

REGIONAL
CONNECTORS
STUDY

WORKING GROUP MEETING

June 11, 2020

Phase 2 Status Report

■ Scenario Planning

- Awaiting model runs for growth scenarios to see if adequate differentiation has been achieved
- Preparing to populate dashboard as model runs are completed

■ Travel Demand Model

- Fine tuning cross harbor adjustments
- Fine tuning technology template
- Fine tuning internal-external trip table

■ Website

- Up to date with minutes, agendas, other documents

■ Schedule

- Early August 2020 completion

Phase 2 Status Report (Cont.)

■ Deliverables

- Scenario Planning Methodology White Paper – **Complete**
- Memo Summarizing Economic Trends and Opportunities – **Complete**
- Memo Summarizing Travel Behavior Data Review – **Late July**
- Memo Summarizing Travel Demand Model Evaluation – **Late July**
- Tech Memo on Drivers, Spatial Assumptions, and Travel Parameters – **Complete**
- Tech Memo on Performance Measures – **Complete**
- Technical Guide on Scenario Evaluation – **Mid-August**

Phase 3 Status Report

- Task 1 – Engagement
 - Uploading agendas, minutes, and reports to website
 - Launched project Facebook page
 - Uploaded FAQ and Project Factsheet
- Task 2 – Preliminary Alternatives
 - Completed review and developed summary of HRCS SEIS Alternatives report
 - Updated cost estimates for mandated segments
- Task 3 – Determination of Candidate Alternatives
 - No activity
- Task 4 – Scenario Planning
 - Nearing completion of VISSIM and FREEVAL analysis for existing condition

Phase 3 Status Report (Cont.)

- Schedule

- <<TBD on internal coordination call next Tuesday>>

- Major Deliverables

- Summary of Mandated Preliminary Segments - **Complete**
- Updated Cost Estimates for Mandated Preliminary Alternatives - **Complete**
- Summary of Candidate Alternatives - TBD
- Tech Memo on Microsimulation Analysis – TBD
- Scenario Planning Report – TBD
- Engagement Summary Report – TBD
- Study Report - TBD

Travel Demand Model Update

- Travel Demand Model Adjustments
 - Cross harbor adjustments
 - Technology template
 - Internal-external trip table

Cross-Harbor Adjustments

- Validation of the HRTPO v2.0 travel model (TDM) revealed overestimation of demand across Harbor compared with observed demand. Adjustments implemented to correct.
- Reduce dependence on current adjustments in the TDM that may affect ability of the TDM to forecast future demand for certain land use alternatives and projects.
 - Bridge Distance Penalties (4.2x)
 - Jurisdiction-to-Jurisdiction Adjustment Factors (Commuters)
- Introduce travel time reliability as, at least, a partial explanation for lower observed demand than estimated by the TDM.

