



MARYLAND TRANSPORTATION SYSTEMS MANAGEMENT & OPERATIONS

Advancing Maryland's TSMO Program

→ February 6, 2020 ←

**MWCOG SPOT Subcommittee Meeting
Washington, DC**

MDOT SHA TSMO Program



- **Plan provides:**
Vision, Purpose, Goals, Objectives & Strategies
- **Focus on Integration:**
Institutional, Operational & Technical
- **Governance Structure:**
Executive Committee, Working Group & Task Forces

GOAL 1



**BUSINESS PROCESSES
& COLLABORATION**

GOAL 2



SYSTEMS & TECHNOLOGY

GOAL 3



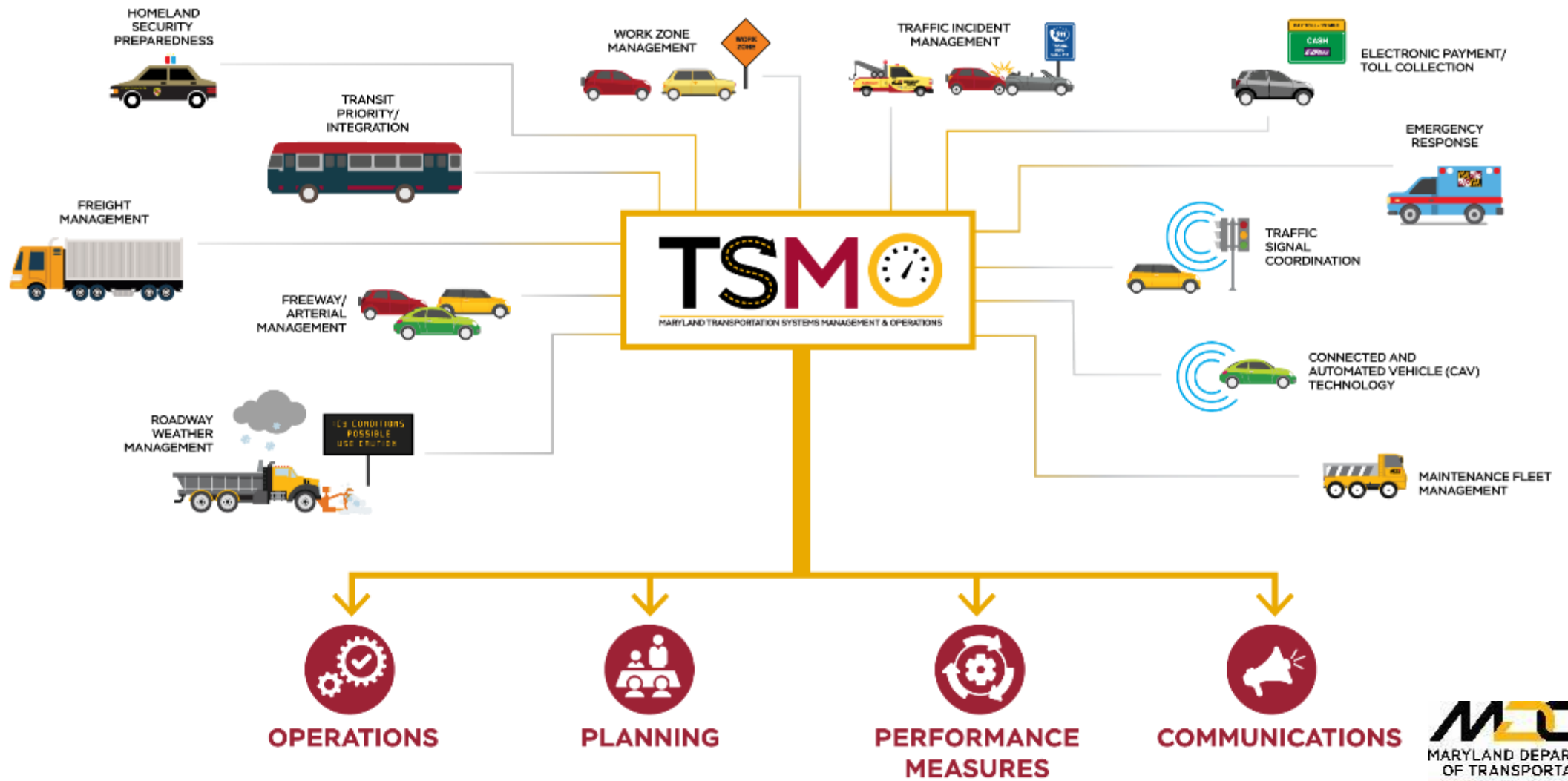
**DATA, ANALYSIS &
PERFORMANCE MANAGEMENT**

