Delmarva Freight Plan

The Delaware Freight Plan with Regional Coordination

FINAL REPORT

May 2015

Delaware Department of Transportation

Maryland Department of Transportation

Dover/Kent County MPO

VDOT

WILMAPCO

WRA
Whitman, Requardt & Associates, LLP
1915 100 YEARS 2015

VANTAGEPOINT
DEVELOPMENT ADVISORS

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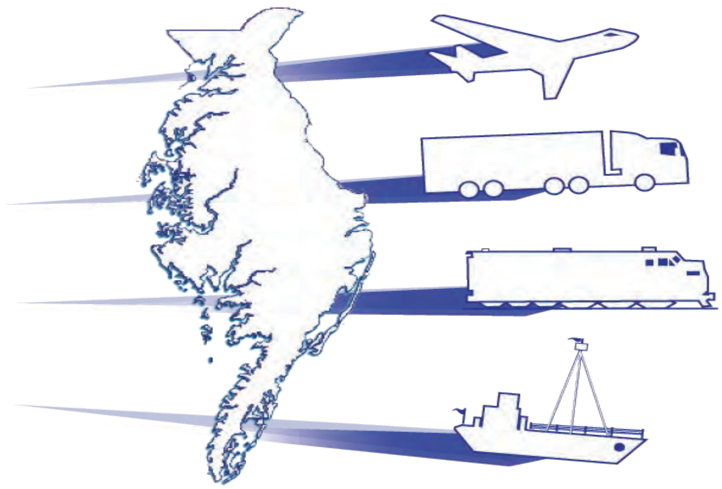

Final Report

May 2015

Prepared for:

Delaware Department of Transportation

Prepared by:

Whitman, Requardt & Associates, LLP, with Vantage Point Development Advisors

In collaboration with:

Maryland Department of Transportation
Virginia Department of Transportation
Wilmington Area Planning Council
Dover/Kent County Metropolitan Planning Organization
Salisbury/Wicomico Metropolitan Planning Organization

With additional support from:

University of Delaware
IHS Global Insight
Federal Highway Administration

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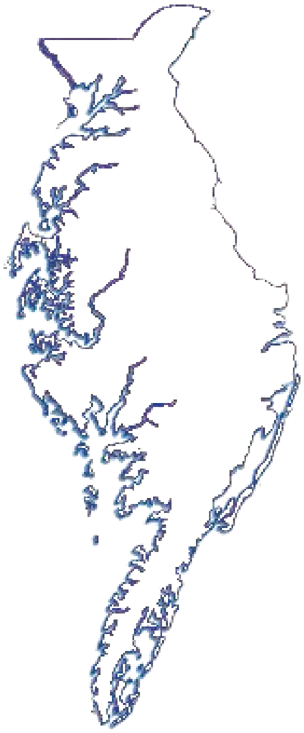
Delmarva Freight Plan

Executive Summary



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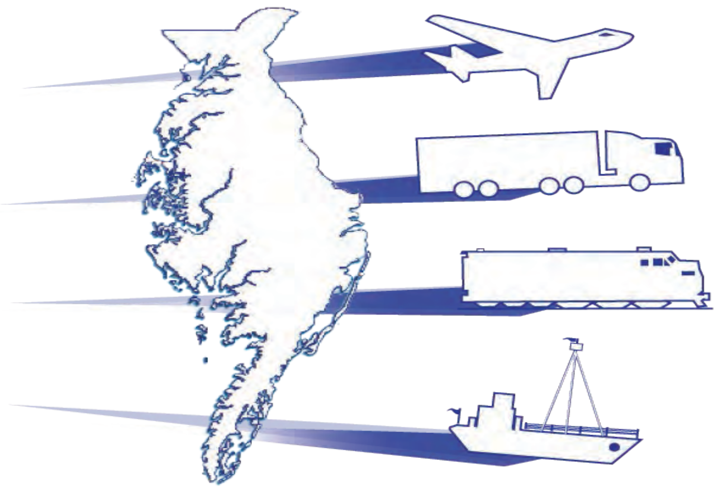

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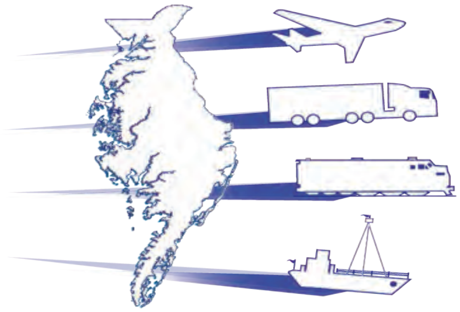
Executive Summary

The Delmarva Freight Plan summarizes current and future freight planning and transportation needs to enhance freight and goods movement and related economic opportunities on the 14-county tri-state area of the Delmarva Peninsula (*Exhibit ES.1*). Undertaken by the Delaware Department of Transportation (DelDOT) and in fulfillment of statewide freight planning requirements for the state of Delaware, the plan aims to comply with Sections 1115 through 1118 of the Moving Ahead for Progress in the 21st Century (MAP-21) act and related National Freight Policy. It supports a regional perspective of freight flows, targets freight issues relevant to the local and regional economies, integrates commodity flow modeling and performance-based scenario planning, and ultimately provides insights to help inform future decision-making, freight infrastructure investments, and related policy guidance.

The plan recognizes and supports the need for multimodal freight planning collaboration within regional jurisdictions and across economic corridors to enhance mobility at the local, state, multi-state, and national level. It spans state boundaries on the peninsula to provide additional insights relevant to existing freight plans in Maryland and Virginia. Its development was thus informed by collaboration with state and Metropolitan Planning Organization (MPO) partners and public/private freight and economic stakeholders across the peninsula.



The Delmarva Freight Plan is organized by chapter to cover:

1. Introduction
2. Existing Economic Context
3. Existing Commodity Flows
4. Existing Freight Transportation System
5. Existing Freight Planning Resources
6. Freight Trends, Needs, and Issues
7. Future Freight Planning Scenarios
8. Freight Project Guidance
9. Freight Policy Guidance and Beyond

DelDOT's Delmarva Freight Plan was developed in collaboration with:

» Maryland Department of Transportation (MDOT)

» Virginia Department of Transportation (VDOT)

» Wilmington Area Planning Council (WILMAPCO)

» Dover/Kent County MPO (Dover/Kent MPO)

» Salisbury/Wicomico MPO (S/WMPO)

» University of Delaware

» IHS Global Insight

» Federal Highway Administration

Outreach and coordination efforts supporting the development of this plan included:

» 2012-2014 Delmarva Freight Summits

» 2013-2014 Delmarva Freight & Goods Movement Working Group meetings

» 12 Project Advisory Committee Meetings

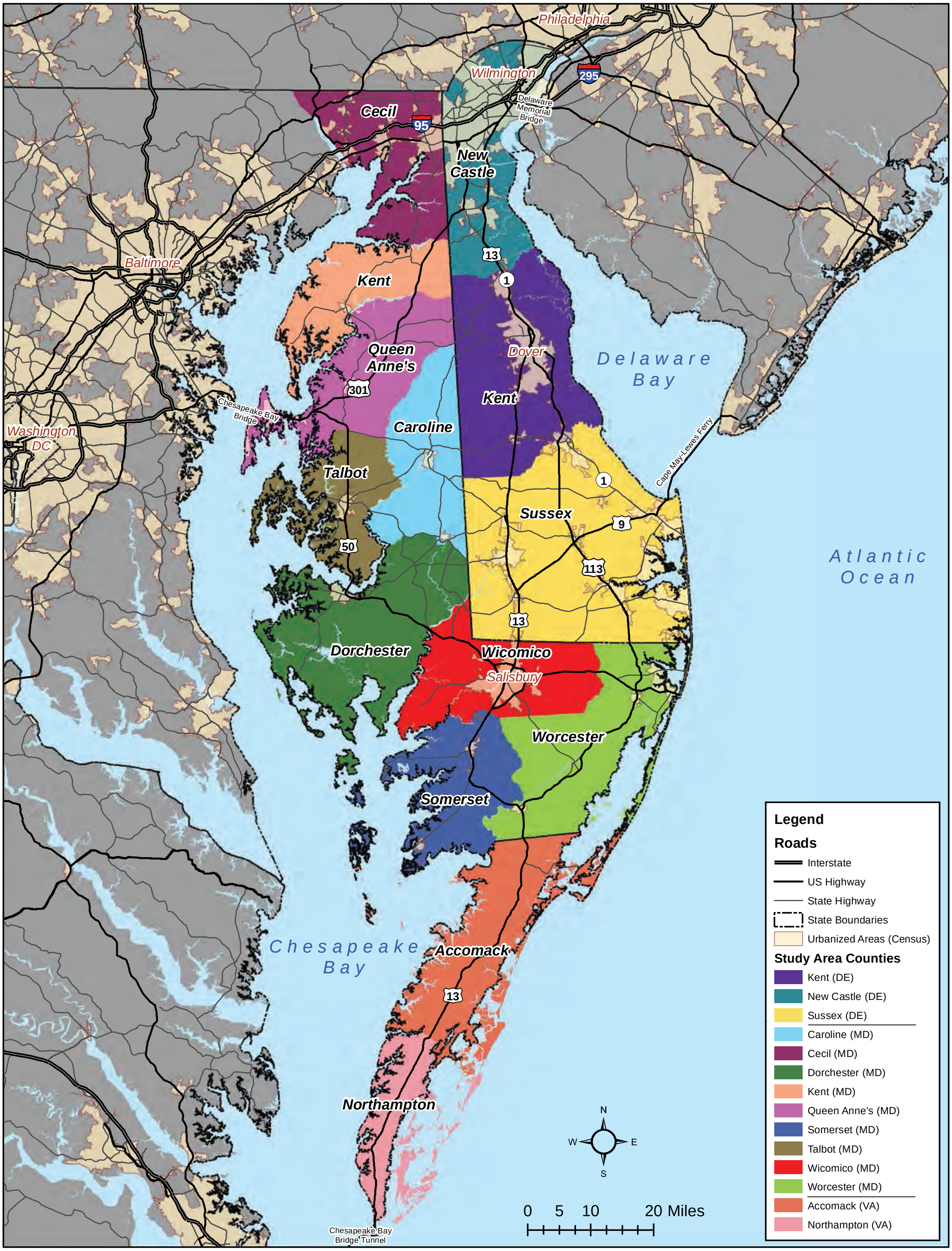
» 30 targeted freight or economic stakeholder interviews

» Over 60 online freight survey responses

» Multiple presentations to area chambers of commerce

» Extensive background document reviews

Exhibit ES.1 – Project Area for the Delmarva Freight Plan

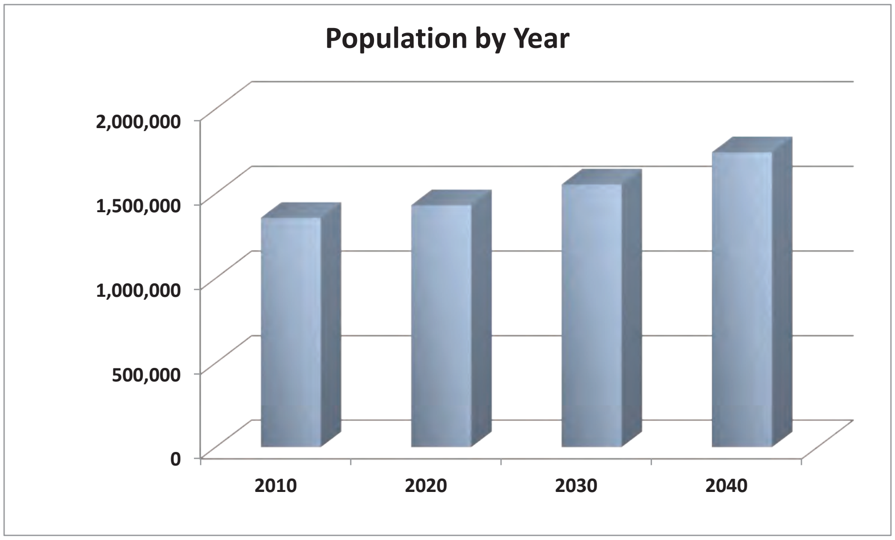


Existing Economic Context

The Delmarva Peninsula is a growing region with well-established industries and developed infrastructure. To fully understand the freight services that are the impetus of the plan, it is important to understand the economic drivers and markets of the region. *Chapter 2* of the plan investigates population and employment growth and related trends; highlights key industries, supply chain characteristics, and goods/cargo movement perspectives; explores the region's numerous economic development strategies that include business enterprise zones, tax credits, and other policies designed to promote industry and business opportunities; and reviews a macro perspective as to how the Delmarva region fits into the global market.

Background estimates anticipate a 29% increase in population between the plan's 2010 Base year and 2040 future horizon year (*Exhibit ES.2*). More population equates to more consumers, which equates to more freight demand. Surges in seasonal traffic in light of the peninsula's coastal resort areas and vibrant tourism industry will likewise grow future freight demands.

