the heartbeat of HAMPTON ROADS TPO
TRANSPORTATION PLANNING ORGANIZATION

REGIONAL CONNECTORS STUDY

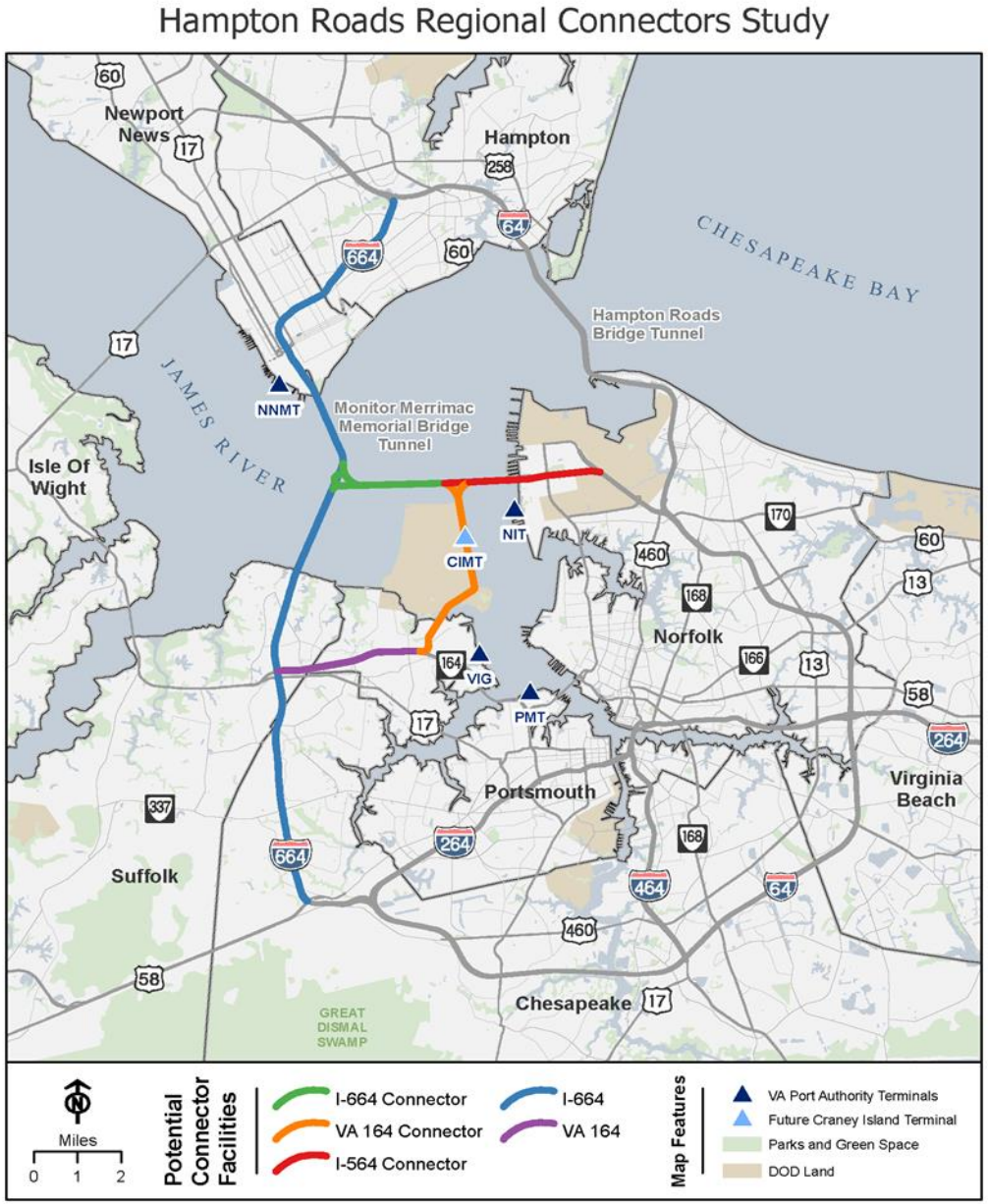
JOINT STEERING (POLICY) COMMITTEE/WORKING GROUP MEETING

June 22, 2021

Michael Baker INTERNATIONAL

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 460/58/13 in Chesapeake, not including Bowers Hill
- To establish a regional long-term vision that investigates 21st 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



October 27, 2020 Meeting Actions

- Approved Phase 2 Completion including Greater Growth scenario planning differentiation and travel demand modeling performance measures
- Directed the study to move forward with studying the feasibility of alternatives comprised of the 5 mandated segments and modifications thereof

Meeting Purpose

- Convey work activity since Oct 27, 2020 joint meeting
- Get final decision on preliminary alternatives (alignments and design options)– **ACTION NEEDED**

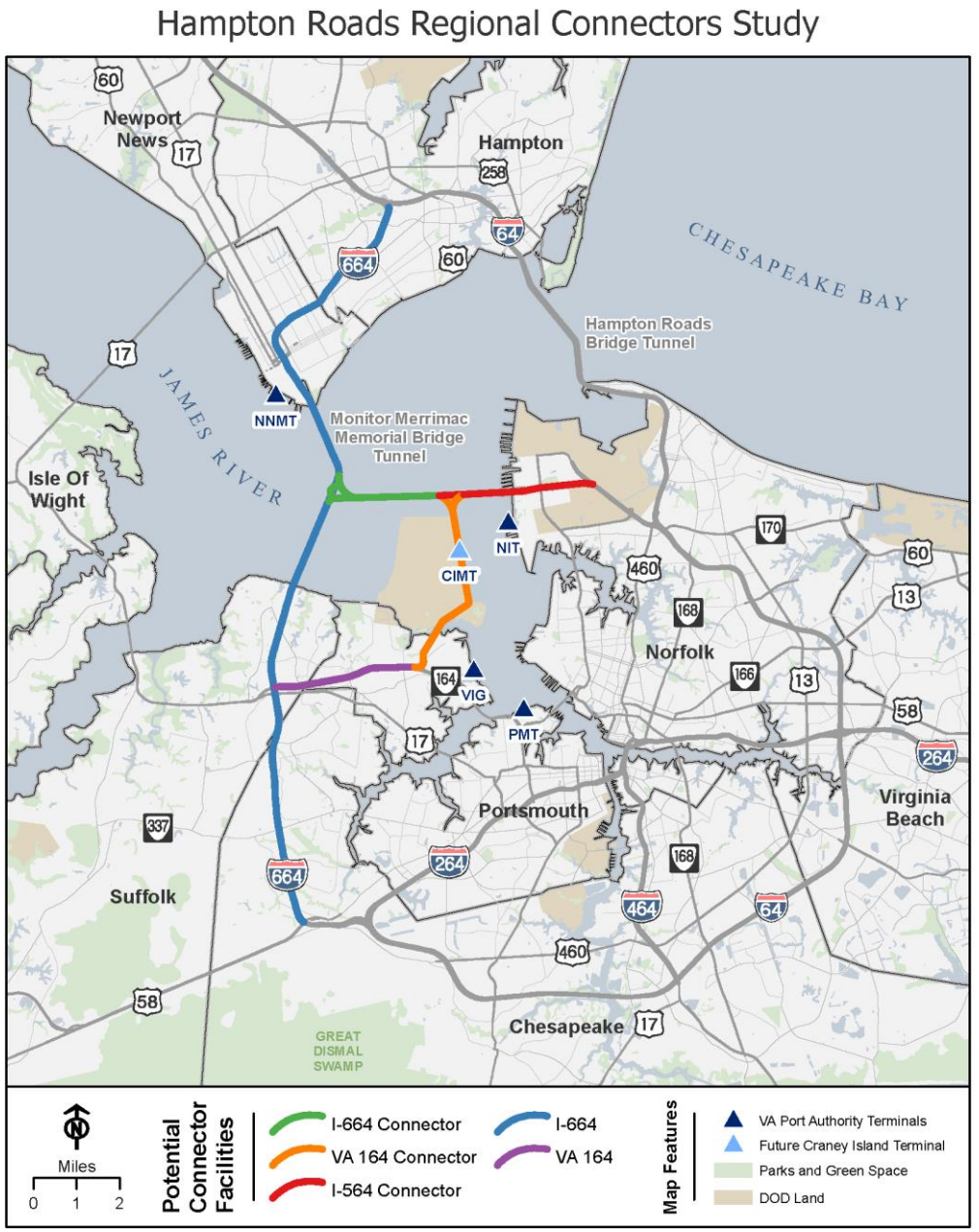
Activity Since Oct 27, 2020 Joint Meeting

- Completed Existing Conditions Analysis Report – May 27
- Will Complete Technical Guide for Scenario Evaluation (Phase 2) – by end of June
- Conducted multiple series of model runs to investigate the effectiveness of various potential alternatives
- Developed typical sections for 6 General Purpose Lanes and 2 Managed Lanes (6GP+2M) and 4 General Purpose Lanes and 4 Managed Lanes (4GP+4M) design options (on I-664 only from I-664 Connector to Powhatan Parkway interchange)
- Screened potential alternatives down to 8

MANDATED SEGMENTS

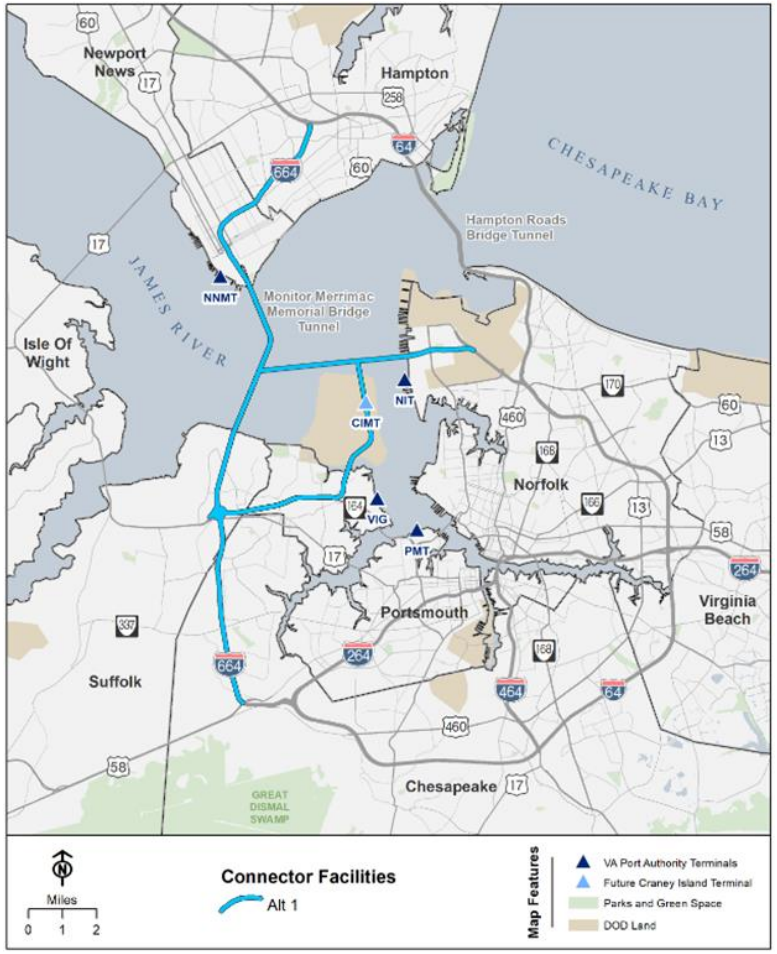
Previous Discussion

- As per October 27, 2020 Joint Steering (Policy) Committee/Working Group recommendation, Consultant team to investigate potential refinements of mandated segments