GOAL 4



**CUSTOMER EXPERIENCE
& ENGAGEMENT**

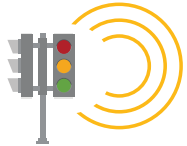
MDOT System of Systems Approach



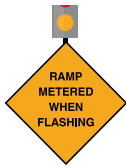
Major TSMO Strategies



ROADWAY WEATHER MANAGEMENT



SMART TRAFFIC SIGNALS



RAMP METERING



HARD SHOULDER RUNNING



INTEGRATED FREEWAY-ARTERIAL OPS



WORK ZONE MANAGEMENT



TRUCK PARKING



CAV TECHNOLOGY DEPLOYMENTS



CROWD SOURCING FOR OPS

BUILDING A SYSTEM OF SYSTEMS WITH TSMO

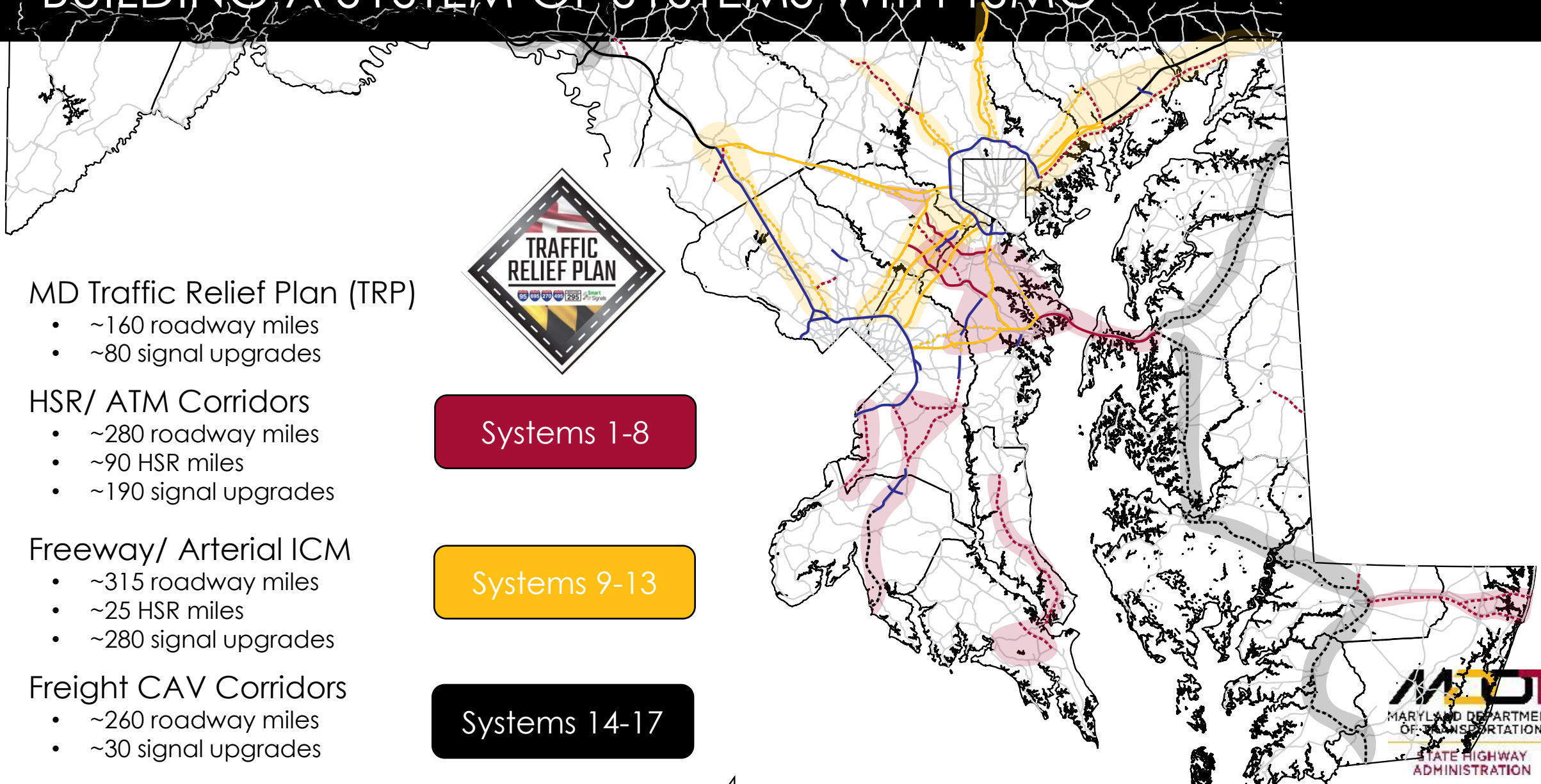
- MD Traffic Relief Plan (TRP)
 - ~160 roadway miles
 - ~80 signal upgrades
- HSR/ ATM Corridors
 - ~280 roadway miles
 - ~90 HSR miles
 - ~190 signal upgrades
- Freeway/ Arterial ICM
 - ~315 roadway miles
 - ~25 HSR miles
 - ~280 signal upgrades
- Freight CAV Corridors
 - ~260 roadway miles
 - ~30 signal upgrades



