

REGIONAL  
CONNECTORS  
STUDY

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**WORKING GROUP MEETING**

**April 8, 2021**

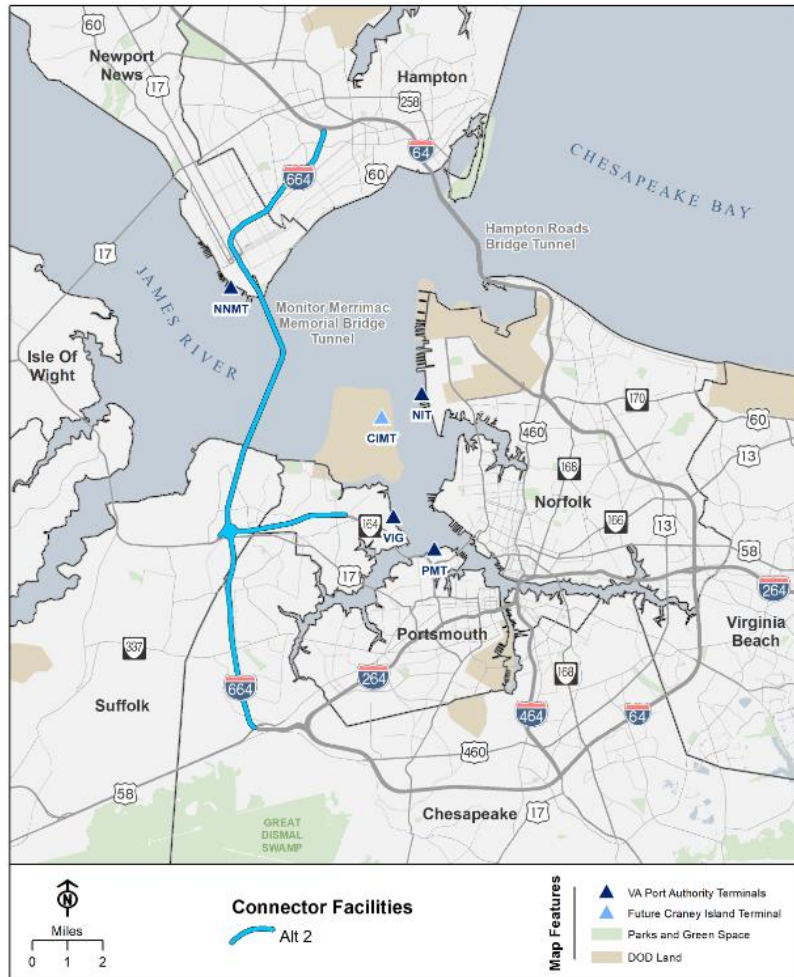
# Meeting Purpose

- Convey work activity since February 11, 2021 meeting
- Get final decision on preliminary alternatives (alignments and design features)— **ACTION NEEDED**

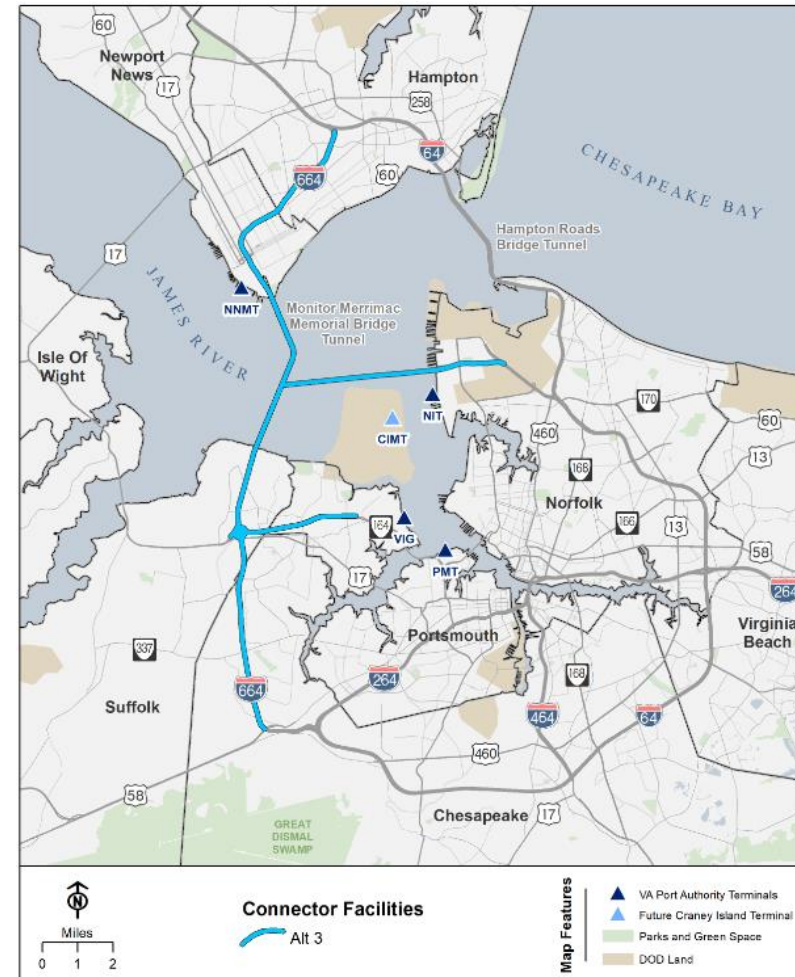
# Activity Since February 11, 2021 Working Group Meeting

- Completed Existing Conditions Analysis Report – distributed for review and comment March 30
- Continued work on draft Technical Guide for Scenario Evaluation (draft by Apr 16)
- Presented study status update to Community Advisory Committee
- Conducted revised model runs for 2045 Baseline and Alternatives 2, 3, 6, and 7