Alternatives Investigation – First Round, January 2021

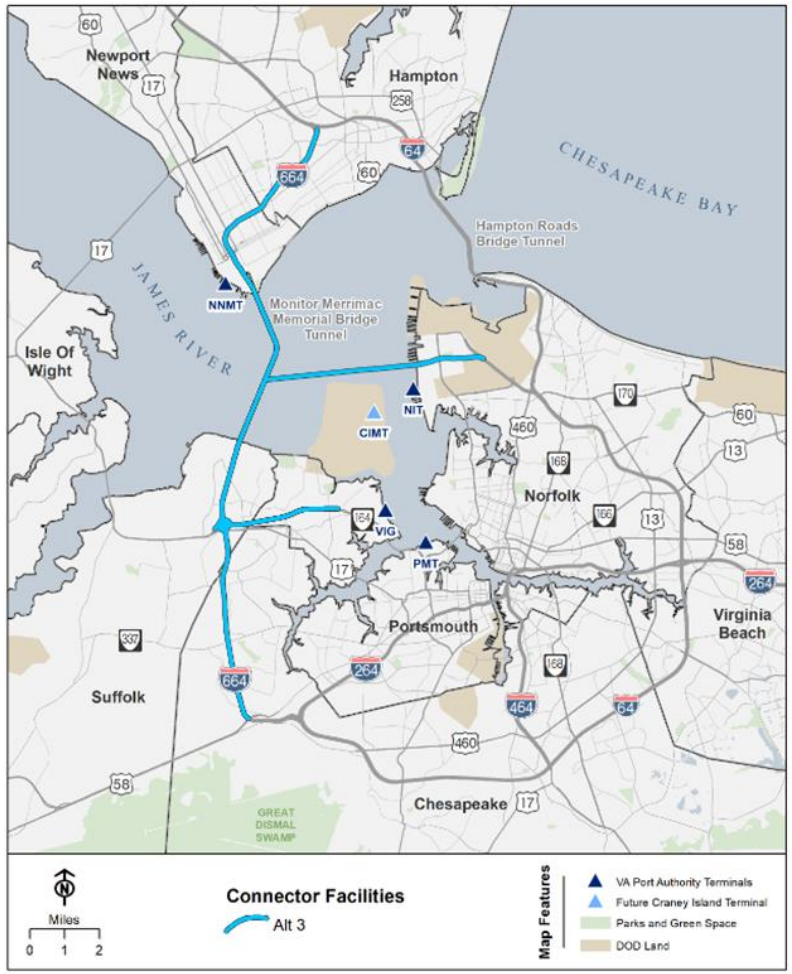
Alternative 1



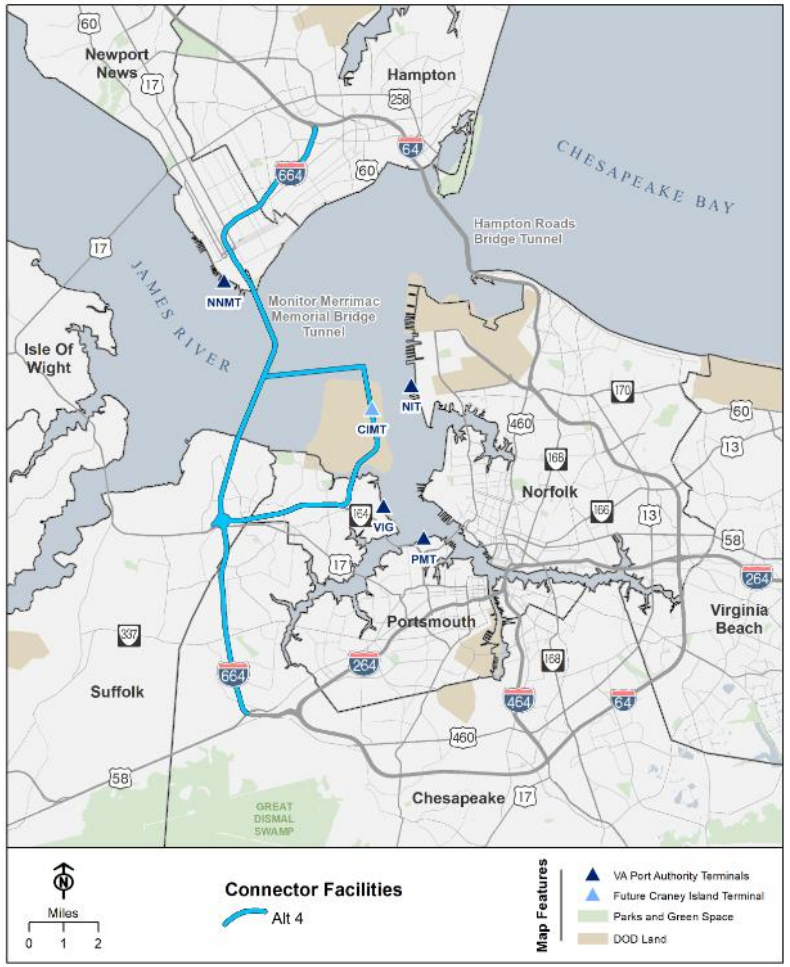
Alternative 2

Alternatives Investigation – First Round, January 2021 (Cont.)

