SMART SIGNALS

MDOT SHA Office of Traffic and Safety

Agenda

- Existing systems and Challenges
- Why Smart Signals?
- Debunking the Myths of Smart Signals
- Implementation Results
- Smart Signal Operations
- Conclusion

Existing Systems and Challenges

- MDOT SHA maintains 3000+ signals statewide
- Controllers - Econolite ASC/3 or Econolite Cobalt
- Detection – Video camera, non-invasive micro loop probes, inductive loop, radar-based detection, thermal detection
- Communication – Telephone Service with Dial-Up Modems and Ethernet Based High Speed Data Communications with Cellular Modems
- Old ATMS (Aries) over 20 years old.

Existing Systems and Challenges

- Outdated communication and ATMS
- Cannot adapt to fluctuations in traffic and non-recurrent congestion events such as temporary work zones, special event, crash etc.
- Existing system cannot respond to early onset of peak period or extended peak periods.
- No way to monitor system performance to prioritize timing reviews.

Why Smart Signals?

To utilize cutting edge technology to effectively modernize and manage our system

SMART SIGNALS

- Adaptive Signal Control Technology
- Upgraded Communication
- Signal Performance Measures
- SPaT Challenge

Traditional Signal Systems *vs.* Smart Signal Systems

TRADITIONAL SIGNAL SYSTEMS

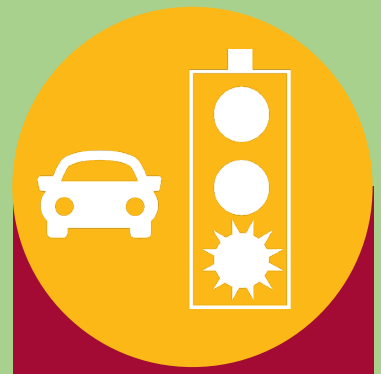
Requires Engineers to Study & Retime

Pre-Programmed Static Signal Timing & Phasing

Delays Increase as Volumes Change

SMART SIGNAL SYSTEMS

Real-Time Updating & Adapting to Traffic



Constantly Adjusting Signal Timing & Phasing

Delays are Managed Continuously

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Smart Signals

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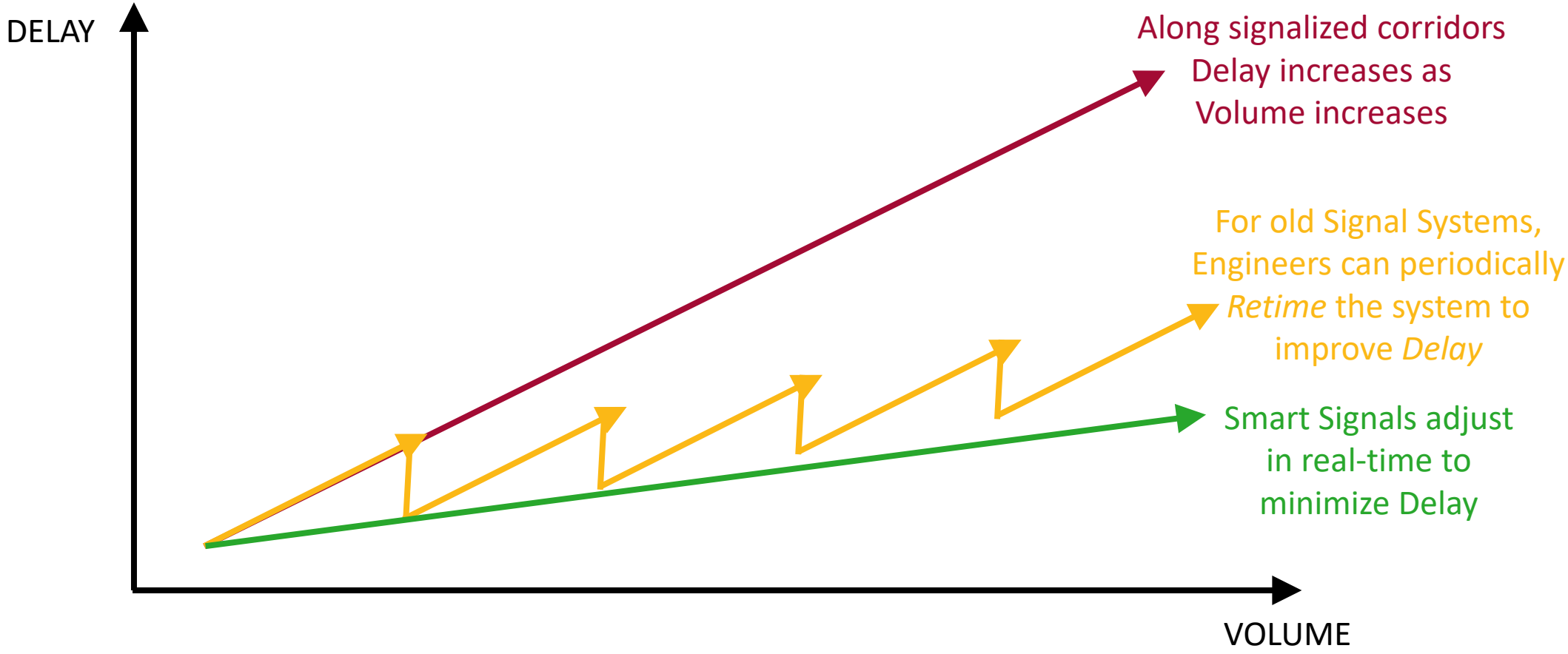
Delay Increases as Volumes Increase