Systems 1-8

Systems 9-13

Systems 14-17

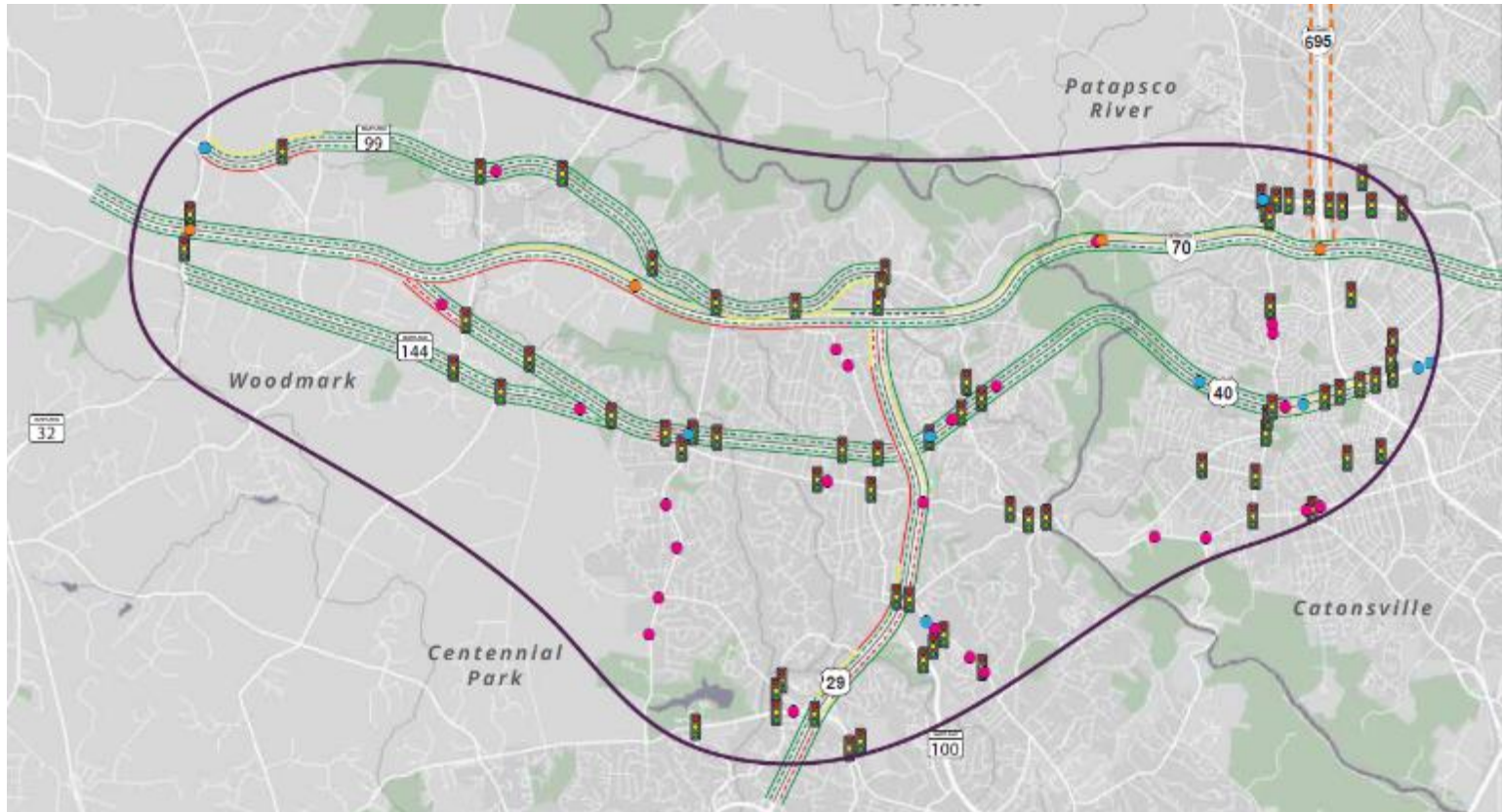


Rethinking Project Development



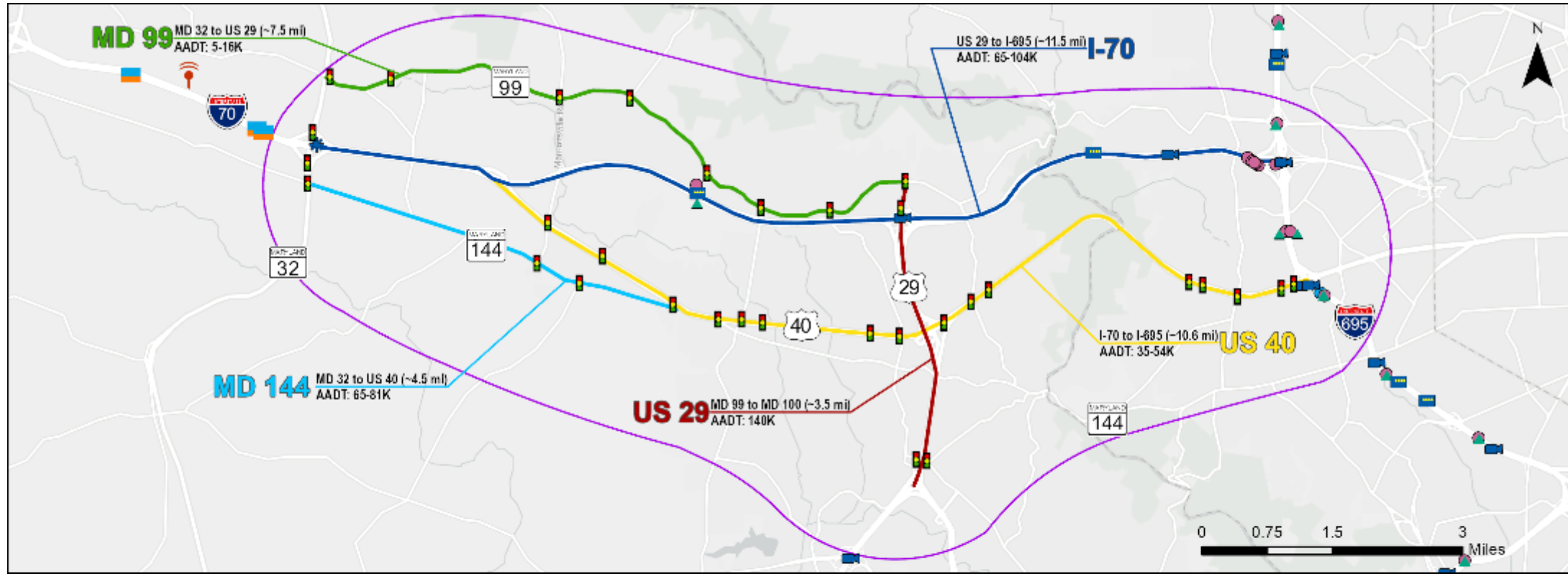
- **Ways to mainstream TSMO projects:**
 - Major Projects (Include TSMO Strategies, ITS Infrastructure in scope)
 - Rethink System Preservation Projects
 - **Develop TSMO-Operational technology Projects (ITS/Software/Communications)**

Rethinking Projects as Systems



- Changes to scoping/project development process
- Consider TSMO strategies in whole or in part
- Thinking beyond traditional boundaries
- Looking at recurring & non-recurring congestion

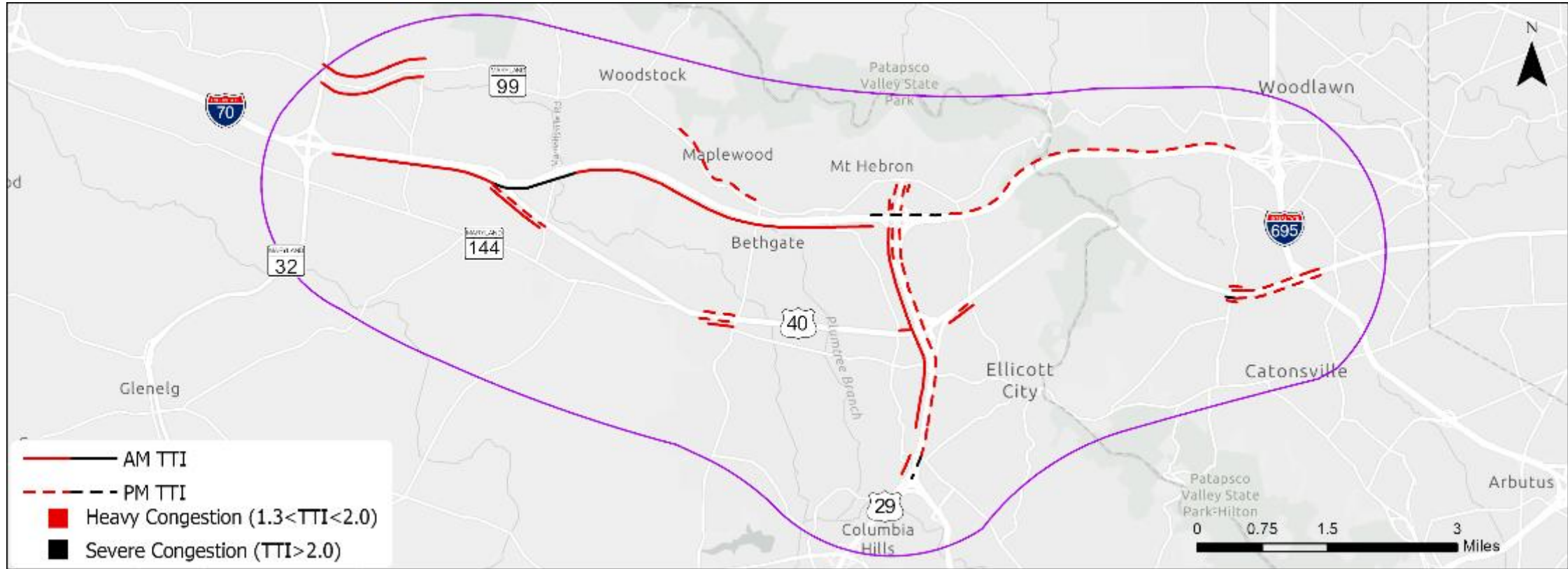
System 1 Overview



I-70	US 29	US 40	MD 144	MD 99	LEGEND:	● Manhole	✱ RWIS	📶 SHA HAR Non-Priority
● 9 devices	🚦 2 devices	🚦 16 devices	🚦 4 devices	🚦 8 devices	● RTMS	📺 Existing CCTV	📺 Existing SHA DMS	
▲ 1 devices	🚦 1 devices				▲ Existing Detector	🚦 Traffic Signal		
▲ 2 devices	📺 2 devices				▲ Existing Weather Sensor	📺 System 1		