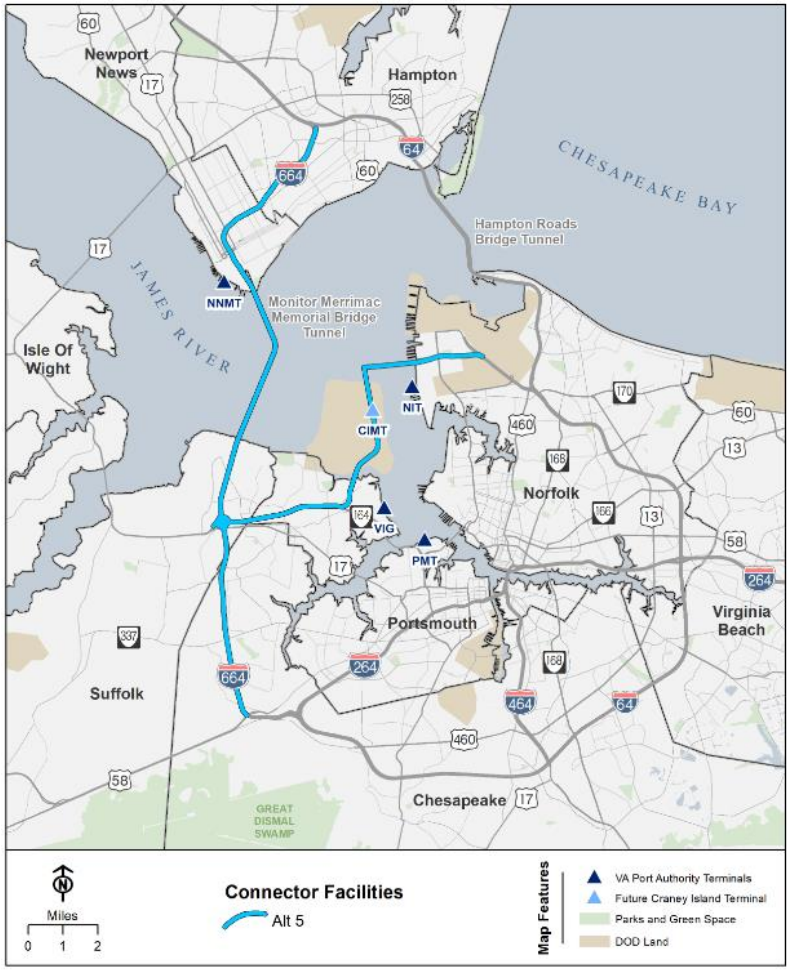
Alternative 3



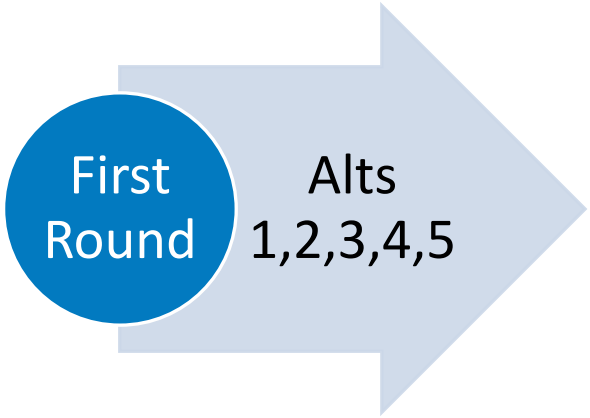
Alternative 4



Alternative 5

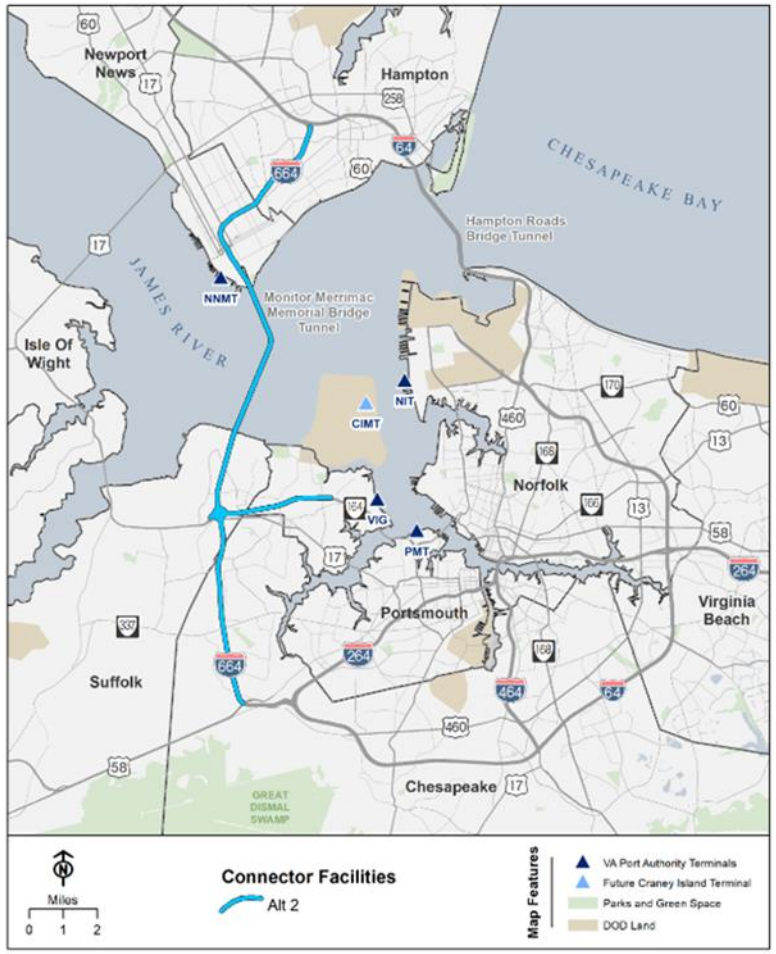


Alternatives Investigation Progression

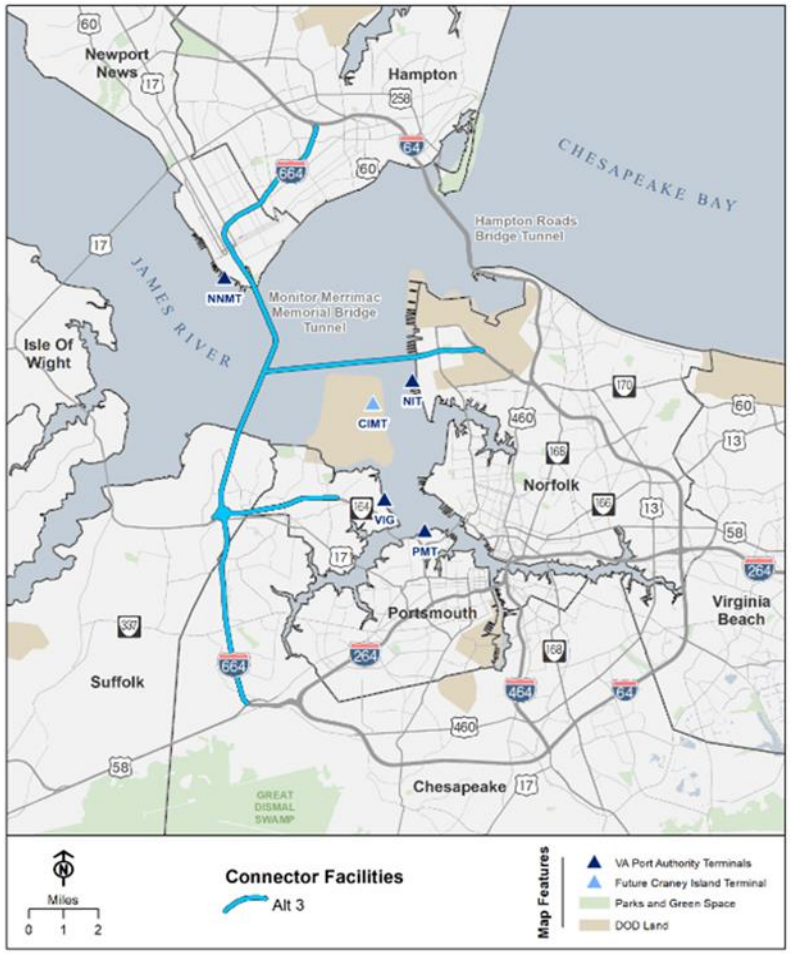


Alternatives Investigation – Second Round, February 2021

Alternative 2

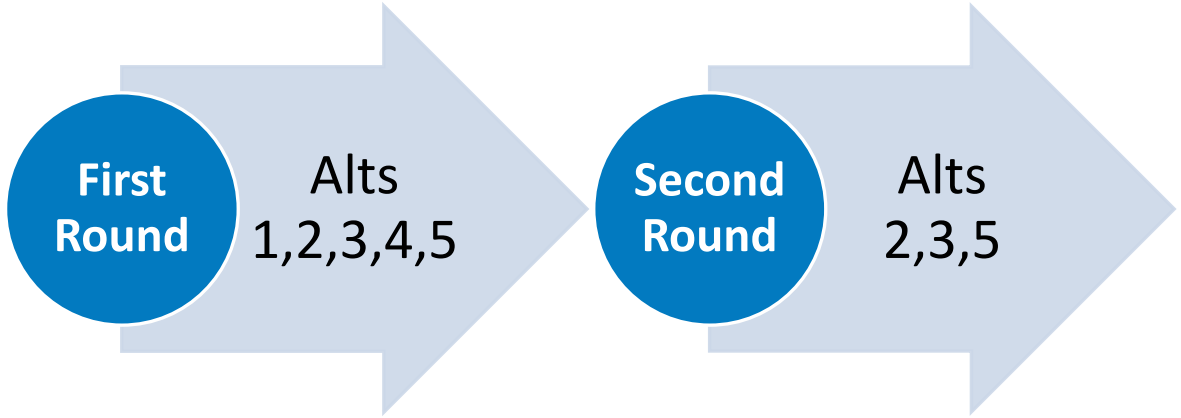


Alternative 3



Alternative 5

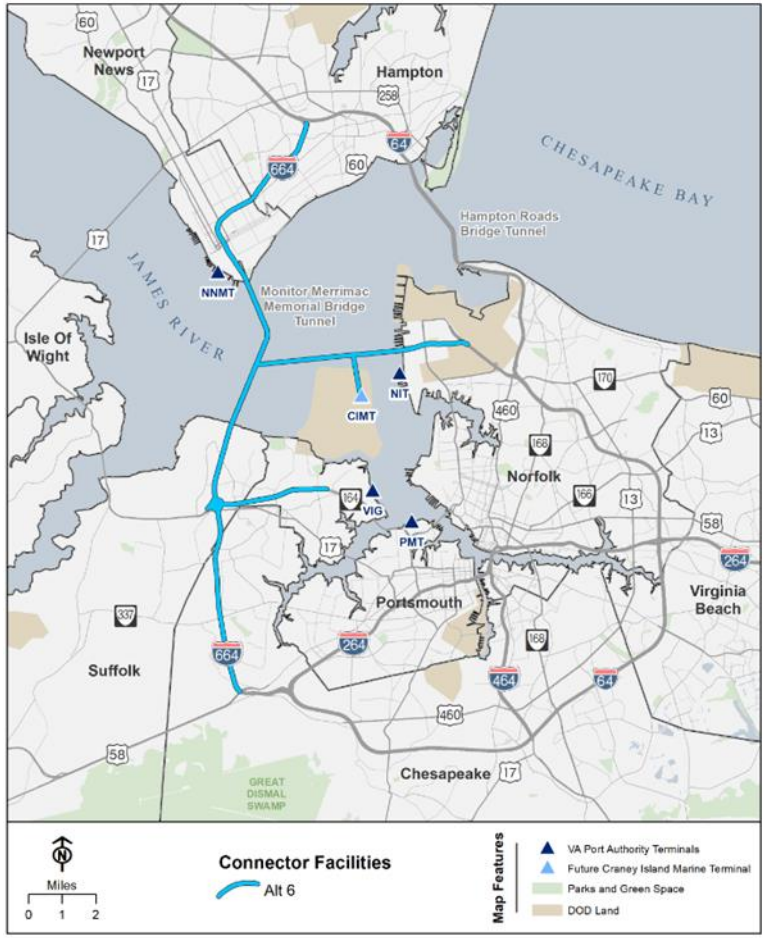
Alternatives Investigation Progression



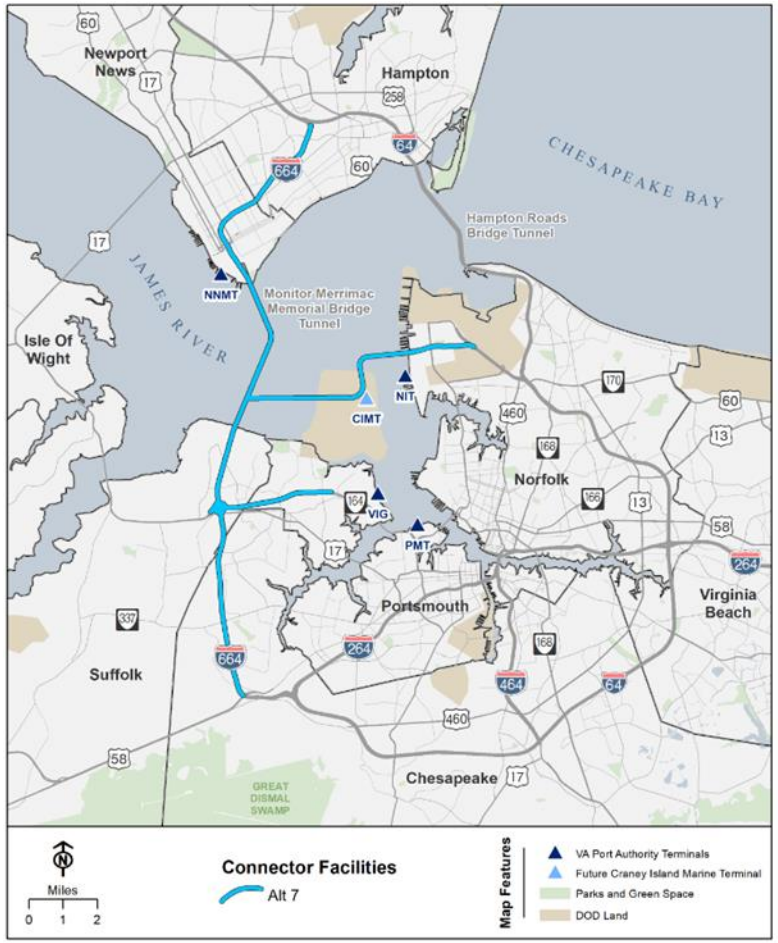
VA 164 Connector Constraints

Alternatives Investigation – Third Round, April 2021

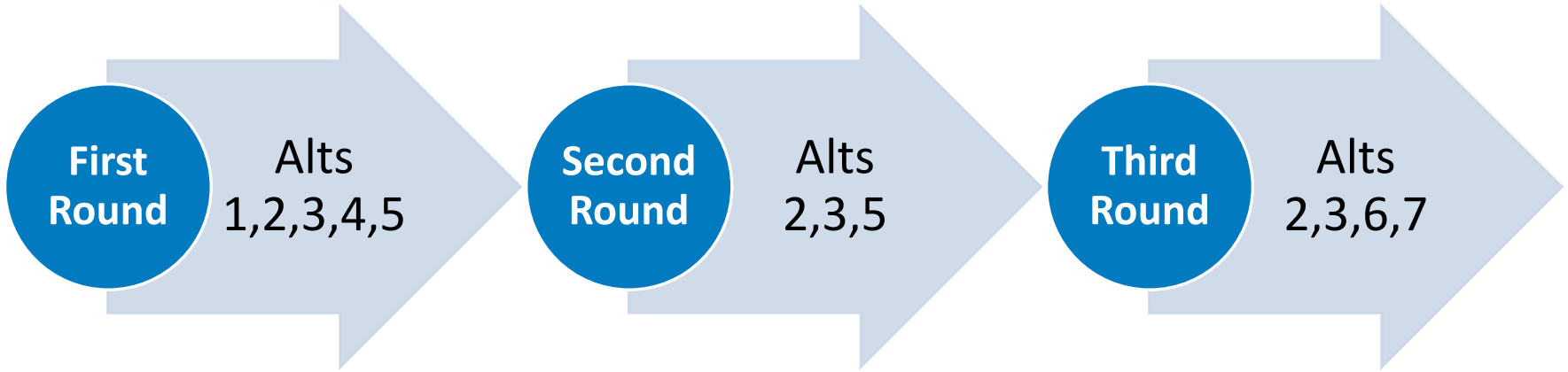
Alternative 6



Alternative 7

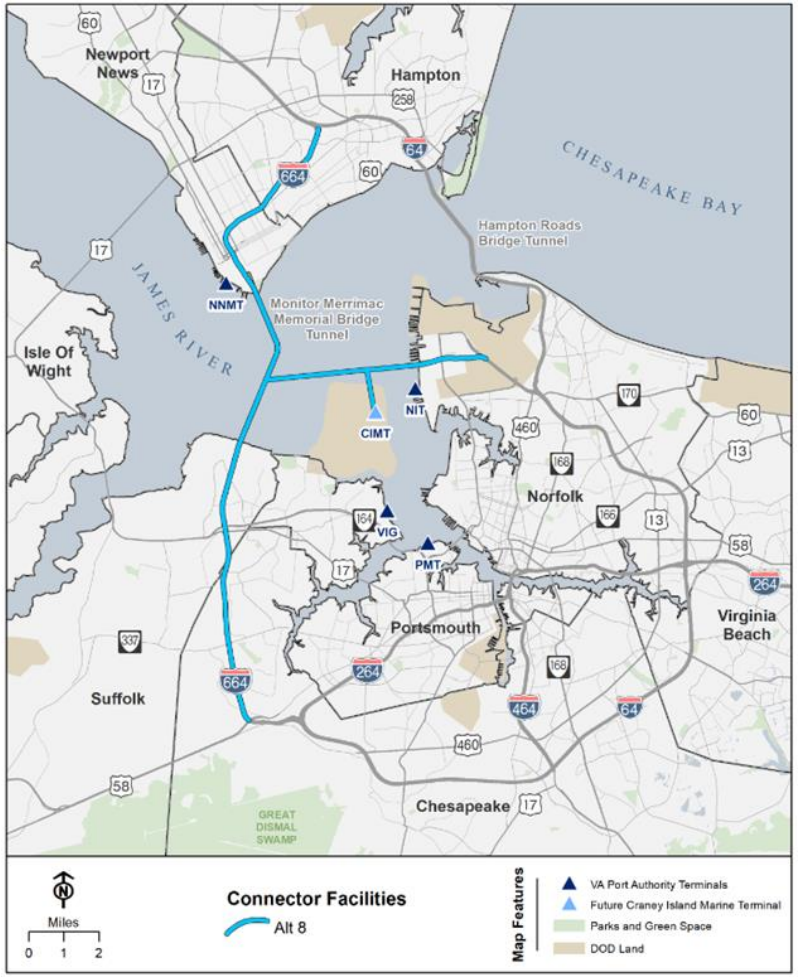


Alternatives Investigation Progression

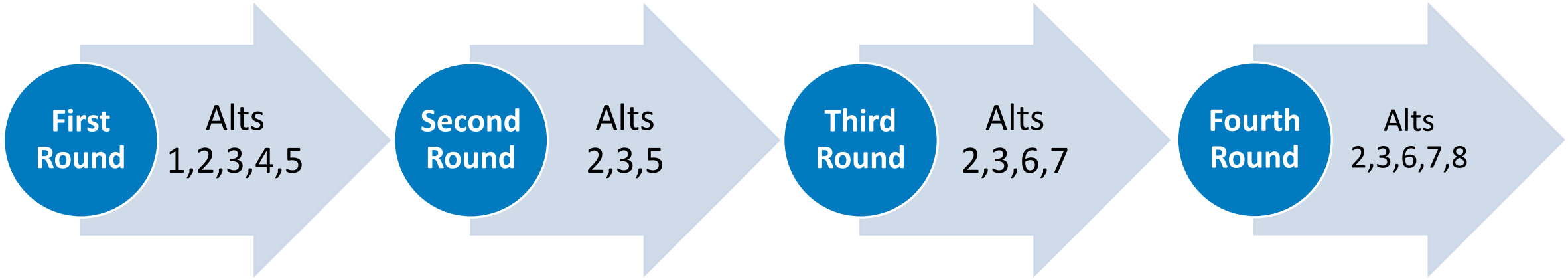


Alternatives Investigation – Fourth Round, May 2021

Alternative 8

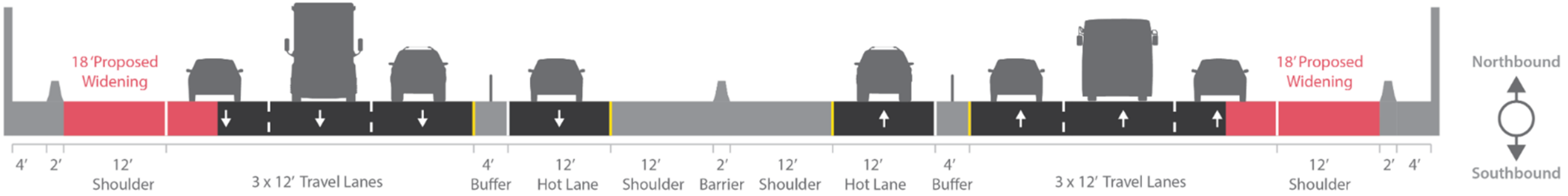


Alternatives Investigation Progression

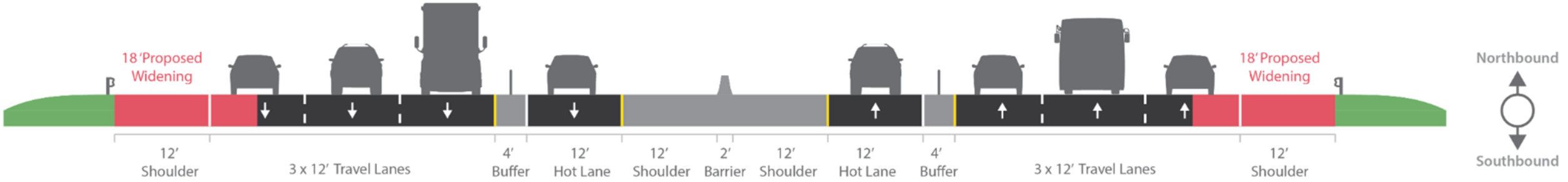


Typical Sections (MMMBT 6GP+2M Design Option)

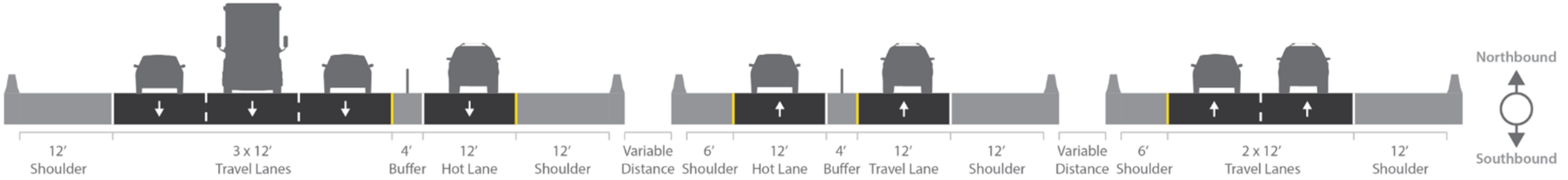
I-664 : 6GP + 2 M
Powhatan Parkway Interchange to I-64/I-664 Interchange