Travel Time Reliability

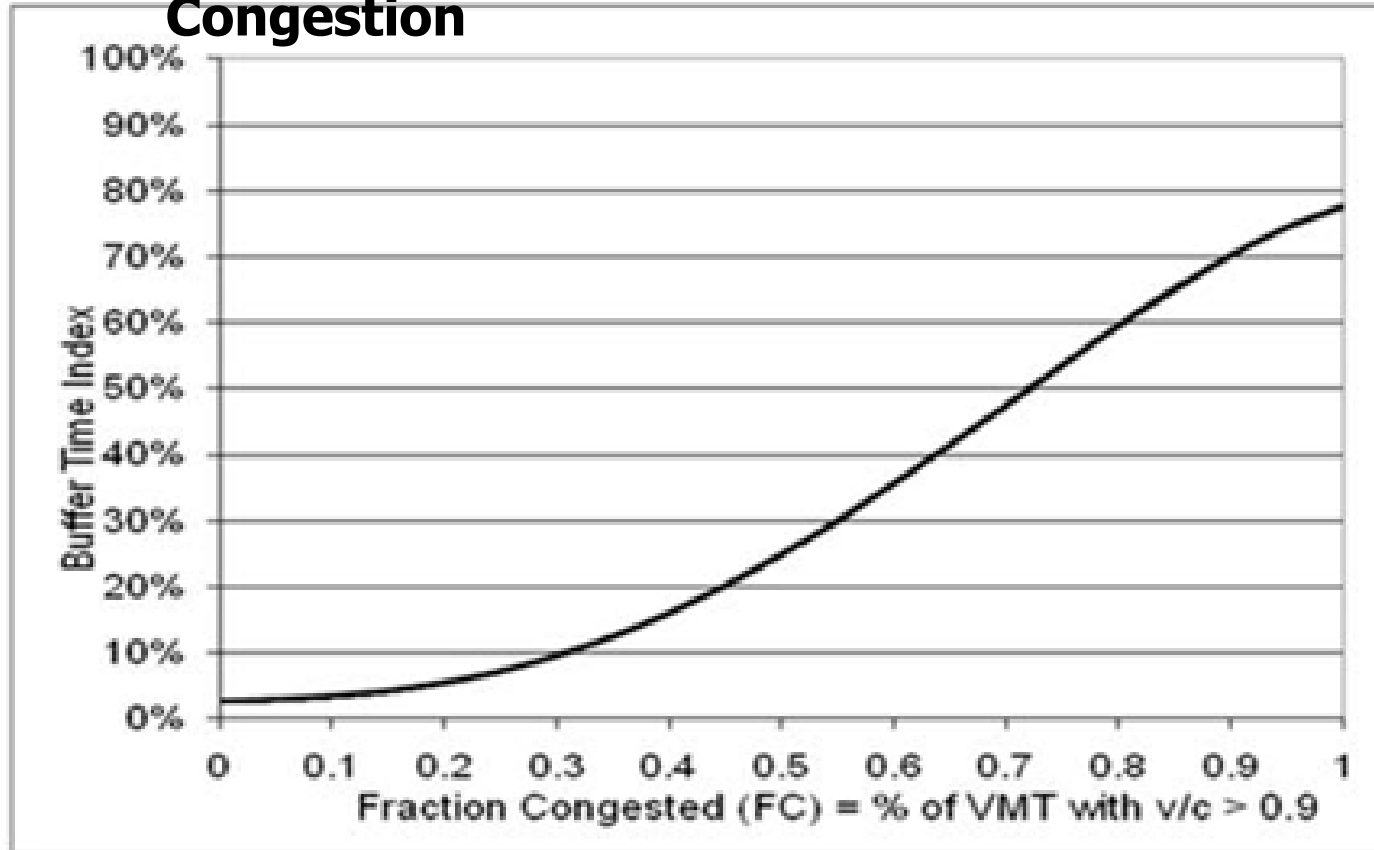
- As congestion increases, the variance in travel time on a day-to-day basis increases – travel times less reliable.
- Travelers program in extra travel time (buffer time) to ensure on-time arrival.
- Perceived Time = Actual Time + Buffer Time
- This additional time makes certain destinations less attractive depending on the level of congestion along the travel path.

Implementation

- Travel paths that use the cross-harbor bridges and tunnels.
- Determine percentage of VMT in congested conditions for each path.
- Calculate buffer time for each path based on congested VMT.
- Add buffer time to actual travel times for each path yielding perceived times.
- Feed perceived times into the TDM.
- Re-validate the TDM using observed travel pattern and traffic count data – focus on cross-harbor travel.
- Examine impact on forecasted growth across the harbor.
- Assess reduction in need for original cross-harbor adjustments.

