Utilizing Advanced Metrics to Optimize Signal Performance

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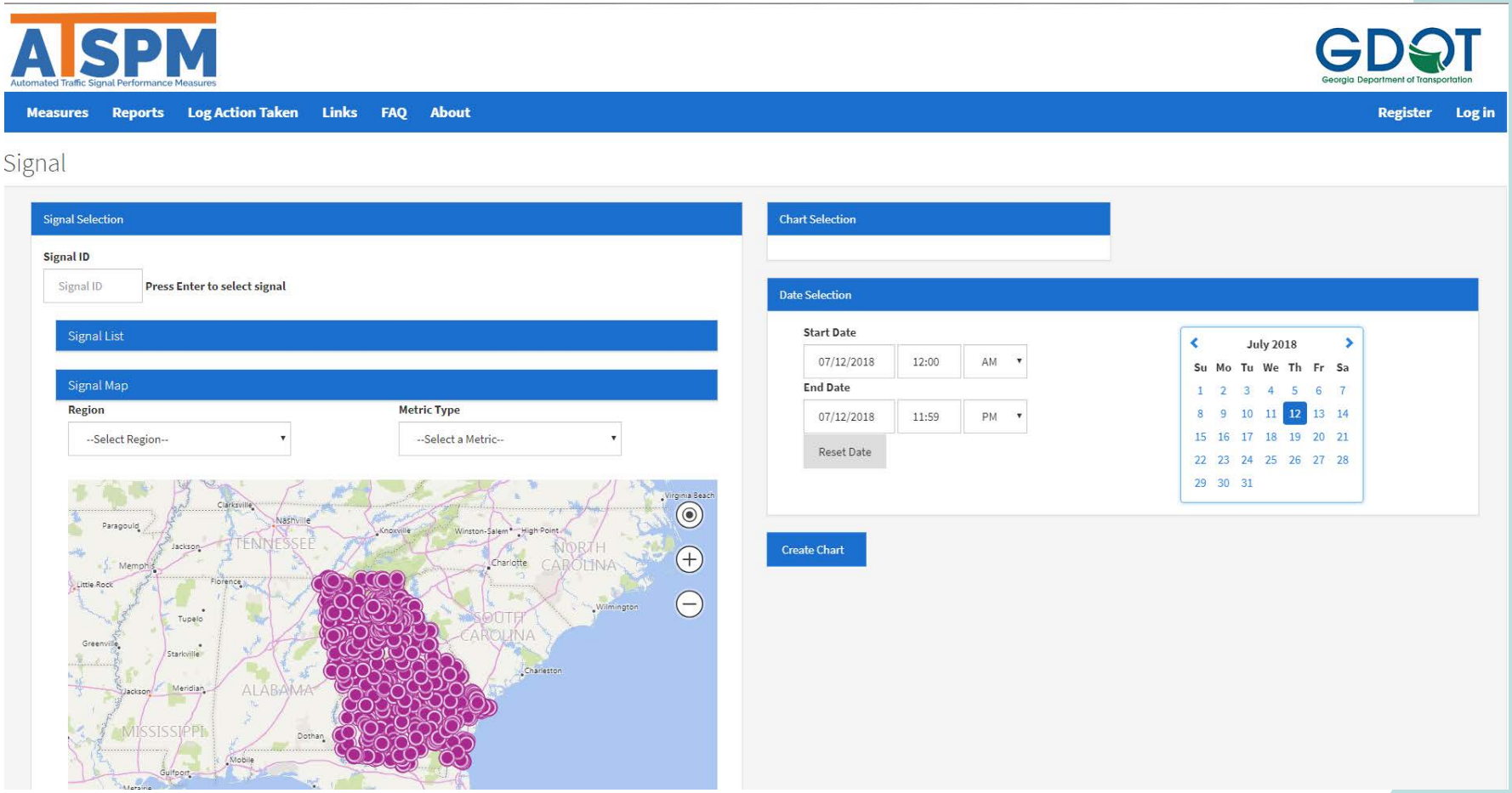
Georgia Department of Transportation

Why Use Advanced Metrics?

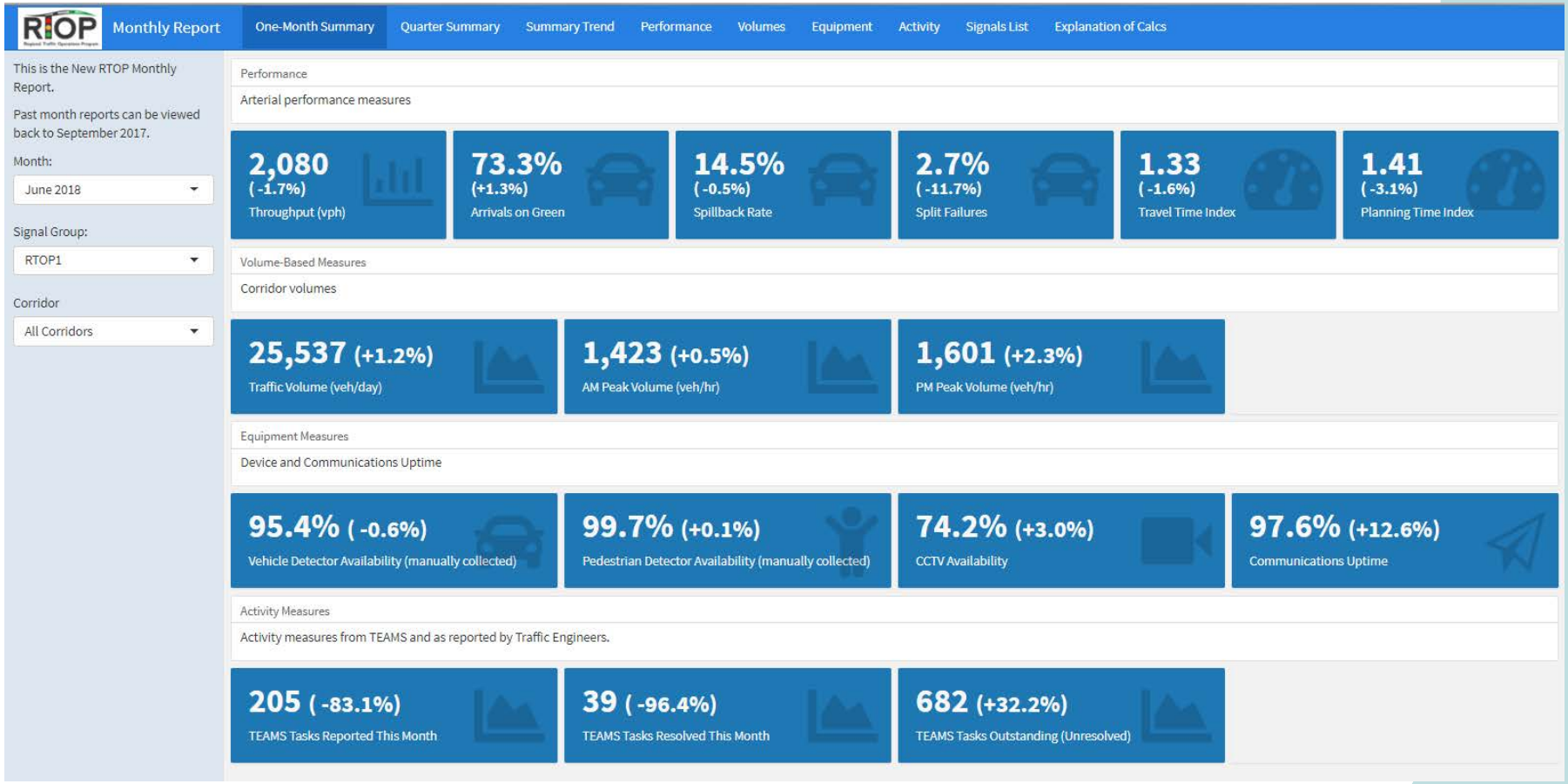
- Because they’re there.
- Data is now more reliable and available.
- Expands from traditional MOEs
- Specific use
- Its cool and fun