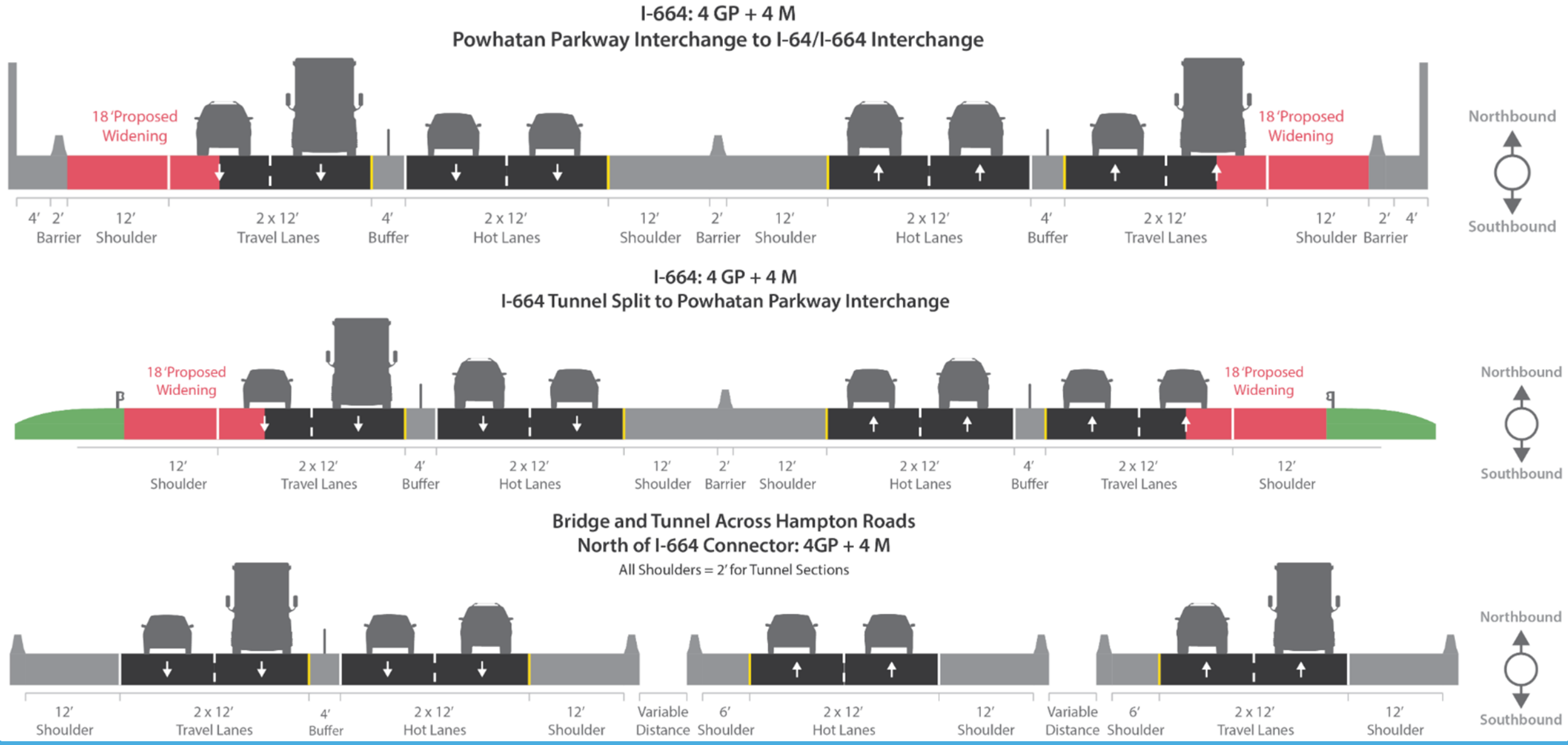
I-664 : 6GP + 2 M
I-664 Tunnel Split to Powhatan Parkway Interchange



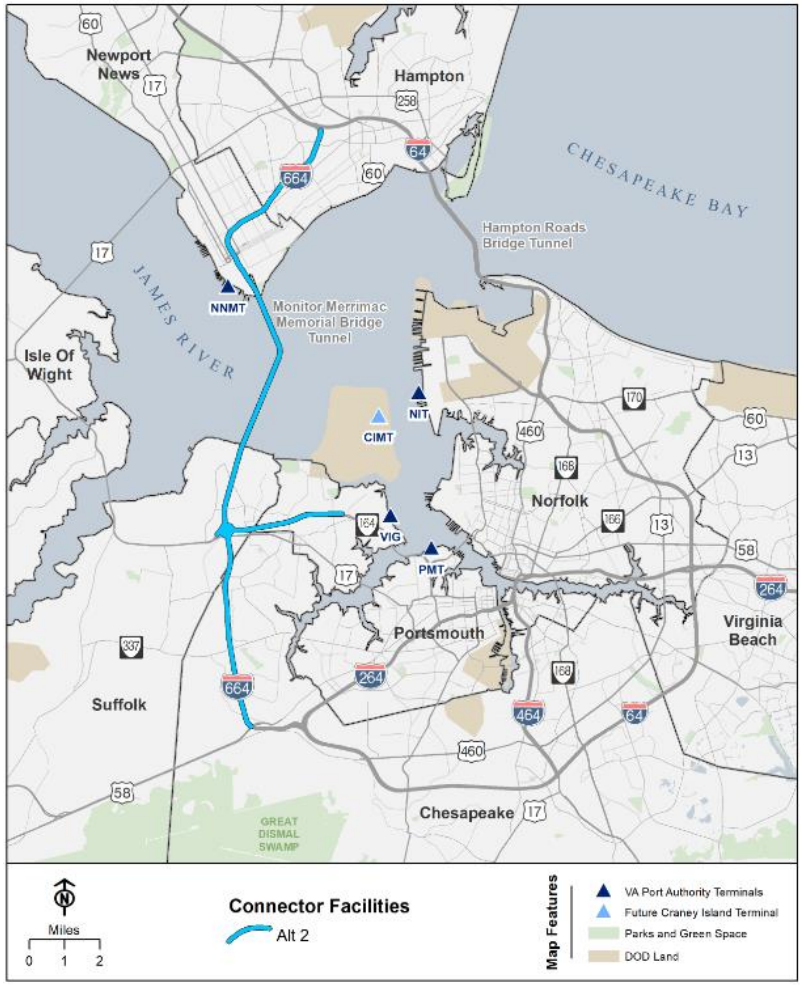
Bridge and Tunnel Across Hampton Roads
North of I-664 Connector: 6 GP + 2M



Typical Sections (MMMBT 4GP+4M Design Option)



Alternatives 2A and 2B

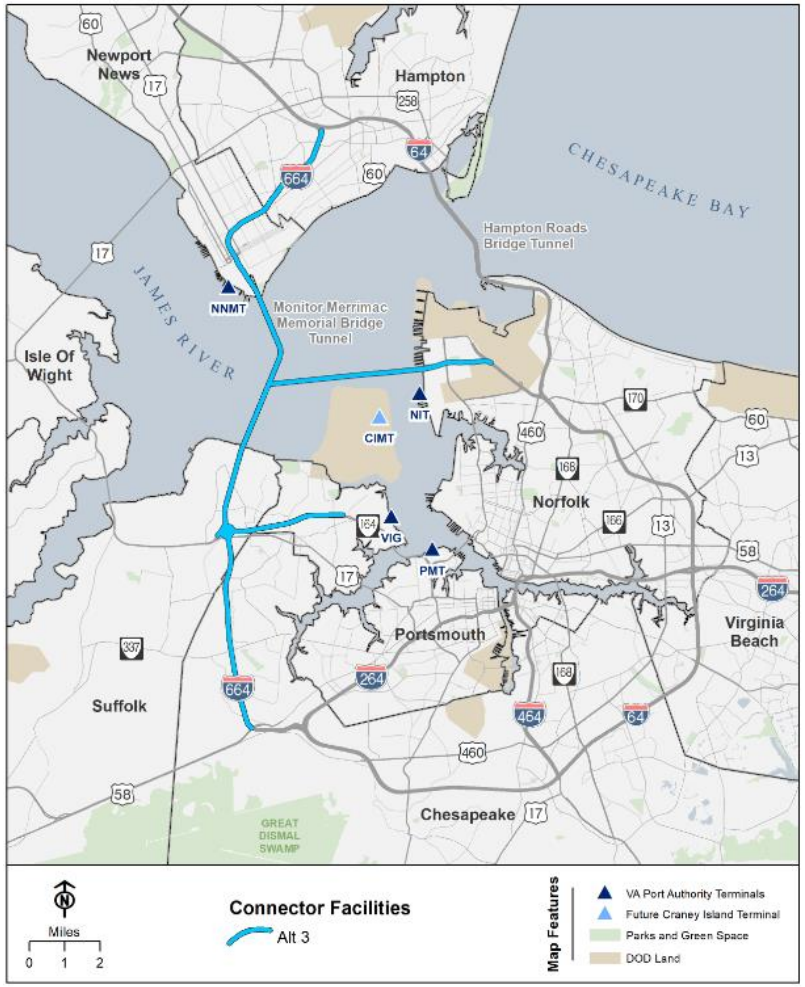


Note:

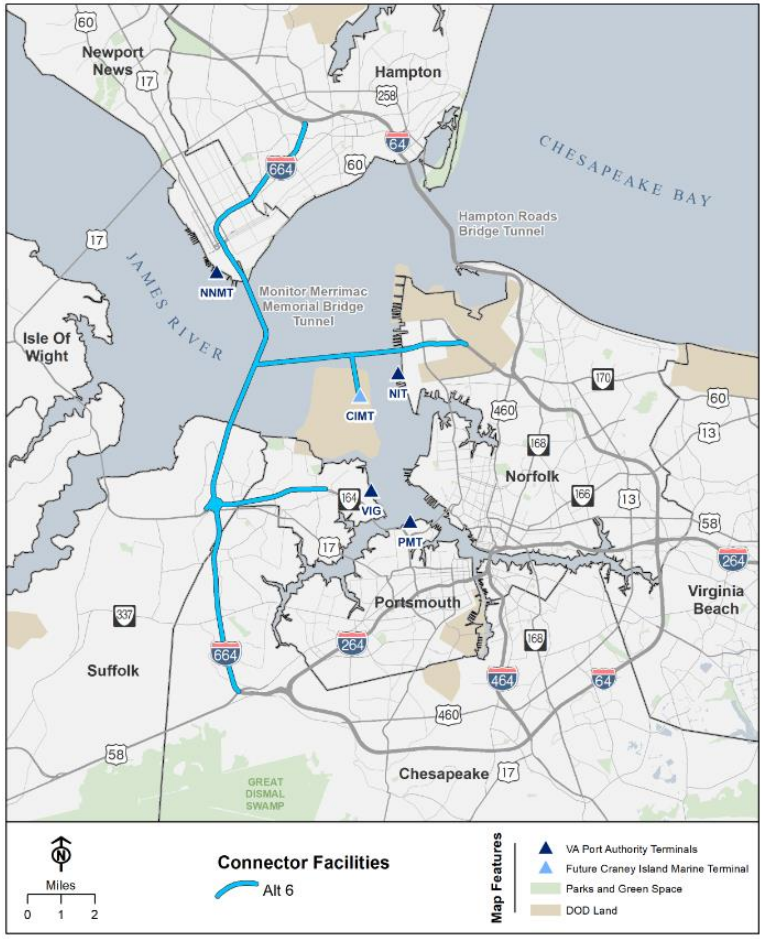
A – 6GP+2M

B – 4GP+4M

Alternatives 3A and 3B



Alternatives 6A and 6B

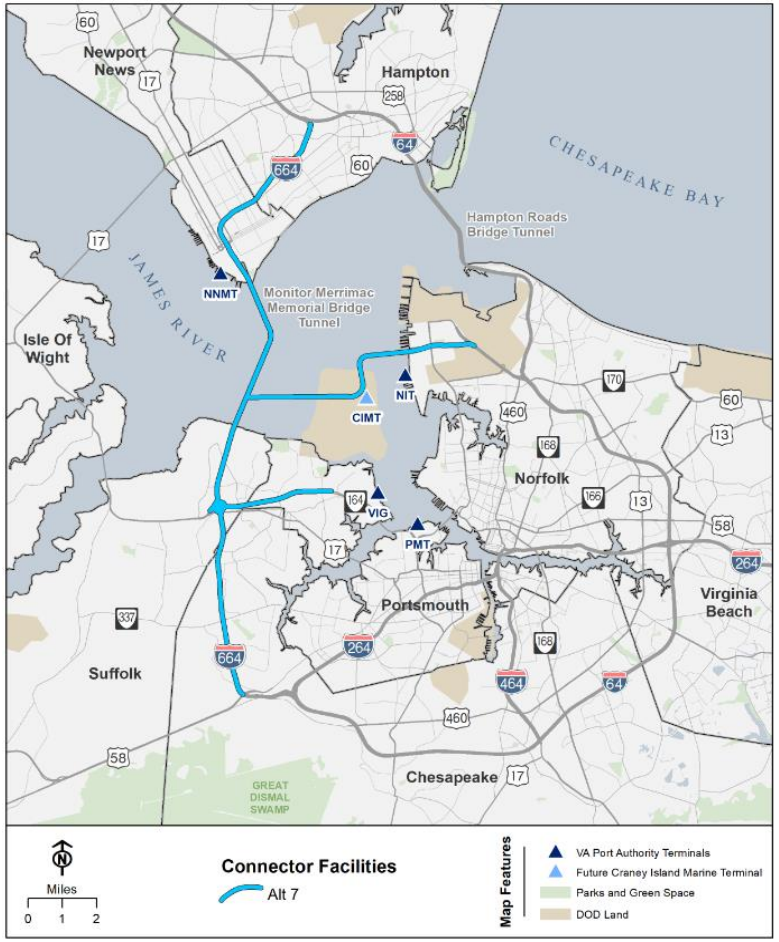


Note:

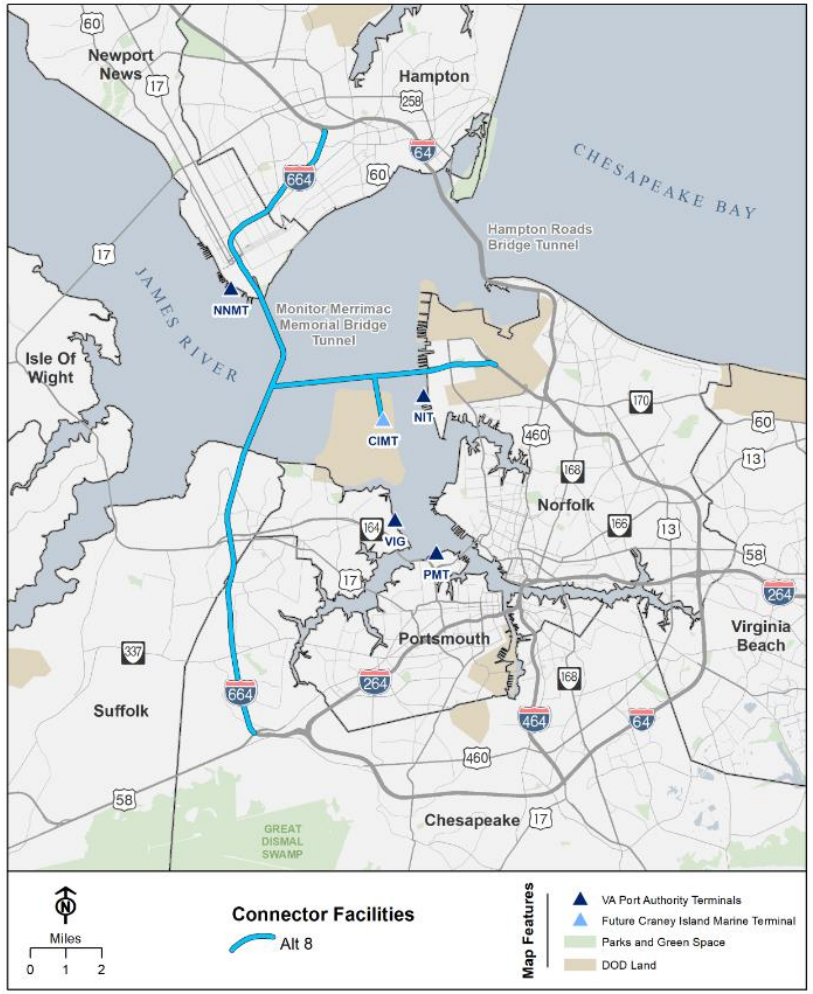
A – 6GP+2M

B – 4GP+4M

Alternatives 7A and 7B



Alternatives
8A and 8B

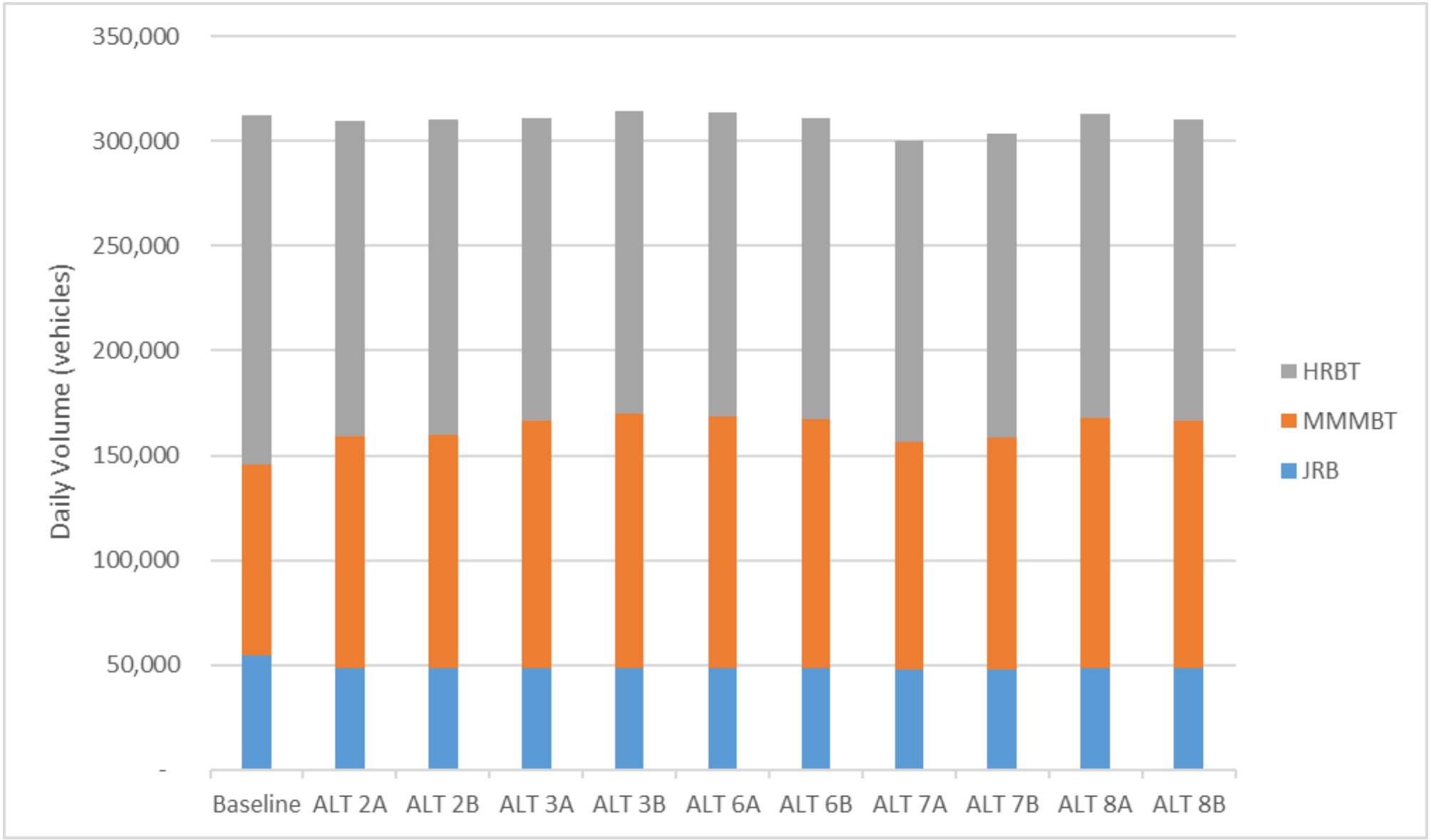


Note:
A – 6GP+2M
B – 4GP+4M

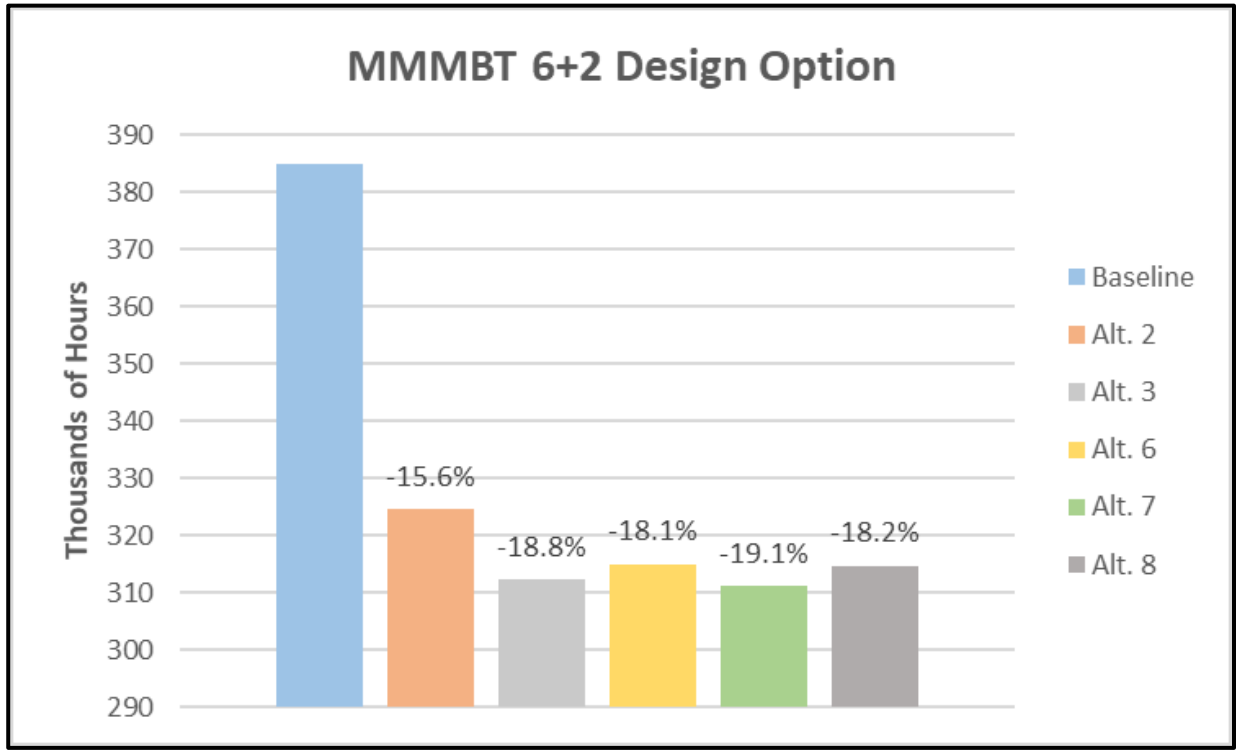
Modeling Runs

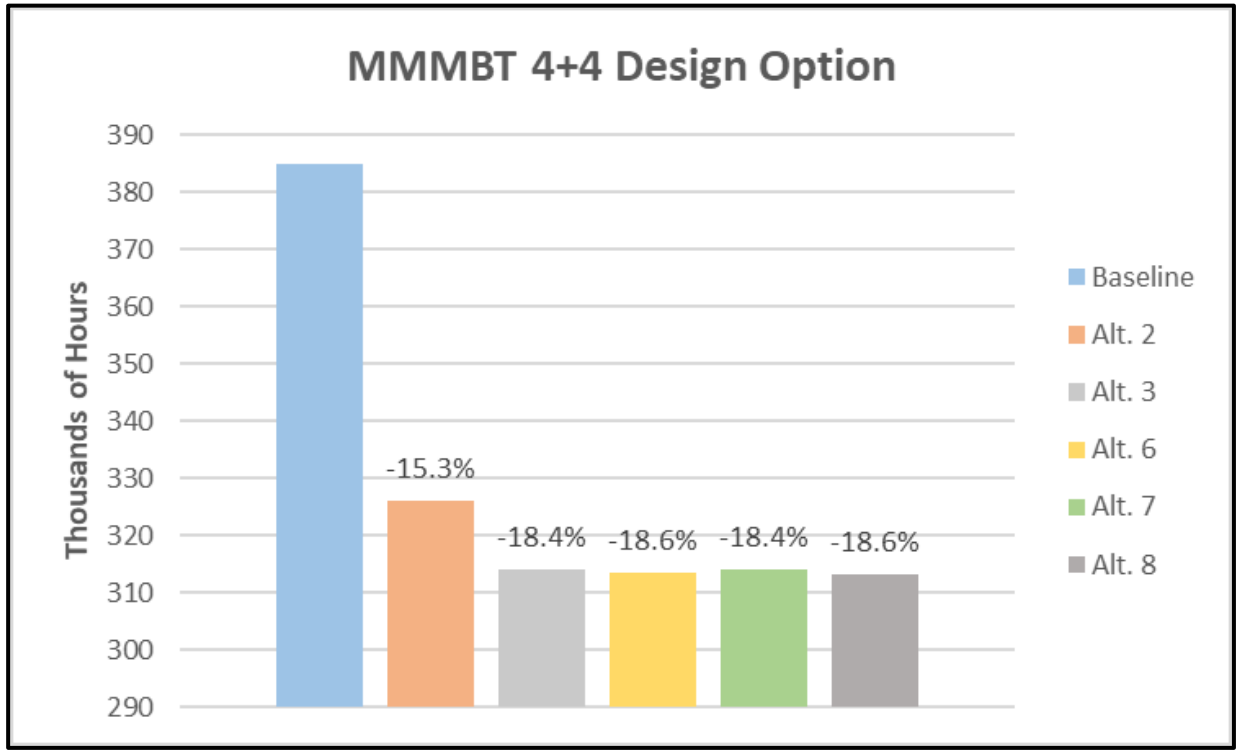
- Ran travel demand model for the 2045 Baseline and 5 combinations of mandated segments for two separate design options for MMMBT (6GP+2M and 4GP+4M):
  - Alternatives 2A, 2B, 3A, 3B, 6A, 6B, 7A, 7B, 8A, and 8B
- Prepared matrix to illustrate volumes for 2017, 2045 Baseline, and the 10 combinations of segments and MMMBT design options

