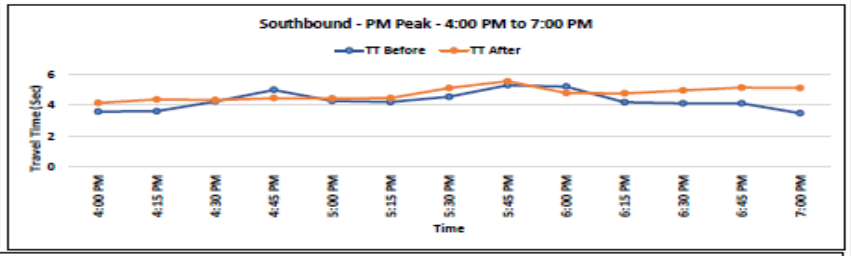


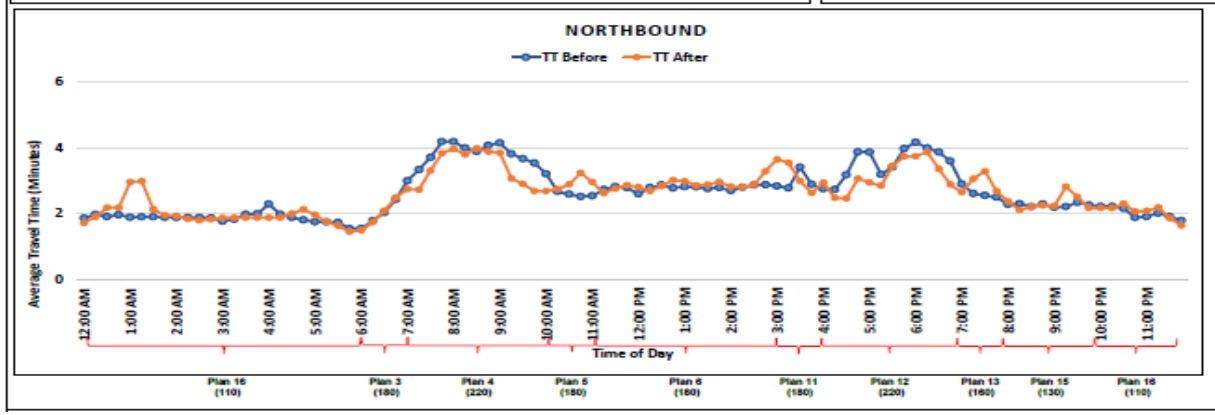


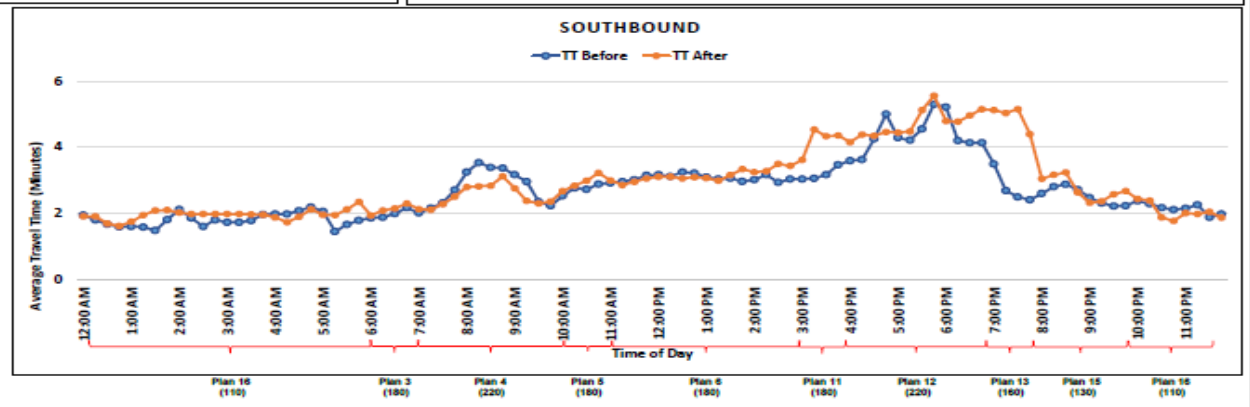












Daily Dashboards

Looking Forward : Arterial Performance Measures

Performance Measure Reporting Dashboard: Corridor Signal System

Corridor Location, SR 5/US 1: Kendall Drive to Le Jeune Road, 3.9 miles in length and 18 Traffic Signals

Coordinated Section (s)
MDC TS&S Signal Section No. 1
US 1 - Riviera Dr to SW 98 St

Functional Classification
C4-Urban General to C5-Urban Center

Key Features:
City of South Miami, City of Coral Gables
University of Miami
Dadeland Mall, The Shops as Sunset Place
MetroRail Stations

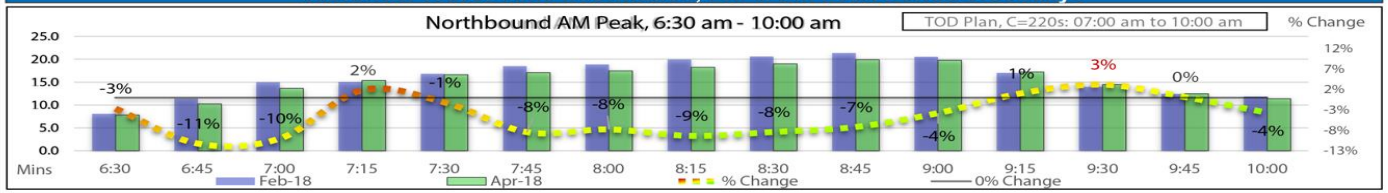
22 Signals On Corridor, 9Signals Off-Corridor

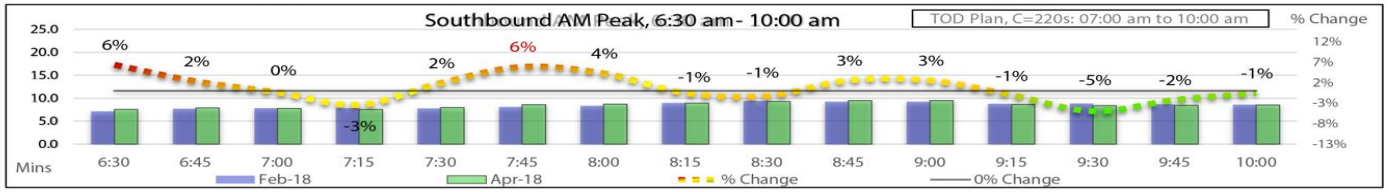
Users
Pedestrians/Bicyclists and Vehicles

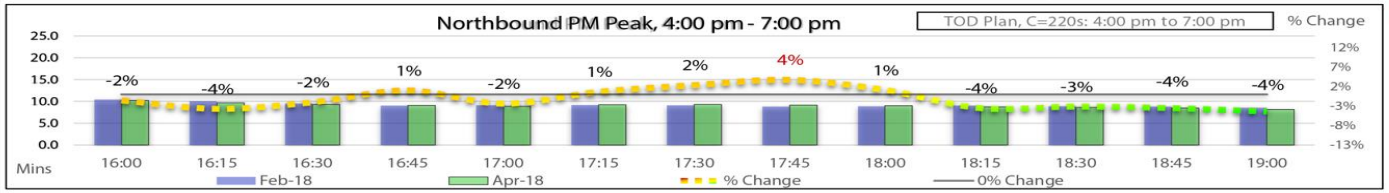
Operational Objectives
Vehicle Mobility: Capacity Allocation
Vehicle Mobility: Corridor Progression
Pedestrian/Bicyclists: Safety & Mobility

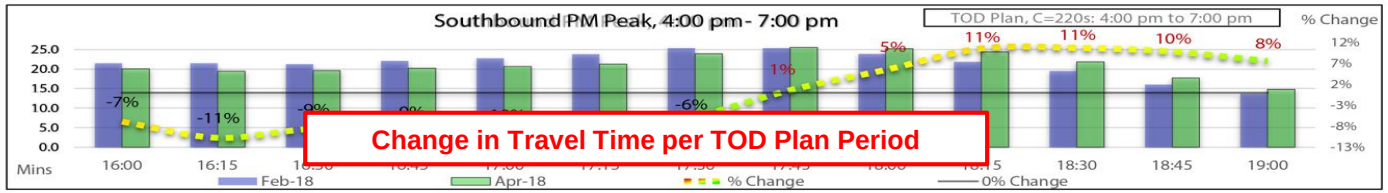
Performance Measures
Travel Time Through Corridor
Travel Time Reliability
Throughput Volumes and Delay Cost

Historical Travel Time Information, AM & PM Peak Period Weekdays





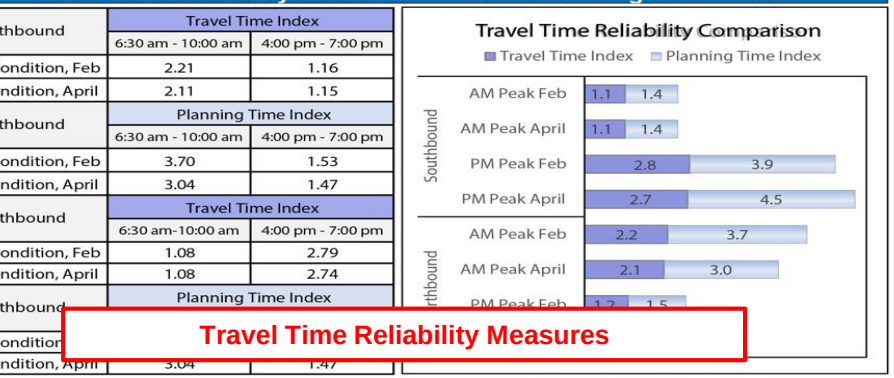




Change in Travel Time per TOD Plan Period

Travel Time Reliability: Travel Time Index & Planning Time Index

Northbound	Travel Time Index	
	6:30 am - 10:00 am	4:00 pm - 7:00 pm
Before Condition, Feb	2.21	1.16
After Condition, April	2.11	1.15
Northbound	**Planning Time Index**	
	6:30 am - 10:00 am	4:00 pm - 7:00 pm
Before Condition, Feb	3.70	1.53
After Condition, April	3.04	1.47
Southbound	**Travel Time Index**	
	6:30 am-10:00 am	4:00 pm - 7:00 pm
Before Condition, Feb	1.08	2.79
After Condition, April	1.08	2.74
Southbound	**Planning Time Index**	
Before Condition		
After Condition, April	3.04	1.47