Available Resources

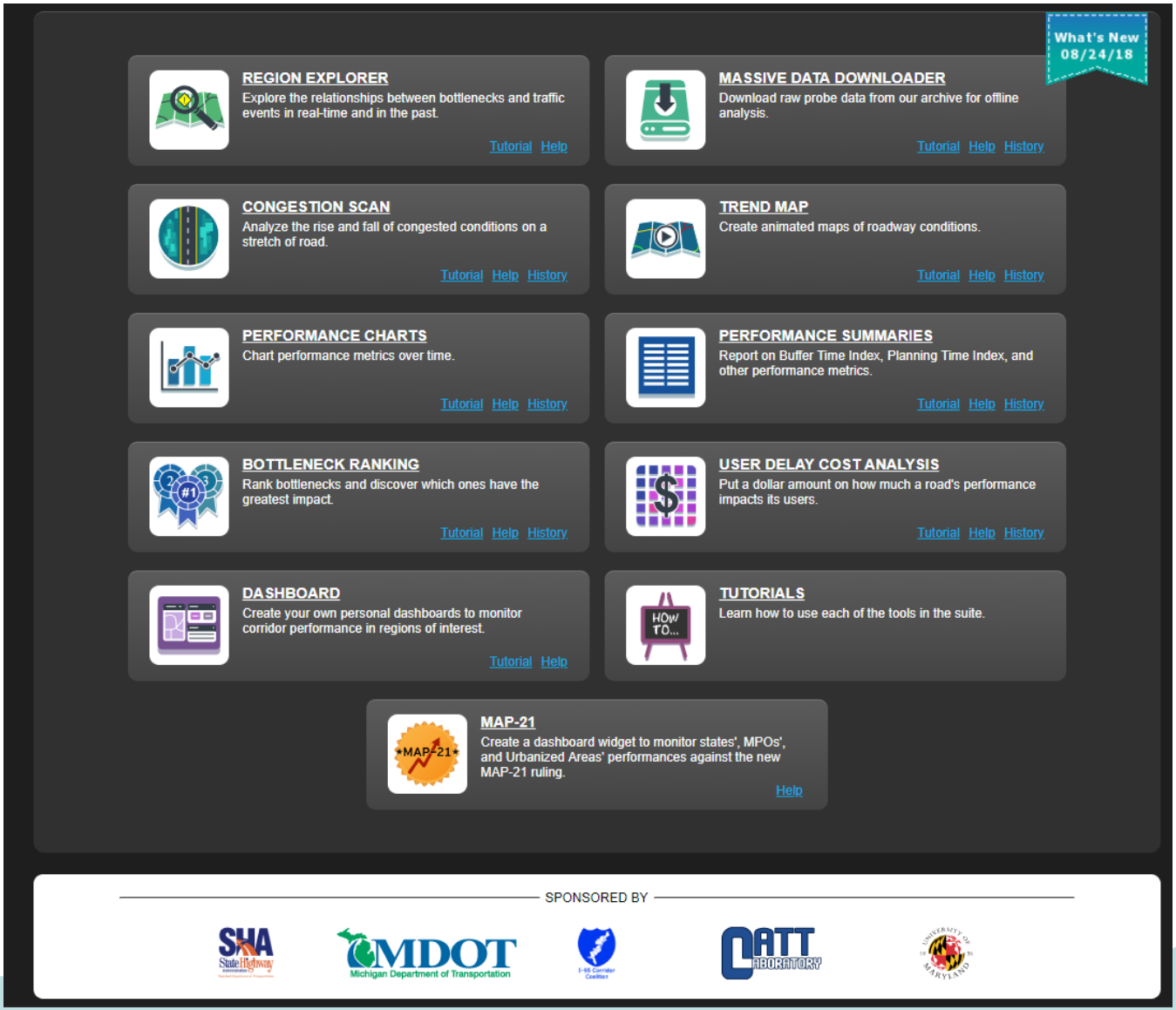
ATSPM


ATSPM
Automated Traffic Signal Performance Measures
GDOT
Georgia Department of Transportation
Measures
Reports
Log Action Taken
Links
FAQ
About
Register
Log in
Signal
Signal Selection
Signal ID
Signal ID
Press Enter to select signal
Signal List
Signal Map
Region
--Select Region--
Metric Type
--Select a Metric--
Chart Selection
Date Selection
Start Date
07/12/2018
12:00
AM
End Date
07/12/2018
11:59
PM
Reset Date
July 2018
Su Mo Tu We Th Fr Sa
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31
Create Chart
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
ALABAMA
MISSISSIPPI
Clarksville
Nashville
Knoxville
Winston-Salem
High Point
Virginia Beach
Paragould
Jackson
Memphis
Little Rock
Florence
Charlotte
Wilmington
Tupelo
Greenville
Starkville
Meridian
Jackson
Charleston
Dothan
Mobile
Gulfport

