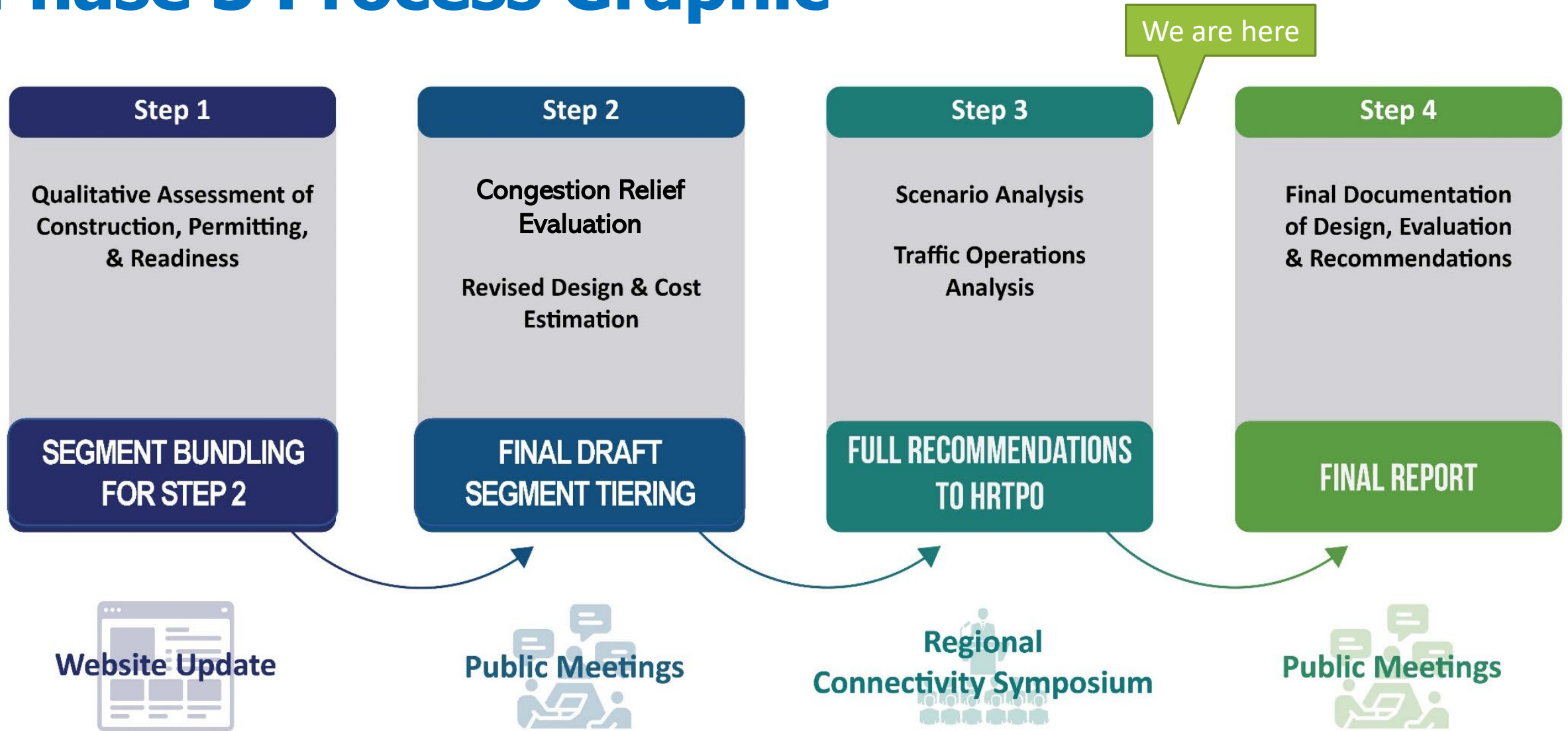


# REGIONAL CONNECTORS STUDY

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

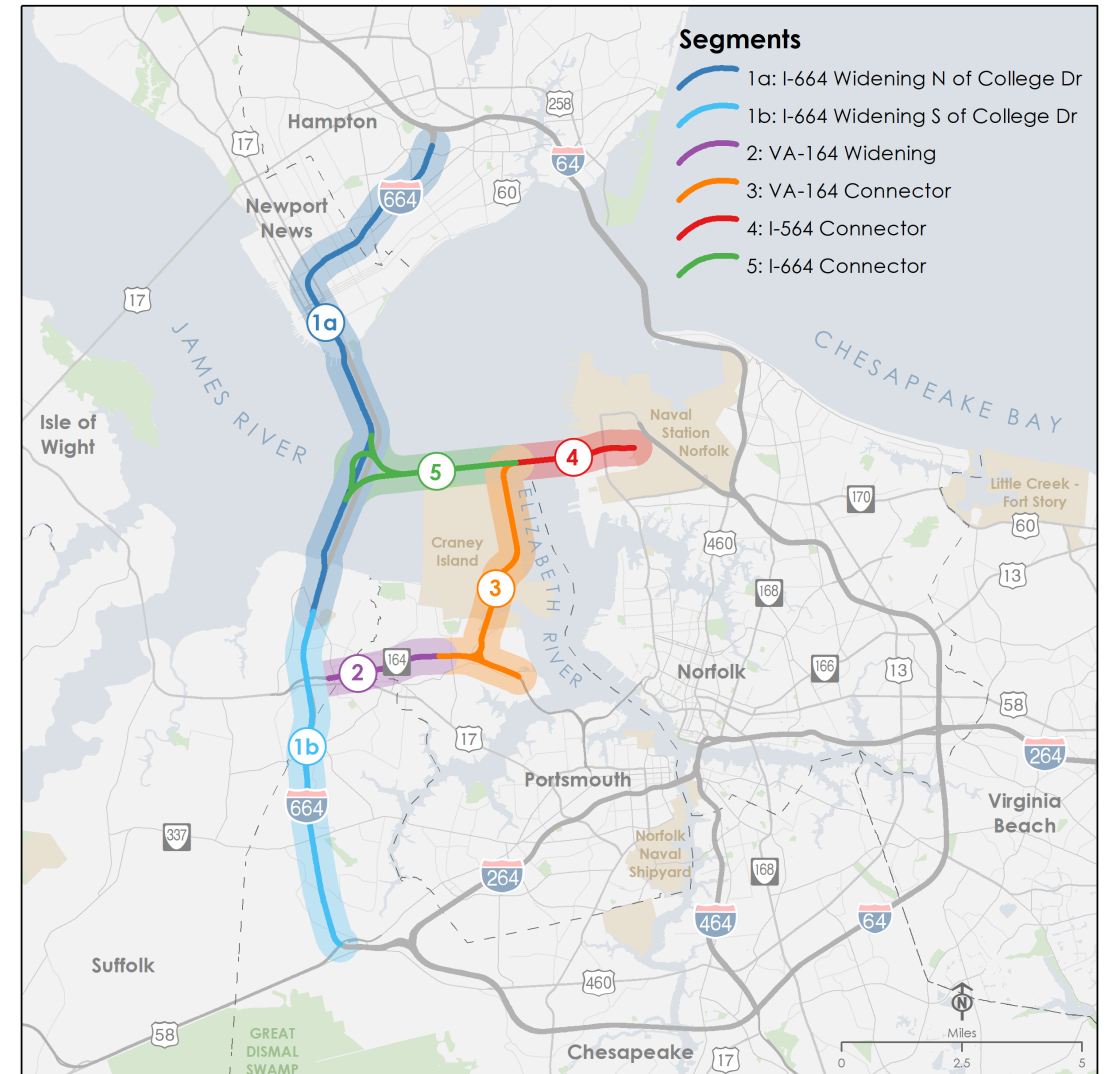
# Phase 3 Process Graphic



# 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

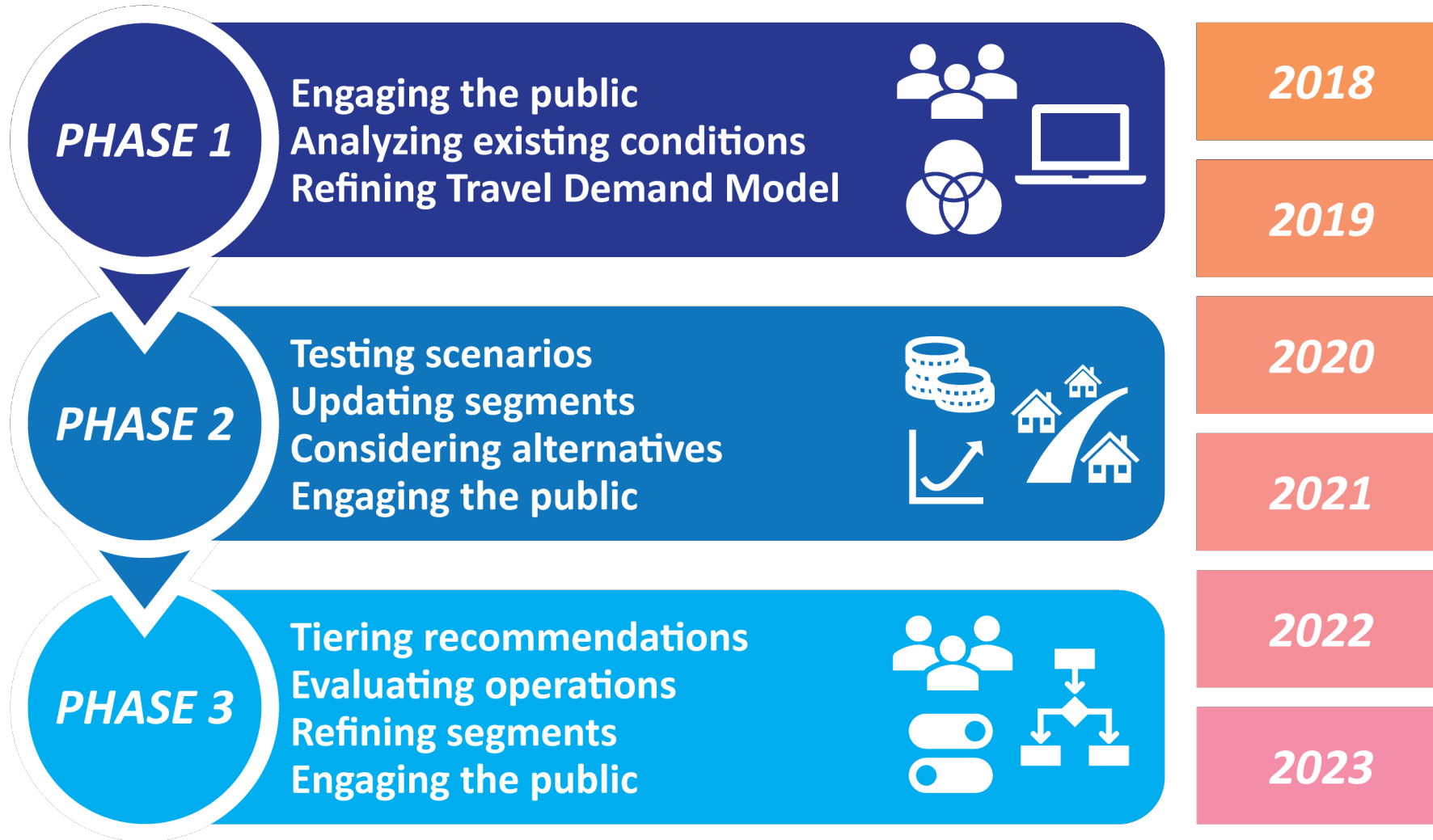


# REGIONAL CONNECTORS STUDY

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## STUDY RECAP

# Regional Connectors Study – 2018 to today



# Regional Connectors Study End Products

## Tiering Recommendations

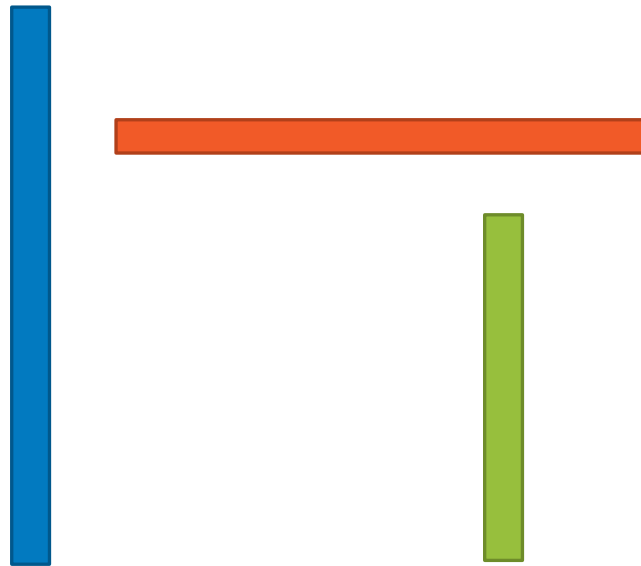
Hand-off to HRTPO:

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

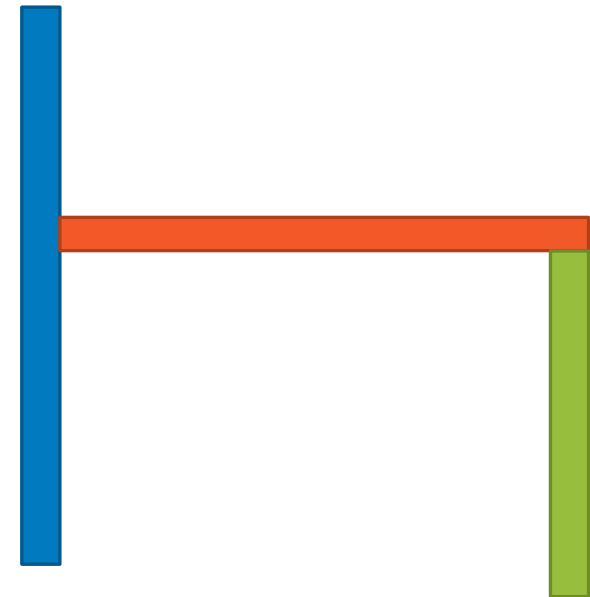
## Study Documentation

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

# Segments vs Bundles



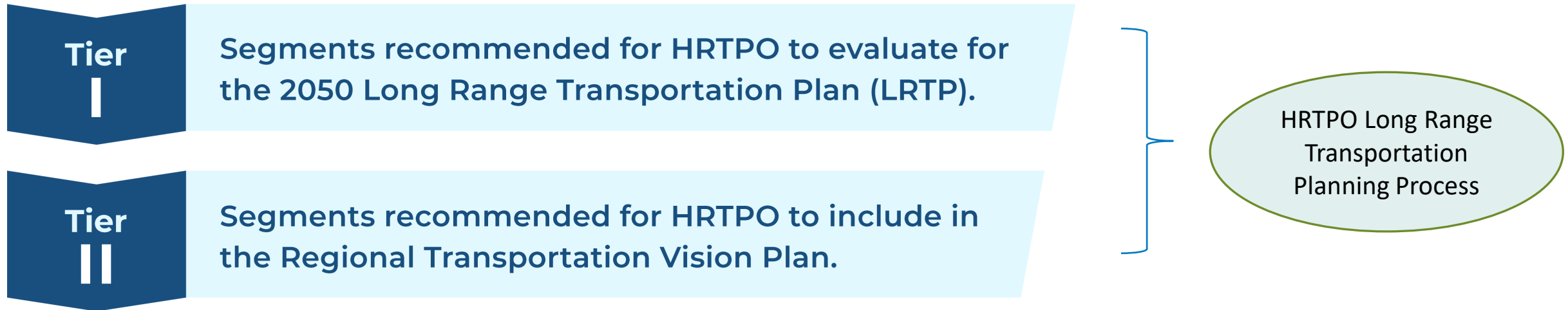
**SEGMENTS**



**BUNDLE**

# Tiering

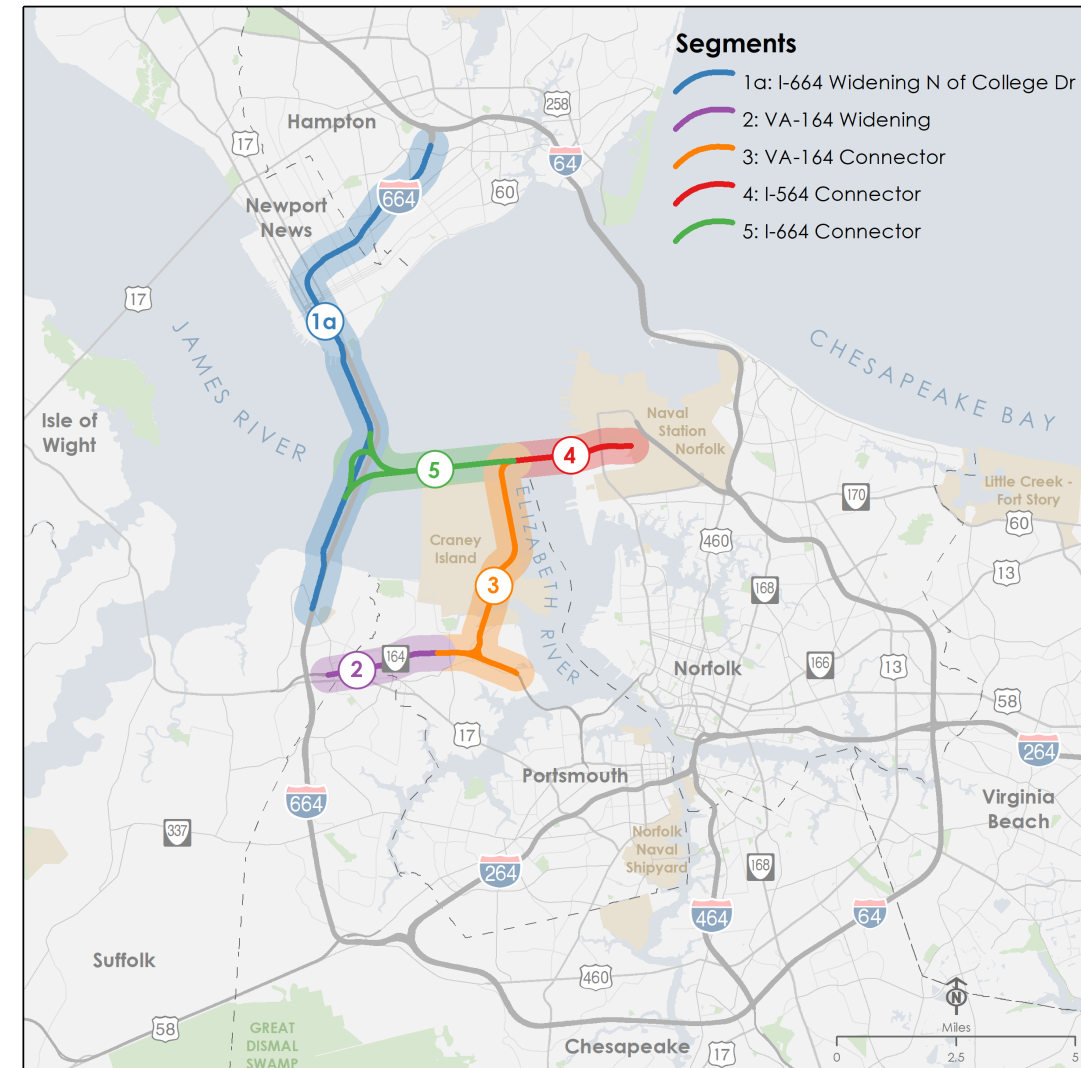
- The RCS will propose roadway segments that are ready to move forward and appear the most cost effective as Tier I recommendations.
- Segments that require further refinement and have hurdles to advancing are Tier II recommendations.