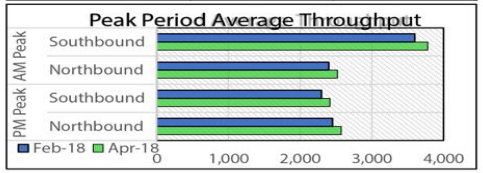


Travel Time Reliability Measures

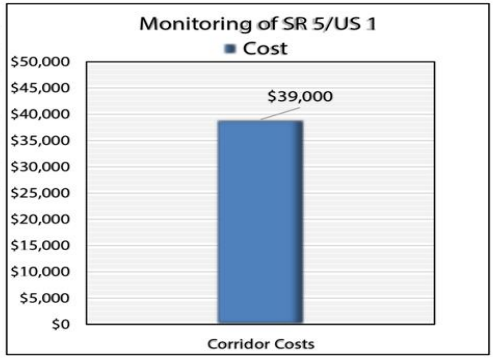
Throughput Volumes

Vehicles Per Hour (vph)	AM Peak: 6:30 am-10:00 am	
	Feb-18	Apr-18
Northbound	3,600	3,780
Southbound	2,400	2,520
Vehicles Per Hour	PM Peak: 4:00 pm-7:00 pm	

Volumes / Throughput

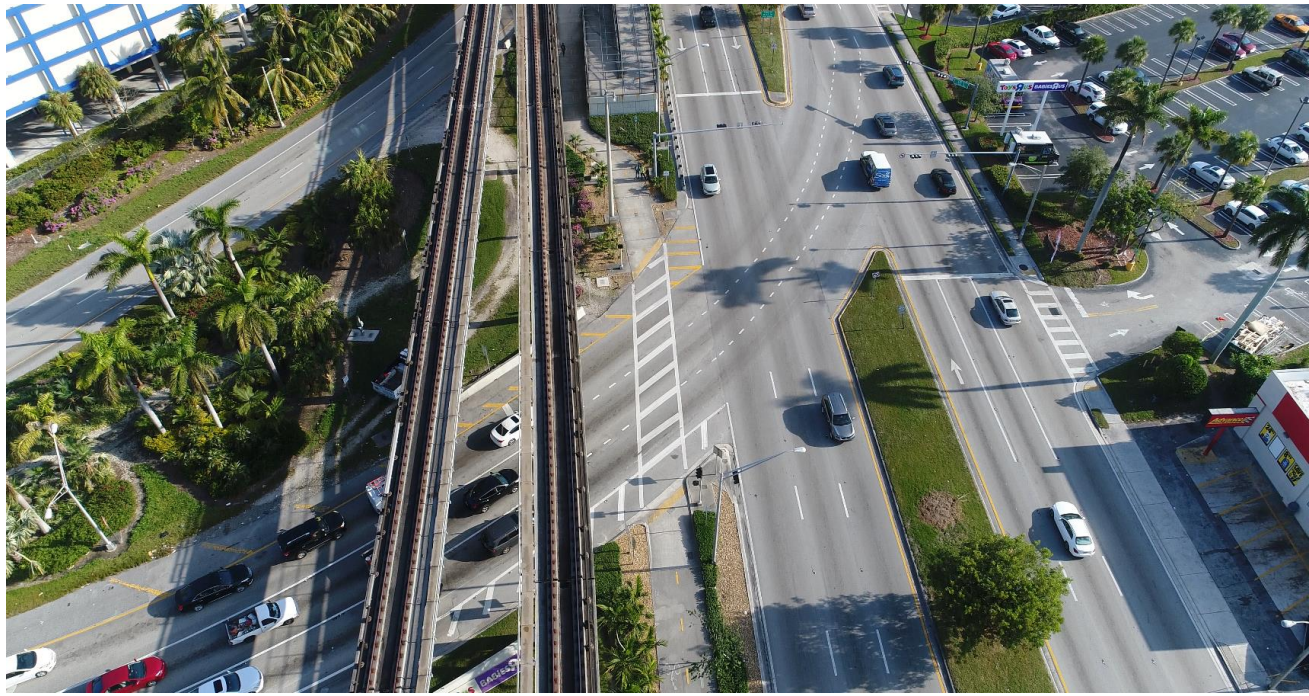


Delay Cost Comparison



Looking Forward : New Applications

- Accessing more granular corridor & intersection level data allowing for specific signal to signal link segmentation
- Integrating signal data into RITIS for study corridors/networks
- Assessing specific movement/phase operational measures at signalized intersections
- Evaluation of Special Operations
  - Expressway/Arterial Interchanges & Ramp Terminals
  - DDI Interchanges
  - Transit Corridors/ TSP



Thank You

Questions?

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Sr. Project Manager, A&P Consulting Transportation Engineers

EEspino@APCTE.com

Thank You

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Next Time: In the spotlight…

RITIS Applications for

1) MDOT US-50 Beach Congestion

2) Washington D.C. Citywide Signal Optimization & Special Event prediction, mitigation, & monitoring

Sabra & Associates

Working Groups Updates

Mark Franz, PhD
UMD CATT Laboratory
Lead Transportation Analyst

mfranz1@umd.edu

Upcoming Working Groups Meetings

- O-D/Trajectory Analytics – February 13th
- Signal Performance Measures – February 26th
- Enhanced Work Zone Analytics – February 28th

New groups starting soon!

- Transit Analytics Working Group
- TDADS (Transportation Disruption and Disaster Statistics) Steering Committee

RITIS & PROBE DATA ANALYTICS SUITE user group

What's new & what's coming

Michael Pack
UMD CATT Laboratory
Director

CATT LABORATORY

RITIS Recent Deployments

- Every Day Counts – Event Query Tool
- Update Radio Player Feeds with new API
  - Fixed a temporary bug in IE preventing radio feeds from playing
  - Send us any missing feeds
- CCTV player shows “static” images along-side streaming video in the video wall
- Updated CCTV Icons to denote which are static vs. which are streaming feeds
- Illinois Incident Data Integration
- Missouri Incident Data Integration
- Significant Trajectory (O-D) Analytics Improvements

EDC-Event Query Tool Demonstration

DEMO

Probe Data Analytics Recent Deployments

Bug Fixes

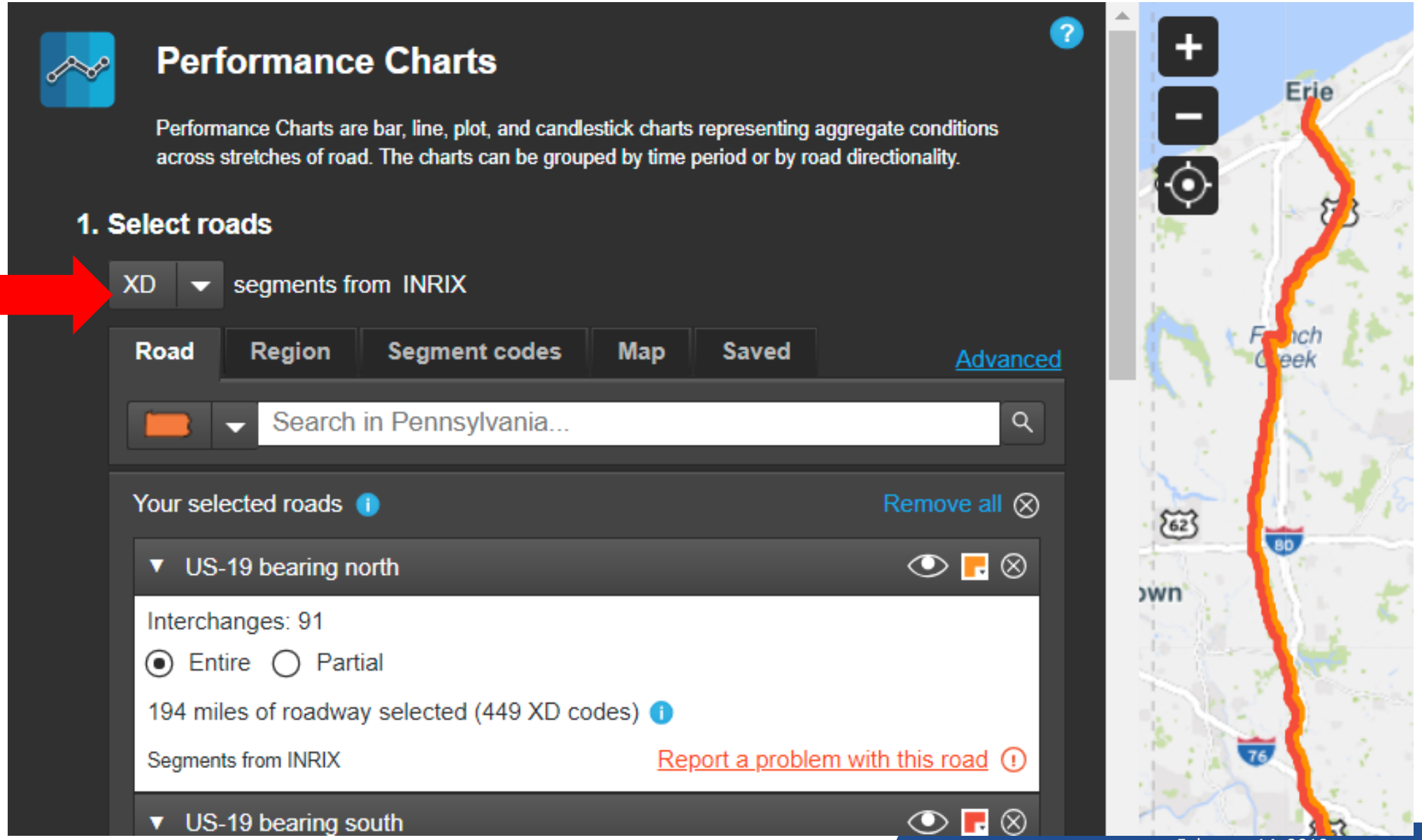
- MAP-21 side-of-road color swap
- UDC saves preferred volume data provider from prior sessions
- Fixed a crash in Bottleneck Ranking when bottlenecks are found that do not have associated geometry data.
- Performance Summaries results will not show duplicate results for requests that contain more than one set of times of days.
- MP4s exported from Trend Map can now be played in a wider range of video players.
- UDC widgets automatically refresh at the beginning of each month.