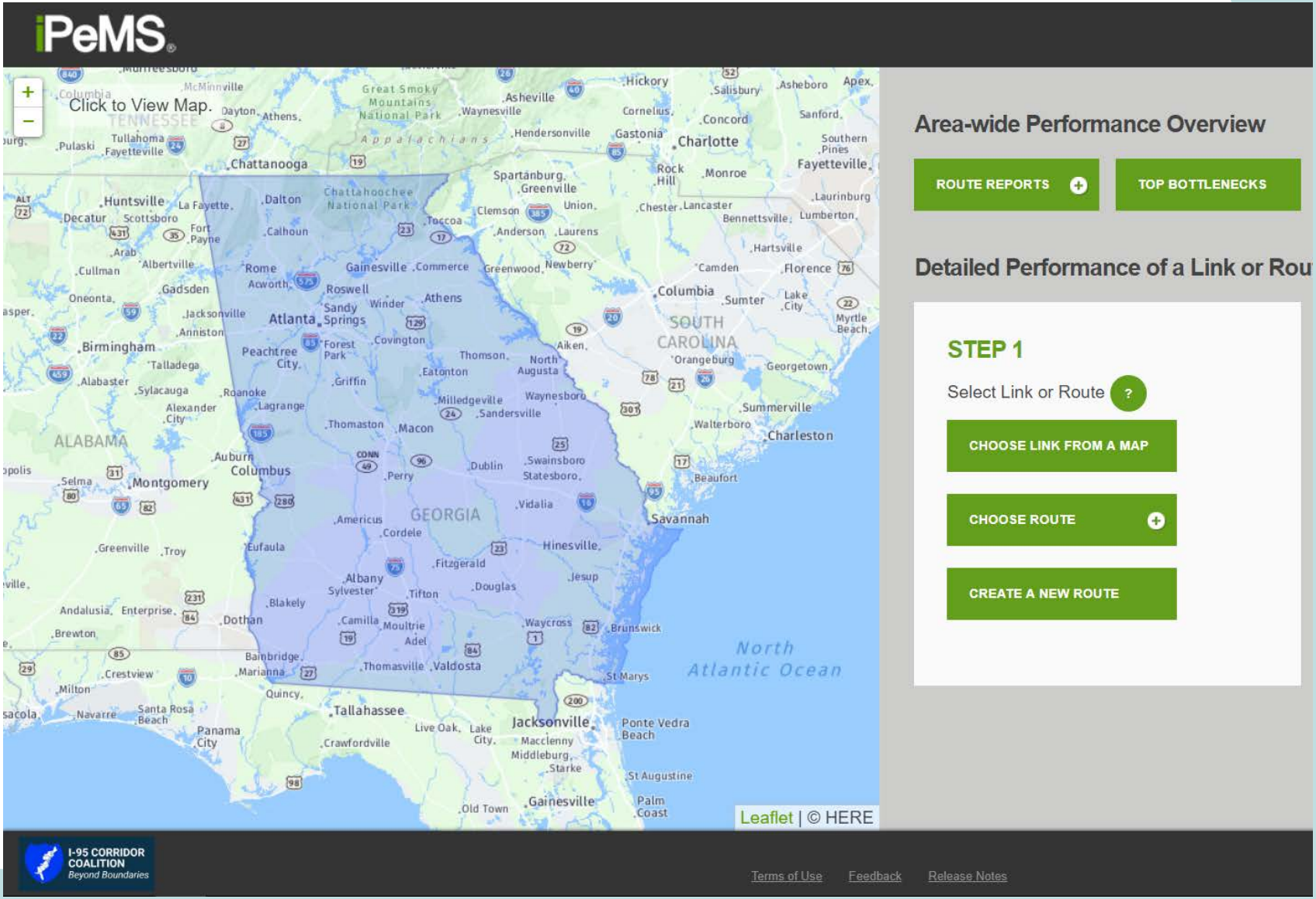
GDOT Monthly Reporting Tool



RITIS


What's New
08/24/18
REGION EXPLORER
Explore the relationships between bottlenecks and traffic events in real-time and in the past.
Tutorial Help
MASSIVE DATA DOWNLOADER
Download raw probe data from our archive for offline analysis.
Tutorial Help History
CONGESTION SCAN
Analyze the rise and fall of congested conditions on a stretch of road.
Tutorial Help History
TREND MAP
Create animated maps of roadway conditions.
Tutorial Help History
PERFORMANCE CHARTS
Chart performance metrics over time.
Tutorial Help History
PERFORMANCE SUMMARIES
Report on Buffer Time Index, Planning Time Index, and other performance metrics.
Tutorial Help History
BOTTLENECK RANKING
Rank bottlenecks and discover which ones have the greatest impact.
Tutorial Help History
USER DELAY COST ANALYSIS
Put a dollar amount on how much a road's performance impacts its users.
Tutorial Help History
DASHBOARD
Create your own personal dashboards to monitor corridor performance in regions of interest.
Tutorial Help
TUTORIALS
Learn how to use each of the tools in the suite.
MAP-21
Create a dashboard widget to monitor states', MPOs', and Urbanized Areas' performances against the new MAP-21 ruling.
Help
SPONSORED BY
SHA State Highway
MDOT Michigan Department of Transportation
I-95 Corridor Coalition
CATT Laboratory
University of Maryland

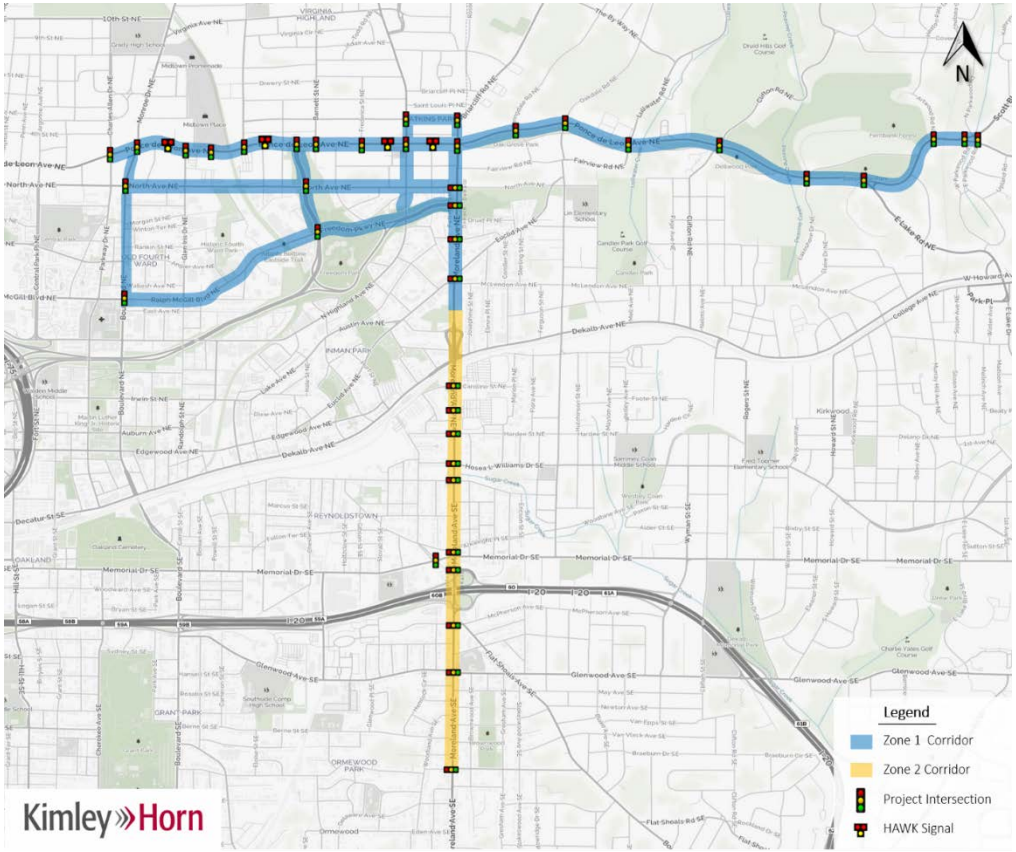
iPeMS


iPeMS
Click to View Map.
Area-wide Performance Overview
ROUTE REPORTS
TOP BOTTLENECKS
Detailed Performance of a Link or Rou
STEP 1
Select Link or Route
CHOOSE LINK FROM A MAP
CHOOSE ROUTE
CREATE A NEW ROUTE
Leaflet | © HERE
I-95 CORRIDOR COALITION
Beyond Boundaries
Terms of Use
Feedback
Release Notes

Case Study: Optimization of SR 42 and SR 8 Corridors

- Background
- Before Use of Metrics
- Implementation Use of Metrics
- After Study Use of Metrics

Case Study: Optimization of SR 42 and SR 8 Corridors



Background:

- RTOP Zone 5
- ZM Robinson Nicol
- 44 Signals
- Primarily Focused on AM, MD, and PM Peaks

Case Study: Optimization of SR 42 and SR 8 Corridors

Use of Before Metrics

- Utilizing ATSPM
  - TMCs
  - Count Locations
  - Trouble Areas
  - TOD Evaluation
  - Etc.
- Utilizing Probe Data
  - TTI / PTI
  - Travel Time
  - Queuing
  - Congestion