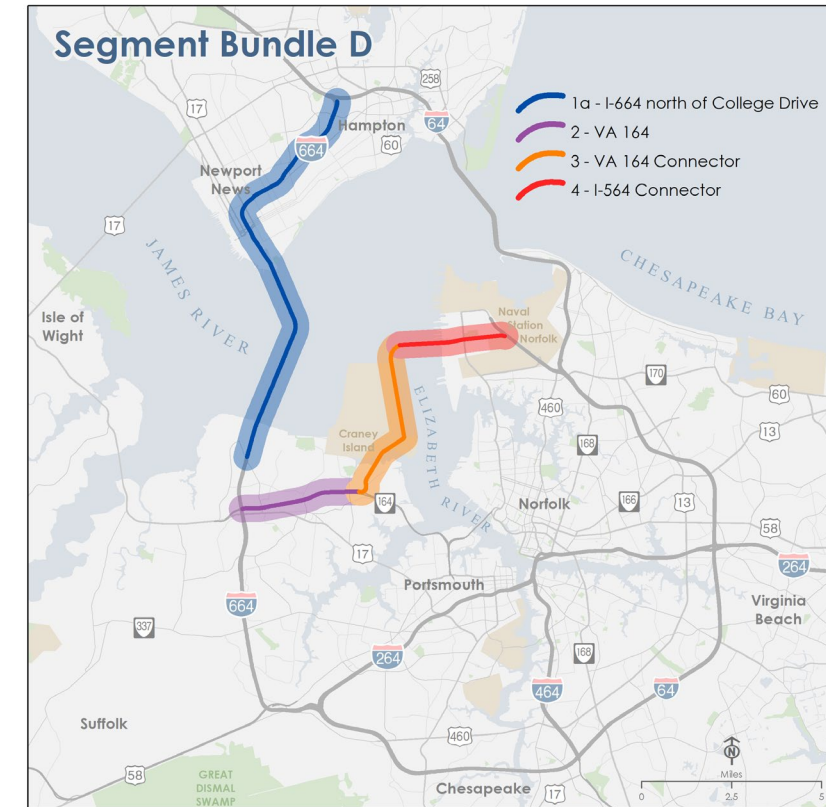
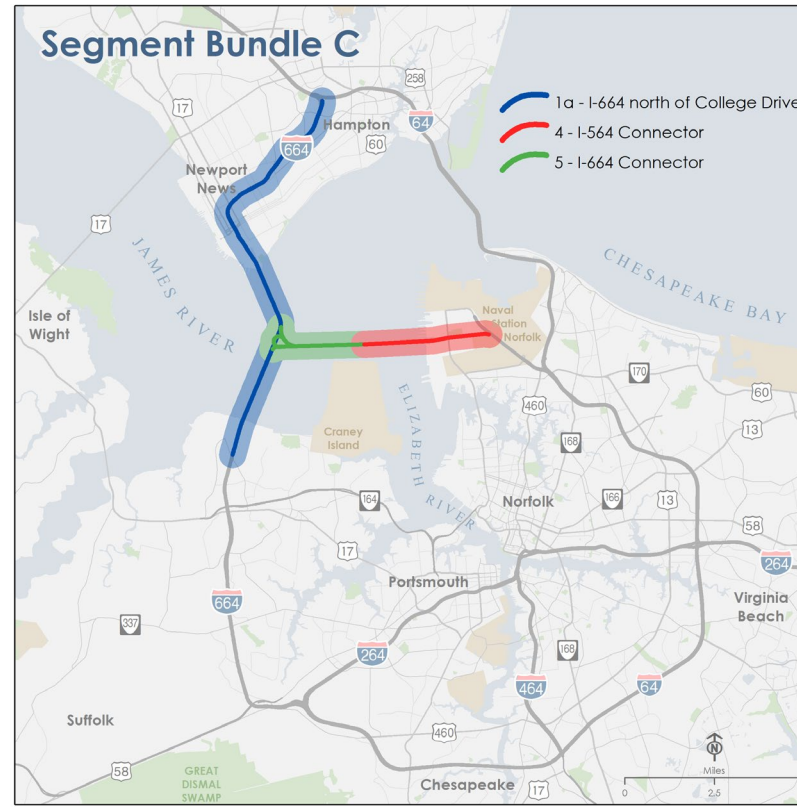


# November 17, 2022 Actions Shaping Step 3 Analysis:

- 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

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## 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

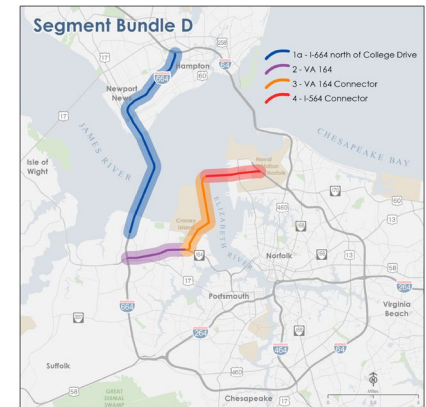
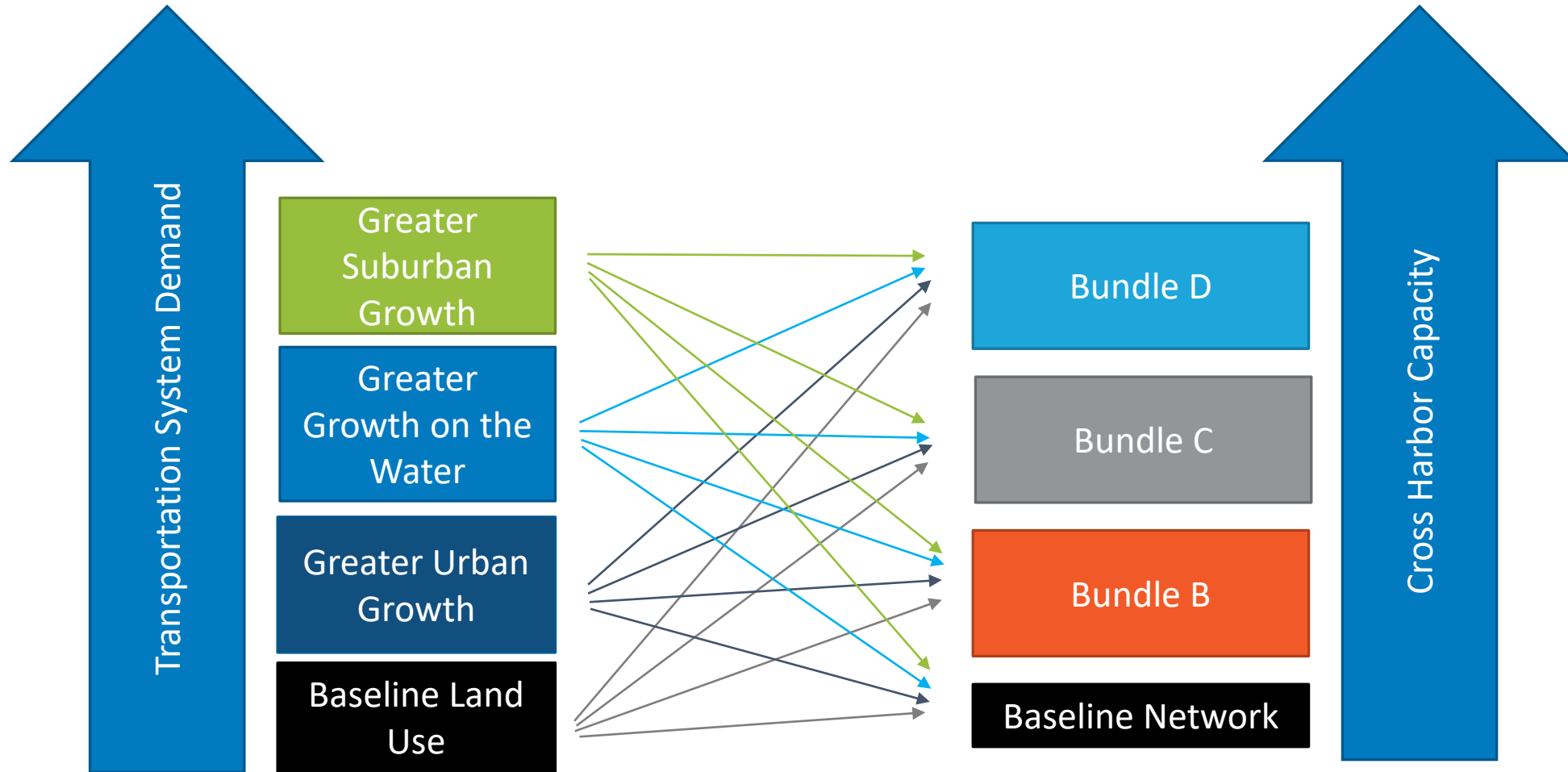
Test more urban & multimodal travel patterns

Suburban

Test more overall regional travel

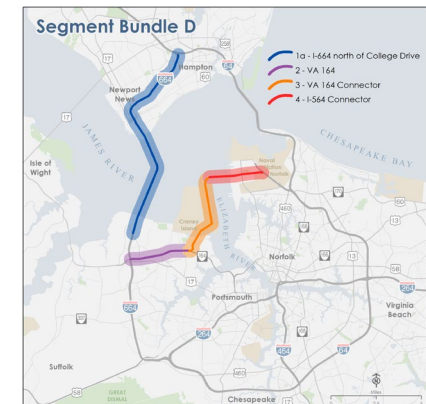
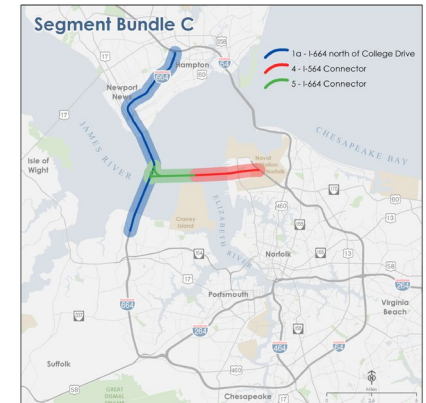


