PROBE DATA ANALYTICS SUITE

RITIS &

u s e r g r o u p

July 19, 2018

Webcast and Audio Information

- The call-in phone number is:

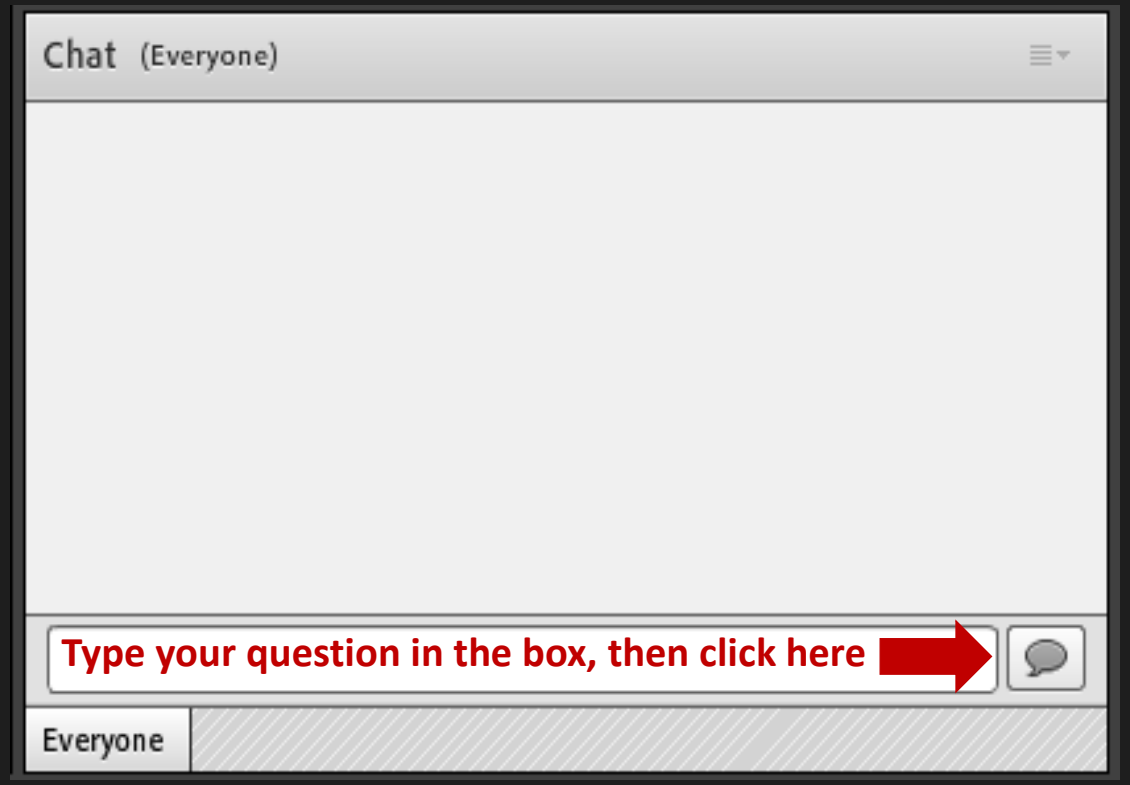
  719-867-1571 & enter 725437# at the prompt

- Due to the number persons participating in the meeting, we will be muting participant lines as you enter until the Agency Input Session.
- Please call 609-970-2584 for difficulties with the web or audio application
- Please press *0 to speak to an operator for questions regarding audio
- This web meeting is being recorded
- **All materials will be available to participants after the web meeting**

Asking Questions

While muted…

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

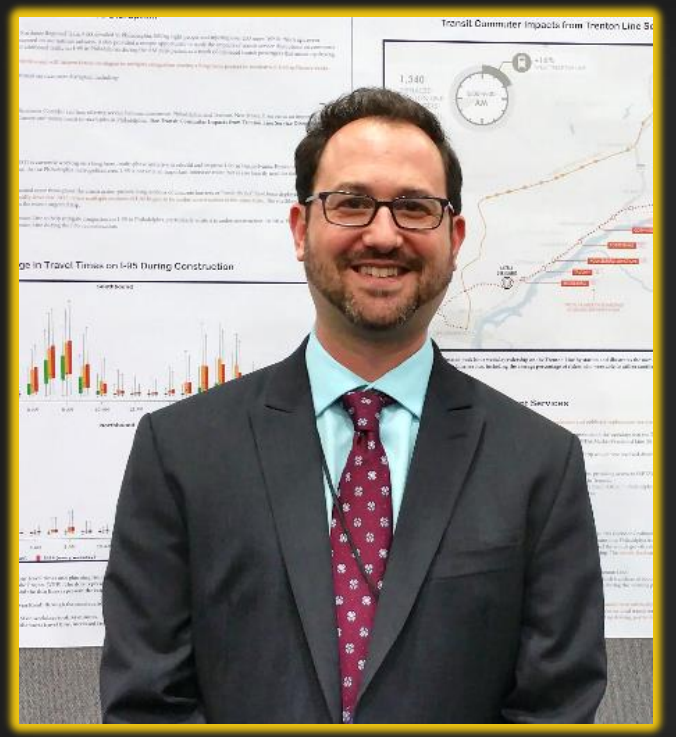


Welcome

Co-chair

Jesse Buerk, DVRPC

User Group Co-chair



Participating Agencies

Agency				
Anne Arundel County office of Transportation	CORE MPO	Loudoun County Government Mapping	New Hampshire DOT	South Carolina DOT
Baltimore Metropolitan Council	DCHC MPO	Maine DOT	New Jersey DOT	South Jersey Transportation Planning Organization
Central Shenandoah Planning District Commission	Delaware Valley Regional Planning Commission	Manatee County - Public Works Dept & Government	New Jersey Institute of Technology	TRANSCOM
Charles County Sheriff's Office	District DOT	Maryland DOT/SHA	New York State DOT	UMD CATT
Chittenden County, Vermont	FHWA	Maryland Transportation Authority	NJTPA	UMD CATT Lab
City of Alpharetta	Florida DOT	MetroCOG	North Carolina DOT	University of Florida
City of Arlington	Florida Turnpike Enterprise	MetroPlan Orlando	Northern Virginia Transportation Authority	University of Virginia
City of Boca Raton	Gainesville Hall MPO	Miami Dade County	Pennsylvania Turnpike Commission	University of South Florida
City of Charlotte (NC)	Georgia DOT	Missouri DOT	Pennsylvania DOT	Vermont AOT
City of Philadelphia	I-81 Corridor Coalition	Montgomery County OEM (MD)	Pennsylvania State Police	Virginia DOT/VTRC
City of Tallahassee (FL)	I-95 Corridor Coalition	Montgomery County Planning Commission (PA)	Pinellas County	
Connecticut DOT	INRIX	Metropolitan Washington Council of Governments	Prince George's County OEM	

Topics for today

- Coalition Update
- Spotlight Presentation from PennDOT on Signalized Corridor Performance Measures in the PDA Suite
- Spotlight Presentation on WAZE Probe Data Analysis for Coalition States
- Description of new features and other recent updates
- Introduction of new States participating in RITIS and the PDA Suite
- New Feature Development Roadmap update
- Agency Feedback Session
- New on-site Training Opportunities
- Wrap-up / Next Meeting

Introductions

Denise Markow, PE
I-95 Corridor Coalition
Director

Michael Pack
UMD CATT Lab
Director

Daniel Farley
PennDOT
Section Chief, Traffic Operations Deployment & Maintenance Section

Mark Franz, PhD
UMD CATT Lab
Lead Transportation Analyst

PROBE DATA ANALYTICS SUITE

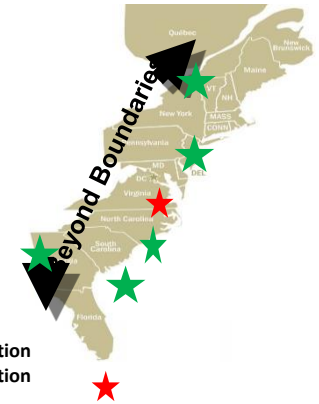
Coalition Update

Denise Markow, PE
I-95 Corridor Coalition
Director

Coalition Quarterly Update – Recent Meetings

- ✓ **Probe Data Analytics Suite User Group Meeting** – March 8, 2018
- ✓ **TSMO Summit** – March 14, 12018
- ✓ **Travel Information Services Committee Meeting** – March 15, 2018
- ✓ **Intermodal/Freight Committee Web Meeting** – March 21, 2018
- ✓ **I-95 CC Steering Committee Web Meeting** – March 12, 2018
- ✓ **Work Zone Webinar** – April 19, 2018
- ✓ **Computer Aided Dispatch Data Integration Workshop –** April 23-24, 2018
- ✓ **CAV - Moving Forward along the East Coast Webinar** – May 15, 2018
- ✓ **Webinar on Accurate Estimates of Traffic Volume Anywhere, Anytime - from GPS Probe Samples** – May 23, 2018
- ✓ **Integration of Maine Tow Operators into Maine Incident Management Workshop** – June 8, 2018
- ✓ **Bi Annual Validation Meeting** – June 18, 2018
- ✓ **Shared Transportation Services - Leveraging GTFS with Regional Partners Webinar** – June 20, 2018

PROBE DATA ANALYTICS SUITE
user group

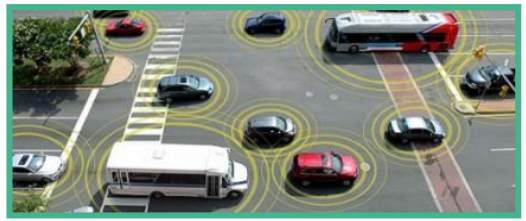


Coalition Quarterly Update
July-August-September Upcoming Meetings

- **Volume and Turning Movement Webinars**
  - **Georgia** – July 2, 2018
  - **Florida** – July 9, 2018
  - **New Hampshire** – August 8, 2018
  - **Volume and Turning Movement Steering Committee** – August 16, 2018
- **TSMO Dashboard Webinar**

  Building TSMO Performance Measures – August 30, 2018

  Internal Performance Reporting & Public Dashboard Consumption
- **Summit on Traveler Info Strategies during Emergency Operations**
  - **Getting the Word Out to the Public** – September 13, 2018
- **Connected Vehicle Webinar: Member State Roadmap Showcase** – September 2018



In the spotlight…

Enabling Signalized Arterial Performance Measures Comparisons

Dan Farley
Section Chief
Traffic Operations Deployment and Maintenance

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Daniel P. Farley
Section Chief
Traffic Operations Deployment and Maintenance

dfarley@pa.gov
717-783-0333

PennDOT's investment in the Probe Data Analytics Suite to enable Signalized Arterial Performance Measures Comparisons

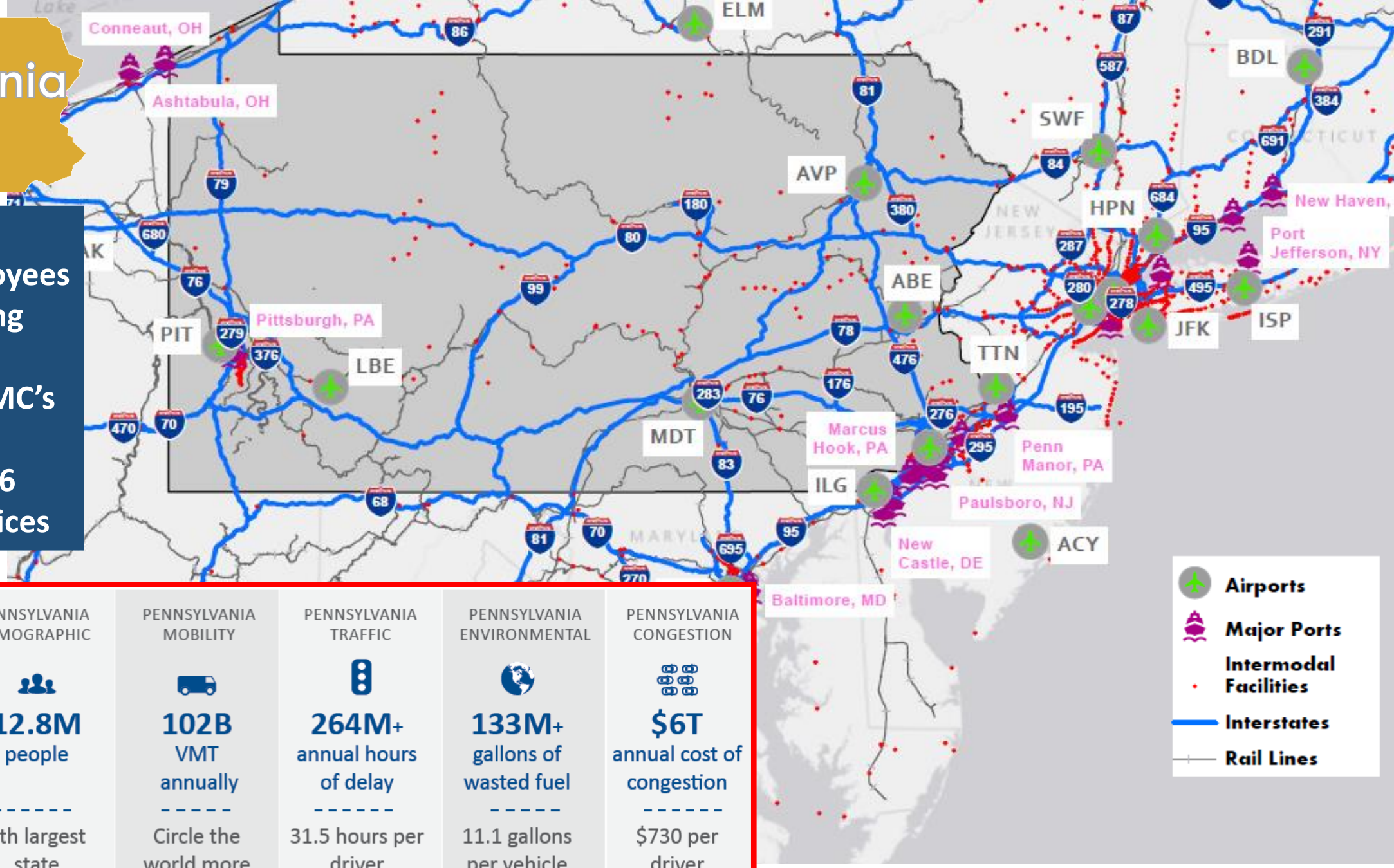
I-95 Corridor Coalition Traffic Signal and Arterial Performance Metric Webinar

July 19, 2018

Pennsylvania Facts

PennDOT

- 11,500 – Employees
- 11 – Engineering Districts
- 4 – Regional TMC's
- 52,000+ Events in 2016
- 1,700+ ITS Devices



PENNSYLVANIA INFRASTRUCTURE	PENNSYLVANIA DEMOGRAPHIC	PENNSYLVANIA MOBILITY	PENNSYLVANIA TRAFFIC	PENNSYLVANIA ENVIRONMENTAL	PENNSYLVANIA CONGESTION
40K mi of state-owned roadway	**12.8M** people	**102B** VMT annually	**264M+** annual hours of delay	**133M+** gallons of wasted fuel	**$6T** annual cost of congestion
5th largest nationally	6th largest state	Circle the world more than 4M times	31.5 hours per driver	11.1 gallons per vehicle	$730 per driver

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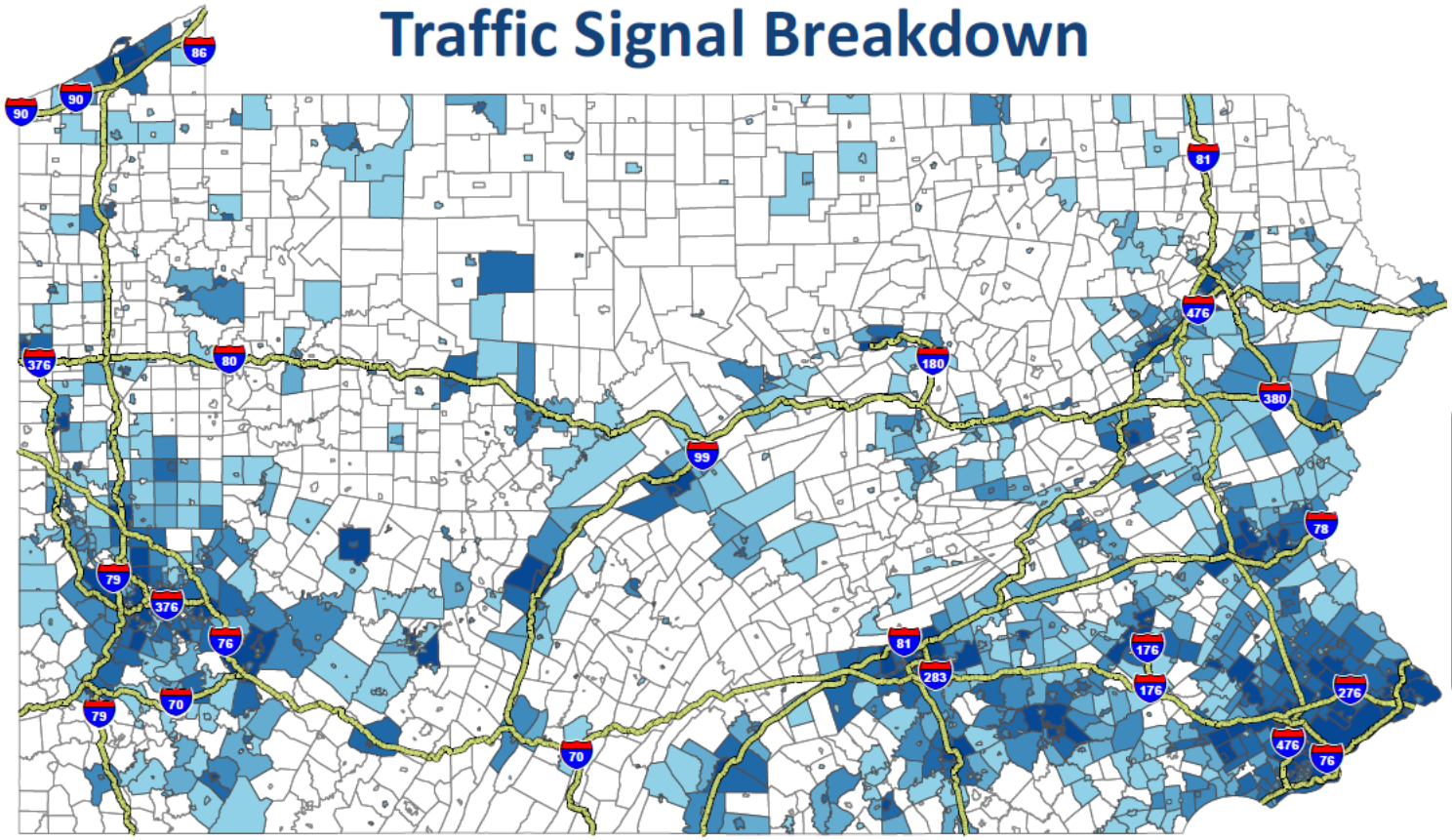
Current Traffic Signal Ownership in Pennsylvania