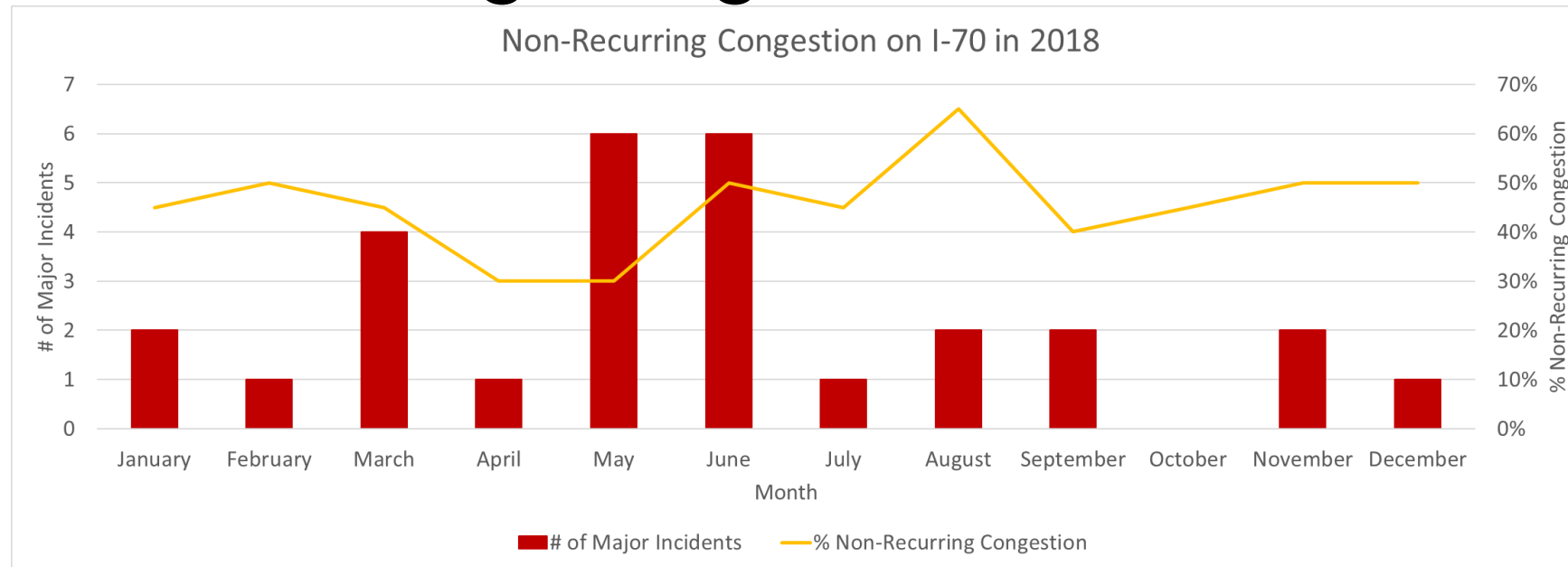
Customer Experience

Recurring Congestion: TTI



Customer Experience

Non-Recurring Congestion



Summary of Incident Patterns, Annual Estimates of Diversion to US 40

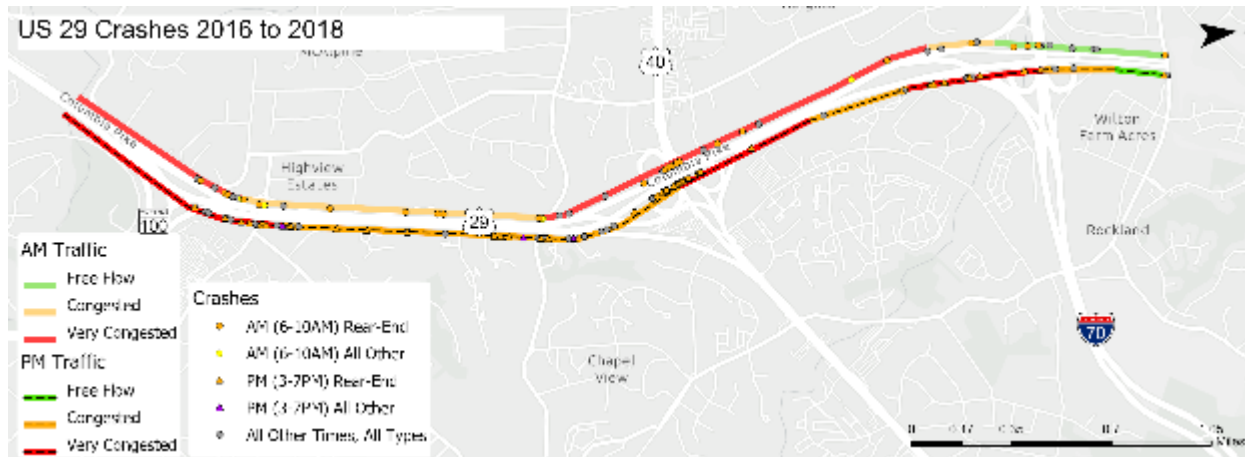
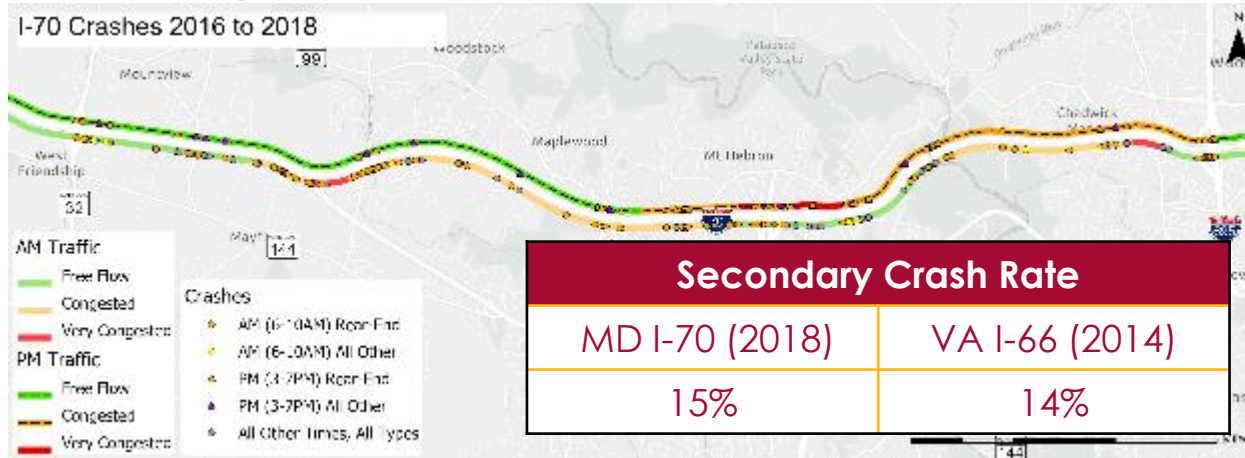
- 30 incidents/year on I-70 cause diversion onto US 40
- Standard practice for design of highway facilities based on the 30th highest hour

Summary of Non-Recurring Congestion on I-70

- 45+% of congestion on I-70 is non-recurring
- 60% is the national average (FHWA)

Customer Experience

Safety: I-70 & US 29



I-70 from MD 32 to I-695 Crash Trends

- Rear-end crash rate is twice the statewide rate
- 50% of all crashes are rear-end type

US 29 from I-70 to MD 100 Crash Trends

- Rear-end crash rate is twice the statewide rate
- 57% of all crashes are rear-end type

TSMO System 1 Goals & Objectives

Objective 1: Improve Safety on I-70 and US 29

- Reduce congestion-related crash rate types (rear-ends and sideswipes)
- Reduce secondary crashes

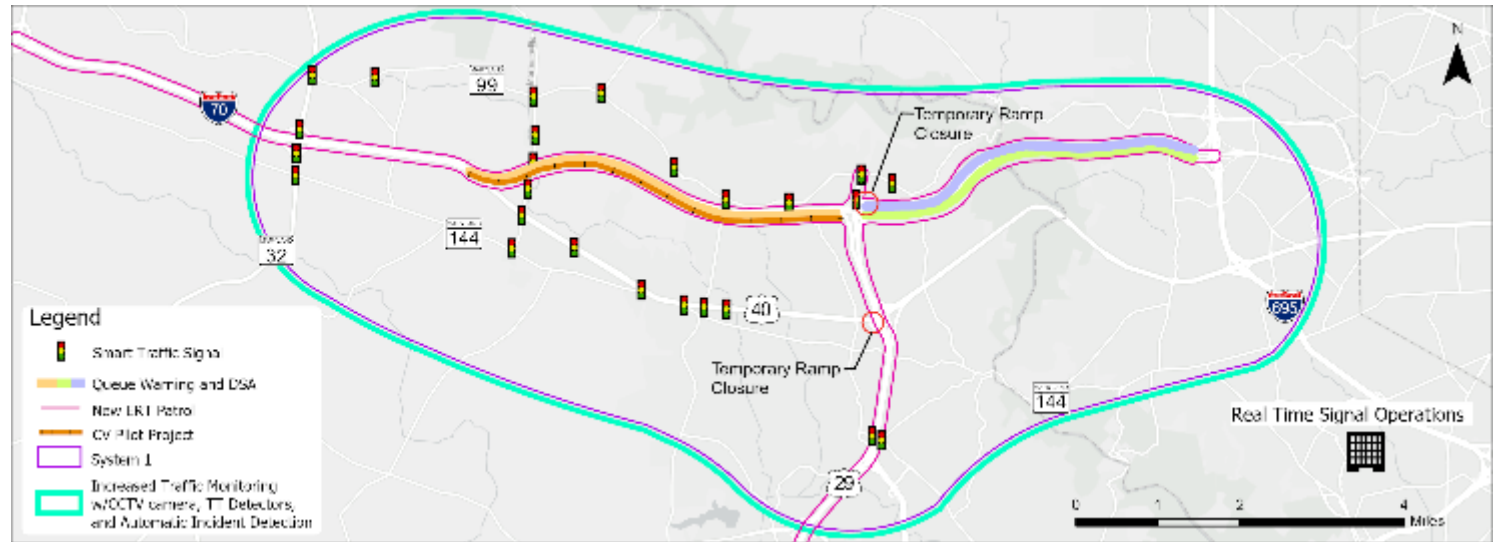
Objective 2: Reduce Non-Recurring Congestion