Exhibit ES.2 – Delmarva Population Projections



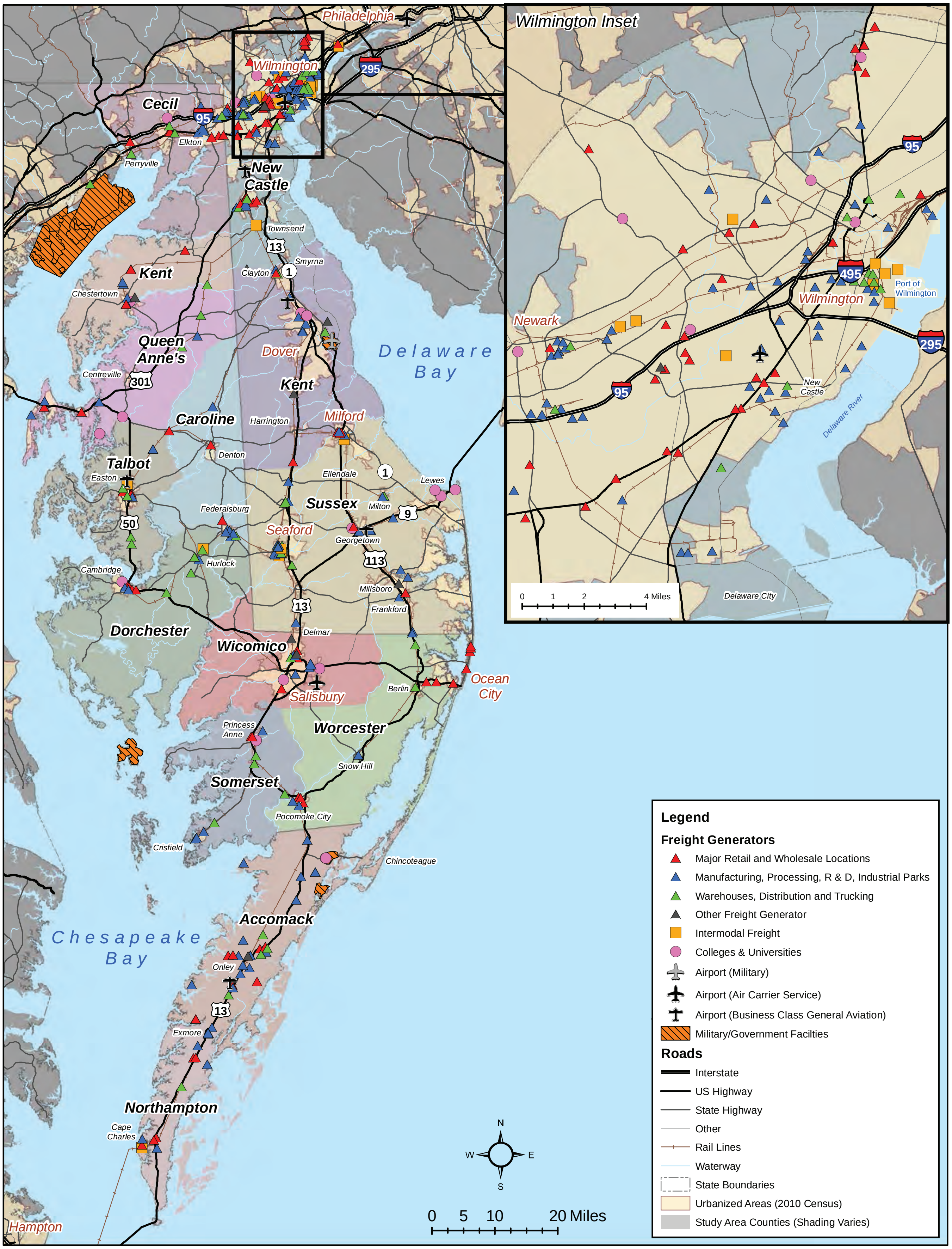
Freight Generators:

The identification of employment details and key freight generating industries across the peninsula (*Exhibit ES.3*) lays the groundwork for detailing Trendline and Accelerated Employment Growth scenarios in subsequent stages of the freight plan.

Supply Chains:

Key supply chains on the Delmarva Peninsula include energy, agriculture, poultry and agribusiness, food products and value-added food production, chemical products, and retail industries, among others.

Exhibit ES.3 – Major Freight Generating Industries on the Delmarva Peninsula



Existing Commodity Flows

Understanding existing commodity flows on and around the Delmarva Peninsula including, for example, what types of freight are moving, by what mode, and to/from where, is an important step toward identifying freight and goods movement patterns, trends, or needs specific to the region. *Chapter 3* of the plan summarizes these flows and establishes a baseline from which to begin developing a project-specific commodity flow model and future freight projections. This summary also highlights potential supply chain perspectives and unique issues related to energy, agriculture, or other productive activity centers that may warrant special attention within the freight planning process.

70 million tons ($75 billion)...
Annual commodity flows to, from, or on the Delmarva Peninsula.

157 million tons ($327 billion)...
Delmarva's annual commodity flows if pass-through freight is added, much of which crosses the peninsula along I-95 and the Northeast Corridor.

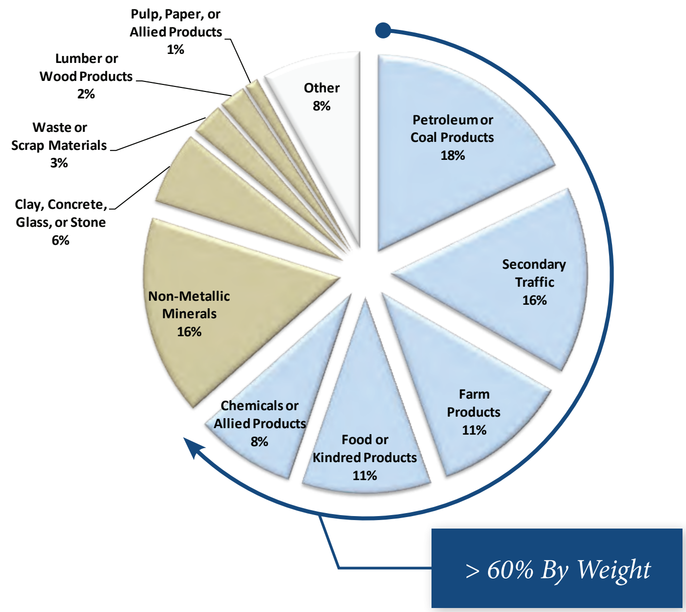
14 million tons ($13 billion)...
Delmarva's international freight total of approximately 12 million export tons and just under 2 million import tons with trade predominately between Canada, Europe, and Central or South America.

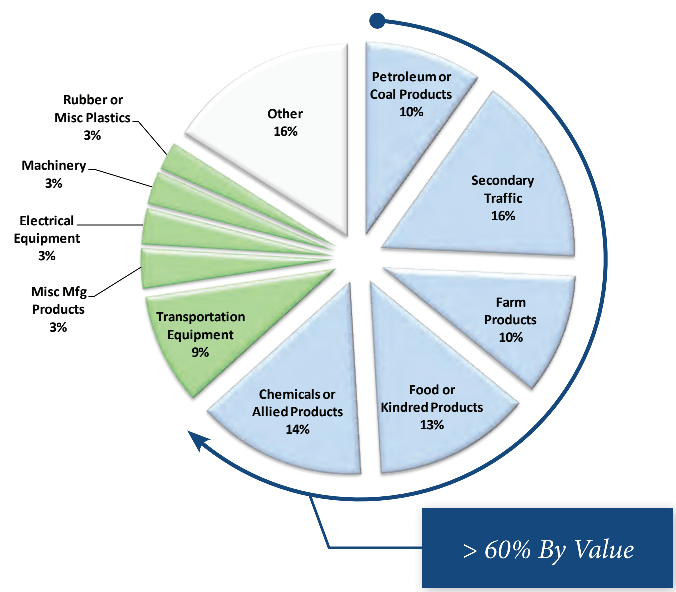
95% east of the Mississippi…
Proportion of Delmarva's domestic trade that generally occurs east of the Mississippi River.

Over 80% by truck…
Proportion of goods moved to, from, or on the peninsula by truck; with the remainder split between rail, water, and pipeline, plus nominal amounts of typically low weight/high value cargo by air.

Over 60% in 5 core groups…
Proportion of Delmarva's freight that can be classified by weight or value into just 5 core commodity groups including petroleum or coal products, secondary traffic, farm products, food or kindred products, and chemicals or allied products (*Exhibit ES.4*).

Exhibit ES.4 – Delmarva's Core Commodity Groups





Existing Freight Transportation System

The existing multimodal freight transportation system (*Exhibit ES.5 and Exhibit ES.6*) on the Delmarva Peninsula is comprised of key highway, rail, port, waterway, air, and pipeline assets across the regional project area. *Chapter 4* of the plan draws from existing sources and inventories to summarize that system and its assets by mode while also beginning to identify freight mobility issues, emphasis areas, or related insights for subsequent investigation. The plan approaches the overall freight transportation system from a multimodal corridor perspective, encompassing six key freight corridors (*Exhibit ES.7*) that capture the majority of Delmarva's freight traffic while also connecting to the most significant urbanized areas, multimodal hubs or related freight system assets. It additionally identifies local freight zones as smaller hubs of activity requiring connectivity to the broader freight corridors and capturing secondary highway/rail connections, local industries, and intra-county goods movements.

Rail operations:

- CSX Transportation
- Norfolk Southern
- Maryland and Delaware Railroad
- Delaware Coast Line Railroad
- Bay Coast Railroad (and carfloat)
- East Penn Railroad
- Wilmington & Western Railway

Key waterborne freight systems:

- Port of Wilmington
- Delaware River
- Chesapeake & Delaware Canal
- M-95 Marine Highway
- Surrounding regional ports
- Port of Salisbury
- Wicomico, Nanticoke, and Pocomoke Rivers

Key airborne freight potential:

- Dover Air Force Base/Air Cargo Ramp
- Wilmington-Philadelphia Regional Airport
- Salisbury-Ocean City-Wicomico Regional Airport
- Other Business Class General Aviation sites

Key pipeline assets:

- Various natural gas transmission systems
- Various refined petroleum products systems
- Sunoco expansion via Project Mariner East to Marcus Hook

Multimodal freight corridors (Exhibit ES.7):

- I-95 **Metro** Freight Corridor
- US 301 **Bay** Freight Corridor
- US 50 **Ocean City** Freight Corridor
- US 13/113 and DE 1 **Coastal** Freight Corridor
- US 202 and DE 41 **Piedmont** Freight Corridor
- MD/DE 404 and US 9 **Lewes** Freight Corridor