Probe Data Analytics Recent Deployments

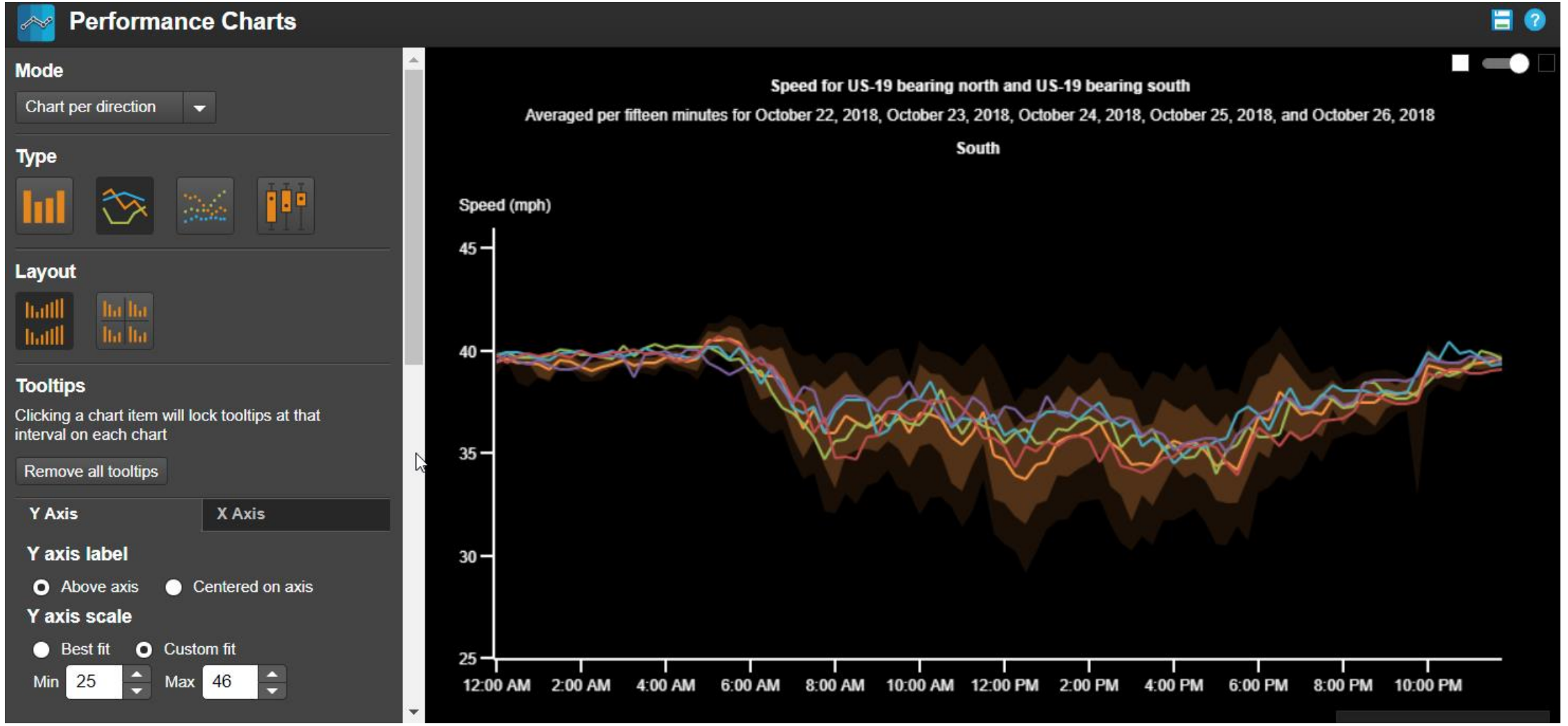
New Features

- INRIX XD (finer granularity in segment lengths)
  - in Congestion Scan
  - in Performance Summaries
  - in Performance Charts
- Two XD Signalized Arterial Analytics Tools Deployed
  - Corridor Ranking Tool
  - Travel Time Delta Ranking
- New Dashboard Widgets Deployed
  - User Delay Cost
  - Ranked Bottleneck Comparison
- Region Explorer Modernization & Enhancements (multiple)
- Major Updates to Bottleneck Ranking Algorithms
- NPMRDS multi-year conflation support
- Finer Temporal Granularity (multiple locations)