- Manage diverted flows from I-70
- Reduce incident timeline
- Reduce time for incident identification/verification

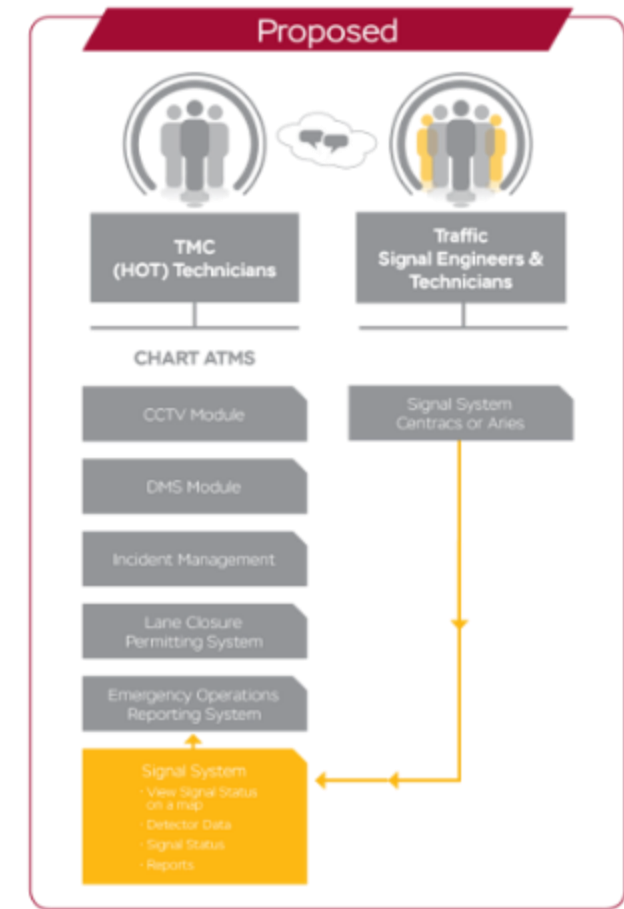
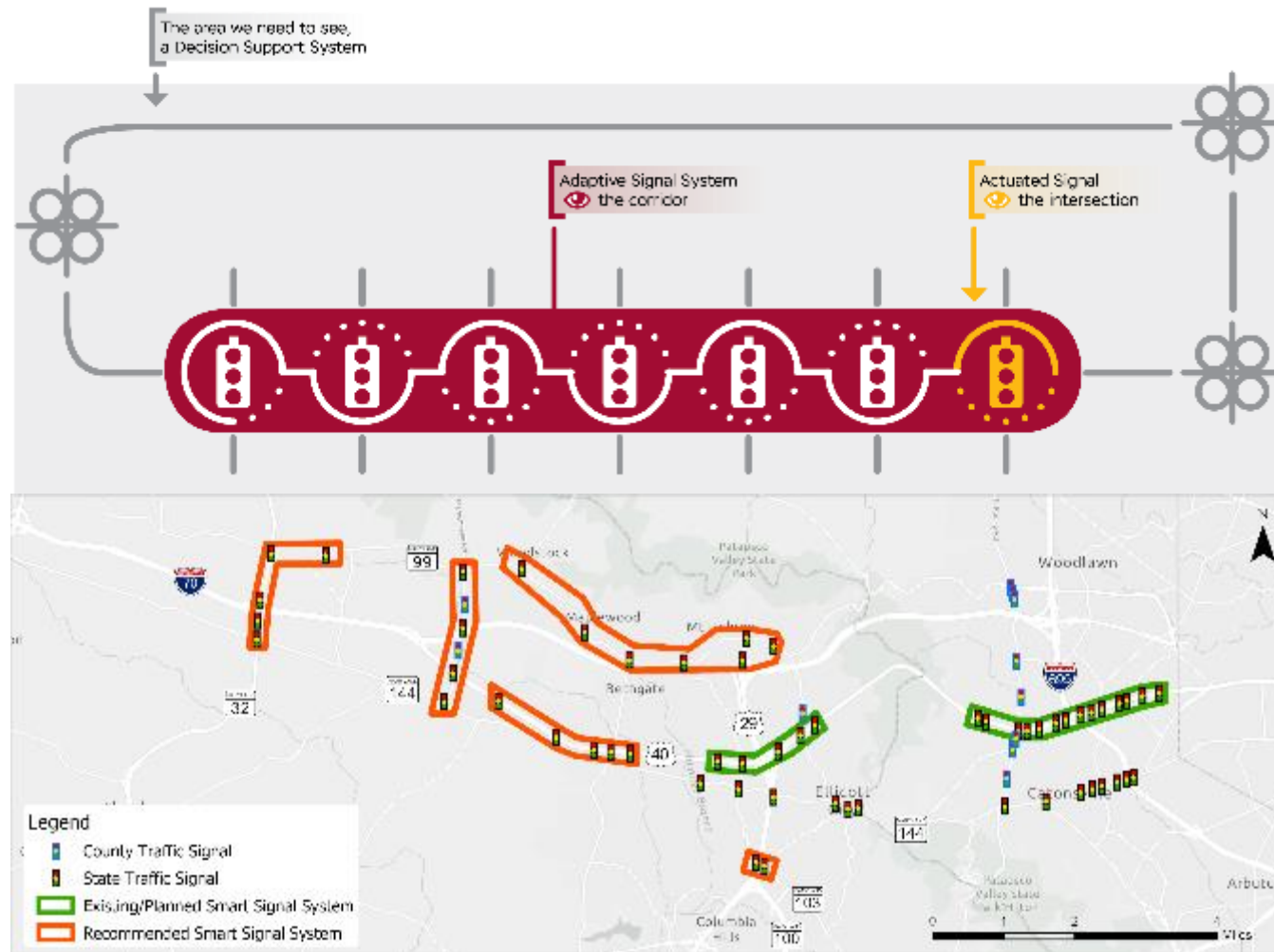
Objective 3: Ease Recurring Congestion at Bottlenecks

- AM
 - EB I-70 at I-695
 - EB I-70 at US 29
 - EB I-70 at Marriottsville Road
 - SB US 29 at MD 100
 - SB US 29 at US 40
 - EB US 40 at US 29
- PM
 - WB I-70 at US 29
 - NB US 29 at I-70
 - WB US 40 at US 29
 - NB US 29 at US 40
 - WB I-70 at Marriottsville Road