Benefits to SMART SIGNALS

$$ Motorist Cost Savings

$$ Agency Cost Savings

Improves the Environment & Reduces Fuel Emissions

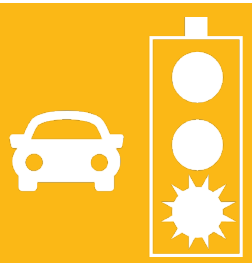
Reduce Complaints & Frustrations

Up To 15% Crash Reduction

Improves Safety

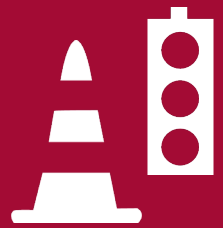
10%-50%

Delay Reduction



Reduce Travel Time

Reacts to Unforeseen Congestion



Continually Adjusting

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Smart Signals

WHAT ARE SMART SIGNALS?

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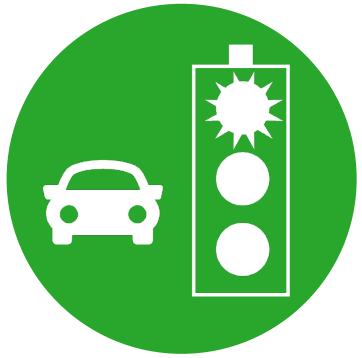
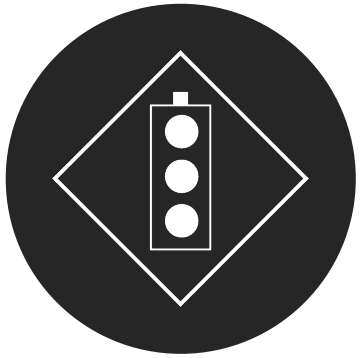
Smart Signals

Debunking Myths:



1. Everyone Gets Green All the Time.
(Traffic Will Still Have to Stop But Delay Is Minimized)

2. You Are Saving Hours of Commute Time **Per** Day.
(You're Saving Minutes Per Day—Annual Time & Money Savings Are Significant)



3. All Corridors Should be Smart Signal Corridors.
(Smart Signals are Most Cost Effective Along Congested Corridors With Highly Variable Traffic Volumes)

4. Smart Signals Are Ideal For Urban Downtown Areas.
(Smart Signals Are Not Recommended For Corridors With High Pedestrian Volumes)