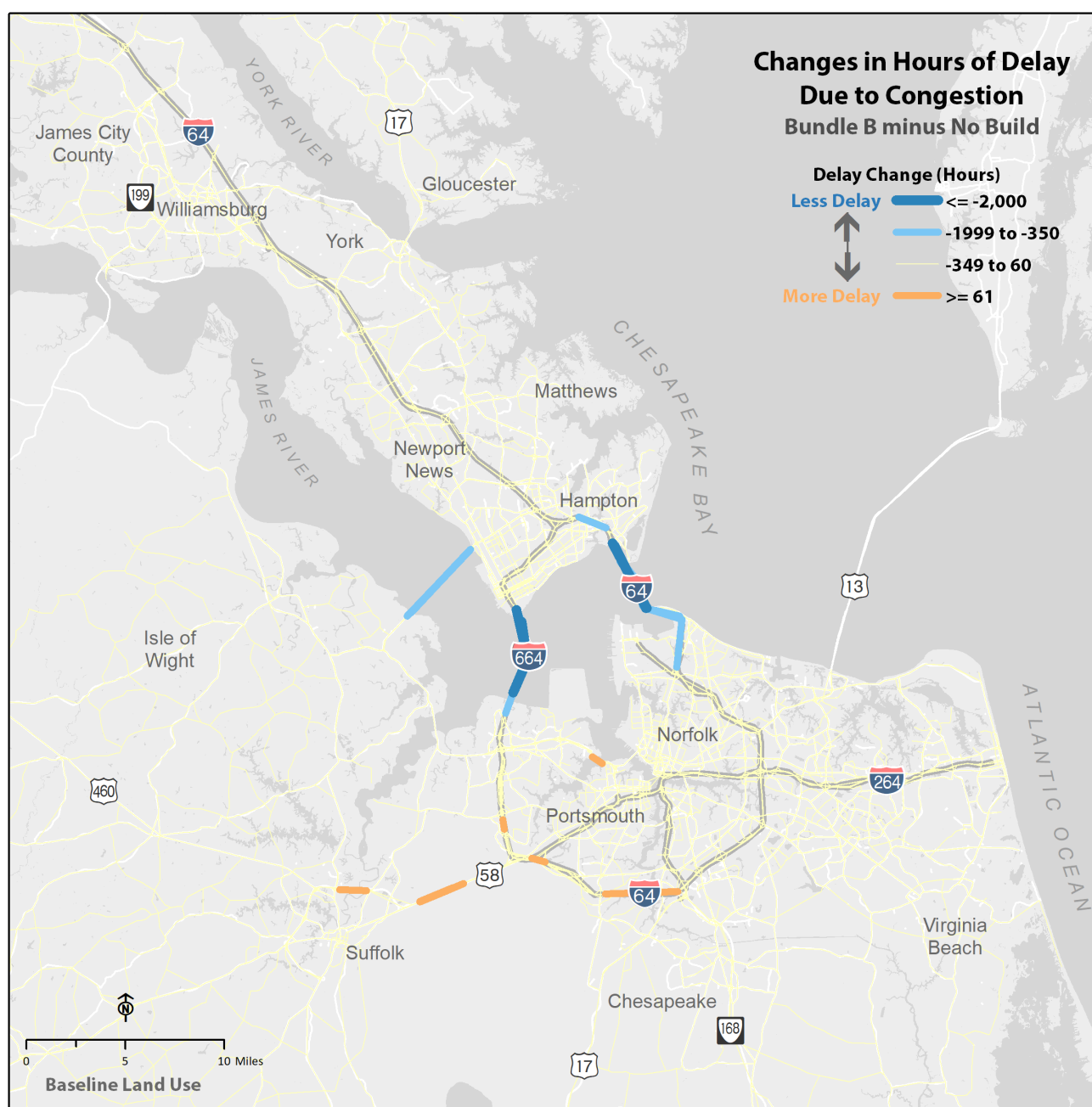
# Scenario Planning – “Stress Test”



# 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



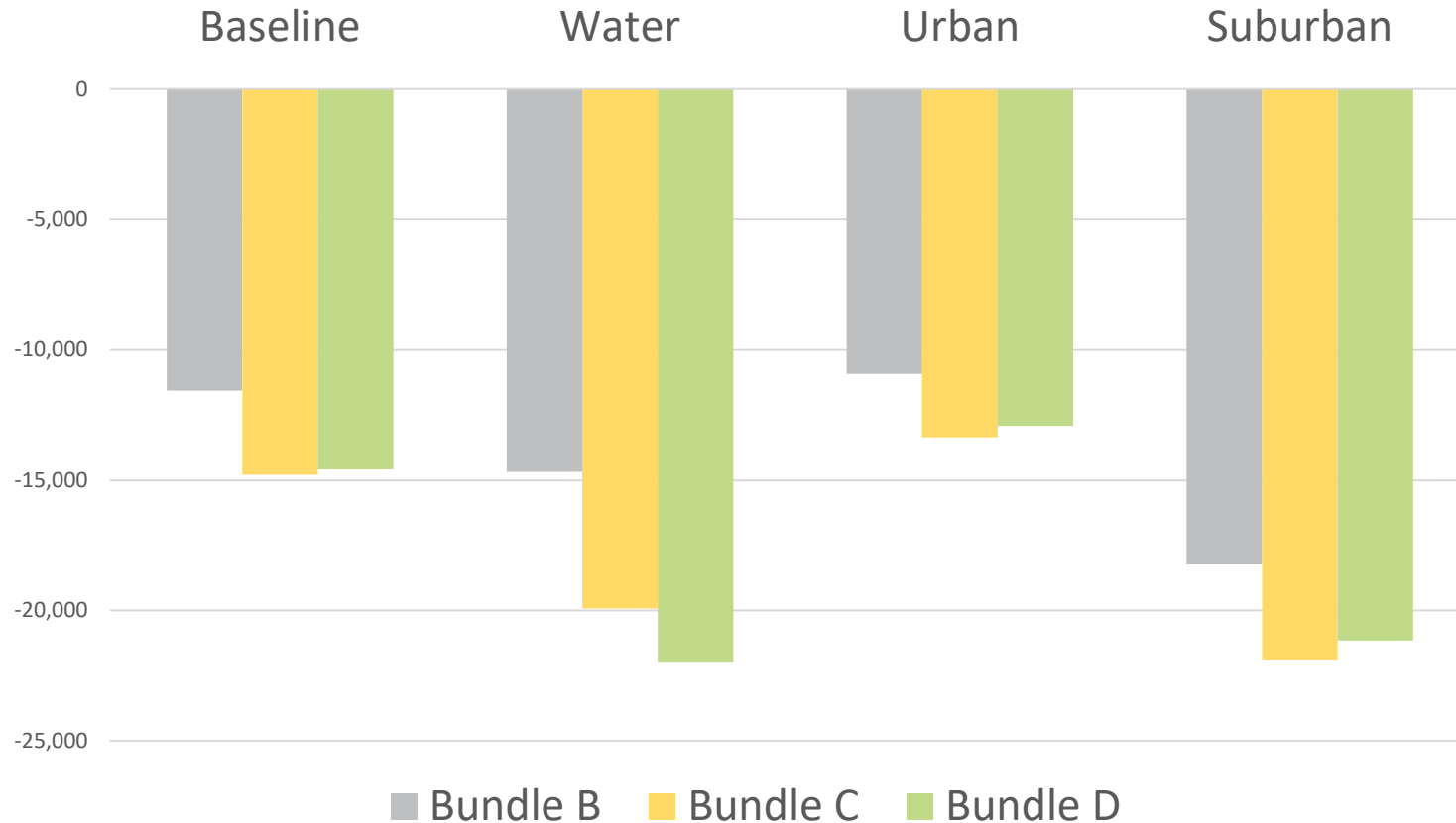


# Congestion Results for Bundle B

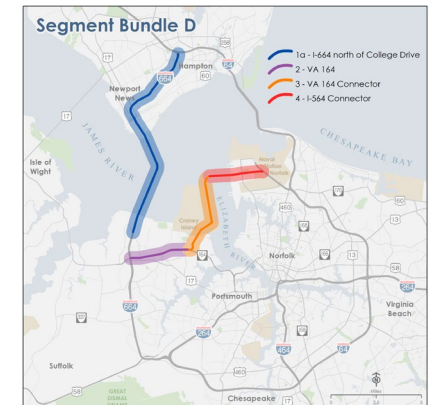
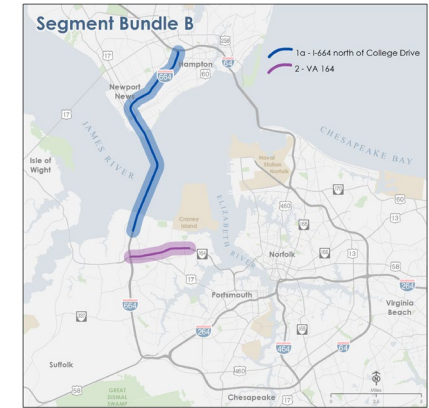