Exhibit ES.5 – Delmarva's Roadway and Multimodal Freight Transportation Network

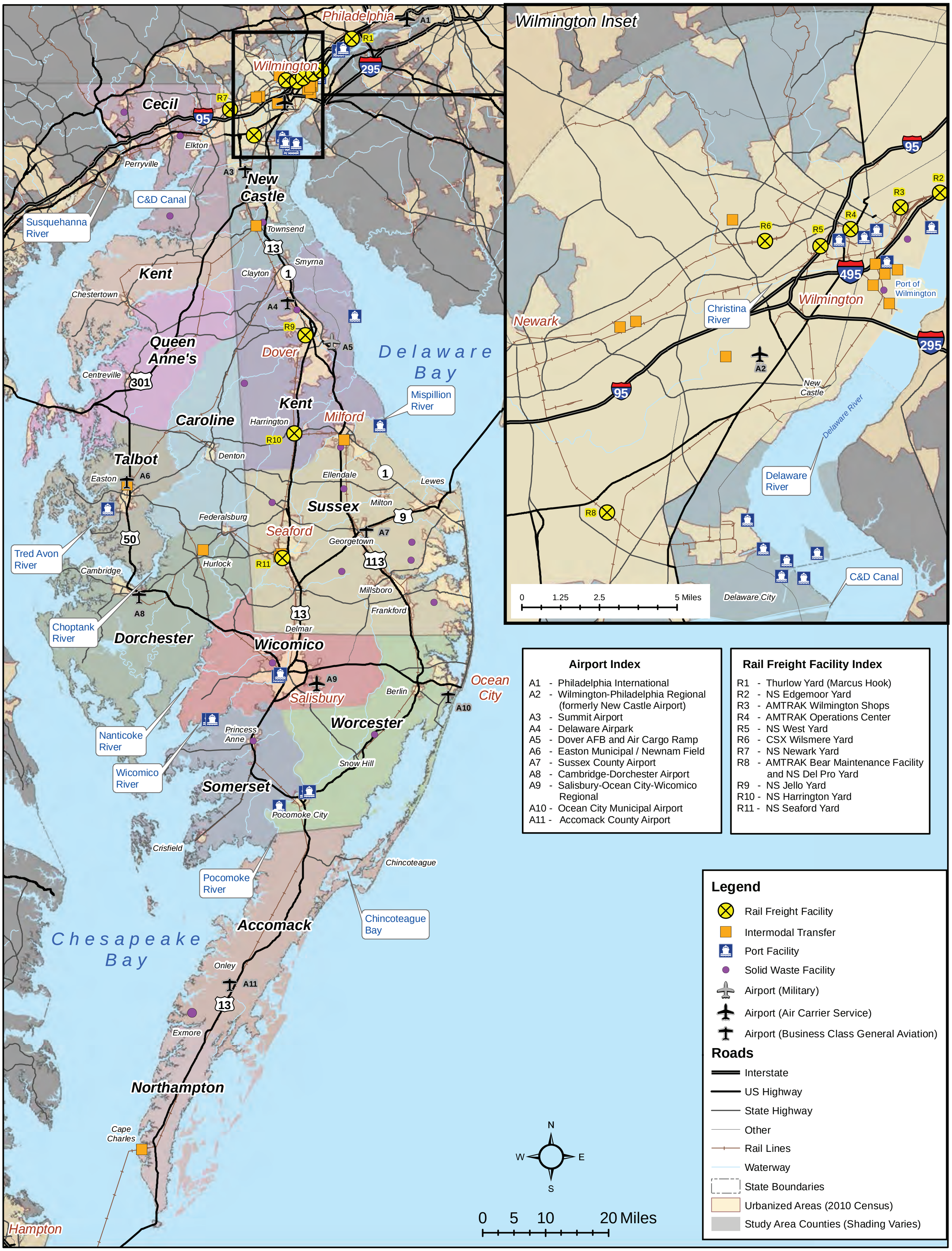


Exhibit ES.6 – Delmarva's Rail Network

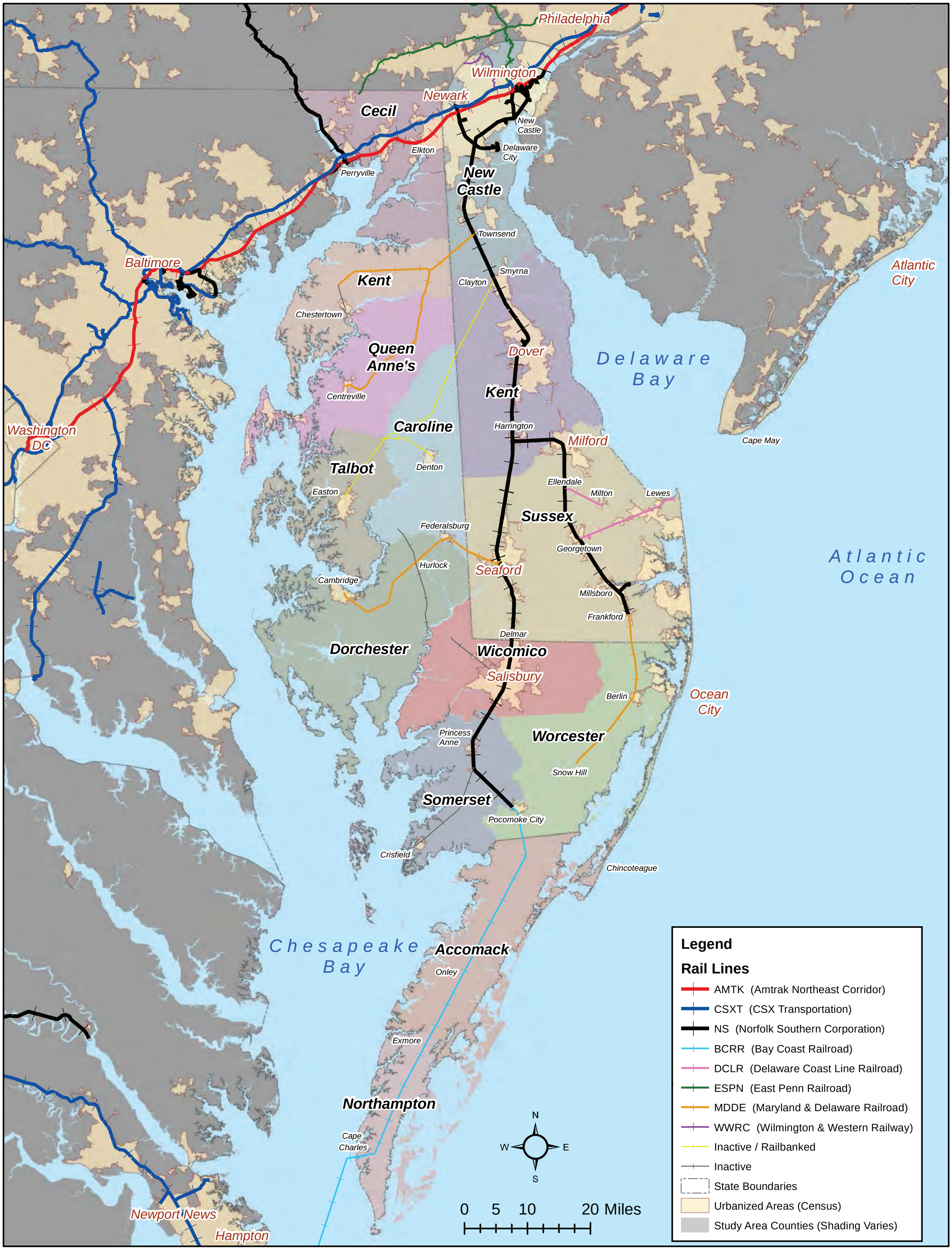
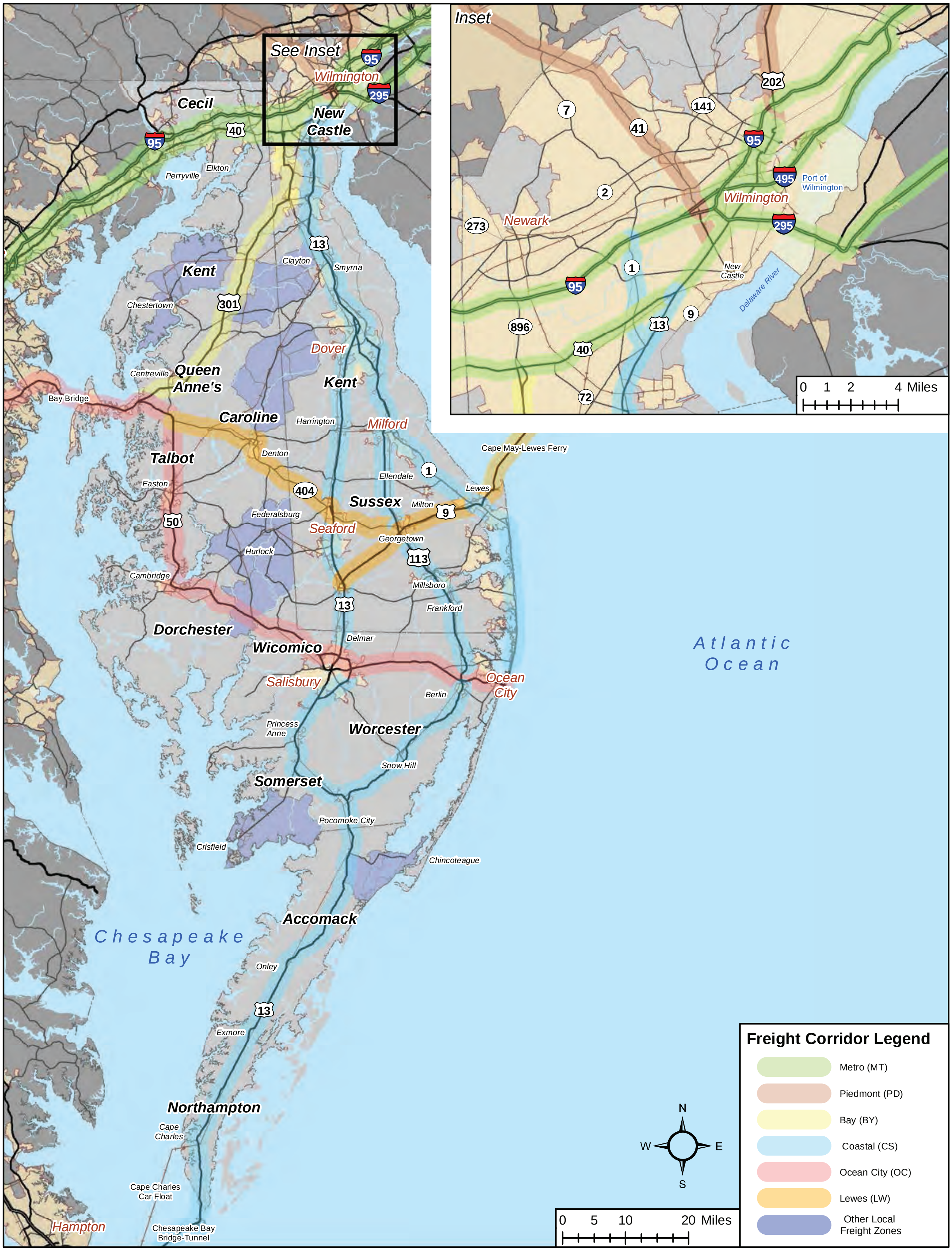


Exhibit ES.7 – Delmarva's Major Freight Corridors and Local Freight Zones



Existing Freight Planning Resources

Several existing freight programs and planning/coordination efforts involving federal, state, county, and local agencies and the private sector operate across the Delmarva Peninsula. Such efforts help to support, enhance, and expand freight and goods movement opportunities locally, regionally, and beyond. Targeted programs for mode-specific rail/port/airport planning efforts or for Commercial Vehicle Information Systems Network (CVISN) assets focus almost exclusively on freight infrastructure and operations, while broader programs such as trade zone designations or each state's transportation improvement program yield indirect opportunities and benefits. While not intended to be all-inclusive, *Chapter 5* of the plan highlights key freight institutions, coordination activities, project funding and revenue sources, and existing capital plans or programs relevant to the overall context of the freight plan.

Effective multi-jurisdictional coordination is critical on the Delmarva Peninsula where freight "knows no boundaries" across the separate systems, regulations, and requirements of the peninsula's 3 states, 14 counties, multiple MPOs, numerous local jurisdictions, and a wide variety of other public/private partners or freight stakeholders. To help facilitate this coordination, WILMAPCO, DelDOT, and MDOT have spearheaded efforts since 2011 to hold periodic meetings of a Delmarva Freight & Goods Movement Working Group, as well an annual Delmarva Freight Summit that, to-date, has been attended by over 200 unique attendees.

Future Opportunities:

Freight planning resources and program references in the Delmarva Freight Plan show a snapshot in time. Subsequent planning and decision-making should remain flexible in order to react to unknown future changes potentially involving MAP-21, the proposed GROW AMERICA act[1], TIGER grant resources, the Projects of National & Regional Significance (PNRS) program, public-private partnership opportunities, programmatic funding levels, or other federal/state freight program modifications.

Existing Capital Plans:

Reviews of existing capital plans/programs identified over 50 projects on the peninsula as anticipated project commitments having potential freight benefits or implications. Such reviews laid the groundwork for compiling future Trendline scenario assumptions and supporting project screening/prioritization efforts later in the plan.

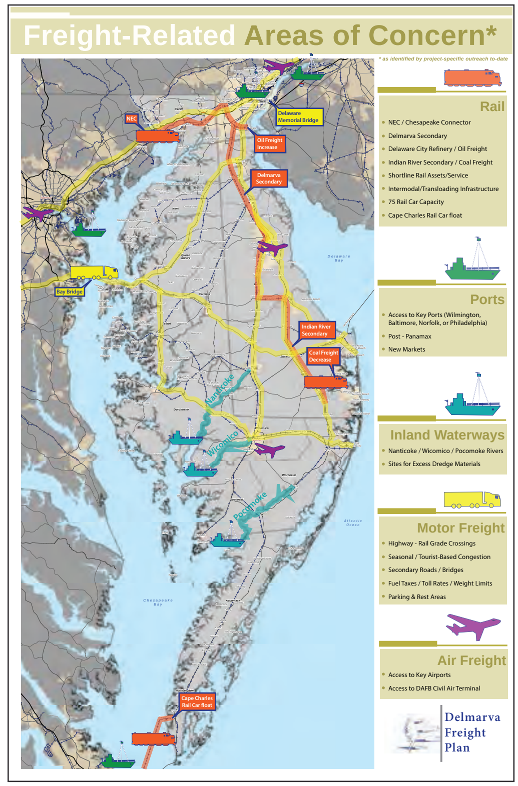
[1] http://www.dot.gov/grow-america

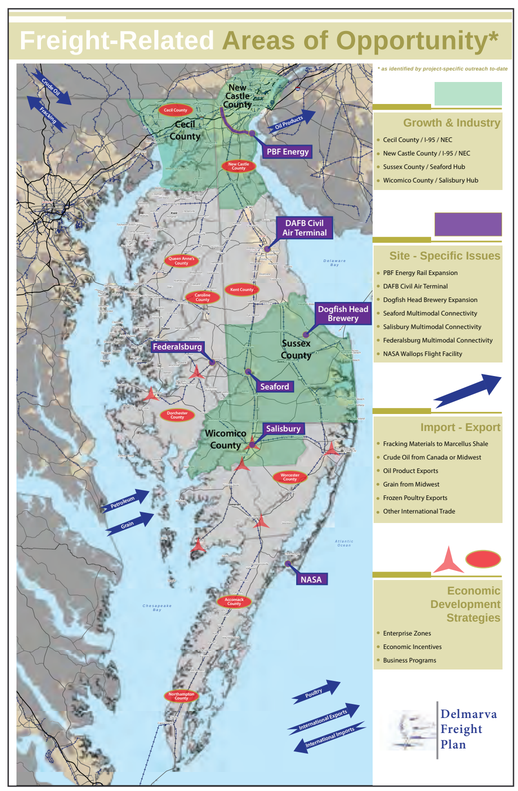
Freight Trends, Needs, and Issues

Chapter 6 of the plan serves as an important transition from identifying the current state of the peninsula's freight and goods movement system to preparing for a detailed assessment of that system and potential improvement scenarios. This transition includes a high-level summary of key areas of concern and areas of opportunity, as well as a more detailed look at unique issues within focus areas corresponding to the plan's categorical goals that encompass:

- **Economic Vitality**…with a focus on issues ranging from site-specific industry needs, key supply chains, or import/export opportunities; to freight land use compatibility and preservation of multimodal options.
- **Freight Connectivity, Mobility, and Accessibility**…with a focus on issues ranging from roadway freight network designations or first/last mile connections; to congestion and conflicts in urban areas, during peak tourist seasons, or at critical at-grade rail crossings.
- **Safety and Security**…with a focus on issues ranging from general crash prevention and oversize/overweight truck enforcement; to evacuation planning, hazardous materials tracking, or cargo screening and Homeland Security support.
- **System Management, Operations, and Maintenance**…with a focus on issues ranging from expansion in CVISN, all-electronic tolling, traffic responsive signal systems, or truck parking; to dredge funding shortfalls or excess dredge material disposal site needs.
- **Sustainability and Environmental Stewardship**…with a focus on issues ranging from truck idling regulations, truck stop electrification, or spills control; to Sea-Level Rise (SLR) adaptation planning or community/livability issues and first/last mile freight conflicts.

