

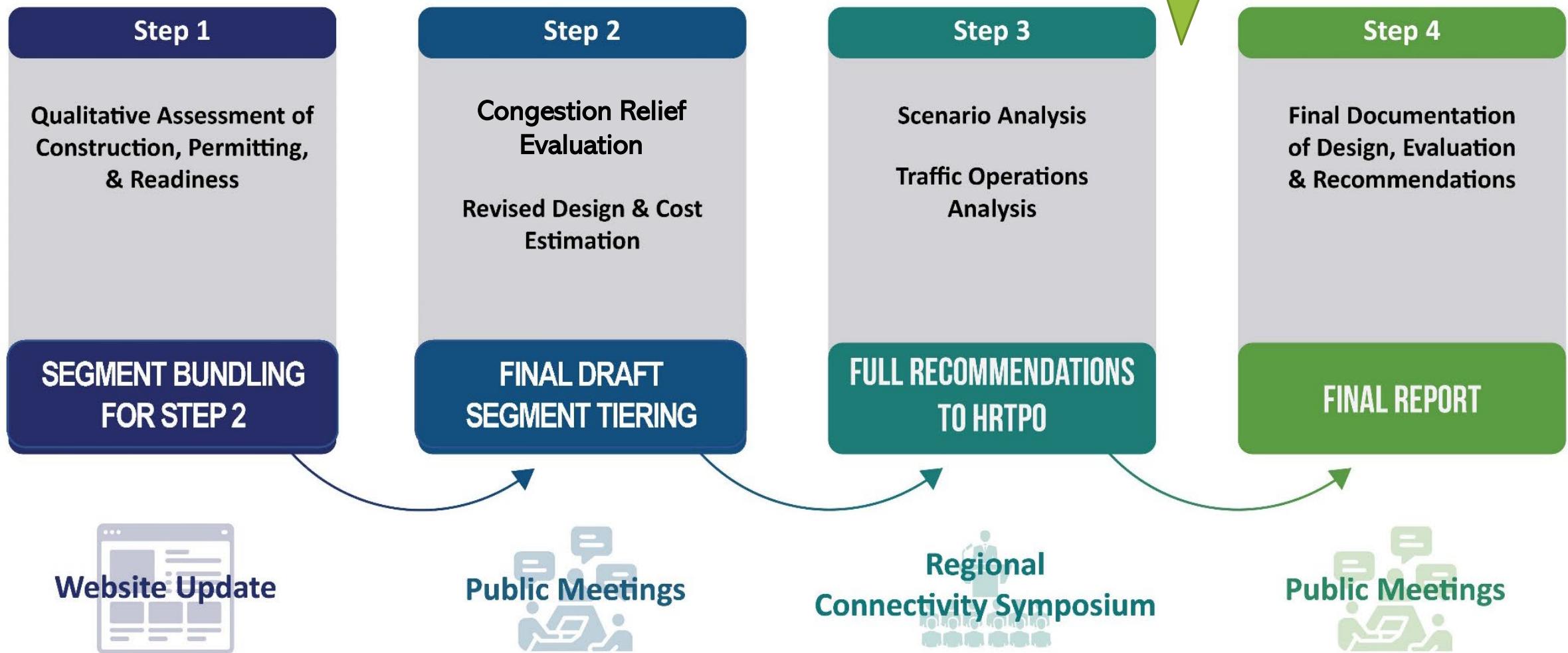


REGIONAL CONNECTORS STUDY

JOINT STEERING (POLICY) COMMITTEE AND WORKING GROUP
JUNE 16, 2023

Michael Baker
INTERNATIONAL

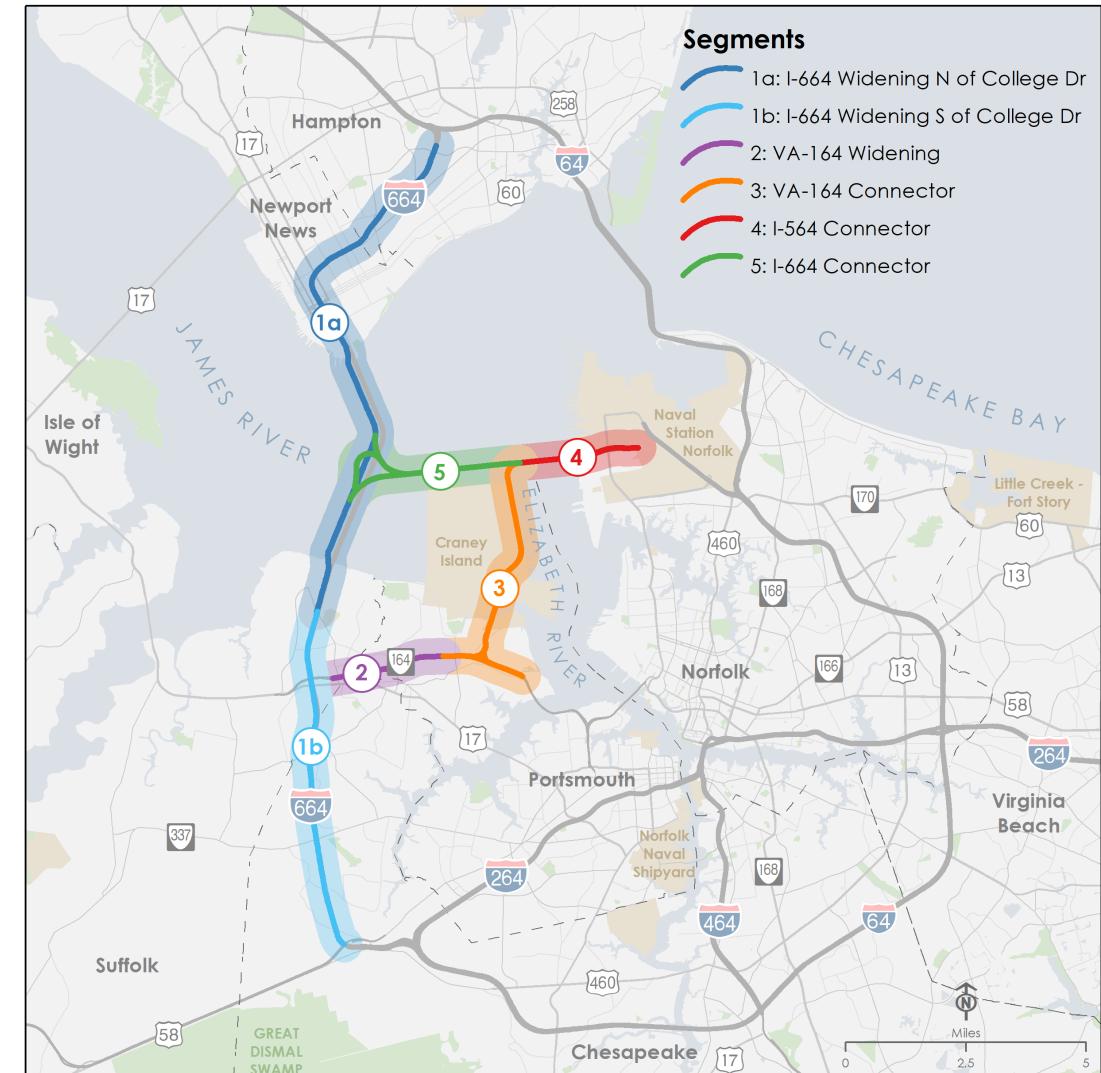
Phase 3 Process Graphic



RCS Phase 3 Update

Agenda

- Study Recap
- Congestion Evaluation & Economic Benefits of Tier I and Tier II Segments
- Traffic Operations Analysis – Tier I Segments
- Public Engagement Update
- Wrapping Up the Study