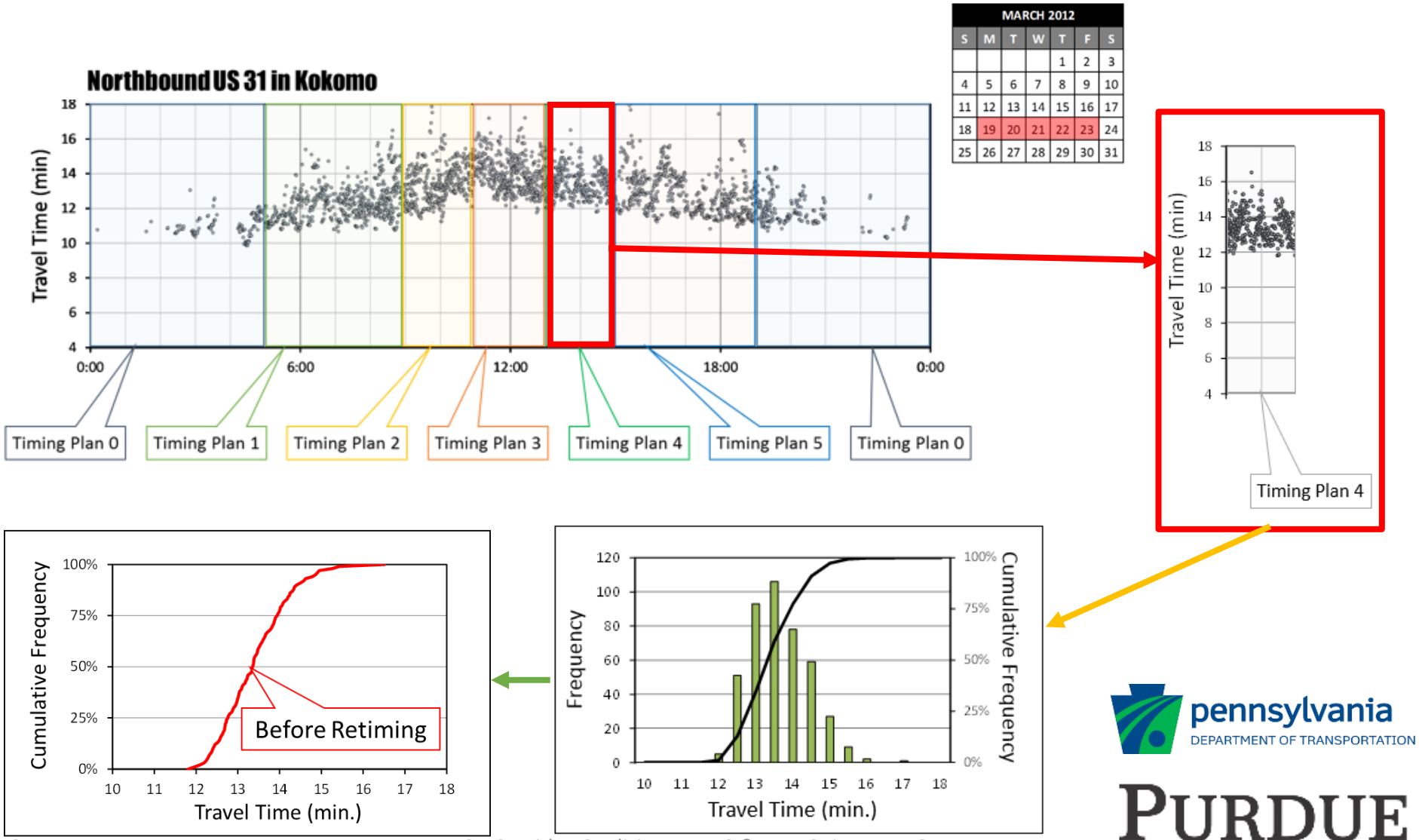
- 13,581 traffic signals in Pennsylvania
- 1,153 municipal traffic signal owners



75% of municipalities own under 10 traffic signals
80%+ of signals are maintained by contractors
10,500 (77%) traffic signals are on state highways

1 Travel Time Comparison Tool

Cumulative Frequency Diagram (CFD)



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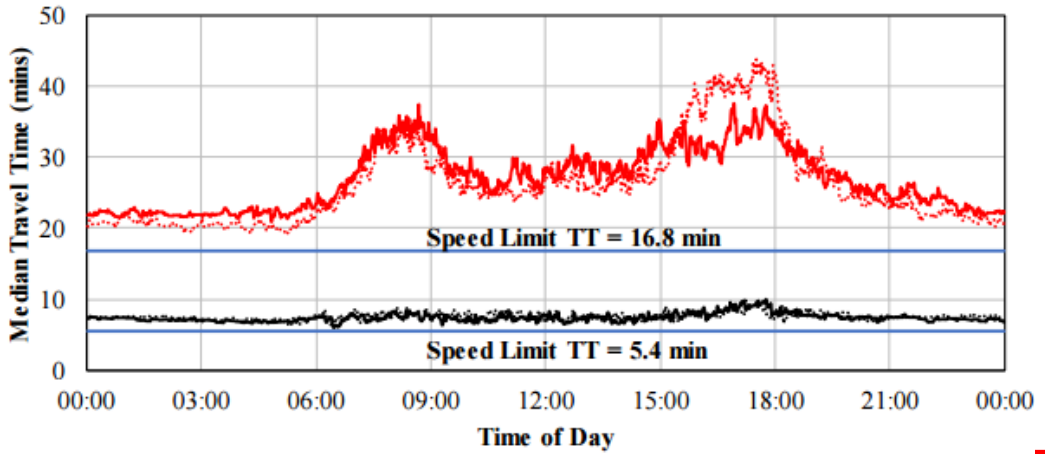
2 Arterial Ranking Tool

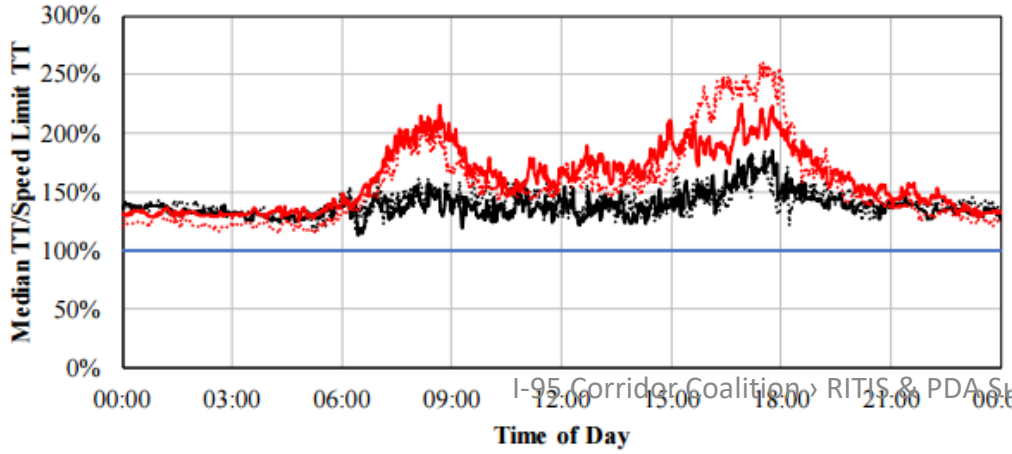
Travel Time Normalization

*Median travel time and speed limit travel time on **Newtown Bypass (shown in black)** and **US-1 (shown in red)** for the study period 12/5/2016 to 12/10/2016*



Normalize

$$\text{Normalized TT} = \frac{\text{Median TT}}{\text{Speed limit TT}}$$



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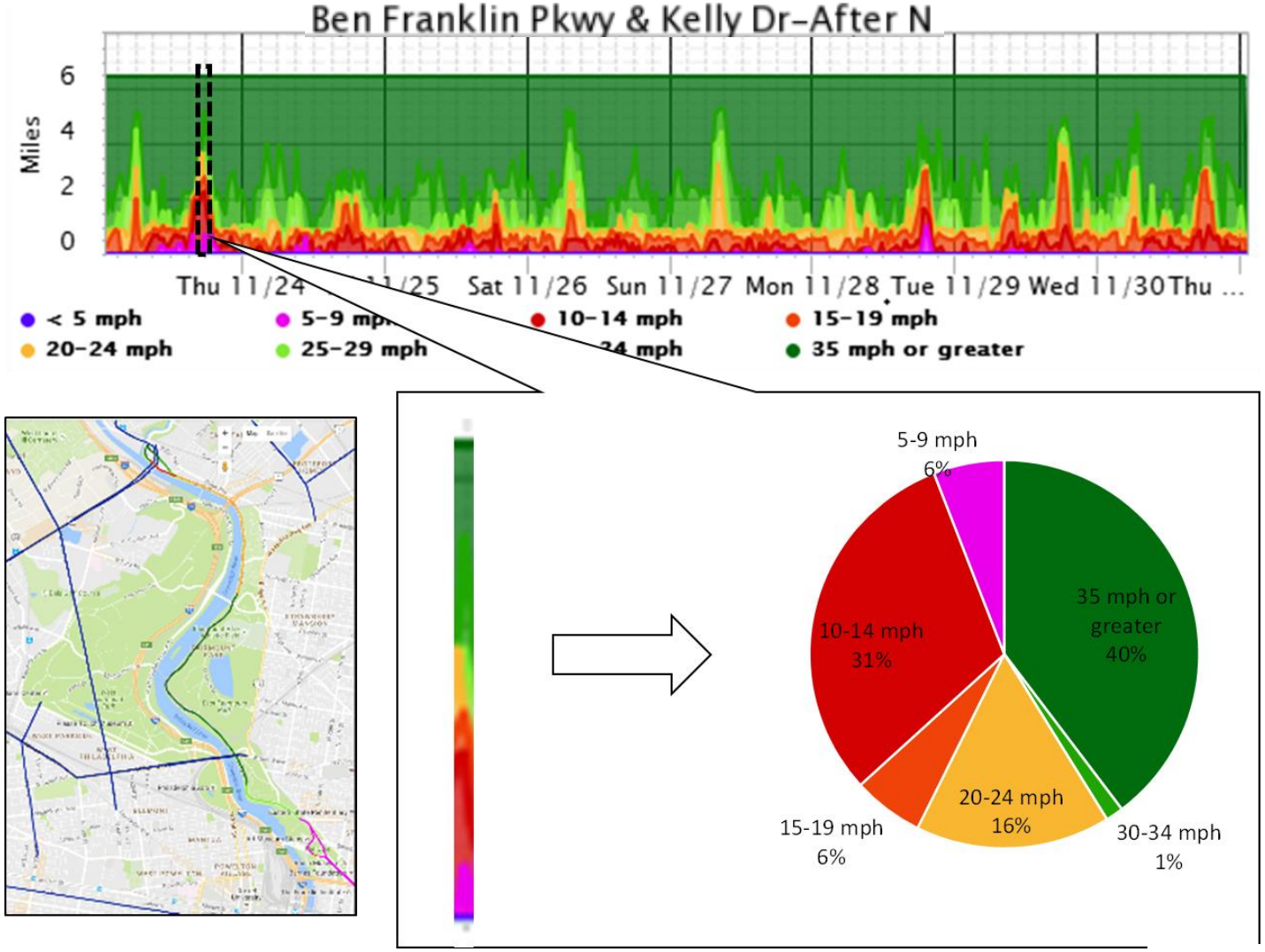
3 Congestion Ticker



4 Benefit Evaluation

Case Study: US 1/State Rd/Township Line Rd/City Ave

Volume

$$vol_i = AADT * k_i * d$$

Change in median TT

$$\Delta TT_i = TT_{before,i} - TT_{after,i}$$

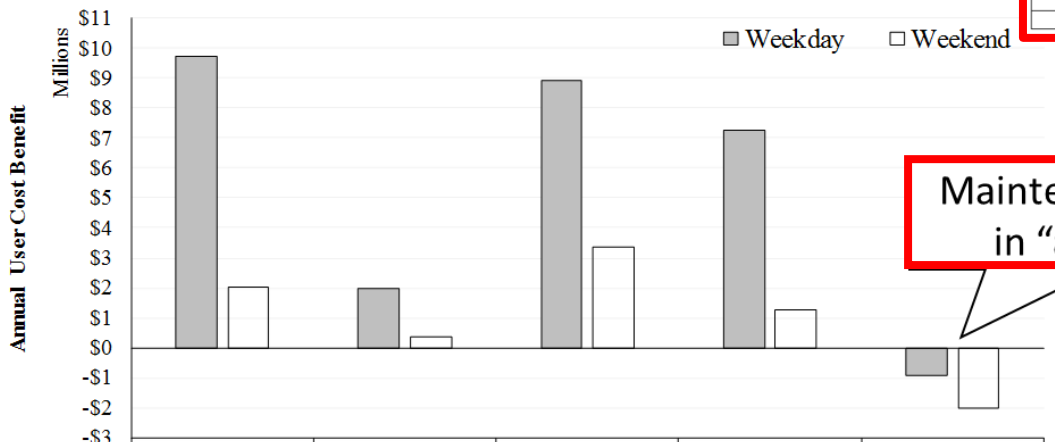
$$user_{car,i} = vol_i * \Delta TT_i * \%C_i * PPV_c * VOT_c \quad + \quad user_{truck,i} = vol_i * \Delta TT_i * \%T_i * PPV_t * VOT_t$$

User benefits (cars) + User benefits (trucks)

Corridor ID	Corridor Name	AADT	Length (mi)	Average Speed Limit (mph)	Signal Count (Adaptive Signals)	Before Date Range	After Date Range
A1	PA 132 / Street Rd	33,965	15.2	45	50 (21)	10/12/2015–11/23/2015	1/4/2016–2/15/2016
A2	PA 332 (Newtown Bypass)	35,015	4.8	53	12 (12)	2/22/2016–4/4/2016	4/25/2016–6/6/2016
A3	US 1/State Rd/Township Line Rd/City Ave	35,268	10.0	36	40 (4)	10/12/2015 11/23/2015	3/7/2016 4/18/2016
A4	US 202/Wilmington Pkwy	46,553	8.6	45	16 (9)	9/4/2015–10/26/2015	1/4/2016–2/15/2016
A5	PA 611/Old York Rd/ Easton Rd	30,919	16.3	42	68 (15)	4/27/2015–6/8/2015	1/4/2016–2/15/2016

Summary of Annual CO_2 Emission Reductions for the Adaptive Signals

Corridor	Weekday CO_2 Savings		Weekend CO_2 Savings	
	Tons	Dollars	Tons	Dollars
A1	3120	$112,000	650	$23,000
A2	640	$23,000	120	$4,000
A3	2890	$104,000	1080	$39,000
A4	2320	$84,000	400	$14,000
A5	-310	-$11,000	-650	-$23,000
Total	**8660**	**$213,000**	**1610**	**$58,000**



	A1	A2	A3	A4	A5
Weekday	$9,716,000	$1,995,000	$8,917,000	$7,238,000	-$904,000
Weekend	$2,030,000	$378,000	$3,370,000	$1,247,000	-$2,001,000

Over $30M in annualized user benefits

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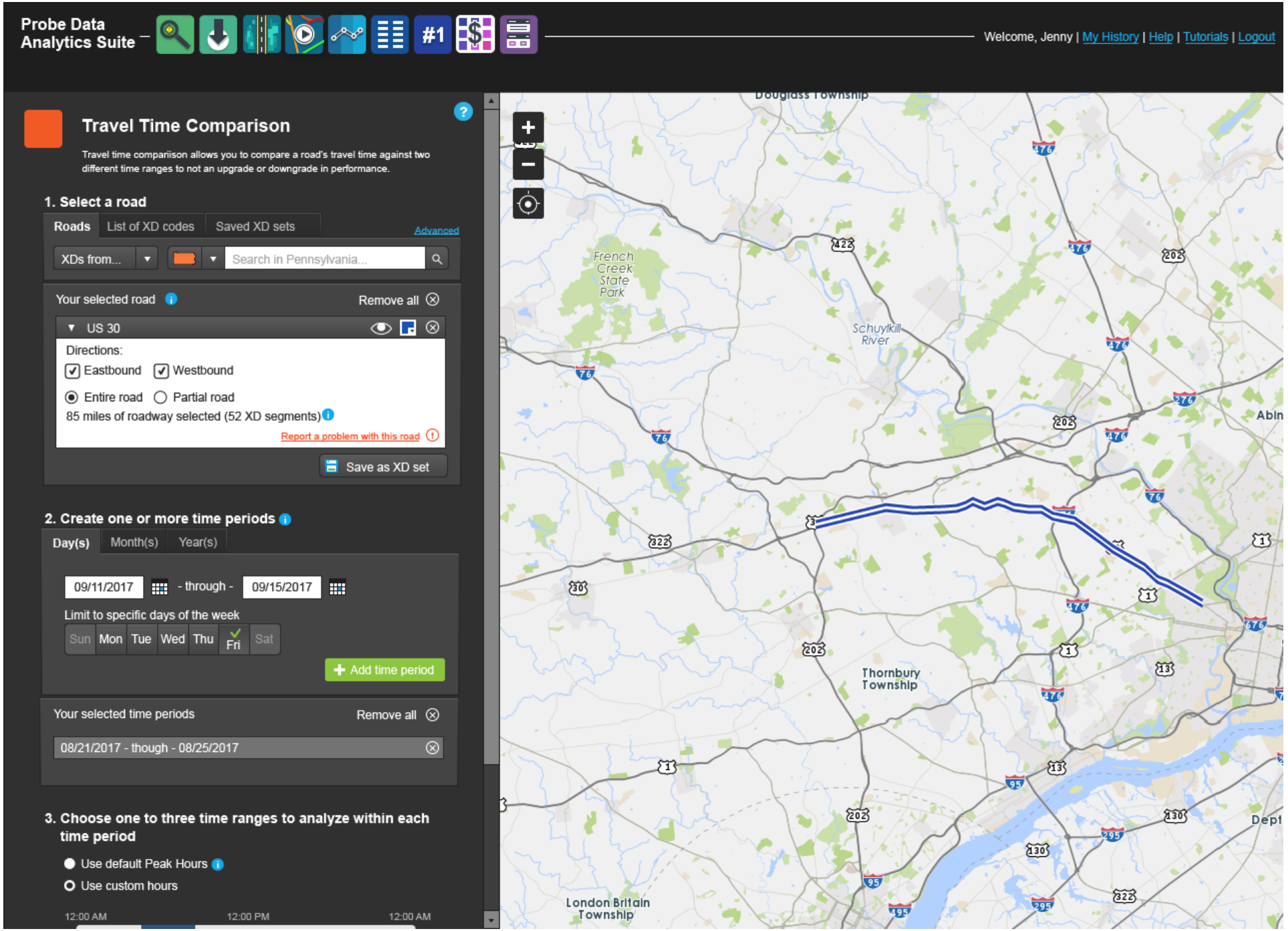
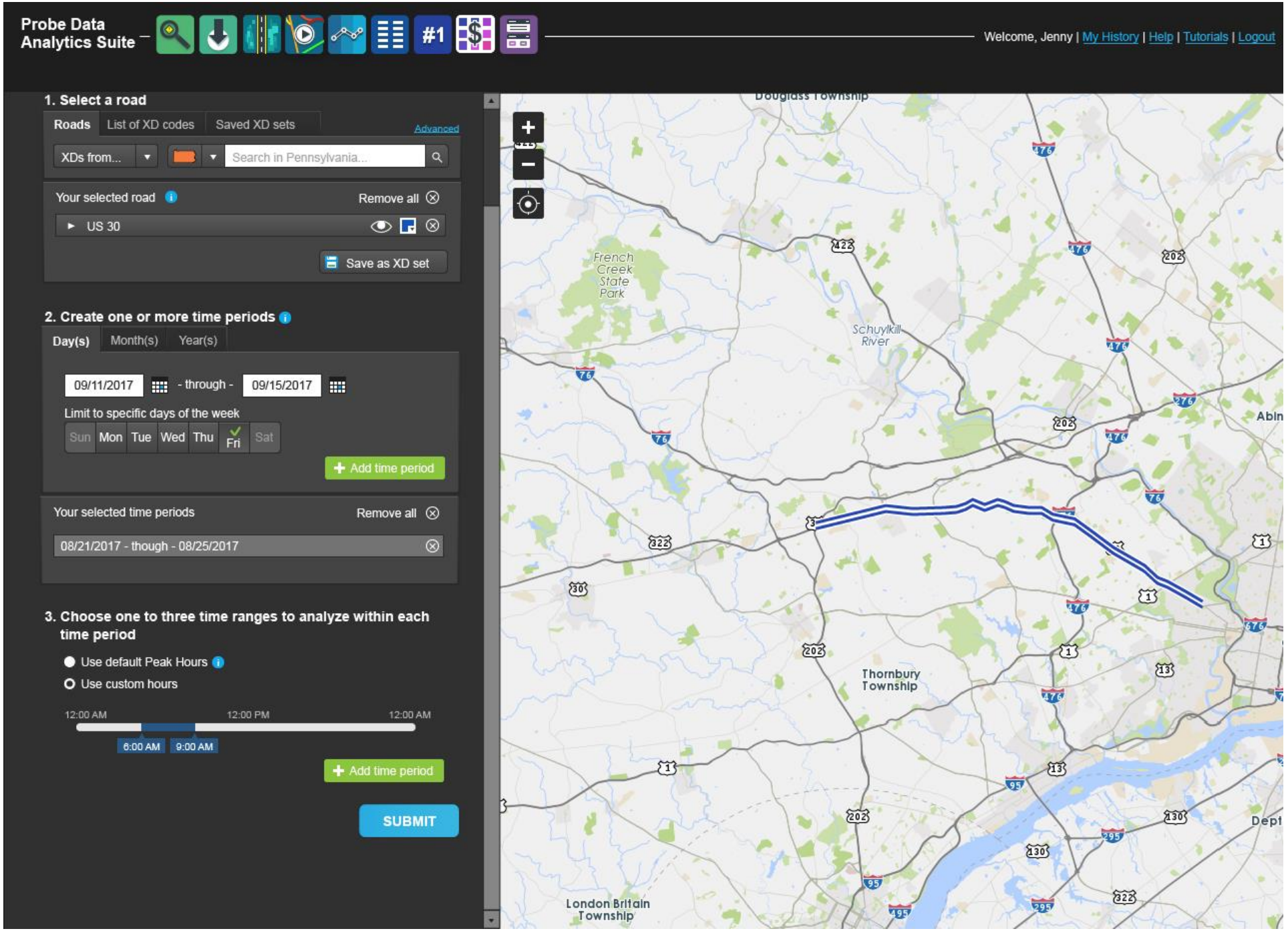
Enabling Access, Scalability, and Usability