Insights from the overall review of freight trends, needs, and issues play a direct role in the freight plan's subsequent action steps (1) by way of inputs into the project-specific screening and prioritization methods and (2) in the formation of the plan's guiding principles and general policy perspectives.



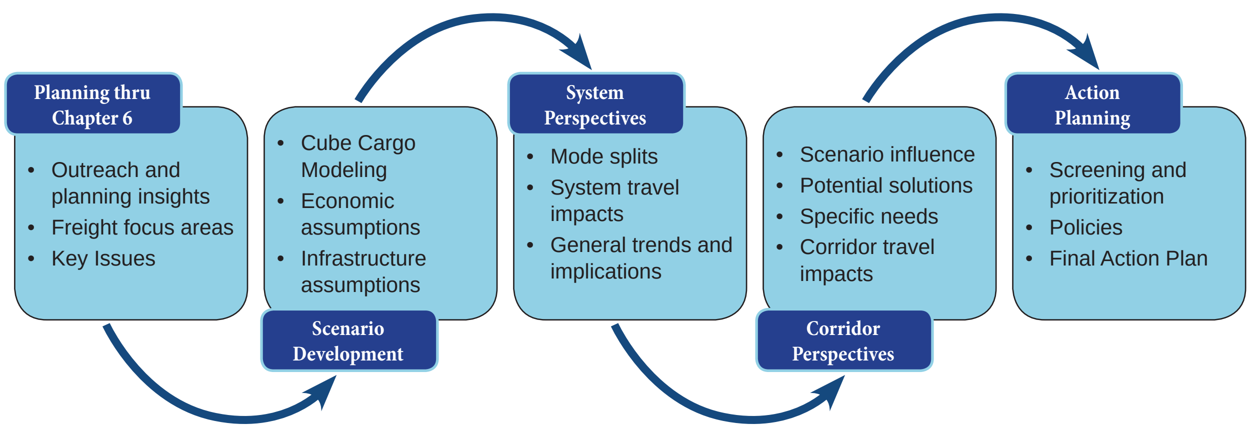


Future Freight Planning Scenarios

Chapter 7 of the plan evaluates future freight planning scenarios to explore "what-if" questions relative to key economic or infrastructure factors impacting freight on the peninsula. Each scenario assumes a combination of changes that to varying degrees may be within an agency's control (e.g. transportation investments) or beyond an agency's control (e.g. regional economic influences). Evaluating how such changes might impact the freight transportation system helps to describe futures to which the DOTs, MPOs, and other stakeholders can better prepare to react, ultimately fostering more informed decision-making, effective infrastructure planning, and relevant policy guidance. The overall scenario planning process (*Exhibit ES.8*) combines qualitative stakeholder and freight study insights with quantitative commodity details and the project's Cube Cargo commodity flow model to compare scenarios such as:

- *2010 Baseline versus 2040 Trendline* – reflecting freight demands and conditions today as compared to projected changes in future year 2040 assuming "status quo" growth and an essentially identical freight transportation network.
- *2040 Multimodal Constraint versus 2040 Multimodal Enhancement* – exploring freight and travel conditions under a loss or reduction of key rail, barge, or other multimodal infrastructure, versus an improvement or expansion of the same.
- *Trendline Growth versus Accelerated Growth* – exploring changes in freight demand with future population, household, and employment assumptions consistent with today's growth expectations, versus a more expansive future economic climate with added growth and targeted industry or market surges.

Exhibit ES.8 – Scenario Planning Process



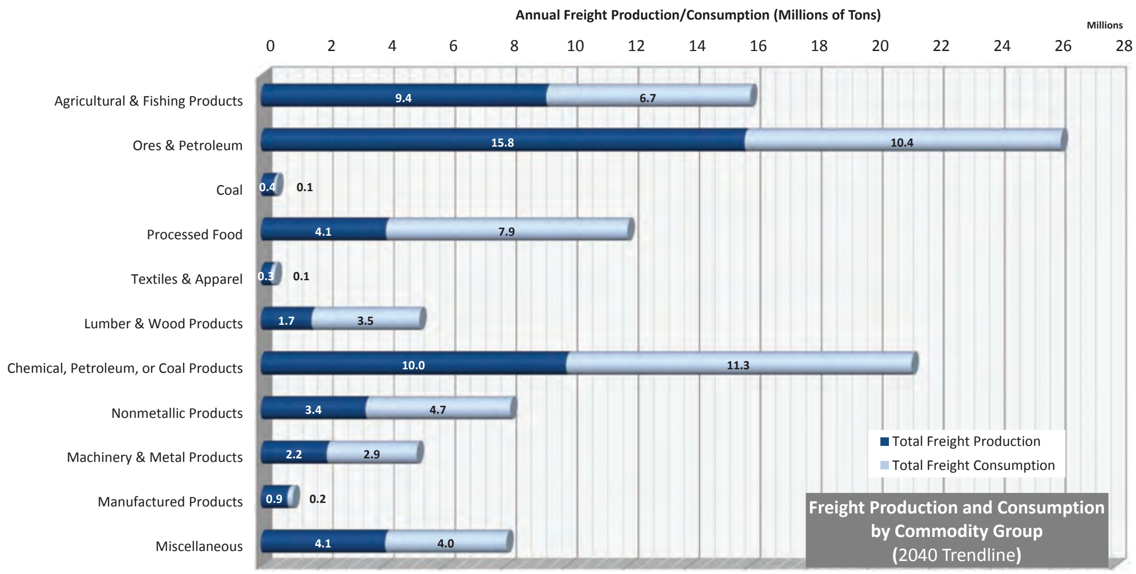
Recent market changes have impacted the volume and pattern of major rail flows onto the peninsula, which raises unique scenario planning questions related, for example, to the impacts of substantial increases in oil traffic to areas in northern New Castle County, alongside massive reductions in coal traffic to areas farther south in Sussex County.

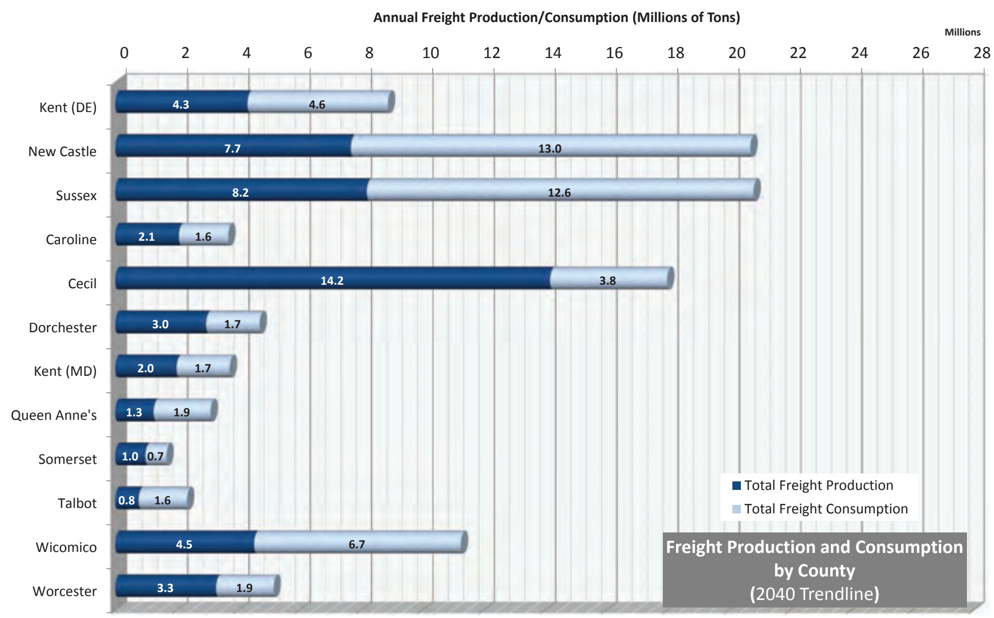
The collective influence of the peninsula's waterborne freight systems also raise unique scenario planning questions related, for example, to broader issues involving expansion of the Panama Canal, interests in the M-95 Marine Highway system, or concerns with dredge related funding shortfalls and excess dredge material disposal sites that could impact the peninsula's river barge capacity.

2040 **Trendline Growth** reflects up to 30% increase in population and employment (versus 2010 levels on the peninsula) and a 70-80% increase in annual freight estimates (*Exhibit ES.9*).

2040 **Accelerated Growth** reflects up to 38% increase in population and employment (versus 2010 levels on the peninsula) and essentially doubles the 2010 freight estimates, resulting in 14% additional freight growth beyond Trendline levels.

Exhibit ES.9 – 2040 Trendline Freight Estimates





The overall scenario planning and modeling insights (including sample results per *Exhibit ES.10 through Exhibit ES.12*) help to inform subsequent action planning steps and the development of proposed project/ policy guidance in a variety of ways. Potential benefits of the plan's approach and related insights include:

- *Example 1 – they help to explore system-wide impacts of unknown futures.* Reviews of system level tons by mode and truck VHT by scenario, for instance, indicate that maintaining or improving efficient multimodal systems may have a limited potential to change the mode split of freight today, but will be a vital part of managing future freight increases while securing industry-specific needs and economic competitiveness on the peninsula.

- *Example 2 – they help to support corridor-specific policy interests.* Corridor assessments under the Multimodal Constraint scenario, for instance, reveal sensitivities to the scenario's reduction in barge and rail opportunities that yield up to a 17% increase in truck VMT or VHT along US 50 alone, or an equivalent increase in truck transportation costs of approximately $36 million per year. Such extremes emphasize the critically of preserving multimodal barge and rail access to Seaford, Salisbury, and other areas throughout the southern peninsula.

- *Example 3 – they help to identify bottlenecks and project candidates.* Model-based truck volume, truck VHT, and level-of-service output, for instance, was compiled using 3D GIS to visually represent truck bottleneck locations across the peninsula, which helped to supplement a list of potential areas of concern and the development of candidate project locations that were subsequently incorporated into the plan's project screening and prioritization process.

Exhibit ES.10 – Relevant Freight Planning Interests by Corridor

Corridor Insights, Issues, or Sensitivities	Metro	Bay	Ocean City	Coastal	Piedmont	Lewes
Truck Cost Sensitivity to Accelerated Scenario*	+3% $37M	+34% $75M	+11% $25M	+38% $395M		
Truck Cost Sensitivity to Constraint Scenario*			+16% $36M			+25% $13M
Development patterns or warehousing shifts	✓					
Regional alternate routes or system redundancy		✓		✓		
Peak season traffic, tourism and freight conflicts			✓	✓		✓
Community and freight access conflicts	✓	✓			✓	✓
Multi-jurisdictional cooperation	✓				✓	✓
Oversize or special freight movements	✓			✓		
Technology advancements (ITS, VWS, autonomous vehicles)	✓	✓		✓		

** shown as a % increase and equivalent $ value increase in truck costs based on VHT and VMT changes vs. the 2040 Trendline*

Exhibit ES.11 – System Level Tons by Mode

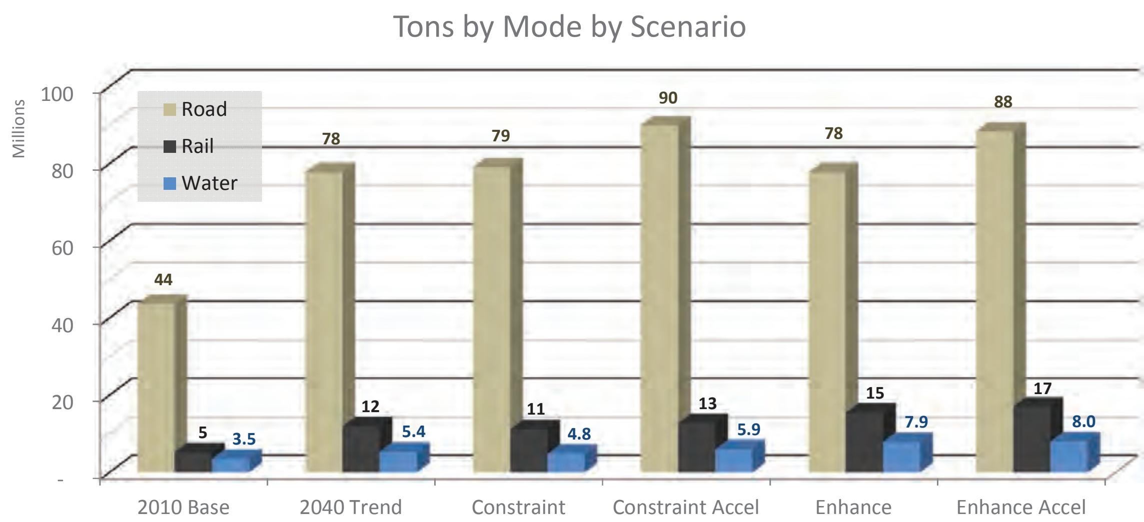
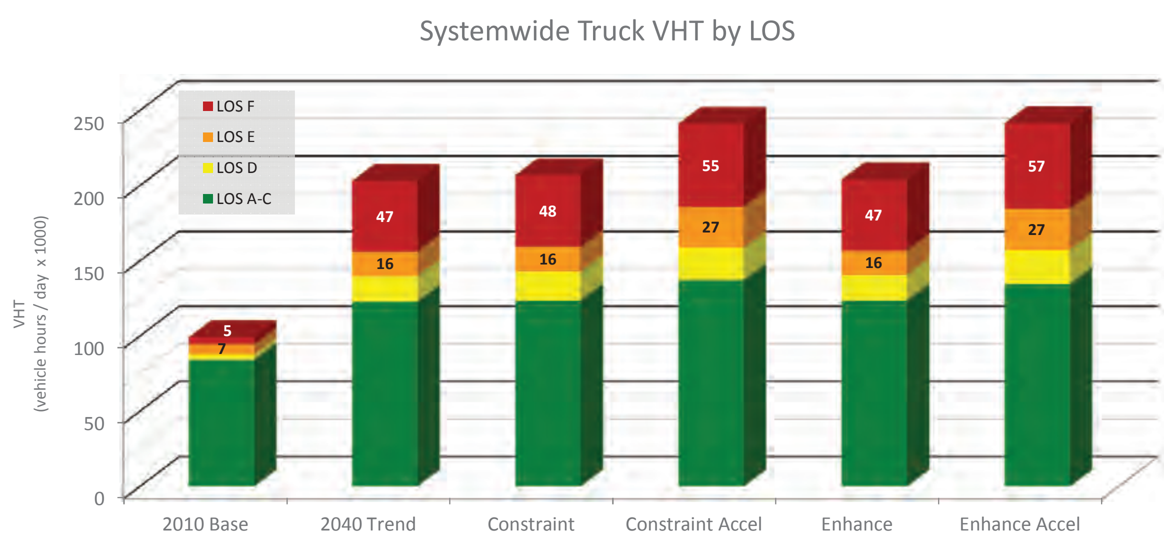


Exhibit ES.12 – System Level Truck VHT by Level of Service



Freight Project Guidance

Building on the plan's summaries of freight trends, needs, issues, and scenario planning insights, closing efforts focus on a compilation of action planning elements that will help to support freight and goods movement opportunities and transportation systems throughout the Delmarva region. These elements include projects, policies, or other actions that may be referenced individually or integrated within the broader planning programs and strategies that are managed by the peninsula's federal, state, MPO, and other public/private partners tasked with overseeing their respective operations, systems, or jurisdictions.