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Smart Signals

Implementation Results: Update

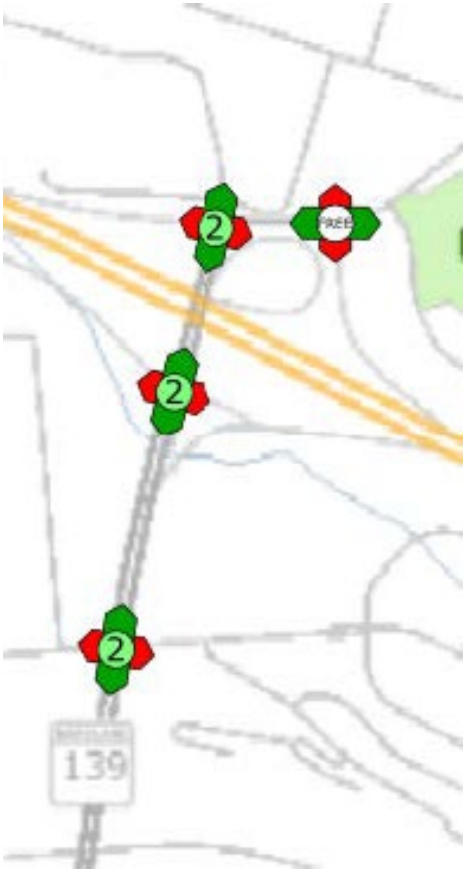
- Studies of 5 Corridors Completed
- Conducting Studies of 20 Corridors with Over 180+ Signals

Signal System	No. of Signals in System
US 1/MD 175 Jessup	16
MD 24/US 1 Bus Bel Air	14
MD 2 Brooklyn Park	4
MD 139 Towson	3
US 40 Catonsville	11

Case Study: MD 139 (Towson)

Average Reduction in Corridor Travel Time (sec/veh) 3 Hour Period	
AM Peak	7 secs.
Midday Peak	8 secs.
PM Peak	0.5 secs.

Average Reduction In Total Delay 3 Hour Period	
AM Peak	1.5 hrs.
Midday Peak	1 hrs.
PM Peak	1.5 hrs.



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Smart Signals

Data Conclusions: MD 139 (Towson)

6 gallons
Per day

That's Equivalent to:

2,190 Gallons per year

438 Home Depot Buckets per year

27 Bathtubs per year

$114,000

Total Annual Savings

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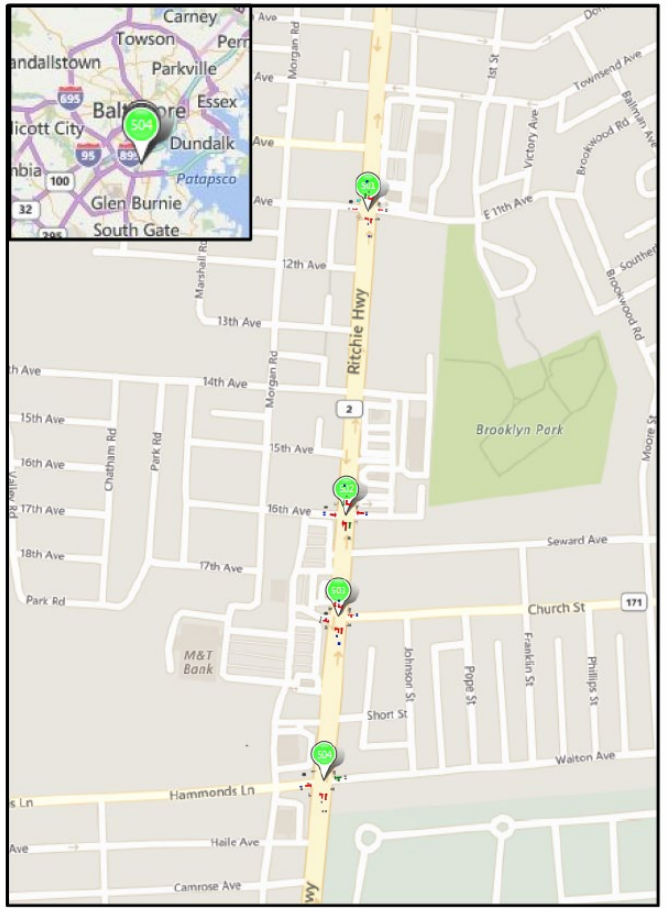
Smart Signals

Case Study: MD 2 (Brooklyn Park)

Average Reduction in Corridor Travel Time (sec/veh) 3 Hour Period	
AM Peak	17 secs.
Midday Peak	10 secs.
PM Peak	28 secs.