- PennDOT desired to integrate the Purdue work into the Probe Data Analytics Suite for many reasons including:
  - Scalability
  - Usability
  - “known” platform
  - Easier access
  - Etc.
- Contracted with the CATT Lab and Purdue to enhance the PDA Suite
- The following slides showcase this ongoing effort.


Probe Data Analytics Suite
Welcome, Jenny | My History | Help | Tutorials | Logout
Travel Time Comparison
Travel time comparison allows you to compare a road's travel time against two different time ranges to not an upgrade or downgrade in performance.
1. Select a road
Roads
List of XD codes
Saved XD sets
Advanced
XDs from...
Search in Pennsylvania...
Your selected road
Remove all
US 30
Directions:
Eastbound
Westbound
Entire road
Partial road
85 miles of roadway selected (52 XD segments)
Report a problem with this road
Save as XD set
2. Create one or more time periods
Day(s)
Month(s)
Year(s)
09/11/2017
- through -
09/15/2017
Limit to specific days of the week
Sun
Mon
Tue
Wed
Thu
Fri
Sat
Add time period
Your selected time periods
Remove all
08/21/2017 - though - 08/25/2017
3. Choose one to three time ranges to analyze within each time period
Use default Peak Hours
Use custom hours
12:00 AM
12:00 PM
12:00 AM
Douglass Township
French Creek State Park
Schuylkill River
Thornbury Township
London Britain Township


Probe Data Analytics Suite
Welcome, Jenny | My History | Help | Tutorials | Logout
1. Select a road
Roads
List of XD codes
Saved XD sets
Advanced
XDs from...
Search in Pennsylvania...
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Day(s)
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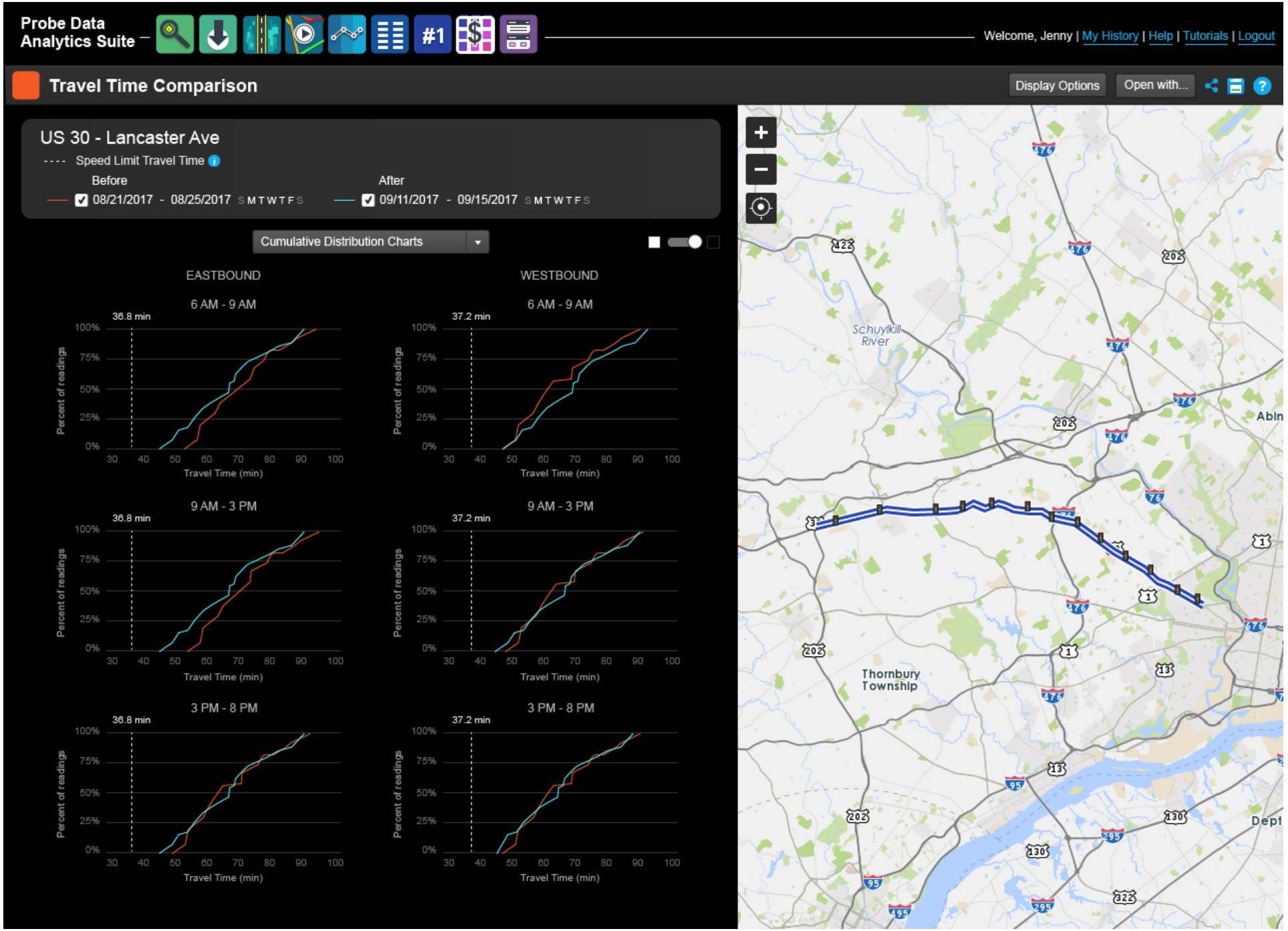
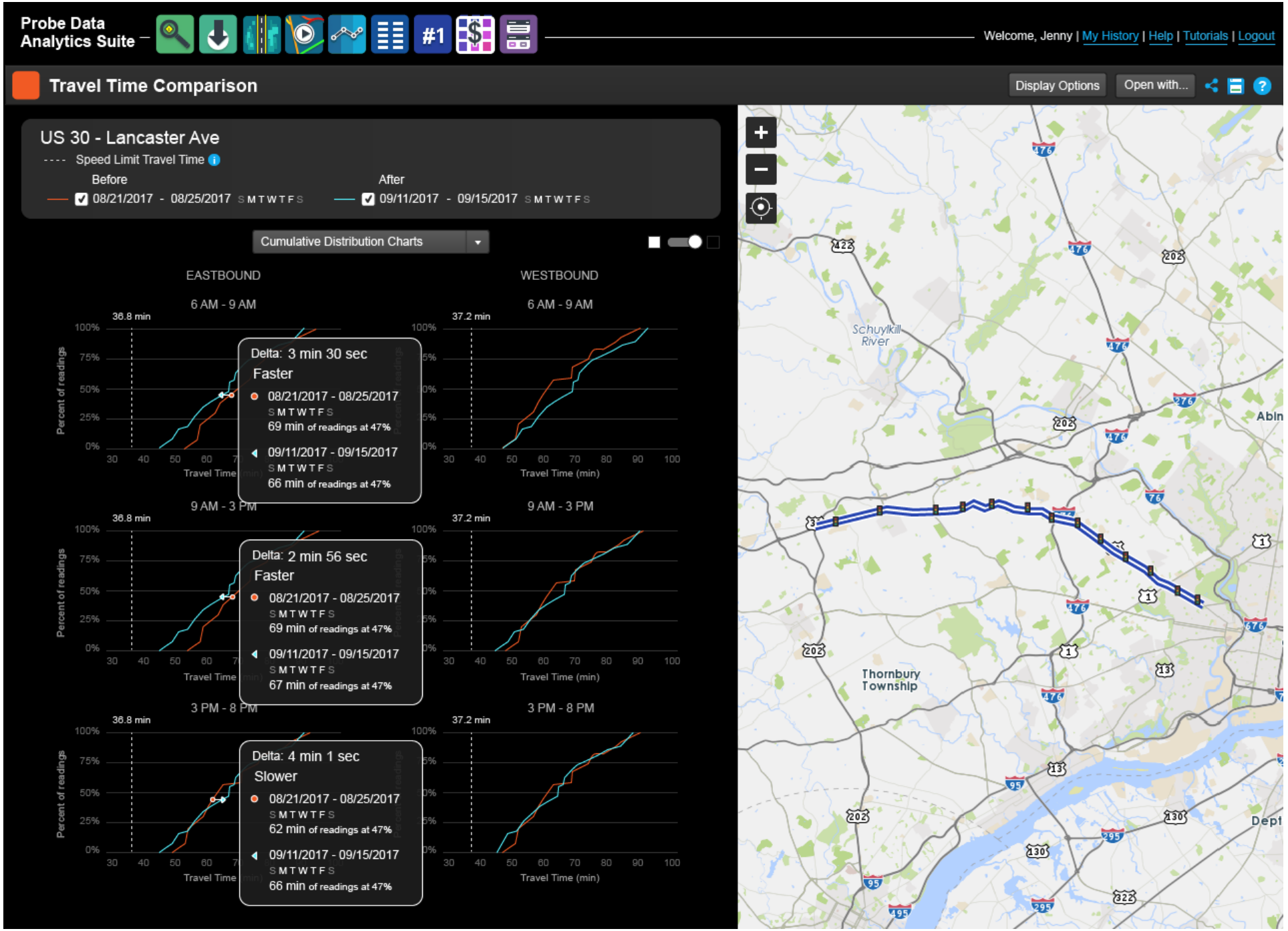
09/11/2017
- through -
09/15/2017
Limit to specific days of the week
Sun
Mon
Tue
Wed
Thu
Fri
Sat
Add time period
Your selected time periods
Remove all
08/21/2017 - though - 08/25/2017
3. Choose one to three time ranges to analyze within each time period
Use default Peak Hours
Use custom hours
12:00 AM
12:00 PM
12:00 AM
6:00 AM
9:00 AM
Add time period
SUBMIT
French Creek State Park
Schuylkill River
Thornbury Township
London Britain Township


Probe Data Analytics Suite
Welcome, Jenny | My History | Help | Tutorials | Logout
Travel Time Comparison
Display Options
Open with...
US 30 - Lancaster Ave
Speed Limit Travel Time
Before
08/21/2017 - 08/25/2017 S M T W T F S
After
09/11/2017 - 09/15/2017 S M T W T F S
Cumulative Distribution Charts
EASTBOUND
WESTBOUND
6 AM - 9 AM
9 AM - 3 PM
3 PM - 8 PM
36.8 min
37.2 min
Percent of readings
Travel Time (min)
Schuylkill River
Thornbury Township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Travel Time Comparison
Display Options
Open with...
US 30 - Lancaster Ave
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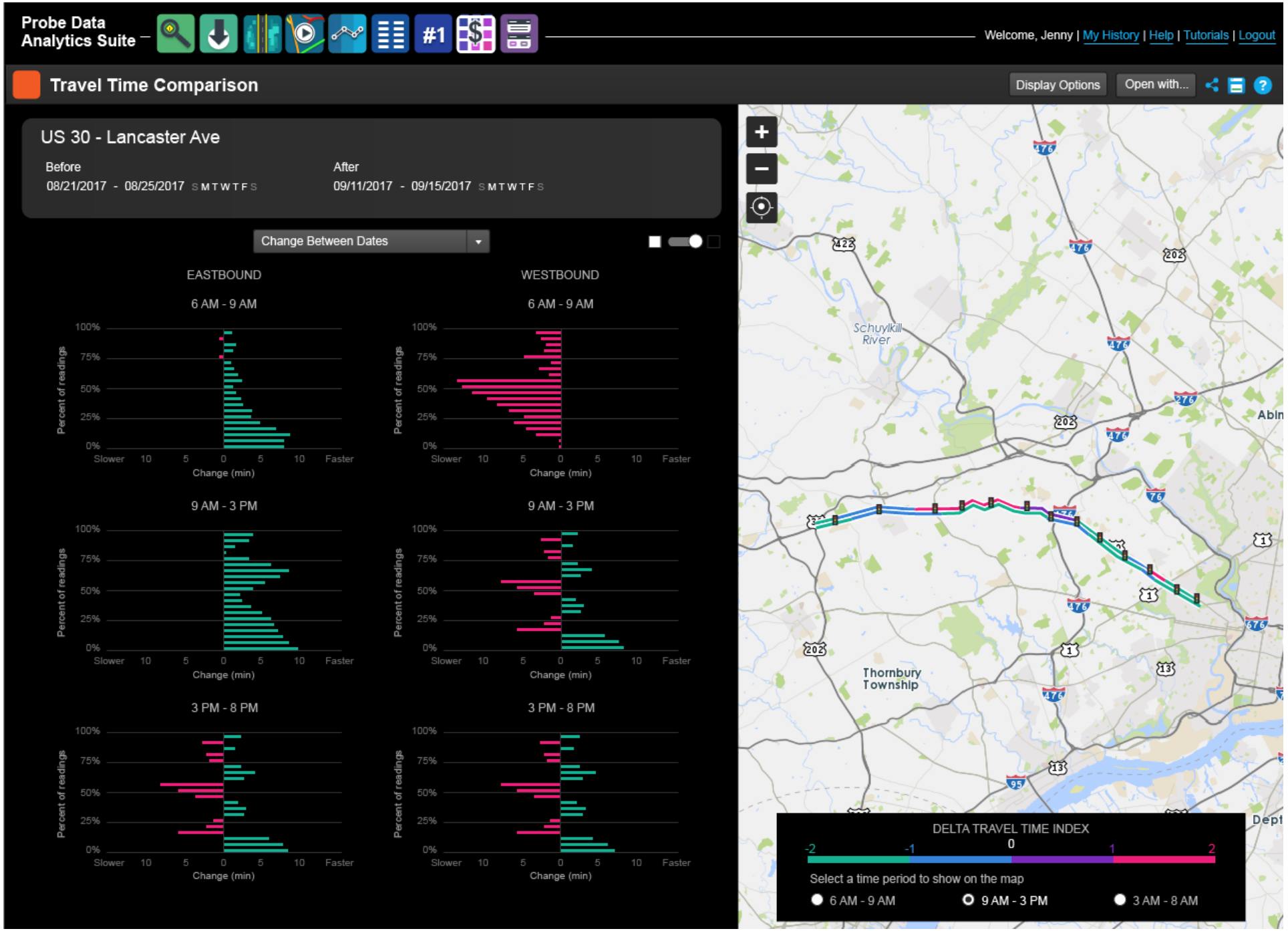
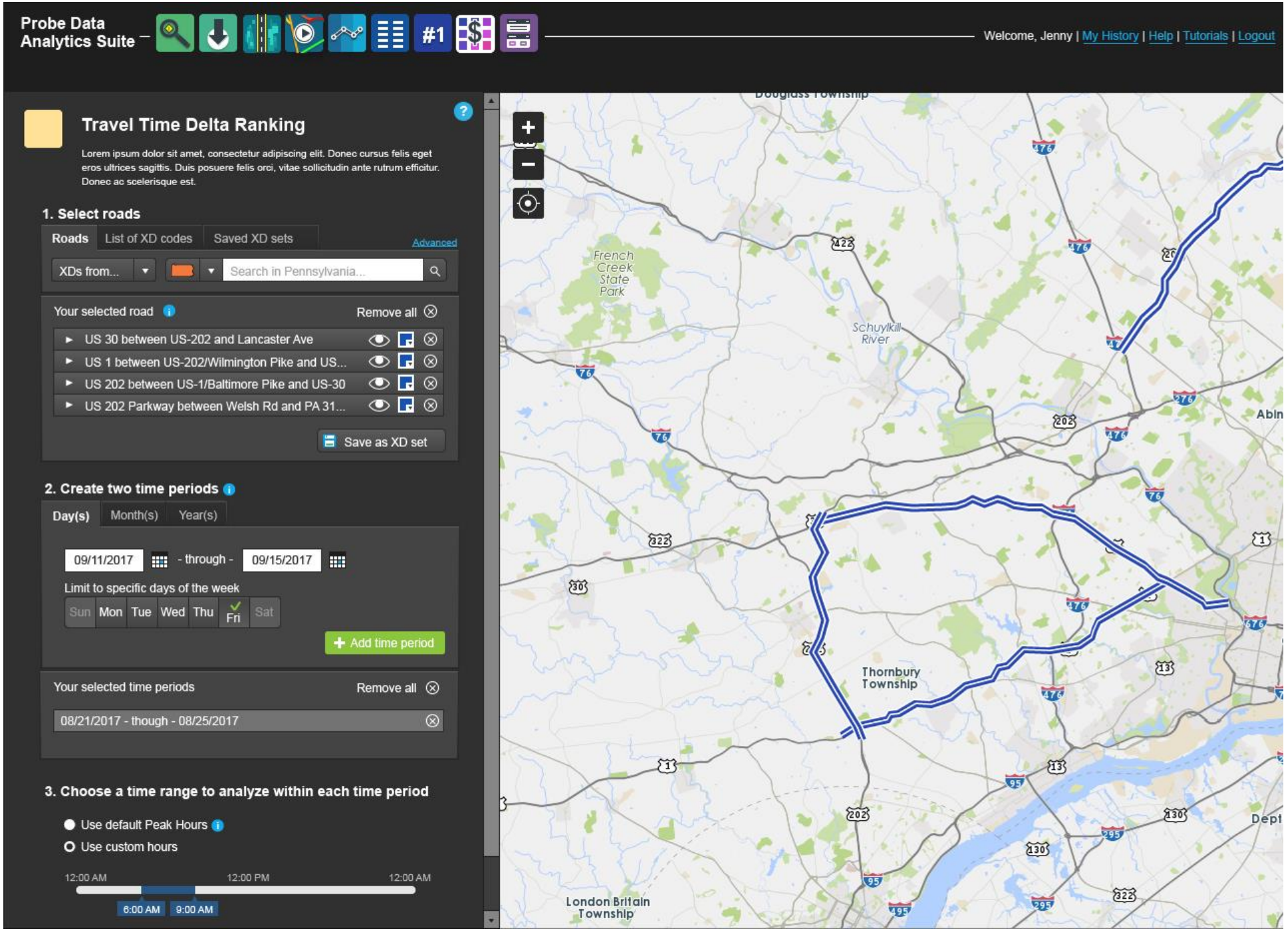
Before
08/21/2017 - 08/25/2017 S M T W T F S
After
09/11/2017 - 09/15/2017 S M T W T F S
Cumulative Distribution Charts
EASTBOUND
WESTBOUND
6 AM - 9 AM
36.8 min
37.2 min
Delta: 3 min 30 sec
Faster
08/21/2017 - 08/25/2017
S M T W T F S
69 min of readings at 47%
09/11/2017 - 09/15/2017
S M T W T F S
66 min of readings at 47%
9 AM - 3 PM
Delta: 2 min 56 sec
Faster
08/21/2017 - 08/25/2017
S M T W T F S
69 min of readings at 47%
09/11/2017 - 09/15/2017
S M T W T F S
67 min of readings at 47%
3 PM - 8 PM
Delta: 4 min 1 sec
Slower
08/21/2017 - 08/25/2017
S M T W T F S
62 min of readings at 47%
09/11/2017 - 09/15/2017
S M T W T F S
66 min of readings at 47%
Percent of readings
Travel Time (min)
Schuylkill River
Thornbury Township


