



# **HRTO Operations Strategy Phase 2**

August 30, 2019

Leadership Briefings

# Regional Transportation Operations Strategies

## May 2016 Report – Operations Strategy Phase 1

- Short, medium, and long-term opportunities were identified ranging from:
  - Developing incident response signal timing plans along regional corridors across jurisdictions
  - Developing regional standards for performance measures, traffic engineering, and Intelligent Transportation Systems (ITS)
  - Assessing the benefits of embracing a common signal controller standard
  - Reviewing opportunities for collaboration on asset management, maintenance contracts, and third-party vendor contracts
  - Evaluating the potential benefits of a collaborative regional 24/7/365 Traffic Operations Center (TOC)

# Regional Transportation Operations Strategies

## Operations Strategy Phase 2

- This current phase went deeper into certain aspects of Phase 1, namely:
  - Assessing five specific Corridors of Regional Significance (CoRS) for needs associated with communications, signal timings, and situational awareness/performance monitoring
  - Assessing the benefits of embracing a common signal controller standard
  - Evaluating the potential benefits of a collaborative regional 24/7/365 Traffic and Traffic Signals Operations Center



# Corridors of Regional Significance (CoRS)

## Identified Corridors:

- US 13
- Route 143/Jefferson Avenue
- Route 60/Warwick Boulevard
- US 17
- US 58

## Key Elements of Success:

- High-speed Communications
- Traffic Detection
- Signal Coordination
- Traveler Information Systems



# Common Controller Platform

- VDOT executed a Statewide signal controller contract
- McCain can offer 2070ATC & NEMA style controllers
- Econolite Cobalt can only offer NEMA controller through this contract

• McCain 2070LXN2 Controllers:	\$1,397.00
• McCain NEMA eX2 type 1 controller (TS-2 cabinet):	\$978.00
• McCain NEMA eX2 type 2 controller (TS-1 cabinet):	\$1,324.00
• D4 Software:	\$750.00
• 20% Bulk software discount for system wide upgrade 100 licenses for \$60,000 (avg. \$600/int.)	
• 20% Bulk software discount for system wide upgrade 150 licenses for \$90,000 (avg. \$600/int.)	
• 20% Bulk software discount for system wide upgrade 200 licenses for \$120,000 (avg. \$600/int.)	
• ~23% Bulk software discount for system wide upgrade 300 licenses for \$175,000 (avg. \$583/int.)	
• ~25% Bulk software discount for system wide upgrade 400 licenses for \$225,000 (avg. \$563/int.)	
• ~33% Bulk software discount for system wide upgrade 1,000 licenses for \$500,000 (avg. \$500/int.)	
• ~38% Bulk software discount for system wide upgrade 1,500 licenses for \$700,000 (avg. \$467/int.)	
• ~40% Bulk software discount for system wide upgrade 1,900 licenses for \$845,000 (avg. \$445/int.)	

# Common Controller Platform

- Regional savings of \$360,000 by sharing a bulk D4 license purchase
- Currently there are over 1500 municipal signals, and another 180 VDOT signals

Regional Summary of Existing Signals			
Agency	Quantity	Controllers	Central S/W
Chesapeake	170	Econolite ASC/2, ASC/3 and Cobalt	Kapsch EcoTrafix
Hampton	190	Trafficware/Naztec Series 900	Trafficware ATMS.Now
Newport News	260	Econolite ASC/3 and some Cobalt	Econolite Centracs
Norfolk	310	Caltrans 170s transitioning to 2070ATC	McCain QuicNet (transitioning to Kimley-Horn KITS)
Portsmouth	125	Econolite ASC/3 and some Cobalt	Econolite Centracs
Suffolk	75	Peek ATC-1000 and McCain eX2	McCain Transparity
Virginia Beach	380	Trafficware/Naztec Series 900 and ATC	Trafficware ATMS.Now and SynchroGreen (Adaptive)
VDOT HptRds	180	transitioning to 2070ATC throughout	Various (transitioning to Kimley-Horn KITS statewide platform)

