



# VDOT TRAFFIC SIGNAL INITIATIVES - PLANNING THROUGH OPERATIONS

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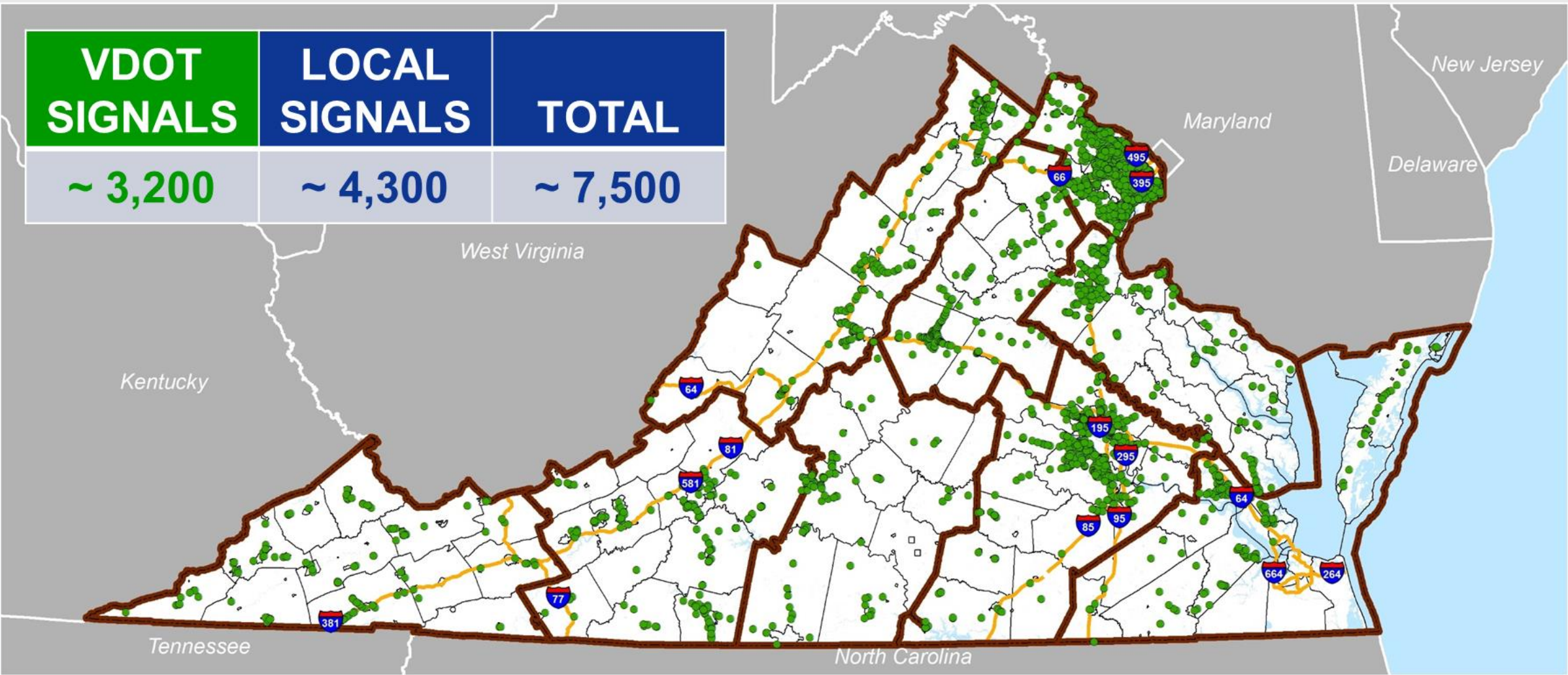
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June 17, 2025

# 1-VDOT SIGNAL AND ARTERIAL SYSTEMS PROGRAM UPDATE

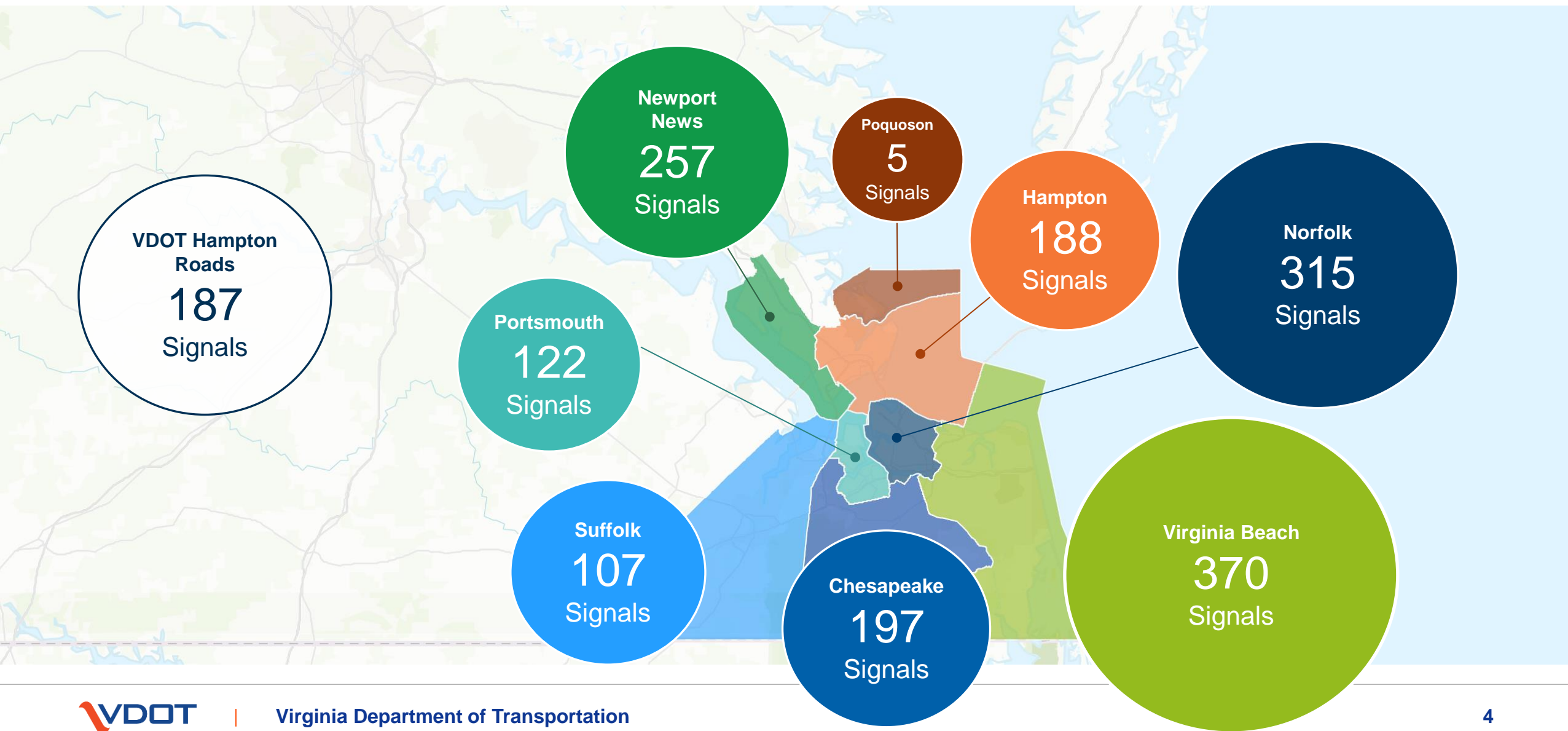
| Matt Bonacci, PE, PTOE – Signal and Arterial  
Systems Program Manager