Probe Data Analytics Suite
Welcome, Jenny | My History | Help | Tutorials | Logout
Travel Time Comparison
Display Options
Open with...
US 30 - Lancaster Ave
Before
08/21/2017 - 08/25/2017 S M T W T F S
After
09/11/2017 - 09/15/2017 S M T W T F S
Change Between Dates
EASTBOUND
WESTBOUND
6 AM - 9 AM
9 AM - 3 PM
3 PM - 8 PM
Percent of readings
100%
75%
50%
25%
0%
Slower 10 5 0 5 10 Faster
Change (min)
Schuylkill River
Thornbury Township
DELTA TRAVEL TIME INDEX
-2 -1 0 1 2
Select a time period to show on the map
6 AM - 9 AM
9 AM - 3 PM
3 AM - 8 AM


Probe Data Analytics Suite
Welcome, Jenny | My History | Help | Tutorials | Logout
Travel Time Delta Ranking
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Donec cursus felis eget eros ultrices sagittis. Duis posuere felis orci, vitae sollicitudin ante rutrum efficitur. Donec ac scelerisque est.
1. Select roads
Roads
List of XD codes
Saved XD sets
Advanced
XDs from...
Search in Pennsylvania...
Your selected road
Remove all
US 30 between US-202 and Lancaster Ave
US 1 between US-202/Wilmington Pike and US...
US 202 between US-1/Baltimore Pike and US-30
US 202 Parkway between Welsh Rd and PA 31...
Save as XD set
2. Create two time periods
Day(s)
Month(s)
Year(s)
09/11/2017
- through -
09/15/2017
Limit to specific days of the week
Sun
Mon
Tue
Wed
Thu
Fri
Sat
Add time period
Your selected time periods
Remove all
08/21/2017 - though - 08/25/2017
3. Choose a time range to analyze within each time period
Use default Peak Hours
Use custom hours
12:00 AM
12:00 PM
12:00 AM
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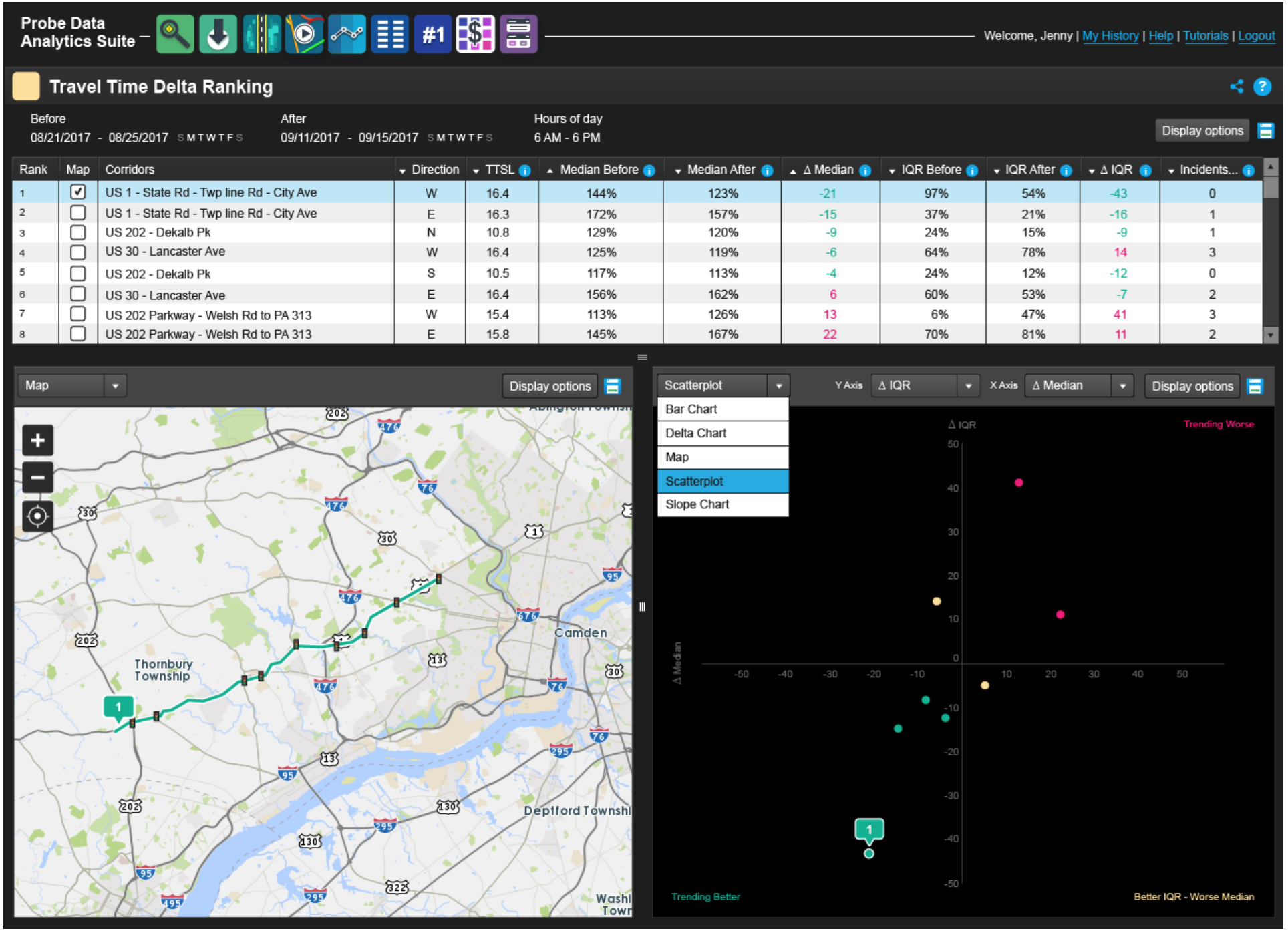
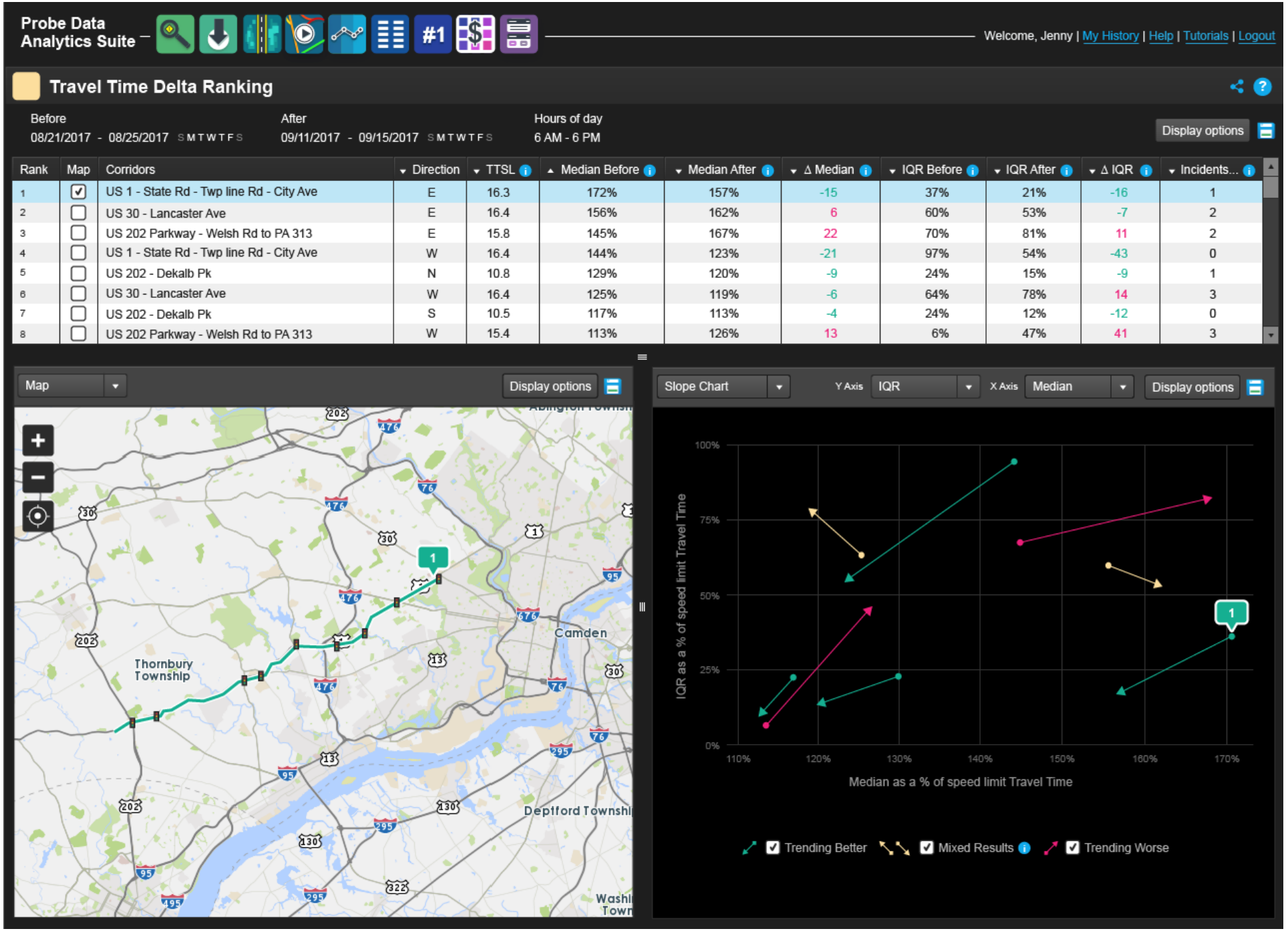

Probe Data Analytics Suite
Welcome, Jenny | My History | Help | Tutorials | Logout
Travel Time Delta Ranking
Before
08/21/2017 - 08/25/2017 S M T W T F S
After
09/11/2017 - 09/15/2017 S M T W T F S
Hours of day
6 AM - 6 PM
Display options
Rank | Map | Corridors | Direction | TTSL | Median Before | Median After | Δ Median | IQR Before | IQR After | Δ IQR | Incidents...
1 | ☑ | US 1 - State Rd - Twp line Rd - City Ave | W | 16.4 | 144% | 123% | -21 | 97% | 54% | -43 | 0
2 | ☐ | US 1 - State Rd - Twp line Rd - City Ave | E | 16.3 | 172% | 157% | -15 | 37% | 21% | -16 | 1
3 | ☐ | US 202 - Dekalb Pk | N | 10.8 | 129% | 120% | -9 | 24% | 15% | -9 | 1
4 | ☐ | US 30 - Lancaster Ave | W | 16.4 | 125% | 119% | -6 | 64% | 78% | 14 | 3
5 | ☐ | US 202 - Dekalb Pk | S | 10.5 | 117% | 113% | -4 | 24% | 12% | -12 | 0
6 | ☐ | US 30 - Lancaster Ave | E | 16.4 | 156% | 162% | 6 | 60% | 53% | -7 | 2
7 | ☐ | US 202 Parkway - Welsh Rd to PA 313 | W | 15.4 | 113% | 126% | 13 | 6% | 47% | 41 | 3
8 | ☐ | US 202 Parkway - Welsh Rd to PA 313 | E | 15.8 | 145% | 167% | 22 | 70% | 81% | 11 | 2
Map
Display options
Thornbury Township
Camden
Deptford Township
Scatterplot
Y Axis
Δ IQR
X Axis
Δ Median
Display options
Bar Chart
Delta Chart
Map
Scatterplot
Slope Chart
Δ IQR
Trending Worse
Δ Median
Trending Better
Better IQR - Worse Median


Probe Data Analytics Suite
Welcome, Jenny | My History | Help | Tutorials | Logout
Travel Time Delta Ranking
Before
08/21/2017 - 08/25/2017 S M T W T F S
After
09/11/2017 - 09/15/2017 S M T W T F S
Hours of day
6 AM - 6 PM
Display options
Rank | Map | Corridors | Direction | TTSL | Median Before | Median After | Δ Median | IQR Before | IQR After | Δ IQR | Incidents...
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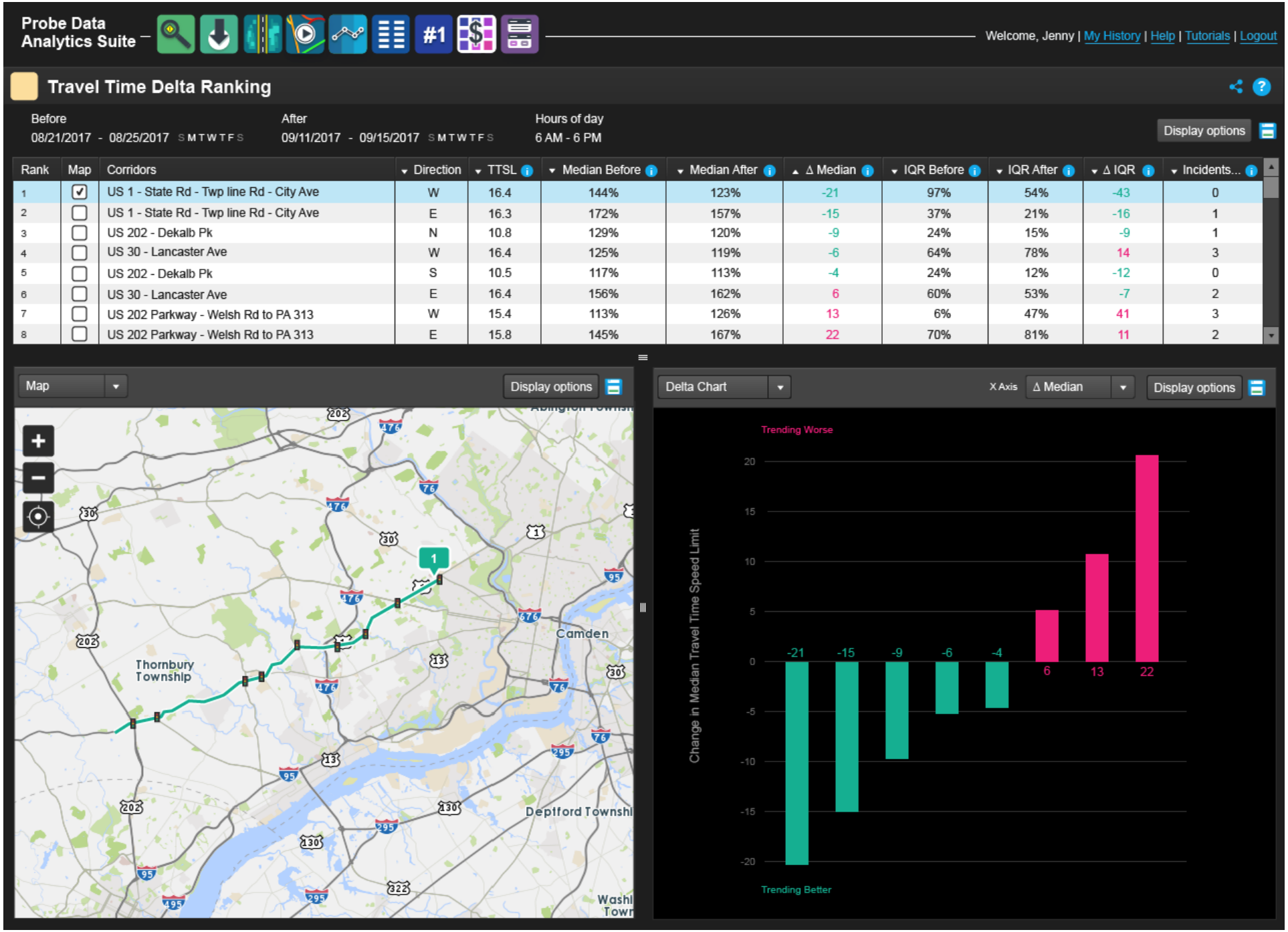
8 | US 202 Parkway - Welsh Rd to PA 313 | W | 15.4 | 113% | 126% | 13 | 6% | 47% | 41 | 3
Map
Display options
Thornbury Township
Camden
Slope Chart
Y Axis
IQR
X Axis
Median
Display options
IQR as a % of speed limit Travel Time
100%
75%
50%
25%
0%
110%
120%
130%
140%
150%
160%
170%
Median as a % of speed limit Travel Time
Trending Better
Mixed Results
Trending Worse