	Purchased individually		Probable Cost if S/W purchased as a Region	
Chesapeake	\$ 329,199.00		\$ 166,260.00	
Hampton	\$ 389,493.50		\$ 218,690.00	
Newport News	\$ 493,672.00		\$ 254,280.00	
Norfolk	\$ 764,830.50		\$ 440,070.00	
Portsmouth	\$ 244,087.50		\$ 122,250.00	
Suffolk	\$ 191,831.50		\$ 76,810.00	
Virginia Beach	\$ 686,136.00		\$ 371,640.00	
VDOT HptRds	\$ 138,000.00		\$ -	
Bulk license for 1900 signals			\$845,000	
			\$374,250	15% contingency
	\$ 3,237,250.00		\$ 2,869,250.00	

# Regional Traffic Operations Center

## Benefits:

- Performance Improvements include:
  - Standardized reporting consistency
  - Improved situational awareness by partnering agencies
  - Performance improvement regionally with prioritization strategies
  - Streamlined data entry, staff efficiency
  - Consistent Incident management
  - Quicker resolution of lane blocking incidents
  - Efficient movement of traffic around/through incidents
- Cost Savings Potential
  - Shared Data/Service Acquisition Costs
  - Shared Staffing Costs

# Operational Objectives

## Automated Assessment

- Identify characteristics consistent with traffic incident or congestion that necessitates a timely response

## Prompt Acknowledgement

- Verification of initial assessment is performed, operations standard procedures are reviewed for appropriate response

## Quick Assignment

- Rapid deployment of resources, and timely adjustment of traffic management system is put into effect to ease impact

## Active Reporting

- Creates accountability to meet performance measures



# Nine Strategies for Regional Operations Vision

1. Embrace and transition to the Statewide traffic signal controller platform
2. Establish regional standards for performance monitoring and data collection to support common reporting and funding requests
3. Embrace shared contracting opportunities for regional maintenance, staffing, and third-party software/crowd-sourcing data
4. Embrace and support the development and integration with the Regional Connectivity Ring (RCR) to advance the communications structure between Hampton Roads Traffic Operations groups.
5. Establish regionwide incident management timing plans starting with CoRS



# Nine Strategies for Regional Operations Vision (Cont.)

6. Embrace and incorporate consistent incident management strategies throughout the region
7. Strive to fill in coverage gaps for surveillance/monitoring of CoRS and sharing the video and data feeds with all member jurisdictions for region-wide situational awareness
8. Endeavor to establish common software systems and communication platforms in the region to facilitate the aforementioned incident management, data sharing, and controls
9. Apply funding as a region to further advance the operational improvements and connectivity



# Embrace and Transition to the Statewide Traffic Signal Controller Platform

- With the Advanced Transportation Controller standard, agencies buy the hardware apart from the field controller software
- Regional savings of \$360,000 by sharing a bulk D4 controller software license purchase
- Some agencies (Suffolk) have controllers that are already compatible with the D4 software, while most of the region would need to migrate their controller hardware
- When Georgia DOT (GDOT) undertook this effort, they did so on a corridor-by-corridor basis



# Establish Regional Standards For Performance Monitoring And Data Collection To Support Common Reporting And Funding Requests

- Establishing regional standards means that everyone will be comparing apples to apples, and striving to achieve improvements based on common goals
- Each agency can manage performance measurement individually or as part of the collective group, but standards need to be established for data reported, data frequency, and how it might be leveraged to evaluate upgrades and funding requests
- The Denver Regional Council of Governments (DRCoG), is similar to the HRTPO, and typifies performance management oversight:
  - “performance measurement is managed as a region by the Colorado Transportation Management Center (CTMC) and the Regional Transportation District (RTD) for routine reporting to DRCOG.”

# Embrace Shared Contracting Opportunities For Regional Maintenance, Staffing, And Third-party Software/Crowd-sourcing Data

For example, in the Georgia DOT (Regional Traffic Operations Program) RTOP program;

- RTOP includes several different teams within their program.
  - To include: Zone Managers, Traffic Engineers, Traffic Signal Operations Specialists (TSOS), Communications Teams, and Advanced Signal Timing Performance Measures (ATSPM)
- Each of these roles involves tasks that are specific to each position. Some of these roles are staffed at GDOT's TMC, while other roles are contracted.