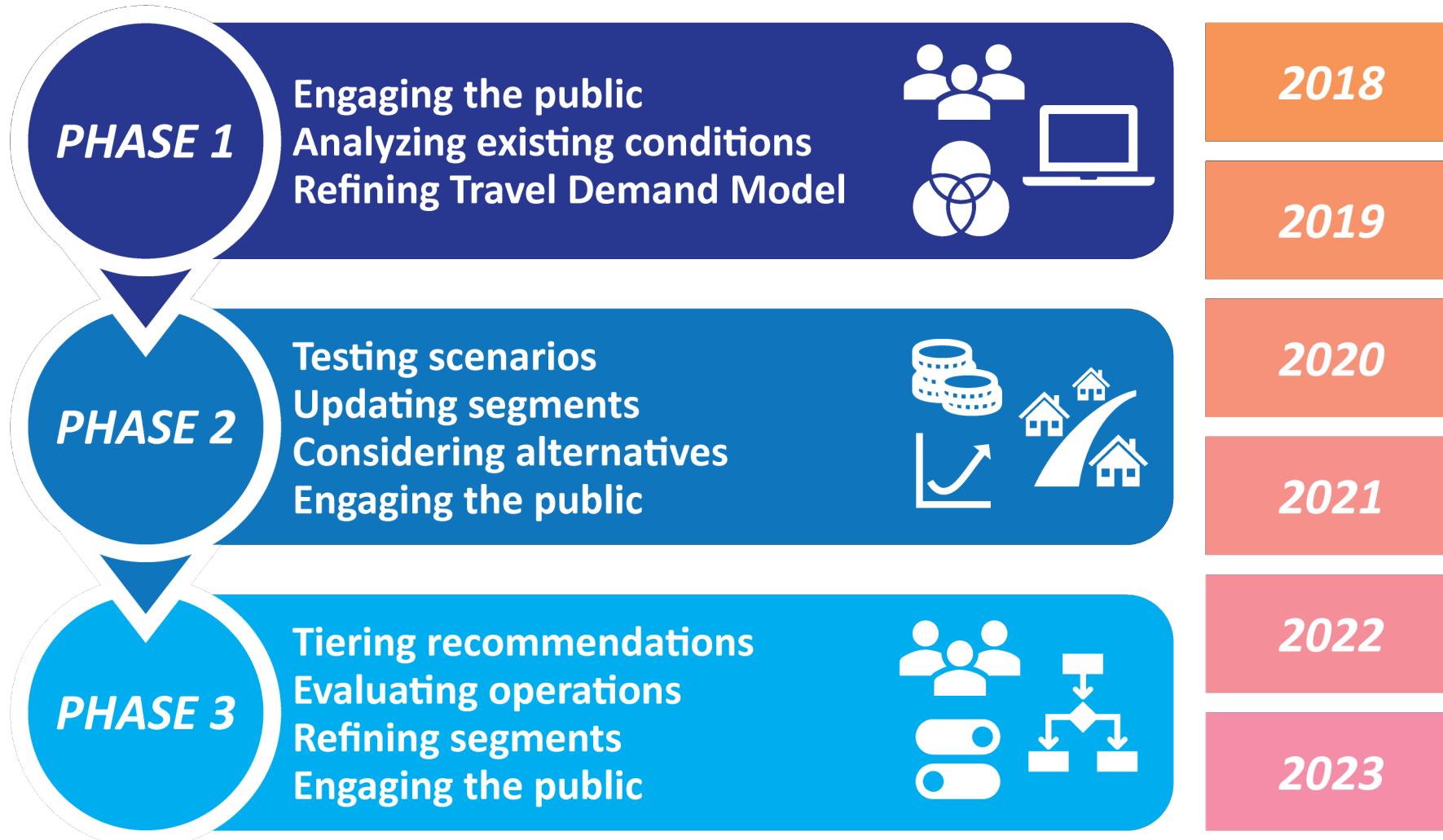


REGIONAL CONNECTORS STUDY

STUDY RECAP

Michael Baker
INTERNATIONAL

Regional Connectors Study – 2018 to today



Regional Connectors Study End Products

Tiering Recommendations

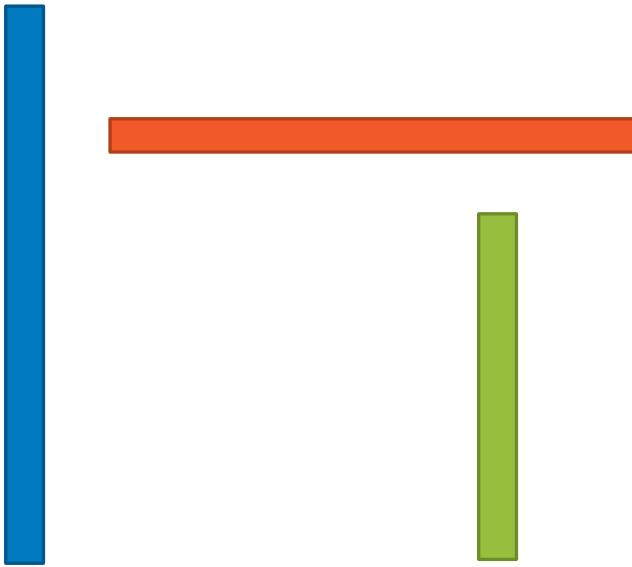
Hand-off to HRTPO:

- Tier I → Evaluate for 2050 Fiscally Constrained Long Range Transportation Plan
- Tier II → Include in 2050 Vision Plan

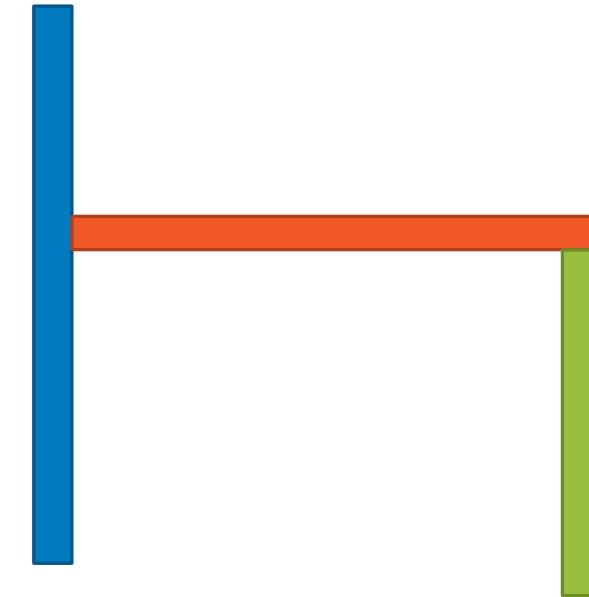
Study Documentation

- Record of the entire process (committee meetings, webinars, public engagement summaries)
- Technical documentation of each phase
- Refined segment concept drawings

Segments vs Bundles



SEGMENTS



BUNDLE

Tiering

- The RCS will propose roadway segments that are ready to move forward and appear the most cost effective as Tier I recommendations.
- Segments that require further refinement and have hurdles to advancing are Tier II recommendations.

Tier
I

Segments recommended for HRTPO to evaluate for the 2050 Long Range Transportation Plan (LRTP).

Tier
II

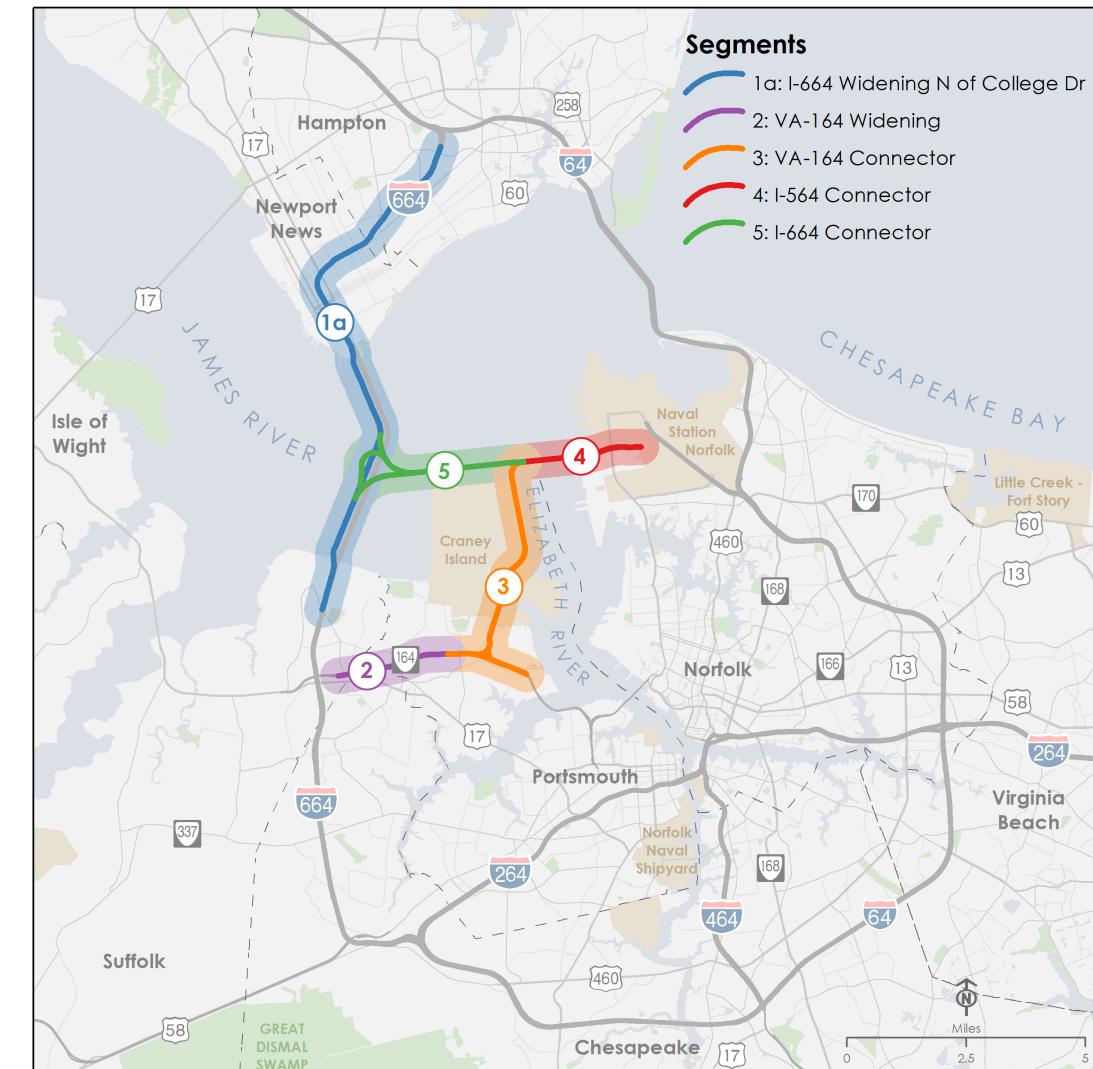
Segments recommended for HRTPO to include in the Regional Transportation Vision Plan.