Probe Data Analytics Suite
Welcome, Jenny | My History | Help | Tutorials | Logout
Travel Time Delta Ranking
Before
08/21/2017 - 08/25/2017 S M T W T F S
After
09/11/2017 - 09/15/2017 S M T W T F S
Hours of day
6 AM - 6 PM
Display options
Rank | Map | Corridors | Direction | TTSL | Median Before | Median After | Δ Median | IQR Before | IQR After | Δ IQR | Incidents...
1 | ☑ | US 1 - State Rd - Twp line Rd - City Ave | W | 16.4 | 144% | 123% | -21 | 97% | 54% | -43 | 0
2 | ☐ | US 1 - State Rd - Twp line Rd - City Ave | E | 16.3 | 172% | 157% | -15 | 37% | 21% | -16 | 1
3 | ☐ | US 202 - Dekalb Pk | N | 10.8 | 129% | 120% | -9 | 24% | 15% | -9 | 1
4 | ☐ | US 30 - Lancaster Ave | W | 16.4 | 125% | 119% | -6 | 64% | 78% | 14 | 3
5 | ☐ | US 202 - Dekalb Pk | S | 10.5 | 117% | 113% | -4 | 24% | 12% | -12 | 0
6 | ☐ | US 30 - Lancaster Ave | E | 16.4 | 156% | 162% | 6 | 60% | 53% | -7 | 2
7 | ☐ | US 202 Parkway - Welsh Rd to PA 313 | W | 15.4 | 113% | 126% | 13 | 6% | 47% | 41 | 3
8 | ☐ | US 202 Parkway - Welsh Rd to PA 313 | E | 15.8 | 145% | 167% | 22 | 70% | 81% | 11 | 2
Map
Display options
Thornbury Township
Camden
Delta Chart
X Axis
Δ Median
Display options
Trending Worse
Change in Median Travel Time Speed Limit
20
15
10
5
0
-5
-10
-15
-20
-21
-15
-9
-6
-4
6
13
22
Trending Better

Next Steps

- CATT Lab is actively archiving XD INRIX data
- Integrating XD functionality into existing PDA Tools
- User Interface Design is complete (the slides you just saw)
- Timeline for Deployment
  - End of September, 2018 (dependent on ongoing XD integration work)
- Requirements for use by other states: RITIS + PDA + XD Integration
- Turn this collaboration into a model for other states, R&D groups, etc. to pool funds for the greater good of all states

Daniel P. Farley
Section Chief
Traffic Operations Deployment and Maintenance

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Questions?

pennsylvania
DEPARTMENT OF TRANSPORTATION

In the spotlight…

Waze Integration & Analysis

Dr. Mark Franz

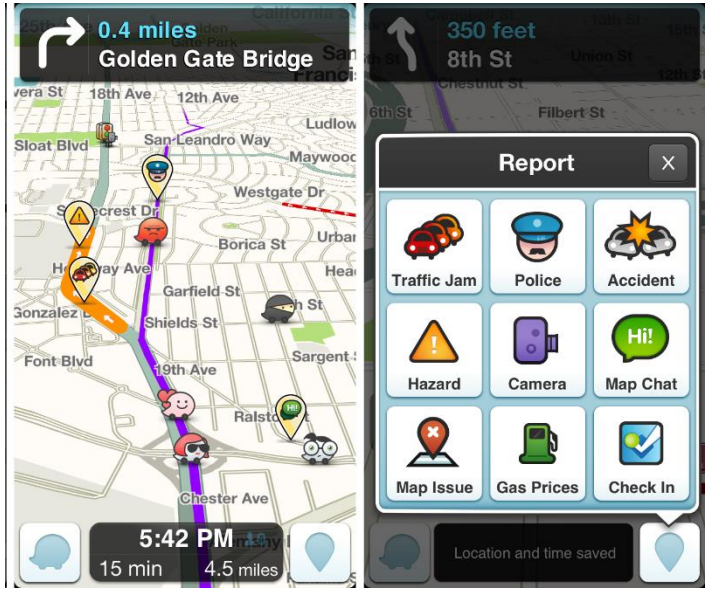
Presentation Agenda

- Motivation and Objectives
- Waze Data Background
- Waze Data Challenges
- Waze Data Assessment
- Recommendations

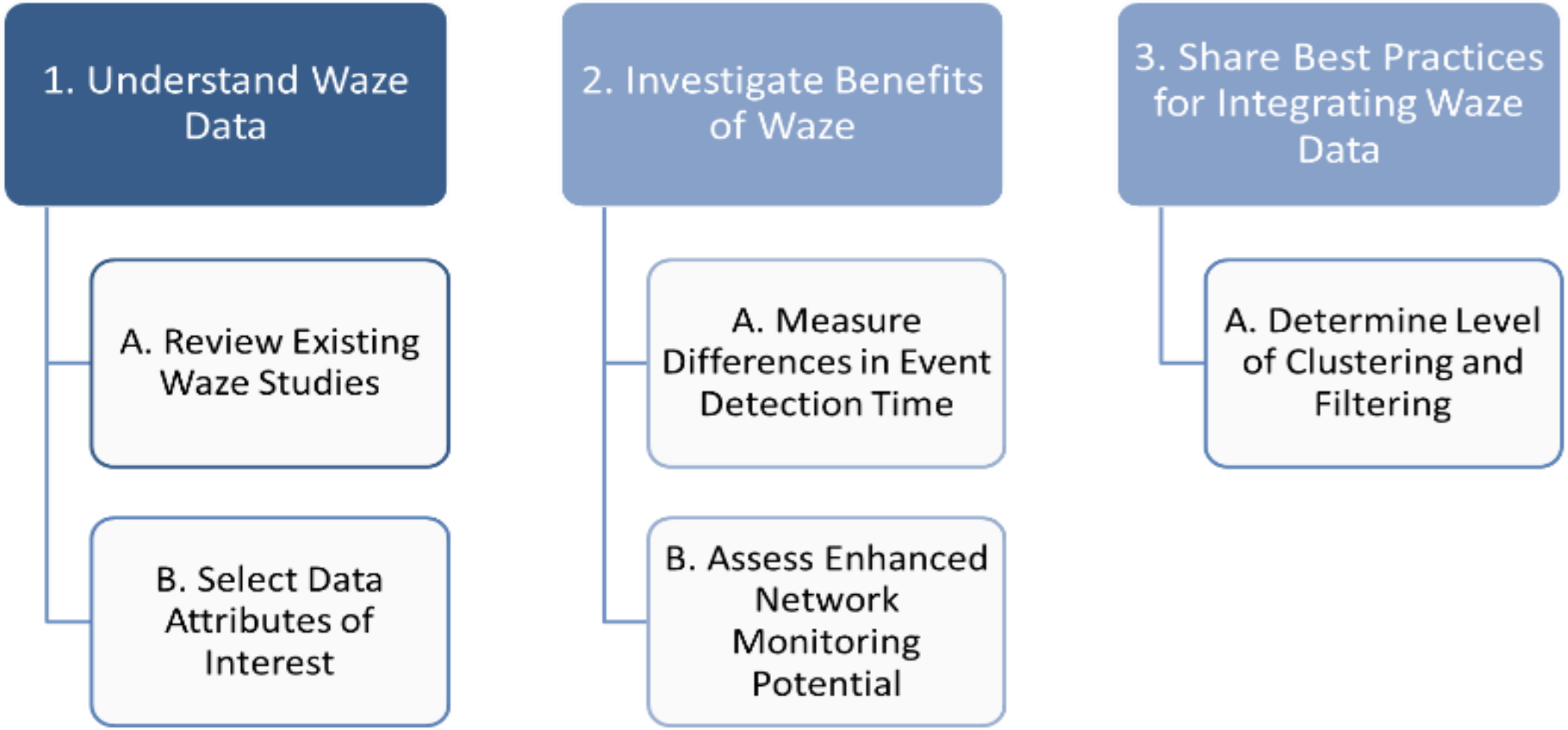
Motivation

- Crowd-sourced data has potential to improve situational awareness and traffic incident management (TIM)
- Limited studies on utilizing this emerging data
  - Most DOTs filter out the following:

    Police activities, cars stopped on shoulders, road closure reports and reports with reliability < 5
  - Most DOTs consolidate duplicates – no specific rules discussed

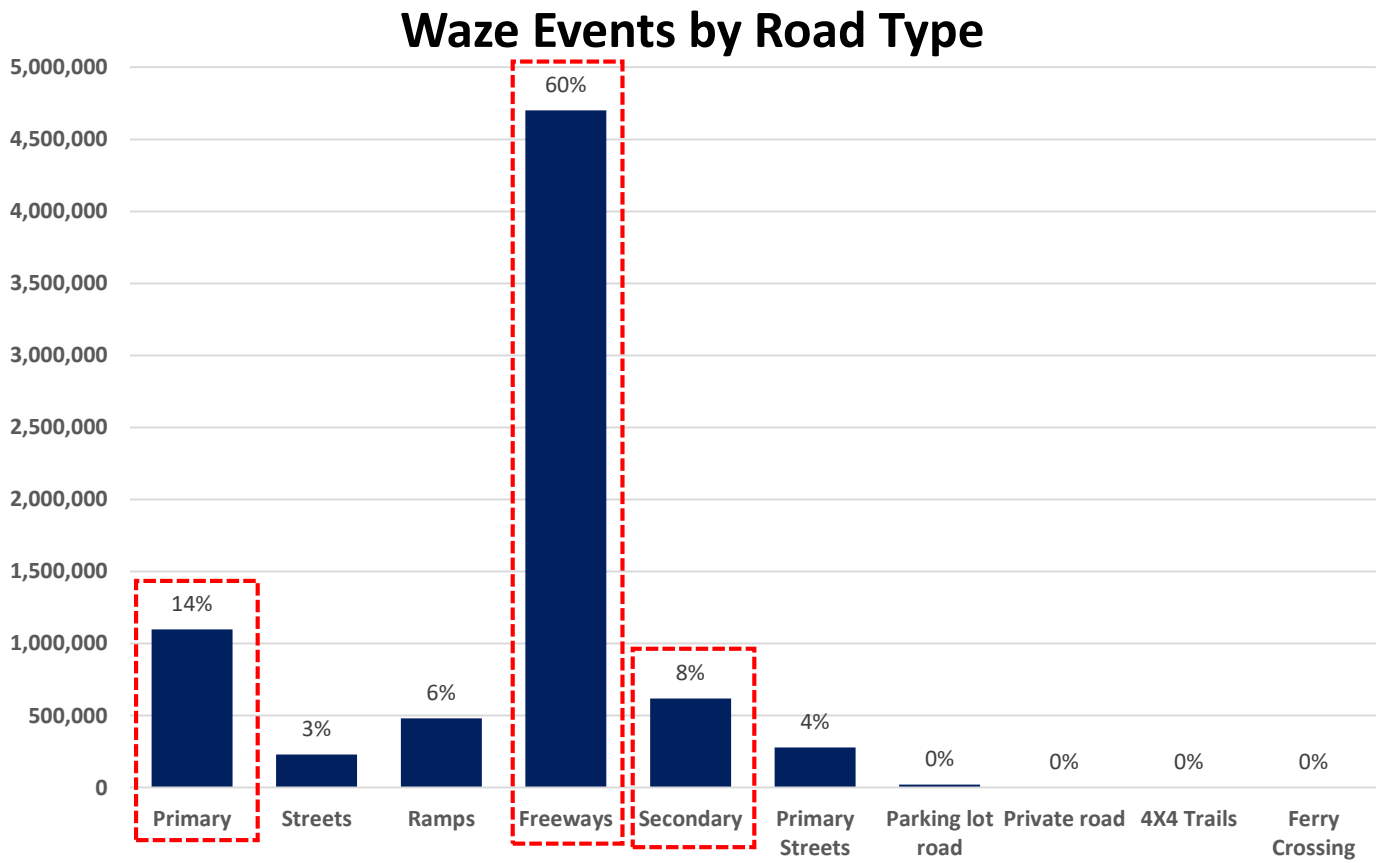


Objectives


1. Understand Waze Data
A. Review Existing Waze Studies
B. Select Data Attributes of Interest
2. Investigate Benefits of Waze
A. Measure Differences in Event Detection Time
B. Assess Enhanced Network Monitoring Potential
3. Share Best Practices for Integrating Waze Data
A. Determine Level of Clustering and Filtering

Waze Data Background

- **Weather/Hazard (88%)**
  - Construction (12%)
  - Pot Hole (5%)
  - Car on Shoulder (52%)
  - Car Stopped on Road (4%)
  - Object in Road (4%)
  - Fog (1%)
  - Animals on Shoulder (1%)
  - Road Kill (1%)
  - Hazard on Shoulder (1%)
- **Accidents (10%)**
  - Major (2%)
  - Minor (3%)
- **Road Closed (2%)**
  - Road Closed Event (1%)

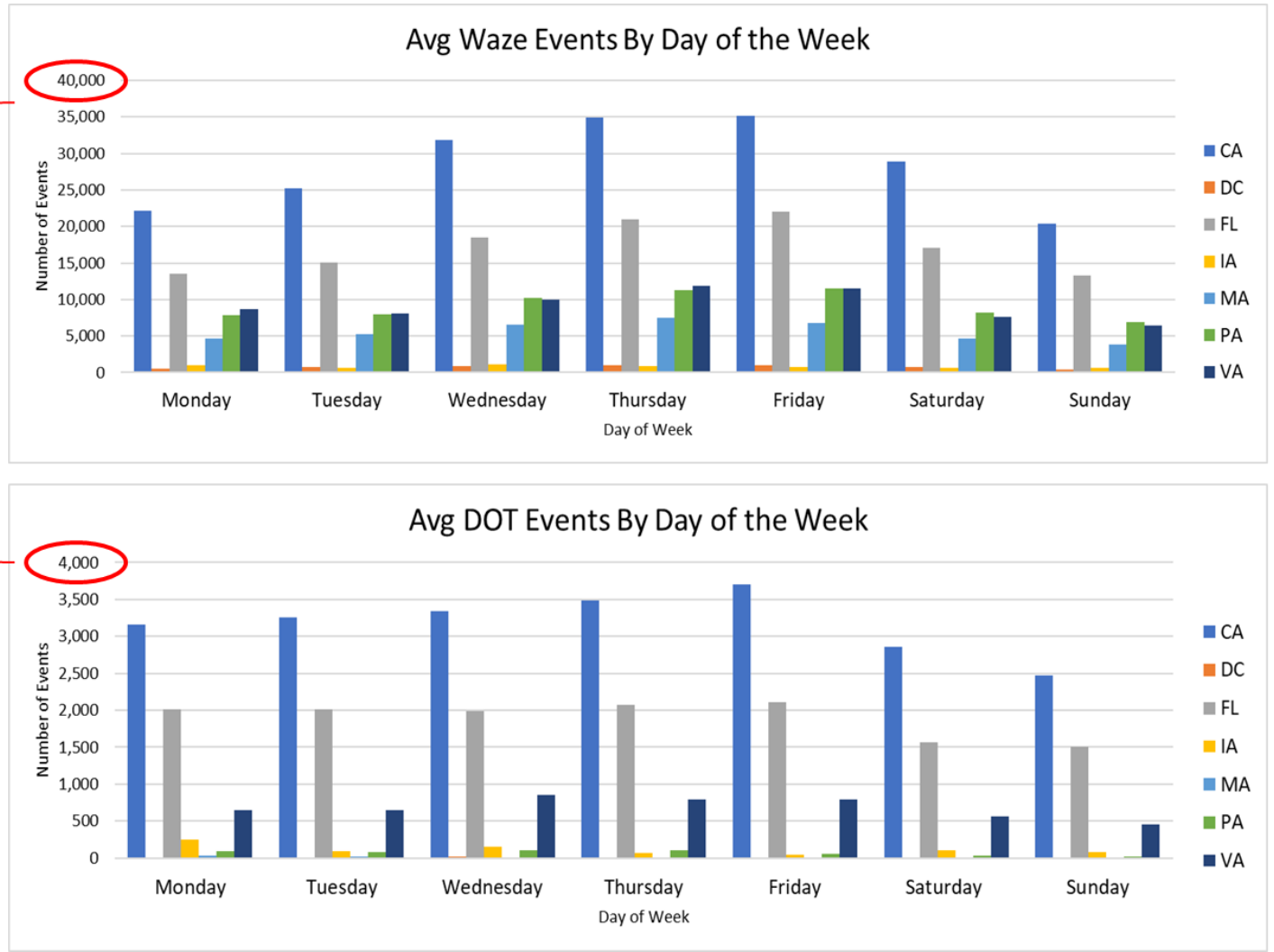


Note:

- Waze data excludes jams event type
- 3 Month Period of 3/17 – 5/17 displayed

Waze Data Challenges

10X More



State	Avg Waze Events Per Day	Avg DOT Events Per Day
CA	28,389	3,184
DC	777	16
FL	17,210	1,895
IA	810	114
MA	5,613	14
PA	9,171	70
VA	9,168	681

Data Quality Considerations:

- Redundancy
- Reliability

Note:

- Waze data excludes jams event type
- 3 Month Period of 3/17 – 5/17 displayed

Waze Data Assessment: Data Focus

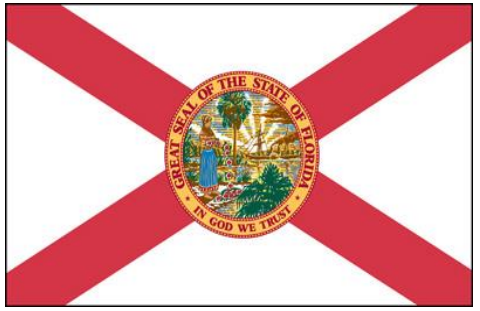
- Two event types: Crashes and disabled vehicle events.
- Two road types: Freeways/ramps and primary/secondary roads.