2045 Estimated Daily Volumes - Harbor Crossings



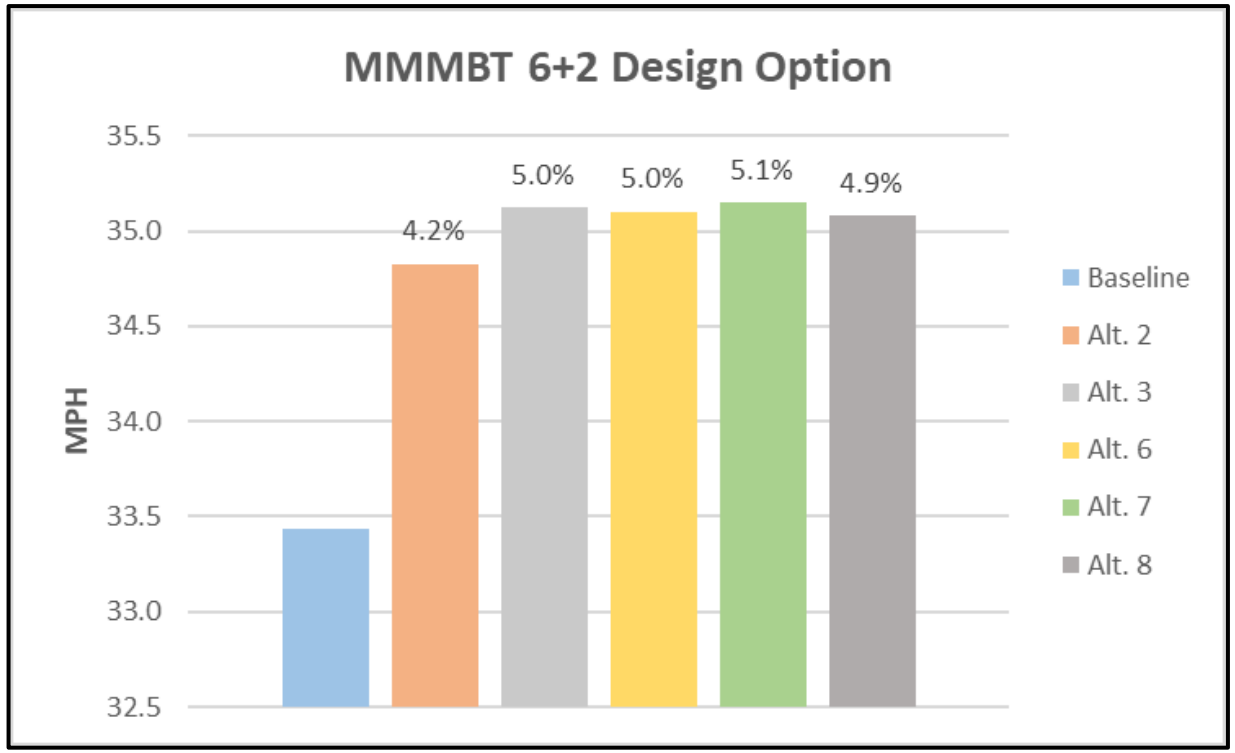
2045 Daily Delay

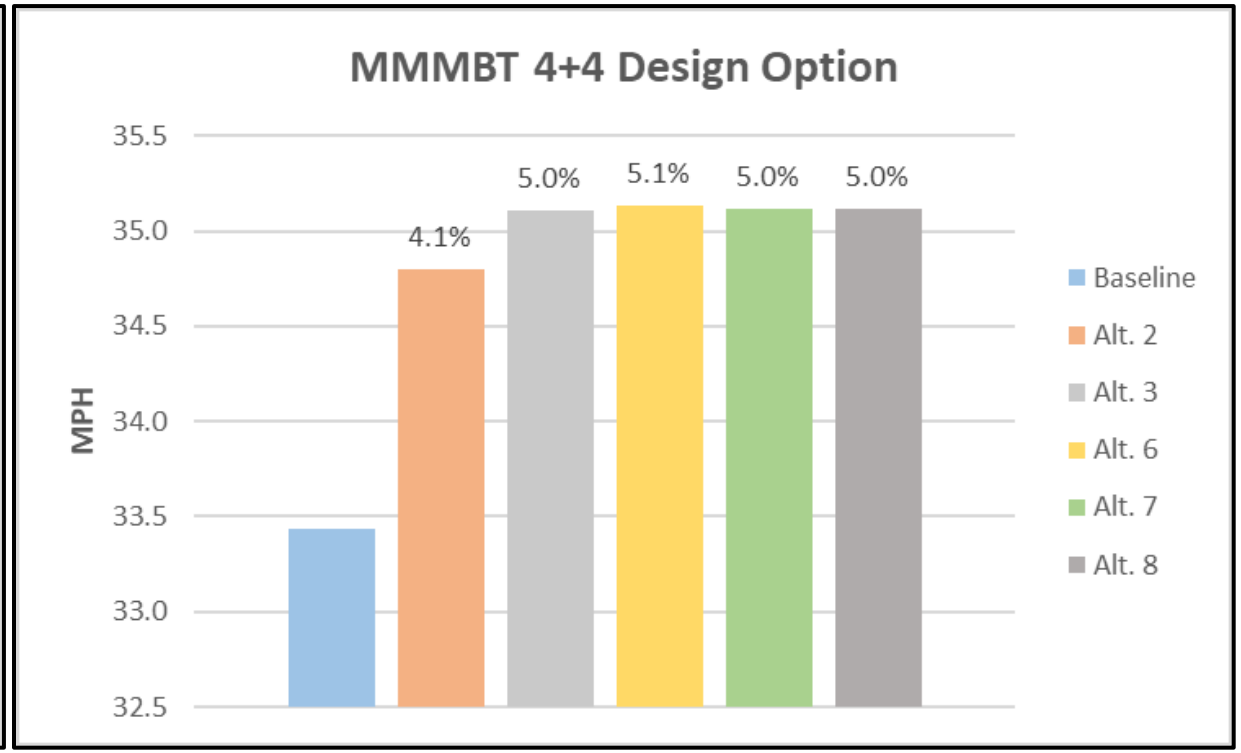




Note: % change compared with 2045 Baseline

2045 Daily Average Congested Speed





Note: % change compared with 2045 Baseline

Traffic Volumes

Daily Traffic Volumes at Selected Key Locations *

Location	2017 Existing	2045 Baseline ***	6GP+2M Design Option**					4GP+4M Design Option**				
			2045 Alternative 2A	2045 Alternative 3A	2045 Alternative 6A	2045 Alternative 7A	2045 Alternative 8A	2045 Alternative 2B	2045 Alternative 3B	2045 Alternative 6B	2045 Alternative 7B	2045 Alternative 8B
James River Bridge	37,431	54,382	48,404	48,241	48,447	47,582	48,363	48,775	48,630	48,472	47,926	48,481
Monitor Merrimack Bridge Tunnel (GP)	74,994	91,474	82,376	84,528	85,454	79,846	85,588	72,511	72,375	71,852	71,025	71,564
Monitor Merrimack Bridge Tunnel (Managed Lanes)	-	-	28,583	33,695	34,902	28,830	34,151	38,565	48,689	47,158	39,458	46,754
Hampton Roads Bridge Tunnel (GP)	92,195	108,450	96,892	96,032	96,300	94,643	96,157	96,947	96,324	95,946	95,229	95,833
Hampton Roads Bridge Tunnel (Managed Lanes)	-	57,699	53,370	48,257	48,544	49,486	48,614	53,377	48,031	47,527	50,116	47,730
Harbor Crossing Totals	204,620	312,005	309,626	310,753	313,646	300,386	312,873	310,175	314,049	310,954	303,755	310,361
US 58 MidTown Tunnel	50,700	61,062	61,495	54,560	54,959	55,274	54,527	61,282	54,611	54,675	55,725	54,397
I-264 under the Elizabeth River (Downtown Tunnel)	76,479	84,455	84,039	82,767	82,819	82,938	82,812	83,989	82,619	82,747	83,076	82,663
I-64 High Rise Bridge (GP)	106,183	122,191	121,885	121,765	122,340	121,863	121,989	122,034	121,690	122,178	122,090	121,866
I-64 High Rise Bridge (Managed Lanes)	-	15,960	21,060	18,381	18,386	18,320	18,620	21,289	18,566	18,858	18,696	18,855
VA 164 just east of I-664	50,087	49,412	58,329	52,447	52,937	52,825	47,051	58,650	53,644	52,999	53,557	47,333
I-564 Connector	-	-	-	39,569	40,146	30,596	40,021	-	39,932	39,752	31,135	39,915
CIMT Connector	-	-	-	-	715	776	727	-	-	723	780	734
I-664 Connector	-	-	-	39,569	40,494	31,000	40,373	-	39,932	40,110	31,542	40,278

Notes:

* I-664 and I-64: $0.06/mile managed lanes only; I-564 and I-664 connectors: $1.00 all lanes; No toll on CIMT connector.

** design plan recommended by Working Group and reviewed by HRTPO, May 13, 2021

*** Baseline network is E+C and consistent with HREL

XXX - Reduction from 2045 Baseline

YYY - Increase from 2045 Baseline

- 4+4 only pertains to I-664 from I-664 Connector to Powhatan Parkway interchange

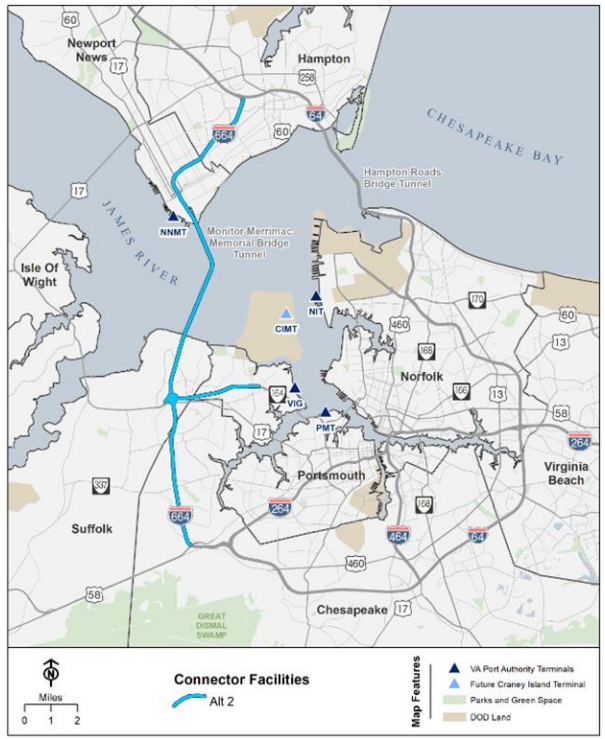
- See Attachment 6D for complete list of key locations

Working Group Recommendations, May 25, 2021

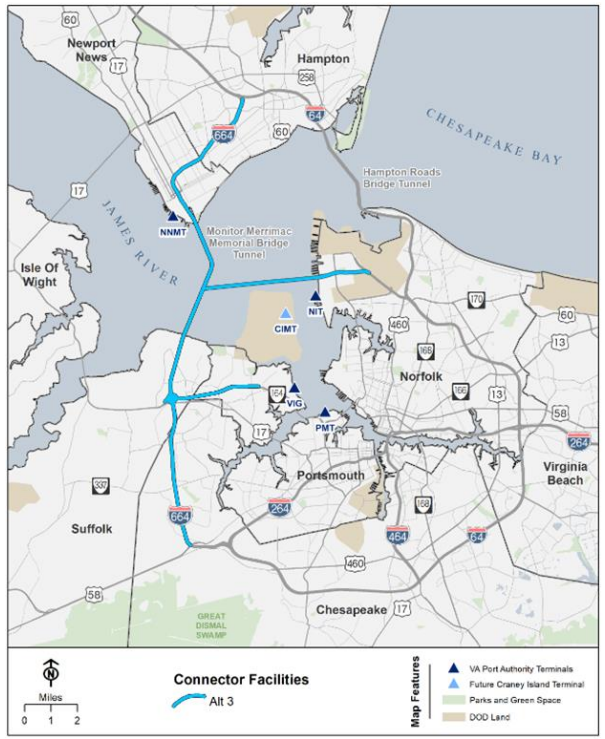
- Eliminate Alts 7A and 7B
  - I-664 and I-564 Connectors cannot be constructed until Craney Island Dredged Material Management Area has concluded operations (currently projected to be 2050)
- Recommend Alts 2A, 2B, 3A, 3B, 6A, 6B, 8A, and 8B as final preliminary alternatives/design options