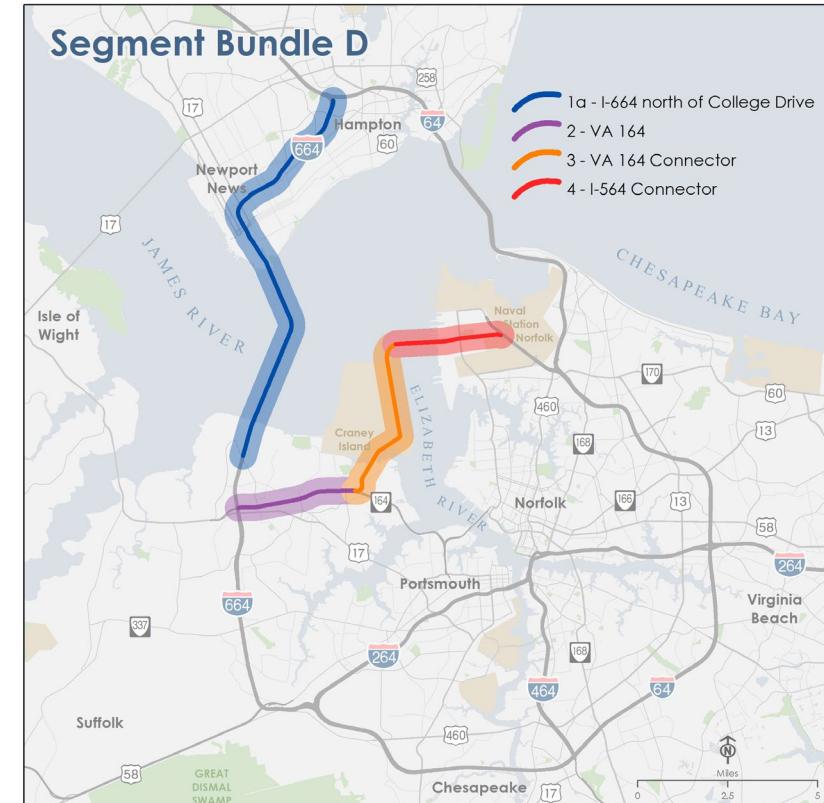
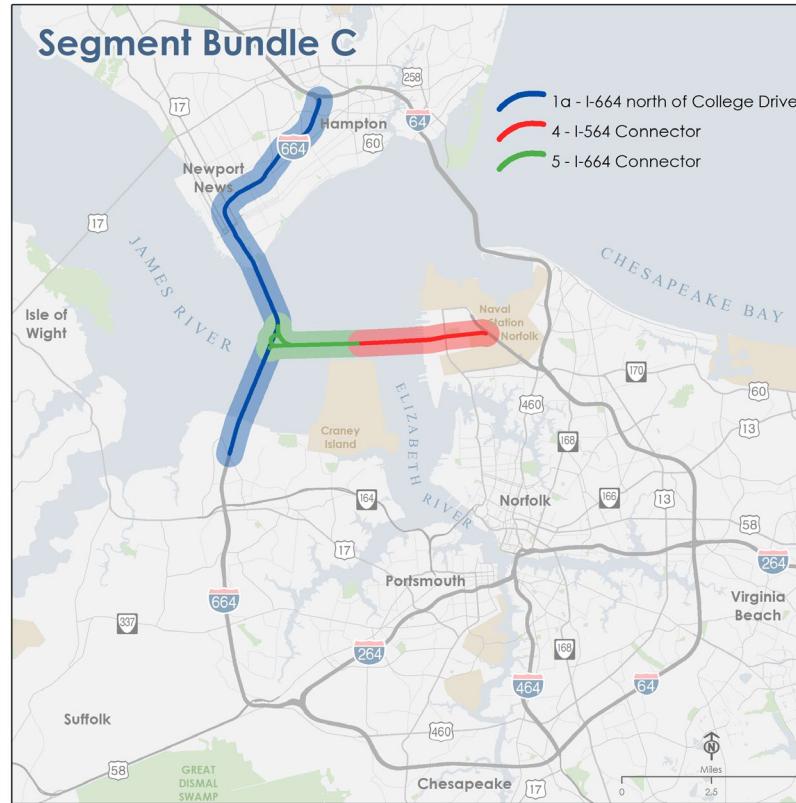
HRTPO Long Range
Transportation
Planning Process

November 17, 2022 Actions Shaping Step 3 Analysis:

- Recommended Segments 1a and 2 for Tier I
- Recommended Segments 3, 4 and 5 for Tier II
- Directed the consultant team to proceed
 - Analyze 3 bundles of Tier I and II segments in the scenario analysis
 - Analyze Tier I segments in traffic operations analysis



Consultant Team Selected Bundles B, C and D for analysis



Scope of work allows testing of baseline and up to 3 bundles of segments in Tiers I and II

REGIONAL CONNECTORS STUDY

RESULTS OF CONGESTION & ECONOMIC ANALYSIS

Greater Growth Scenarios

- Greater Growth Scenarios reflect 2x the employment growth from 2015-2045 and associated increase in population growth

Approved by Steering (Policy) Committee 7/09/2019

GREATER GROWTH ON THE WATER

- » Growth in water-oriented activity
- » Port of Virginia becomes even more competitive with freight more multimodal
- » More dispersed housing locations
- » Moderate assumptions for CAV adoption & network adaptation

GREATER GROWTH IN URBAN CENTERS

- » Significant economic diversification
- » Low space requirements per job
- » Large role for “digital port”
- » New professionals prefer to live/work in urban settings
- » High level of CV adoption & low auto ownership or high TNC mode

GREATER SUBURBAN / GREENFIELD GROWTH*

- » Growth is suburban / exurban, but growth includes walkable mixed use centers
- » Port of Virginia becomes even more competitive
- » “Digital port” brings additional jobs
- » Housing is more suburban
- » High level of AV adoption & network adaptation

WHAT THESE WILL HELP US TEST



Water

Test greater cross-harbor travel in particular



Urban

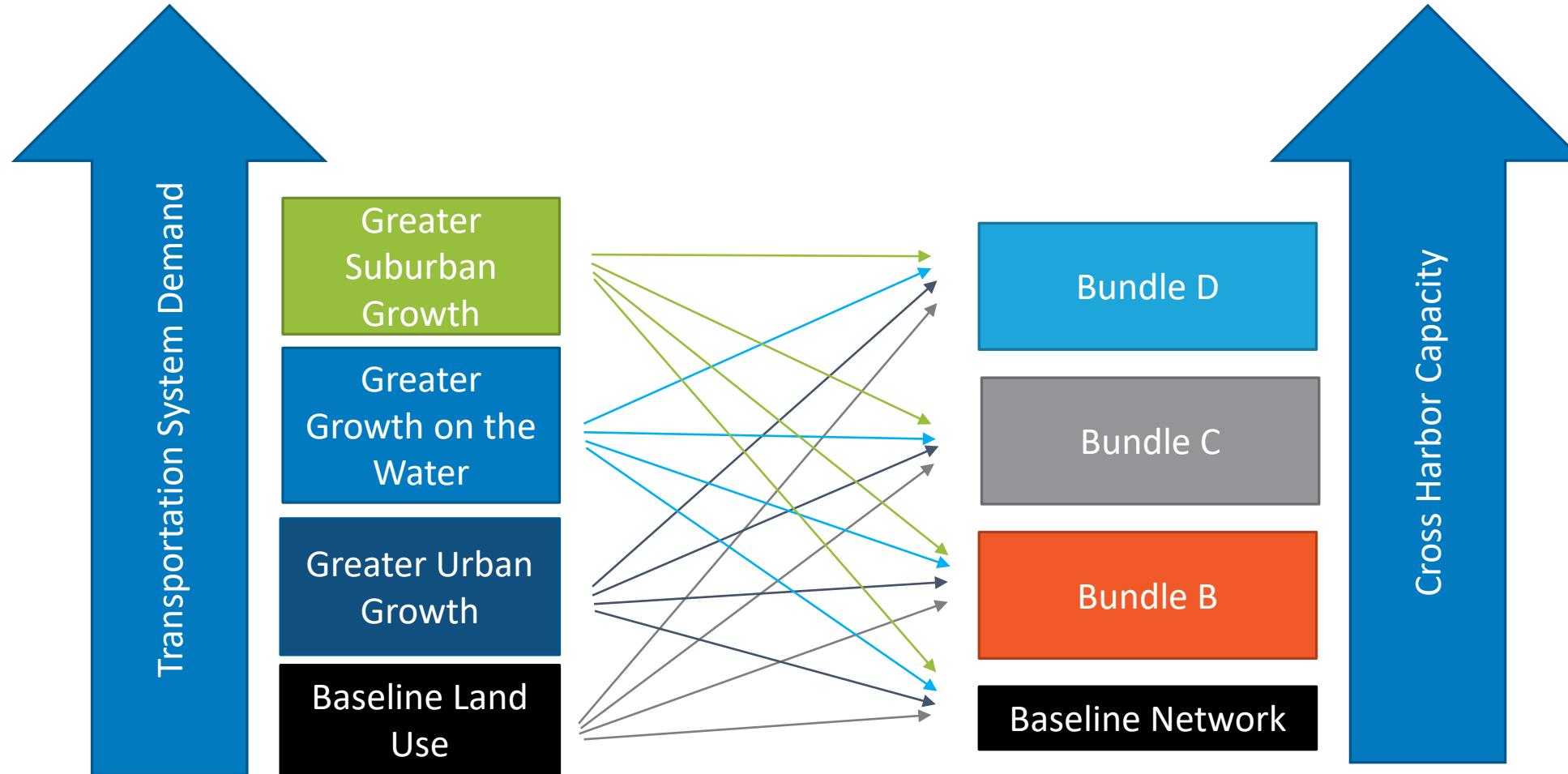
Test more urban & multimodal travel patterns