1. Freeway/Ramp Crashes
2. Freeway/Ramp Disabled Vehicles
3. Primary/Secondary Crashes
4. Primary/Secondary Disabled Vehicles

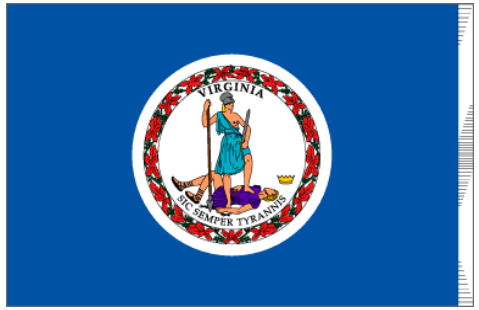
States

California

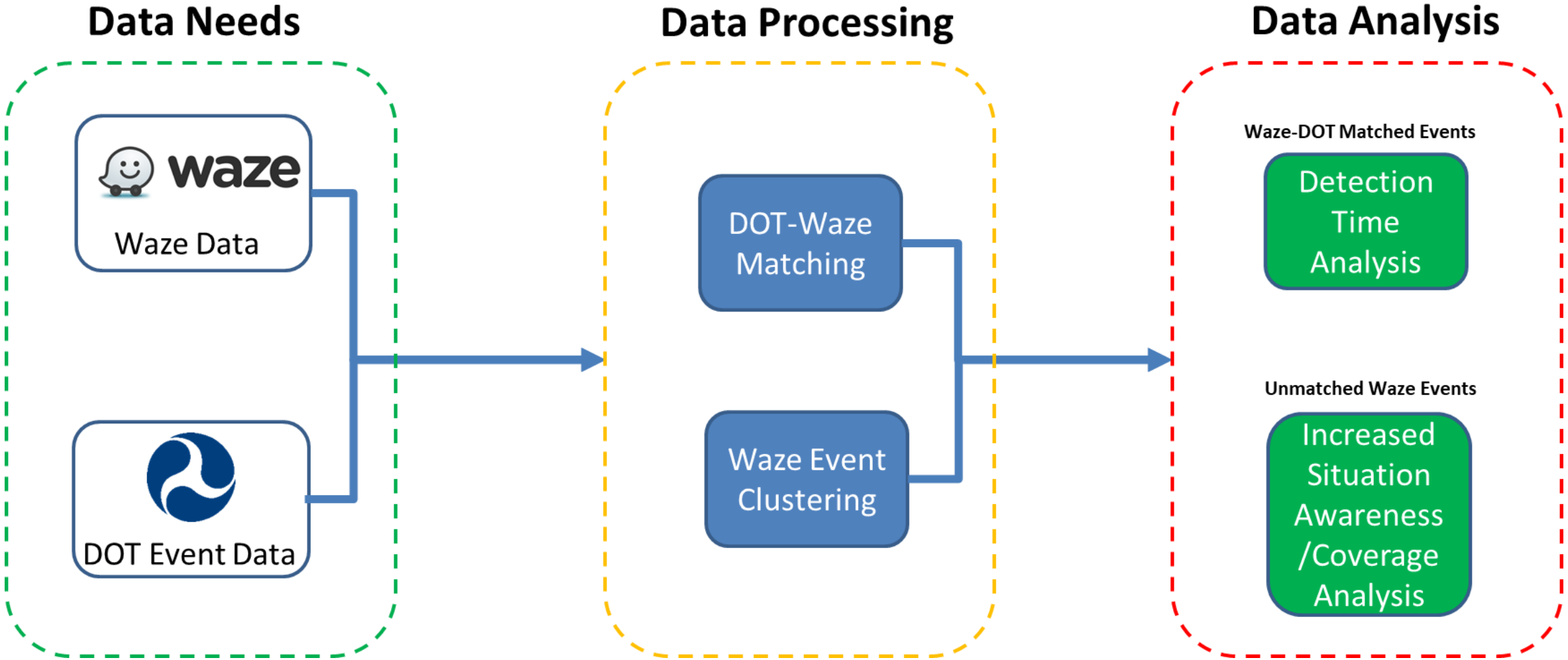
Florida



Virginia

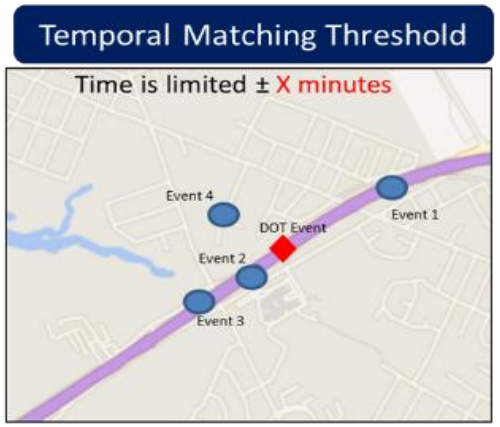


Waze Data Assessment: Methodology



Matching and Clustering Procedure

Matched DOT events to Waze events	Clustered redundant Waze events
Step 1: Established initial search parameters	**Step 1:** Established initial search parameters
Step 2: Created rules to match DOT events to Waze events	**Step 2:** Created rules to cluster Waze events
Step 3: Analyzed matching distributions to refine thresholds	**Step 3:** Analyzed clustering distributions to refine thresholds



Identified 4 Waze events within ± X minutes of the DOT event

Determined that 3 of the Waze events were within ± Y miles of the DOT event

Determined that 1 of the Waze events was on the correct road and direction of travel

Analysis Scenario	Matching Refined Thresholds		Clustering Refined Thresholds	
	X (Minutes)	Y (Miles)	X (Minutes)	Y (Miles)
Freeway/Ramps Crashes	10	0.37	10	0.37
Freeway/Ramps DV	30	0.44	15	0.44
Primary/Secondary Crashes	10	0.19	10	0.19
Primary/Secondary DV	30	0.37	10	0.37

Analysis Summary: Matching & Detection Time

	Matching	
Type of Event	**% DOT Matched to Waze**	**Average Time that a Waze Event was Reported Before a DOT Event**
Freeways/Ramps Crashes	40%	3 Minutes
Primary/Secondary Crashes	12%	3 Minutes
Freeways/Ramps Disabled Vehicles	37%	14 Minutes
Primary/Secondary Disabled Vehicles	4%	16 Minutes

Waze Data Assessment: Clustering Results

Crash Results on Freeways/Ramps

Type of Event	Percent Reduction in Events Due to Clustering	Percent Reduction Attributable to Duplication in DOT Sharing Data with Waze	Percent Reduction in Events Due to Clustering (including adjustments)
VA Crashes	8.6%	0.8%	7.8%
FL Crashes	16.6%	7.4%	9.2%
CA Crashes	19.8%	7.8%	12.0%

- VA: 585 additional unique events per day
- FL: 1,528 additional unique events per day
- CA: 2,294 additional unique events per day

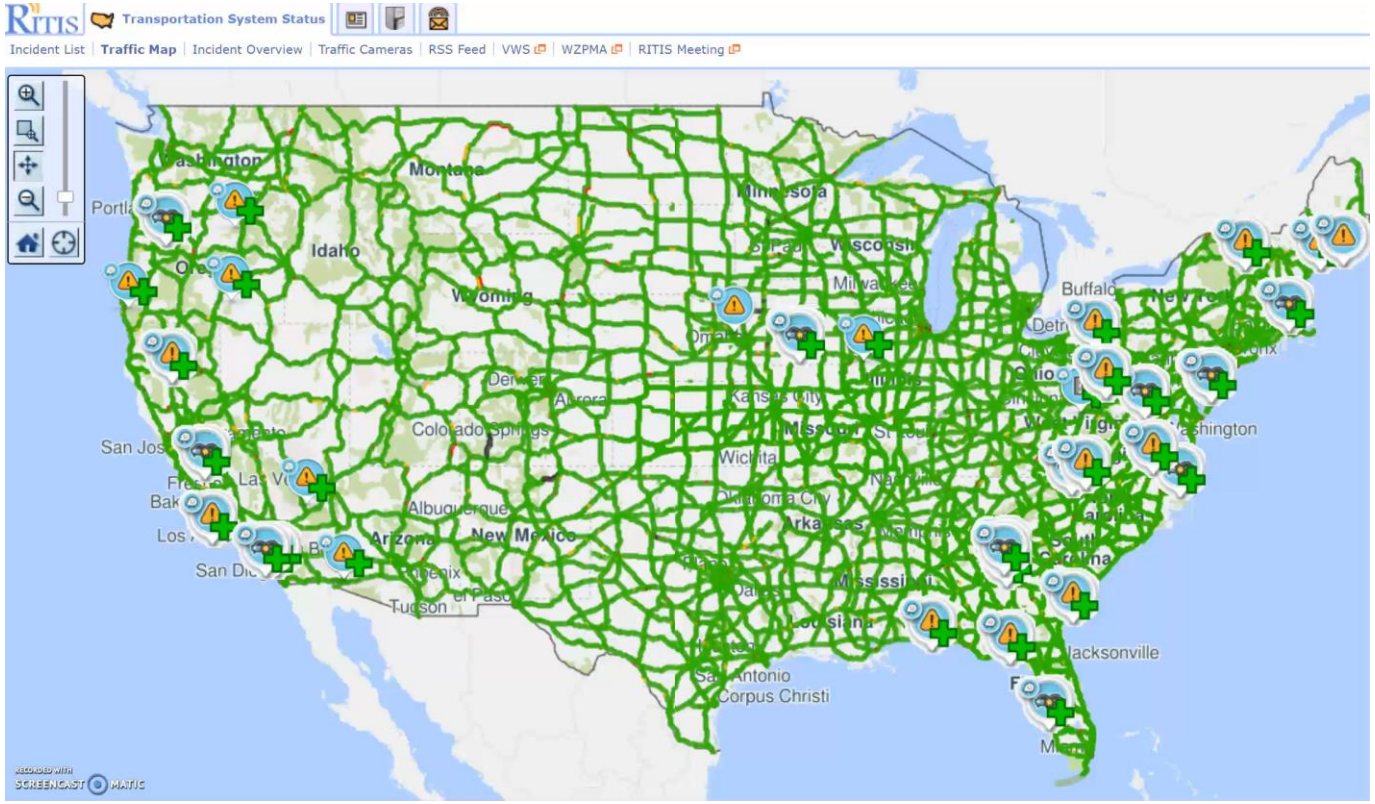
The additional unique Waze events are events that have been clustered and were not matched to DOT events.

Analysis Summary: Enhanced Network Monitoring

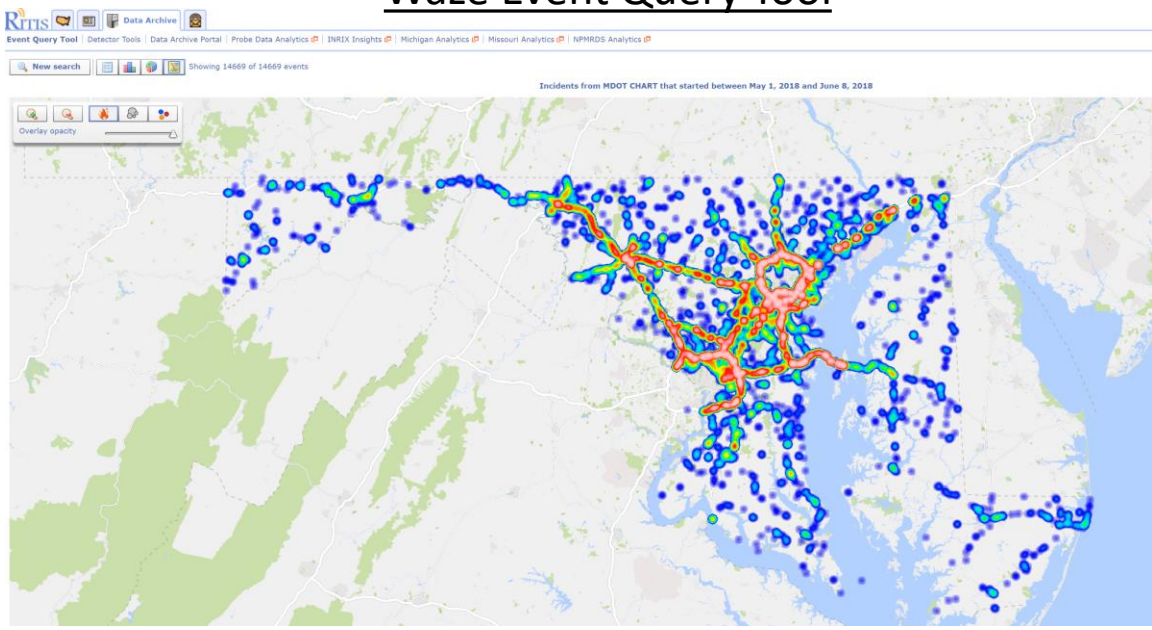
	Virginia		Florida		California	
	Existing VDOT Crash / Disabled Vehicle Events	Additional Unique VA Waze Crash / Disabled Vehicle Events	Existing FDOT Crash / Disabled Vehicle Events	Additional Unique FL Waze Crash / Disabled Vehicle Events	Existing CALTRANS Crash Events	Additional Unique CA Waze Crash Events
Daily Number of Events						
Freeways/Ramps	178	4,349	408	9,358	1,477	2,294
Primary/Secondary	44	1,406	-	2,763		1,182
Combined Total	**222**	**5,755**	**408**	**12,121**	**1,477**	**3,476**
	~26X more events/day		~30X more events/day		~3X more events/day (no disabled vehicles)	

Next Steps

National Waze Data-Feed



Waze Event Query Tool



Thank you!

Mark L. Franz, Ph.D.
Lead Transportation Analyst
CATT Laboratory
mfranz1@umd.edu

Poll Question #1

1 Is your agency using Waze data?

___ Yes
___ No
___ Not Sure

RITIS & PROBE DATA ANALYTICS SUITE

u s e r g r o u p

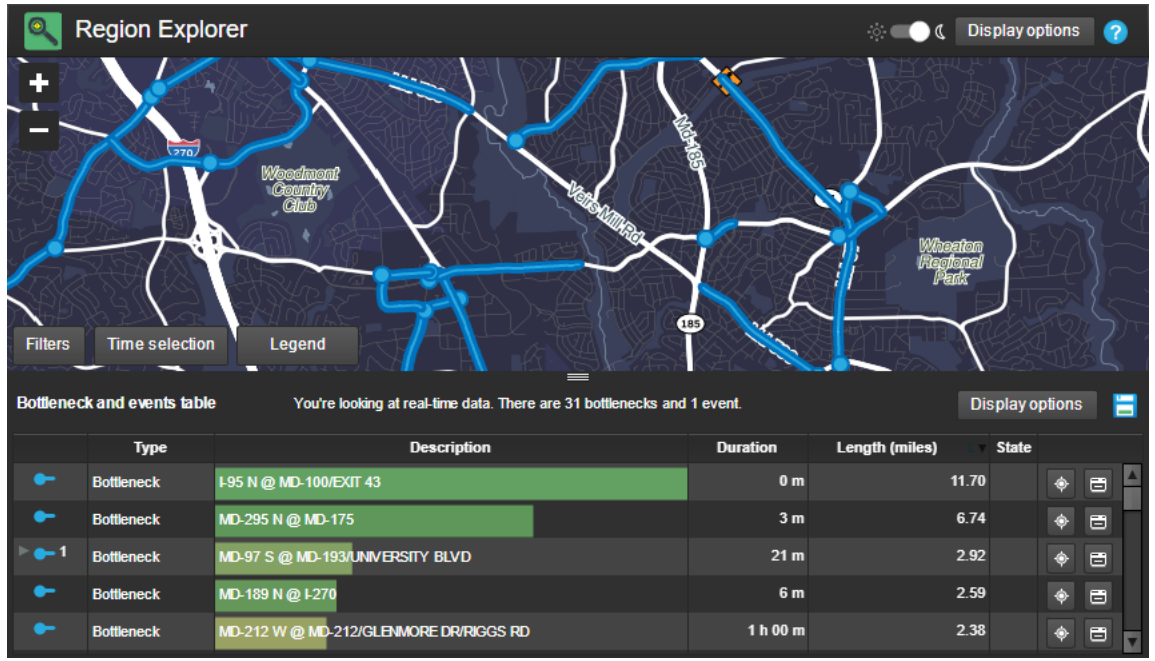
What's New

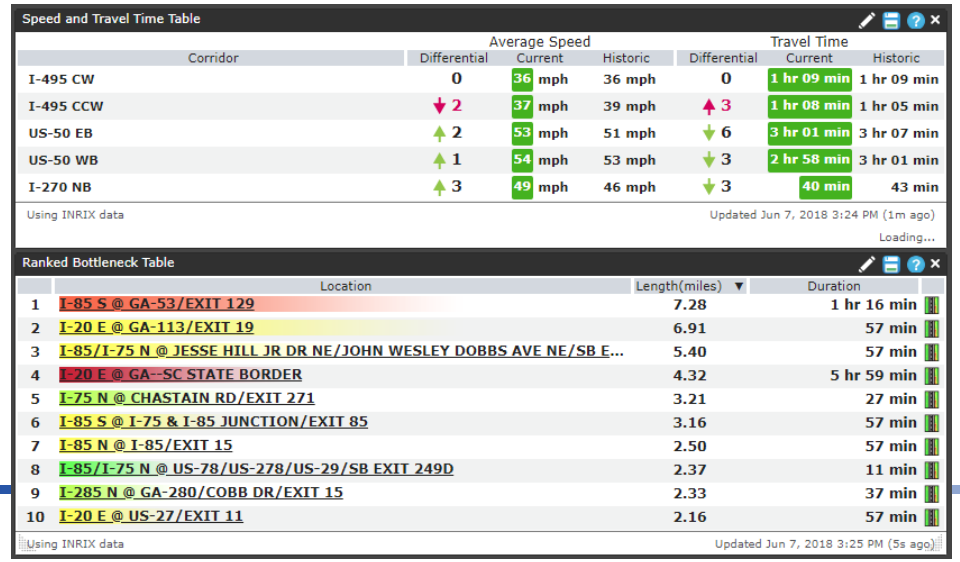
RITIS Recent Deployments

- CCTV Player Modernization
- New Tiling Infrastructure
- Enhanced performance of Work Zone Application
- Added PA Turnpike Incident Data
- GDOT CCTV Feeds
- Numerous Bug Fixes related to:
  - Chat rooms
  - Media Uploads
  - API Key requests

Probe Data Analytics Recent Deployments

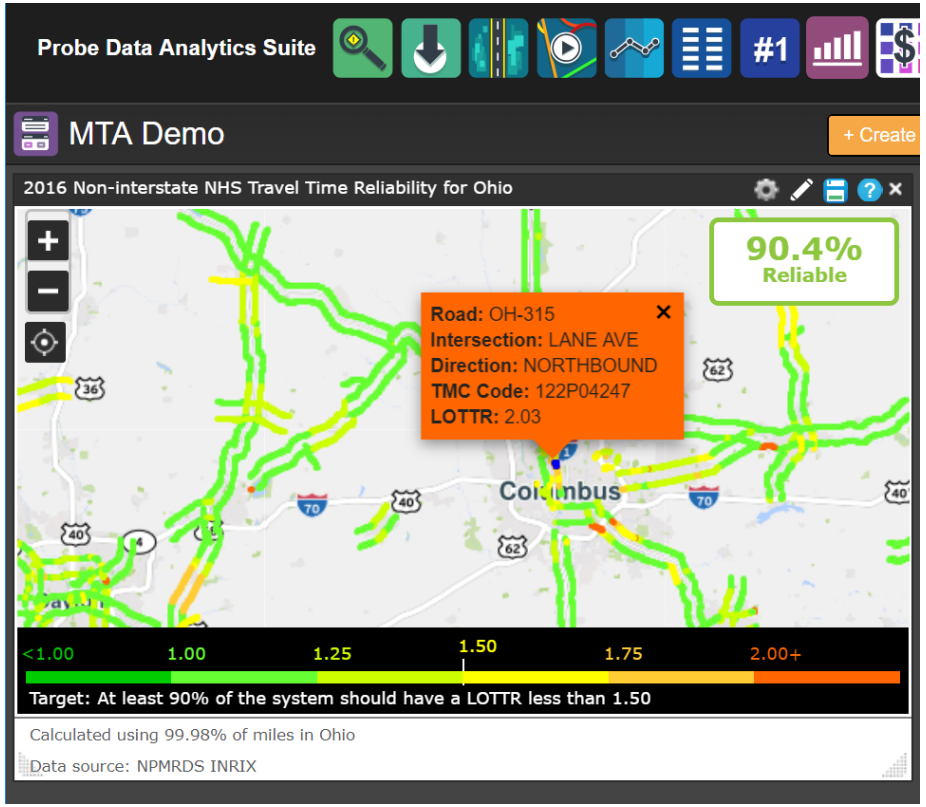
- Significant documentation updates
- Segment positioning at zoom levels
- Night-mode for Region Explorer
- Dashboard formatting
- Tiling/Mapping modernization





Probe Data Analytics Recent Deployments (cont.)