Average Reduction In Total Delay 3 Hour Period	
AM Peak	3.5 hrs.
Midday Peak	2.6 hrs.
PM Peak	12.3 hrs.



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Smart Signals

Data Conclusions: MD 2 (Brooklyn Park)

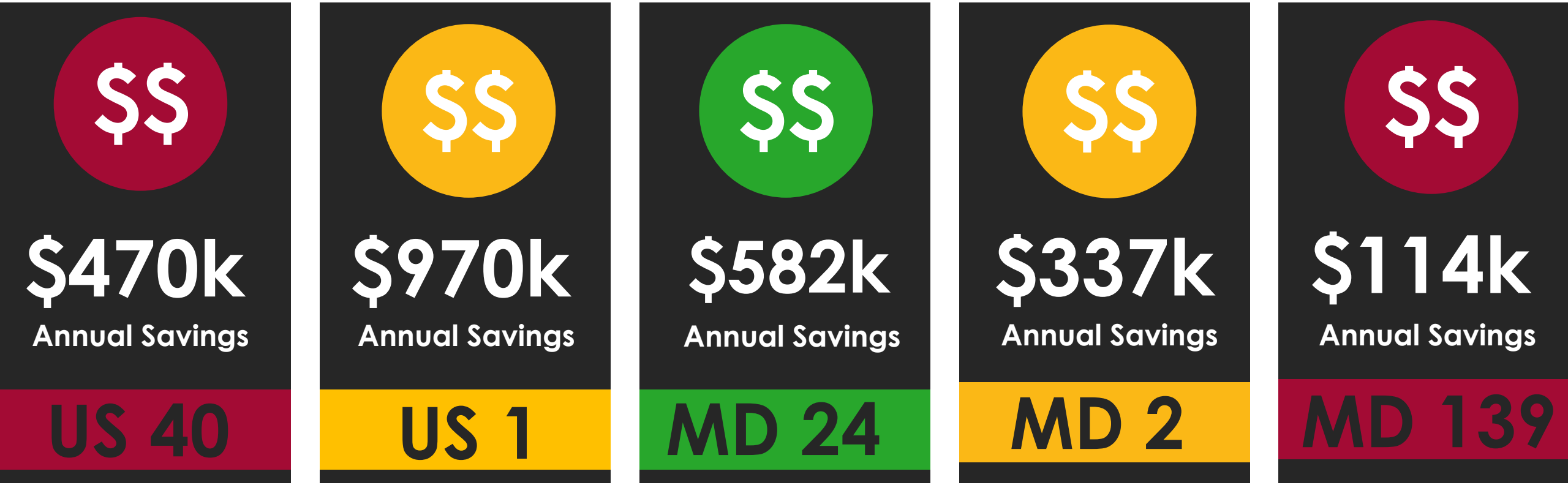
20 gallons
Per day

That's Equivalent to:

- 7,300 Gallons per year
- 1,460 Home Depot Buckets per year
- 91 Bathtubs per year