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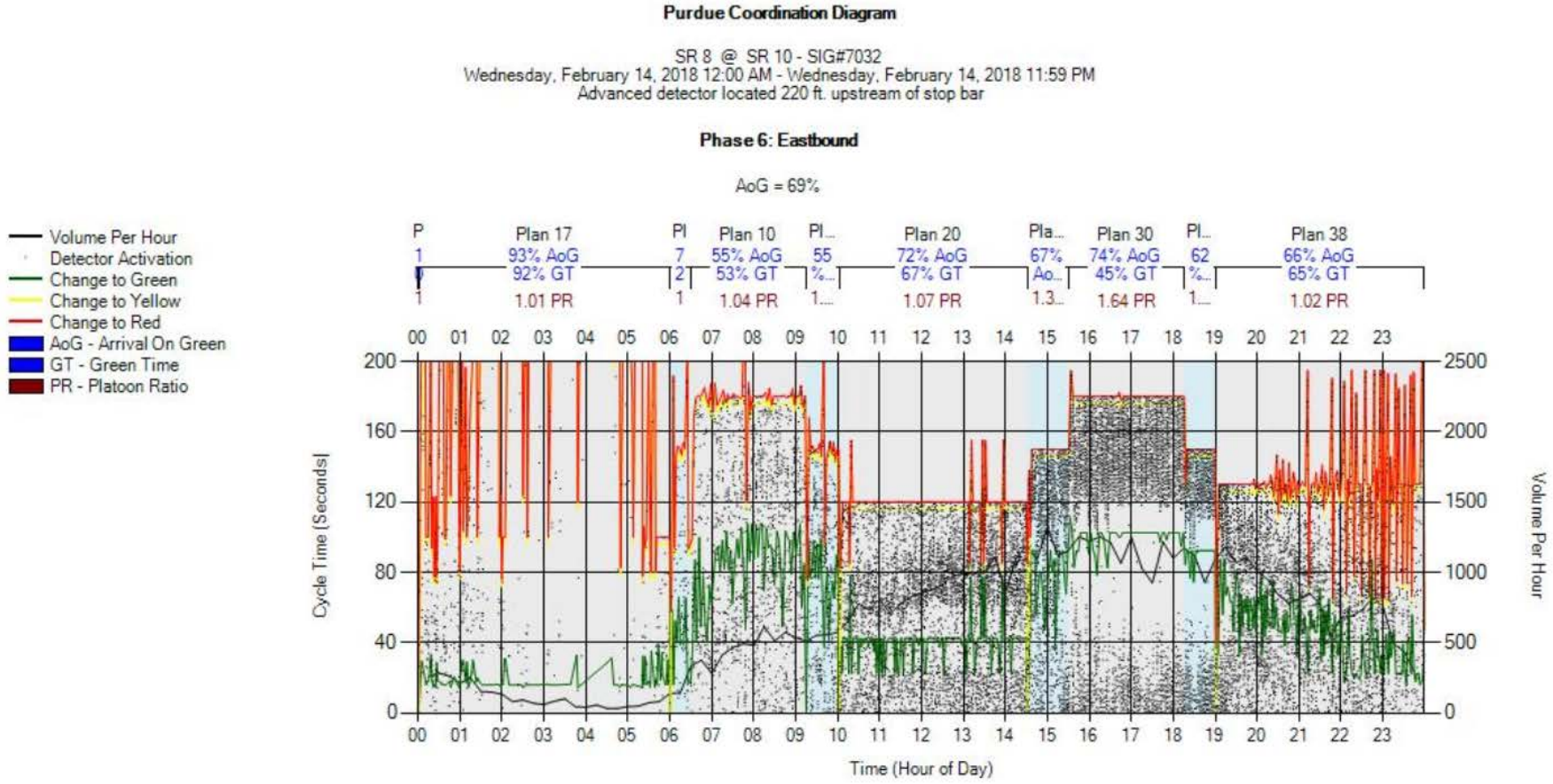

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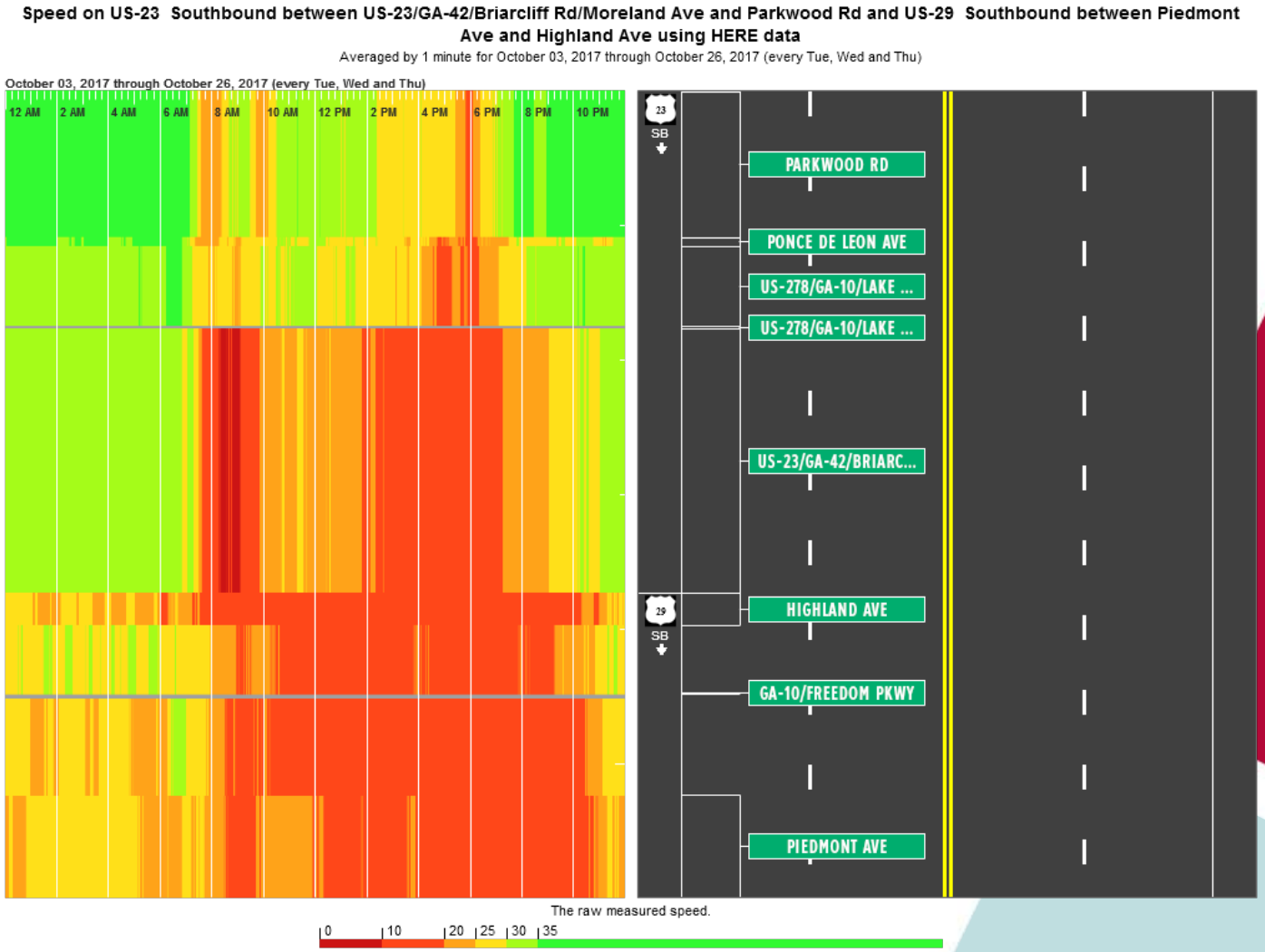

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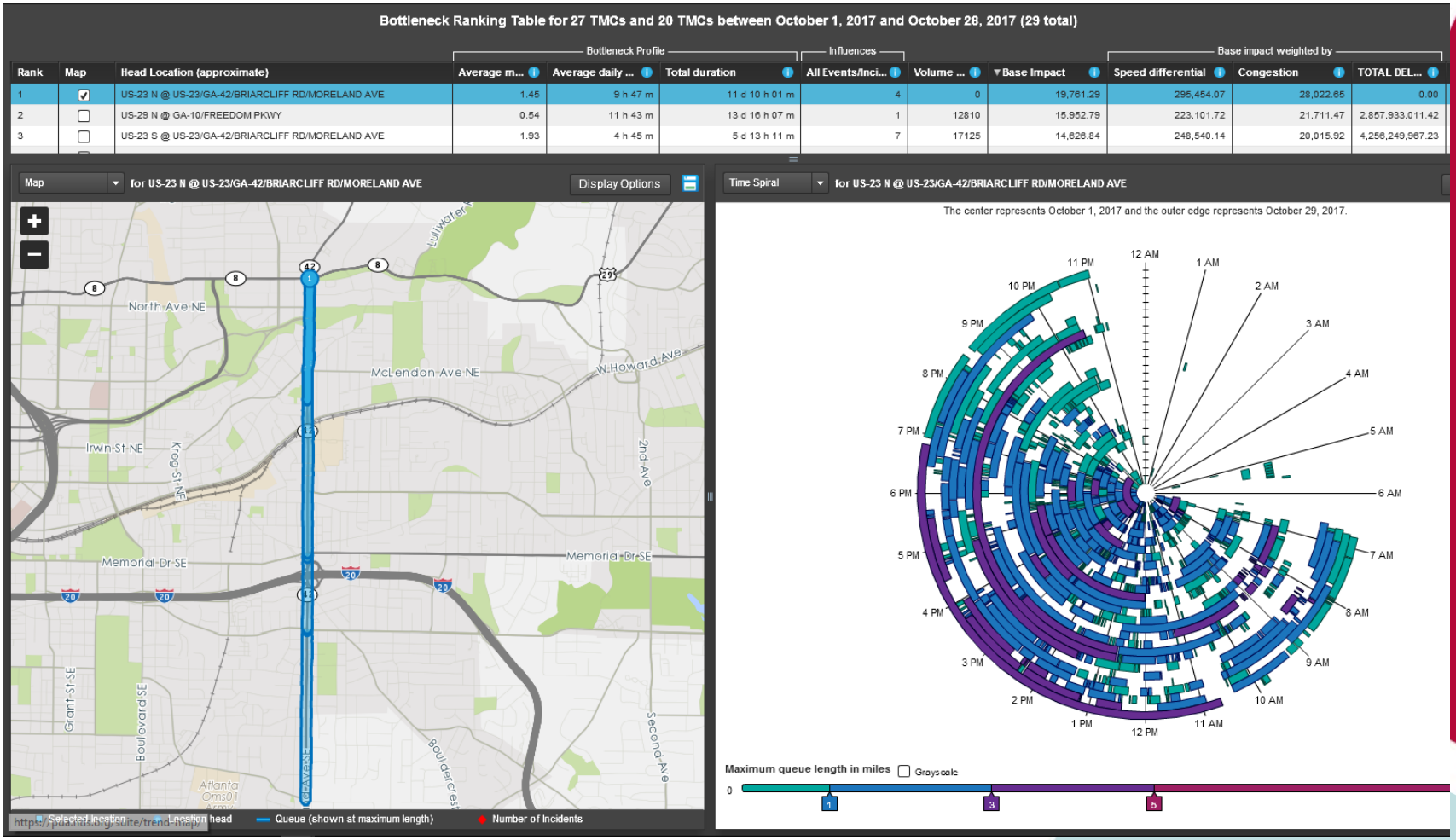