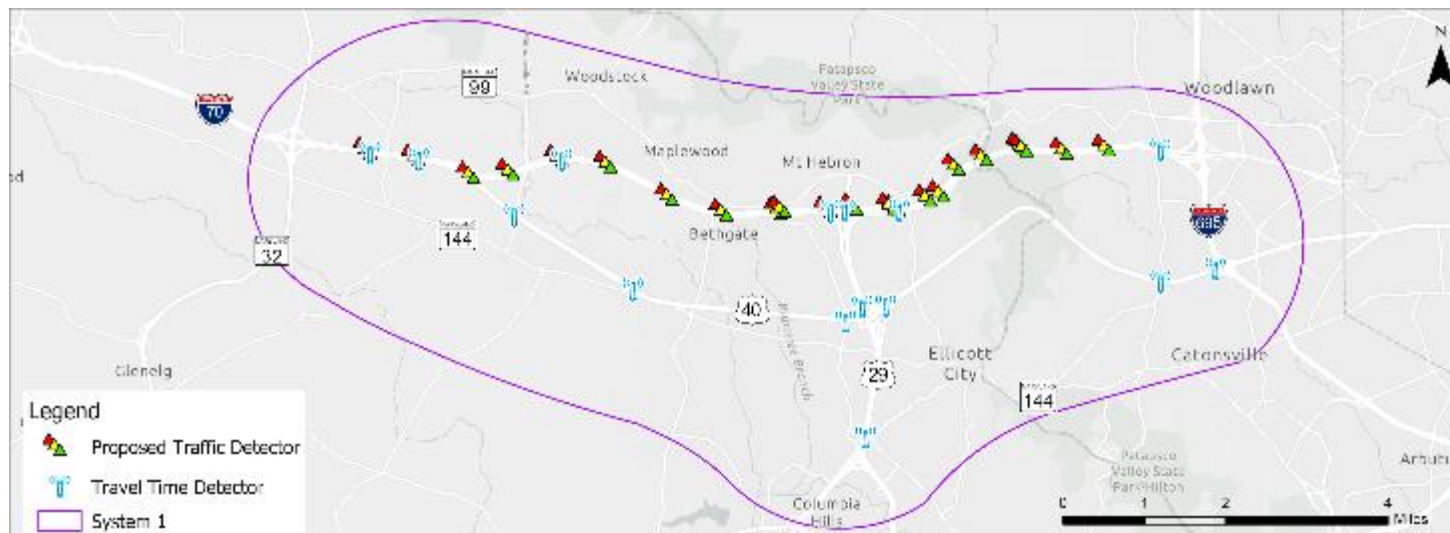
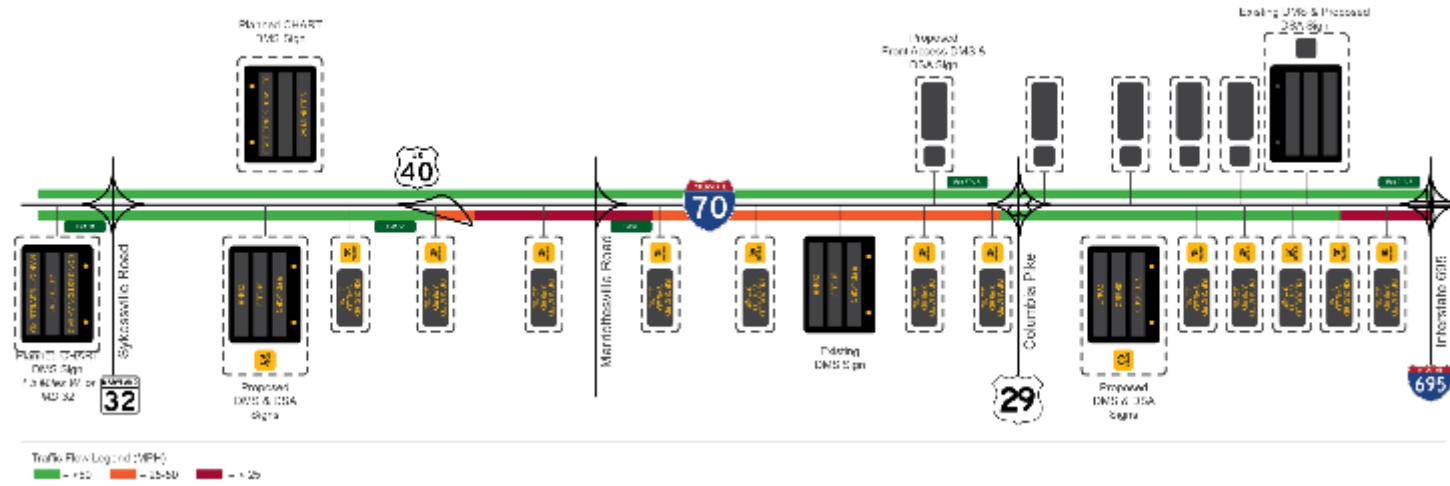
TSMO System 1 Strategies – Tier 1