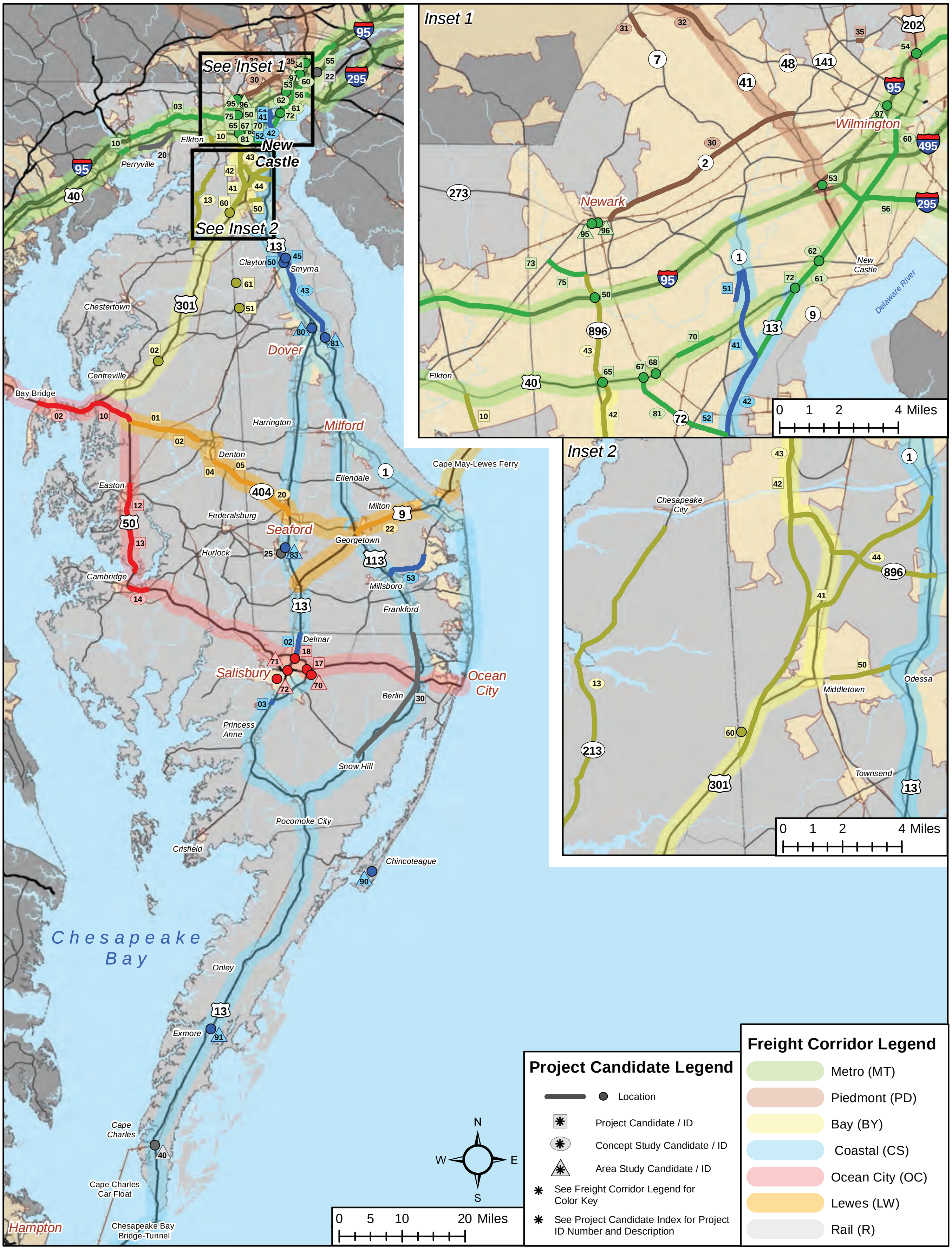
Chapter 8 of the plan outlines freight project planning guidance. To develop this guidance, two stages of project assessments were completed:

- **Project screening** was primarily a qualitative exercise that addressed all project candidates in each of the three states across the peninsula. This broad-based assessment aimed to reasonably filter which project candidates could have a greater or lesser potential freight influence versus the specific interests and concerns throughout the Delmarva region (i.e. relative to previously-identified freight focus areas). Assessments were viewed both in general and against the backdrop of a variety of unknown futures (i.e. relative to previously-evaluated future scenarios).

- **Project prioritization** was more of a quantitative exercise that addressed candidates in the state of Delaware only. The prioritization stage, in this case, was directed specifically at supporting future DelDOT and Delaware State planning efforts; whereas Maryland and Virginia interests are subject to separate plans/processes in use by those jurisdictions. In-line with the performance-based objectives of MAP-21, the potential merits of individual projects were rated, scored, and ranked according to a variety of weighted evaluation criteria. Criteria included Cube Cargo model based levels-of-service, daily truck volumes, and congested travel speeds, as well as details involving fatal crash activity or the number of freight generators near the project area.

Roughly 200 project candidates were assessed in the above manner. The resulting screening or prioritization results were used to assign general ratings from "nominal" to "high" and to help establish the relative top priorities and key project or study lists included in the plan. Leading candidates are mapped below (*Exhibit ES.13*) and categorized in the tables that follow.

Exhibit ES.13 – Key Project Candidates Map



Delaware Key Projects w/ Anticipated Commitments

ID	Route/Area	Limits	Description
MT 54	I-95	at US 202	Interchange improvements
MT 56	**I-295**	**I-95 to DE Memorial Bridge**	**Improvements**
MT 75	DE 4	DE 2 to DE 896	Eastbound widening
BY 41	**US 301**	**MD Line to DE 1**	**New 4-lane expressway**
BY 50	DE 299	DE 1 to Catherine St	Widen
CS 51	DE 7	Newtown Rd to DE 273	Widen
CS 52	DE 72	McCoy Rd to DE 71	Widen from 2 to 4 lanes
PD 35	DE 141	Tyler McConnell Bridge	Construct bridge and DE 141 tie-ins

Delaware Key Projects w/ Unfunded Aspirations

ID	Route/Area	Limits	Description
MT 50	**I-95**	**at DE 896**	**Major interchange reconstruction**
MT 53	**I-95**	**at DE 141**	**Phase I and II interchange projects**
MT 55	I-95	US 202 to I-495/DE 2	Widen from 4 to 6 lanes
MT 65	US 40	at DE 896	New interchange
MT 67	US 40	at DE 72	Intersection improvements
MT 68	US 40	at NS Rail Crossing (Bear, DE)	Grade separation
MT 70	US 40	Salem Church Rd to Walther Rd	Widen from 4 to 6 lanes
MT 72	**US 40**	**at US 13**	**New interchange**
BY 42	**DE 896**	**DE 2 to Boyds Corner Rd**	**Signal retiming and/or upgrades**
CS 41	DE 1	Tybouts Corner to DE 273	Widen from 4 to 6 lanes

Delaware Key Projects w/ Planned VWS Focus

ID	Route/Area	Limits	Description
BY 51	DE 300	West of Smyrna	Planned VWS
BY 60	DE 299	West of Middletown	Planned VWS
BY 61	DE 6	West of Smyrna	Planned VWS
CS 45	DE 1	Northbound near Smyrna	Planned VWS
CS 50	US 13	Northbound near Smyrna	Planned VWS

** **BOLD** text indicates High Priority Rating per screening/prioritization efforts*

Delaware Targeted Studies w/ Corridor or Concept Design Focus

ID	Route/Area	Limits	Study Focus
MT 60	**US 13**	**I-495 to Christiana River**	**Freight management upgrades**
MT 61	**US 13**	**DE 1 to I-495**	**Roadway or capacity upgrades**
MT 62	**US 13**	**at DE 273**	**Interchange feasibility**
MT 81	**DE 72**	**US 40 to US 13**	**Freight management upgrades**
BY 43	DE 896	C&D Canal to US 40	Roadway or capacity upgrades
BY 44	**DE 896**	**US 301 to DE 1**	**Freight management upgrades**
CS 42	**DE 1/US 13**	**DE 72 to DE 71**	**Freight management upgrades**
CS 43	DE 1	Dover (Exit 97) to Smyrna (Exit 119)	Freight management upgrades
CS 53	DE 24	US 113 to DE 23	Freight management upgrades
PD 30	**DE 2**	**DE 273 to DE 141**	**Freight management upgrades**
PD 31	DE 7	Valley Rd to PA Line	Freight management upgrades
PD 32	**DE 41**	**DE 48 to PA Line**	**Freight management upgrades**
LW 20	DE 404	MD Line to US 113	Freight management upgrades
LW 22	US 9/US 9 Tk	US 113 to DE 5	Freight management upgrades

Delaware Targeted Studies w/ Area-wide Focus

ID	Route/Area	Limits	Study Focus
MT 95	Newark	Area study and/or upgrades	Freight management
MT 97	Wilmington	Area study and/or upgrades	Freight management, route signage
CS 80	Dover	Area study and/or upgrades	Freight management
CS 83	Seaford	Area study and/or upgrades	Freight management

Delaware Key Multimodal Candidates

ID	Route/Area	Limits	Description
MT 96	Newark	Area study	Intermodal center feasibility
CS 81	Dover	Area study	Air cargo ramp, Aero Park development
R 20	**NS/NEC**	**Prince to Bacon interlocking**	**Chesapeake Connector**
R 22	NS	Edgemoor Yard	Flood mitigation; raise yard 2-6 feet
R 25	NS	Seaford Rail Bridge	Bridge replacement or modernization

** **BOLD** text indicates High Priority Rating per screening/prioritization efforts*

Maryland Key Project Candidates

ID	Route/Area	Limits	Description
MT 03	**I-95**	**MdTA Section 400**	**Reconstruct and widen**
MT 10	US 40	MdTA Thomas J. Hatem Memorial Bridge	All-electronic tolling; rehab approaches
BY 02	US 301	Bay County Rest Area	Truck parking
BY 10	MD 213	US 40 to Frenchtown Rd	Widen; US 40 intersection improvements
OC 10	**US 50**	**US 50/301 Split to MD 404**	**Divided hwy reconstruct; access control**
OC 12	US 50	MD 322 N/S of Easton	Divided hwy reconstruct
OC 13	US 50	MD 322 S of Easton to Choptank River Br	Access control improvements
OC 17	**US 50**	**at Salisbury Bypass**	**Additional lane from US 50 onto Bypass**
OC 18	**US 50**	**US 50 WB off-ramp at US 13**	**Signalize ramp; improve US 13 NB weave**
CS 02	US 13	Salisbury Bypass to DE Line	Divided hwy reconstruct w/access control
CS 03	US 13	Somerset Co Line to US 13 Bus	Divided hwy reconstruct w/interchanges
LW 01	MD 404	US 50 to MD 404 Bus	Upgrade w/access control
LW 02	MD 404	Queen Anne's Co Line to MD 404 Bus	Reconstruct and widen
LW 04	MD 404	MD 16 (Harmony Rd to Greenwood Rd)	Reconstruct w/access control
LW 05	MD 404	MD 16 (Harmony Rd) to DE Line	Reconstruct w/access control

Maryland Key Study Candidates

ID	Route/Area	Limits	Study Focus
BY 13	MD 213	Basil Ave to MD 290/MD 313	Freight management upgrades
OC 02	**US 50/301**	**Bay Bridge to US 50/301 Split**	**Freight management upgrades**
OC 14	US 50	MD 16 (Church Ck Rd to Mt Holly Rd)	Freight management upgrades
OC 71	Salisbury	Area study	Freight management upgrades

Maryland Key Multimodal Candidates

ID	Route/Area	Limits	Study Focus
OC 70	Salisbury	Area study; Airport Rd to US 50	Airport access study; new connection
OC 72	Salisbury	Area study; Wicomico River	Wicomico River port development study
R 30	MDDE	Frankford to Snow Hill Line	286k rail upgrade

Virginia Key Study Candidates

ID	Route/Area	Limits	Study Focus
CS 90	Accomack Co	Wallops Island/Chincoteague	Freight access study
CS 91	US 13	Accomack and Northampton Counties	US 13 truck parking study
R 40	BCRR	Cape Charles to Pocomoke City	Multimodal service enhancement study

** **BOLD** text indicates High Priority Rating per screening/prioritization efforts*

Freight Policy Guidance and Beyond

Building from the freight project guidance, details in *Chapter 9* of the plan summarize general policy perspectives that will play an equally crucial role in helping to guide the course of freight related activities on the peninsula and highlight future freight actions. This policy guidance generally aims to encompass the previously identified key issues, stakeholder concerns, and focus areas. It also closes with a series of next steps to consider beyond completion of this plan relative to performance monitoring, future updates, or further research.