## Alternative 2



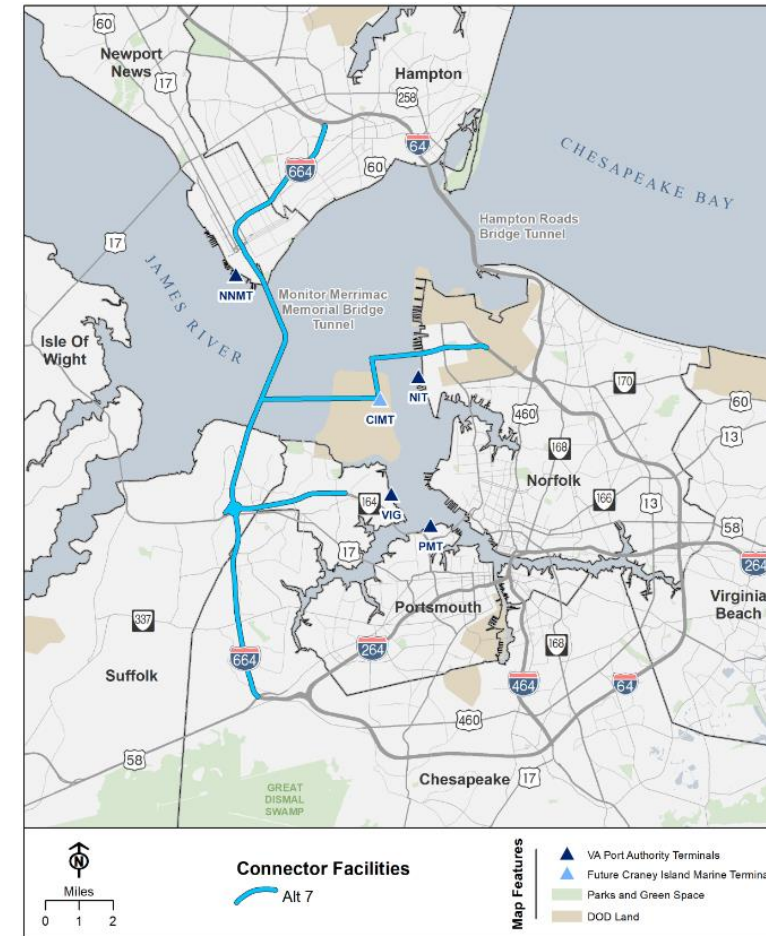
## Alternative 3



# Alternative 6



# Alternative 7



# Modeling Runs

- Ran travel demand model the 2045 Baseline and 4 combinations of mandated segments with all mandated segments constrained like the rest of the network:
  - Alternatives 2, 3, 6, and 7
- Prepared matrix to illustrate volumes for 2017, 2045 Baseline, and the 4 combinations of segments in constrained conditions



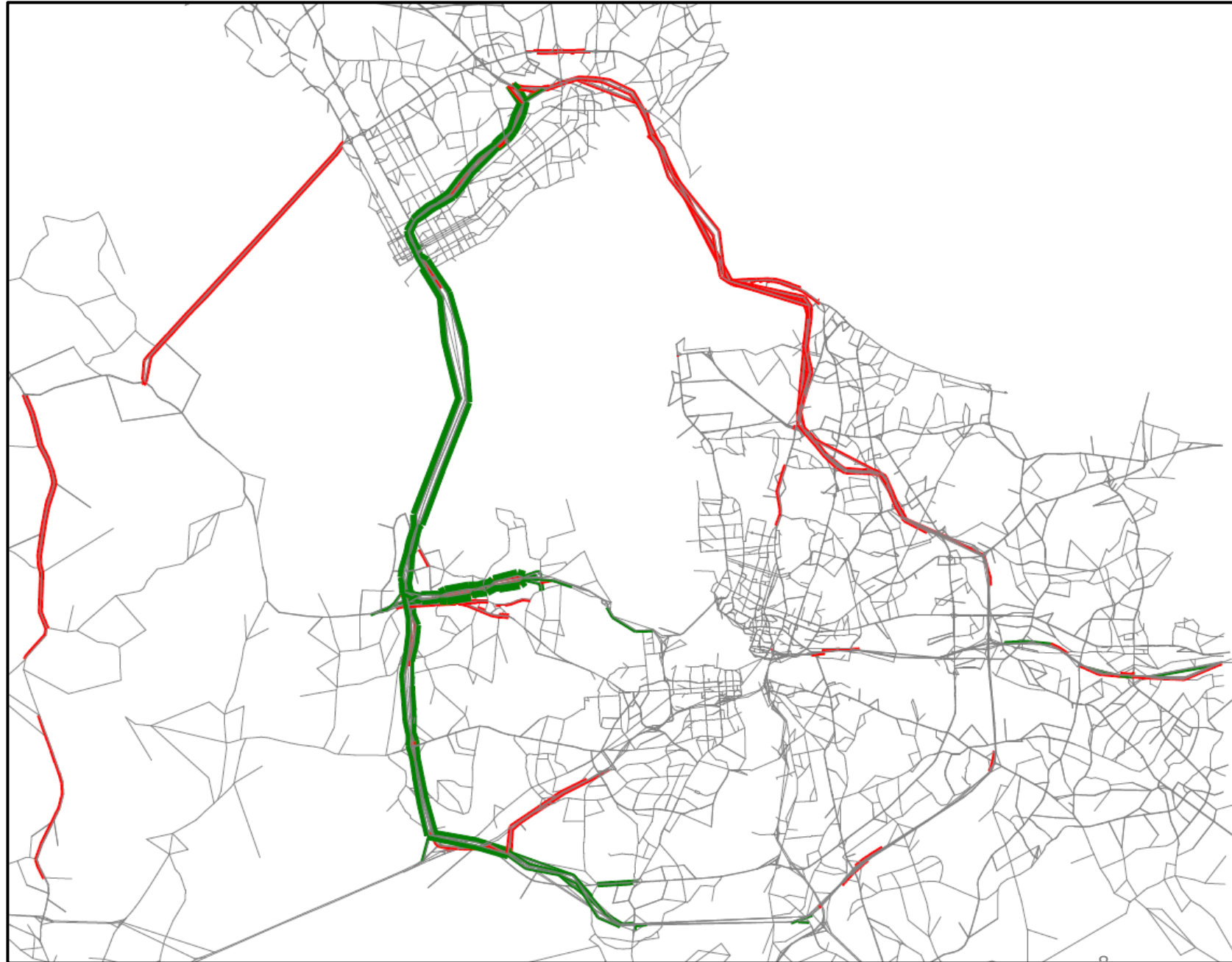
# Modeling Runs Assumptions

## Notes:

- Number of lanes is total for both directions – E+C network as of Oct 2020
- All toll values in Year 2017 US dollars
- Trucks are prohibited from using the managed lanes.
- Managed lane tolls only apply to single-occupant vehicles (SOV)