Multiple XD Enhancements



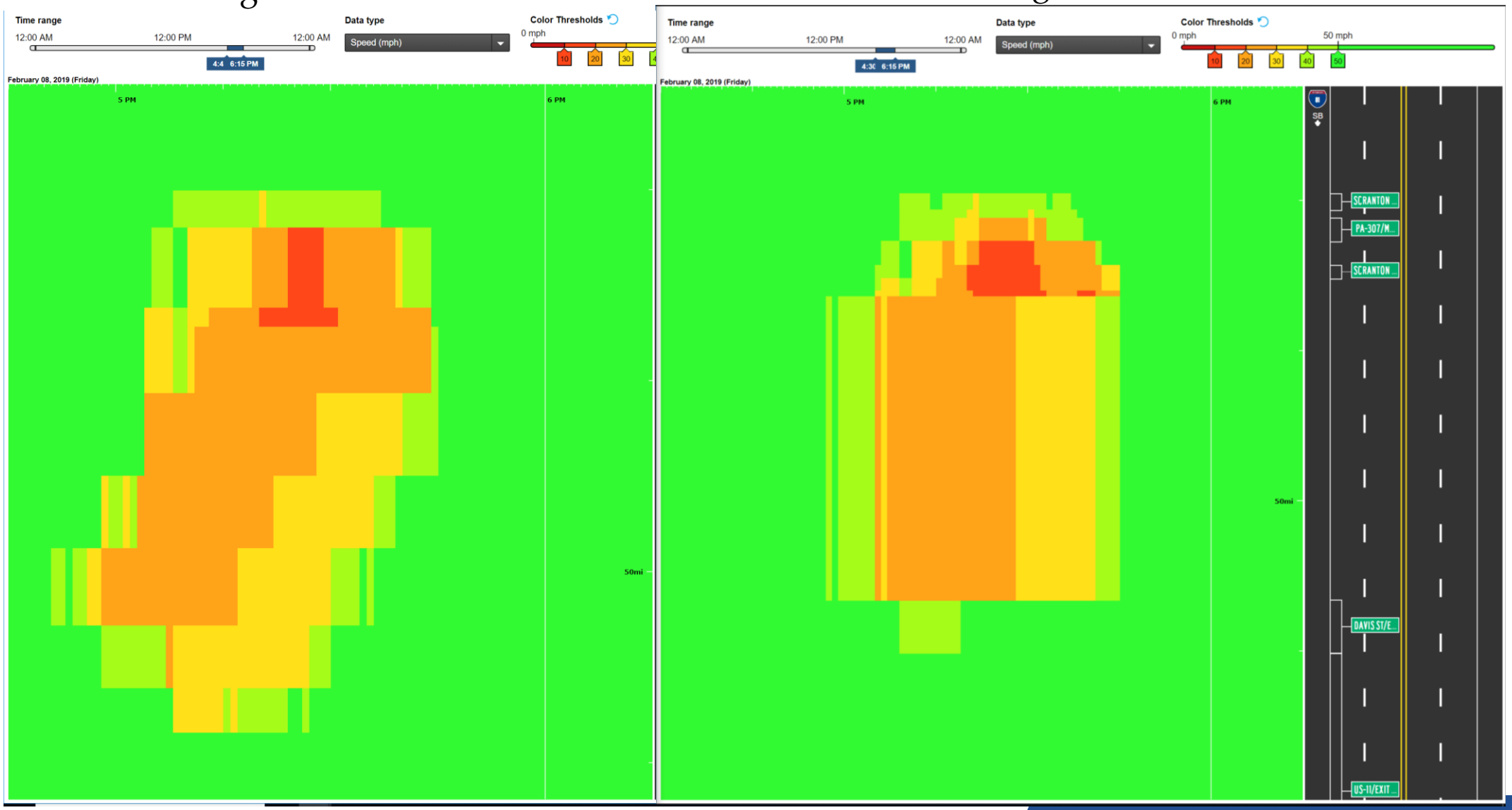
XD in Performance Charts & Summaries



XD in Congestion Scan

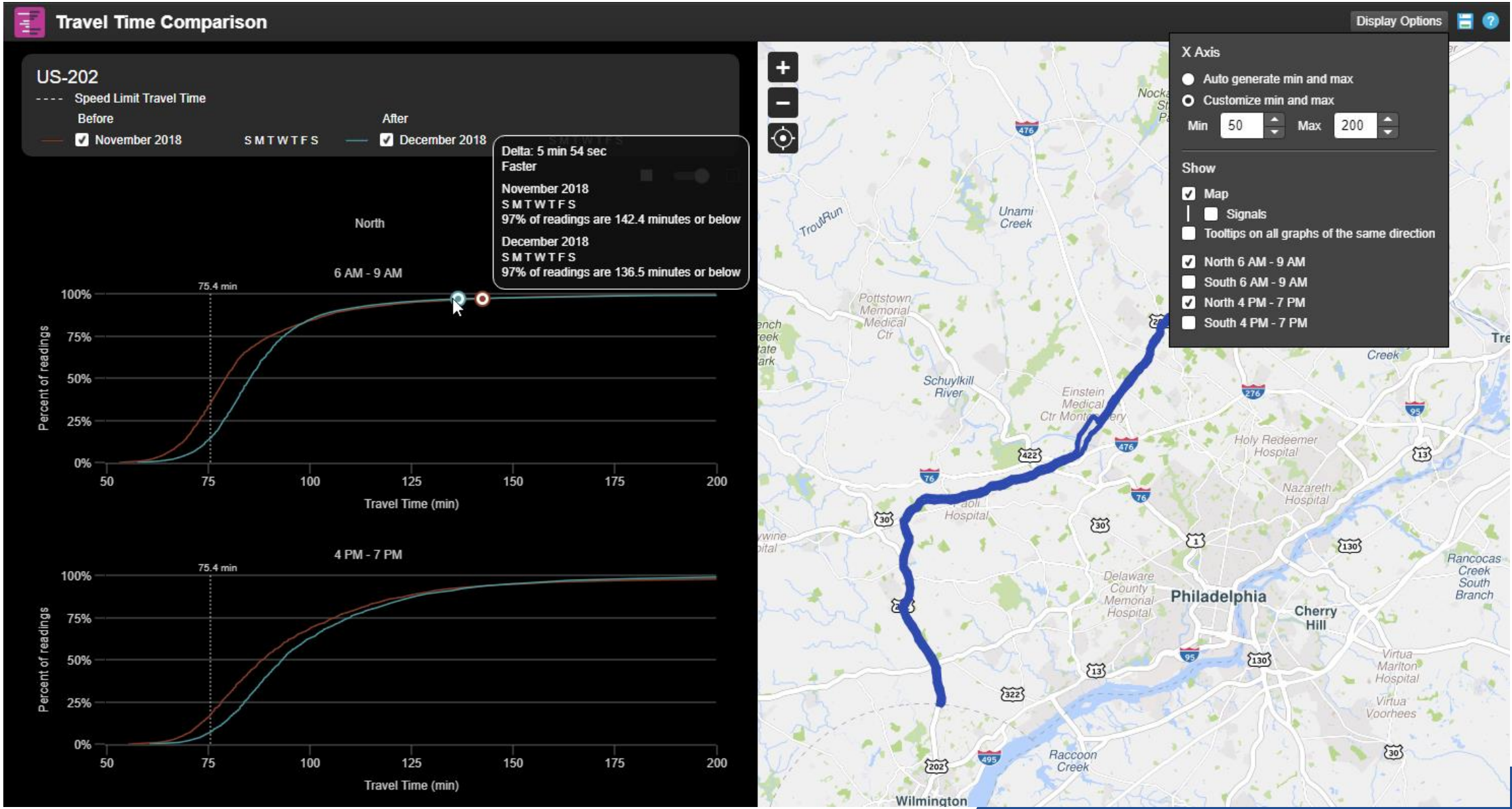
XD Segmentation

TMC Segmentation

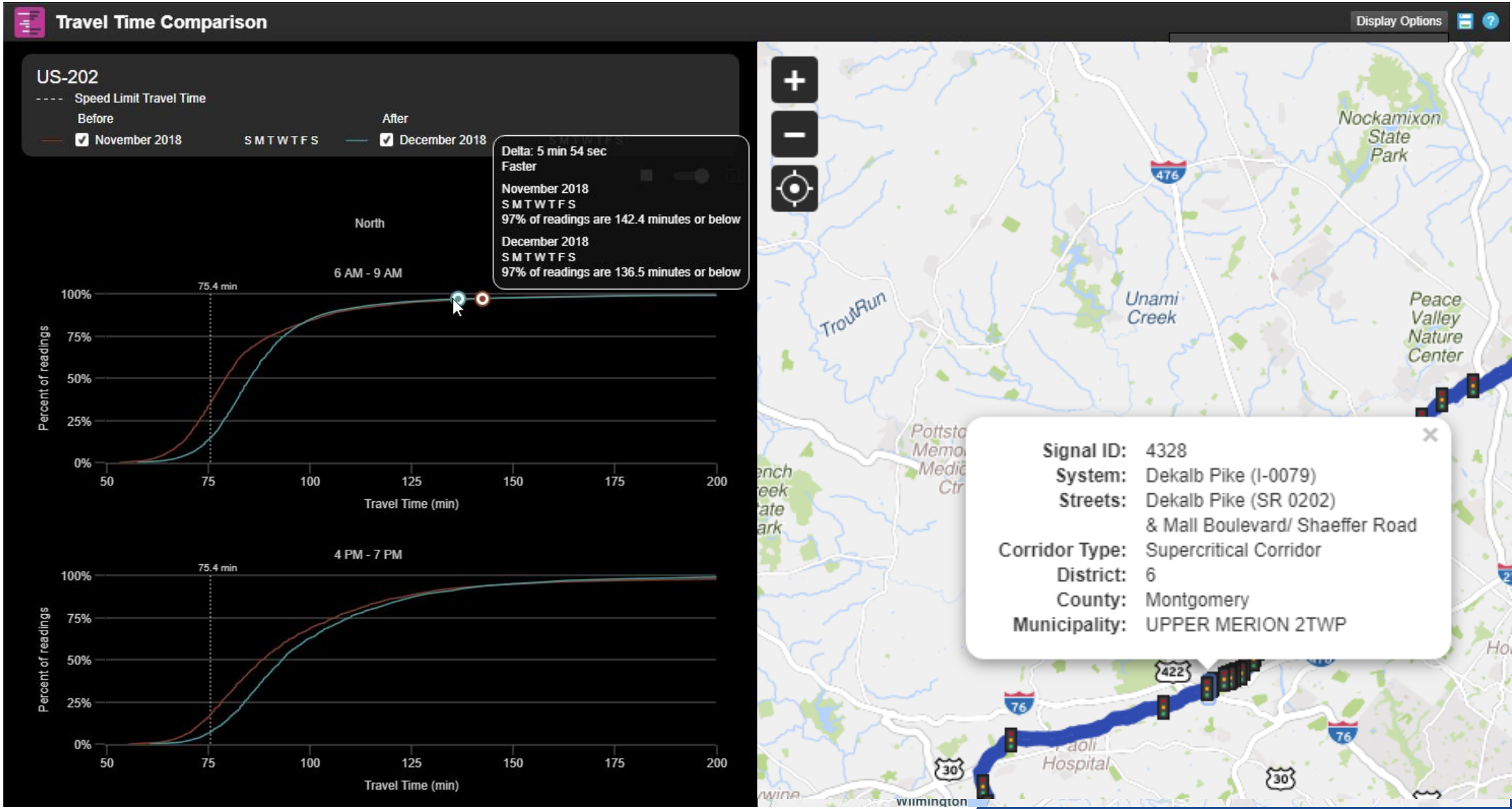


I-81 South in PA

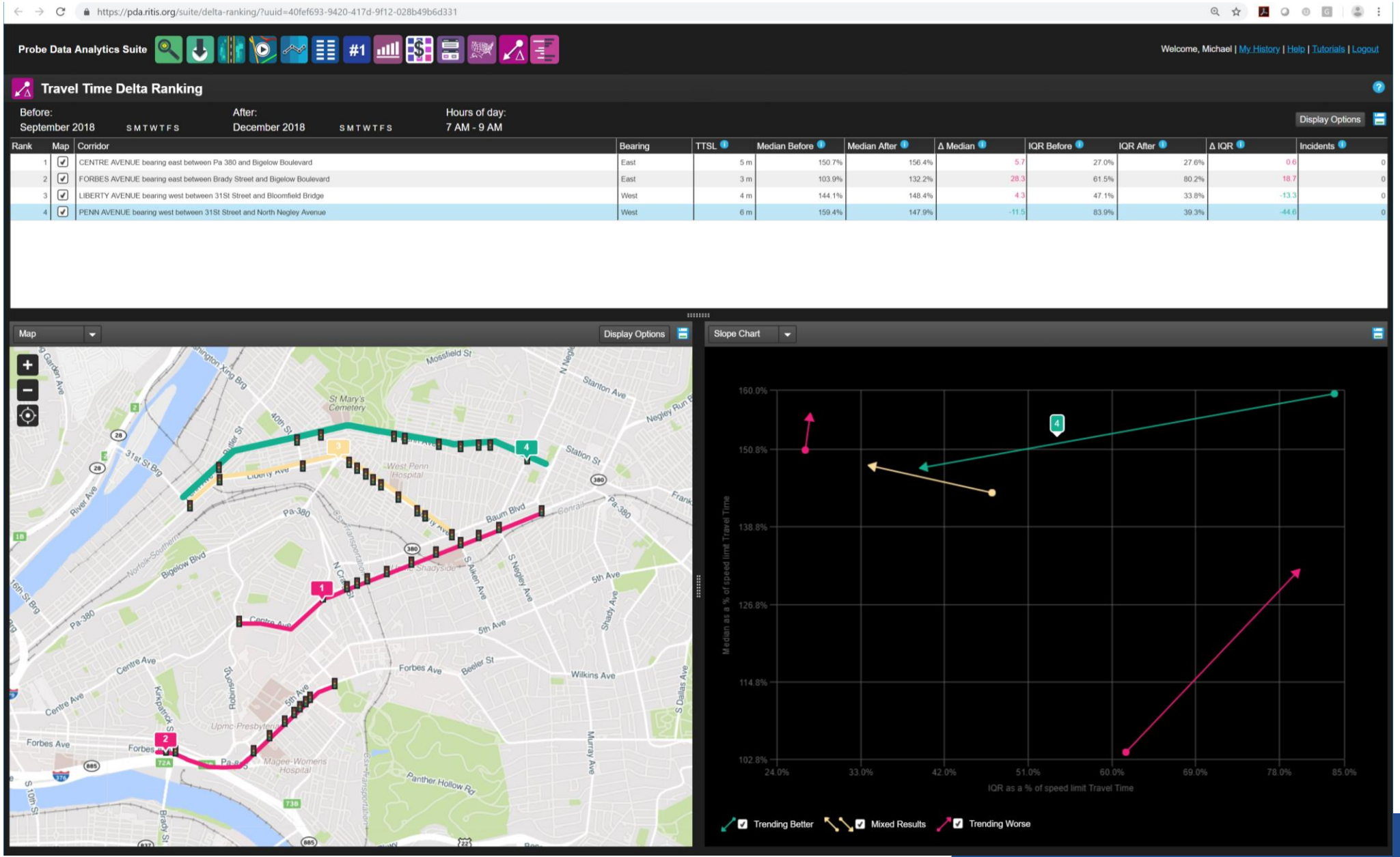
XD Travel Time Comparison Tool



XD Travel Time Comparison Tool



XD Delta Ranking Tool



Bottleneck Ranking Algorithm & HW Improvements

- Road Ordering Methodology
- Handling of Missing Data (small gaps for TMC-loss)
- Handling of Missing Data (larger gaps)