Guiding Principles

Guiding principles summarize an overall direction or approach toward fostering effective freight planning on the Delmarva Peninsula, including key actions to:

- Align with strategic freight goals (*Exhibit ES.14)* that support National Freight Policy
- Enhance peninsula-specific freight focus areas summarized by this plan
- Integrate freight-related project planning insights summarized by this plan
- Foster multi-jurisdictional freight coordination

Freight Advisory Groups:

Continued planning efforts should build upon the recent successes of the Delmarva Freight Summit meetings, Delmarva Freight and Goods Movement Working Group meetings, and other activities that have fostered open and proactive discussions between public and private freight stakeholders, industries, interest groups, infrastructure owners, and local communities. Though the specific needs and interests of the various players may not always align, their potential abilities to successfully influence the peninsula's future are clearly intertwined.

Planning vs. Programming:

The freight plan is not a formal programming document, does not have authority to commit priorities or funding for any jurisdiction, and makes no attempt to supplant any broader transportation planning requirements or processes of the state, MPO, or other transportation entities serving the peninsula. However, insights from the freight plan's screening/prioritization efforts and policy guidance perspectives should serve as valuable references in terms of potentially supporting or enhancing future decision-making by such entities within their respective processes and regardless of jurisdiction.

Exhibit ES.14 – Strategic Freight Goals for the Delmarva Peninsula

Economic Vitality

Improve the contribution of the freight transportation system to economic efficiency, productivity, and competitiveness

- *Support efforts to preserve existing multimodal freight-transportation infrastructure to ensure mode choice and competition between modes*
- *Support efforts to preserve land use compatibility adjacent to freight infrastructure throughout the peninsula*
- *Support strategically-located or planned improvements that recognize existing and projected population concentrations, employment and development, and related secondary traffic/population-based freight patterns*
- *Support efforts that address changes in economic activities (local, regional, national, or global) or growth in targeted industries*
- *Support efforts to enhance access to and from major regional ports and international shipping opportunities in multiple surrounding states*

Freight Connectivity, Mobility & Accessibility

Reduce congestion on the freight transportation system

- *Enhance freight mobility through broader transportation improvements that recognize the unique seasonal or tourist-based congestion aspects of travel to, from, and within the Delmarva Peninsula*
- *Enhance freight network connectivity with an emphasis on the unique needs and constraints related to serving the Delmarva Peninsula's limited geographical points of access*
- *Enhance opportunities for accessing and utilizing the freight transportation network on the peninsula through strategic multimodal infrastructure improvements*

Safety & Security

Improve the safety, security, and resilience of the freight transportation system

- *Support improvements that recognize the criticality and regional/national freight significance of I-95 and the Northeast Corridor*
- *Support improvements that enhance system redundancy with respect to I-95 and the Northeast Corridor and with respect to the geographical point of access limitations of the peninsula*
- *Support improvements that recognize the presence and unique needs of the region's governmental, military, or international shipping communities*

System Management, Operations & Maintenance

Improve the state of good repair of the freight transportation system

Use advanced technology, performance management, innovation, competition, and accountability in operating and maintaining the freight transportation system

- *Enhance policies and opportunities related to truck parking and rest areas, weight limits, taxes, tolls, or other motor freight issues*
- *Support efforts to address physical improvements on secondary roads and bridges critical to motor freight access throughout the peninsula*
- *Support efforts to maintain or enhance dredging operations and the identification and preservation of adequate disposal sites for excess dredge materials*

Sustainability & Environmental Stewardship

Reduce adverse environmental and community impacts of the freight transportation system

- *Support improvements that recognize the unique relationships between consumer demand and commodity flows on the peninsula with respect to seasonal or tourist-based variability and quality of life*
- *Support efforts to improve the flexibility and resiliency of the freight transportation system to meet changing global energy demands or sources*

Bold	*- National Freight Policy Goals*
Italics	*- Focus details for Delmarva Peninsula*

General Policy Perspectives

General policy perspectives recommend that freight planning agencies and stakeholders on the Delmarva Peninsula consider actions that help to address the region's key freight issues or concerns from a focus area perspective and including:

Economic Vitality:

- Focus on regional supply chain positioning
- Support trade and market expansion opportunities
- Enhance regional port access and opportunities
- Consider area-specific strategies and opportunities
- Discuss land use issues and implications
- Reflect market access and logistics trends or needs

Freight Connectivity, Mobility, and Accessibility:

- Detail the peninsula's roadway freight network, building on classification efforts to-date
- Formalize the peninsula's road way freight network, by federal/state program where applicable
- Enhance multimodal/intermodal connections and access to key freight hubs
- Manage traffic congestion and access
- Minimize freight/passenger conflicts

Safety and Security:

- Integrate freight interests throughout safety planning activities
- Integrate freight interests throughout emergency planning activities
- Focus on overweight and hazardous materials
- Support Homeland Security efforts relative to peninsula-specific freight activities

System Management, Operations, and Maintenance:

- Strengthen jurisdictional relationships and collaboration
- Review and monitor truck policies and peninsula-wide implications or inconsistencies
- Consider truck traffic needs or impacts during roadway maintenance/construction
- Expand the use of technologies in freight system management and operations
- Explore long-term solutions to waterway dredging needs on the peninsula

Sustainability and Environmental Stewardship:

- Implement strategies to reduce freight's impact on air quality
- Support efforts to research and manage freight's relationship with water resources
- Investigate freight issues relative to Sea-Level Rise (SLR) adaptation planning
- Balance freight operations and key community, land use, or quality of life issues

Beyond the Freight Plan

Effective freight planning must continue beyond the research, analyses, projects, and policies summarized throughout this document. The exact course of future efforts will inevitably vary depending on changes in statutory requirements, local or regional freight and industry trends, technological developments, or other such influences; and specific planning activities will involve agencies, stakeholders, and planning partners at all levels. Key follow-up actions summarized below focus on anticipated needs relative to freight system performance monitoring, strategic implementation actions, and future plan enhancement options.

Freight System Performance Monitoring:

MAP-21 establishes performance measurement and performance monitoring as key features to support decision-making processes that will help to invest resources in projects that collectively will make progress toward the achievement of national planning goals in seven overall areas, including freight movement and economic vitality. Research and technical efforts in this Delmarva Freight Plan lay the groundwork toward complying with these provisions; however, subsequent efforts will also be needed to manage five key challenges:

- Statutory schedule, including finalization of relevant requirements by USDOT
- Multi-state challenges, including efforts to ensure data consistency/availability
- Performance measure refinements, reflecting subsequent trends or lessons learned
- Performance target refinements, reflecting formal requirements and state interests
- Impacts of regional influences on system performance, or realistic progress monitoring

Performance Measures:

An initial set of performance measures (*Exhibit ES.15*) was compiled for monitoring the freight environment on the Delmarva Peninsula generally, and in the state of Delaware specifically. However, finalizing the baseline values for proposed measures that have been noted as To-Be-Determined (TBD) will require additional coordination, data details, documentation of future implementation trends, or integration with broader non-freight related planning efforts (e.g., tracking congestion or bridge/pavement conditions) beyond the confines of this freight plan. It is anticipated that DelDOT Planning, their MPO planning partners, and other participants involved with the Delmarva Freight & Goods Movement Working Group contain the necessary personnel and resources to champion future efforts to fill-in and/or refine the initial set of measures proposed here.

Performance Targets:

MAP-21 further requires the establishment of performance targets in relation to the performance measures, integration of the targets within state and MPO planning processes, and periodic reports on progress in relation to the targets. While this plan proposes an initial set of performance measures, it does not attempt to establish the corresponding set of performance targets. As with finalization of the measures themselves, it is anticipated that setting such targets will be an ongoing effort (at least until the final USDOT ruling) by DelDOT planning, their MPO planning partners, and other participants involved with the Delmarva Freight & Goods Movement Working Group.

Exhibit ES.15 – Performance Monitoring Measures

Measures for Economic Vitality	Baseline Data	Background Assumptions
Population level	**1.39M**	2010, 14-county basis w/ 902,823 in DE + 442,296 in MD + 45,553 in VA
Employment level	**504k**	2010, 14-county basis w/ 359,026 in DE + 130,865 in MD + 14,461 in VA
Source: TBD in conjunction w/ broader planning programs; baseline data above from freight plan Exhibit 7.4 and related scenario planning efforts		
Delmarva freight total tonnage	**69.6M**	2011, 12-county basis w/ 28.8M inbound + 28.0M outbound + 12.8M internal; not incl. 87.2M pass-thru
Delmarva freight total value	**$74.6B**	2011, 12-county basis w/ 33.2B inbound + 31.5B outbound + 10.0B internal; not incl. 252.7B pass-thru
Delmarva freight inbound/outbound freight ratio (by weight)	**1.03**	2011, 12-county basis w/ 28,884,251 inbound vs. 27,954,253 outbound
Source: TBD in conjunction w/ future commodity data updates; baseline data above from freight plan Exhibits 3.1-3.2 and related Transearch, Waybill, and FAF data summaries		
Port of Wilmington annual cargo tonnage	**5.6M**	2011 basis w/ 5,628, 807 tons
Port of Wilmington foreign cargo tonnage	**4.4M**	2011 basis w/ 1,246,918 domestic + 4,381,889 foreign
Port of Wilmington foreign import/export ratio	**3.68**	2011 basis w/ 3,446,432 imports + 935,457 exports
Source: USACE Navigation Data Center or Diamond State Port Corporation; baseline data above from freight plan Exhibit 4.17 and related USACE principal ports data summaries		
Waterborne freight tonnage along freight-significant river systems	**2.3M**	2011 basis w/ 1,064,830 via Wicomico River + 653,357 via Nanticoke River + 569,650 via Pocomoke River
Inbound/outbound freight ratio along freight-significant river systems	**1.39**	2011 basis w/ 1,329,807 inbound vs. 958,030 outbound via the Wicomico, Nanticoke, and Pocomoke Rivers
Source: USACE Navigation Data Center or Delmarva Water Transport Committee; baseline data above from freight plan Exhibit 4.18 and USACE waterborne commerce data summaries		

Measures for Freight Connectivity, Mobility, and Accessibility	Baseline Data	Background Assumptions
Travel time and/or delay in freight-significant corridors	**TBD**	-
Travel time and/or delay between benchmark destinations	**TBD**	-
Source: TBD pending future coordination w/ broader state or MPO planning programs; refer also to freight plan Exhibit 7.9 and other Chapter 7 system or corridor-specific modeling summaries		
Truck share of Delmarva freight total tonnage	**83%**	2010 basis vs. 10% rail + 7% river barge; does not reflect air, pipeline, or major regional port shipping
Source: TBD in conjunction w/ future commodity data updates; baseline data above from freight plan Exhibit 7.8 and related scenario planning efforts		
Daily Truck VMT	**5.3M**	2010 basis for truck miles traveled per model run data
Daily Truck VHT	**93k**	2010 basis for truck hours traveled per model run data
Percent of truck VHT at LOS E/F	**11%**	2010 basis for truck hours traveled at LOS E/F vs. total truck VHT per model run data
Daily system truck delay	**5.5k**	2010 basis for system truck delay hours per model run data
Percent of road mileage at congested speeds < 60% of free-flow speeds	**5%**	2010 basis per model run data for typical weekday PM peak periods
Source: DelDOT Cube Cargo / Cube Voyager model; baseline data above from freight plan Chapter 7 and related scenario planning efforts; additional corridor details available throughout Chapter 7		
Percent of rail network capable of supporting 286k	**TBD**	-
Port of Wilmington average truck turn-around time	**TBD**	-
Source: TBD pending future coordination (e.g., w/ state rail agencies, rail owner/operators, Diamond State Port Corporation)		

Exhibit ES.14 - Performance Monitoring Measures (Continued)

Measures for Safety and Security	Baseline Data	Background Assumptions
Number of total crashes involving large trucks	TBD	-
Number of fatal crashes involving large trucks	**18**	3-year average (2011-2013), 14-county basis w/ annual fatal counts per NHTSA FARS data
Number of persons injured in crashes involving large trucks	TBD	-
Source: TBD pending future coordination (e.g., w/ state crash reporting programs and available system data); baseline fatal crash counts from online NHTSA FARS database		
Number of total crashes at public highway-rail crossings	**8**	3-year average (2011-2013), 14-county basis w/ annual crash counts per FRA WBAPS data
Number of public highway-rail crossing improvements implemented	TBD	-
Source: TBD pending future coordination (e.g., w/ state rail agencies or rail owners/operators); baseline crash counts from online FRA Web Accident Prediction System		
Number of commercial vehicle inspections performed	TBD	-
Source: TBD pending future coordination (e.g., w/ applicable state agencies or enforcement personnel)		

Measures for System Management, Operations, and Maintenance	Baseline Data	Background Assumptions
Pavement conditions summary	TBD	-
Bridge conditions summary	TBD	-
Source: TBD pending future coordination w/ broader state or MPO planning programs		
Number of VWS or WIM sites added (or in operation)	TBD	-
Number of truck parking spaces available	TBD	-
Number of traffic signals updated or retimed	TBD	-
Source: TBD pending future coordination (e.g., w/ applicable state agencies and/or MPOs, as well as progress tracking subsequent to this freight plan)		
Dredge material placement capacity remaining	TBD	Anticipate a focus on the Nanticoke, Pocomoke, and Wicomico Rivers
Percent of key waterway mileage at federally-authorized depth	TBD	Anticipate a focus on the Nanticoke, Pocomoke, and Wicomico Rivers
Source: TBD pending future coordination (e.g., w/ USACE, Delmarva Water Transport Committee)		
Number (or value) of high/moderate priority freight actions implemented	TBD	Anticipate tracking and/or referencing projects or actions throughout freight plan Chapters 8 and 9
Mileage (or value) of rail enhancements implemented	TBD	TBD
Source: TBD pending future coordination (e.g., w/ state planning or MPOs, state rail agencies, rail owners/operators, as well as progress tracking subsequent to this freight plan)		