# Regional Crossings: 2045 Congestion on HRBT

Change in Daily Hours of delay from No Build: HRBT



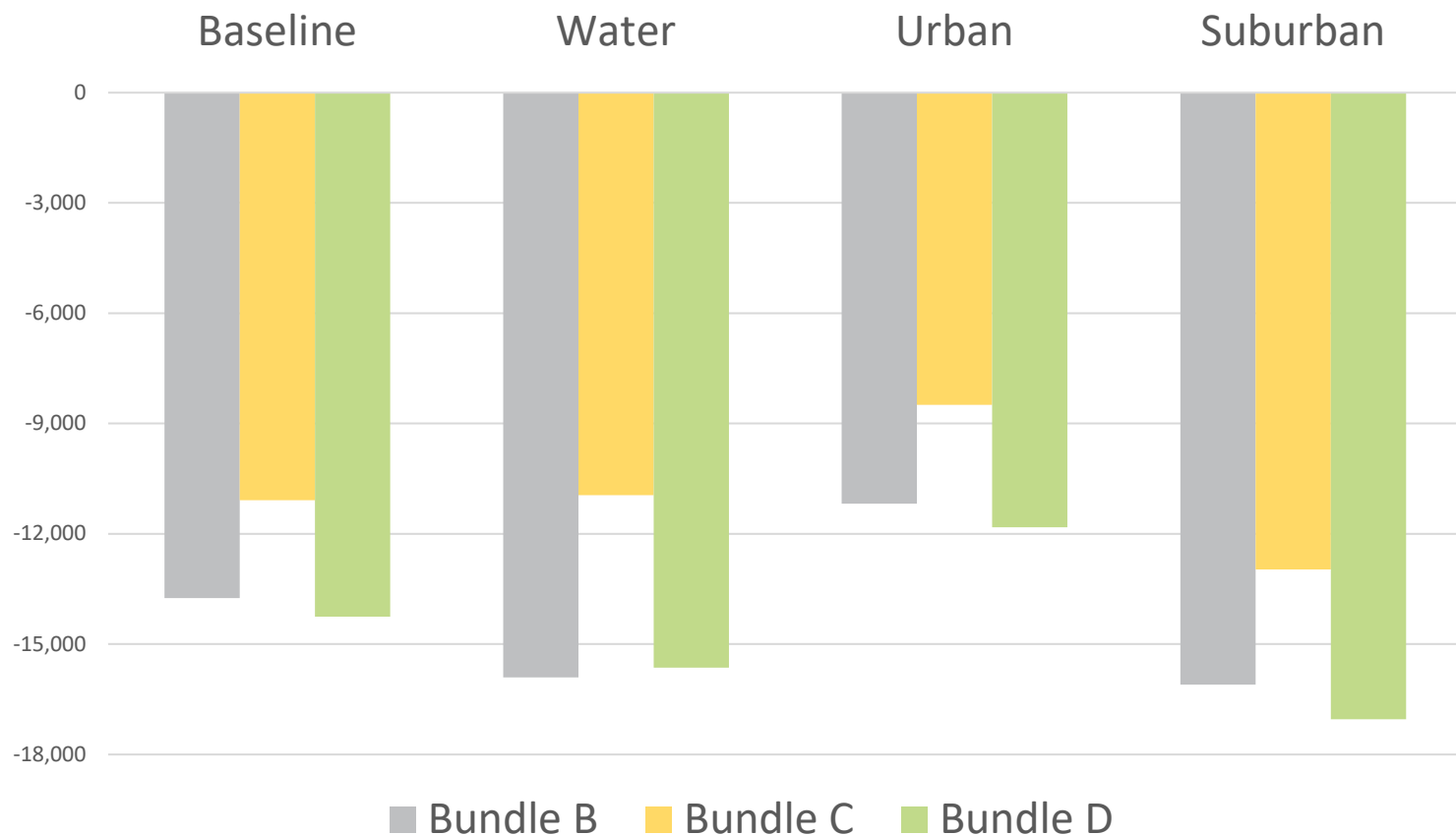
- HRBT sees more delay with greater growth scenarios, generally following pattern of regional bundle results.



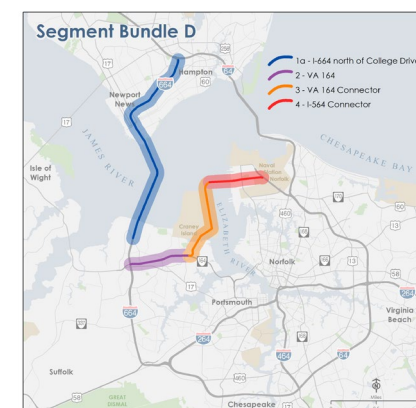
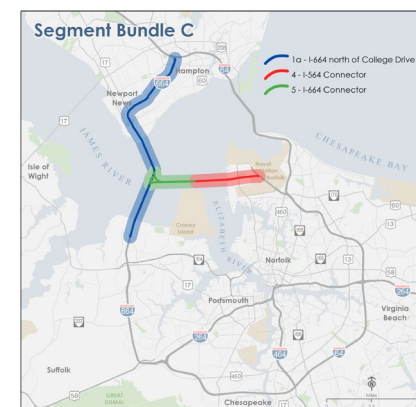


# Regional Crossings: 2045 Congestion on MMMBT

Change in Daily Hours of delay from No Build: MMMBT

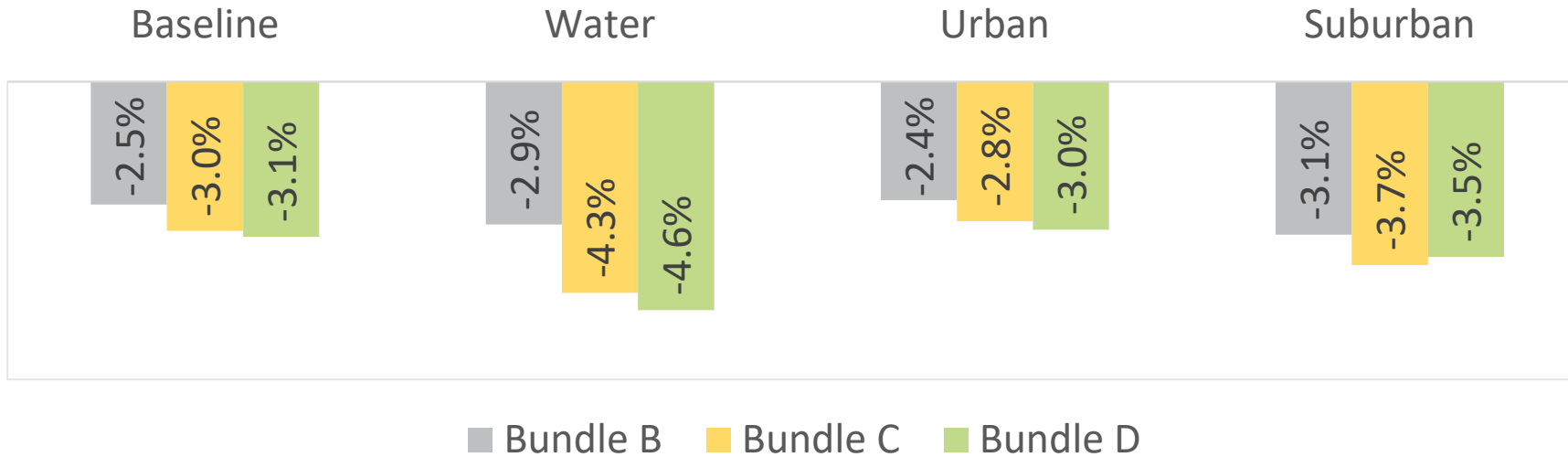


- MMMBT delay dramatically improved with all bundles in all scenarios although delay is higher with **Bundle C**

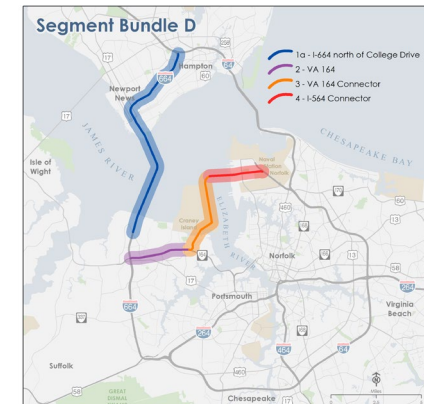
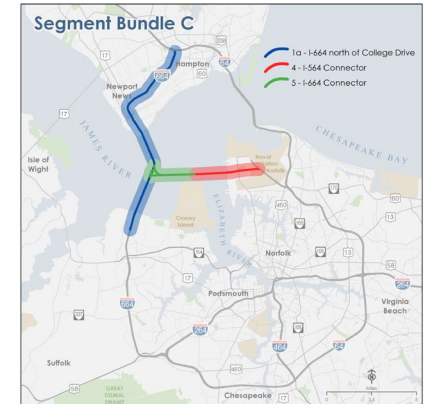


# Improvement in Regional Average Trip Times

Percent Change in 2045 Average Trip Time, from No Build

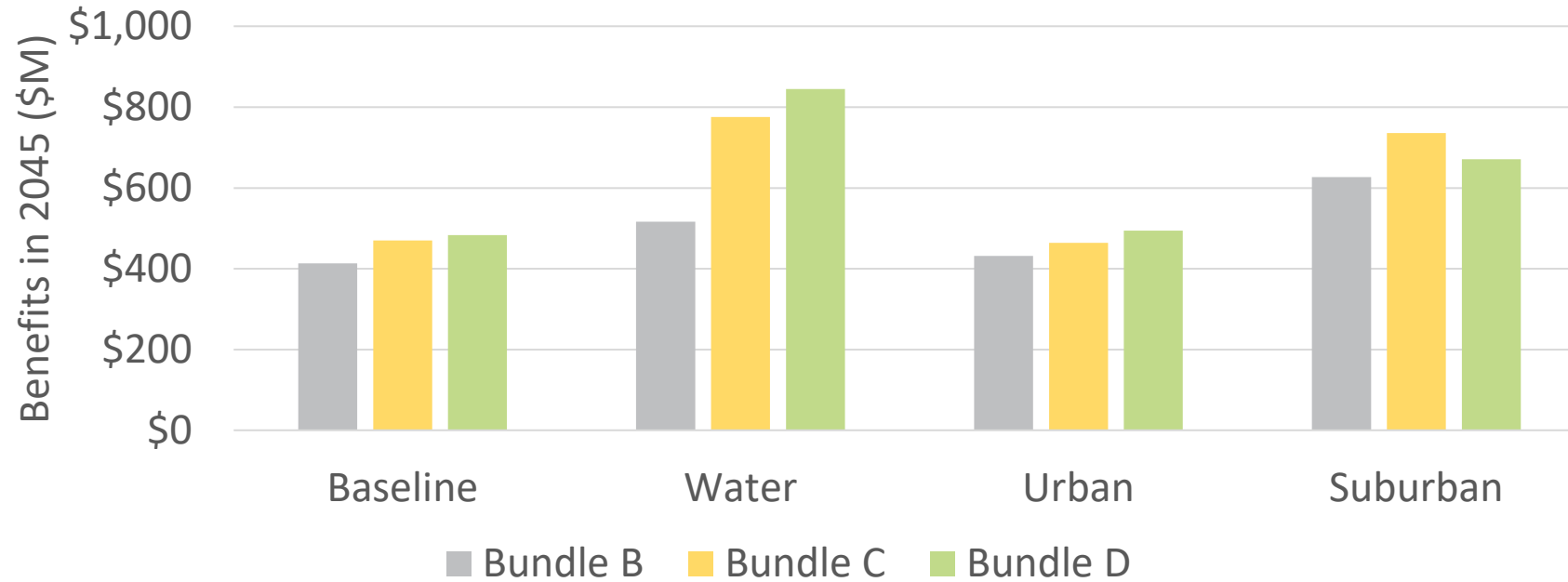


- Minimal change in average trip length across all bundles and scenarios
- **Bundle D** provides the greatest reduction in average trip time and congestion across all scenarios, except in the suburban scenario where **Bundle C** performs a little bit better