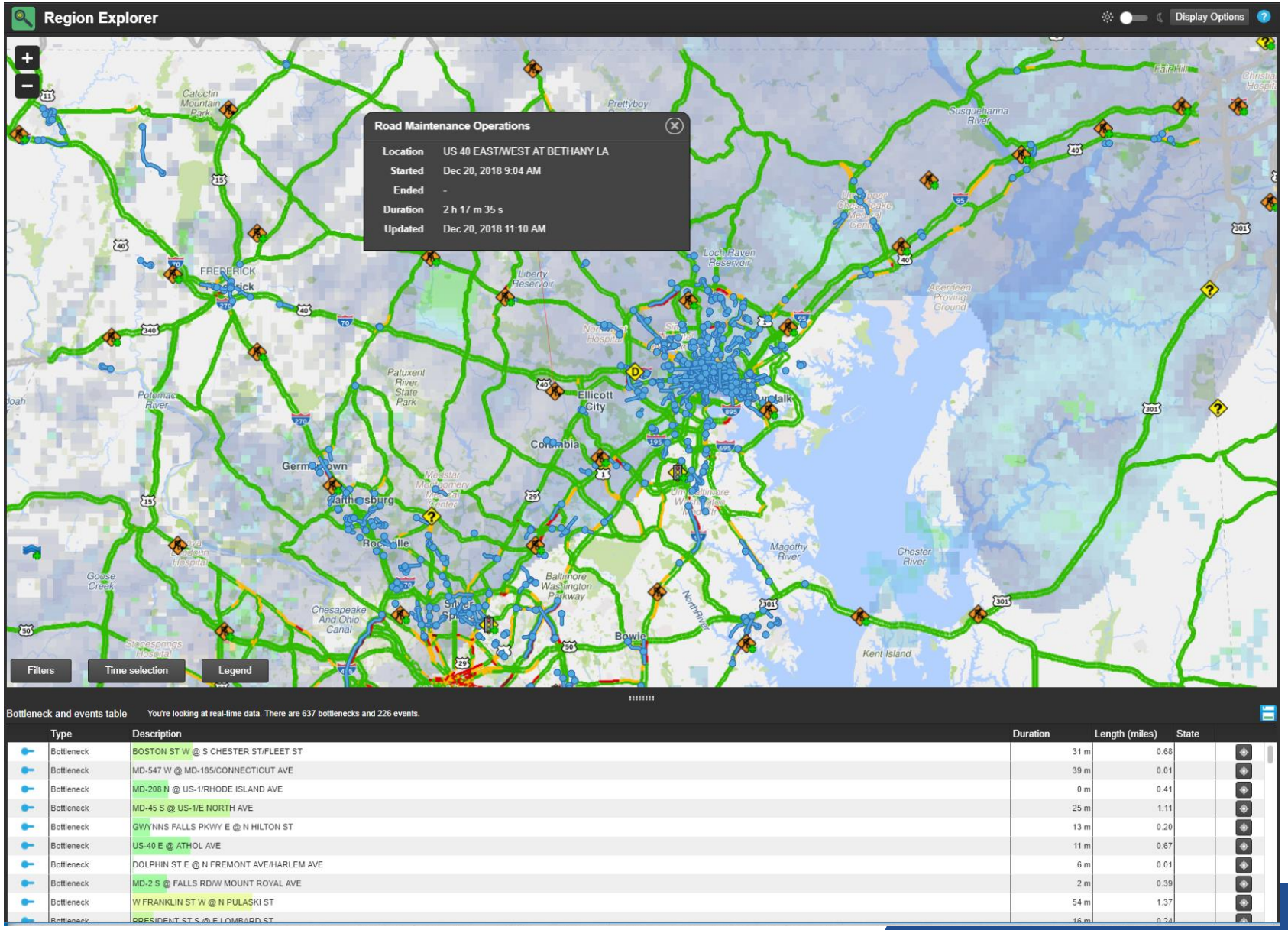
Raw data

	TMC Speeds				
Time Interval	TMC-A	TMC-B	TMC-C	...	TMC-Z
t	48	46	47		49
t+1	No data	No data	No data		No data
t+2	No data	No data	No data		No data
t+3	45	48	47		47
. . .					
T	51	51	53		52

Processed data

	TMC Speeds				
Time Interval	TMC-A	TMC-B	TMC-C	...	TMC-Z
t	48	46	47		51
t+1	47	47	47		49
t+2	46	48	47		47
t+3	45	49	47		45
. . .					
T	51	51	53		52

Region Explorer Modernization



New Dashboard Widgets

Ranked Bottlenecks Comparison

2018					Current Month	
Jan	Feb	Mar	Apr	May	June	Location
1	1	2	2	2	1	I-495 CW @ I-270 SPUR
2	2	3	3	3	2	I-495 CCW @ MD-97/GEORGIA AVE/EXIT 31
4	-	7	1	1	3	I-495 CW @ CLARA BARTON PKWY/EXIT 41
-	6	5	8	4	4	I-695 CW @ I-83/MD-25/EXIT 23
-	4	4	4	8	5	I-695 CCW @ US-40/EXIT 15
5	-	6	-	7	6	I-695 CCW @ EDMONDSON AVE/EXIT 14
7	-	-	-	10	7	I-270 S @ MD-109/EXIT 22
-	5	8	7	5	8	I-495 CW @ MD-214/CENTRAL AVE/EXIT 15
-	-	-	-	-	9	I-95 N @ MD-100/EXIT 43
-	7	9	6	-	10	I-895 N @ HARBOR TUNNEL THWY (NORTH)

Ranking 1 2 3

Using INRIX data

Updated Jun 13, 2018

NPMRDS-HPMS Conflation Updates

- https://npmrds.ritis.org/analytics/shapefiles
  - 2018 NPMRDS Network ⇔2016 HPMS/NHS
  - 2017 NPMRDS Network ⇔2015 HPMS/NHS

NPMRDS Shapefiles

NPMRDS INRIX Shapefiles

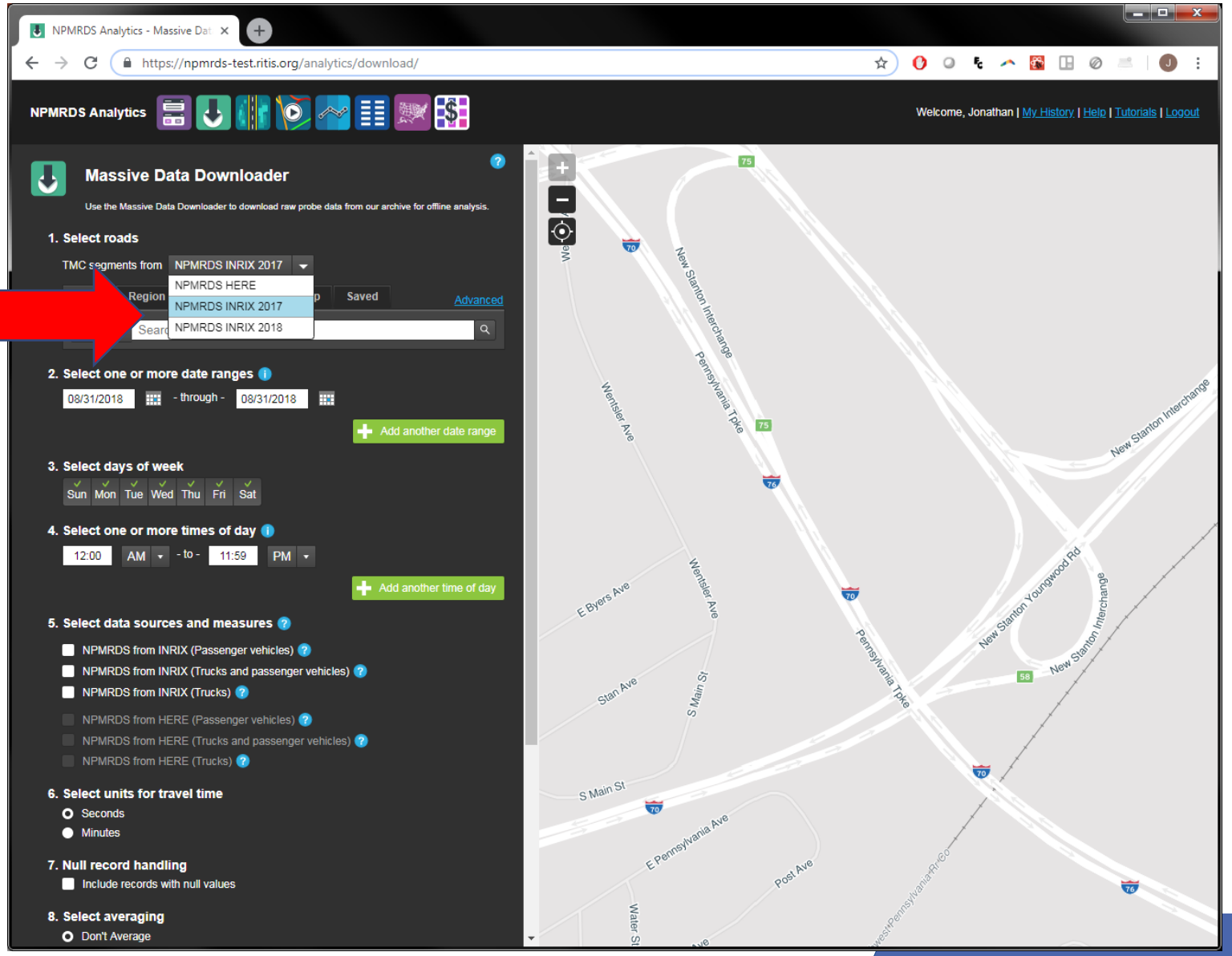
For use with NPMRDS INRIX data

Statewide Shapefiles

State	Conflation year	
	2017 (January 1, 2017 - December 31, 2017)	2018 (January 1, 2018 - present)
Alabama	Download (3.8MB)	Download (3.5MB)
Alaska	Download (1.8MB)	Download (1.7MB)
Arizona	Download (2.3MB)	Download (2.2MB)