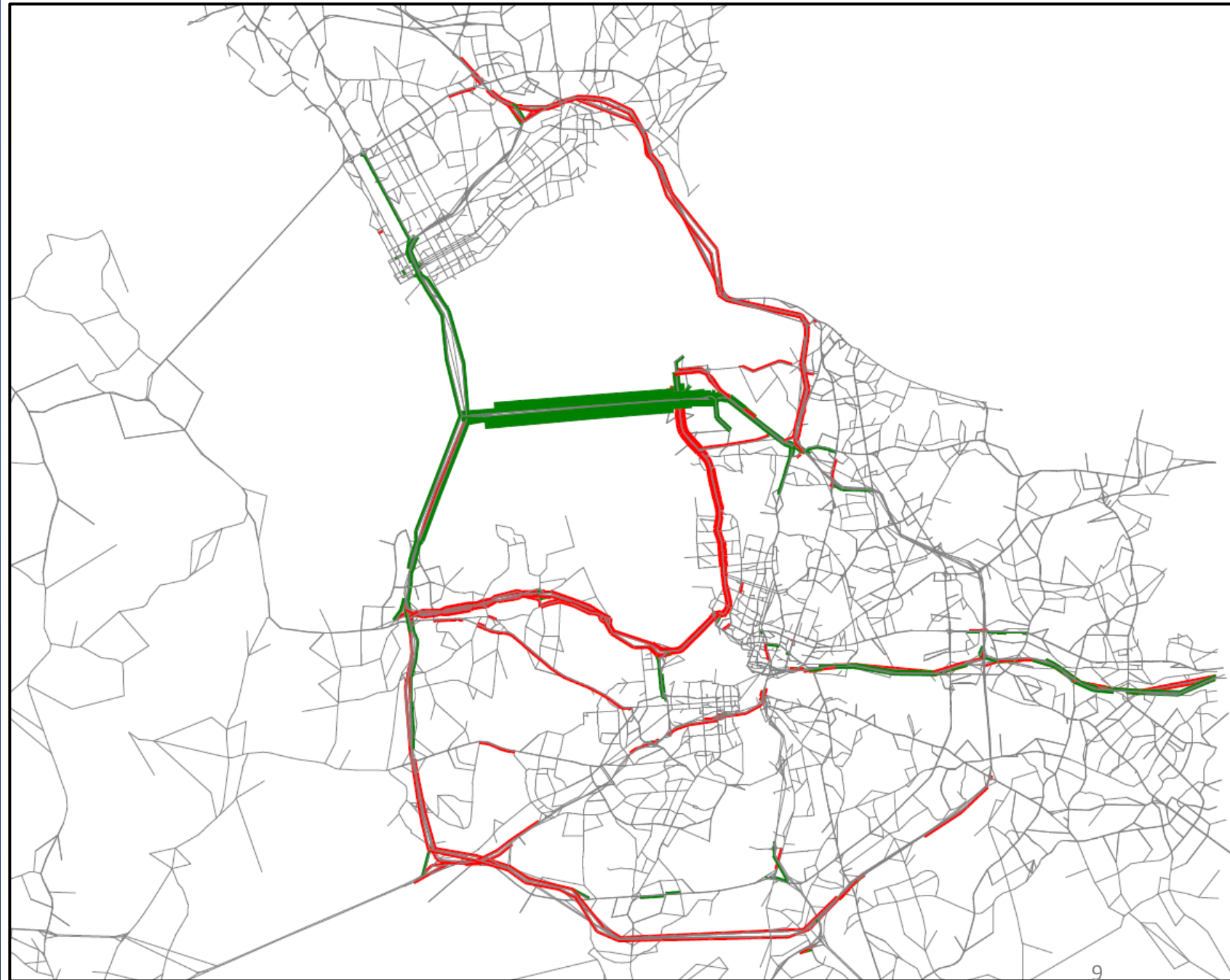
| I-664   |                       |               |                               |                               |
|---|-----------------------|---------------|-------------------------------|-------------------------------|
| Roadway Segments  | General Purpose Lanes | Managed Lanes | Toll Rate (\$/mi.)            |                               |
|   |                       | 24 Hrs.       | Peak                          | Off-Peak                      |
| I-664: I-64 to Terminal Avenue Interchange                    | 6                     | 2             | \$ 0.10                       | \$ 0.10                       |
| I-664: Terminal Avenue Interchange to I-664 Connector         | 6                     | 2             | \$ 0.35                       | \$ 0.26                       |
| I-664: I-664 Connector to College Dr. (Exit 8)                | 6                     | 2             | \$ 0.10                       | \$ 0.10                       |
| I-664: College Dr. (Exit 8) to VA 164                         | 6                     | 2             | \$ 0.10                       | \$ 0.10                       |
| I-664: VA 164 to US 58 (Bowers Hill)                          | 4                     | 2             | \$ 0.10                       | \$ 0.10                       |
| I-664: US 58 (Bowers Hill) to I-264W                          | 6                     | 2             | \$ 0.10                       | \$ 0.10                       |
| Other Mandated Segments                                       |                       |               |                               |                               |
| Roadway Segments  | General Purpose Lanes | Managed Lanes | Toll Rate (\$/mi.)            |                               |
|   |                       | 24 Hrs.       | Peak                          | Off-Peak                      |
| I-564 Connector   | 4                     | -             | \$1.00 Auto*<br>\$3.00 Truck* | \$1.00 Auto*<br>\$3.00 Truck* |
| I-664 Connector including I-664 Interchange                   | 4                     | -             | \$1.00 Auto*<br>\$3.00 Truck* | \$1.00 Auto*<br>\$3.00 Truck* |
| CIMT Connector  | 4                     | -             | -                             | -                             |
| VA 164: I-664 to Cedar Lane                                   | 4                     | 2             | \$ 0.10                       | \$ 0.10                       |
| * - Fixed toll at a location on the segment - all lanes (GP). |                       |               |                               |                               |