Suburban

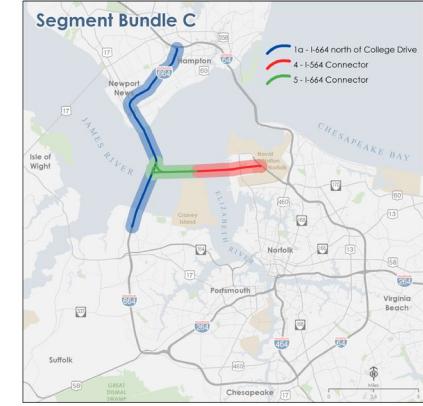
Test more overall regional travel

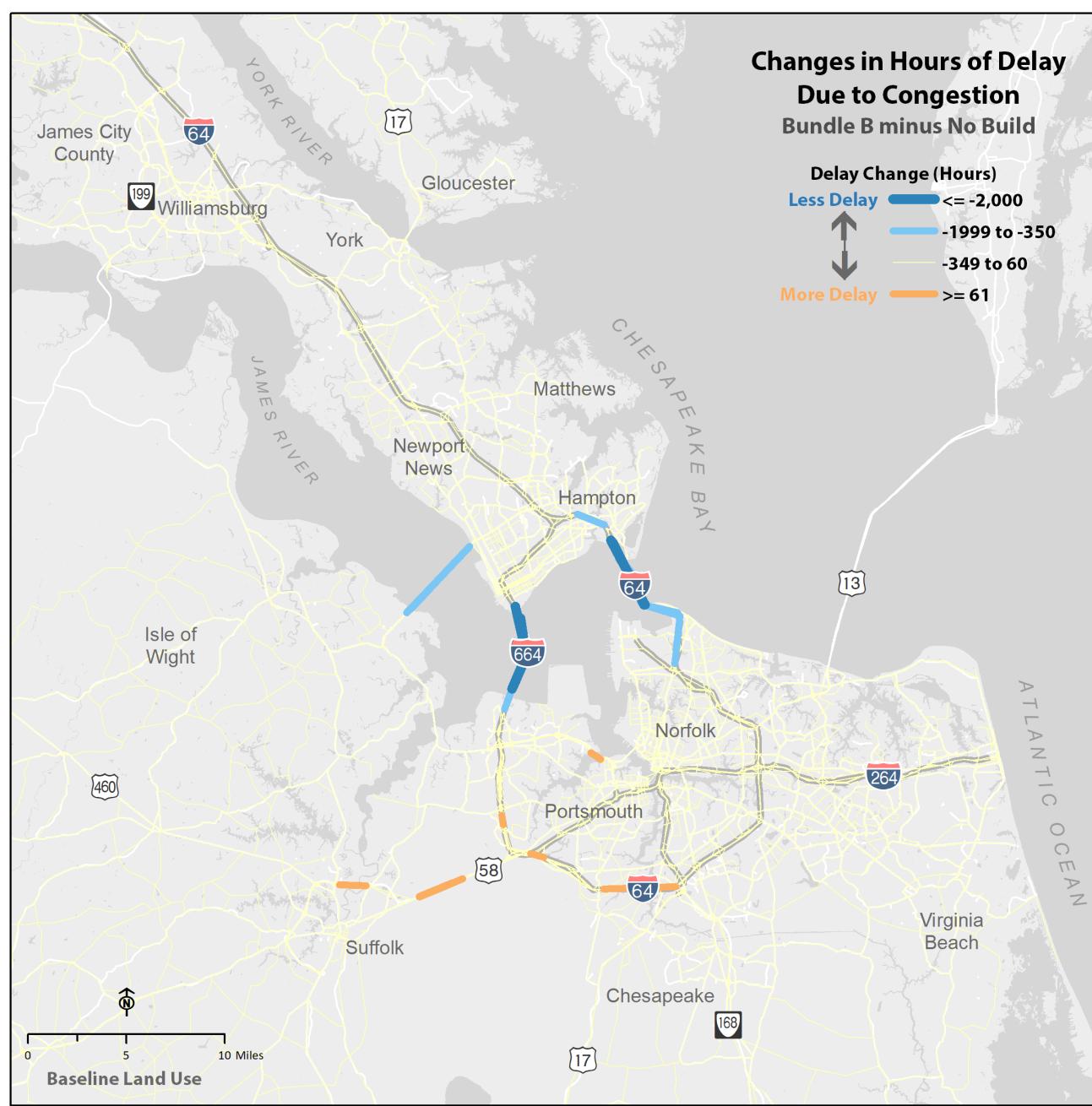
Scenario Planning – “Stress Test”



Regional Congestion Results

- The Greater Growth scenarios increase regional congestion. There is a minor increase in Greater Urban Growth and more substantial increases with Greater Growth on the Water and Greater Suburban Growth.
- **Bundle B** produces the most incremental reduction in regional delay for all scenarios (relative to the No Build network)
- **Bundle D** provides the greatest total reduction in delay across all scenarios, except in the suburban scenario where **Bundle C** performs slightly better
- **Bundle C** and **Bundle D** provide the most additional benefit (reduction in delay in addition to Bundle B) under Greater Growth on the Water



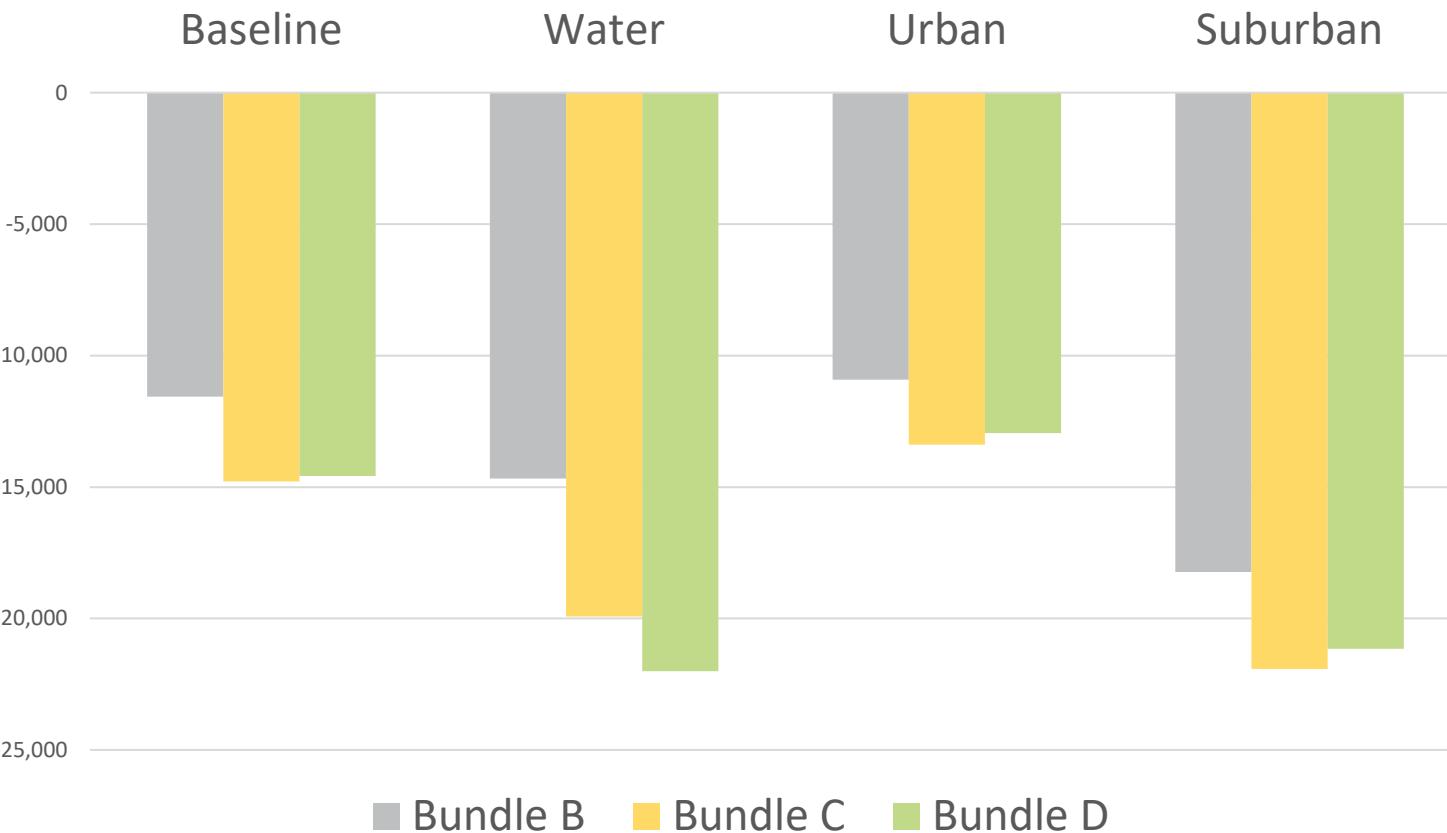


Congestion Results for Bundle B



Regional Crossings: 2045 Congestion on HRBT

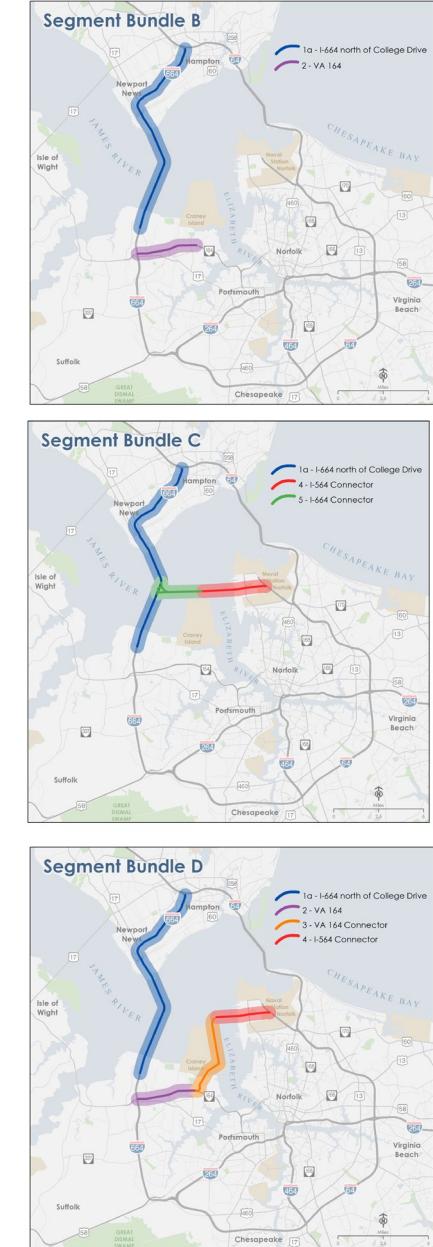
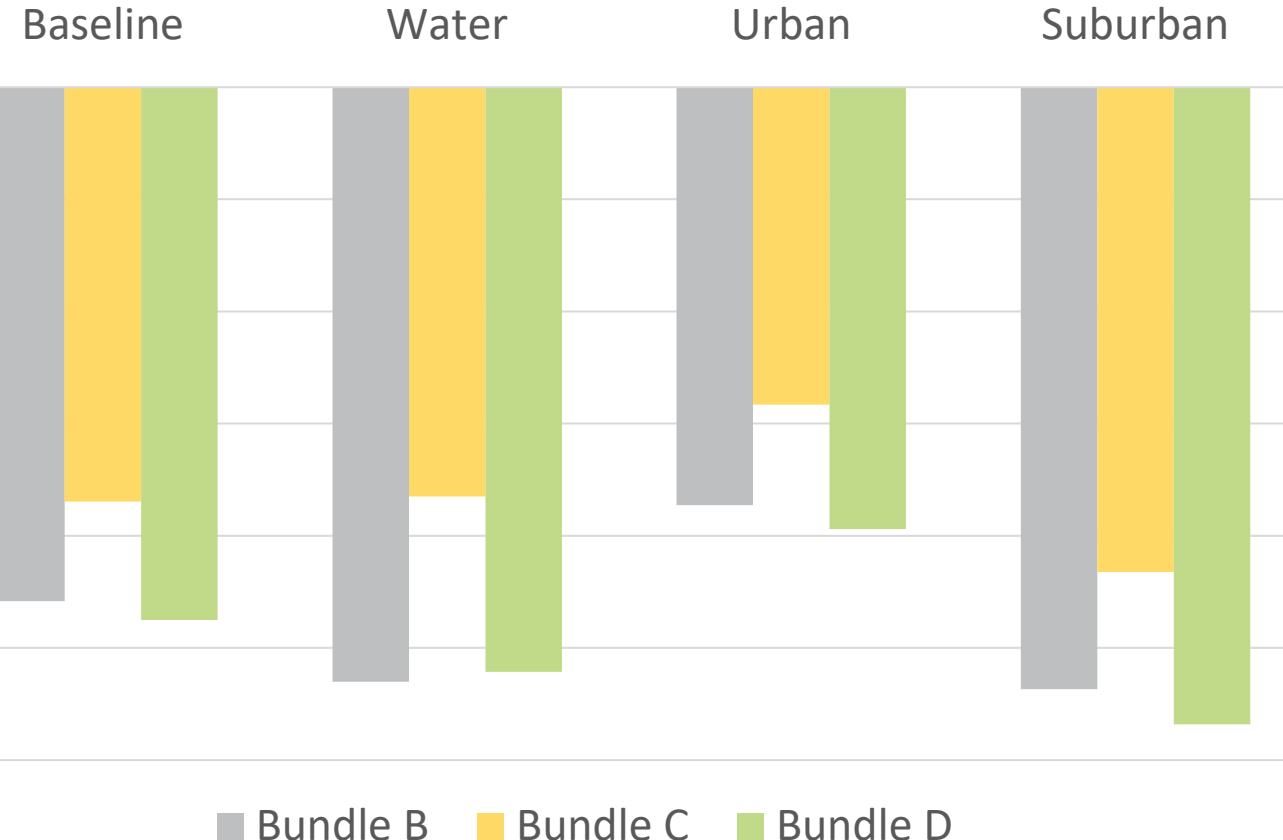
Change in Daily Hours of delay from No Build: HRBT