NPMRDS Conflation Updates

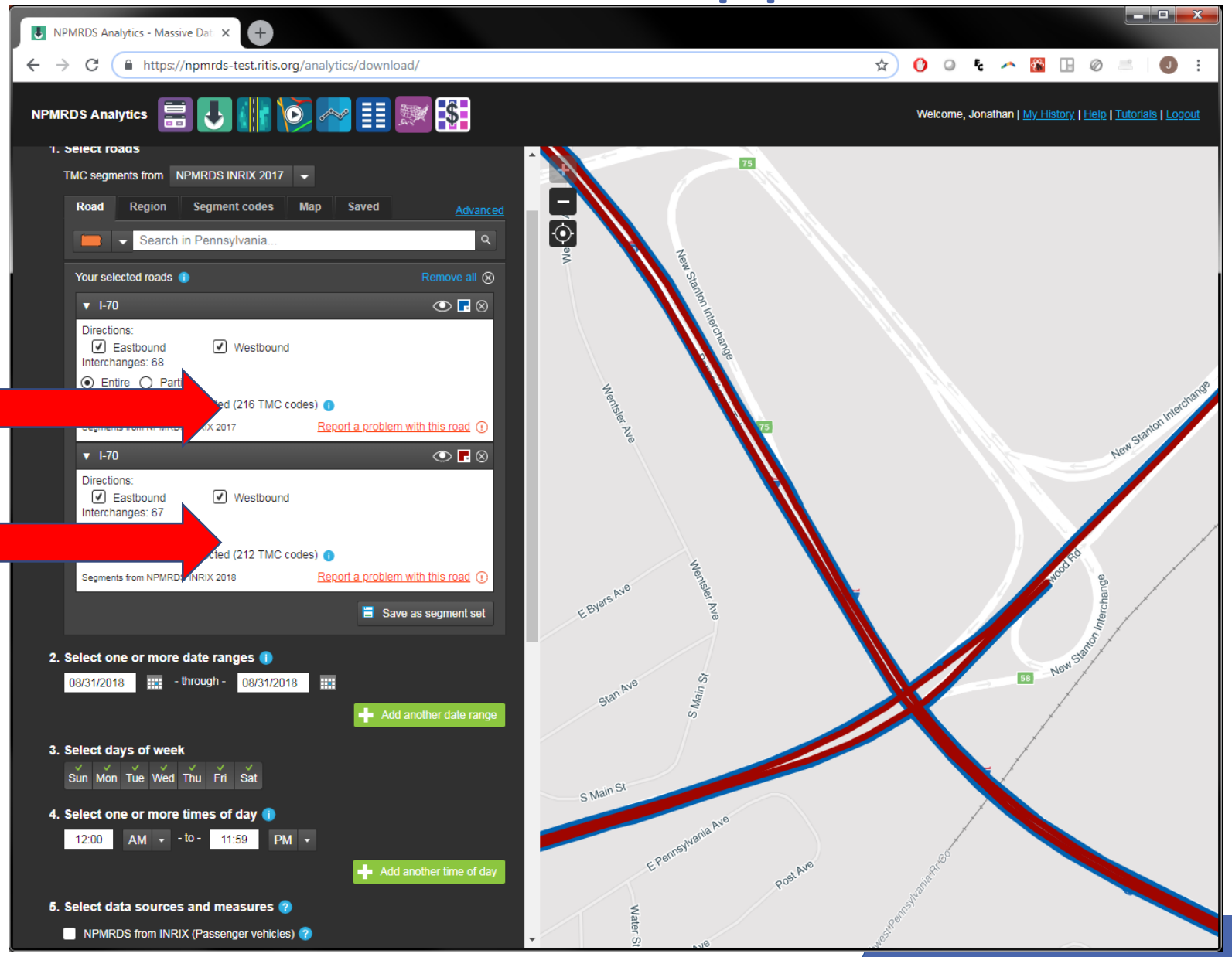
*New! The ability to switch between 2017 and 2018 conflations on the Massive Data Downloader



NPMRDS Conflation Support Continued

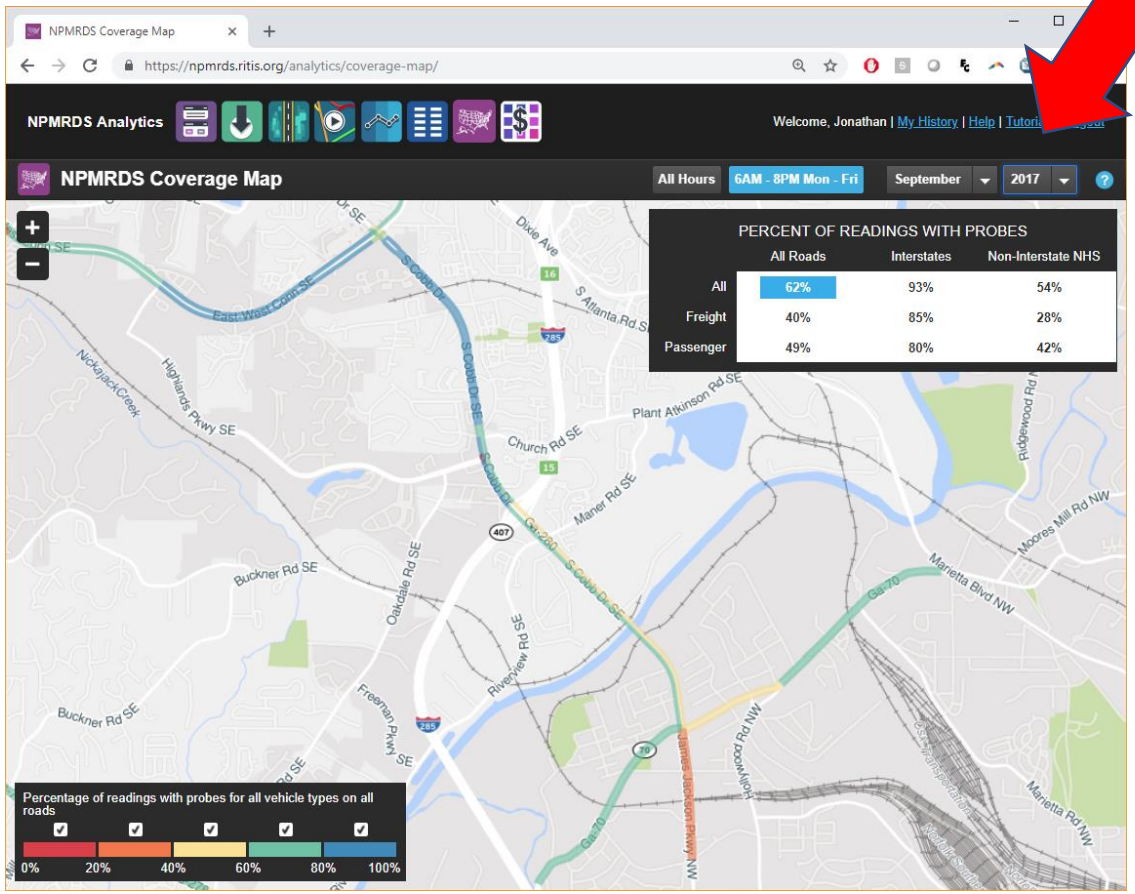
Compare NPMRDS NHS roads from different conflations.