# Effect of I-664 and VA 164 Improvements on Regional Daily Traffic

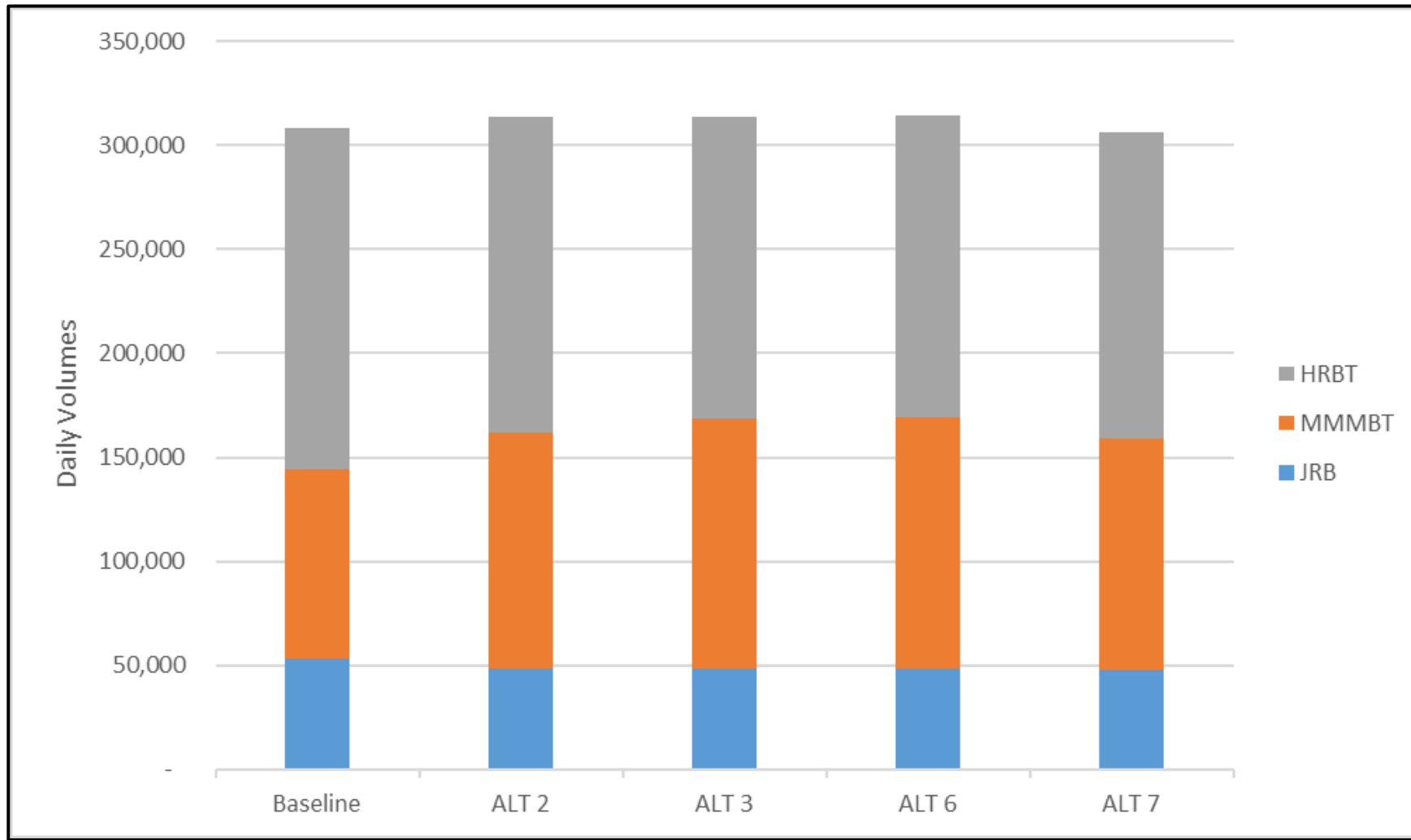




# Effect of East-West Connector on Regional Daily Traffic



# 2045 Daily