Group Discussion

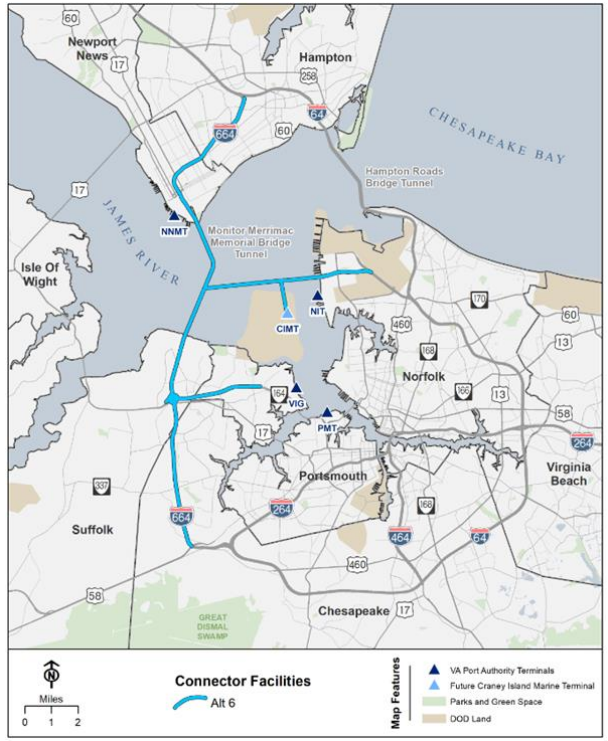
Note:
A – 6GP+2M
B – 4GP+4M



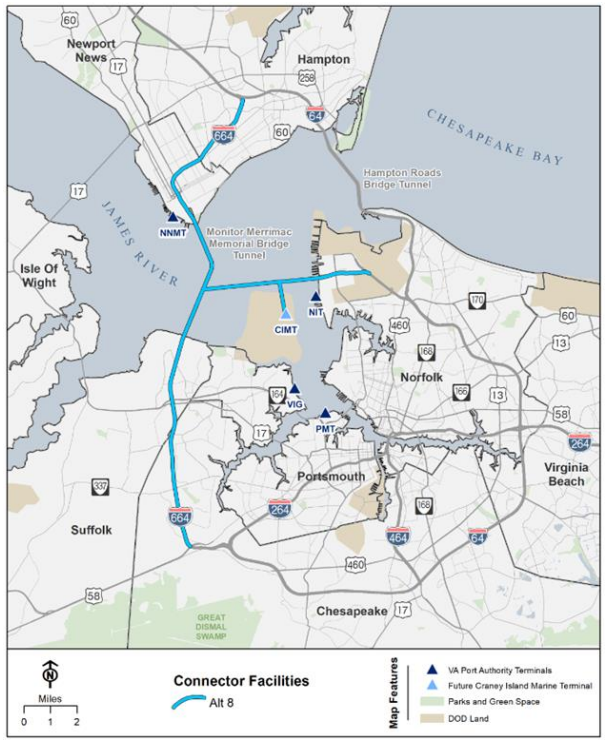
2A and 2B



3A and 3B



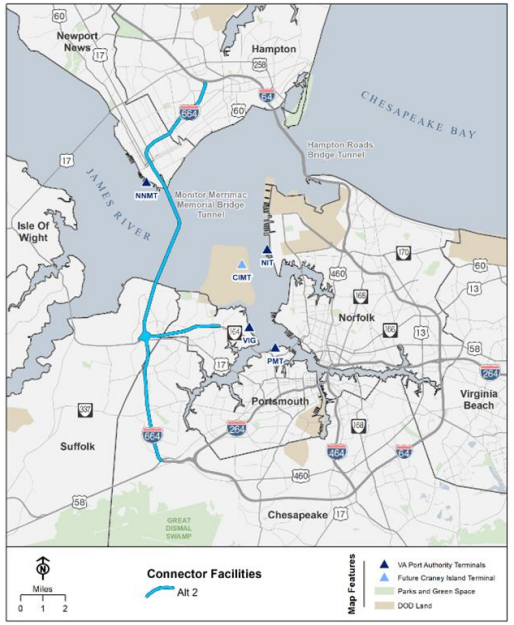
6A and 6B

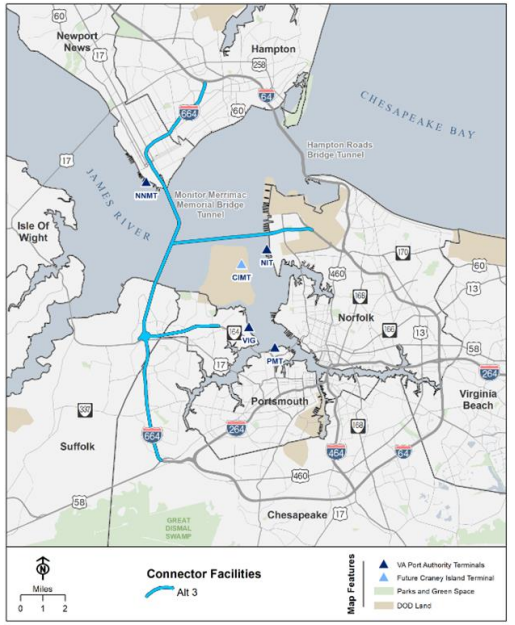


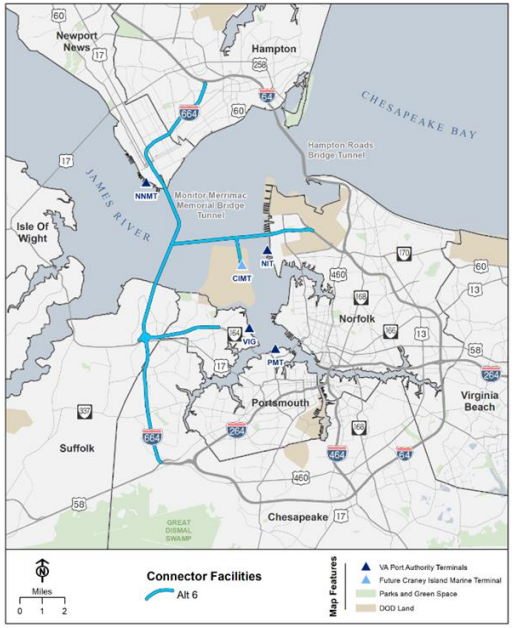
8A and 8B

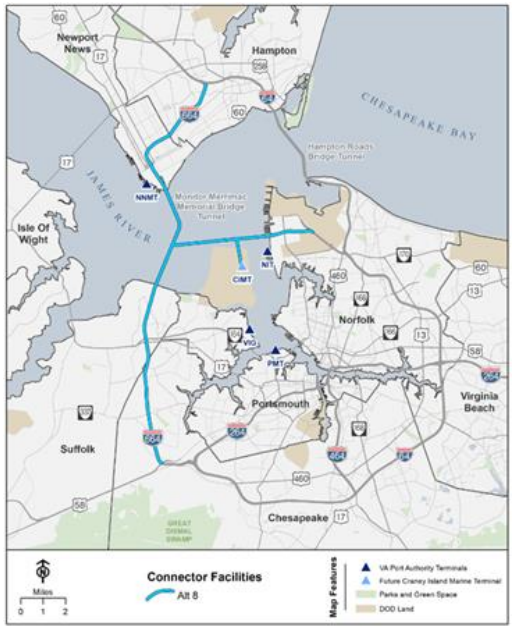
Recommended Action

- Approve preliminary alternatives and design options









the heartbeat of HAMPTON ROADS TPO
TRANSPORTATION PLANNING ORGANIZATION

REGIONAL CONNECTORS STUDY

6-MONTH OUTLOOK

Michael Baker INTERNATIONAL

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 September completion)
  - Hydraulics and Hydrology (Task 2.3 – end of September completion)
  - Structures (Task 2.4 – end of September completion)
  - Utilities and Railroad Crossings (Task 2.5 – end of September completion)
  - Planning Cost Estimates (Task 2.6 – end of September completion)
- Determination of Candidate Alternatives (Task 3)
  - Conduct Congestion Relief Assessments (Task 3.1a – end of August completion)
  - Performance Evaluation (Task 3.1b – mid-December completion)
  - Conduct Permitability Assessments (Task 3.2 – mid-December completion)
  - Conduct Constructability Assessments (Task 3.3 – mid-December completion)

Phase 3 Schedule

REVISED - Regional Connectors Study - Phase 3 Schedule (June 8, 2021)

Task No.	Task	2021 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	2022 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	2023 JAN	FEB	MAR	APR	MAY
TASK 1	EXECUTE ENGAGEMENT PLAN																													
1.1	Task Management																													
1.2	Engagement Plan Review																													
1.3a	Study Mailing List and Comment Database																													
1.3b	Scenario Planning Virtual Meeting																													
1.3c	Community Briefings and Presentations																													
1.3d	Brochures, Factsheets, and Handouts																													
1.3e	Public Meetings																													
1.3f	Regional Connectivity Symposium																													
1.3g	Community Events and Outreach																													
1.3h	Social Media Engagement																													
1.3i	Engagement Report																													
1.4	Website Upgrades and Maintenance																													
TASK 2	DEVELOPMENT OF PRELIMINARY ALTERNATIVES																													
2.1a	Summarize Background Information																													
2.1b	Conduct Unconstrained Travel Demand Model Analysis																													
2.1c	Preliminary Alternatives Identification																													
2.2	Develop/Refine Geometry of Preliminary Alternatives																													
2.3	Hydraulics and Hydrology																													
2.4	Structures																													
2.5	Utilities and Railroad Crossings																													
2.6	Planning Cost Estimates																													
TASK 3	DETERMINATION OF CANDIDATE ALTERNATIVES																													
3.1a	Conduct Congestion Relief Assessments																													
3.1b	Performance Evaluation																													
3.2	Conduct Permitability Assessments																													
3.3	Conduct Constructability Assessments																													
3.4	Identify Candidate Alternatives																													
TASK 4	CONDUCT SCENARIO PLANNING																													
4.8a	Confirmation/Network Coding of Candidate RCS projects for testing																													
4.8b	Travel Demand Modeling for Baseline and 3 Greater Growth Scenarios (each Candidate Project)																													
4.8c	Evaluate Performance of Candidate Projects under Baseline and 3 Greater Growth Scenarios																													
4.8d	Evaluate Traffic Operating Conditions																													
4.9a	Scenario Results Workshops																													
4.9b	Recommendation Documentation																													
TASK 5	PREPARE FOR AND ATTEND MEETINGS (WORKING GROUP AND STEERING COMMITTEE)																													
5.1	Working Group Meetings																													
5.2	Steering Committee Meetings																													
TASK 6	MANAGE THE PROJECT																													
6.1	Weekly Coordination with Study Leadership																													
6.2	Schedule and Budget Oversight																													
6.3	Quality Assurance of Deliverables																													
TASK 7	PREPARE DOCUMENTATION																													
7.1	Draft Study Report																													
7.2	Final Study Report																													

Continuous Task
Task Schedule
Key Decision Point
Steering Committee Meetings
Working Group Coordination Meeting
Public Meeting

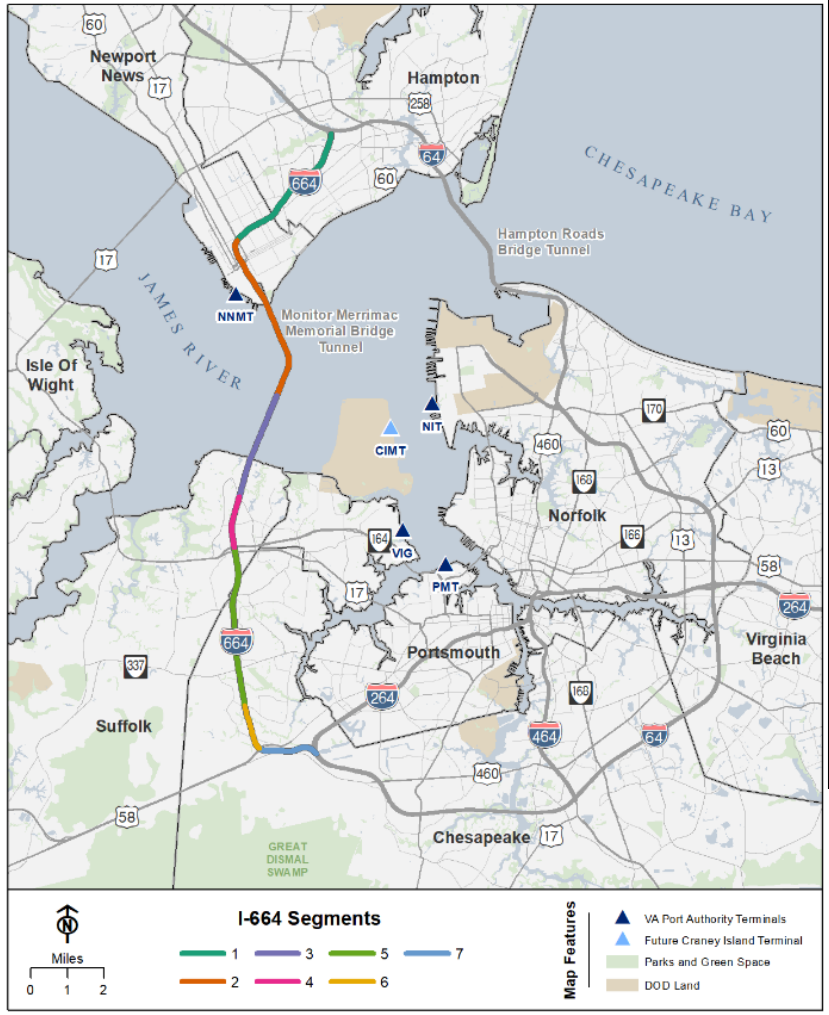
the heartbeat of HAMPTON ROADS TPO
TRANSPORTATION PLANNING ORGANIZATION

REGIONAL CONNECTORS STUDY

REFERENCE SLIDES – IF NEEDED

Michael Baker INTERNATIONAL

Modeling Assumptions



I-664 Roadway Segments	Actual Existing Lanes	MMMBT Design Option (6+2)	MMMBT Design Option (4+4)	Comments
I-64 to Terminal Avenue Interchange	6	6+2	6+4/2*	
Terminal Avenue Interchange to I-664 Connector	4	6+2	4+4	MMMBT
I-664 Connector to College Dr. (Exit 8)	4	6+2	4+4	
College Dr. (Exit 8) to VA 164**	6	6+4	6+4	Bowers Hill Study Area
VA 164 to Dock Landing Rd**	4	4+4	4+4	
Dock Landing Rd to US 58 (Bowers Hill)**	4	6+4	6+4	
US 58 (Bowers Hill) to I-264W**	8	8+4	8+4	
* Adds/drops second HOT lane at Powhatan Parkway				
**Per Bowers Hill Interchange Improvement Study				

2045 Roadway Capacity Utilization – Harbor Crossings
MMMBT 6+2 Design Option

Description	Baseline		Alternative 2A		Alternative 3A	
	Peak	Off-Peak	Peak	Off-Peak	Peak	Off-Peak
James River Bridge	131%	72%	111%	69%	111%	71%
Monitor Merrimac Memorial Bridge-Tunnel (GP)	128%	95%	79%	58%	85%	60%
Monitor Merrimac Memorial Bridge-Tunnel (Managed)	-	-	84%	50%	88%	65%
Hampton Roads Bridge-Tunnel (GP)	161%	121%	138%	115%	130%	114%
Hampton Roads Bridge-Tunnel (Managed)	134%	100%	103%	98%	107%	91%

Note: Values reflect peak direction of traffic for AM peak and Midday off-peak periods for selected alternatives only

2045 Roadway Capacity Utilization – Harbor Crossings
MMMBT 4+4 Design Option

Description	Baseline		Alternative 2B		Alternative 3B	
	Peak	Off-Peak	Peak	Off-Peak	Peak	Off-Peak
James River Bridge	131%	72%	111%	70%	112%	71%
Monitor Merrimac Memorial Bridge-Tunnel (GP)	128%	95%	98%	83%	95%	83%
Monitor Merrimac Memorial Bridge-Tunnel (Managed)	-	-	69%	28%	80%	38%
Hampton Roads Bridge-Tunnel (GP)	161%	121%	137%	115%	131%	115%
Hampton Roads Bridge-Tunnel (Managed)	134%	100%	100%	98%	107%	89%

Note: Values reflect peak direction of traffic for AM peak and Midday off-peak periods for selected alternatives only