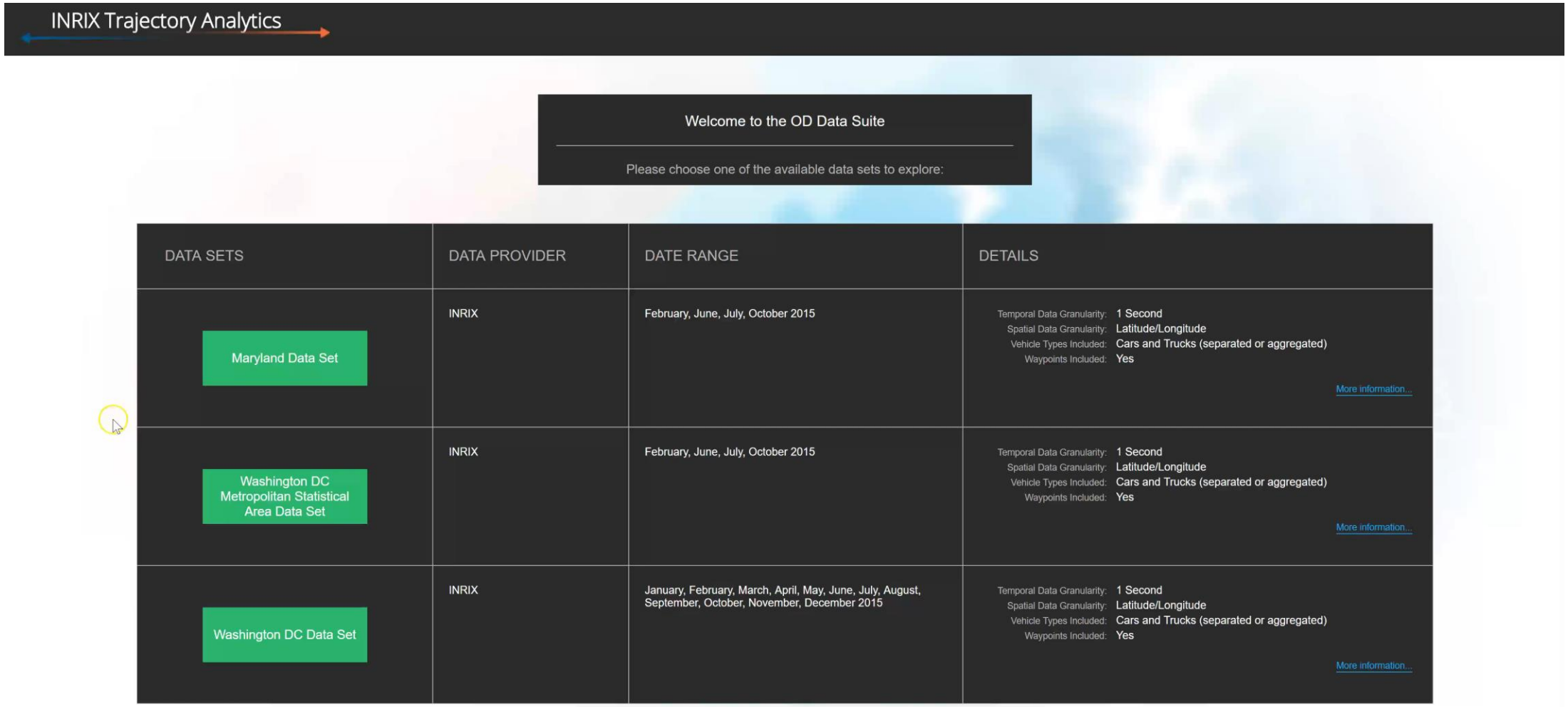
- Trend map performance enhancements
- Road search bug fixes
- MAP-21/PM3 screencasts and tutorials
- PM3 finalization (significant)
- Integrated state speed limits, vehicle occupancy, etc.
- Massive Data Downloaded bug fixes
- Ability to archived XD data



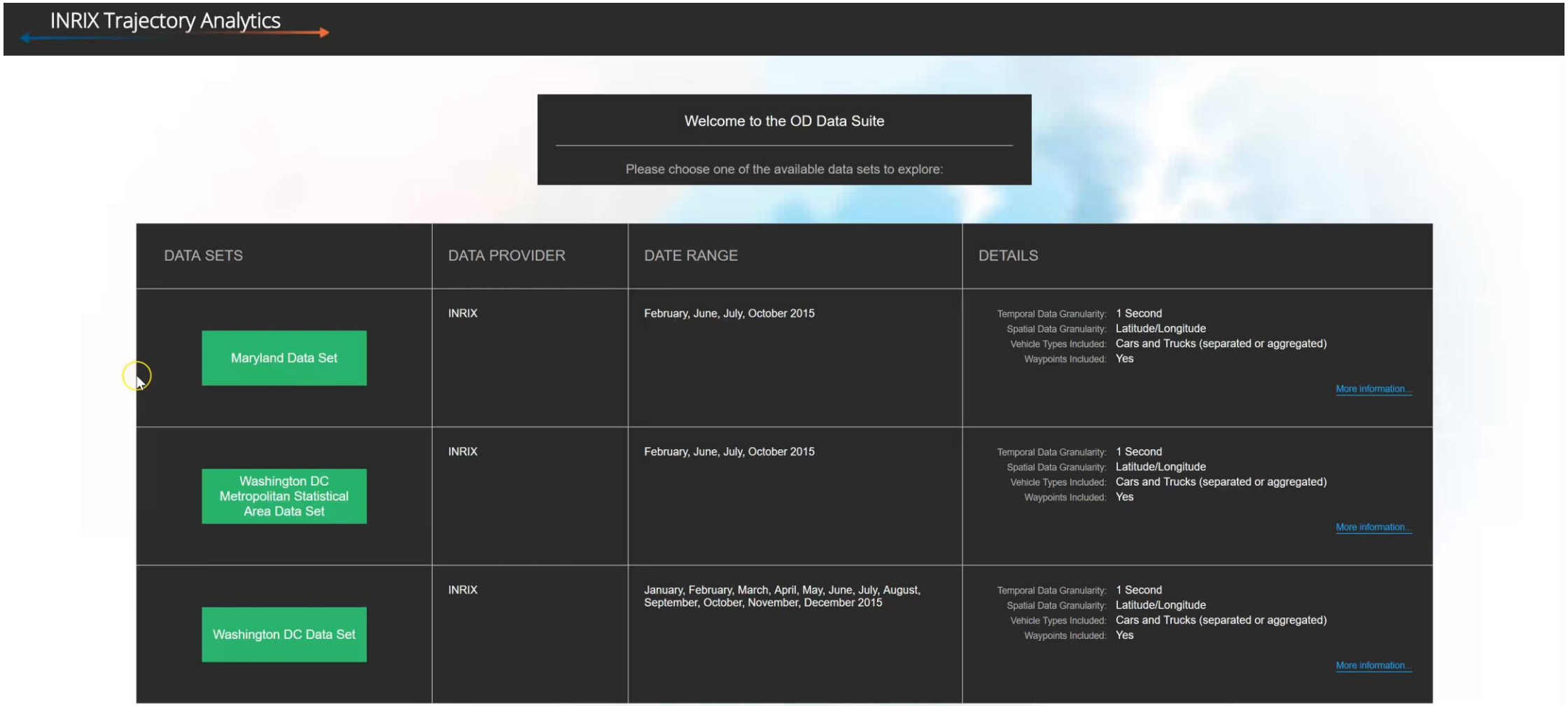
Planned Work & Work in Progress

- RITIS
  - Flash Conversion
    - Event Query Tool
    - Detector Query Tool
  - General UI Improvements
  - Transit Analytics
  - WZPMA Improvements
  - Origin-Destination Analytics
    - Route analytics
    - Chord Diagrams
    - More
- PDA
  - XD visualizations
  - Flash Conversion
    - Congestion Scan Modernization
    - Region Explorer Modernization
    - Bottleneck Ranking Modernization
  - Signalized Arterial PMs
  - Mid-block travel time analysis
  - Advanced intersection analytics
  - New Performance Widgets

Developing a “traditional” OD Matrix



Developing a “pass through” trip map visualization



Chord Diagrams

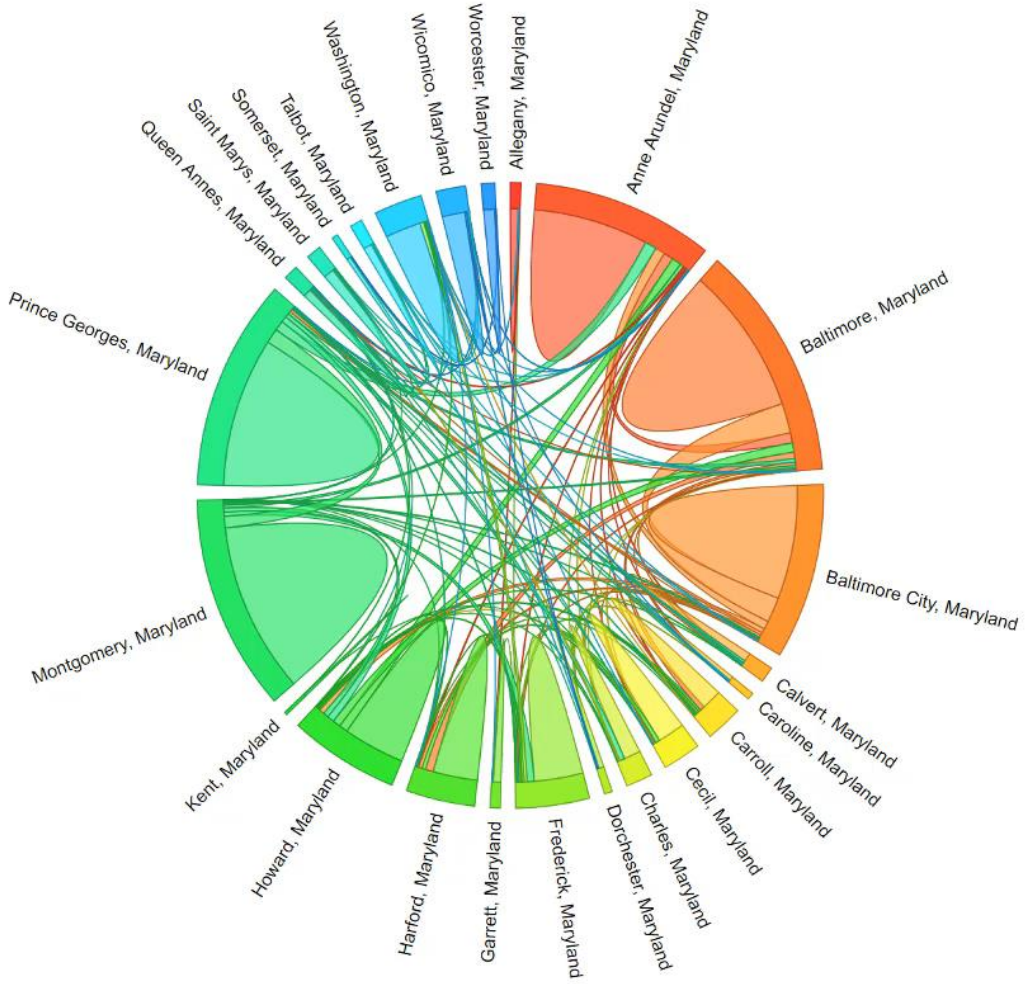
INRIX Trajectory Analytics

Switch to Matrix

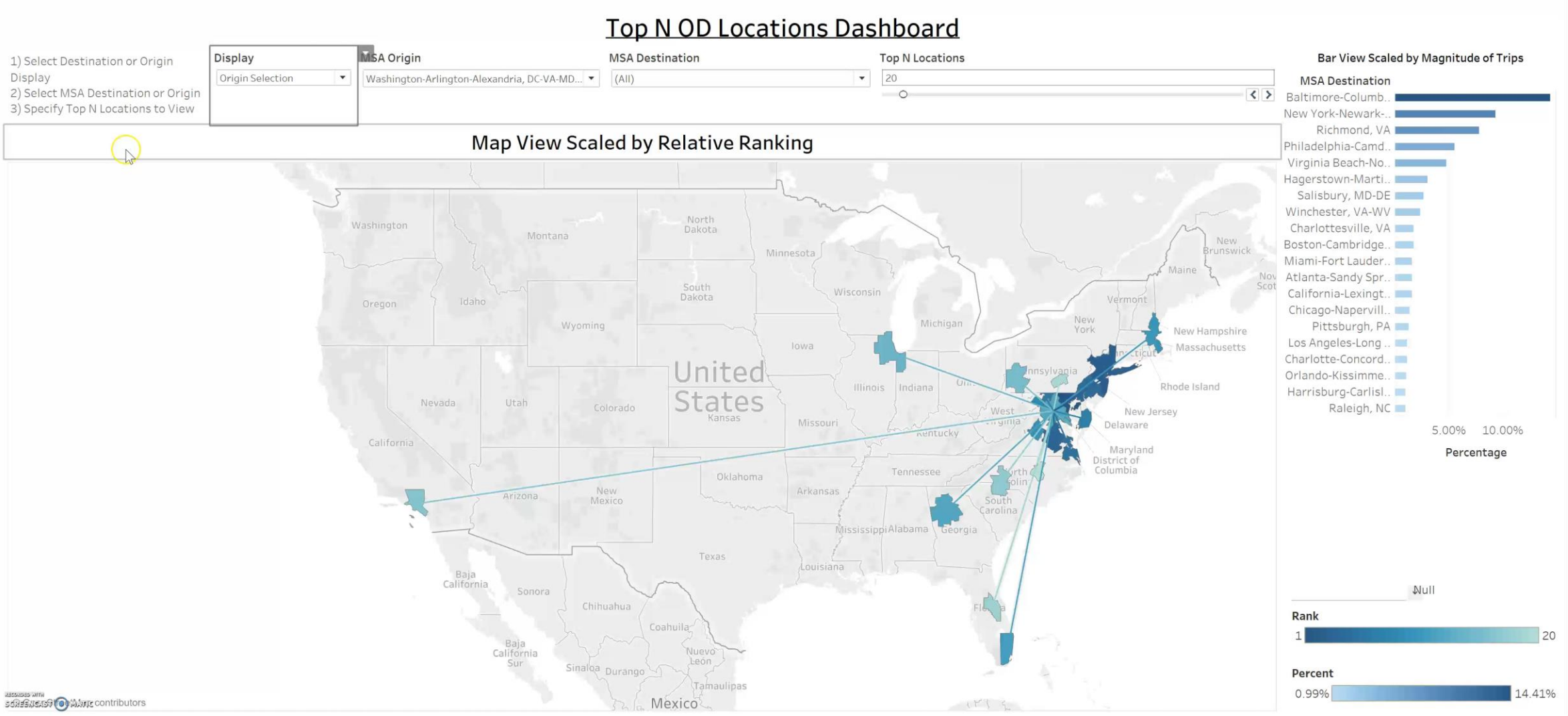
Top Ten OD Pairs

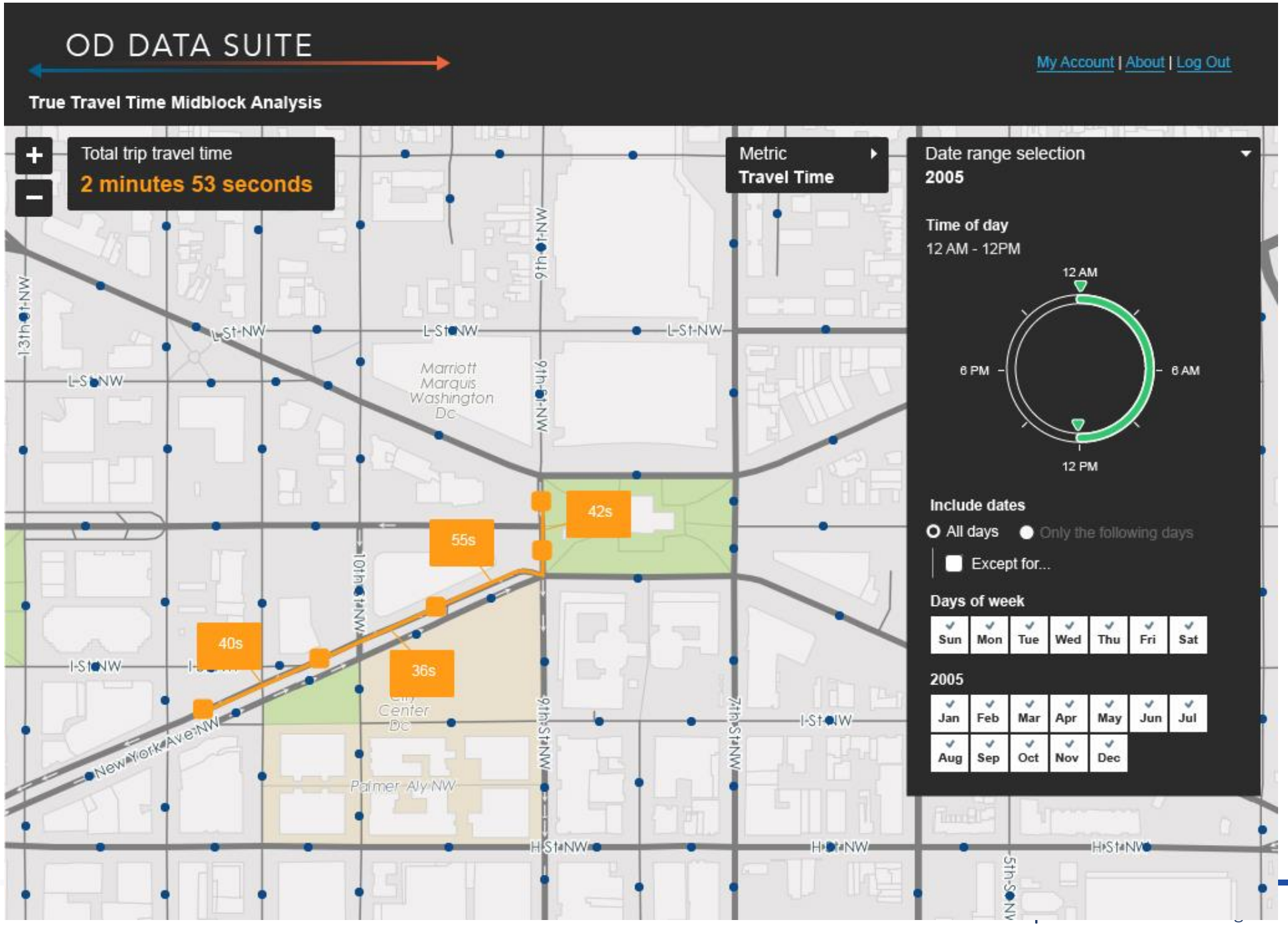
Montgomery, Maryland → Montgomery, Maryland	11.83%
Prince Georges, Maryland → Prince Georges, Maryland	10.38%
Baltimore, Maryland → Baltimore, Maryland	10.27%
Anne Arundel, Maryland → Anne Arundel, Maryland	7.99%
Baltimore City, Maryland → Baltimore City, Maryland	7.88%
Howard, Maryland → Howard, Maryland	4.28%
Frederick, Maryland → Frederick, Maryland	3.38%
Harford, Maryland → Harford, Maryland	3.09%
Washington, Maryland → Washington, Maryland	2.45%
Baltimore, Maryland → Baltimore City, Maryland	2.06%