Volumes - Harbor Crossings

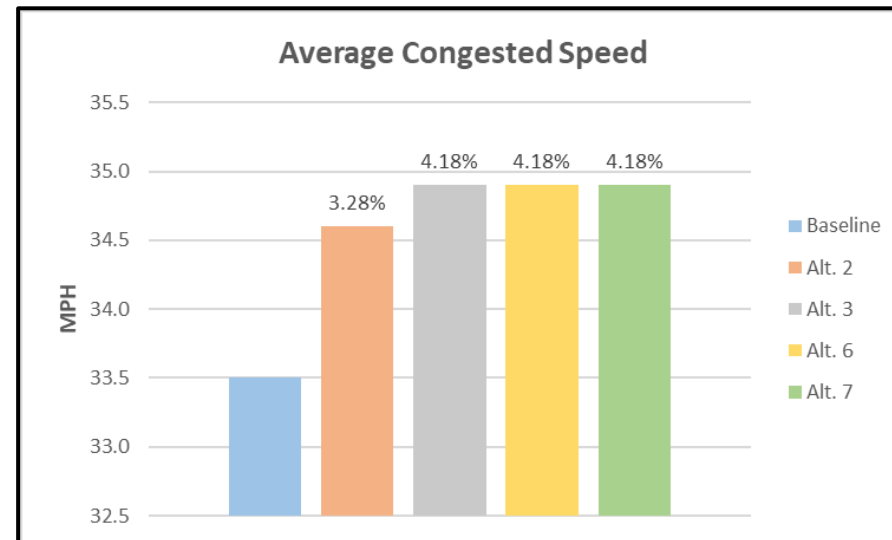
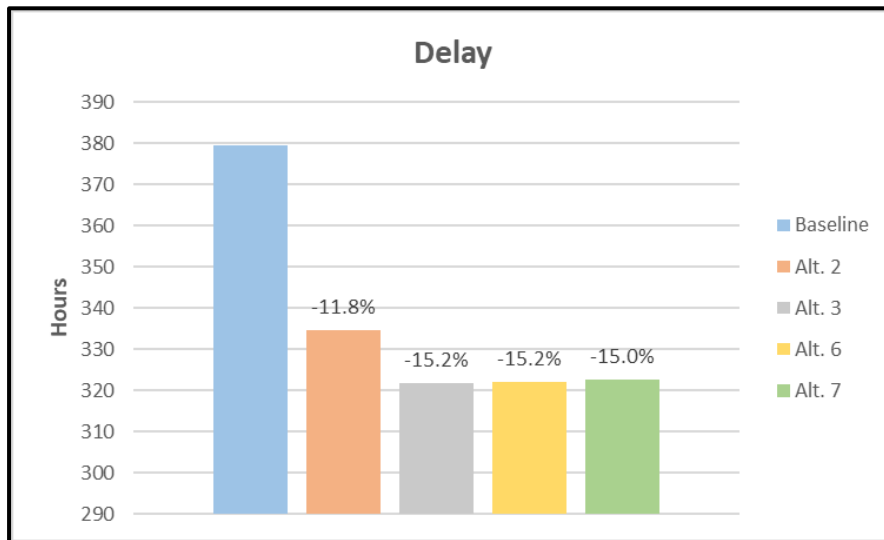
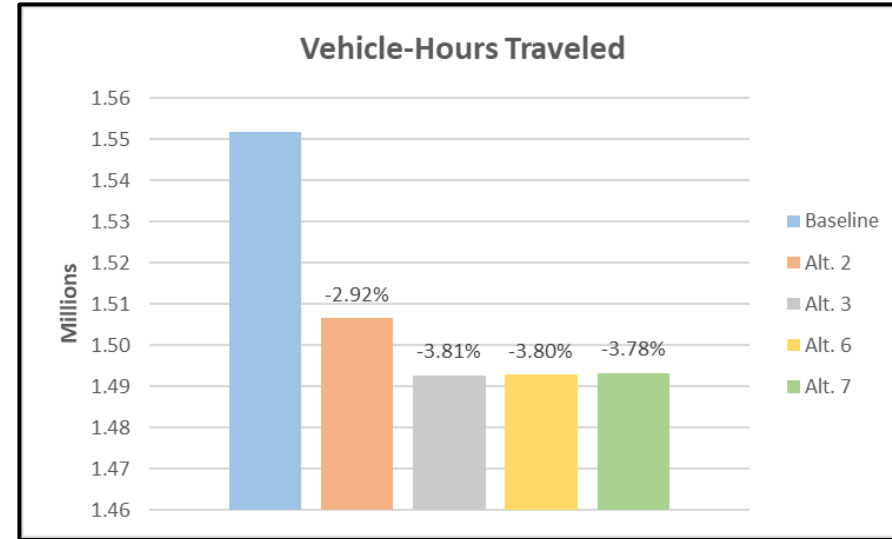
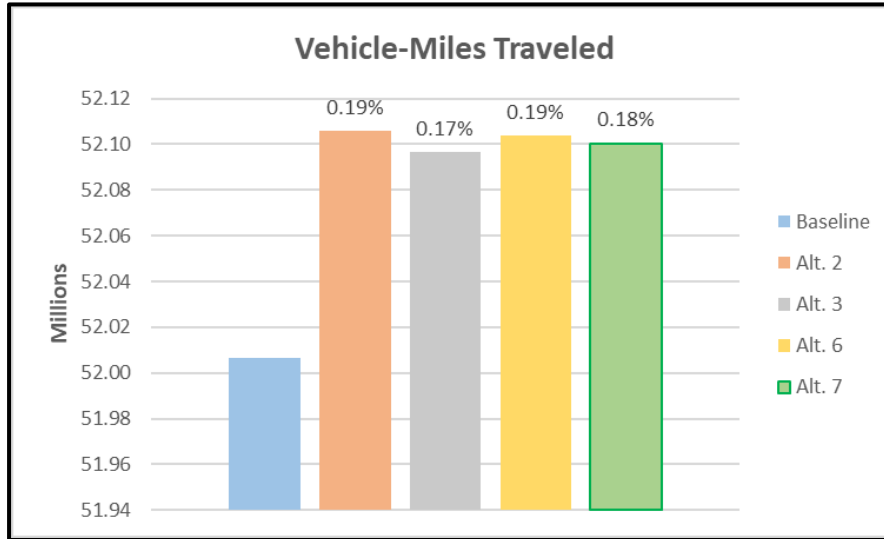