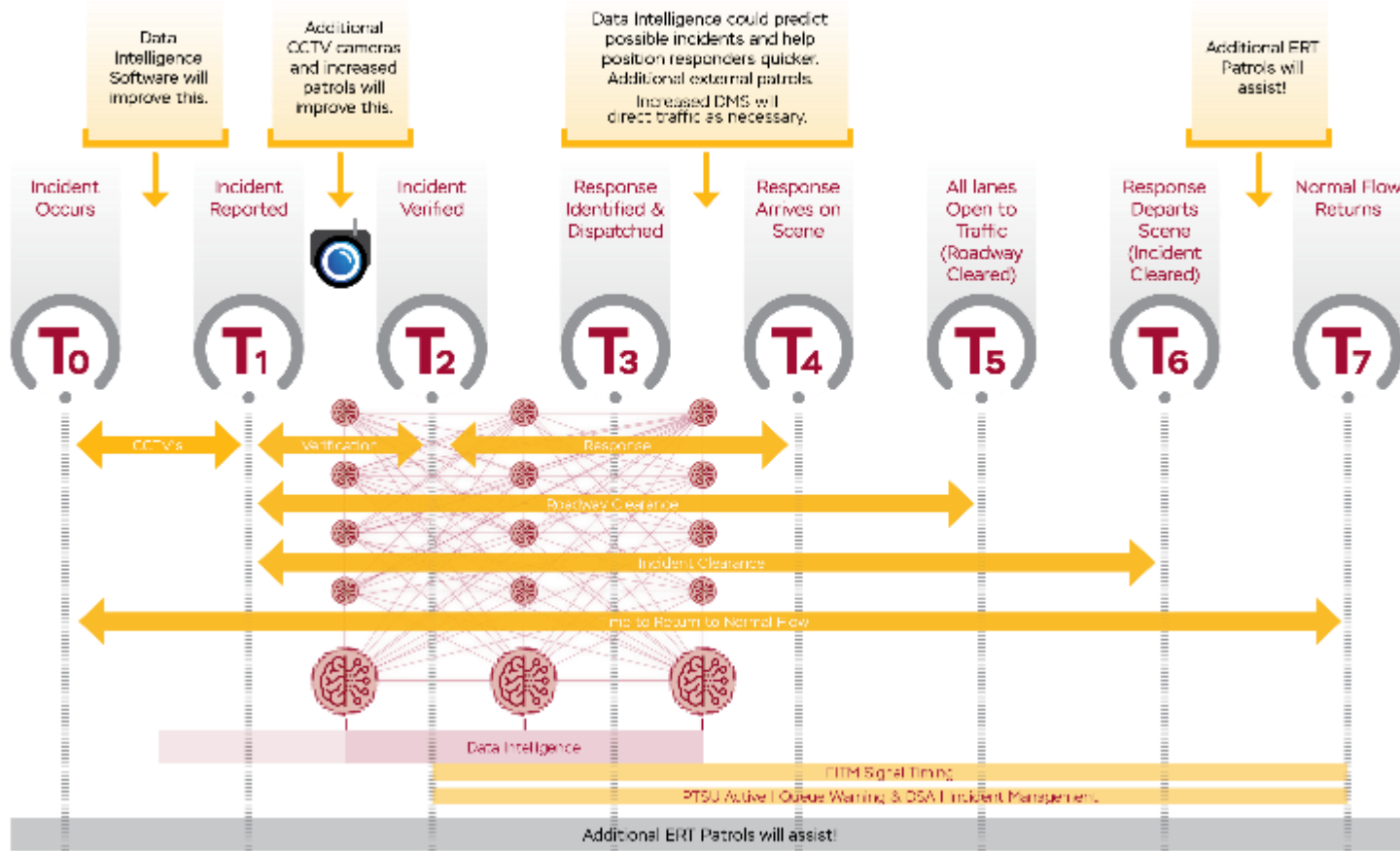
Tier 1: Smart Signals



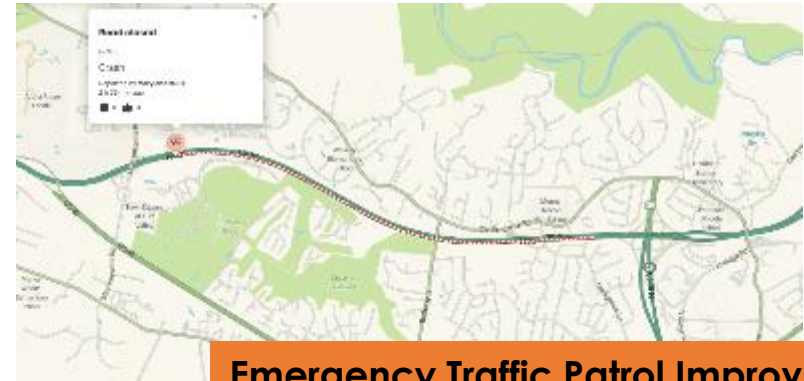
Tier 1: Queue Warning and Detection



Tier 1: Incident Management



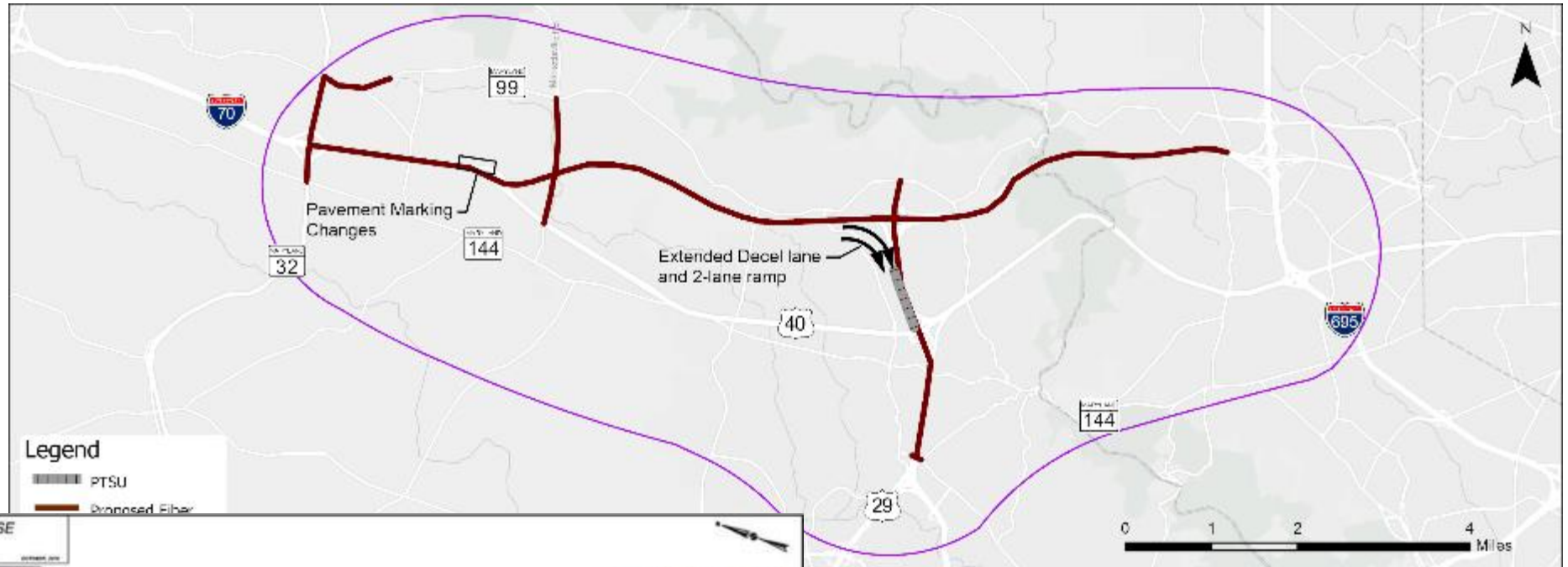
Waze CCP and Other Big Data Apps



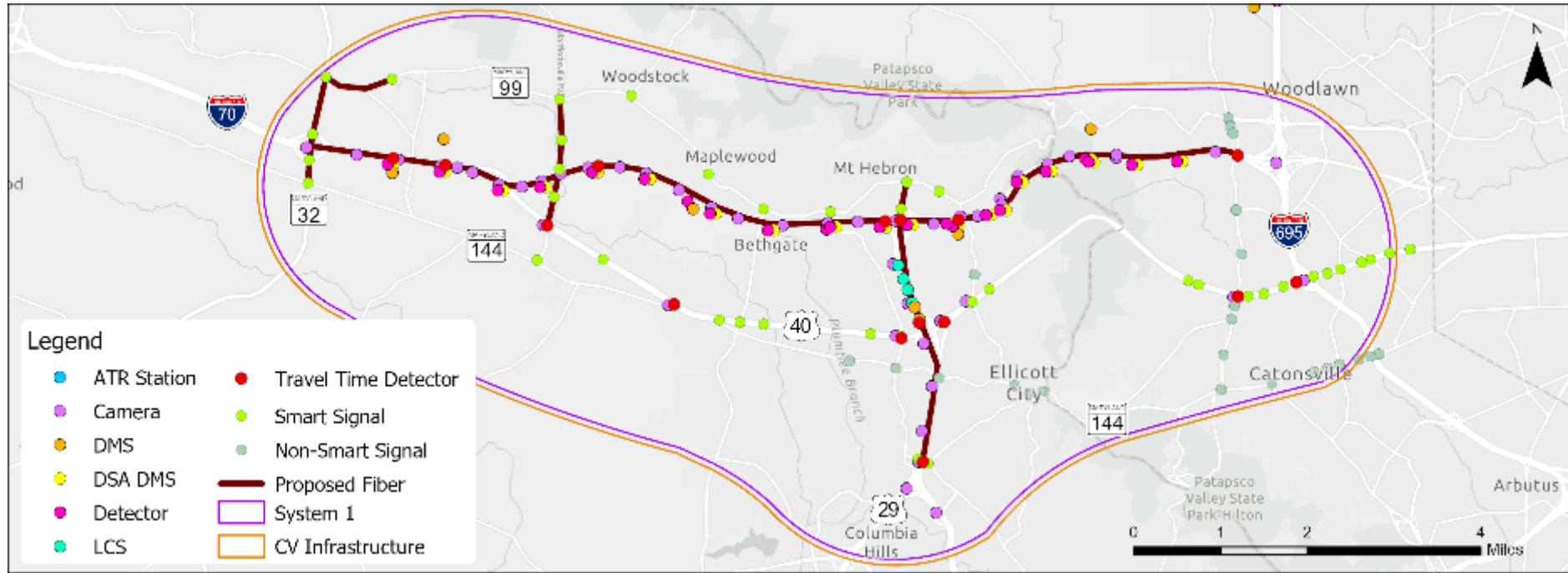
Emergency Traffic Patrol Improvements



Tier 2: TSMO Strategies

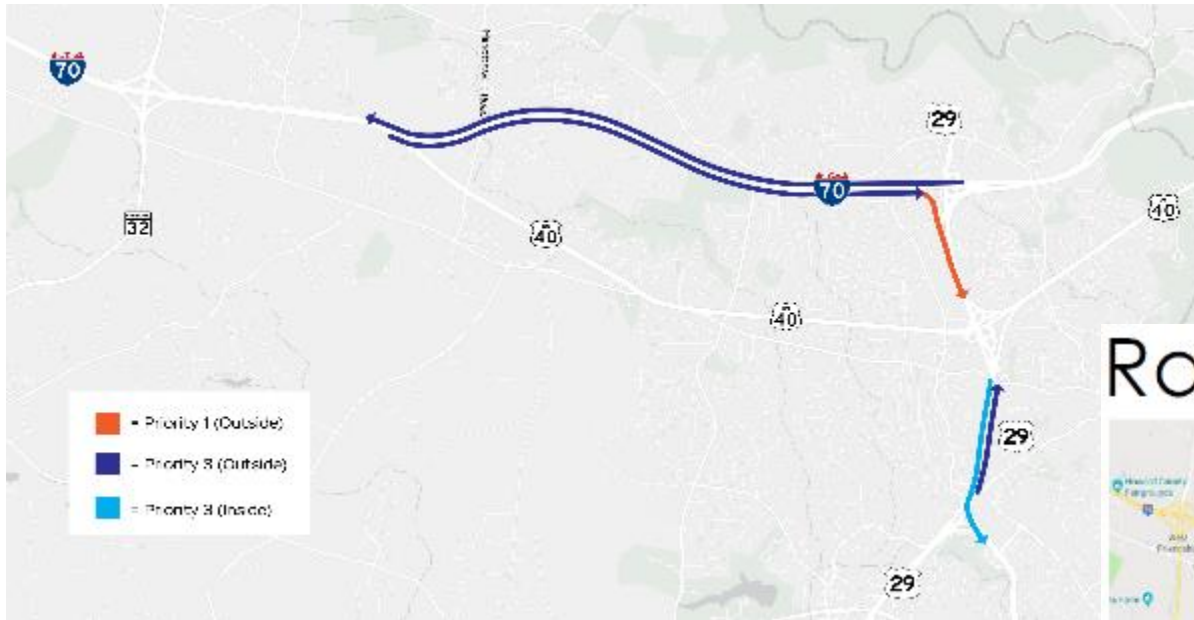


Tier 2: Telecommunications & CAV Applications



Tier 3: TSMO Strategies

Part Time Shoulder Use on I-70/



Ramp Metering