# Traffic Signals in Virginia



Note: Map contains only VDOT owned and maintained signals.

# Signals in Hampton Roads



# VDOT Signal and Arterial Systems Program Goals



**Deploy ATSPM at  
all VDOT signals**



**Leverage data to  
improve corridor  
operations  
statewide**



**Investigate  
opportunities for  
interjurisdictional  
collaboration**

# Goal 1



**Deploy ATSPM at  
all VDOT signals**



Leverage data to  
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Investigate  
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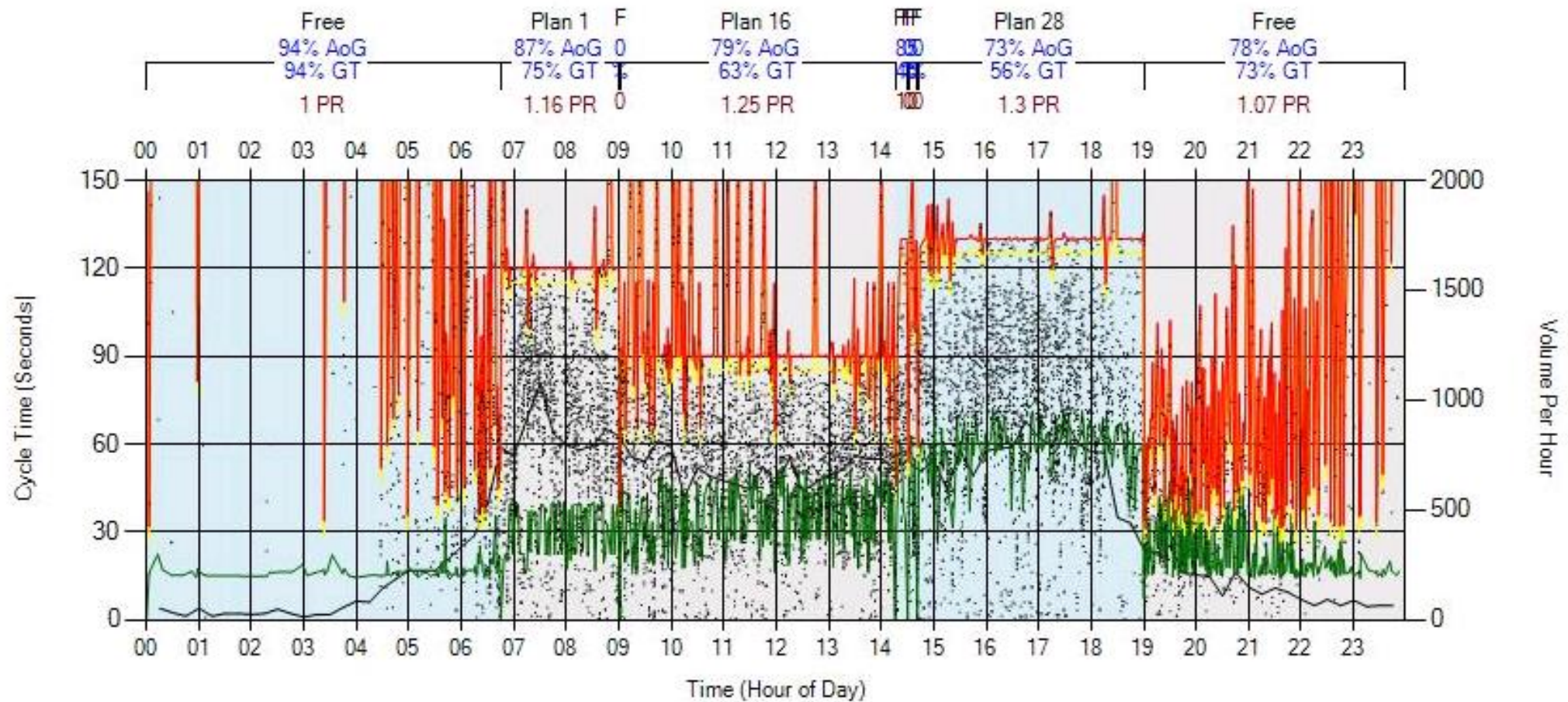
# What are Automated Traffic Signal Performance Metrics?