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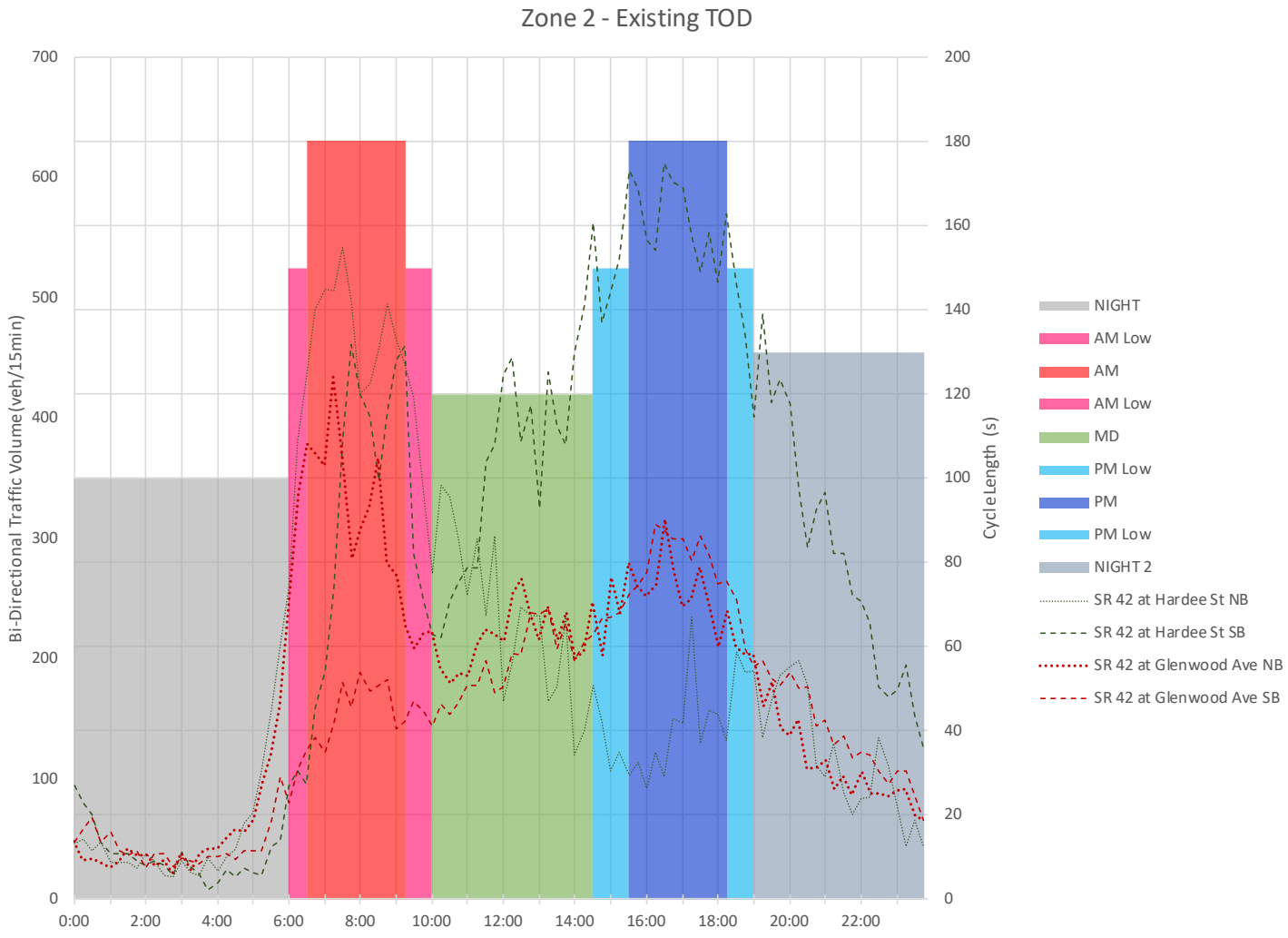