# Roadway Capacity Utilization – Harbor Crossings

| Description                                       | Baseline |          | Alternative 2 |          | Alternative 3 |          |
|---|----------|----------|---------------|----------|---------------|----------|
|   | Peak     | Off-Peak | Peak          | Off-Peak | Peak          | Off-Peak |
| James River Bridge                                | 129%     | 72%      | 110%          | 70%      | 111%          | 71%      |
| Monitor Merrimac Memorial Bridge-Tunnel (GP)      | 126%     | 94%      | 85%           | 63%      | 86%           | 63%      |
| Monitor Merrimac Memorial Bridge-Tunnel (Managed) | -        | -        | 83%           | 38%      | 86%           | 66%      |
| Hampton Roads Bridge-Tunnel (GP)                  | 159%     | 120%     | 142%          | 119%     | 135%          | 118%     |
| Hampton Roads Bridge-Tunnel (Managed)             | 132%     | 100%     | 115%          | 93%      | 105%          | 84%      |

\* Values reflect peak direction of traffic for AM peak and Midday off-peak periods.

# Impacts on Regional Roadway Network (2045 Daily)



\* % change compared with 2045 Baseline

# Travel Times



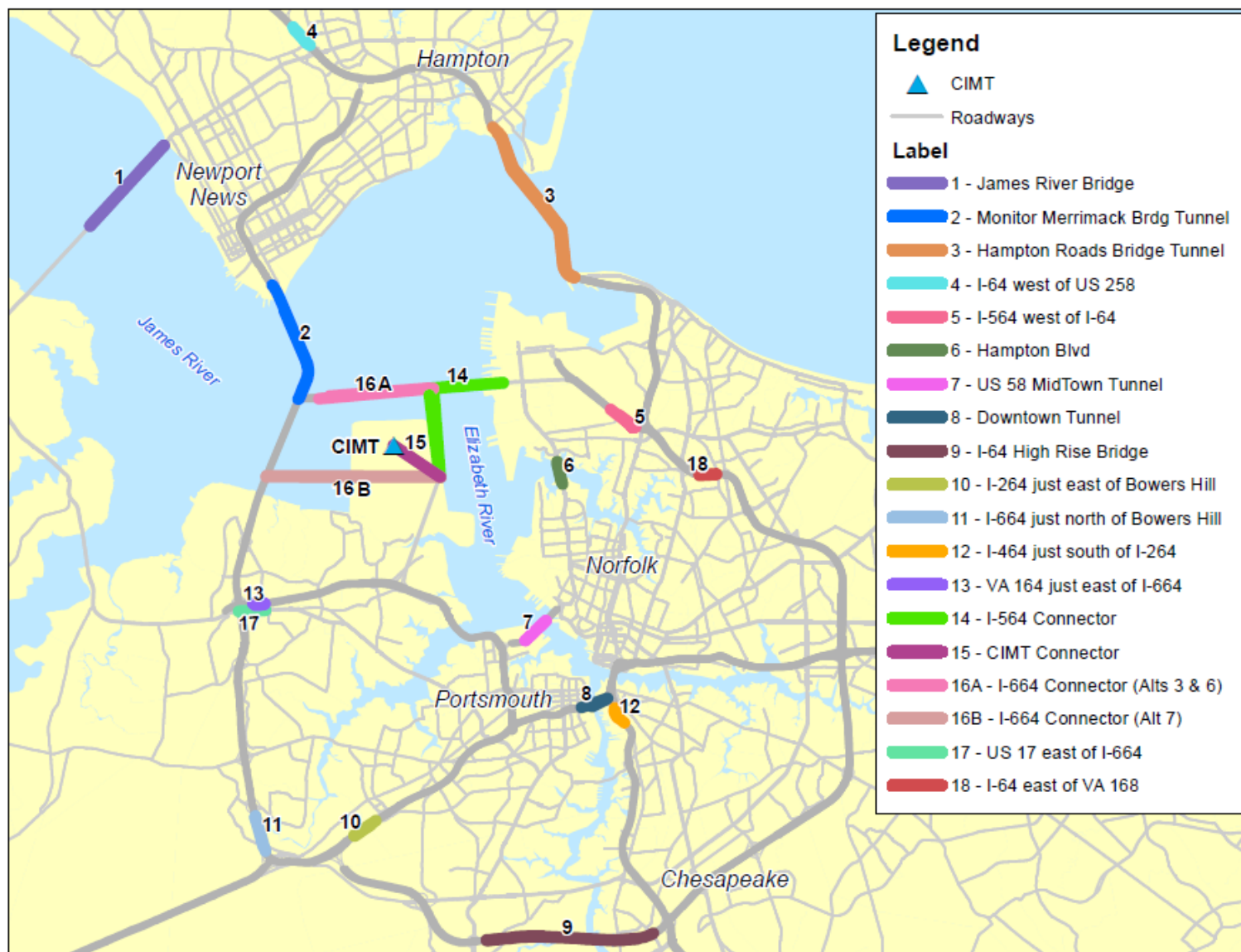
- Blue – Path A
- Pink – Path B

| Direction of Travel   |               | 2045 Baseline |         | Alternative #2 |         | Alternative #3 |         |
|-----------------------|---------------|---------------|---------|----------------|---------|----------------|---------|
|                       |               | GP            | Managed | GP             | Managed | GP             | Managed |
| Path A<br>(via I-664) | Peak (SB)     | 64.0          | -       | 42.8           | 29.0    | 40.0           | 27.5    |
|                       | Change        | -             | -       | -33.1%         | -       | -37.5%         | -       |
|                       | Off-Peak (SB) | 37.1          | -       | 35.3           | 24.8    | 33.6           | 25.2    |
|                       | Change        | -             | -       | -4.9%          | -       | -9.4%          | -       |
| Path B<br>(via I-64)  | Peak (SB)     | 86.4          | 72.6    | 68.1           | 50.2    | 61.8           | 35.4    |
|                       | Change        | -             | -       | -21.2%         | -30.9%  | -28.5%         | -51.2%  |
|                       | Off-Peak (SB) | 49.1          | 26.3    | 48.4           | 26.2    | 47.4           | 26.1    |
|                       | Change        | -             | -       | -1.4%          | -0.4%   | -3.5%          | -0.8%   |

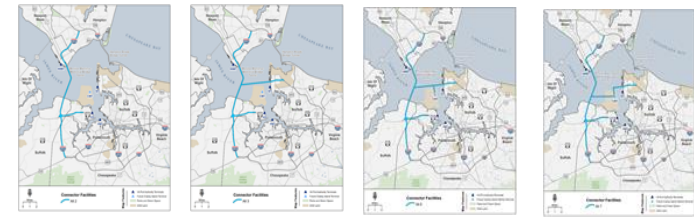
\* Travel times reflect peak direction of traffic for AM peak and Midday off-peak periods; % change compared with 2045 Baseline; Units in minutes.



# Modeling Volume Locations



# Daily Traffic Volumes at Key Locations



## Note:

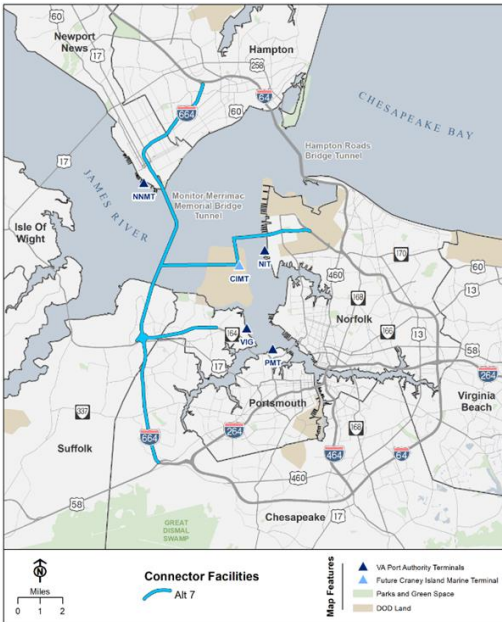
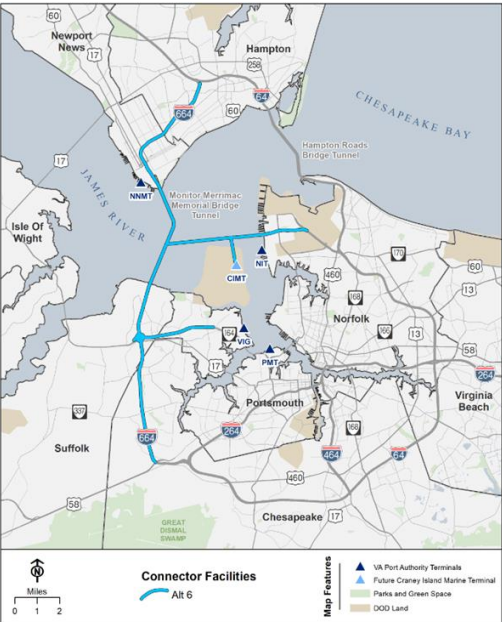
- **Red** – decrease from 2045 Baseline
- **Green** – increase from 2045 Baseline