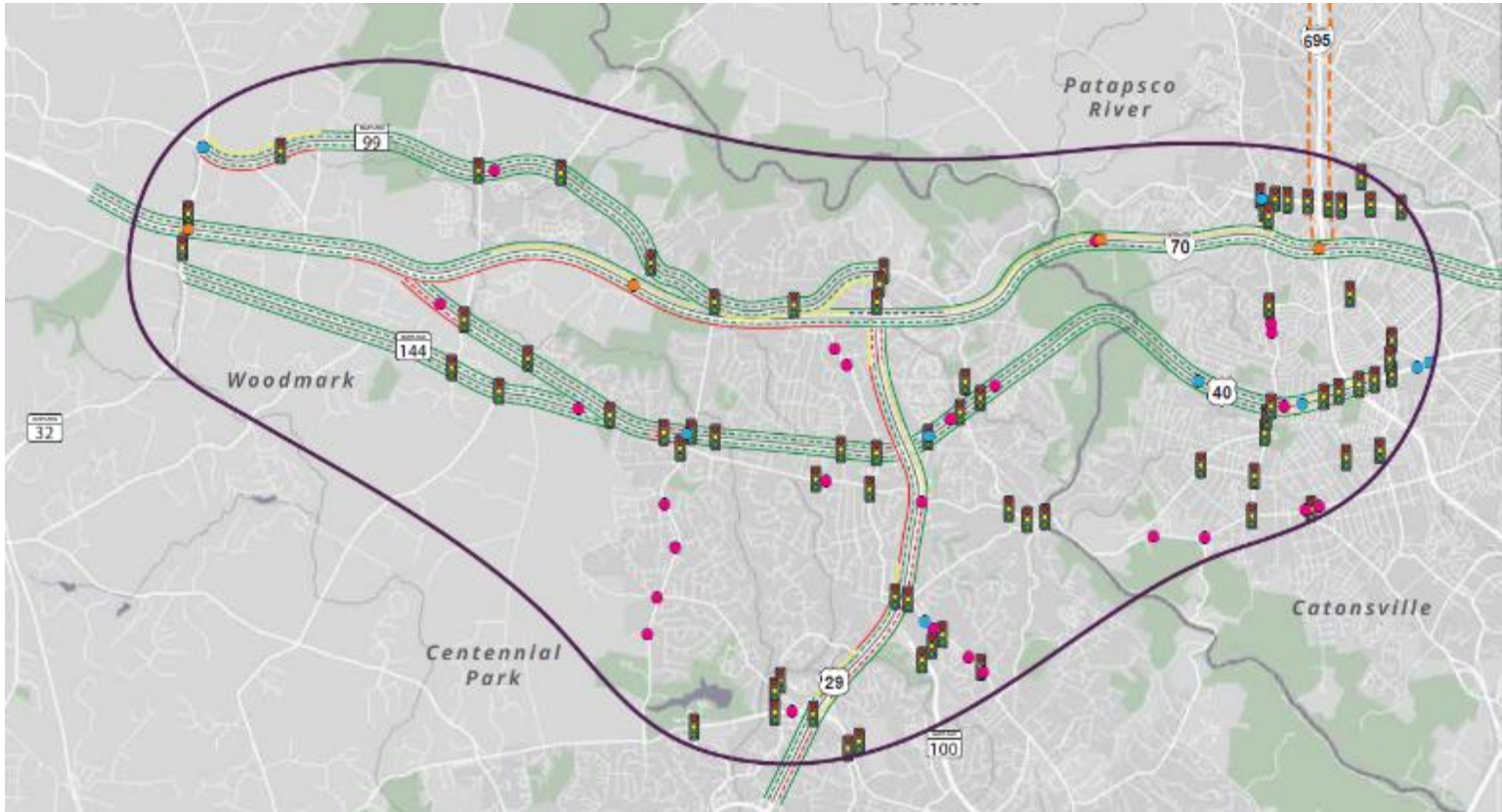


Multimodal Strategies

Predictive Capabilities

Connected Automated Applications

Next Steps



- High-level Design Requirements for Tier 1 Strategies
- Multiple Delivery Strategies – package of stand-alone projects for Design, Bid and Delivery
- Planning, Purpose & Need, Environmental and Design for projects with Civil Scope
- Investments in Big Data, CAV applications, pilots etc.

QUESTIONS?
THANK YOU!

CONTACT INFORMATION

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