$337,000
Total Annual Savings

Implementation Summary:
US 40, US 1, MD 24, MD 2, & MD 139,



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Smart Signals

Upcoming SMART SIGNAL Corridors

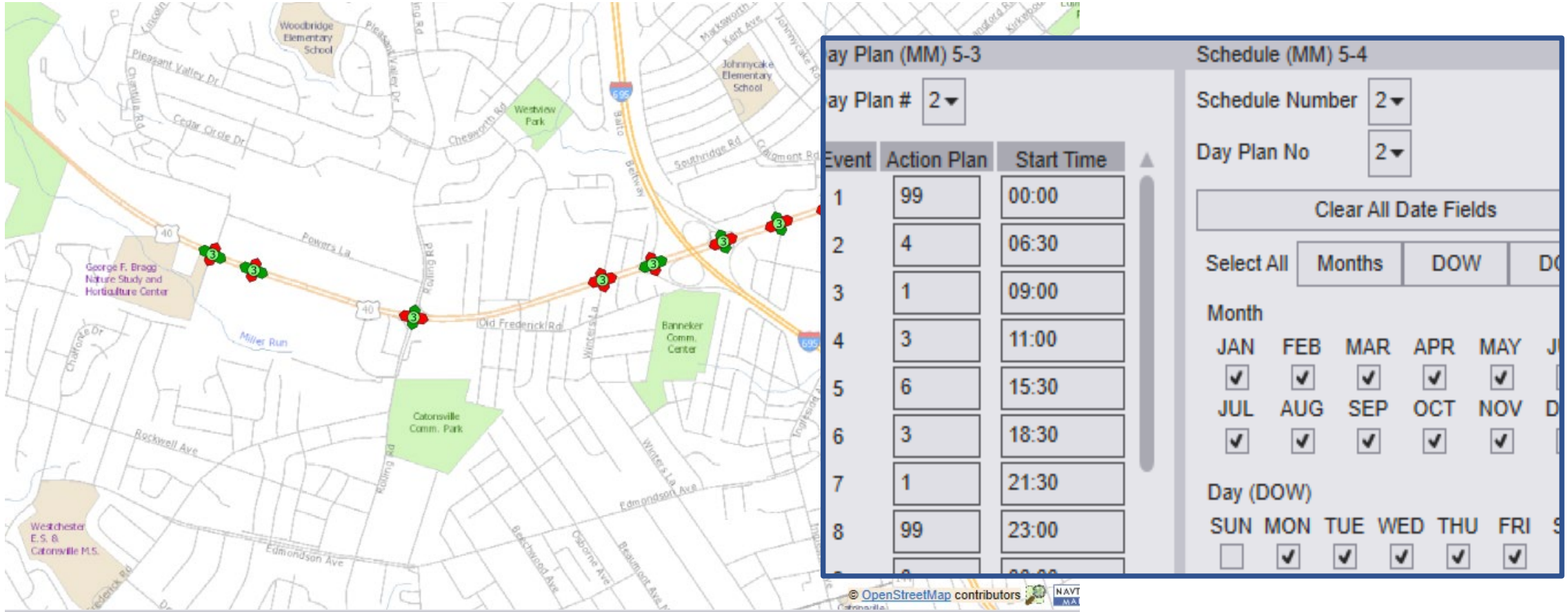
CORRIDORS ADAPTIVE READY

Signal System	No. of Signals in System
US 301 Bowie	6
MD 2 Annapolis Harbor	4
MD 3 Crofton	12
MD 22 Aberdeen	8
US 13 Business North Salisbury	5
MD 202 Landover	5