Case Study: Optimization of SR 42 and SR 8 Corridors

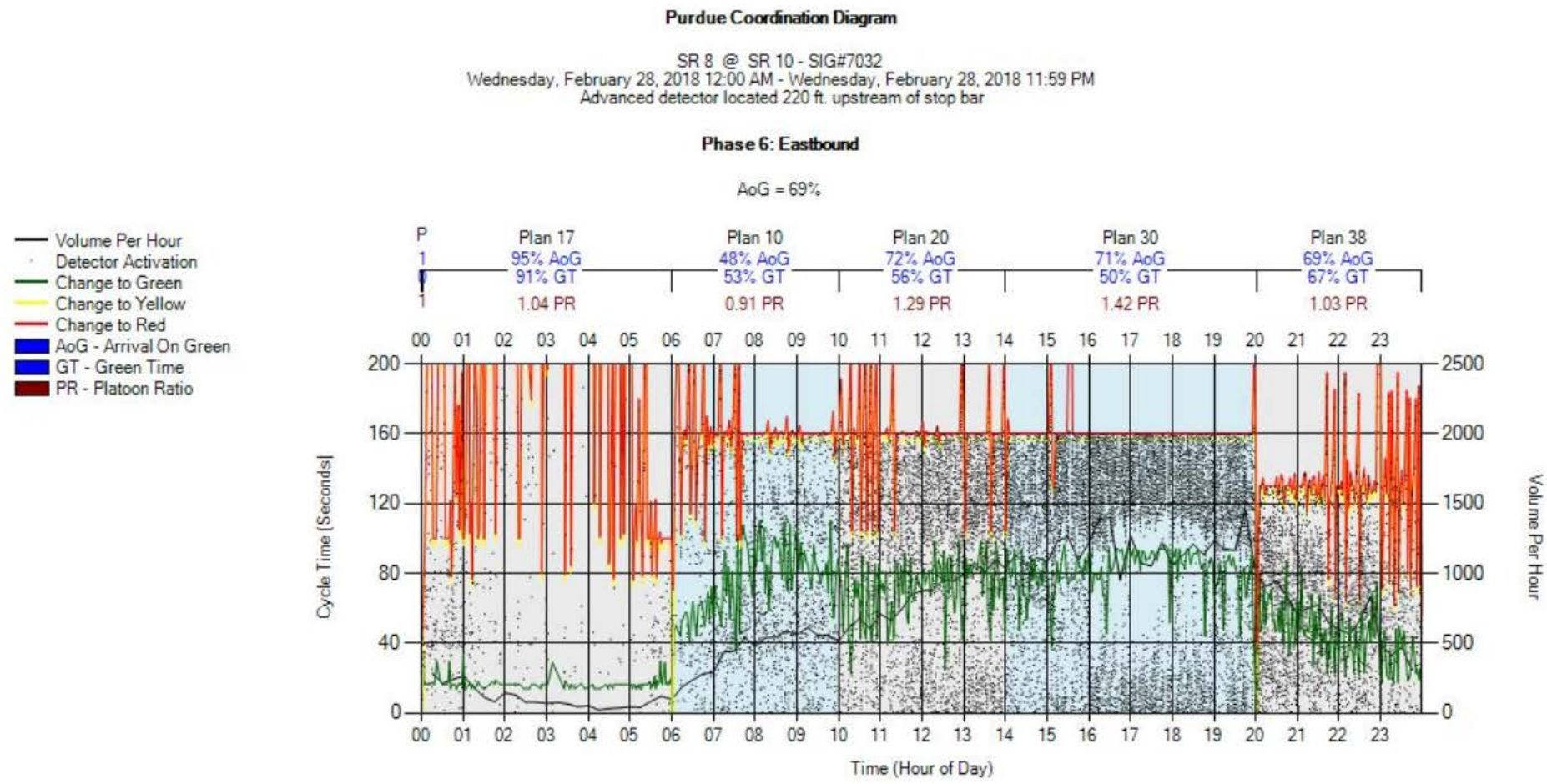
Implementation Use of Metrics

- Utilizing ATSPM
  - Arrivals on Green
  - Split Failures
  - Cycle Length
  - TOD Evaluation
- Utilizing Probe Data
  - TTI / PTI
  - Travel Time
  - Queuing
  - Congestion

Case Study: Optimization of SR 42 and SR 8 Corridors

- Progression Balancing between mainline and side street
- Observing queuing and delays
- Adjustments in cycle lengths
- Additional patterns

Case Study: Optimization of SR 42 and SR 8 Corridors

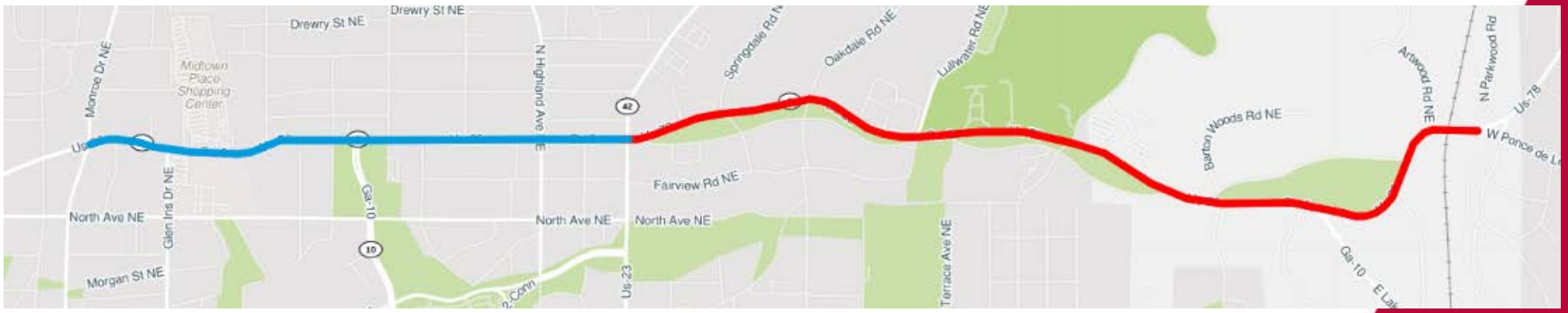


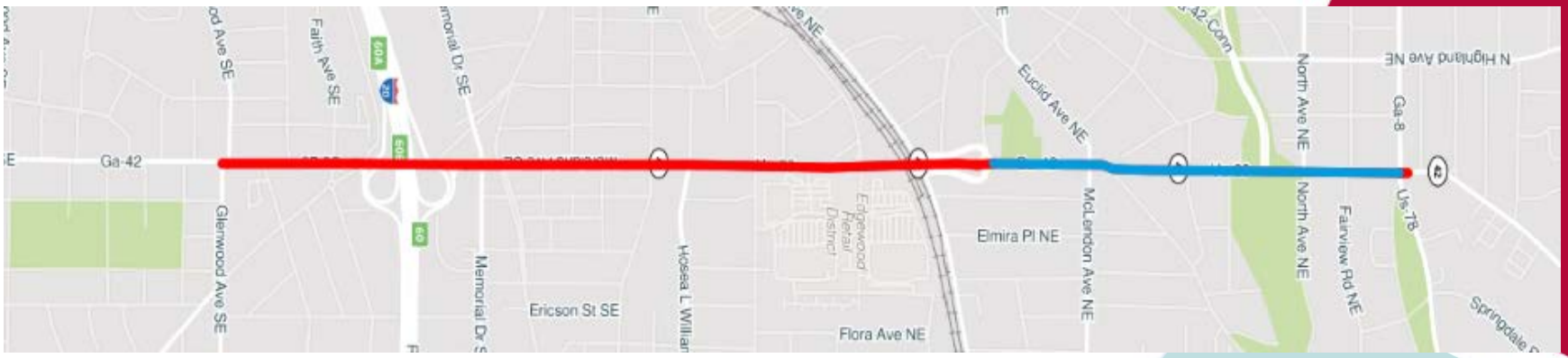
Case Study: Optimization of SR 42 and SR 8 Corridors

After Study Use of Metrics

- Utilizing ATSPM
  - Purdue Diagram
  - Split Failures
  - Arrivals on Green
  - Etc.
- Utilizing Probe Data
  - TTI / PTI
  - Travel Time
  - Queuing
  - Congestion

Case Study: Optimization of SR 42 and SR 8 Corridors





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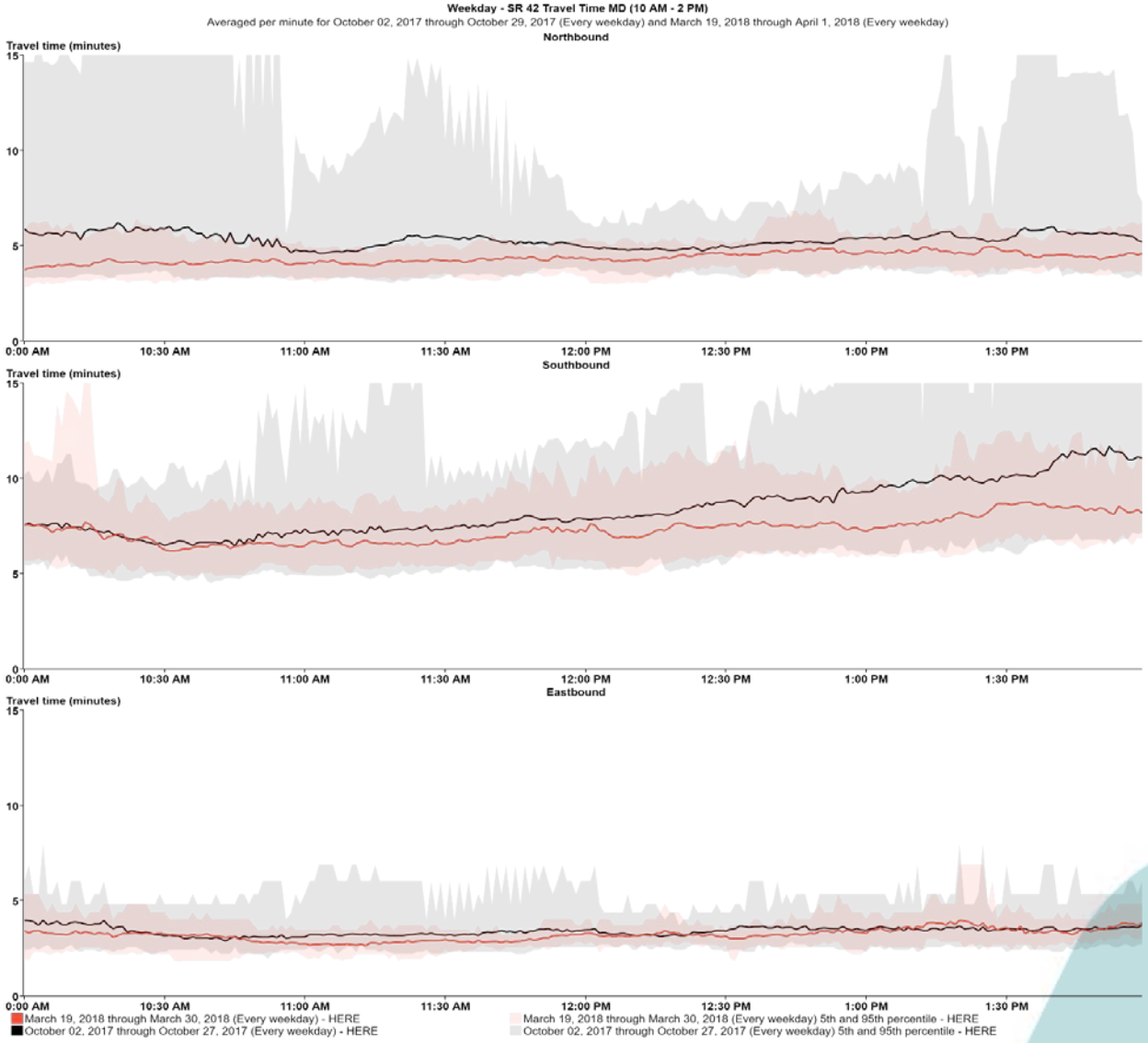