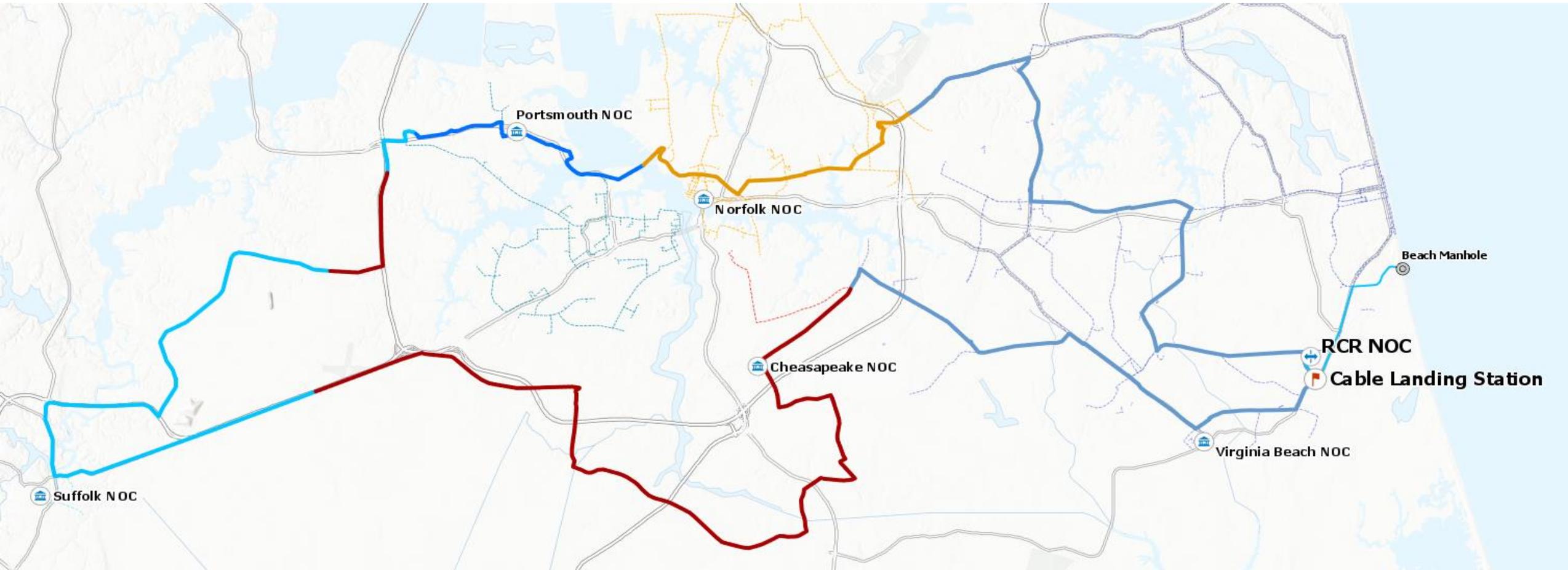


# Embrace And Support the Development and Integration with the Regional Connectivity Ring (RCR) to Advance the Communications Structure between Hampton Roads Traffic Operations Groups

- As a separate initiative in Hampton Roads, the RCR is anticipated to provide a 108 mile fiber backbone loop beginning with the Southside cities
- Not all routes within each municipality will be touched. Thus, extensions from the fiber loop will be needed to connect transportation/ITS infrastructure into the network and between all of the HRTTO groups
- Starting with the CoRS routes for communication upgrades and gradually increasing device connectivity to the RCR and the regional TOC



# Regional Connectivity Ring (RCR)



# Establish Regionwide Incident Management Timing Plans Starting With CoRS

Georgia DOT transitioned, they implemented timing plans on a strategic, corridor-by-corridor basis

The Memphis Metropolitan Planning Organization (MPO) also incorporated this strategy into a broader Congestion Management Process (CMP) that the HRTTO can reference in the regional vision for Hampton Roads



# Embrace And Incorporate Consistent Incident Management Strategies Throughout The Region

- Strategies thus far have loosely involved municipalities for freeway diversions (e.g. James River Bridge as a backup route to I-664 MMBT), but not regionwide
- Build upon established practices here, as well as those in similar areas around the country
- Memphis MPO, for example, utilizes a regional Congestion Management Process (CMP) using performance planning that factors into incident and demand management, as well as long-term planning. HRTTO can leverage these examples to develop a model that works for our region



# Strive To Fill In Coverage Gaps For Surveillance/Monitoring Of CORS And Sharing The Video And Data Feeds With All Member Jurisdictions For Region-wide Situational Awareness