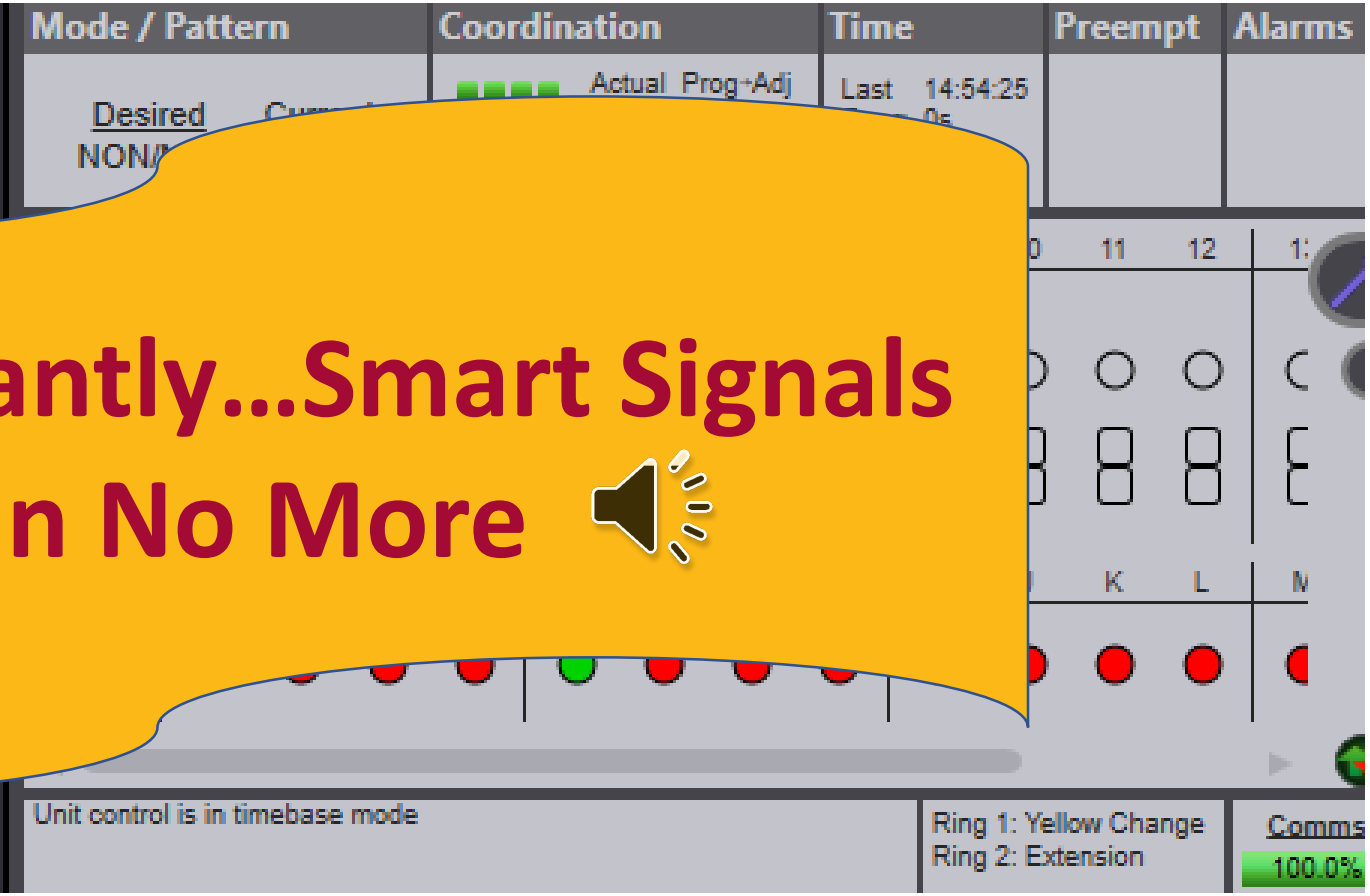
CORRIDORS IN CONSTRUCTION

Signal System	No. of Signals in System
US 301 Waldorf	20
MD 198 West Laurel	2
MD 108 Olney	11
US 40 Ellicott City East	5
MD 140 Westminster	13
MD 450 Parole	10
MD 2 Severna Park	11
MD 2 Glen Burnie North	10