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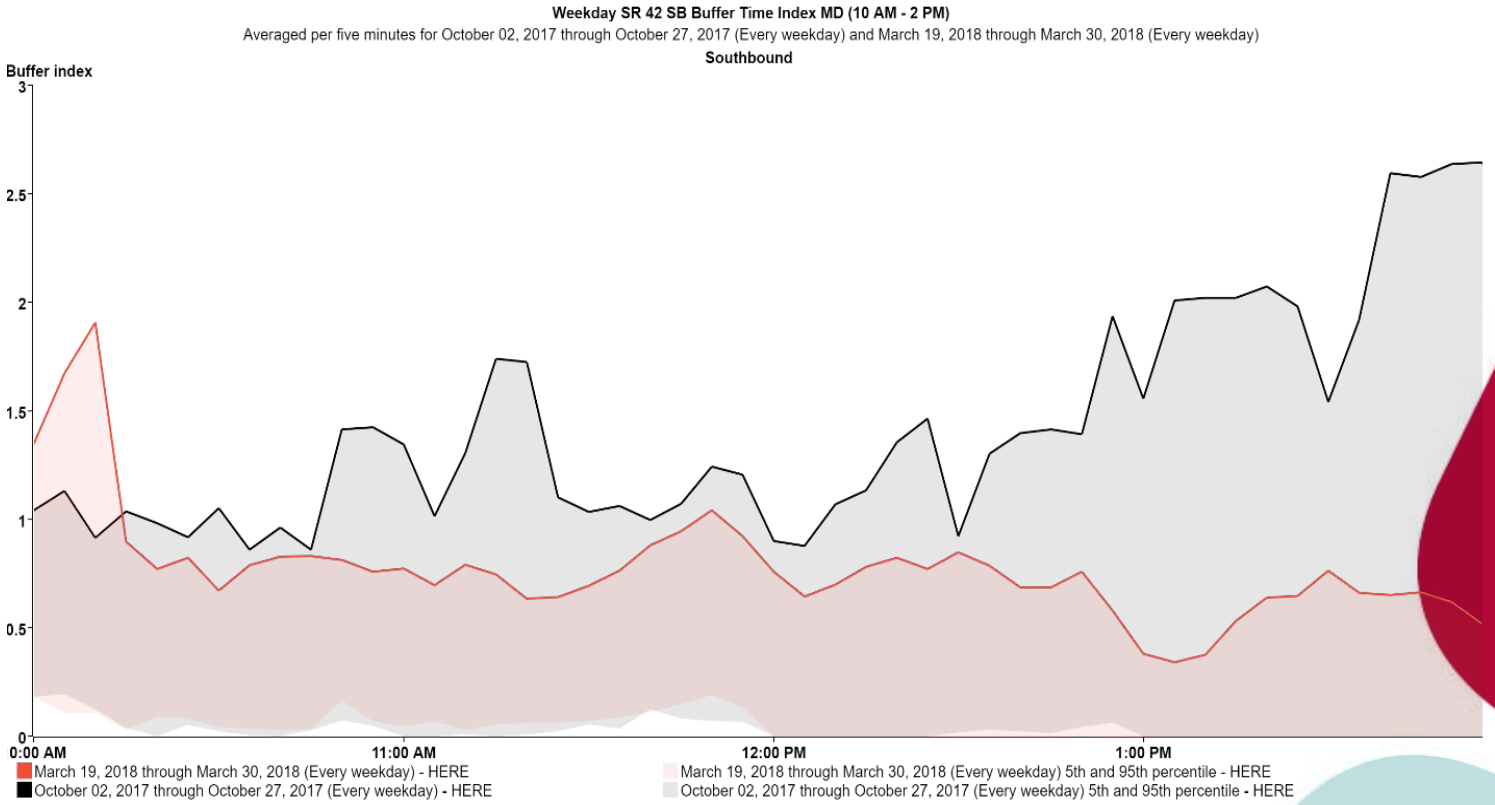
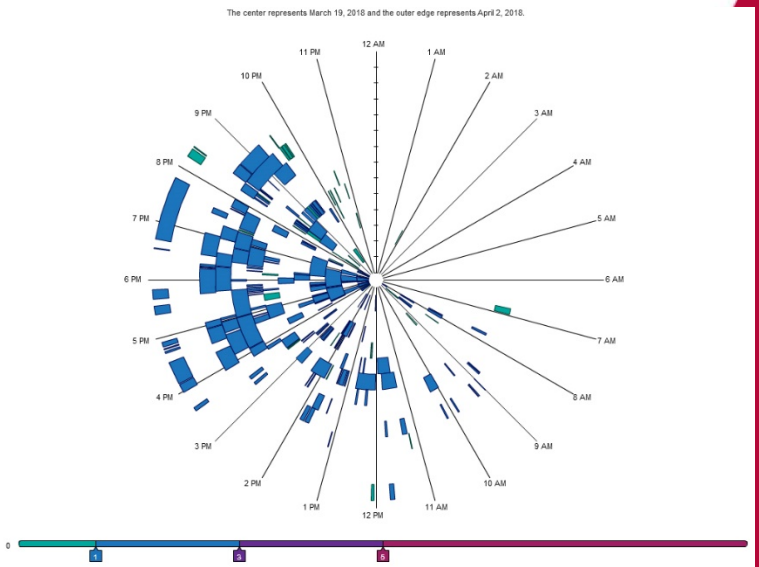


Case Study: Optimization of SR 42 and SR 8 Corridors

Before

After



Case Study: Optimization of SR 42 and SR 8 Corridors

SR 42 NB Bottleneck Analysis

SR 42 Northbound										
	at SR 8		**at I-20**		**at Memorial**		**at Glenwood**		**at Euclid**	
	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018
Average Max Length (Miles)	1.45	1.23	0.71	0.61	0.42	0.33	0.13	0.12	1.19	1.18
Average Daily Duration	9 h 48 m	7 h 11 m	11 h 06 m	3 h 12 m	4 h 33 m	2 h 52 m	2 h 14 m	2 h 58 m	38 m	11 m