- **High resolution data directly from the signal controller**
  - Phase Termination
  - Detector information
  - Pedestrian actuations
  - Preemption
- **Complement to signal retiming – fine adjustments**
- **Requirements** – modern signal controller, high speed communications, freeware available to process data





# Example ATSPM Output – Arrival on Green Diagram



# Who does ATSPM Benefit?

## 1 Signal Operations

*Are vehicles arriving when the signal is green?*

## 2 Decision Makers

*Are investments improving conditions over time?*

## 3 Signal Designers

*Which equipment works best in different scenarios?*

## 4 Signal Maintenance

*Is equipment functioning properly?*

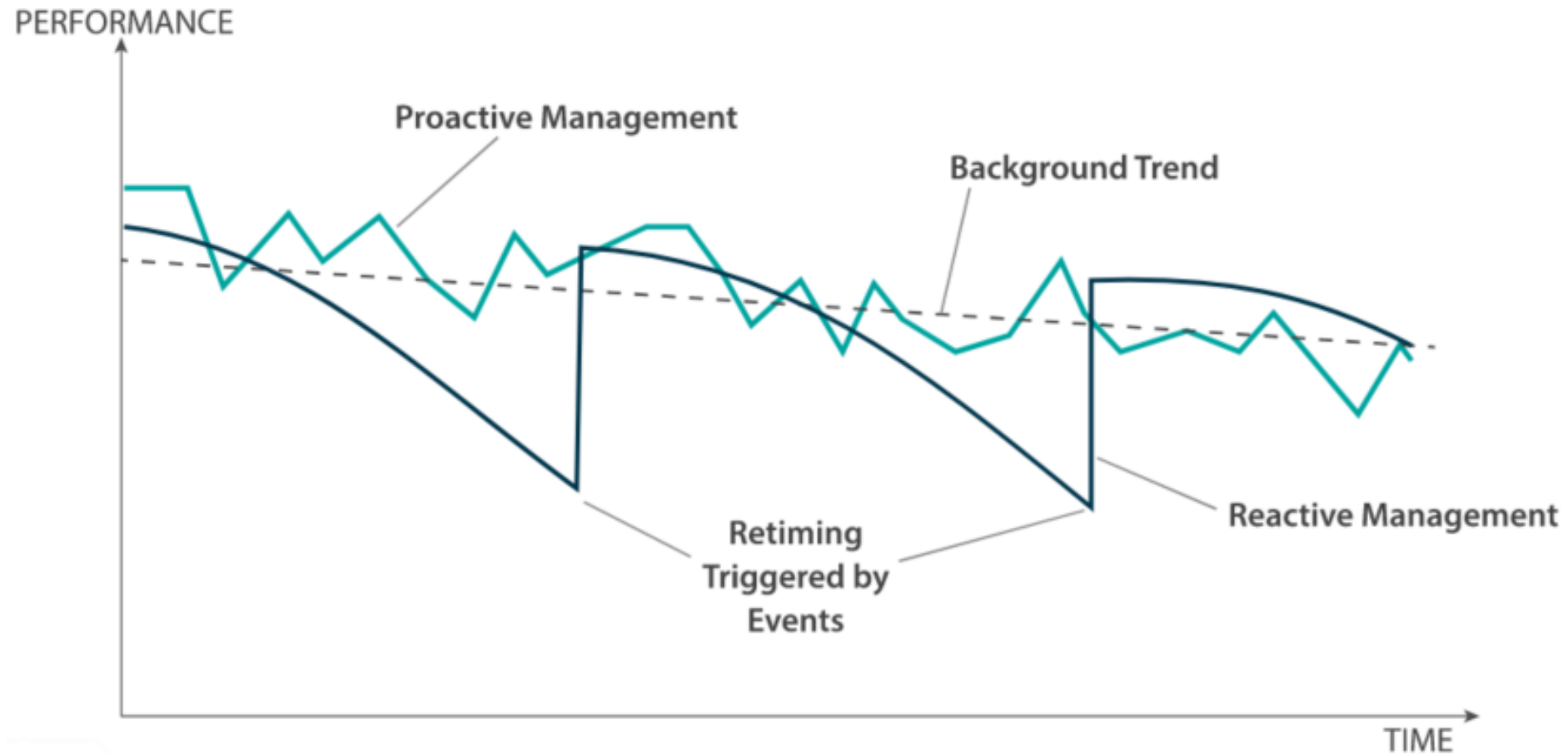
## 5 The Public

*Is my agency making trips safer and more reliable?*

## 6 Planners

*Is traffic changing?*

# Proactive vs Reactive Response



Source: FHWA

# Pilot ATSPM Benefit-Cost Analysis (2021)

## NOVA District

B-C Ratio: 2.0

14 ATSPM Signals

## Hampton Roads District

B-C Ratio: 17.3

4 ATSPM Signals

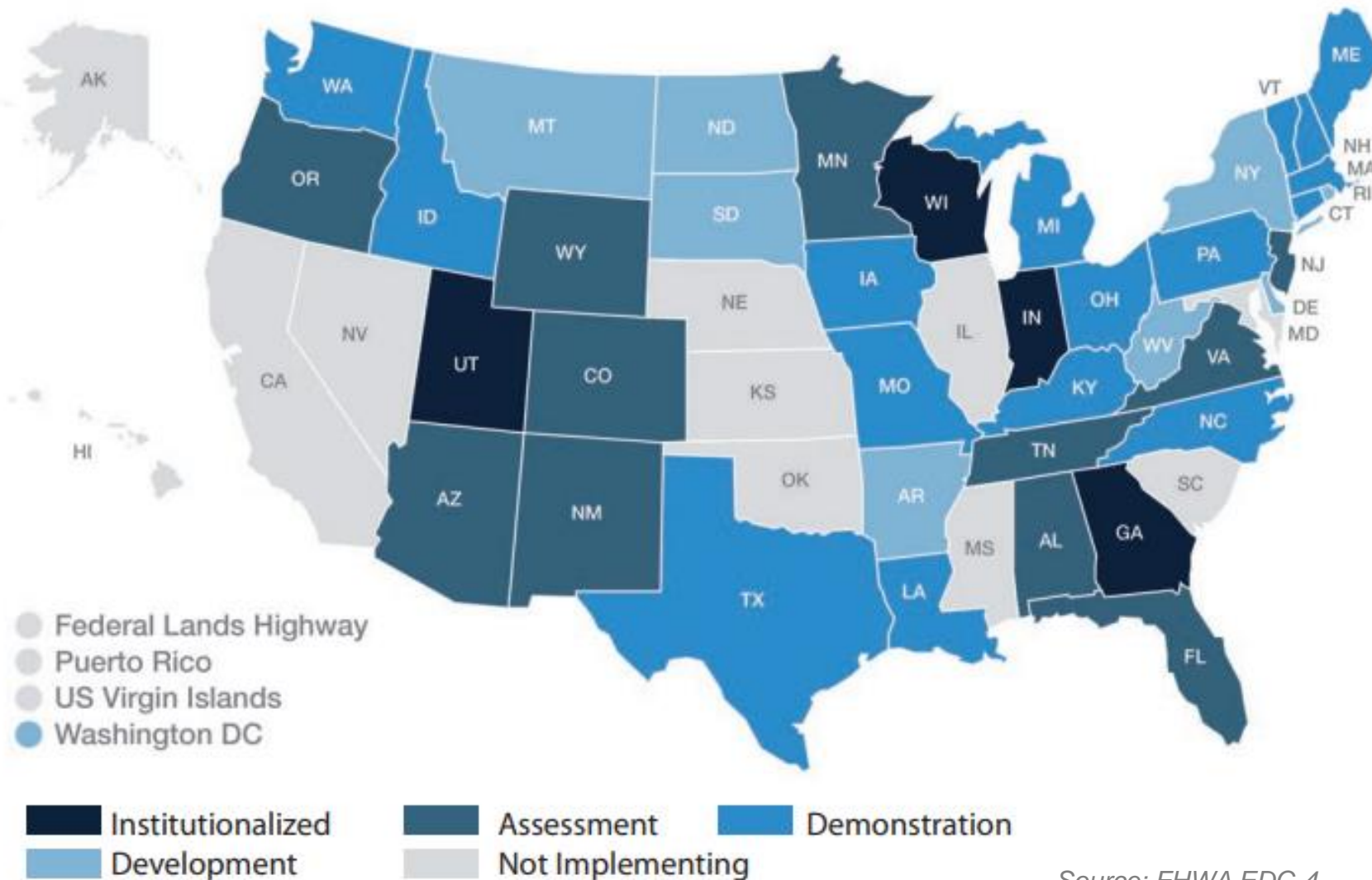