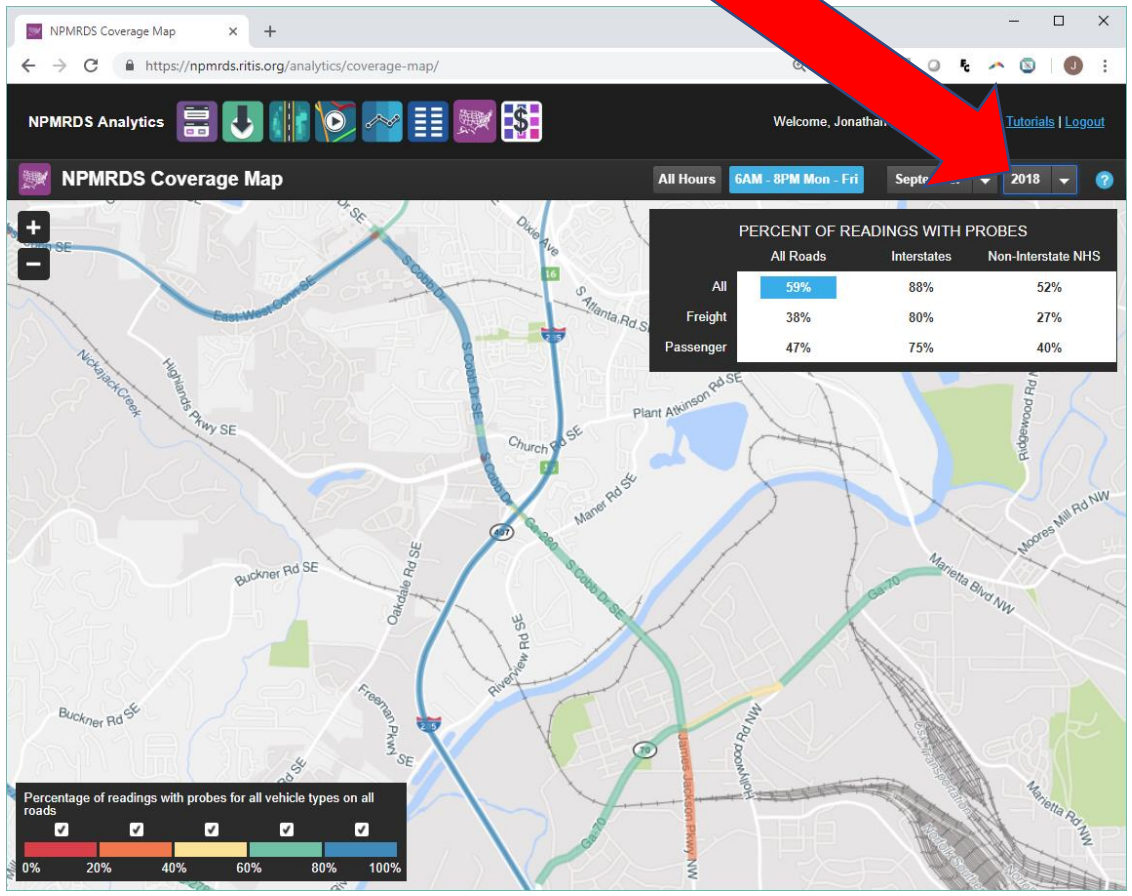
Note: Let us know if you see any issues: npmrds@ritis.org.



NPMRDS Conflation Updates

See coverage percentages for 2017 and 2018.

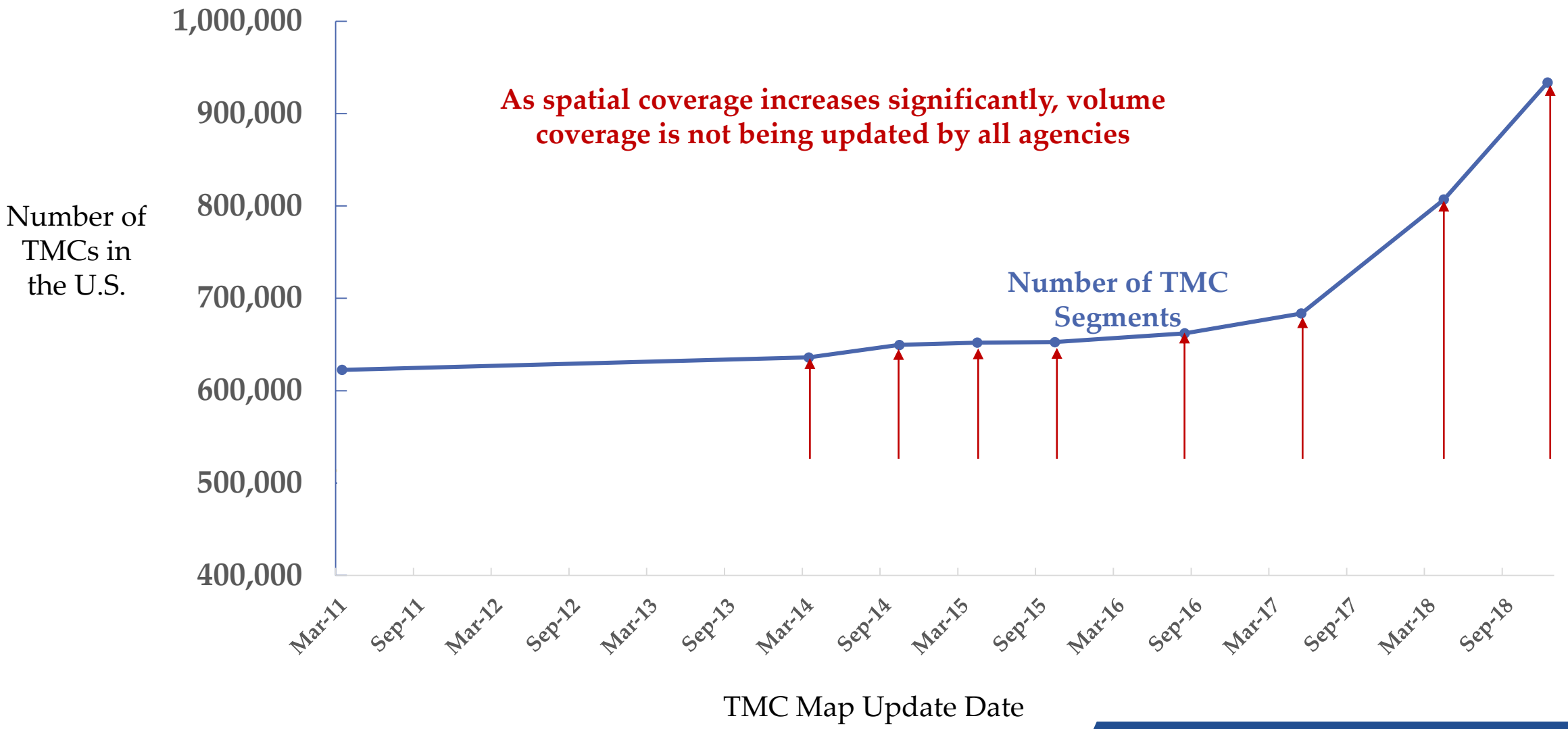




Important Update on Volume Data (slide 1)

- In 2011, INRIX donated a national volume dataset to all Coalition probe data purchasing members. INRIX worked with Texas A&M to create this data set.
- This was a **one-time donation**
- Most agencies have been using this data set for User Delay Cost (UDC) calcs
- Except for one or two agencies, most are NOT providing UMD with updated volumes every year.
- Why does this matter?
  - Volumes change over time
  - TMCs are retired
  - New TMCs are added
- How big of a problem is this?

Important Update on Volume Data (slide 2)



Important Update on Volume Data (slide 3)

- What can be done about this?

1. You can provide us your own volume (preferably annually) in the format described here: https://pda.ritis.org/suite/help/#udc-analysis/preferred-volume-format

AADT Sample Data

AADT	Year	TMC	Comm %
9580	2009	108-04996	28
9912	2010	108-04996	28
9544	2011	108-04996	29
29300	2009	108+04457	5
29050	2010	108+04457	5
27500	2011	108+04457	6

Time Bins Sample Data

Volume	Time Bin	Day of Week	TMC	Comm %
536	0	0	108+04918	7
578	1	0	108+04918	7
590	2	0	108+04918	7
678	3	0	108+04918	7

2. You could have us replace old volume data with that from the NPMRDS/HPMS conflation exercise (though that won't fix EVERY problem, and will only improve the NHS)

3. The Coalition is working with researchers UMD and NREL on a volume estimation project to produce higher quality volume estimation beyond that which conflation can produce. Doing this for your state would require funding and coordination as it is a data intensive effort.

4. You can work with your probe data provider to get new volumes (they will likely reach out to UMD or Texas A&M to get an updated volume set). This will cost money.

Work in Progress

- Additional EDC Work
- Bottleneck Ranking Modernization (Flash migration)
- Detector Analytics Modernization (Flash migration)
- Dashboard Widgets
  - Reliability
  - Incidents & Event Comparisons
- MAP-21 / NPMRDS Enhancements