Measures for Sustainability and Environmental Stewardship	Baseline Data	Background Assumptions
Number (or value) of emissions reducing actions implemented	TBD	-
Source: TBD pending future coordination (e.g., w/ applicable state agencies or the Mid-Atlantic Diesel Collaborative)		

Strategic Implementation Actions:

To support the implementation of projects, policies, or related activities outlined by this plan while also generally continuing to advance the state of freight planning on the peninsula, a number of strategic follow-up planning actions will be required. As with previous discussions on performance monitoring, it is anticipated that the peninsula's state, MPO, or regional planning partners and efforts through the Delmarva Freight & Goods Movement Working Group will be able to identify the necessary personnel and resources to champion such actions including, but not limited to, the following:

- Encourage the State Freight Advisory Committee
- Finalize performance measures
- Set initial performance targets
- Prepare for performance reporting
- Refine future performance monitoring details
- Track future implementation details
- Enhance integration within statewide planning processes
- Inform future funding and implementation decisions
- Maintain compliance with federal freight planning revisions

Future Plan Enhancement Options:

To further advance the state of freight planning on the peninsula while also maintaining or enhancing key components relative to future plan updates, a number of additional freight planning enhancements may also be considered. Whereas the previous list of strategic implementation actions focused primarily on management, application, or integration of the plan; the potential enhancements discussed here focus more on discrete add-on components that would supplement or expand the scope of the current plan including, but not limited to, the following:

- Maintain future commodity flow data
- Maintain the Cube Cargo model
- Investigate additional freight planning scenarios
- Study key supply chains
- Study potential expansion of CVISN's VWS coverage
- Study potential expansion of CVISN's enforcement coverage
- Evaluate strategies for compiling multistate crash data
- Integrate dashboard summaries
- Develop a mapping and data platform to summarize Delmarva's freight environment

Closing

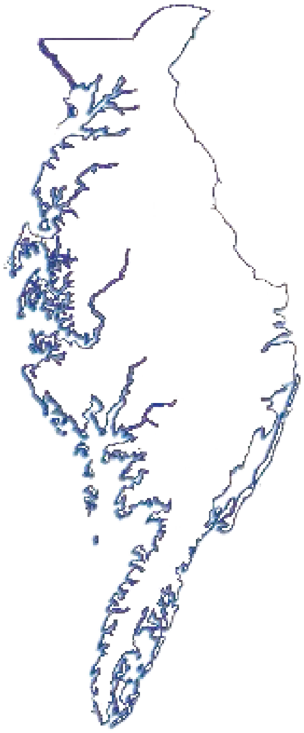
The Delmarva Freight Plan was aimed at supporting key national freight planning goals in compliance with MAP-21, while also providing a broad assessment of local and regional freight planning needs. This approach was paired with the development of a Cube Cargo commodity flow model to support ongoing and future planning efforts in the region, alongside customized freight scenario testing to help inform decision-making in the face of unknown futures. The plan further included a comprehensive project screening and prioritization process to help evaluate projects having the most potential to influence the freight system, while also providing data-oriented elements that may be used to help pursue freight-specific funding options for those projects. Capping these efforts were generalized summaries of freight policies, performance monitoring needs, strategic implementation actions, and future plan enhancement options that will ultimately help to support the region's freight planning efforts now, tomorrow, and into the future.

While completion of this plan may be considered a milestone amongst freight planning activities on the Delmarva Peninsula, it is undoubtedly not an end. Rather it should serve as a catalyst that helps to continue the momentum of a renewed emphasis on freight and goods movement planning that must continue well beyond the confines of this document.

Delmarva Freight Plan

Chapter 1

Introduction



Chapter 1
Introduction

The *Delmarva Freight Plan* summarizes current and future freight planning and transportation needs to enhance freight and goods movement and related economic opportunities on the Delmarva Peninsula. Undertaken by the Delaware Department of Transportation (DelDOT) in collaboration with the Maryland Department of Transportation (MDOT) and the Virginia Department of Transportation (VDOT), the plan supports a regional perspective of freight flows to, from, through, and within the project area. In further coordination with the Wilmington Area Planning Council (WILMAPCO), the Dover/Kent County Metropolitan Planning Organization (Dover/Kent MPO), the Salisbury/Wicomico MPO (S/WMPO), and coupled with extensive stakeholder outreach, the plan also supports consistency with other area planning efforts while targeting specific freight-related issues relevant to the local and regional economies.

1.1 Purpose

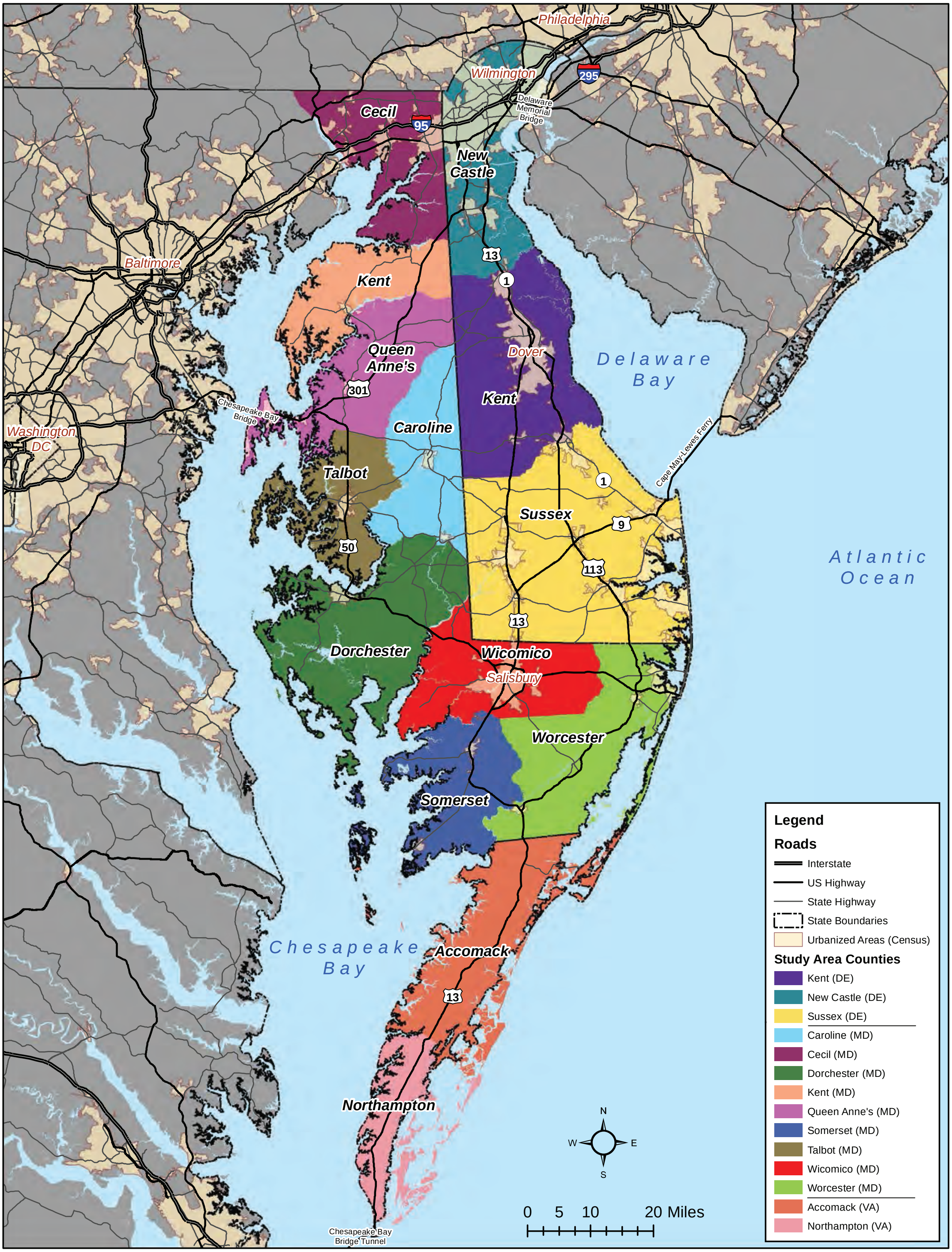
The overall purpose of the *Delmarva Freight Plan* is to provide relevant information that will assist the state DOTs, area MPOs, and other stakeholders in making well-informed decisions on freight infrastructure investments and freight-related policies. To accomplish this task, the study aimed to:

- Better understand existing and anticipated freight flows, issues, and concerns within the project area and to/from the surrounding areas
- Comprehensively evaluate the multimodal/intermodal freight transportation system while encompassing commodity flows via truck, rail, water, air, and pipeline
- Explore and analyze future freight-planning scenarios through year 2040 with an emphasis on a performance-driven approach
- Identify relevant infrastructure, policies and regulation changes or other investments that seek to enhance the safety, performance, and efficiency of freight travel in the region, as well as related environmental impacts and economic opportunities

1.2 Project Area

The *Delmarva Freight Plan* fulfills statewide freight plan requirements for the state of Delaware, while also spanning boundaries to provide additional support for existing freight plans in Maryland and Virginia. The plan's primary geographic focus is the entirety of the Delmarva Peninsula, referred to as "the peninsula", bound by the Chesapeake Bay, Delaware Bay, and Atlantic Ocean (*Exhibit 1.1*). This area encompasses all three counties in the state of Delaware (New Castle, Kent, and Sussex); nine counties on Maryland's Eastern Shore (Cecil, Kent, Queen Anne's, Caroline, Talbot, Dorchester, Wicomico, Somerset, and Worcester); and two counties in Virginia at the peninsula's southern tip (Accomack and Northampton).

Exhibit 1.1 – Delmarva Freight Study Project Area



1.3 Multi-Jurisdictional Plan Perspective

It is crucial to recognize that the Delmarva Freight Plan embraces a multistate/multi-jurisdictional and multimodal freight planning perspective that stretches beyond the identified project area. Supply chains and freight flows vary by commodity, industry, supply and demand, and origins and destinations and are rarely limited to a single jurisdiction. Transportation freight plans are best approached by a multi-faceted perspective of trade lanes, key commodities, or key industries in the U.S. and neighboring trade partners (i.e. Latin America and Canada), rather than simply from within a state's geography.

DelDOT, MDOT, VDOT, and their MPO planning partners, for example, are critical components of the freight movement system in the I-95 Corridor. As international markets continue to emerge for imports and exports, and with expansions of the Panama and Suez Canals, the port-airport-rail-highway system in the I-95 Corridor will remain one of the most critical components of the United States' freight network.

The broader I-95 Corridor encompasses a region of 16 States (from Maine to Florida) generating 41% of the Nation's Gross Domestic Product and representing 40% of the Nation's population. Within this essential region are:

- 41 Ports, and Coastal Shipping Lanes in the Atlantic, and the Intercoastal and Inland Waterways
- 106+ Airports
- 907,000 miles of Highway
- 30,495 miles of Freight Railroad Track, with 1,111 heavy-rail directional route miles (70% of the national total)

Comprehensive freight planning must address the systems within individual political jurisdictions or state boundaries while recognizing the multi-state economic corridor that comprises the trip of a particular mode. Assistance for addressing the growing needs of the industry will come from the USDOT national freight strategic plan guidance, with its national freight framework built upon multistate corridors.

States understand that economic corridor planning is comprehensive, not simply mode specific. Ensuring robust connectivity to state and regional airports, rail, and seaports is key to a competitive regional economy and comprehensive State Freight Plan. Through implementation and utilization of more efficient economic corridors, managed lanes, and strategic improvements, states can optimize the network for more reliable freight flows as well as better commute times for its end users.

This combined individual and multi-jurisdictional perspective allows better identification of vital freight improvement projects, sustaining an economically robust freight system for supply chains moving within Delaware, Maryland, Virginia, and beyond. In the development of this freight plan, the planning agencies recognize and support the need for collaboration in freight planning within regional jurisdictions and across economic corridors, enhancing mobility at the local, state, multi-state, and national level.

1.4 Plan Highlights

Critical background information or unique components that have been woven throughout this plan include:

Federal Freight Planning Compliance: The Moving Ahead for Progress in the 21st Century act (MAP-21) was signed into law by the President on July 6, 2012. MAP-21 sections 1115 through 1118 outline new details for a National Freight Policy, the prioritization of projects to improve freight movements, the establishment of state freight advisory committees, and related requirements for state freight plans. The Delmarva Freight Plan fulfills these requirements while also incorporating related interim guidance from the U.S. Department of Transportation (USDOT), as well as established freight planning practices from the Federal Highway Administration (FHWA).

MAP-21 Section 1118 requires that a State Freight Plan developed pursuant to Section 1118 include, at a minimum, the following elements:

- An identification of significant freight system trends, needs, and issues with respect to the state;
- A description of the freight policies, strategies, and performance measures that will guide the freight-related transportation investment decisions of the state;
- A description of how the plan will improve the ability of the state to meet the national freight goals established under section 167 of title 23, United States Code;
- Evidence of consideration of innovative technologies and operational strategies, including intelligent transportation systems, that improve the safety and efficiency of freight movement;
- A description of improvements that may be required to reduce or impede roadway deterioration in the case of routes on which travel by heavy vehicles (including mining, agricultural, energy cargo or equipment, and timber vehicles) is projected to substantially deteriorate the condition of roadways;
- An inventory of facilities with freight mobility issues, such as truck bottlenecks, within the state, and a description of the strategies the state is employing to address those freight mobility issues.