- HRBT sees more delay with greater growth scenarios, generally following pattern of regional bundle results.

Regional Crossings: 2045 Congestion on MMMBT

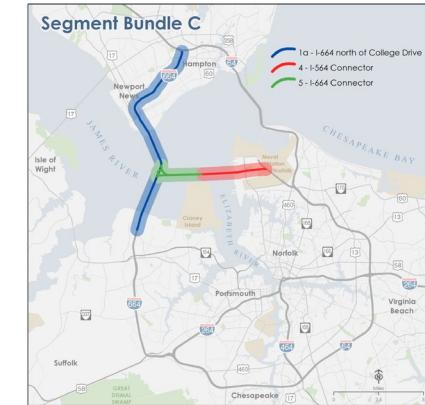
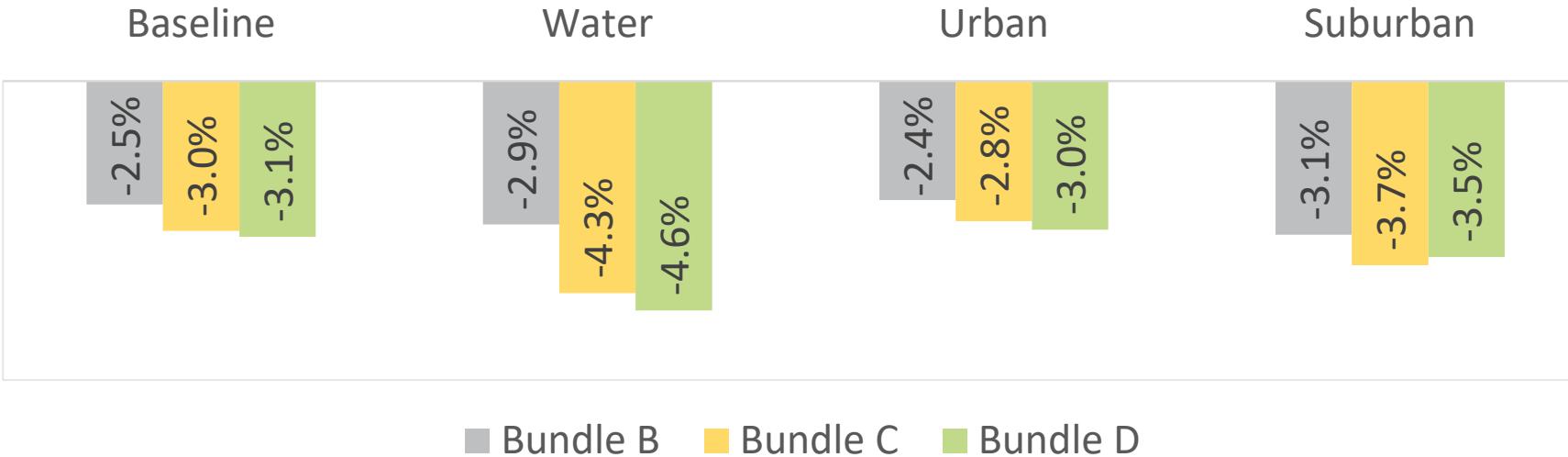
Change in Daily Hours of delay from No Build: MMMBT



- MMMBT delay dramatically improved with all bundles in all scenarios although delay is higher with **Bundle C**

Improvement in Regional Average Trip Times

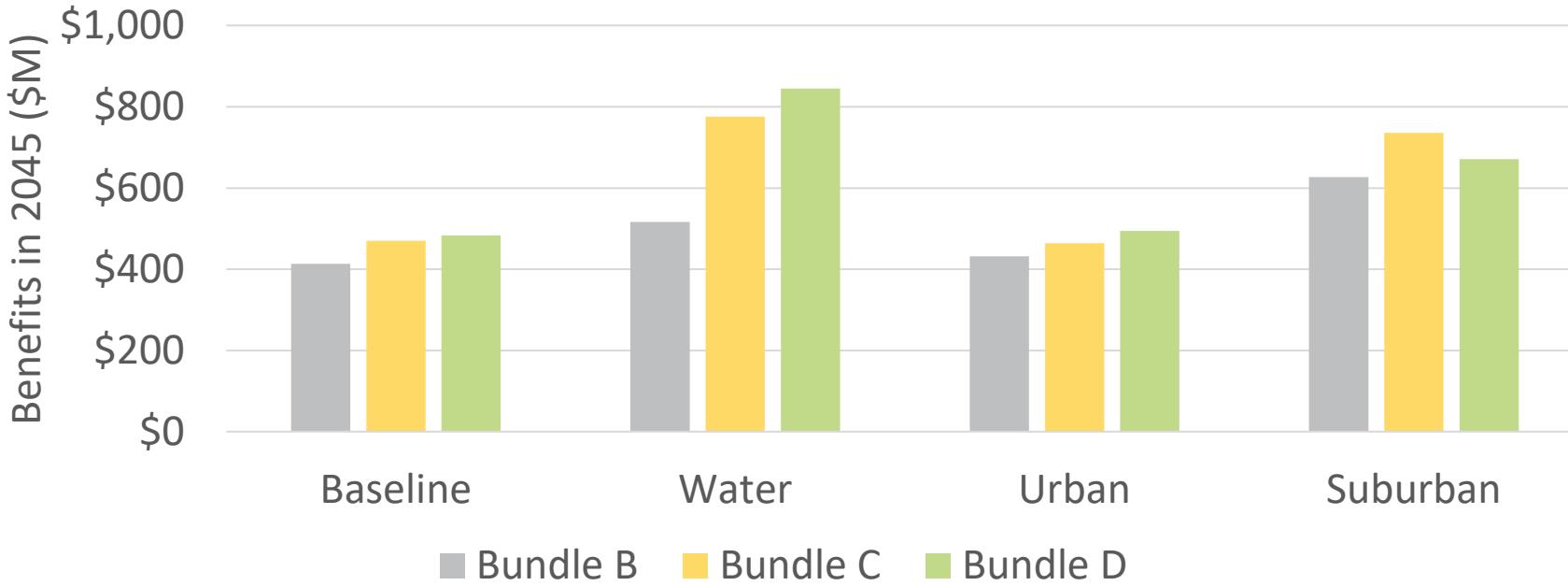
Percent Change in 2045 Average Trip Time, from No Build



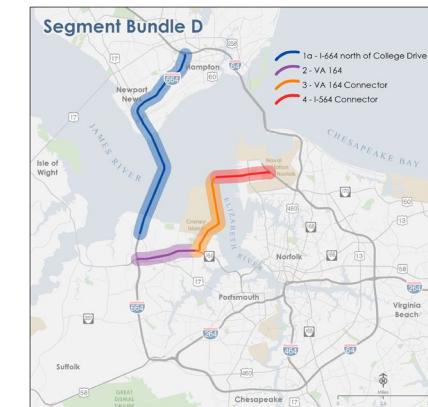
- Minimal change in average trip length across all bundles and scenarios
- **Bundle D** provides the greatest reduction in average trip time and congestion across all scenarios, except in the suburban scenario where **Bundle C** performs a little bit better

Societal Benefits in 2045

(Annual, \$M, benefits of each bundle are relative to 2045 No Build)

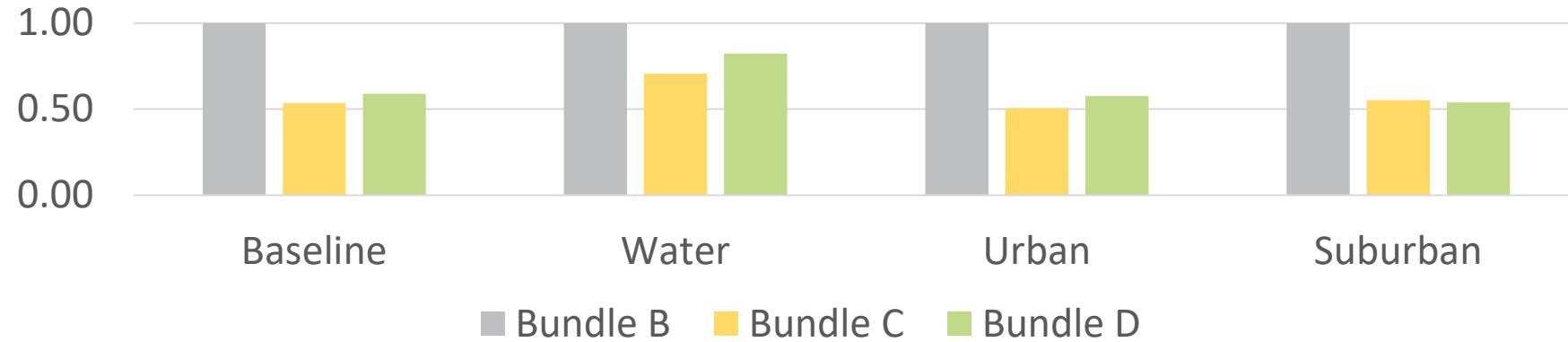


- **Bundle D** has the greatest total economic value among the bundles across all scenarios except the suburban scenario where **Bundle C** is the best performing.
- Greater growth along the water or in suburban areas tends to enhance the benefits of a regional connector (regardless of which bundle is selected)