Smart Signal Operations

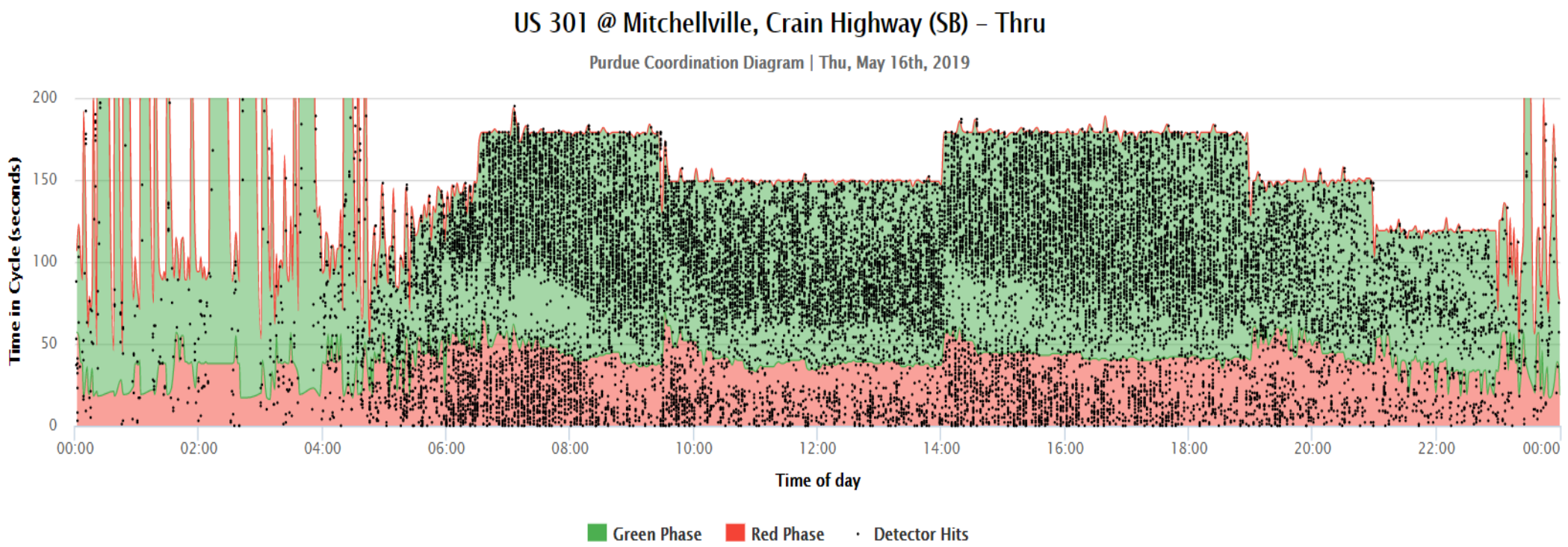


Smart Signal Operations

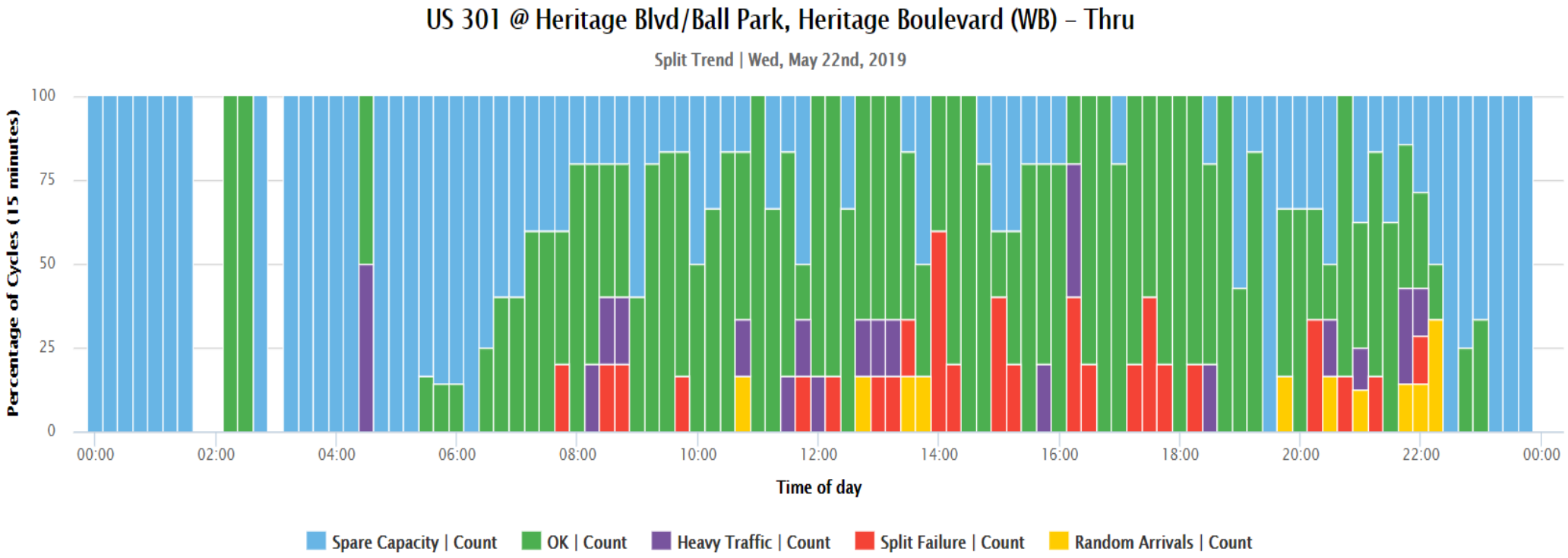


Most Importantly…Smart Signals Mean No More

How Smart are Smart Signals?