- HRTO has looked at initiatives in Denver for examples of data collaboration
  - Denver's transportation planning organization's (DRCOG) group of agencies collectively agreed to operate/manage the network as a team
  - Congestion management process is part of DRCOG's performance-based planning process
  - Performance Measures monitored by each locality but reported and managed in a standard way across the region by DRCOG
  - Among performance measures, they track "Non-SOV mode share to work", Daily VMT, Avg. travel time variation (peak vs. off-peak), daily person delay per capita, and number of traffic fatalities



## **Strive To Fill In Coverage Gaps For Surveillance/Monitoring Of CoRS And Sharing The Video And Data Feeds With All Member Jurisdictions For Region-wide Situational Awareness (Cont.)**

- Several agencies are already connected to VDOT's 511 video feeds. The goal would be to provide motorists with a one-stop location for region-wide situational awareness for CoRS, and non-CoRS alike
- Corridors don't need surveillance devices at every intersection, but gaps can be filled starting with CoRS, and establishing regional priorities for remaining corridors
- Communications with VDOT and a Regional TOC can serve a key role in disseminating regional traffic conditions across all jurisdictions as well as gathering performance measures from all jurisdictions



## Endeavor To Establish Common Software Systems And Communication Platforms In The Region To Facilitate The Aforementioned Incident Management, Data Sharing, And Controls

- Similar to the common controller discussion, there is a cost savings and an operational benefit of embracing a common software system for transportation management in the region
- When other parts of the country have undertaken this effort, such as Georgia DOT (GDOT), they have done so on a corridor-by-corridor basis (RTOP)
  - Corridors are managed and operated as if owned by one entity, regardless of the agencies owning the individual intersections.
  - MOUs have been established to agree what level of control and responsibility each entity has in the management of the corridors.
  - Hampton Roads could embrace this for CoRS and parallel interstate segments as part of an Integrated Corridor Management (ICM) program to:
    - Address standardized incident management, and
    - Gather throughput/performance metrics for the collective parallel corridors
- Starting with the CoRS routes for communication upgrades and gradually increasing device connectivity to the Regional Connectivity Ring (RCR) and the regional TOC

# Apply Funding As A Region To Further Advance The Operational Improvements And Connectivity

- Common platforms open the door for pursuing funding at a regional level instead of competing individually
- Resiliency is a critical infrastructure/DHS initiative that should be considered on a routine basis by leveraging the regional connectivity ring for network/system
- Demonstrating regional cost savings by collaborating on contracts can be used to pursue federal funding (ATCMTD grants and other programs), which give more weight to regional efforts than to agency-specific initiatives
- Performance measures will demonstrate the ability to improve operations, and will make a stronger case for funding improvements in the remainder of the region to continue increasing the baseline

# Next Steps

## Project Scope Outline

**Task 1:** Define the concept of Active Traffic Management (ATM) for Regional Operations, as well as system requirements and specifications

**Task 2:** Deployment Schedule and detailed design of ATM devices and deployment on CoRS

**Task 3:** Identify semi-automated ATM action plans and the associated inputs

**Task 4:** Develop ATMS reporting performance systems standards



# Glossary of Acronyms/Terms

ATCMTD: Advanced Transportation and Congestion Management Technologies Deployment Program grants to fund new technologies that improve transportation efficiency

ATC: The Advanced Traffic Controller is the latest set of standards available in the traffic signal operations industry.

D4: Fourth Dimension is the supplier of the signal controller firmware that was selected with VDOT's statewide common controller procurement

DRCOG: The Denver Regional Council of Governments is equivalent to our HRTPO

DHS: Department of Homeland Security



# Glossary of Acronyms/Terms (Cont.)

ITS: Intelligent Transportation Systems

TOC: Traffic Operations Center

CoRS: Corridors of Regional Significance: While the State has Corridors of Statewide Significance (CoSS), the region has identified a tier of corridors that have critical importance to Hampton Roads traffic management, but are not necessarily covered by CoSS

CoSS: Corridors of Statewide Significance (CoSS)



# Glossary of Acronyms/Terms (Cont.)

NEMA: National Electrical Manufacturers Association

A standardization body that governs much of the field equipment that is used in the traffic signal operations industry

Regional Connectivity Ring (RCR): An initiative to build a fiber optic ring around Hampton Roads originating within the Southside to connect to new transoceanic cables that are homed in Virginia Beach

RTOP: Regional Traffic Operations Program: A multi-jurisdictional, cutting-edge signal timing program with the goal of improving traffic flow and reducing vehicle emissions through improved signal timing