SR 42 SB Bottleneck Analysis

SR 42 Southbound										
	at SR 8		**at I-20**		**at Memorial**		**at Glenwood**		**at Euclid**	
	2017	2018	2017	2018	2017	2018	2017	2018	2017	2018
Average Max Length (Miles)	-	-	1.42	0.99	1.63	1.65	1.15	0.81	0.83	0.83
Average Daily Duration	-	-	2 h 28 m	2 h 39 m	4 h 48 m	2 h 28 m	3 h 39 m	2 h 03 m	2 h 52 m	4 h 17 m

SR 42 Queue Analysis

SR 42				
	Northbound		**Southbound**	
	2017	2018	2017	2018
Queue Density	1.11	1.01	1.71	1.35
Queue Occupancy	0.90	0.68	0.73	0.57
Q. Score	1.00	0.69	1.25	0.77

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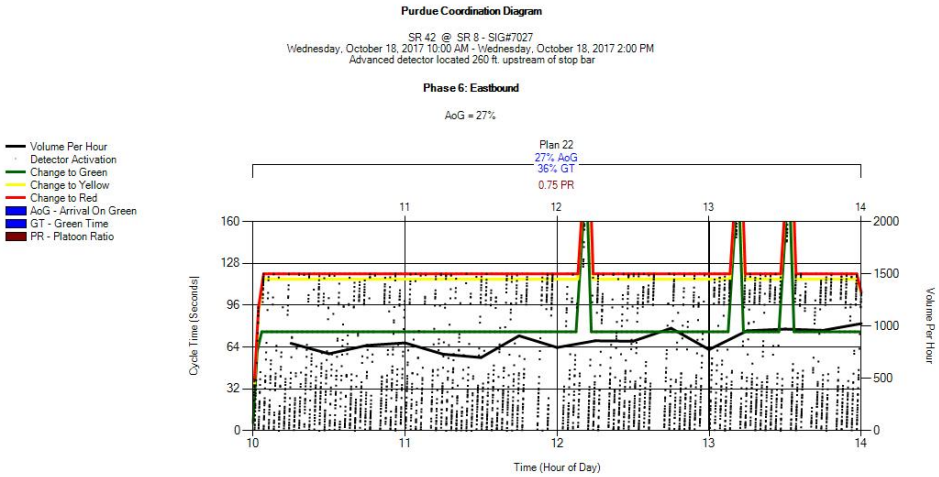
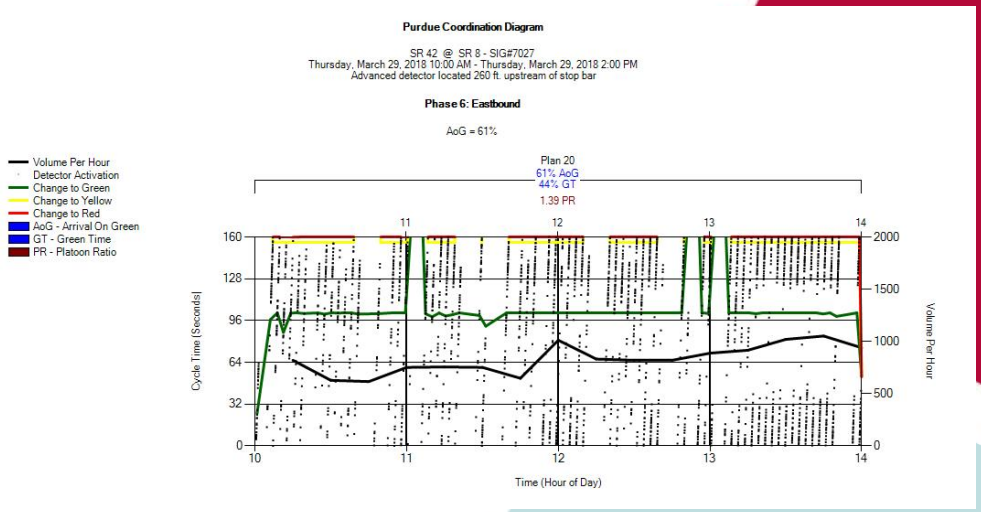
Before



After



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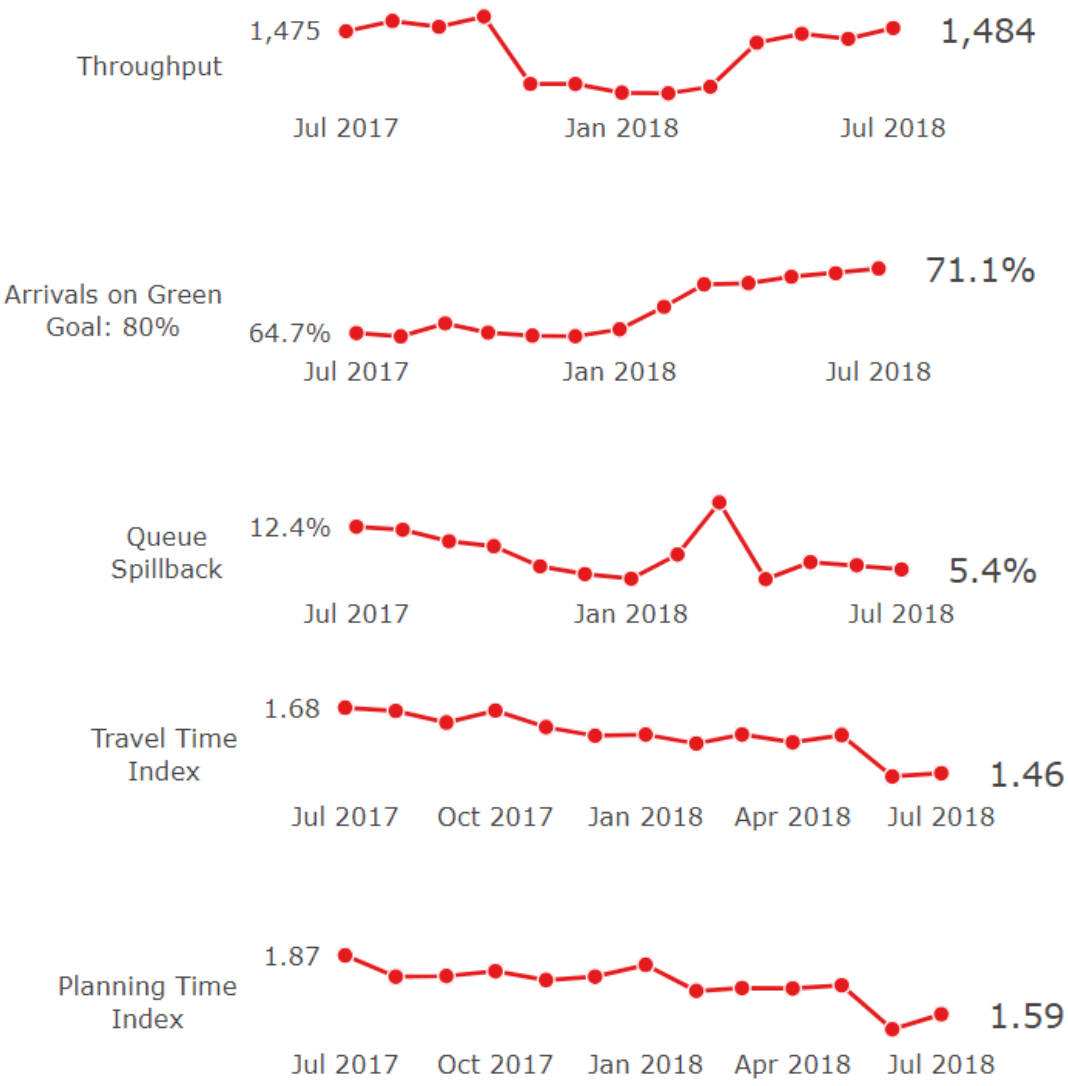

Resources, Tips &Tricks

- https://traffic.dot.ga.gov/ATSPM/
- https://pda.ritis.org/suite/
- https://gdot.iteris-pems.com/
- Processing the data can be tricky
- Before and after comparisons of retiming

What’s Next?

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Thanks!

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