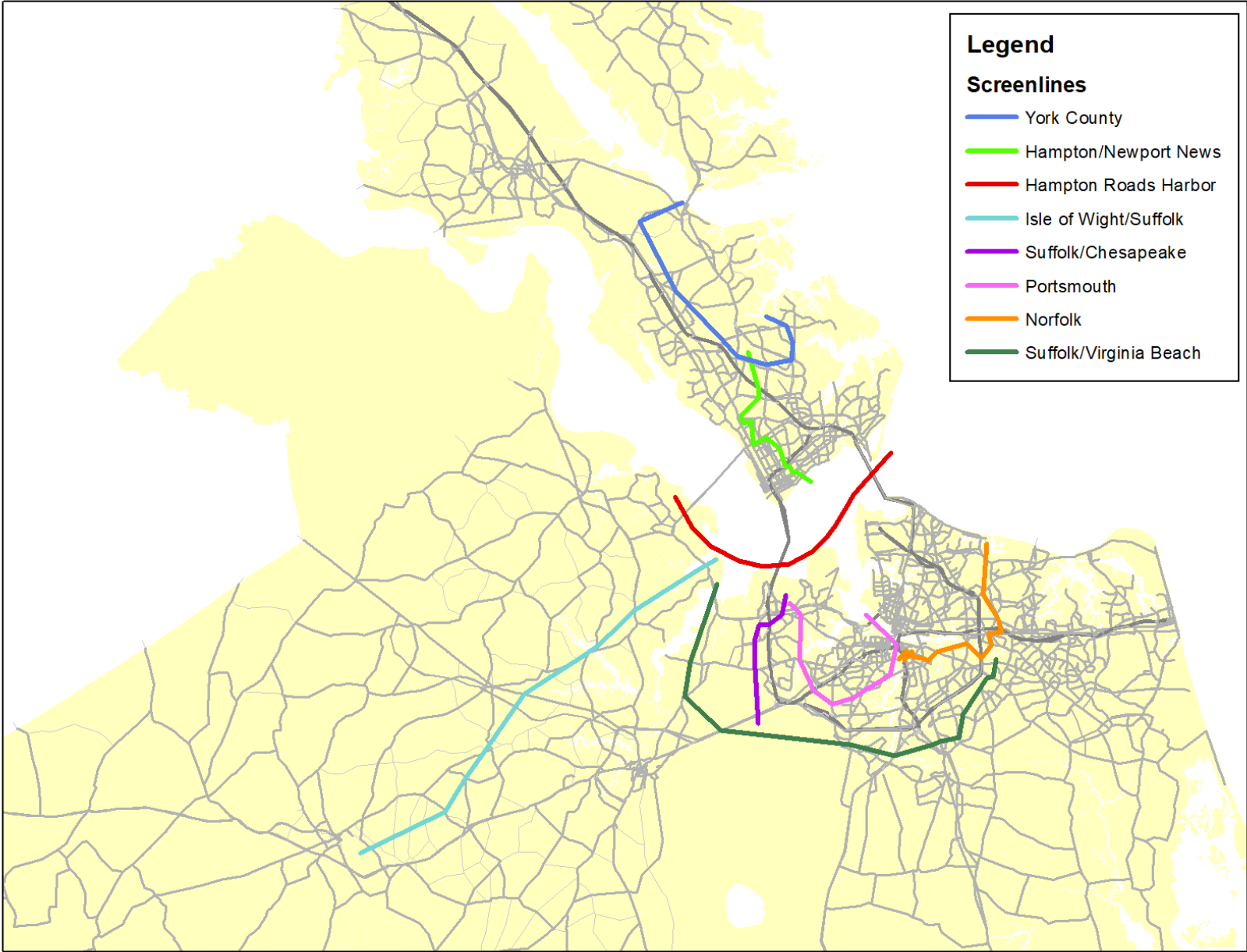
Implementation

Relationship between Buffer Time Index and Congestion



Source: TREDIS Technical Documentation

Validation



Validation – Cross Harbor Travel

HRTPO Model Update

2017 Screenline Validation, Daily Volumes

Screenline	"Stock" HRTPO Model Update			Removal of Cross-Harbor Adj.			Reliability + Modified Adjustments			VDOT Criteria
	Count	Model	Error	Count	Model	Error	Count	Model	Error	
York County	181,869	165,153	-9%	181,869	171,814	-6%	181,869	165,330	-9%	+/- 6%
Hampton/Newport News	388,528	408,370	5%	388,528	441,442	14%	388,528	413,636	6%	+/- 3%
Hampton Roads Harbor	194,391	200,904	3.4%	194,391	229,111	17.9%	194,391	205,179	5.5%	+/- 6%
Isle of Wight/Suffolk	51,312	58,344	14%	51,312	62,053	21%	51,312	58,380	14%	+/- 11%
Suffolk/Chesapeake	281,392	272,902	-3%	281,392	283,802	1%	281,392	274,210	-3%	+/- 5%
Portsmouth	311,106	348,572	12%	311,106	361,652	16%	311,106	350,680	13%	+/- 3%
Norfolk	758,331	764,728	1%	758,331	763,578	1%	758,331	771,804	2%	+/- 4%
Suffolk/Virginia Beach	367,065	363,993	-1%	367,065	366,405	0%	367,065	364,351	-1%	+/- 2%

Validation – Regional

HRTPO Model Update

2017 Validation by Facility Type, Daily Vehicle-Miles Traveled

Facility Type	"Stock" HRTPO Model Update			Removal of Cross-Harbor Adj.			Reliability + Modified Adjustments			VDOT Criteria
	Count	Model	Error	Count	Model	Error	Count	Model	Error	
Interstate	7,124,081	7,337,125	3.0%	7,124,081	7,559,426	6.1%	7,124,081	7,419,929	4.2%	+/- 7%
Freeway	1,164,317	1,152,257	-1.0%	1,164,317	1,165,200	0.1%	1,164,317	1,152,074	-1.1%	+/- 7%
Principal Arterial	1,564,267	1,571,892	0.5%	1,564,267	1,598,232	2.2%	1,564,267	1,577,976	0.9%	+/- 10%
Major Arterial	464,193	470,129	1.3%	464,193	477,799	2.9%	464,193	471,543	1.6%	+/- 15%
Minor Arterial	2,163,506	2,052,706	-5.1%	2,163,506	2,048,495	-5.3%	2,163,506	2,058,354	-4.9%	+/- 15%