# Future

- VDOT planning statewide rollout
- Desire to incorporate into day-to-day practices
- Training – open to localities if interested





# Future – ATSPM Deployments



[VDOT Pooled Fund Study Presentation Link](#)



Source: FHWA EDC-4

# Future – More Info

- Utah DOT and Georgia DOT are power users
- Publish ATSPM data publicly



<https://udottraffic.utah.gov/atspm/>



<https://traffic.dot.ga.gov/atspm/>

# Goal 2 + 3



Deploy ATSPM at  
all VDOT signals



**Leverage data to  
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**Investigate  
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interjurisdictional  
collaboration**



# Leverage Data + Interjurisdictional Collaboration

- ❓ **Problem:** VDOT is data rich, but information poor; networking and cybersecurity requirements create challenges in collaboration and data sharing
- ✓ **Solution:** make data more available!
- ★ **Benefits:**
  - Day-to-day operations
  - Incident Management
  - Internal/External collaboration

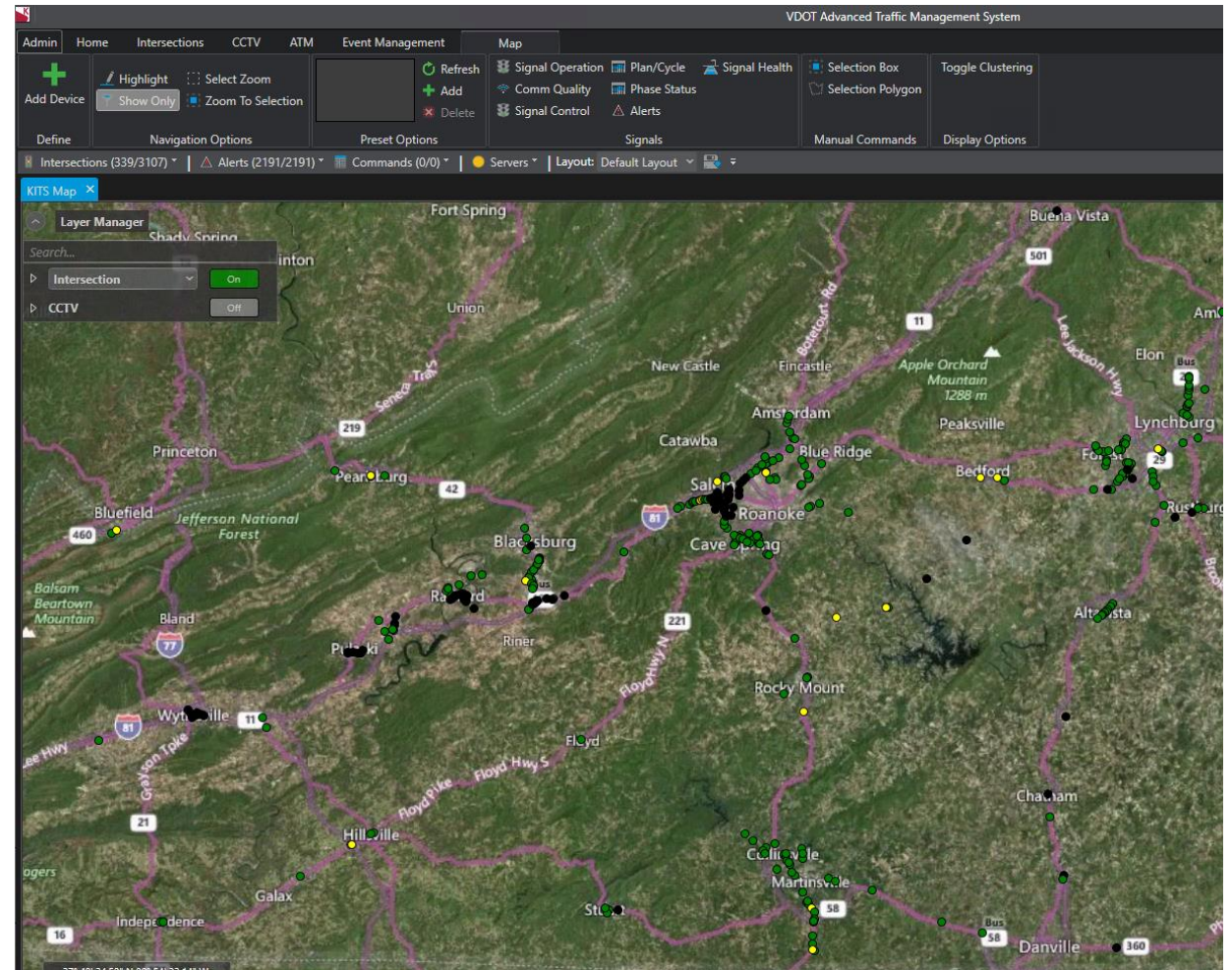
# Data + Collaboration | Signal System data availability