| ID                            | Location   | 2017 Existing  | 2045 Baseline (full HREL) (No Toll on I-664) | 2045 Constrained Alternative 2 (w/ Toll) | 2045 Constrained Alternative 3 (w/ Toll) | 2045 Constrained Alternative 6 (w/ Toll) | 2045 Constrained Alternative 7 (w/ Toll) |
|-------------------------------|--|----------------|--|--|--|--|--|
| 1                             | James River Bridge                                 | 37,431         | 53,554                                       | 48,831                                   | 48,537                                   | 48,564                                   | 47,806                                   |
| 2                             | Monitor Merrimack Bridge Tunnel (GP)               | 74,994         | 90,487                                       | 88,908                                   | 89,422                                   | 89,795                                   | 86,487                                   |
| 102                           | Monitor Merrimack Bridge Tunnel (Managed Lanes)    | -              | -  | 24,439                                   | 30,535                                   | 30,664                                   | 25,051                                   |
| 3                             | Hampton Roads Bridge Tunnel (GP)                   | 92,195         | 107,051                                      | 103,165                                  | 101,702                                  | 101,669                                  | 101,363                                  |
| 103                           | Hampton Roads Bridge Tunnel (Managed Lanes)        | -              | 57,265                                       | 48,371                                   | 43,408                                   | 43,551                                   | 45,595                                   |
| <b>Harbor Crossing Totals</b> |  | <b>204,620</b> | <b>308,357</b>                               | <b>313,715</b>                           | <b>313,603</b>                           | <b>314,245</b>                           | <b>306,301</b>                           |
| 4                             | I-64 west of US 258 (Mercury Blvd) (GP)            | 119,617        | 159,714                                      | 158,924                                  | 157,410                                  | 157,632                                  | 157,270                                  |
| 104                           | I-64 west of US 258 (Mercury Blvd) (Managed Lanes) | 13,802         | 14,445                                       | 14,358                                   | 14,651                                   | 14,830                                   | 14,184                                   |
| 5                             | I-564 west of I-64                                 | 96,455         | 77,917                                       | 77,529                                   | 81,352                                   | 80,983                                   | 79,571                                   |
| 6                             | Hampton Blvd over the Lafayette River              | 42,949         | 44,070                                       | 43,428                                   | 35,575                                   | 36,222                                   | 35,822                                   |
| 7                             | US 58 MidTown Tunnel                               | 50,700         | 61,016                                       | 61,638                                   | 54,721                                   | 54,562                                   | 55,420                                   |
| 8                             | I-264 under the Elizabeth River (Downtown Tunnel)  | 76,479         | 84,487                                       | 84,646                                   | 83,134                                   | 82,947                                   | 83,370                                   |
| 9                             | I-64 High Rise Bridge (GP)                         | 106,183        | 122,614                                      | 123,384                                  | 122,889                                  | 123,289                                  | 123,164                                  |
| 109                           | I-64 High Rise Bridge (Managed Lanes)              | -              | 16,004                                       | 19,584                                   | 17,250                                   | 17,701                                   | 17,351                                   |
| 10                            | I-264 just east of Bowers Hill                     | 64,611         | 82,854                                       | 77,758                                   | 76,195                                   | 75,802                                   | 76,111                                   |
| 11                            | I-664 just north of Bowers Hill (GP)               | 85,186         | 101,159                                      | 101,610                                  | 101,146                                  | 101,149                                  | 101,246                                  |
| 111                           | I-664 just north of Bowers Hill (Managed Lanes)    | -              | -  | 16,932                                   | 14,508                                   | 14,746                                   | 14,739                                   |
| 12                            | I-464 just south of I-264                          | 88,248         | 97,530                                       | 96,945                                   | 97,763                                   | 97,519                                   | 97,579                                   |
| 13                            | VA 164 just east of I-664 (GP)                     | 50,087         | 49,561                                       | 47,370                                   | 43,414                                   | 43,642                                   | 42,900                                   |
| 113                           | VA 164 just east of I-665 (Managed Lanes)          | -              | -  | 17,173                                   | 13,574                                   | 13,742                                   | 14,821                                   |
| 14                            | I-564 Connector                                    | -              | -  | -  | 39,040                                   | 39,081                                   | 31,977                                   |
| 15                            | CIMT Connector                                     | -              | -  | -  | -  | 704                                      | 842                                      |
| 16                            | I-664 Connector                                    | -              | -  | -  | 39,040                                   | 39,410                                   | 32,425                                   |
| 17                            | US 17 east of I-664                                | 22,206         | 27,148                                       | 24,723                                   | 23,718                                   | 23,741                                   | 23,835                                   |
| 18                            | I-64 east of VA 168 (GP)                           | 113,334        | 114,430                                      | 111,292                                  | 112,484                                  | 112,111                                  | 112,276                                  |
| 118                           | I-64 east of VA 168 (Managed Lanes)                | 34,994         | 33,076                                       | 30,160                                   | 30,835                                   | 30,307                                   | 29,457                                   |

# Group Discussion

## ■ Preliminary Alternatives Decisions:

- Select from 2,3,6, and 7 (e.g. 3,6 and 7)
- Select designs (e.g. MMBT 6+2, MMBT 4+4)
- Total combinations (3x2 = 6)
- Label Alternatives (3A, 3B, 6A, 6B, 7A, 7B)





# Modeling Runs Assumptions



| I-664   |                       |               |                    |          |
|---|-----------------------|---------------|--------------------|----------|
| Roadway Segments                                      | General Purpose Lanes | Managed Lanes | Toll Rate (\$/mi.) |          |
|   |                       | 24 Hrs.       | Peak               | Off-Peak |
| I-664: I-64 to Terminal Avenue Interchange            | 6                     | 2             | \$ 0.10            | \$ 0.10  |
| I-664: Terminal Avenue Interchange to I-664 Connector | 6                     | 2             | \$ 0.35            | \$ 0.26  |
| I-664: I-664 Connector to College Dr. (Exit 8)        | 6                     | 2             | \$ 0.10            | \$ 0.10  |
| I-664: College Dr. (Exit 8) to VA 164                 | 6                     | 2             | \$ 0.10            | \$ 0.10  |
| I-664: VA 164 to US 58 (Bowers Hill)                  | 4                     | 2             | \$ 0.10            | \$ 0.10  |
| I-664: US 58 (Bowers Hill) to I-264W                  | 6                     | 2             | \$ 0.10            | \$ 0.10  |

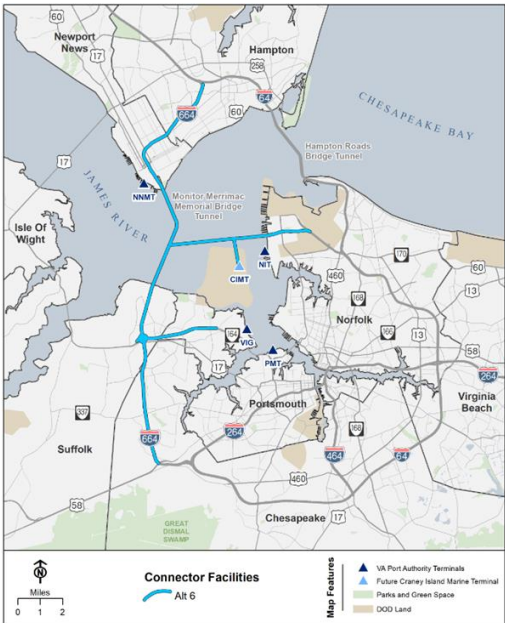
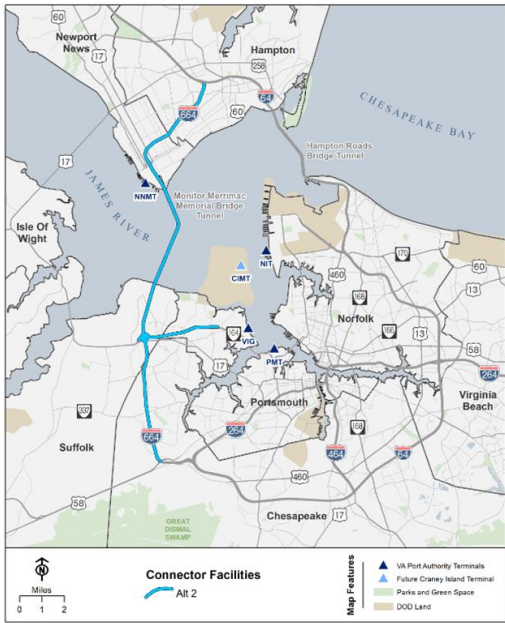
## Other Mandated Segments

| Roadway Segments                            | General Purpose Lanes | Managed Lanes | Toll Rate (\$/mi.)            |                               |
|---|-----------------------|---------------|-------------------------------|-------------------------------|
|   |                       | 24 Hrs.       | Peak                          | Off-Peak                      |
| I-564 Connector                             | 4                     | -             | \$1.00 Auto*<br>\$3.00 Truck* | \$1.00 Auto*<br>\$3.00 Truck* |
| I-664 Connector including I-664 Interchange | 4                     | -             | \$1.00 Auto*<br>\$3.00 Truck* | \$1.00 Auto*<br>\$3.00 Truck* |
| CIMT Connector                              | 4                     | -             | -                             | -                             |
| VA 164: I-664 to Cedar Lane                 | 4                     | 2             | \$ 0.10                       | \$ 0.10                       |

\* - Fixed toll at a location on the segment - all lanes (GP).