Major Collector	219,716	232,694	5.9%	219,716	235,345	7.1%	219,716	232,282	5.7%	+/- 20%
Minor Collector	493,884	441,211	-10.7%	493,884	441,851	-10.5%	493,884	440,985	-10.7%	+/- 20%
Local	14,632	10,785	-26%	14,632	10,612	-27%	14,632	10,659	-27%	
Total	13,208,596	13,268,799	0.5%	13,208,596	13,536,960	2.5%	13,208,596	13,363,802	1.2%	

Effect on Cross-Harbor Growth (2017 to 2045 E+C)

Crossing	Direction	"Stock" HRTPO Model Update					Reliability + Modified Adjustments				
		2017		2045 E+C		Growth	2017		2045 E+C		Growth
		Volume	V/C*	Volume	V/C		Volume	V/C	Volume	V/C	
Hampton Roads Bridge-Tunnel	NB	47,411	0.95	71,253	0.78	50.3%	47,149	0.94	75,575	0.83	60.3%
	SB	49,247	0.98	74,188	0.81	50.6%	48,665	0.97	79,276	0.87	62.9%
Monitor Merrimac Memorial Bridge-Tunnel	NB	34,440	0.67	40,308	0.78	17.0%	36,874	0.72	44,078	0.86	19.5%
	SB	37,442	0.73	41,722	0.81	11.4%	39,907	0.78	45,143	0.88	13.1%
James River Bridge	NB	16,905	0.51	22,407	0.68	32.5%	16,938	0.51	23,605	0.72	39.4%
	SB	15,459	0.47	20,534	0.62	32.8%	15,645	0.48	21,544	0.65	37.7%
TOTAL		200,904	0.75	270,412	0.77	34.6%	205,178	0.76	289,221	0.82	41.0%

Note: Raw travel model daily volumes

* Volume-to-capacity ratio

Modified Adjustments

- Bridge Distance Penalties
 - **Removed**
- Jurisdiction-to-Jurisdiction Adjustment Factors (Commuters)

Movement	Previous	Modified
Newport News to Norfolk	-4.00x	-1.67x
Hampton to Norfolk	-6.67x	-1.25x

* - a value of '1.0' indicates no adjustment

Technology Template Updates/ Fixes

- Zero-Passenger Vehicle (ZPV) Trip Generation & Distribution – scripting fixes/additions and recalibration*. Addresses over-estimation of vehicle-miles traveled for ZPVs that are autonomous. Adds capability of modeling ZPVs associated with conventional MaaS trips.
- Mode Choice Model – scripting fixes. Addresses error in calculation of mode shares and reporting for certain market segments.