- Signal data hosted separately, not readily accessible



## Solution:

- SQL access to support user queries
- Data exported for use in Regional planning effort (RM3P)



KITS Central Signal System

# Data + Collaboration | Travel Time Tool

## VDOT Hampton Roads Travel Time Diversion Routes

Click on a Route from Step 1 or select Route from Quick Glance Chart. For Travel Times during PRIOR WEEKS proceed to Steps 2-4

### STEP 1: Select a Route

ALL

I-64 (Westbound)

I-64 (Eastbound)

134/Neil Armstrong Pkwy  
Diversion (NB)

134/Neil Armstrong Pkwy  
Diversion (SB)

Jefferson Ave/Clyde Morris Blvd  
(NB)

Jefferson Ave/Clyde Morris Blvd  
(SB)

Jefferson Ave/ to I-64 (NB)

Jefferson Ave/ to I-64 (SB)

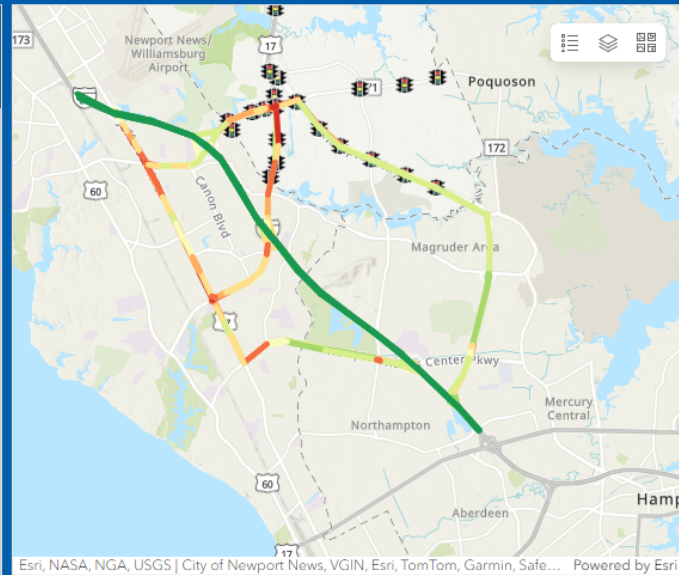
Reset

STEP 2: View Prior Weeks  
2024 Week 39 - September 22nd

STEP 3: Select Day(s) of ...  
No category selected

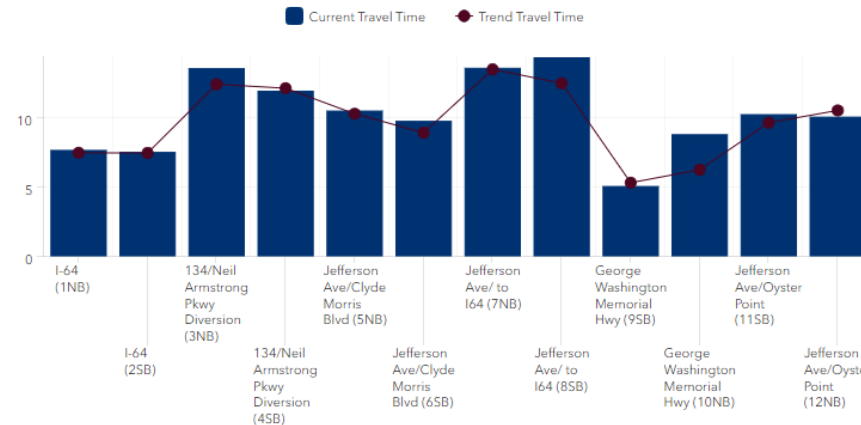
STEP 4: Select by Direction  
ALL

STEP 4: Select a Time Peri...  
Full Day - 24 Hour



Esri, NASA, NGA, USGS | City of Newport News, VGIN, Esri, TomTom, Garmin, Safe... Powered by Esri

### Real-Time Corridor Quick Glance - Updated every 5 min



Real-Time Quick Glance Comparison

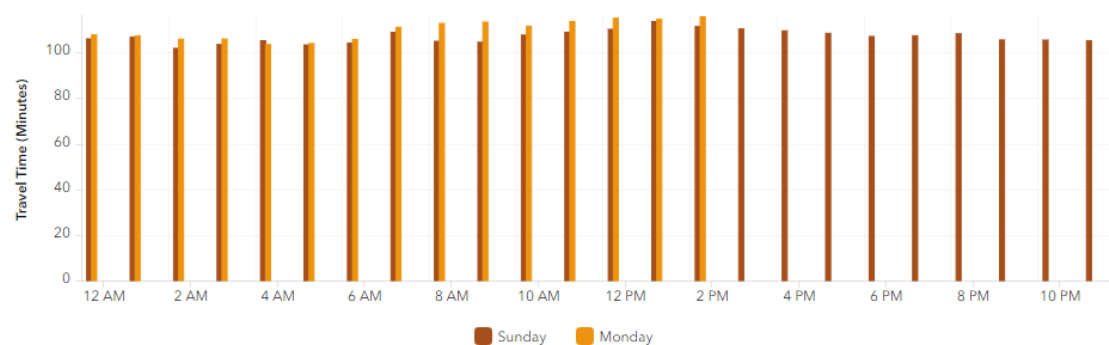
Current Travel Time  
(Updated every 5 minutes)