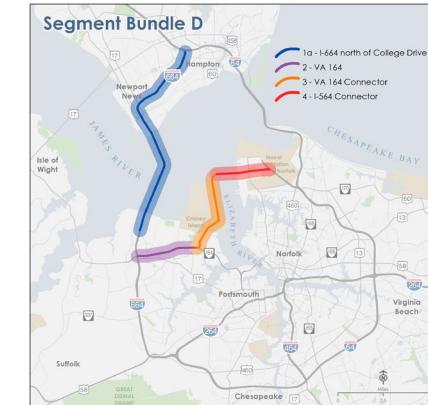
Societal Benefit Relative to Cost (Bundles)

2045 Societal Benefit Per Cost Index



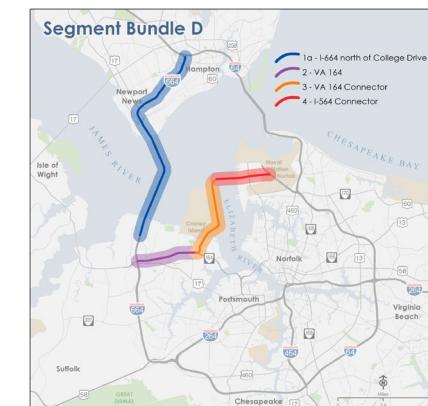
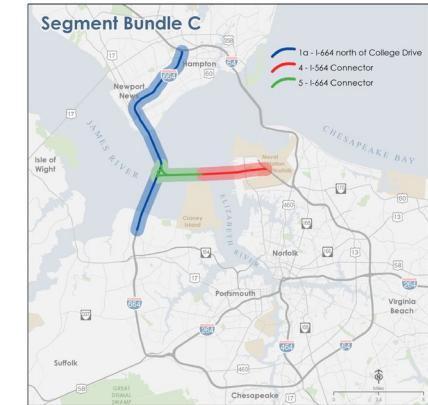
Note: Results are indexed so that the most cost-effective bundle is assigned a score of 1, and the other bundles are assigned fractions based on their relative cost effectiveness.

- **Bundle B** is always the most cost effective across all scenarios.
- **Bundle C** and **Bundle D** are closest to **Bundle B** in relative cost-effectiveness in the Greater Growth on the Water Scenario.



Congestion & Economic Results - Takeaways

- Comparing benefits and costs, Bundle B (Tier I segments) has the strongest results in any growth scenario
- There is more congestion overall with greater growth scenarios
- With greater congestion, scenarios show additional benefits from the segments including Tier 2 segments
 - Bundle C and D may merit future consideration despite their high cost, depending on how the future evolves, particularly under the Greater Growth on the Water assumptions



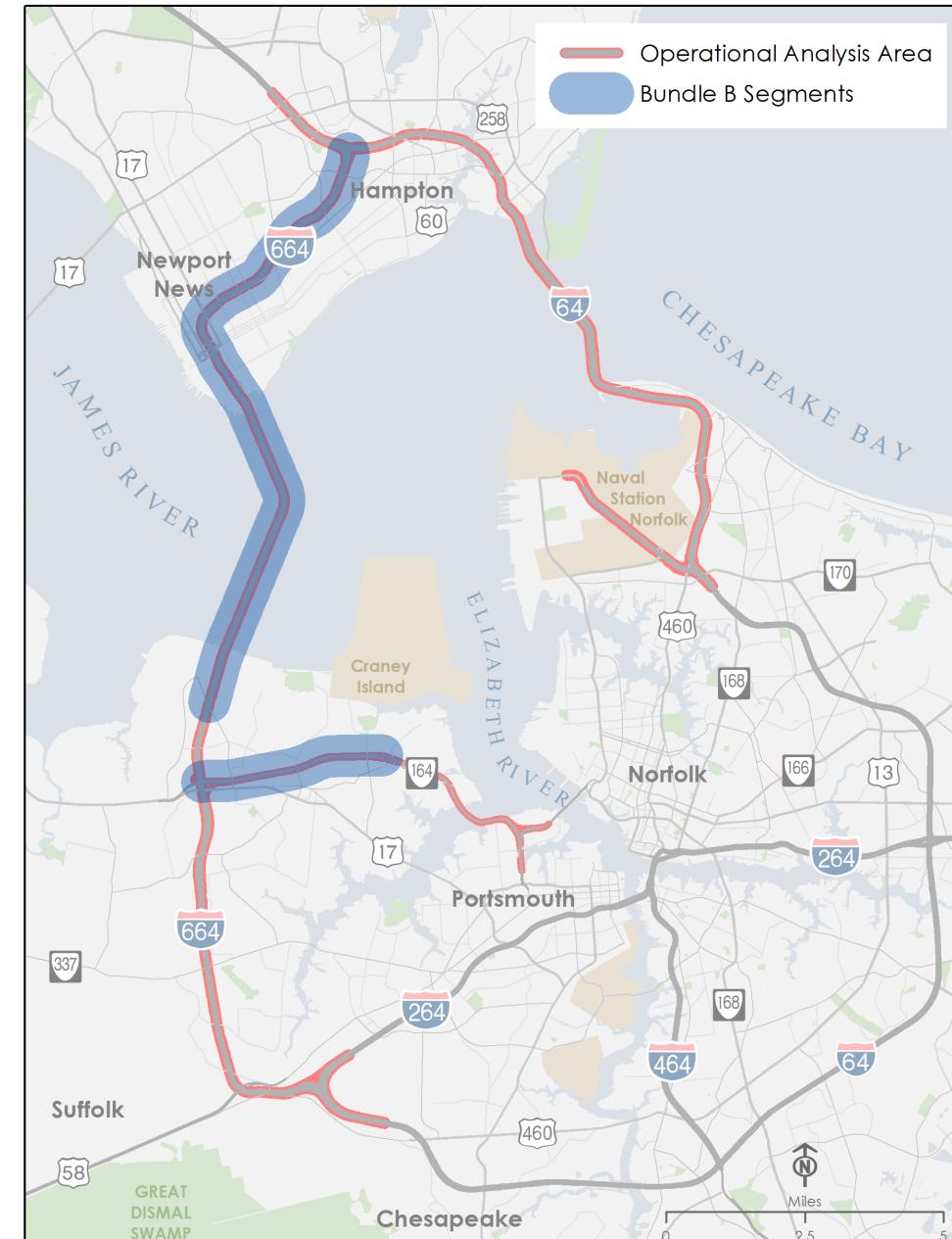
REGIONAL CONNECTORS STUDY

RESULTS OF OPERATIONS ANALYSIS

Overview

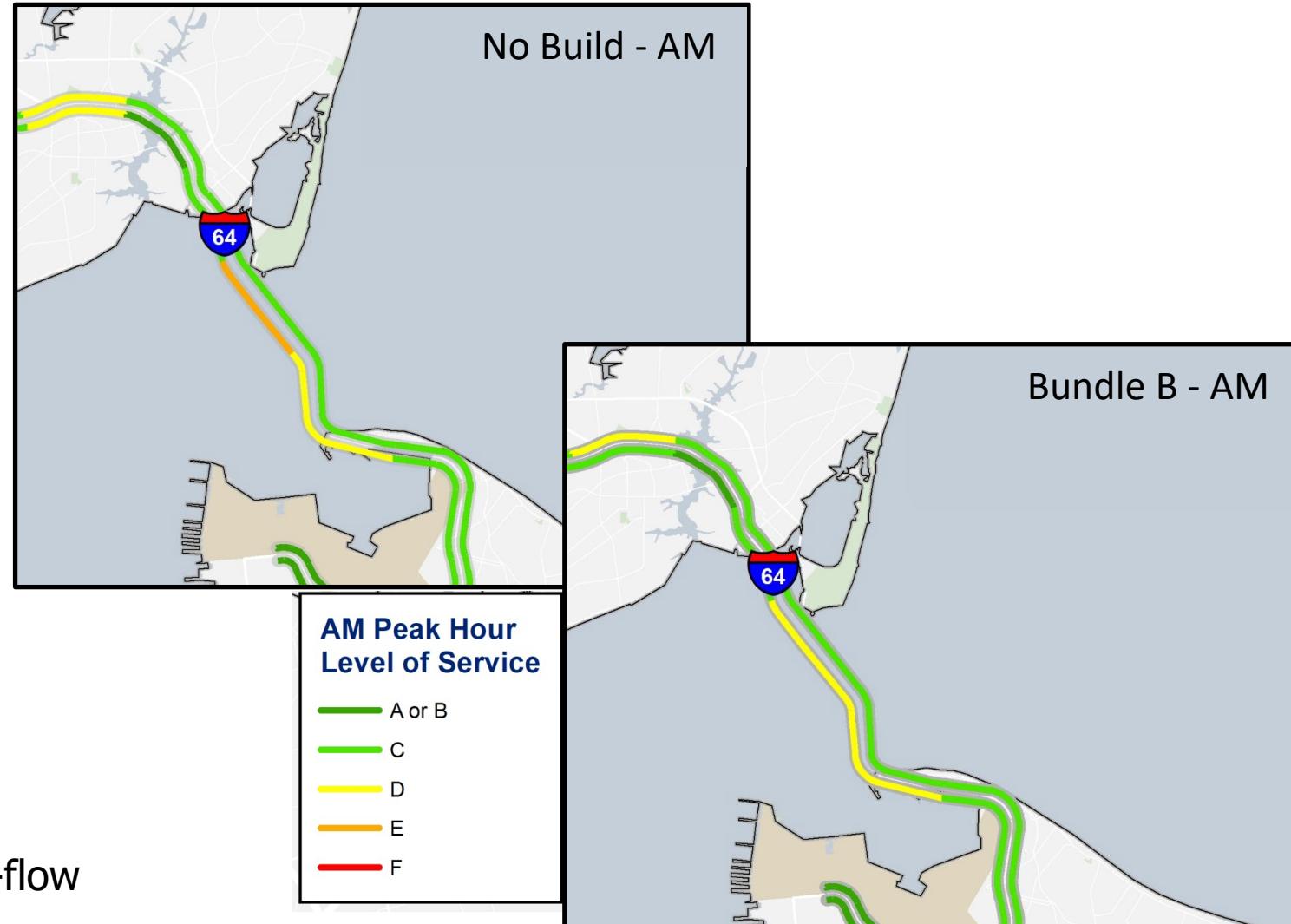
Conducted **traffic operational analyses** for study roadways and ramp junctions