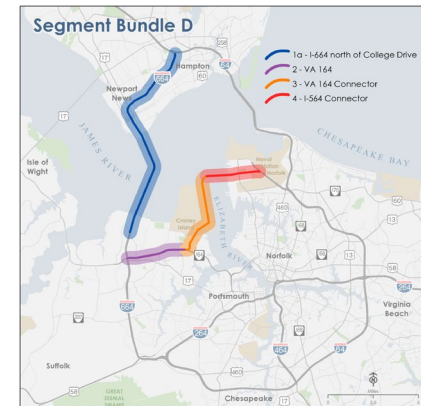
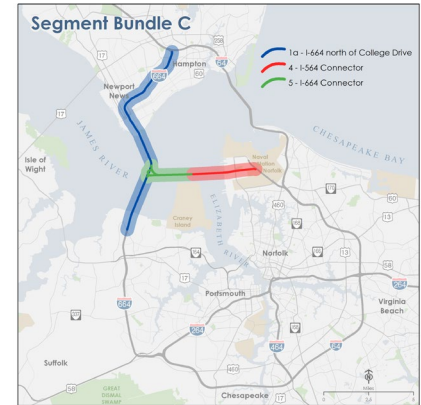
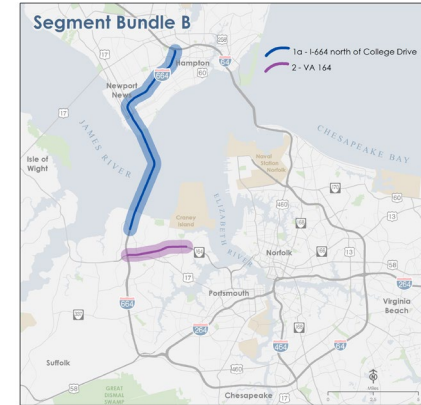


# Societal Benefits in 2045

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

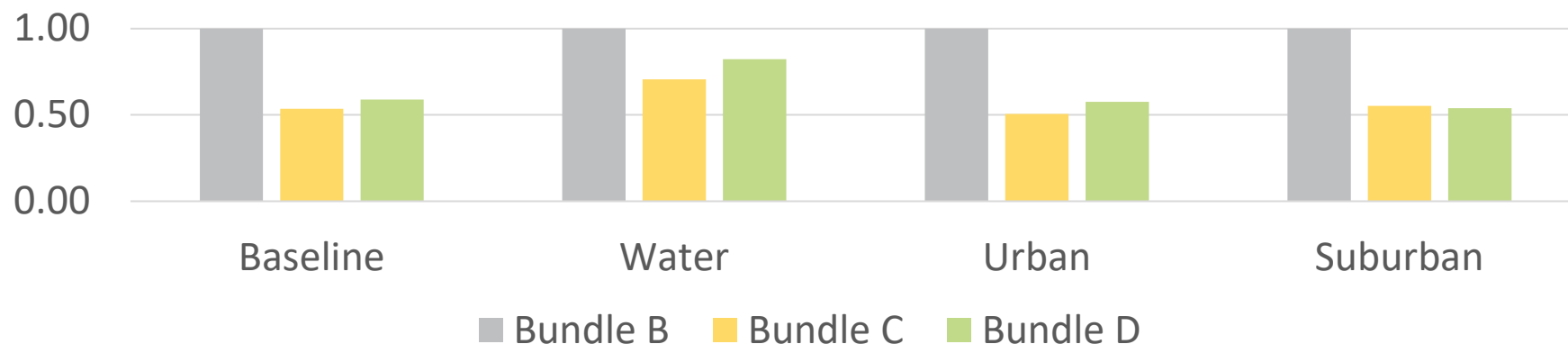


- **Bundle D** has the greatest total economic value among the bundles across all scenarios except the suburban scenario where **Bundle C** is the best performing.
- Greater growth along the water or in suburban areas tends to enhance the benefits of a regional connector (regardless of which bundle is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



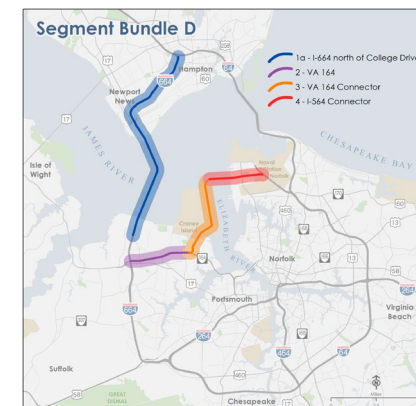
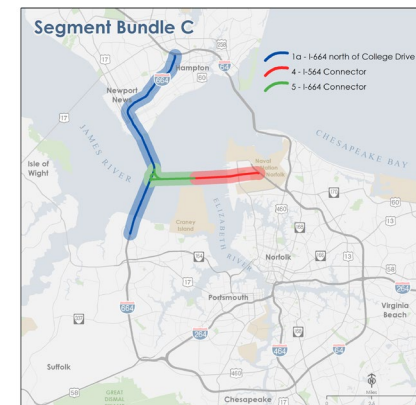
# Societal Benefit Relative to Cost (Bundles)

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.*

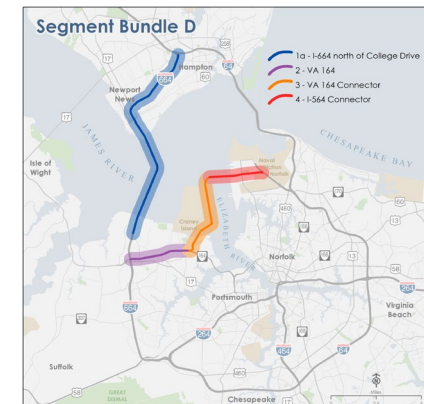
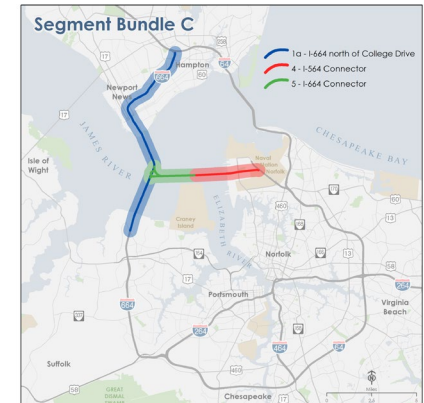
- **Bundle B** is always the most cost effective across all scenarios.
- **Bundle C** and **Bundle D** are closest to **Bundle B** in relative cost-effectiveness in the Greater Growth on the Water Scenario.





# 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

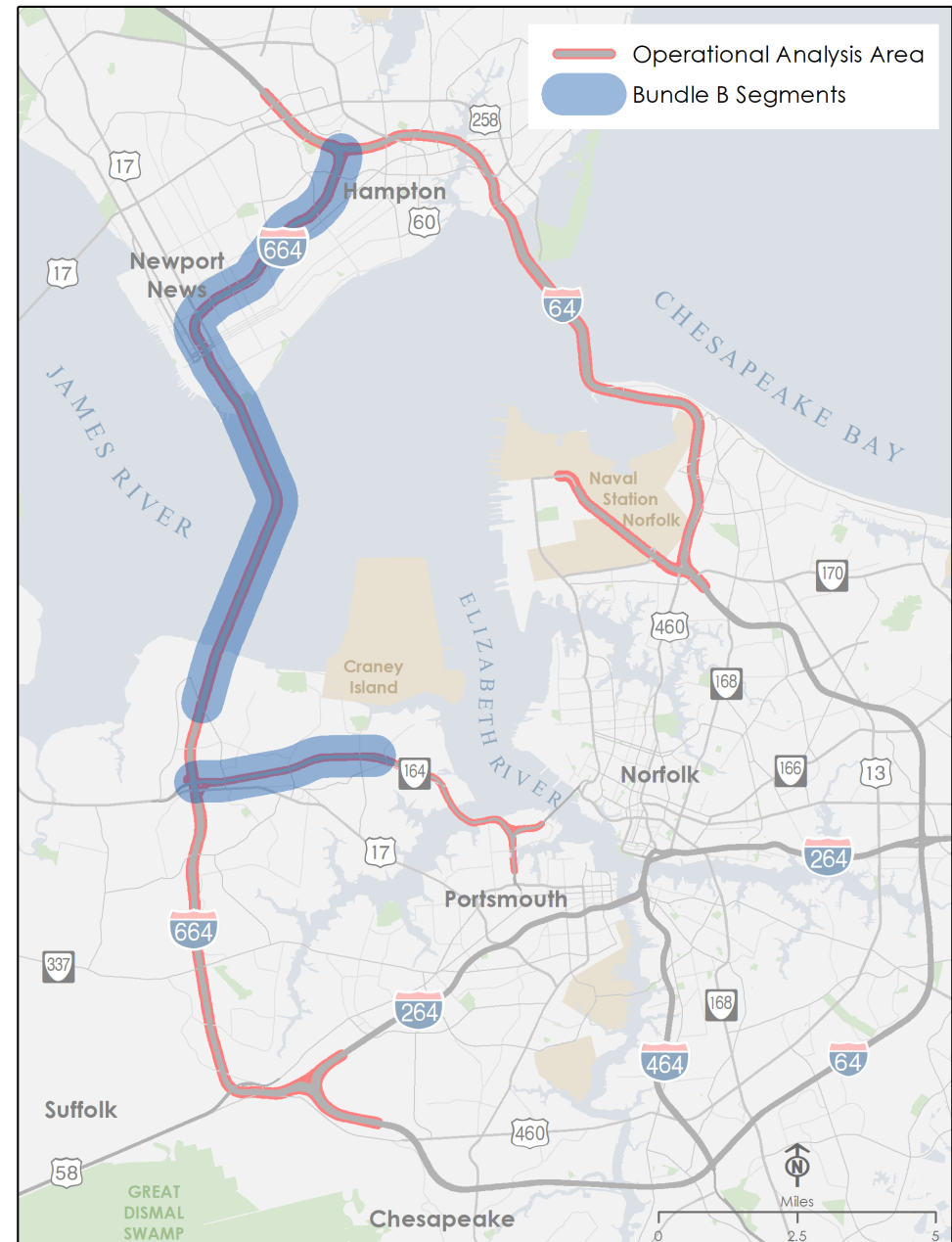
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## RESULTS OF OPERATIONS ANALYSIS