**123.5**  
length = 10.5 miles

Trend Travel Time  
(Trend Reflects Comparable Time)

**117**  
length = 10.5 miles

### Travel Time Comparison (Updates Hourly)



### Travel Time Trend Alert

Unexpected Deviations Detected

Route: **George Washington Memorial Hwy Eastbound (10NB)**

Deviation Percent from Trend: **40.12%**

Travel Time Increase (minutes): **2.53**

Route: **Jefferson Ave/ to I-64 (8SB)**

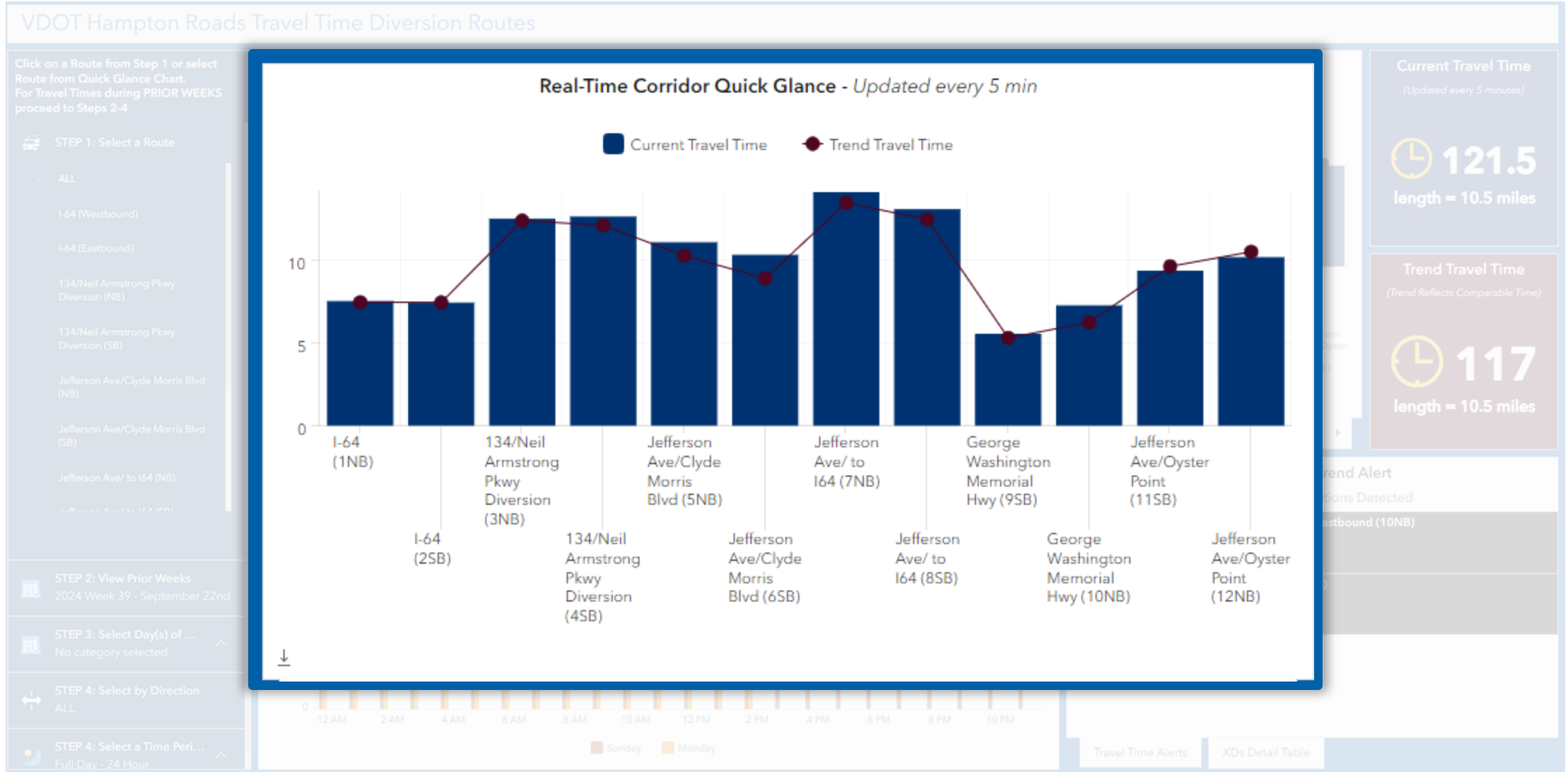
Deviation Percent from Trend: **15.01%**