- I-64
- I-664
- I-564
- VA 164



Results Summary – 2045 AM – HRBT Operations

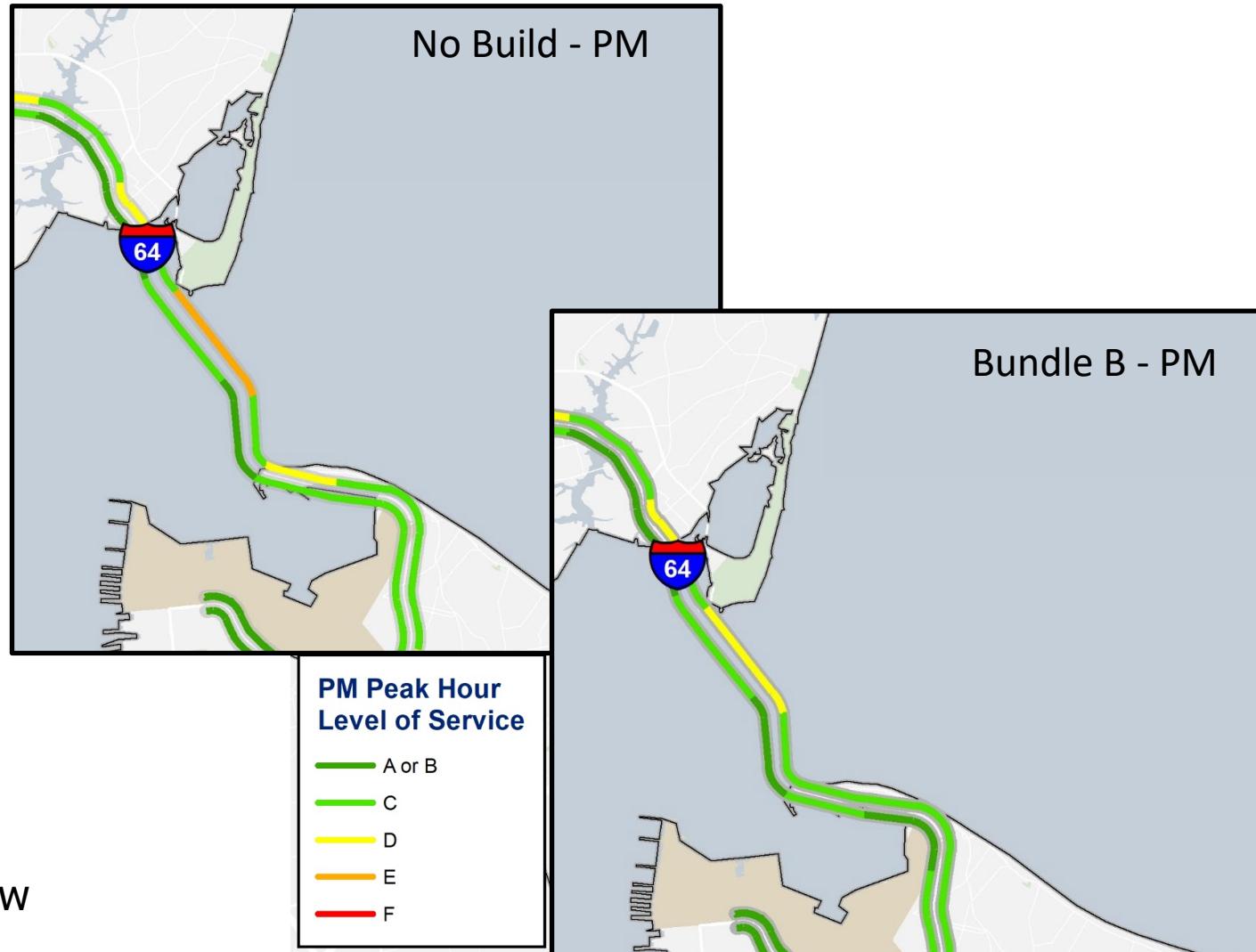
- Eastbound improves from Level of Service (LOS) E to LOS D



*Maps show general purpose network
Managed Lanes always operate at or near free-flow
Analyses reflect 2045 baseline land use

Results Summary – 2045 PM – HRBT Operations

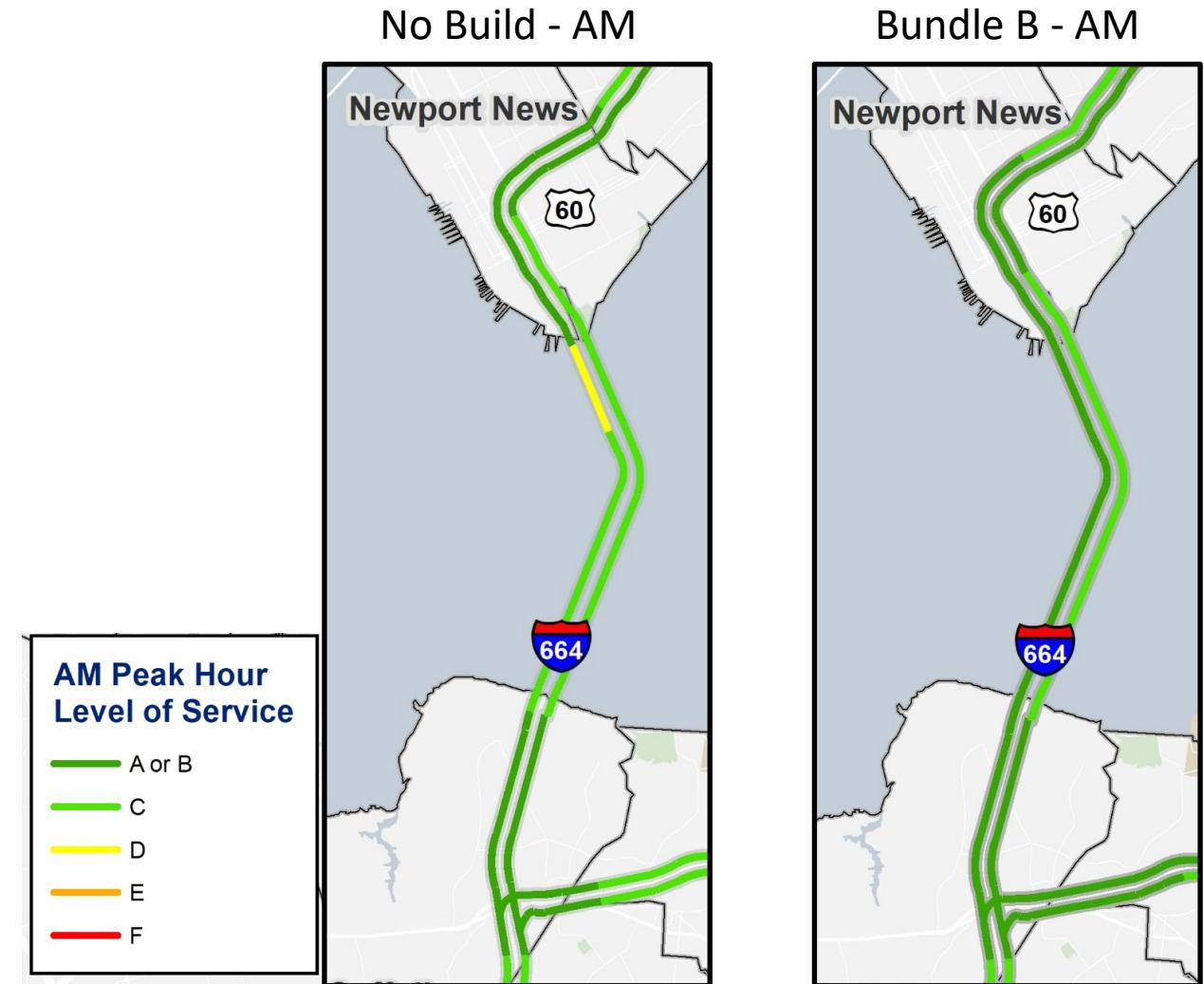
- Westbound improves from LOS E to LOS D



*Maps show general purpose network
Managed Lanes always operate at or near free-flow
Analyses reflect 2045 baseline land use