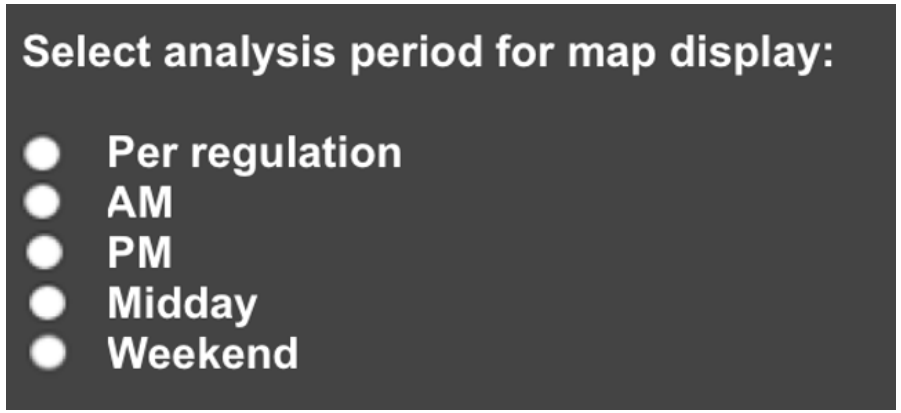
RITIS

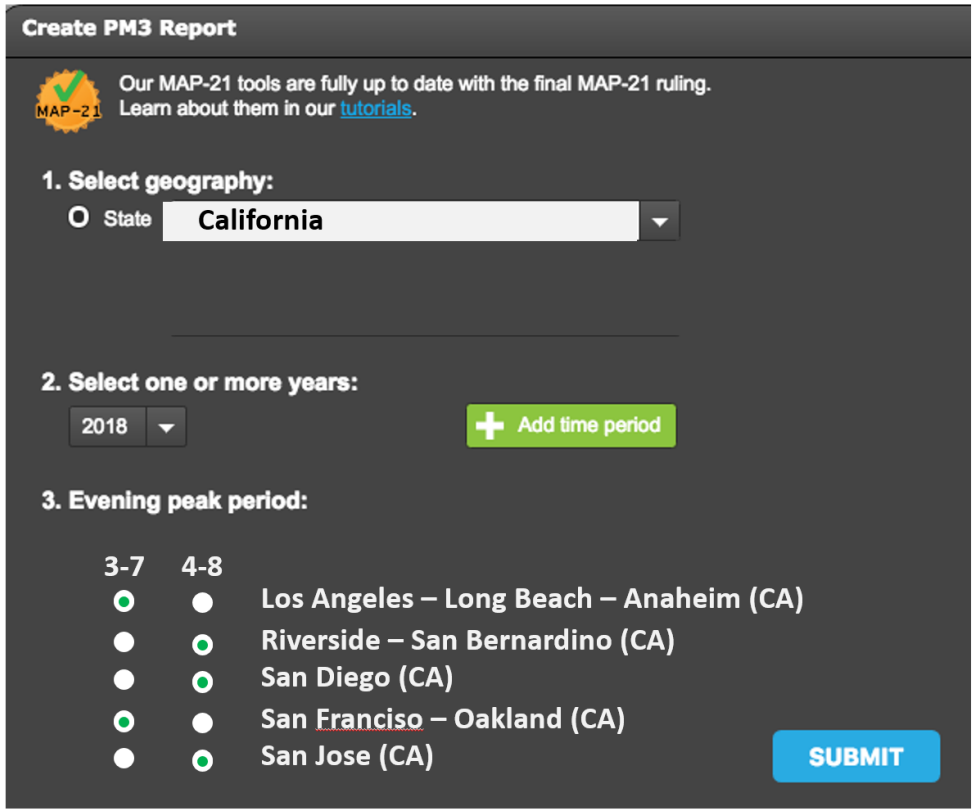
PROBE DATA ANALYTICS SUITE

u s e r g r o u p

New PM3 Analysis Options being Added

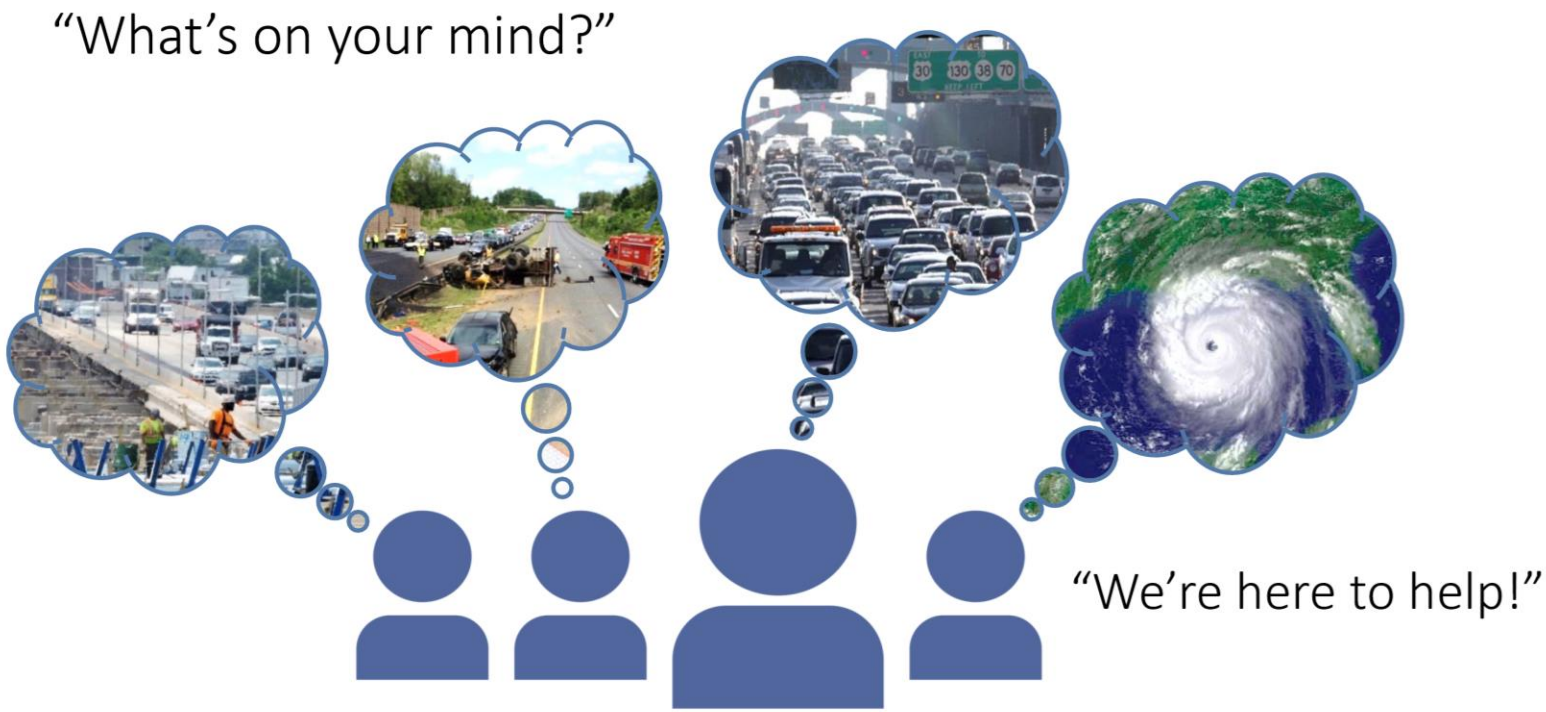
- Deep-dive Analytics users have been brainstorming new features/functionality including:
  - Mixing peak periods per UZA
  - Sub-UZA selections (useful for multi-state UZAs)
  - Built-in Sensitivity Analysis
  - Non-standard reports
  - MAP-21/PM3 reporting on non-NHS segments
  - Other reporting/visualization tools to aid in target setting and long-term planning
  - Etc…





Your Input is Needed!

- 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 chat box below, or with an email to support@ritis.org



Agency Input Session

"What's on your mind?"

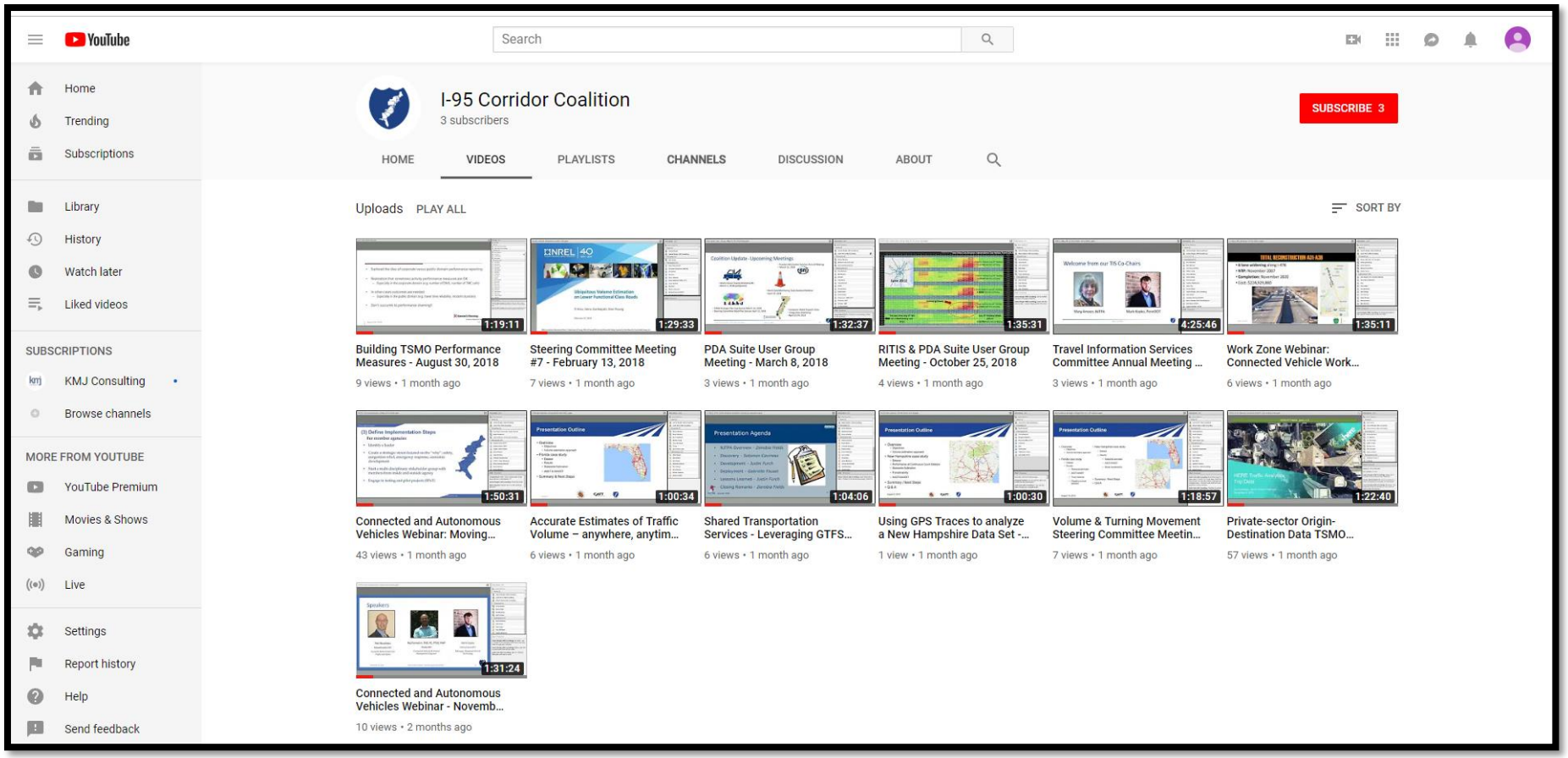
Wrap Up

Denise Markow, PE, I-95 Corridor Coalition

TSMO Director

Visit the I-95 Corridor Coalition YouTube Channel

https://www.youtube.com/channel/UC4ySXvd1ht4KE4dR1Az7geA



Questions?

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thank you!

CATT LABORATORY