Travel Time Increase (minutes): **1.88**

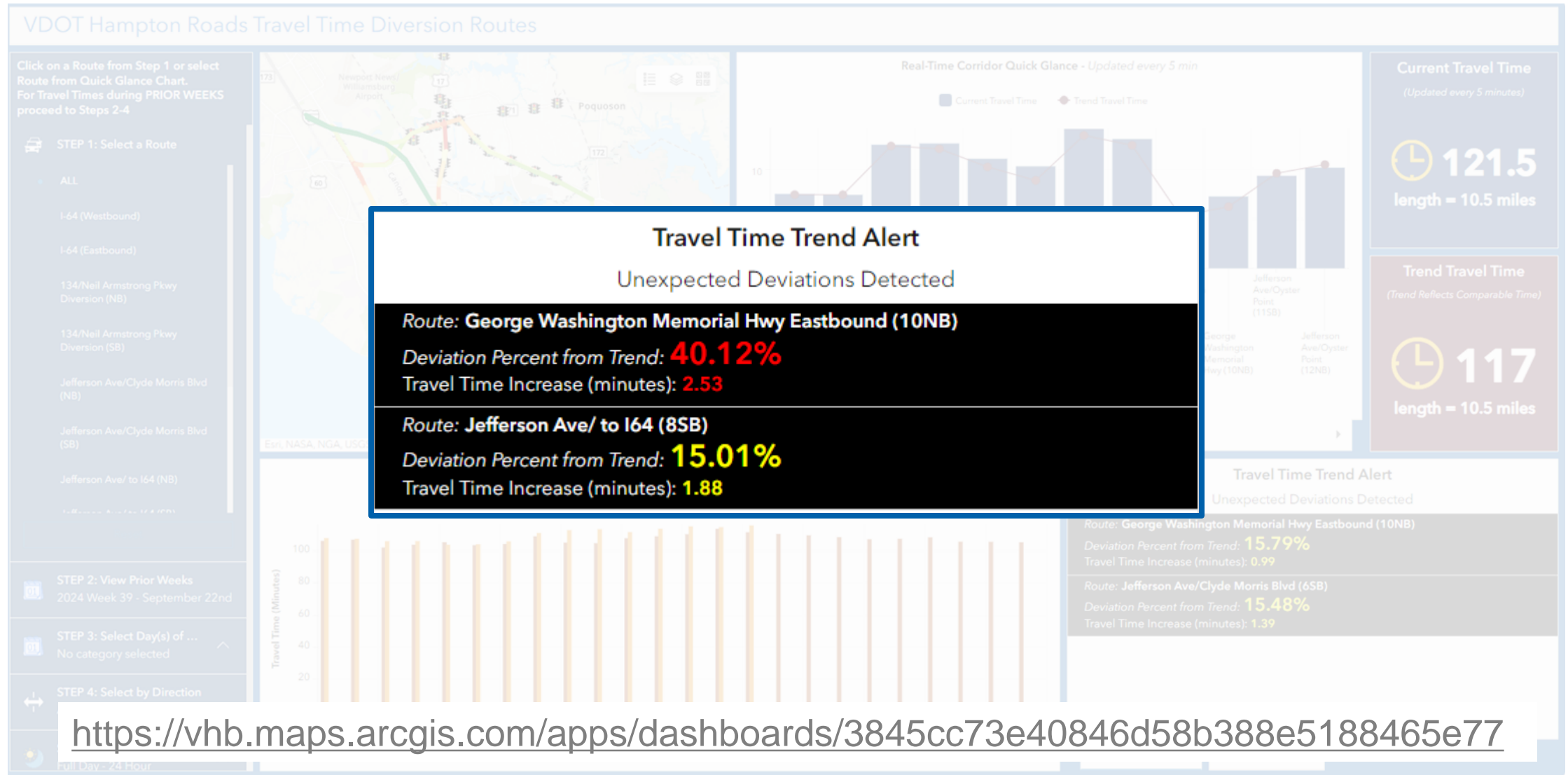
Travel Time Alerts

XD's Detail Table

# Data + Collaboration | Travel Time Tool



# Data + Collaboration | Travel Time Tool





# Data + Collaboration | Future of Travel Time Tools

- Piloting email alerts, expansion of corridors
  - VDOT and locality alerts as travel time deviates
  - Expansion of tool into other VDOT districts

[illegible]