* - Henao, A., Marshall, W.E. The impact of ride-hailing on vehicle miles traveled. *Transportation* **46**, 2173–2194 (2019).

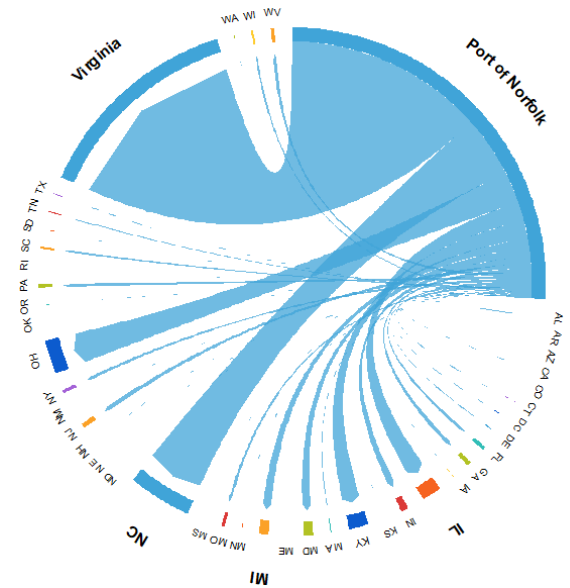
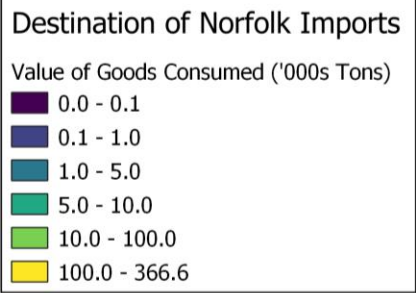
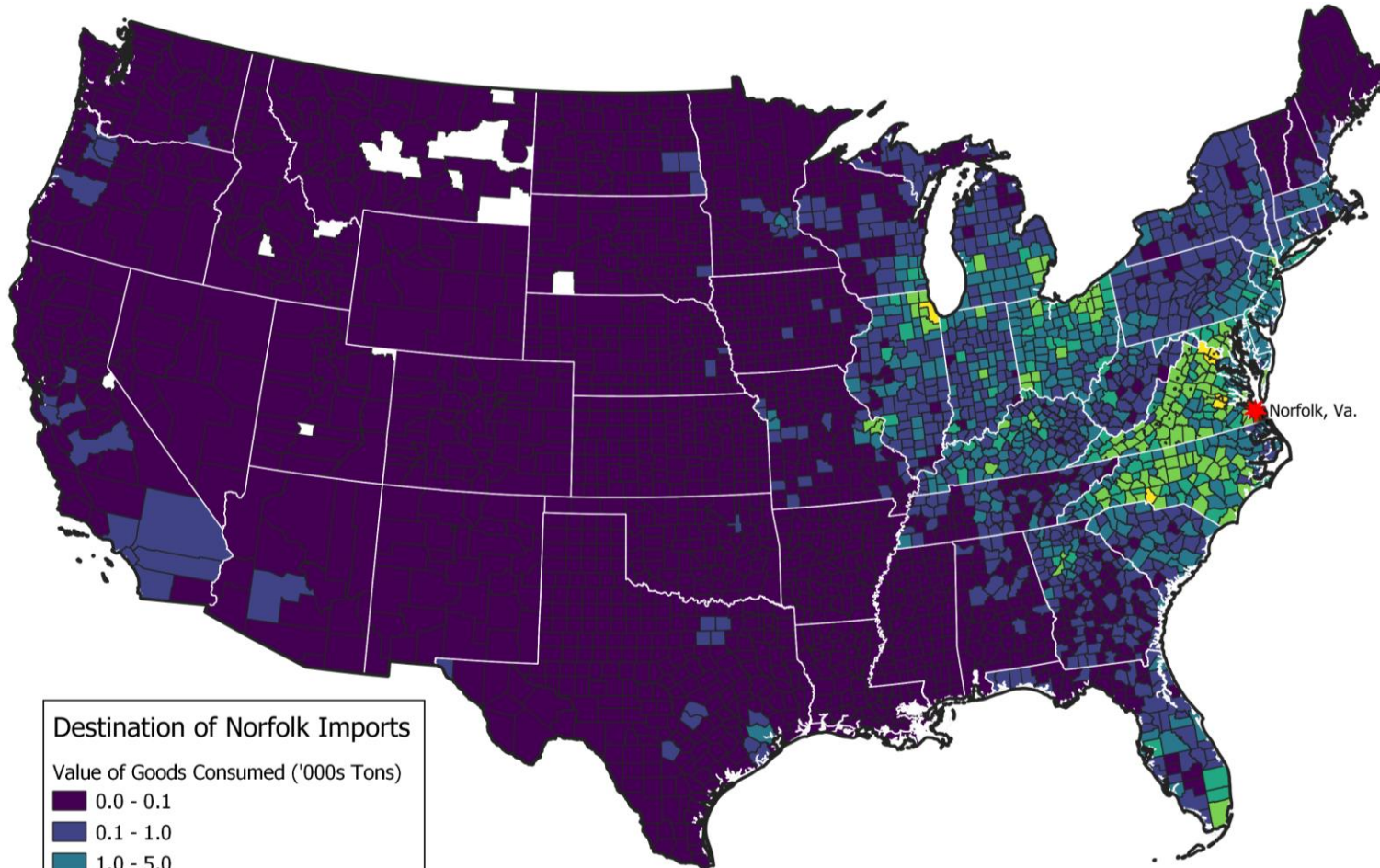
Port Activity and the RCS Scenarios