# Overview

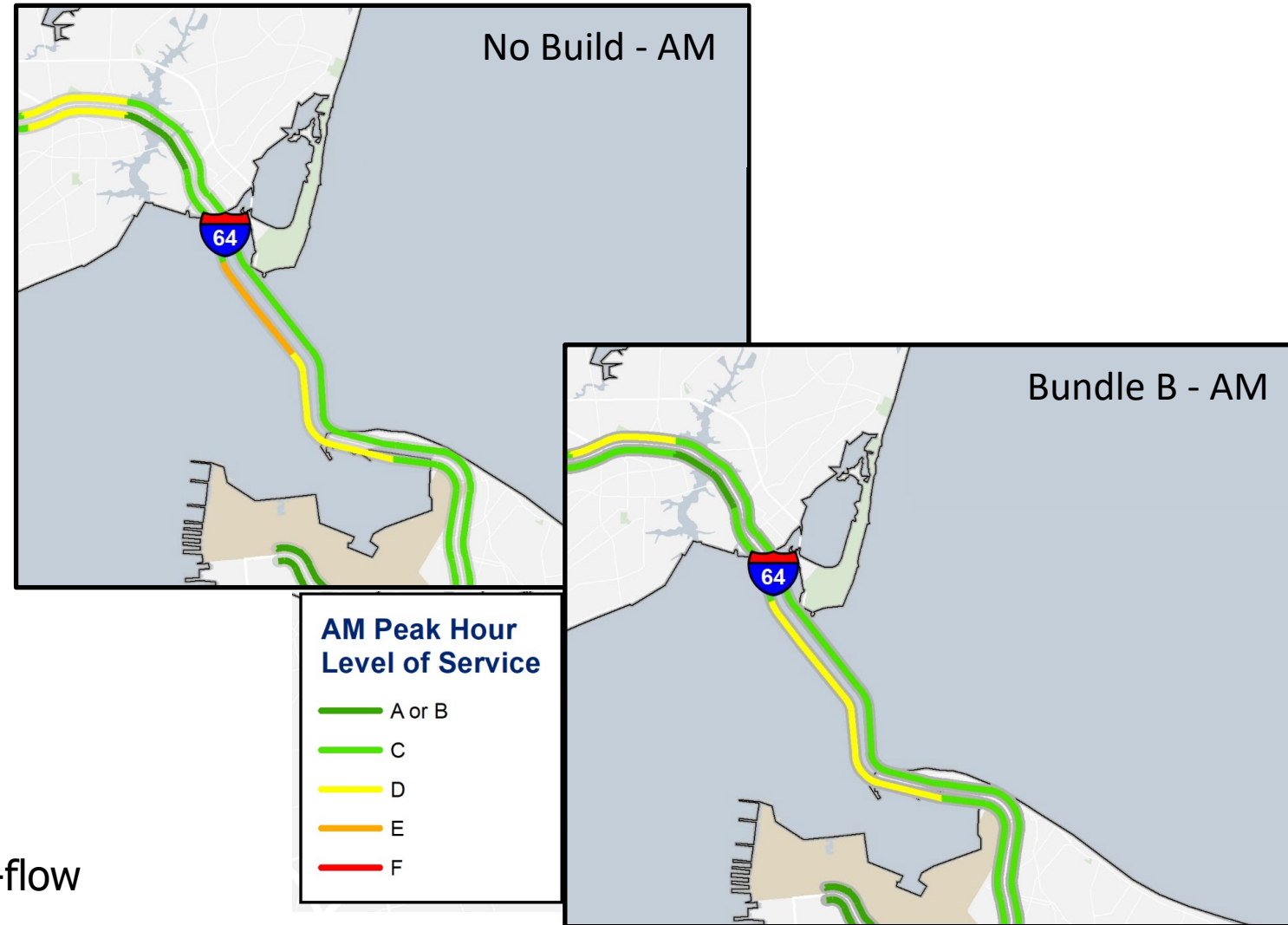
Conducted **traffic operational analyses** for study roadways and ramp junctions

- 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

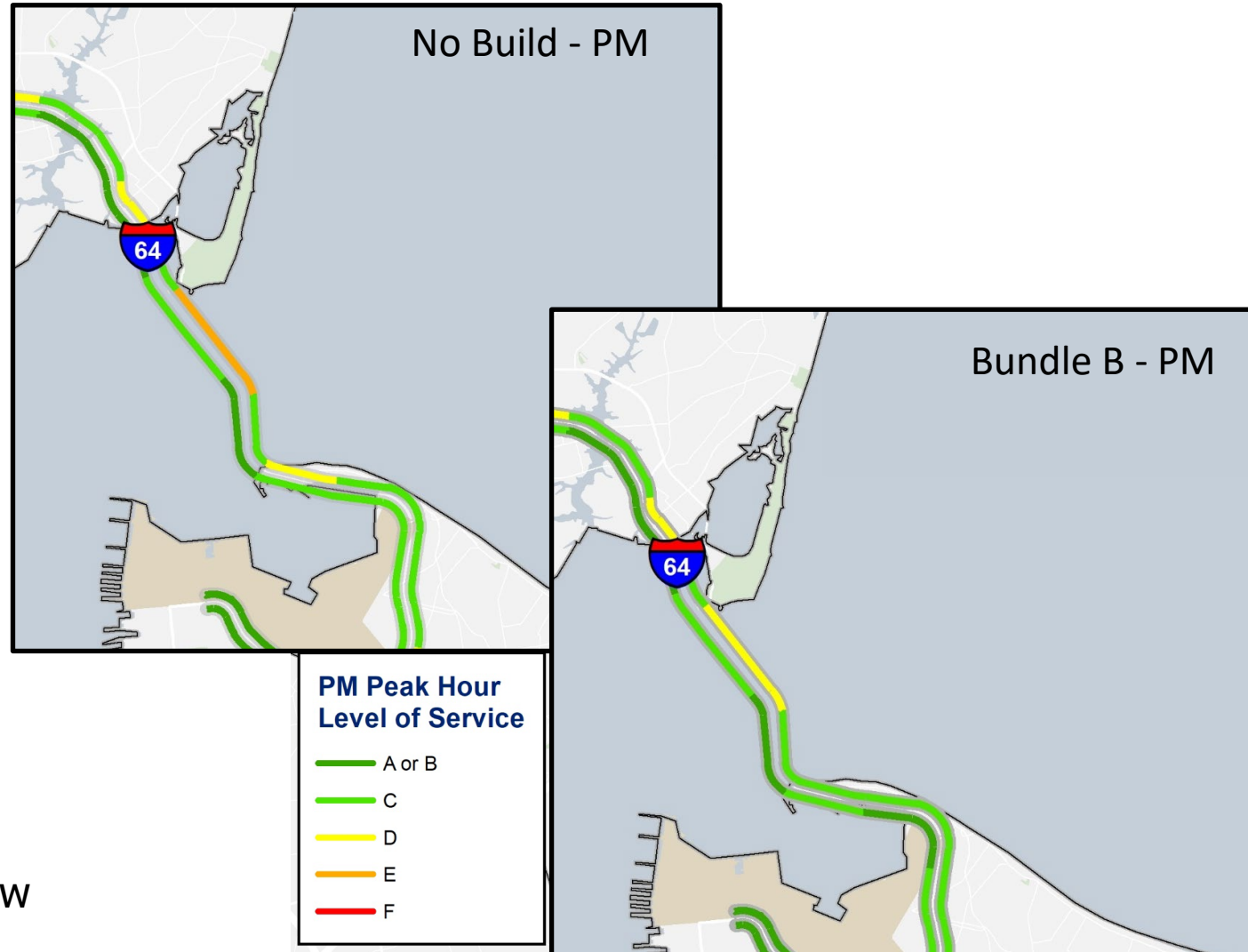


\*Maps show general purpose network  
Managed Lanes always operate at or near free-flow  
Analyses reflect 2045 baseline land use