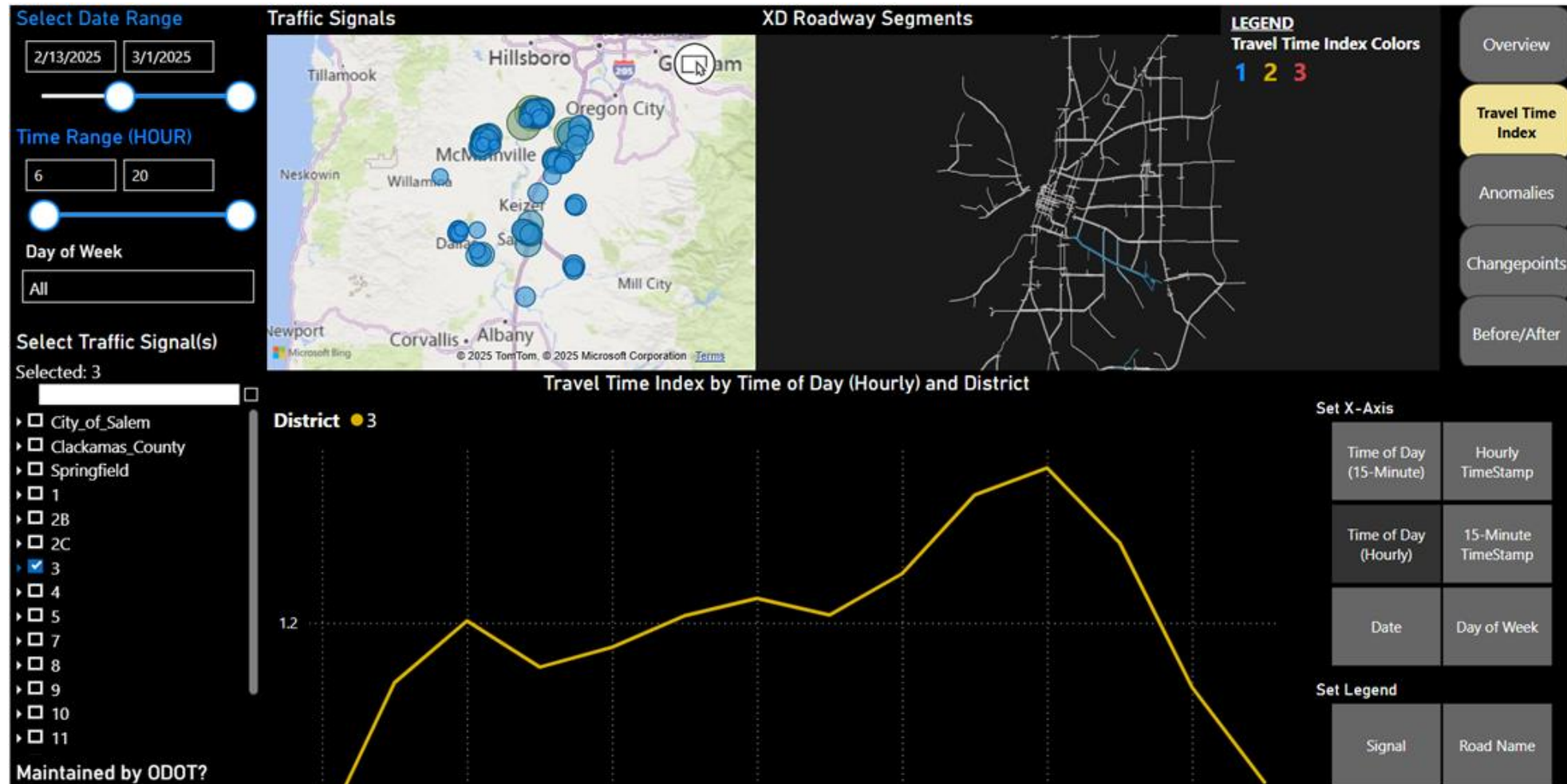
# Data + Collaboration | Future Tools

## GIS locality-sourced detour routes under development



<https://experience.arcgis.com/experience/4909edb15df0455482268d79741b20d9/>

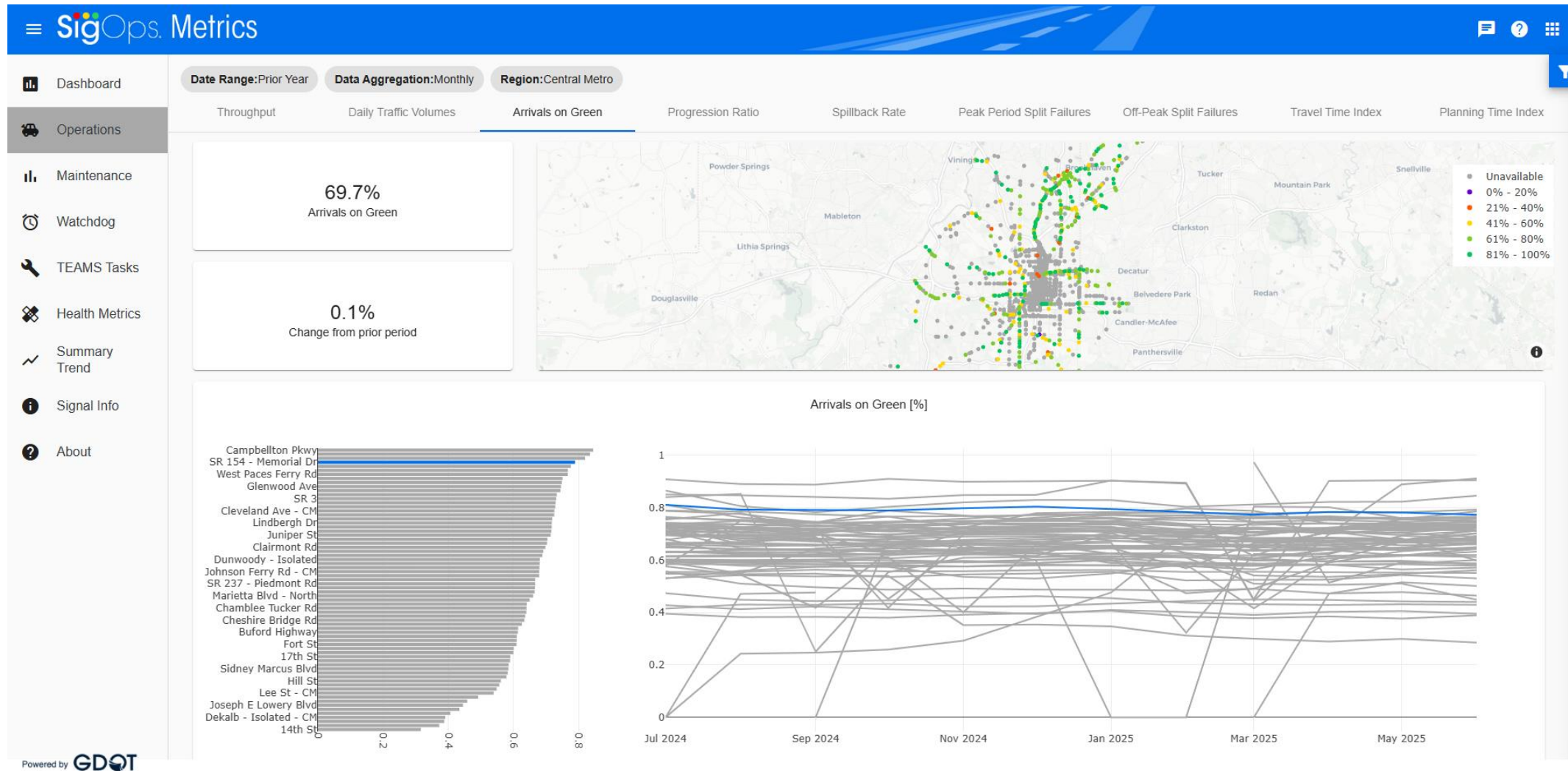
# Data + Collaboration | FUTURE Tools



<https://app.powerbigov.us/view?r=eyJrljoiYTE2ODU3ZTctNTUzMjIyLTk1NDktNGM5NzMyMjM0NWRlliwidCI6IjI4YjBkMDEzLTQ2YmMtNGE2NC04ZDg2LTJfjOGExMWNmNTkwZCJ9&pageName=ReportSection53befaa95e1126075c6d>



# Data + Collaboration | FUTURE Tools



<https://sigopsmetrics.dot.ga.gov/>

# Next Steps



**Continue to build partnerships with other agencies inside and outside Virginia**



**Evaluate other sources of probe-based data (INRIX Signal Analytics, Flow Labs, Iteris ClearGuide) in parallel with District of Columbia DOT project**



**Further analyze and develop tools to leverage available data**