# Recommended Action

- Finalize preliminary alternatives including design features
- Recommend for Steering (Policy) Committee consideration and approval





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STUDY

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**6-MONTH OUTLOOK**

# Tasks - Next 6 Months

- Determine Preliminary Alternatives (today)
- Complete Phase 2 documentation
- Development of Preliminary Alternatives (Task 2)
  - Develop/Refine Geometry of Preliminary Alternatives (Task 2.2 – end of Aug completion)
  - Hydraulics and Hydrology (Task 2.3 – end of Aug completion)
  - Structures (Task 2.4 – end of Aug completion)
  - Utilities and Railroad Crossings (Task 2.5 – end of Aug completion)
  - Planning Cost Estimates (Task 2.6 – end of Aug completion)
- Determination of Candidate Alternatives (Task 3)
  - Conduct Congestion Relief Assessments (Task 3.1a – end of May completion)
  - Performance Evaluation (Task 3.1b – mid-Oct completion)
  - Conduct Permitability Assessments (Task 3.2 – mid-Oct completion)
  - Conduct Constructability Assessments (Task 3.3 – mid-Oct completion)

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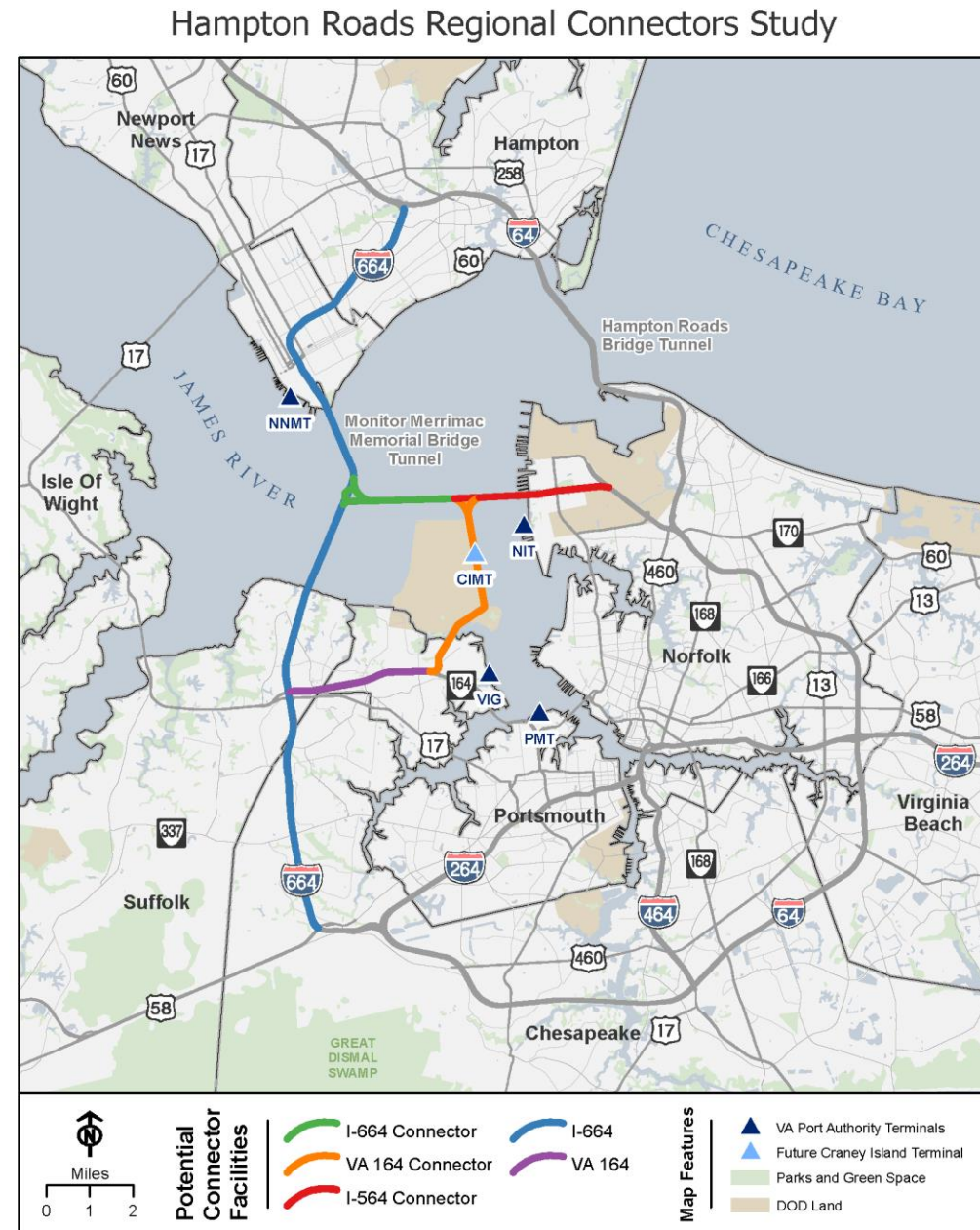
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**REFERENCE SLIDES – IF NEEDED**

# MANDATED SEGMENTS

## Previous Discussion

- As per October 27 Joint Steering (Policy) Committee/Working Group recommendation, Consultant team to investigate potential refinements of mandated segments







# Study Purpose

- To evaluate the feasibility, permitability, and transportation benefits (including congestion relief) of the following segments not included in the CTB approved HRCS SEIS Preferred Alternative (Alternative A)
  - VA 164
  - I-564 Connector
  - VA 164 Connector
  - I-664 Connector
  - I-664 from I-64 to US 460/58/123 in Chesapeake, not including Bowers Hill
- To establish a regional long-term vision that investigates 21<sup>st</sup> century transportation options that connect the Peninsula and the Southside across the Hampton Roads Harbor that enhance economic vitality and improve the quality of life in the region