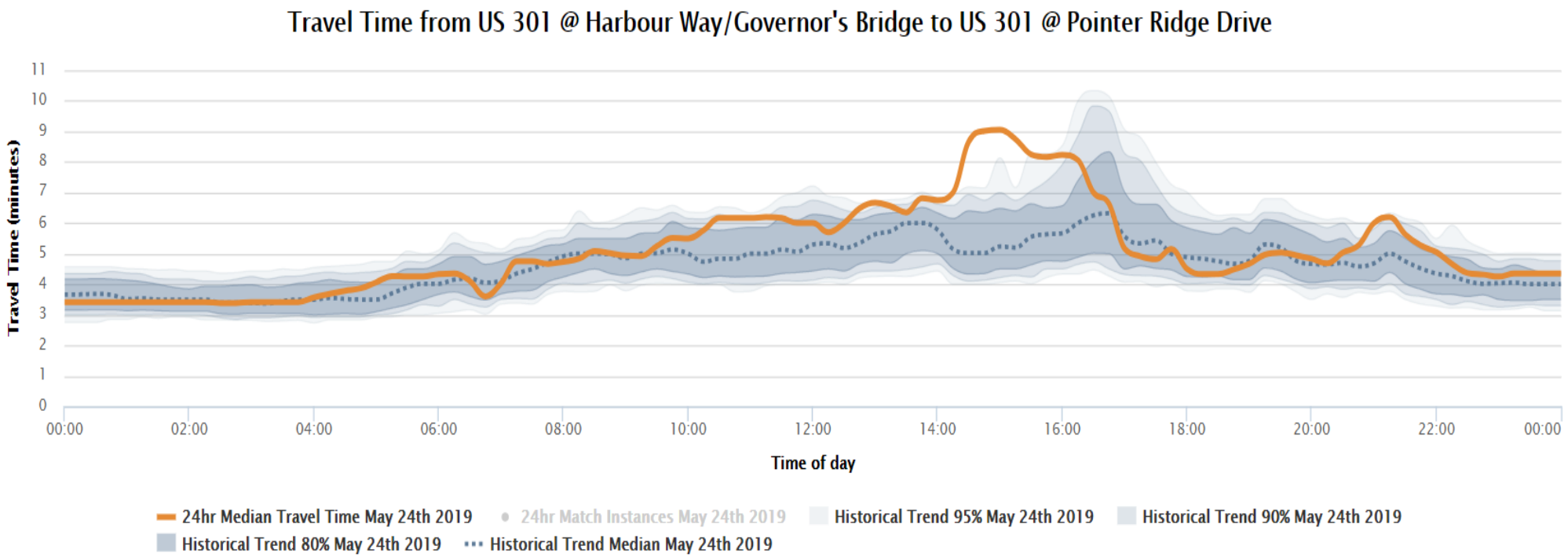


Hmmm…What Else?



Stop! I am not a traffic engineer

…(but I do love MD beaches)



THANK YOU

For more information contact:

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