Port Driver	Greater Growth on the Water	Greater Growth in Urban Centers	Greater Suburban / Greenfield Growth
Containerized volume (TEUs)	↑	–	↑
Rail mode share	↑↑	↑	↓
Barge mode share	↑	–	–
Truck mode share	↓	↓	↑↑
Internal versus external markets	More external	–	More internal (regional industry growth)

Connecting Scenarios to TDM

- Need to relate port volumes to both internal regional truck traffic and internal-external truck flows.
 - TDM internal-external truck trip generation is a function of distance of a generator to the geographic boundary of the model and does not reflect the unique trip characteristics of the ports.
- Need to adapt in order to handle future scenario narratives.
- Port I/E flows have potential relevance to harbor crossings.

Understanding the Port's Market Reach



2018 – Containerized Imports, Moving by Truck to their Destination

Source: vFreight, 2018

Derived from FAF, WisierTrade (US Census Foreign Trade Database), and IMPLAN (county economic activity and I/O data)

Internal-External Travel

- Current version of TDM significantly underestimates proportion of port traffic exchanged with areas outside Hampton Roads
 - Sources: FAF, US Census Foreign Trade, TREDIS vFreight
- Streetlight data used in development of the external travel model may have limitations, particularly for the ports
 - Effect of gate stops on identifying truck destinations
- Remedies:
 - Only address port demand issues by developing truck flow tables for the ports and implementing directly in the TDM.
 - Entertain more comprehensive re-work of internal-external travel in TDM.

Next Steps

- Finalize cross-harbor adjustments. Try to improve validation of screenlines, other than the harbor crossings.
- Reconcile technology template updates/fixes implemented by the consultant team and those contained in VDOT's May 2020 update of the TDM.
- Determine approach to addressing port/internal-external travel issues; implement; and report results.
- Given final cross-harbor adjustments, refine technology template updates and internal-external travel adjustments.

Revised Draft Schedule

REVISED - Regional Connectors Study - Phase 3 Schedule

Task No.	Task	2020												2021												2022											
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP			
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 Permittability 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																																				

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