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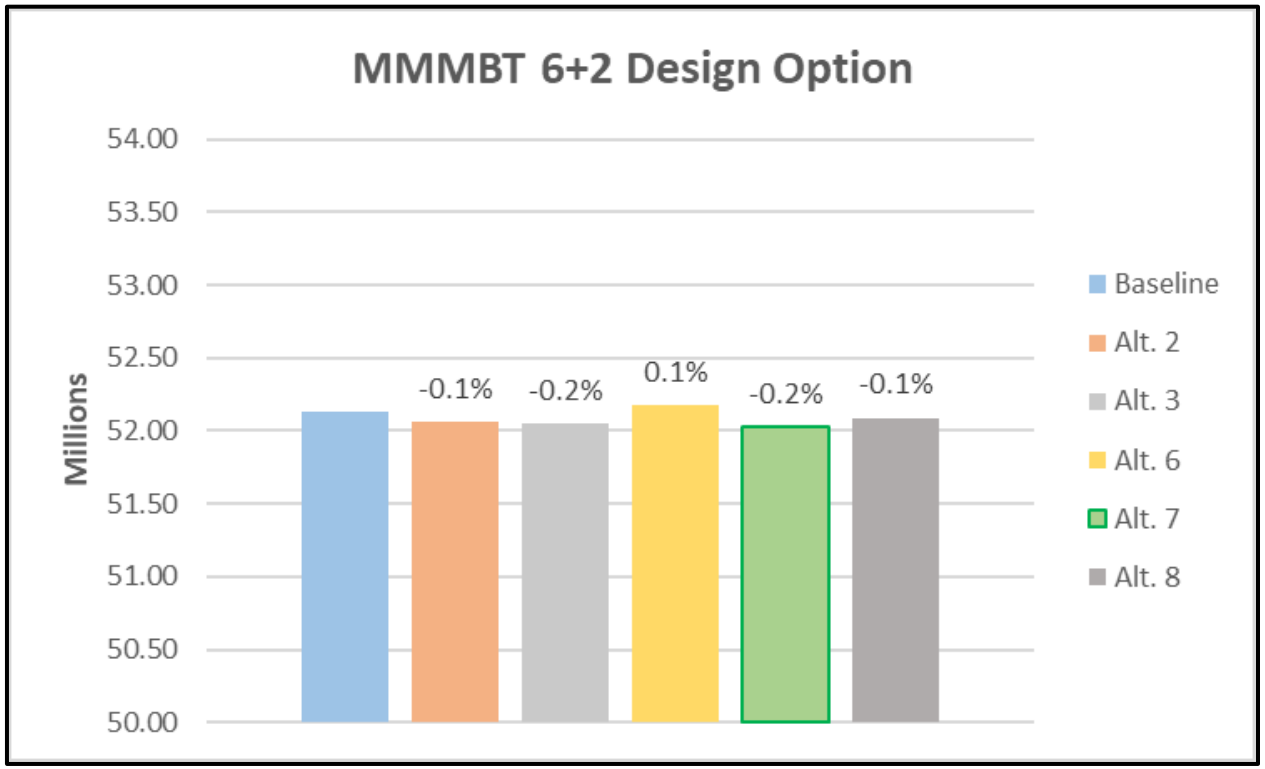
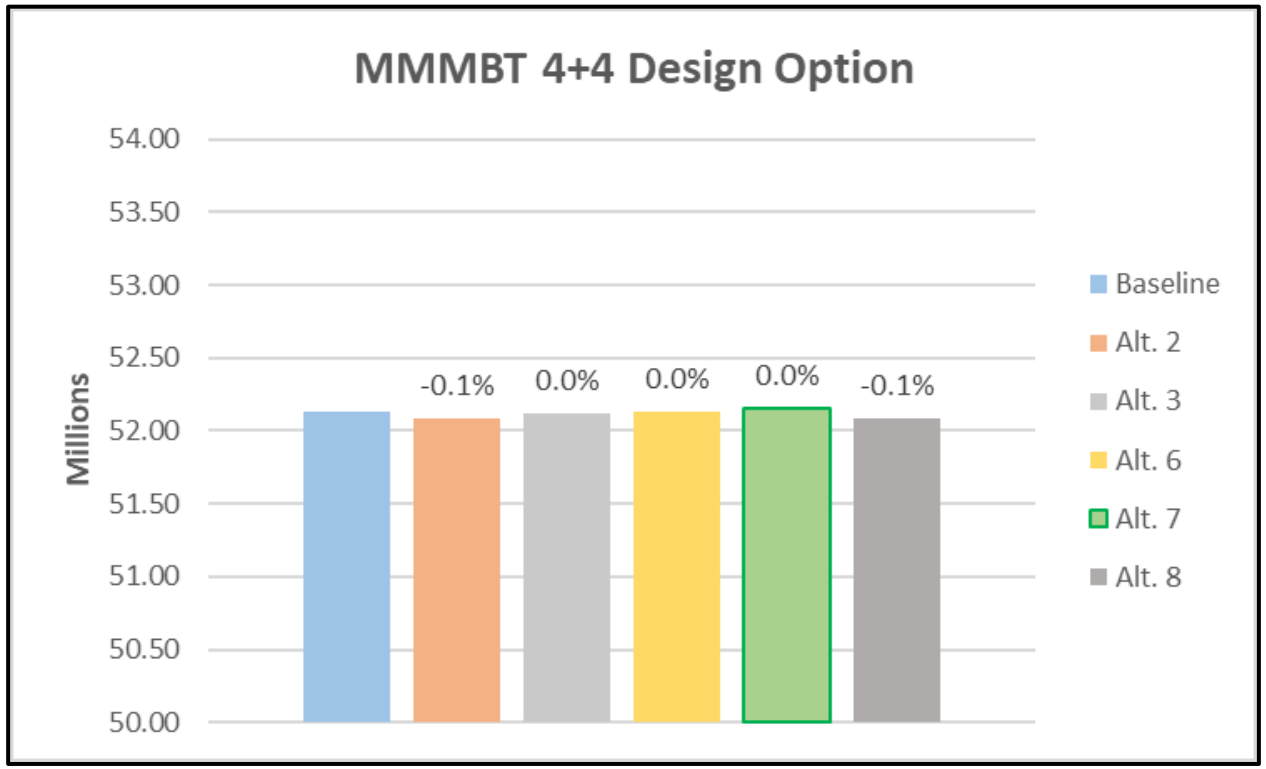
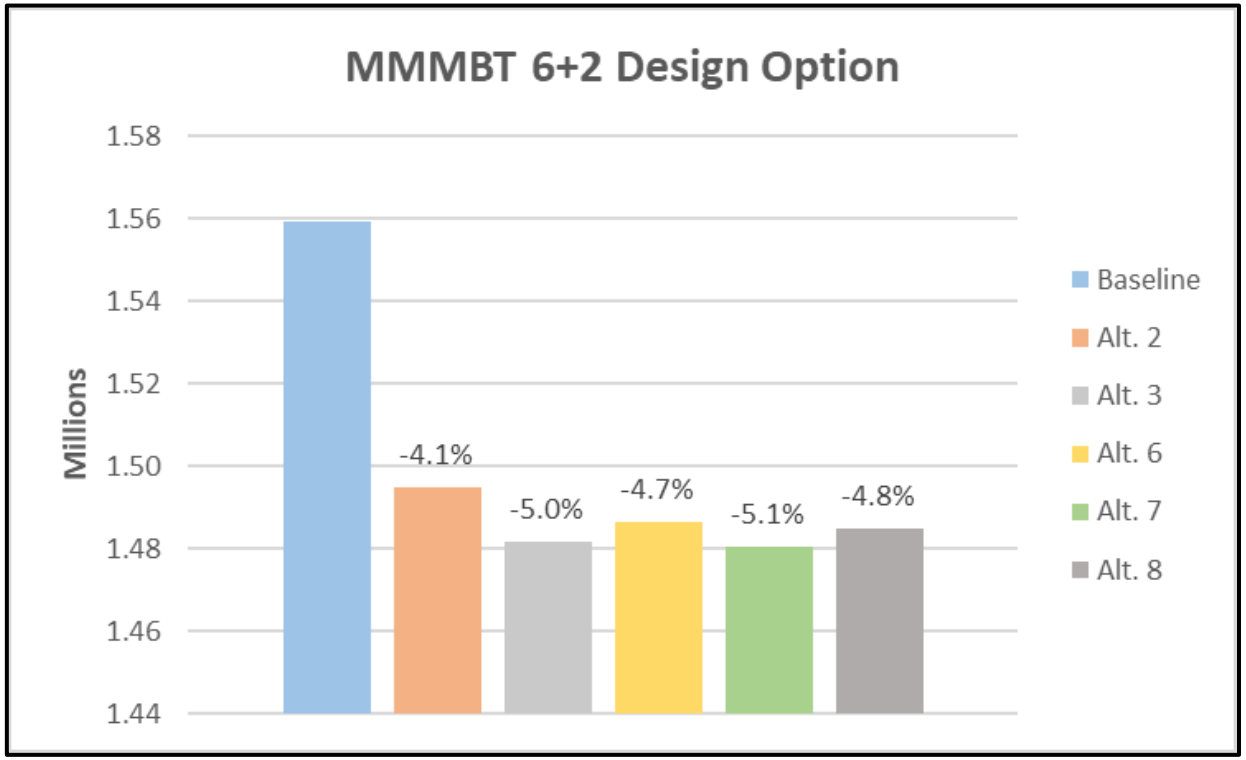
2045 Daily Vehicle-Miles Traveled

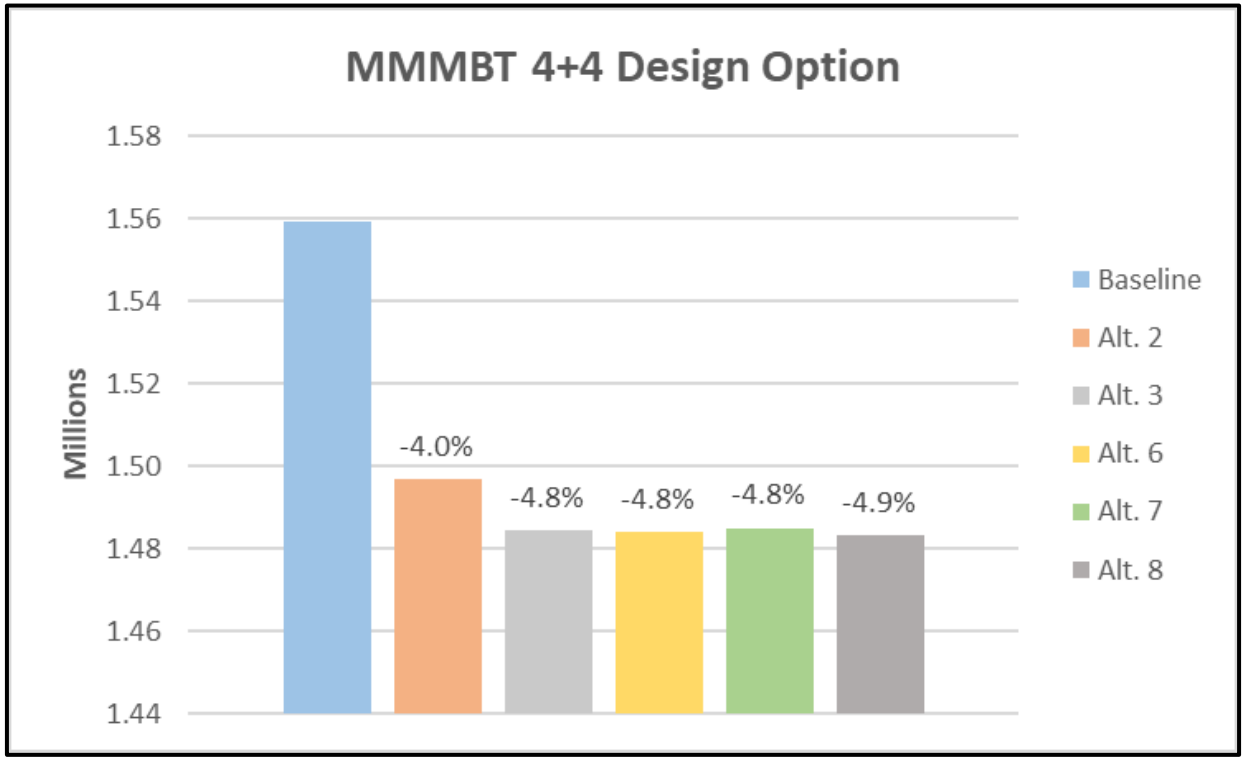




Note: % change compared with 2045 Baseline

2045 Daily Vehicle-Hours Traveled





Note: % change compared with 2045 Baseline

2045 Travel Times (in minutes)

- Blue – Path A
- Pink – Path B

Direction of Travel		2045 Baseline		MMMBT 6+2 Design Option				MMMBT 4+4 Design Option			
				Alternative 2A		Alternative 3A		Alternative 2B		Alternative 3B	
		GP	Managed	GP	Managed	GP	Managed	GP	Managed	GP	Managed
Path A (via I-664)	Peak (SB)	64.2	-	39.8	28.8	38.1	27.4	41.1	27.7	38.4	27.0
	Change	-	-	-38.1%	-	-40.8%	-	-36.0%	-	-40.3%	-
	Off-Peak (SB)	36.3	-	33.4	25.0	32.7	25.2	35.0	24.7	34.4	24.8
	Change	-	-	-7.9%	-	-9.8%	-	-3.4%	-	-5.2%	-
Path B (via I-64)	Peak (SB)	89.2	69.3	64.8	49.5	57.8	38.7	64.6	45.7	58.0	39.9
	Change	-	-	-27.3%	-28.5%	-35.2%	-44.1%	-27.5%	-34.0%	-35.0%	-42.4%
	Off-Peak (SB)	50.1	26.3	46.0	26.3	45.2	26.2	46.4	26.2	45.6	26.2
	Change	-	-	-8.3%	-0.2%	-9.9%	-0.5%	-7.5%	-0.2%	-9.0%	-0.5%

Note: - Travel times (in minutes) reflect direction of traffic for AM peak and Midday off-peak periods; % change compared with 2045 Baseline

Modeling Volume Locations