Chord Diagram



National Travel Maps

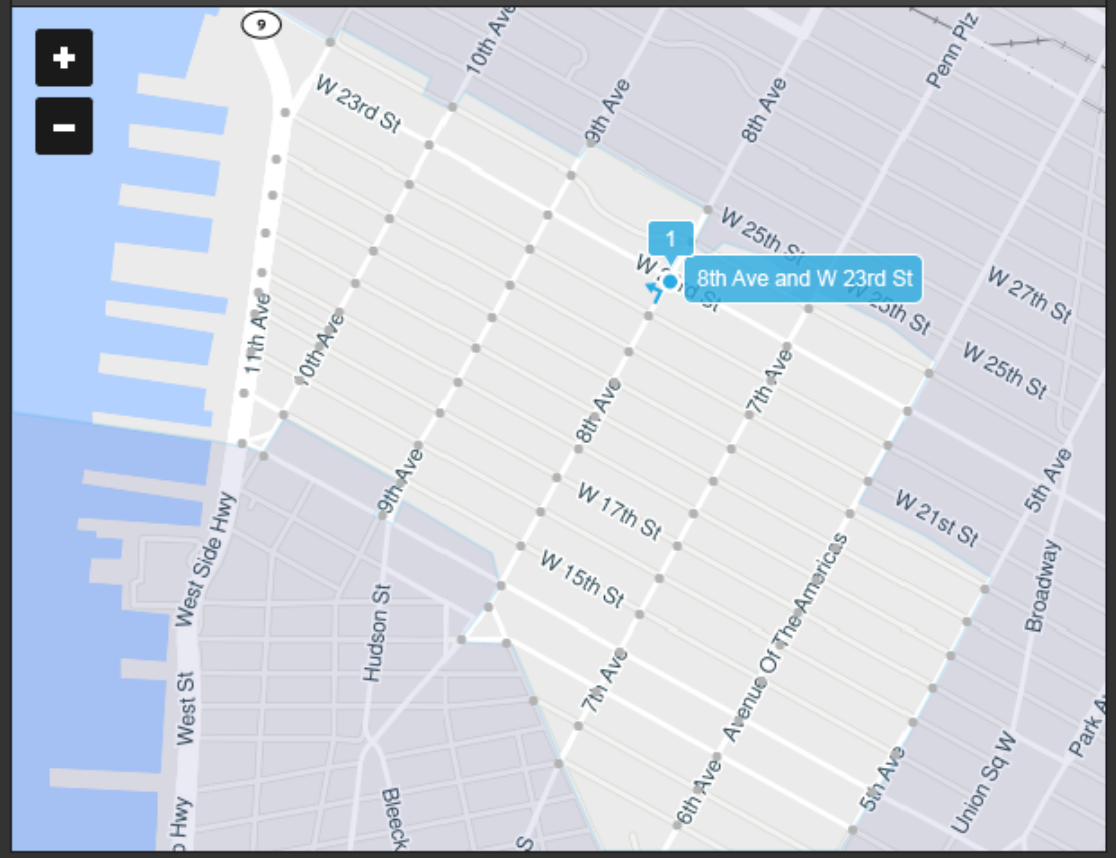



OD DATA SUITE
True Travel Time Midblock Analysis
My Account | About | Log Out
Total trip travel time
2 minutes 53 seconds
Metric
Travel Time
Date range selection
2005
Time of day
12 AM - 12PM
12 AM
6 PM
6 AM
12 PM
Include dates
All days
Only the following days
Except for...
Days of week
Sun
Mon
Tue
Wed
Thu
Fri
Sat
2005
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
42s
55s
40s
36s
13th St NW
L St NW
9th St NW
10th St NW
I St NW
New York Ave NW
Marriott Marquis Washington Dc
Palmer Aly NW
H St NW
7th St NW
5th St NW

Ranked intersection movements in the 10011 zip code for the date range of 05/06/18 through 05/12/18

Rank	Map	Intersection	Approach	Movement	Volume	User Delay Cost	▲ Average Travel Time	25th Precentile	75th Precentile	5th Precentile	95th Precentile
1	☑	8th Ave at W 23rd St	Northbound	Left	489	$4,235.00	5.5 mins	2.5 mins	7.2 mins	1.5 mins	7.5 mins
2	☐	W 20th St at 8th Ave	Eastbound	Through	761	$4,194.00	5.2 mins	2.1 mins	6.9 mins	1.4 mins	7.1 mins
3	☐	W 19th St at 9th Ave	Westbound	Left	504	$4,895.00	5.0 mins	2.1 mins	6.8 mins	1.4 mins	6.9 mins
4	☐	W 23rd St at 8th Ave	Eastbound	Through	210	$2,305.00	4.9 mins	1.7 mins	7.1 mins	1.2 mins	7.2 mins
5	☐	W 20th St at 8th Ave	Westbound	Left	354	$3,204.00	4.7 mins	1.8 mins	6.6 mins	1.3 mins	6.8 mins
6	☐	7th Ave at W 17th St	Southbound	Through	159	$2,987.00	4.7 mins	1.5 mins	6.3 mins	1.2 mins	6.6 mins
7	☐	W 15th St at 11th Ave	Westbound	Left	263	$2,516.00	4.5 mins	1.4 mins	6.0 mins	1.1 mins	6.5 mins
8	☐	W 19th St at 6th Ave	Westbound	Right	186	$1,425.00	4.4 mins	0.8 mins	5.8 mins	0.6 mins	6.2 mins
9	☐	W 14th St at 7th Ave	Eastbound	Through	218	$1,546.00	4.3 mins	1.5 mins	5.6 mins	1.0 mins	6.0 mins
10	☐	W 21st St at 10th Ave	Eastbound	Left	135	$1,204.00	4.0 mins	0.7 mins	5.5 mins	0.5 mins	6.0 mins

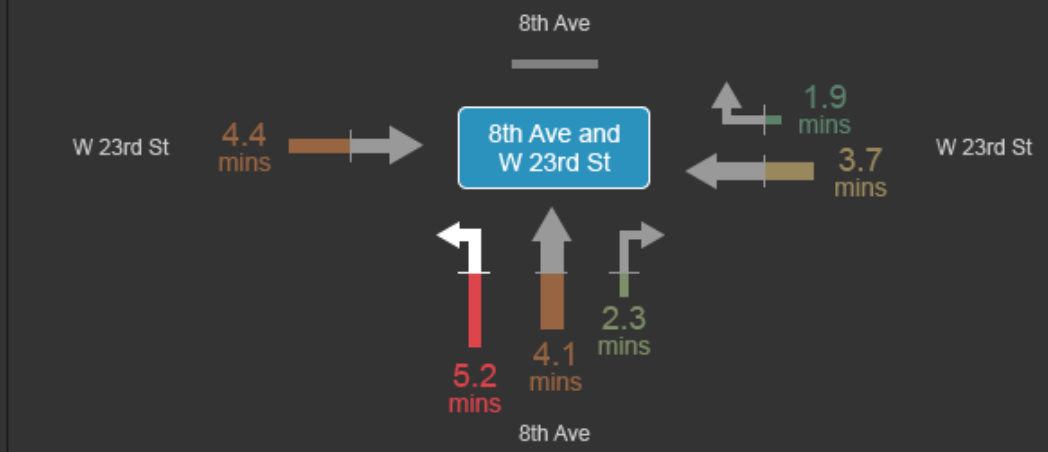
Map | Display Options



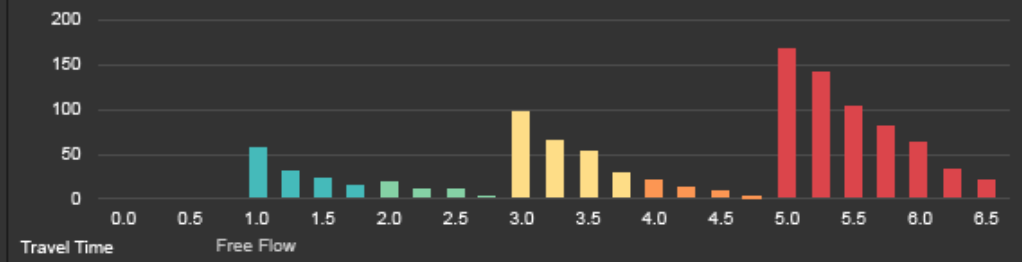
Intersection Breakdown | 8th Ave at W 23rd St | Travel Time | Display Options

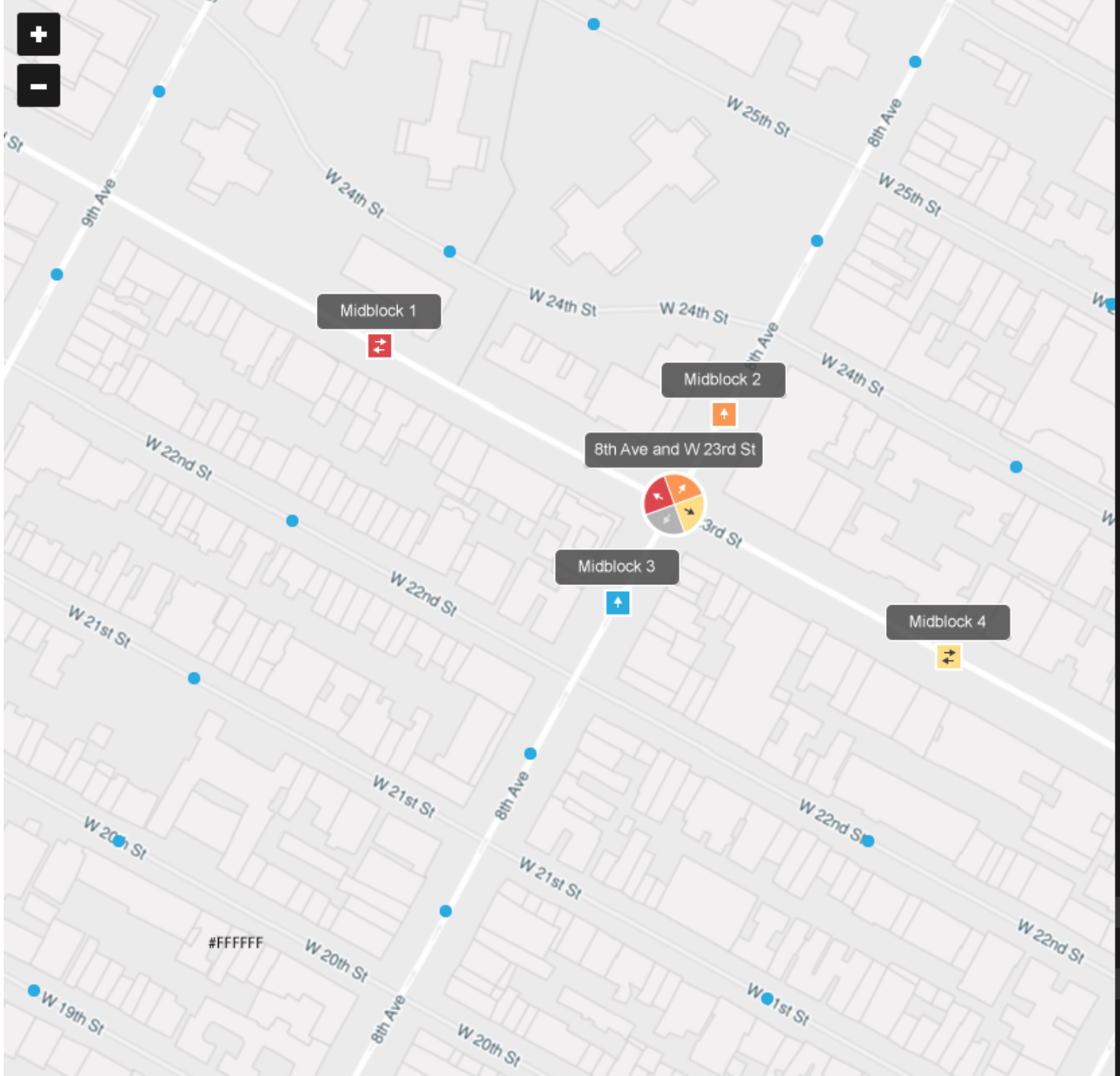
1 mins 2 3 4 5 6+ mins

Time of Day All Hours



Total Trips

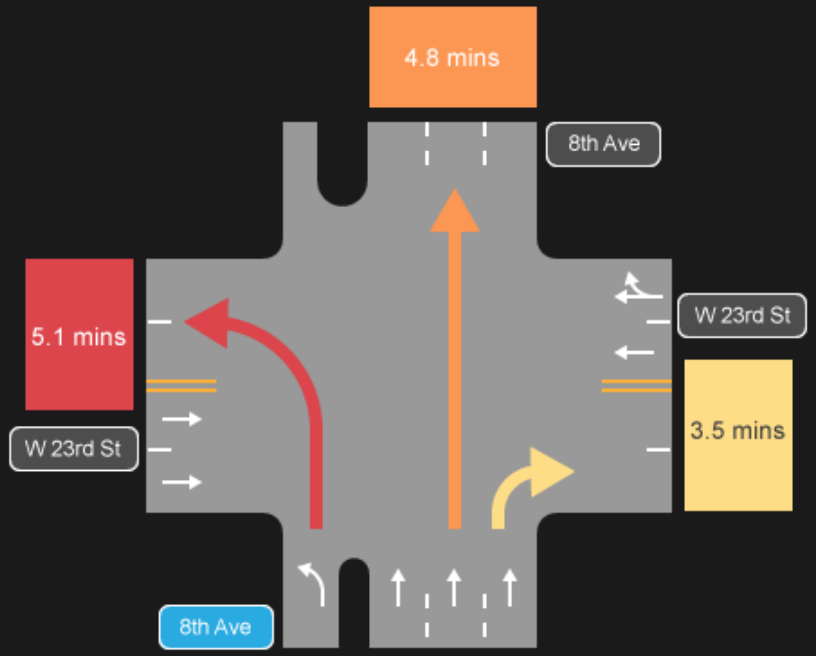




Intersection
8th Ave and W 23rd St

Date range
05/10/2018 SMTWTFS

Metric
Travel time through intersection



Midblock	Avg Travel Time to midblock	6AM - 9AM	12PM - 3PM	6PM - 9PM
Midblock 1	5.5 mins	5.9 mins	5.1 mins	5.4 mins
Midblock 2	4.2 mins	4.5 mins	3.8 mins	4.2 mins
Midblock 3	-	0	0	0
Midblock 4	3.1 mins	3.6 mins	2.9 mins	2.7 mins

1 - 2 minutes | 2 - 3 minutes | 3 - 4 minutes | 4 - 5 minutes | 5 - 6 minutes

New Agencies Participating in RITIS

- Illinois
- Missouri
- Austin, TX
- Louisiana (coming soon)

Agency Input Session

"What's on your mind?"

Asking Questions during the Agency Input Session

- When the phone lines are opened…
  - **Please mute your phone line** until you are asking a question (press *6 to mute/unmute individual phone lines)
  - Please do not place call “on hold” as your hold music will be heard by the group
  - Please state your name and agency before asking a question

FHWA EDC 5 – Crowdsourcing Update

Denise Markow, I-95 Corridor Coalition





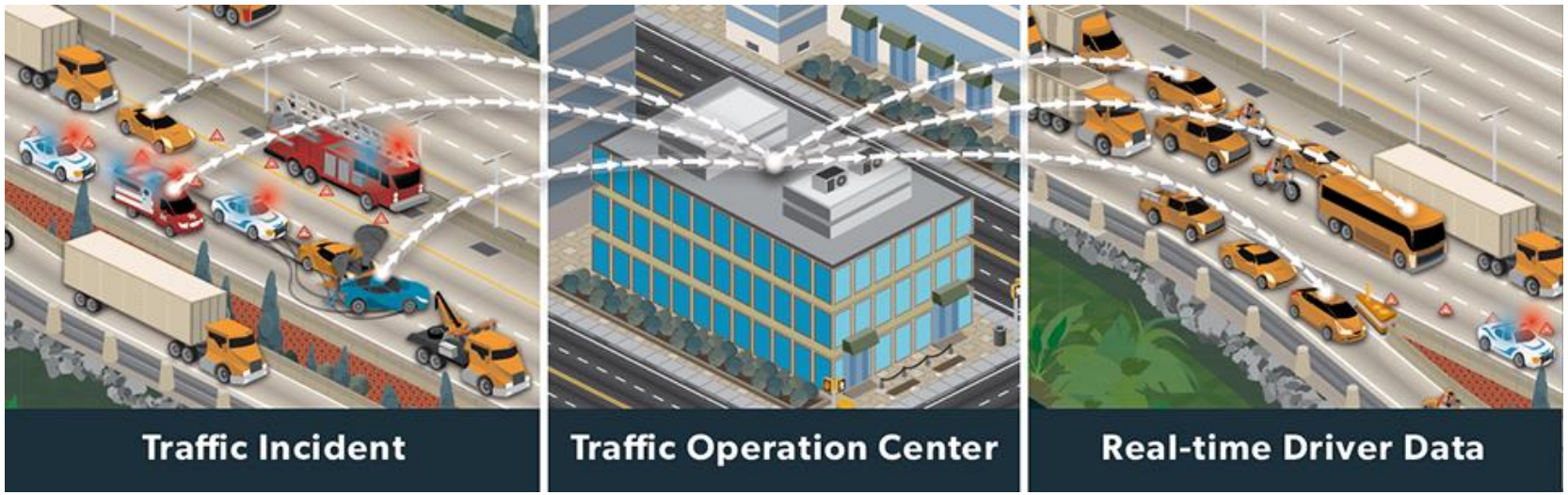




Use of Crowdsourcing to Advance Operations

Every Day Counts (EDC)-5 (2019-2020)

Crowdsourcing turns transportation system users into sensors on system performance, providing real-time, high-quality data on traffic operations, conditions, and driver behavior.



Crowdsourcing Initiative: EDC-5

- Focusing on traffic operations uses:
  - Early notification of incidents
  - Real-time traffic monitoring (situational awareness)
  - Traveler information
  - Active traffic management
  - Others
- Benefits include:
  - **Increased safety** through quicker and improved responses to congestion events.
  - **Improved operations** through better traffic management and more accurate traveler information.
  - **Cost savings** through reduced need for sensors and associated maintenance costs.

Crowdsourcing Initiative: EDC-5

Next steps:

- The crowdsourcing Implementation Team is still determining which uses to encourage.
- 5 EDC Summits will take place this fall.
  - All States attend a summit.
  - Each state will select which initiatives they would like to support.
  - Encourage State attendees to select the crowdsourcing initiative.

Wrap Up

Denise Markow, I-95 Corridor Coalition

Questions?

Please contact:

I-95 Corridor Coalition – Denise Markow 301.789.9088 or dmarkow@i95coalition.org

RITIS or PDA Suite – Michael Pack at packml@umd.edu

RITIS Technical Support – support@ritis.org

PDA Suite Technical Support – vpp-support@ritis.org

Logistics – Joanna Reagle 610.228.0760 or jreagle@kmjinc.com


thank you!

Please confirm that your line is **muted** ***6**

Thank You!