Results Summary – 2045 AM – MMMBT Operations

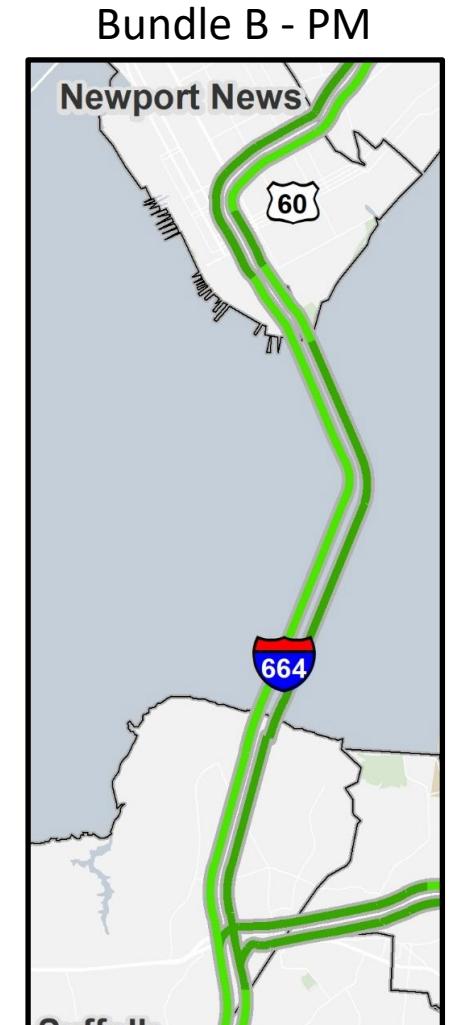
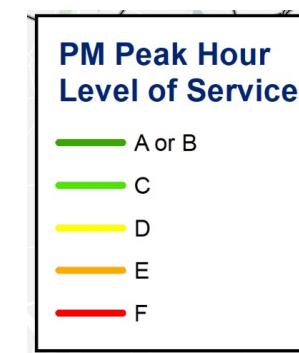
- Southbound improves from LOS D to LOS C



*Maps show general purpose network
Managed Lanes always operate at or near free-flow
Analyses reflect 2045 baseline land use

Results Summary – 2045 PM – MMMBT Operations

- Northbound improves from LOS D to LOS C
- Southbound improves from LOS E to LOS C



*Maps show general purpose network
Managed Lanes always operate at or near free-flow
Analyses reflect 2045 baseline land use

Operations Analysis – Key Take-Aways

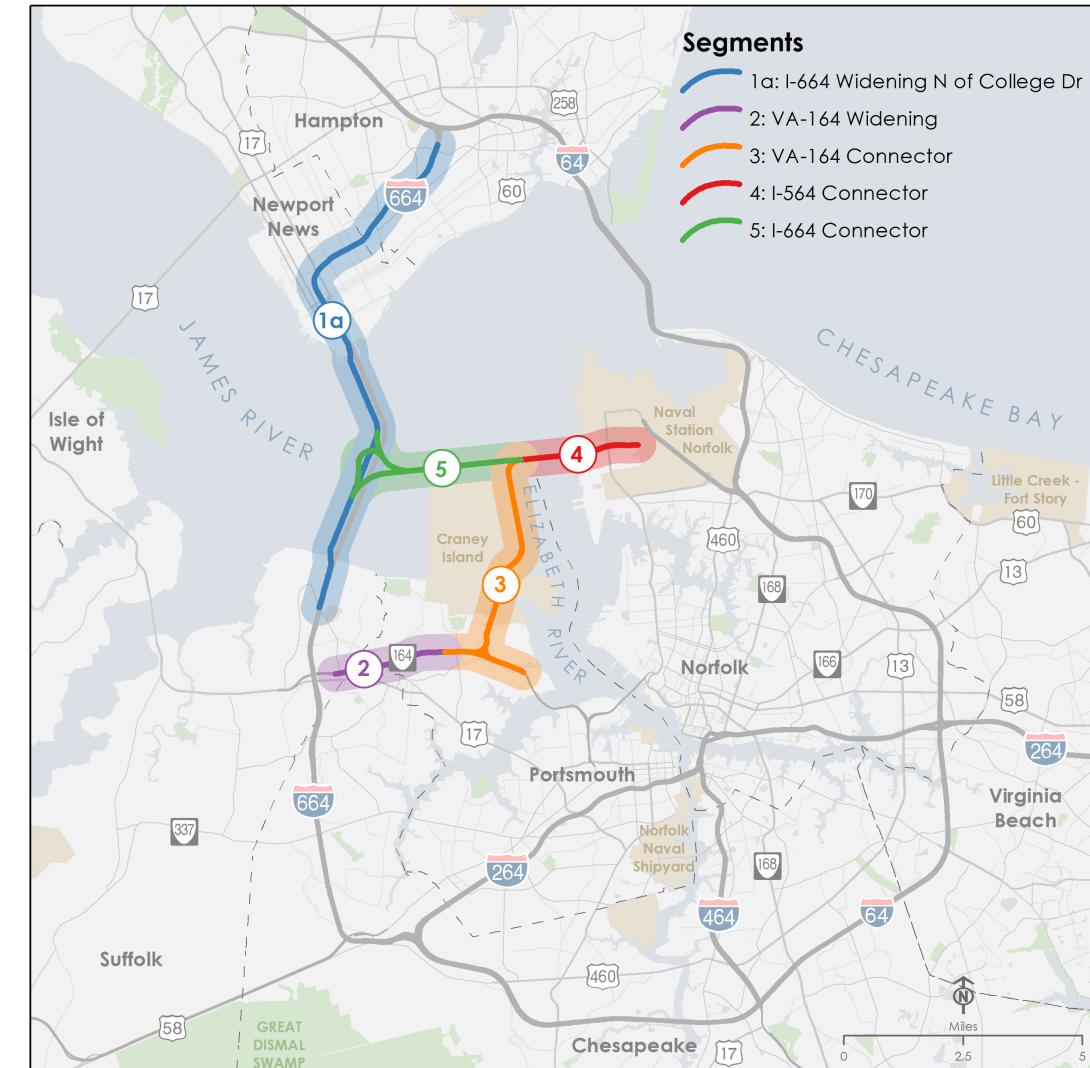
HRBT and MMMBT corridor volume comparison

- In their improved configuration, the two tunnel crossings were tested by the study team for their future operational performance
- For both facilities in 2045, as General Purpose lanes approach capacity, travelers will either decide to divert to the other tunnel crossing or utilize the available express lanes
- For all growth scenarios, both the HRBT and improved MMMBT facilities will have sufficient capacity to handle 2045 demand

Summary of Step 3 Analysis Findings

The findings support the Tier I and Tier II recommendations

- Tier I: Segments 1a and 2
 - Consistently most cost-effective segments and greatest increment of regional benefits supporting their nomination for the 2050 HRTPO Constrained Long Range Plan
- Tier II: Segments 3, 4 and 5
 - The analyses show that Greater Growth scenario assumptions increase the benefits of the Tier II segments, supporting their inclusion in the 2050 HRTPO Vision Plan



Recommended Actions

Agenda Item #5 - Approve the results of Scenario Planning, Congestion Benefits, and Economic Impacts of Bundles B, C, and D

Agenda Item #6 – Approve the results of the Traffic Operations Analysis

REGIONAL CONNECTORS STUDY

PUBLIC ENGAGEMENT UPDATE

Regional Symposium Summary

- Invited a wide range of groups representing underserved populations throughout the study area
- 18 participants attended from groups including NAACP, several universities, Civil rights and environmental justice specialists from state agencies, and agencies serving seniors, people with disabilities, unhoused, low income, and minorities.
- Worked in small groups throughout the workshop to address questions about the segments' potential benefits, potential impacts (burdens), and strategies to improve the outcomes from implementing the segment projects.
- Materials are posted on the website for additional circulation and input

Regional Symposium Summary

Benefits

- Access to jobs
- Bus reliability (esp. with express lanes)
- Shorter travel routes
- Lower travel times
- Access to tourism, services & education



Burdens



- Construction impacts
- Adjacent property impacts
- Environmental impacts
- Visual impacts
- Tolls/costs

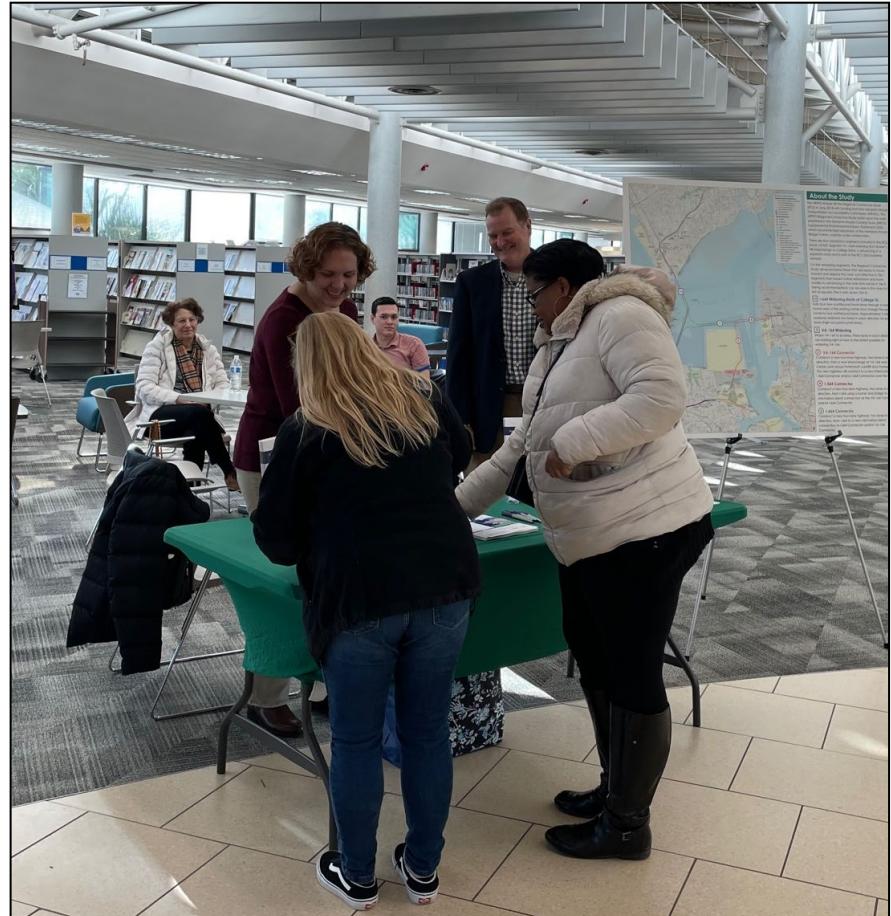
Balancing



- Communication re: construction
- Bike/ped safety at ramps & crossings
- Add recreation access/features
- Manage various construction impacts

Final Public Meetings

- Similar approach as winter meetings
 - 3-4 advance pop-ups
 - 3-4 open house meetings
- Open House meetings between July 31 and August 16
- Online Open House afterward



REGIONAL CONNECTORS STUDY

WRAPPING UP THE STUDY

Michael Baker
INTERNATIONAL

Next Steps ➔