# Results Summary – 2045 PM – HRBT Operations

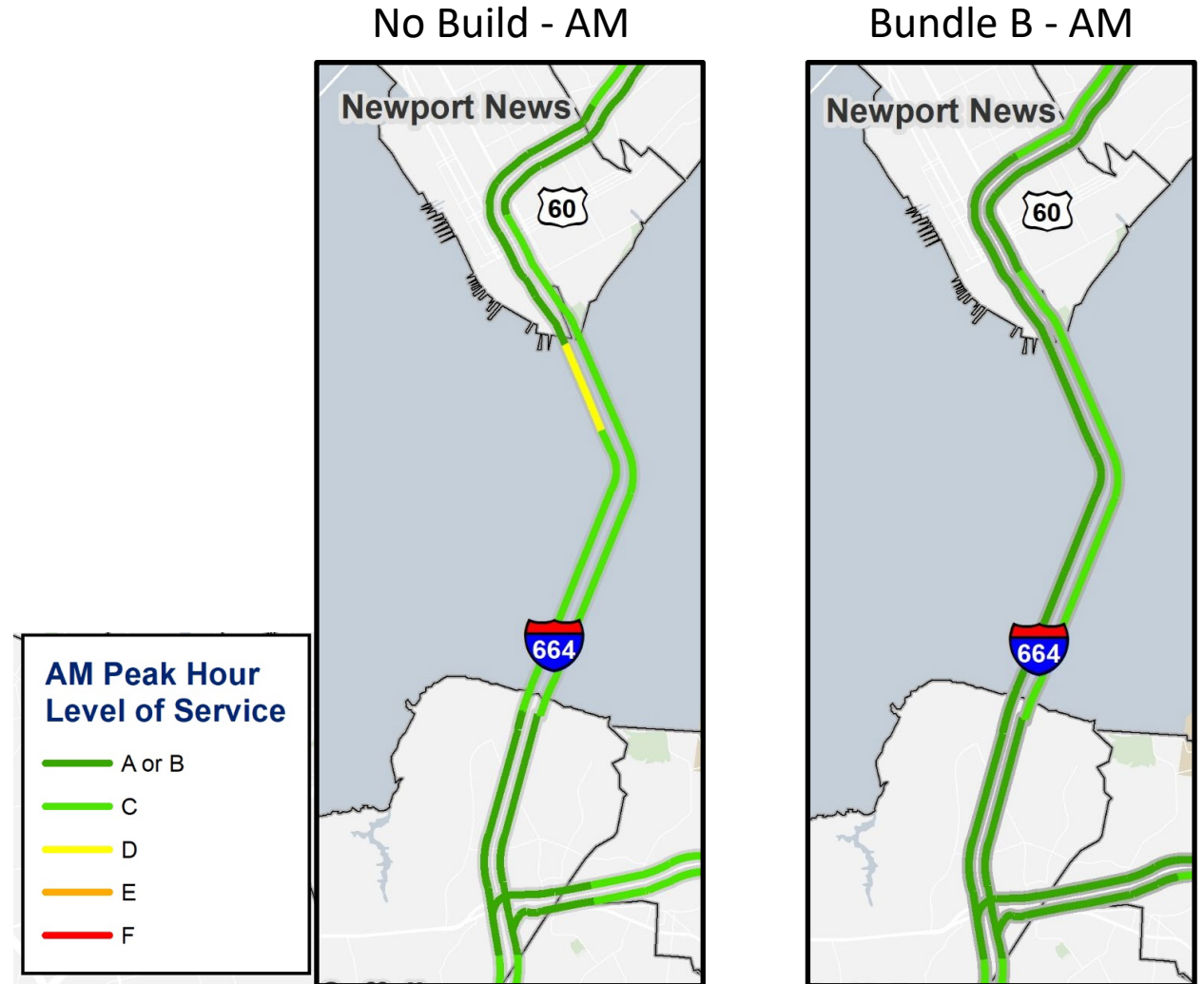
- Westbound improves from LOS E to LOS D



\*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

No Build - PM



Bundle B - PM



\*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

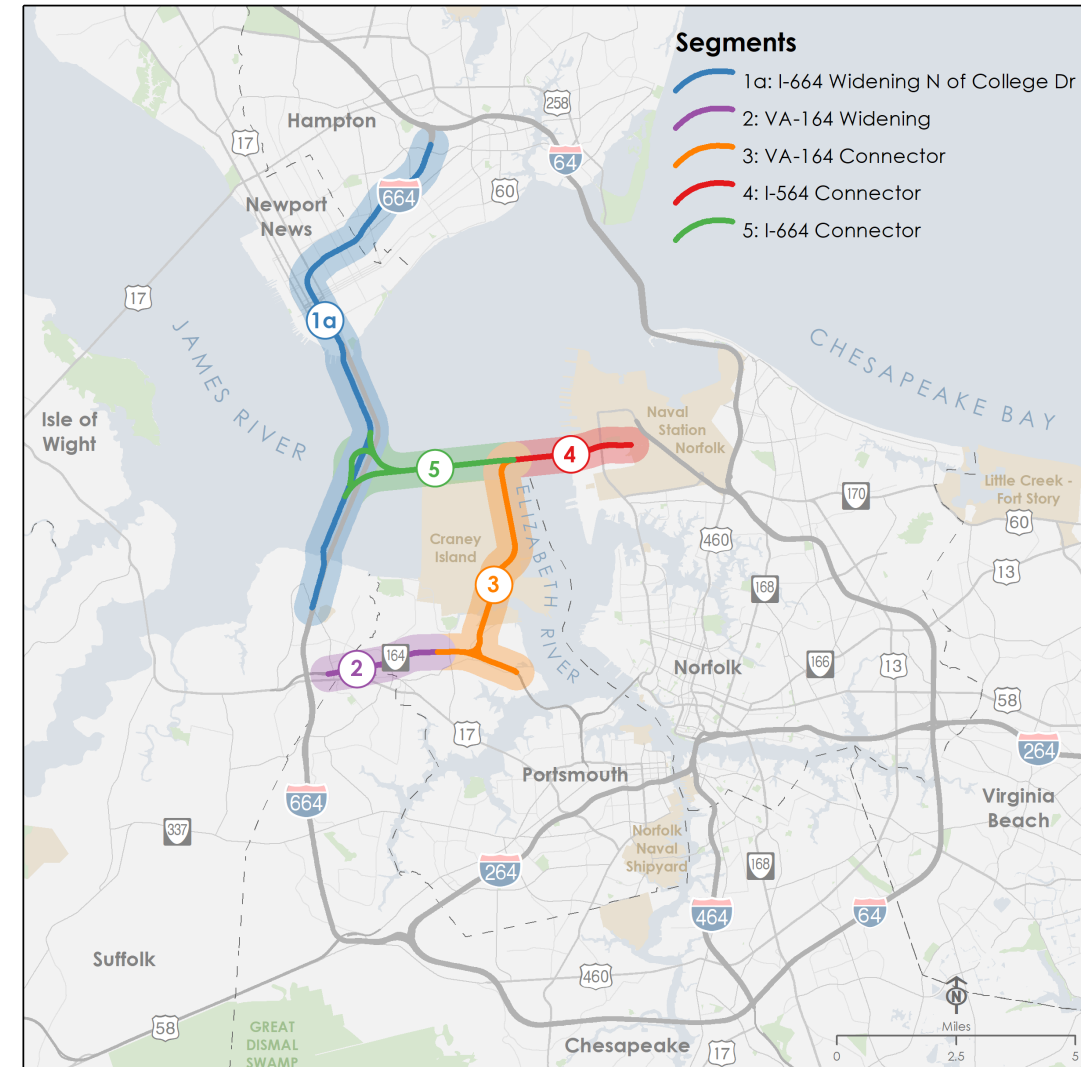
## HRBT and MMBT corridor volume comparison

- 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 MMBT 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

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**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

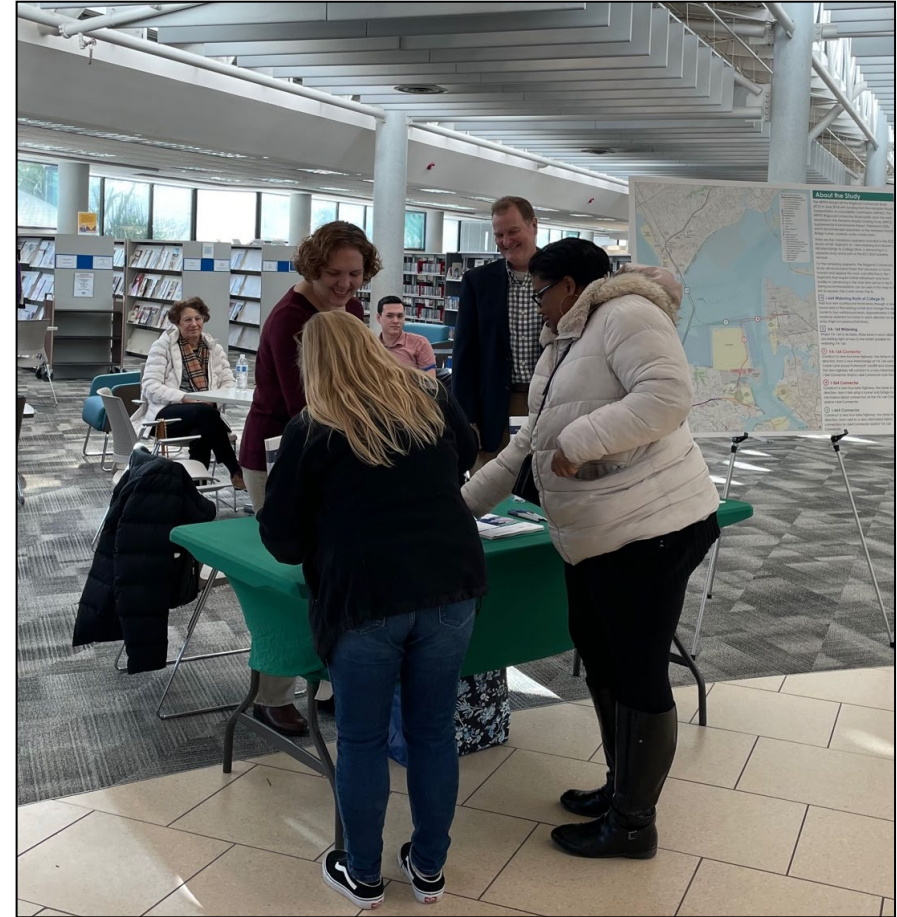
## Balancing



- 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

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## WRAPPING UP THE STUDY

# Next Steps →