Extensive Document Review: To ensure consistency with existing plans and the current state-of-the-practice, the Delmarva Freight Plan commenced with an extensive document review effort. In addition to building upon or supporting previous freight-plans in Delaware, Maryland, and Virginia, such research helps this plan to reflect intra-regional, inter-regional, and national trends in freight movement and planning.

Robust Stakeholder Outreach: One of the best ways to determine existing conditions, bottlenecks, needs, and forecasted growth is through an active stakeholder outreach program. To accomplish this, the study team conducted a series of outreach activities to explore the unique, but overlapping, perspectives of various stakeholder agencies, shippers and carriers, businesses, and industries. Outreach mechanisms included project advisory meetings, stakeholder interviews, and an online survey. In addition, plan development coincided with and benefitted from ongoing efforts being spearheaded by WILMAPCO, DelDOT, and MDOT to conduct a regularly-scheduled freight forum focusing on the needs and interests of the Delmarva Peninsula. An annual freight summit (June 2012/2013/2014) was modeled on past successes of the Delmarva Rail Summit, but with an expansion to address all modes of freight and goods movement. Subsequent efforts beyond the annual summit also include periodic meetings of the Delmarva Freight & Goods Movement Working Group.

MAP-21 Section 1117 and related interim guidance specify that State Freight Advisory Committees should be charged with:

- Advising the state on freight-related priorities, issues, projects, and funding needs;
- Serving as a forum for discussion of state decisions affecting freight transportation;
- Communicating and coordinating regional priorities with other organizations;
- Promoting the sharing of information between the private and public sectors on freight issues; and
- Participating in the development of the state's freight plan.

Detailed Commodity Flow Investigations: To better understand the types, volumes, origins, destinations, and related details of freight within the project area, a number of commodity flow sources were referenced. FHWA's Federal Analysis Framework Version 3 (FAF3) data provided a general overview; the Surface Transportation Board's (STB) rail waybill samples supported a review of rail commodities; and IHS Global Insight's Transearch data provided more extensive detail for project-specific investigation. Combined, such details helped to paint a more accurate picture of specific commodity flows and related needs, while also supporting model development tasks and performance-based emphases throughout the study.

Commodity Flow Model Development: A major component of this project was the development and customization of a Commodity Flow model using the Cube Voyager software platform, coupled with the expansion and refinement of DelDOT's existing statewide travel demand model (i.e. the Peninsula Model). This model is a powerful software tool with the capability to forecast current and future freight movements on the peninsula by commodity group and mode of travel; to accurately capture intermodal transfer of goods and freight system performance; and to test the impacts of decisions such as infrastructure investments, changes in regulations, and modal enhancements. Use of the model was not only key to investigating freight scenarios for this project, but also establishes the software tool as an efficient means for DelDOT to help support ongoing or future freight planning efforts.

Performance-Based Scenario Planning: Incorporating each of the highlighted components above, this plan culminates in the development and evaluation of future freight planning scenarios. Each scenario represents an alternate future based on some combination of various assumptions (e.g. loss of barges and rails, significant increase in water freight, status quo). Scenario planning combines stakeholder guidance with general study insights, commodity details, and the Commodity Flow model to conduct a transparent qualitative/quantitative review of how the freight transportation system might perform under each scenario. The performance outcomes help describe a future to which the DOTs, MPOs, and other stakeholders can better prepare to react, ultimately fostering more informed decision-making and the development of effective infrastructure plans and policy guidance.

Project Screening and Prioritization: Approximately 200 project candidates were identified by the freight plan and assessed using a two-stage screening and prioritization methodology. This approach helped to evaluate projects having the most potential to influence the freight system, while also providing data-oriented elements that may be used to help pursue freight-related funding options. Such insights will work in concert with the plan's freight policy perspectives and next steps for managing, implementing, or enhancing the freight plan; and will ultimately help to support the region's freight planning efforts well into the future.

1.5 Strategic Goals

MAP-21 requirements specify that a state freight plan must improve the ability of the state to meet the national freight goals established under 23 U.S.C. 167 and included as part of the National Freight Policy, while also highlighting and/or expanding on the most important strategic goals for the state. To that end, the *Delmarva Freight Plan* categorizes a set of strategic freight goals that support the broader multimodal goals established in the various long range transportation plans for Delaware, Maryland, and Virginia as follows :

- Economic Vitality
- Freight Connectivity, Mobility & Accessibility
- Safety & Security
- System Management, Operations & Maintenance
- Sustainability & Environmental Stewardship

Economic Vitality

- **National Freight Policy:** Improve the contribution of the freight transportation system to economic efficiency, productivity, and competitiveness
- **Delmarva Focus:** Support efforts to preserve existing multimodal freight-transportation infrastructure to ensure mode choice and competition between modes
- **Delmarva Focus:** Support efforts to preserve land use compatibility adjacent to freight infrastructure throughout the peninsula
- **Delmarva Focus:** Support strategically-located or planned improvements that recognize the existing and projected population concentrations, employment and development, and related secondary traffic/population-based freight patterns
- **Delmarva Focus:** Support efforts that address changes in economic activities (local, regional, national, or global) or growth in targeted industries
- **Delmarva Focus:** Support efforts to enhance access to and from major regional ports and international shipping opportunities in multiple surrounding states

Freight Connectivity, Mobility & Accessibility

- **National Freight Policy:** Reduce congestion on the freight transportation system
- **Delmarva Focus:** Enhance freight mobility through broader transportation improvements that recognize the unique seasonal or tourist-based congestion aspects of travel to, from, and within the Delmarva Peninsula
- **Delmarva Focus:** Enhance freight network connectivity with an emphasis on the unique needs and constraints related to serving the Delmarva Peninsula‘s limited geographical points of access
- **Delmarva Focus:** Enhance opportunities for accessing and utilizing the freight transportation network on the peninsula through strategic multimodal infrastructure improvements

Safety & Security

- **National Freight Policy:** Improve the safety, security, and resilience of the freight transportation system
- **Delmarva Focus:** Support improvements that recognize the criticality and regional/national freight significance of I-95 and the Northeast Corridor
- **Delmarva Focus:** Support improvements that enhance system redundancy with respect to I-95 and the Northeast Corridor and with respect to the geographical point of access limitations of the peninsula
- **Delmarva Focus:** Support improvements that recognize the presence and unique needs of the region's governmental, military, or international shipping communities

System Management, Operations & Maintenance

- **National Freight Policy:** Improve the state of good repair of the freight transportation system
- **National Freight Policy:** Use advanced technology, performance management, innovation, competition, and accountability in operating and maintaining the freight transportation system
- **Delmarva Focus:** Enhance policies and opportunities related to truck parking and rest areas, weight limits, taxes, tolls, or other motor freight issues
- **Delmarva Focus:** Support efforts to address physical improvements on secondary roads and bridges critical to motor freight access throughout the peninsula
- **Delmarva Focus:** Support efforts to maintain or enhance dredging operations and the identification and preservation of adequate disposal sites for excess dredge materials

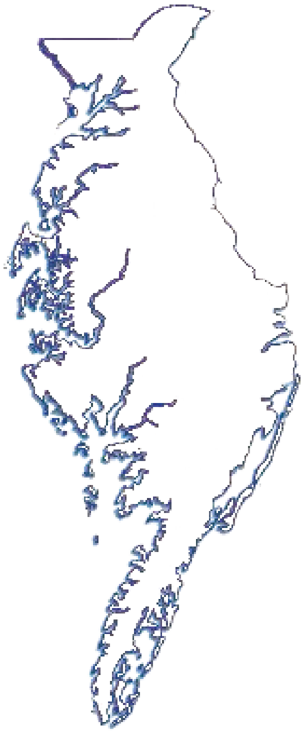
Sustainability & Environmental Stewardship

- **National Freight Policy:** Reduce adverse environmental and community impacts of the freight transportation system
- **Delmarva Focus:** Support improvements that recognize the unique relationships between consumer demand and commodity flows on the peninsula with respect to seasonal or tourist-based variability and quality of life
- **Delmarva Focus:** Support efforts to improve the flexibility and resiliency of the freight transportation system to meet changing global energy demands or sources

Delmarva Freight Plan

Chapter 2

Existing Economic Context

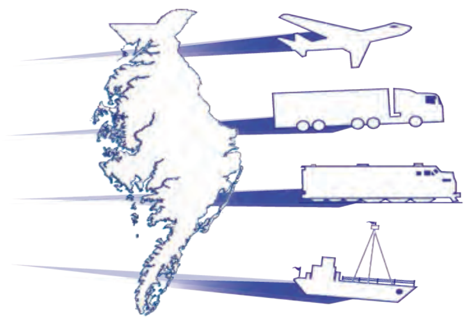


Chapter 2

Existing Economic Context

The Delmarva Peninsula is a growing region with well-established industries and developed infrastructure. To fully understand the freight services that are the impetus of this plan it's important to understand the economic drivers and markets of the region. To that end, this chapter provides an overview of the following:

- Population growth, employment patterns, and what these trends indicate about the region.
- Key industries, supply chain characteristics, and goods/cargo movement perspectives.
- The region's numerous economic development strategies that include business enterprise zones, tax credits, and other policies designed to promote industry and business opportunities.
- A macro perspective as to how the Delmarva region fits into the global market.



2.1 Population and Employment

Overview

The population on the Delmarva Peninsula is very urban in and around the Northeast Corridor and rural in the central and southern parts of the peninsula. Population concentrations help to drive commodity flows on the peninsula as much of the reoccurring freight is what is known as secondary traffic (i.e. consumer goods or other freight that is trucked between warehouses, distribution centers, retail stores, or other final points of delivery, often with more localized origins and destinations). Estimated household growth on the peninsula will continue to have an influence on commodity flow trends. Continued growth in population may also be a catalyst for strong employment growth in the coming years, particularly for the peninsula's largest industry groups. Trade, transportation, and utilities industries comprise the largest of these groups, while manufacturing is the second largest industry on the peninsula in terms of employees, employing 10% of the peninsula's working population.

Employment hubs stationed around the peninsula have enabled household income to increase as the majority of households earn $50,000 to $99,999 per year. Increased household income will help to increase the demand for consumer goods, which will continue to fuel the cycle of commodity flows from suppliers to consumers. The relationship between consumer demands and commodity flows on the peninsula are expected to influence freight trends and drive growth in truck transportation establishments in each county to accommodate the expected growth.

Population by State

Secondary traffic, often consumer goods, accounts for a significant portion of freight being moved on the Delmarva Peninsula. High population areas drive a portion of secondary traffic to meet the needs of consumers. The peninsula's combined population in 2010 was 1,358,044 people, accounting for all 14 counties within the project area that includes 3 counties in Delaware, 9 counties on Maryland's Eastern Shore, and 2 counties in Virginia. The majority of the peninsula's population lives in Delaware, totaling 902,823 people in 2010, of which almost 60% (538,734) reside in New Castle County.

The Delmarva population is estimated to grow by almost 29% from 2010 through 2040 (*Exhibit 2.1*), resulting in a 2040 population of 1,745,104. The largest incremental increase will occur in Delaware's three-county area with 226,376 additional persons, or 58% of the overall growth. The largest percentage increase will occur in Maryland's nine-county area with 160,680 additional persons, or 41% of the overall growth. Population change in Virginia's two-county area is not expected to be significant.

Exhibit 2.1 – Population on the Delmarva Peninsula (2010-2040)

Population by Year	DE (3 Counties)	MD (9 Counties)	VA (2 Counties)	Delmarva Peninsula
2010	902,823	409,668	45,553	1,358,044
2020	961,828	425,078	45,565	1,432,471
2030	1,035,534	473,758	45,564	1,554,856
2040	1,129,199	570,348	45,557	1,745,104
Population Change	226,376	160,680	Negligible	387,060
(2010-2040)	25%	39%	0%	29%

Source: VPDA, LLC compiled with MDBED, DE Population Consortium 2010 & ESRI Online Business Analyst compound growth rate projected by MDBED & DE Population Consortium.

Population by County

Population hubs on the peninsula have created markets and are served by markets that are freight dependent and that provide consumer goods with strong relationships to secondary traffic commodity flows. Populations across these hubs are generally expected to increase through 2040 for all Delaware and Maryland counties on the peninsula, while populations in the two Virginia counties will be stagnant or decline slightly (*Exhibit 2.2*).

Exhibit 2.2 – Population on the Delmarva Peninsula by County (2010-2040)

Population by Year	DE (3 Counties)				MD (9 Counties)										VA (2 Counties)		
	New Castle	Sussex	Kent	DE TOTAL	Caroline	Cecil	Dorchester	Kent	Queen Annes	Somerset	Talbot	Wicomico	Worcester	MD TOTAL	Accomack	Northampton	VA TOTAL
2010	538,734	198,500	165,589	902,823	32,459	101,125	31,397	19,982	46,999	26,693	36,406	96,243	18,364	409,668	33,164	12,389	45,553
2020	542,963	234,069	184,796	961,828	36,483	125,017	32,106	20,308	48,152	26,982	37,169	98,643	19,088	443,948	33,432	12,133	45,565
2030	571,523	270,846	193,165	1,035,534	40,835	146,373	34,948	21,612	52,759	28,138	40,214	108,241	21,994	495,114	33,568	11,996	45,564
2040	614,360	306,949	207,890	1,129,199	45,777	165,765	40,335	23,962	65,471	30,258	43,962	127,493	27,325	570,348	33,661	11,896	45,557
Population Change	75,626	108,449	42,301	226,376	13,318	64,640	8,938	3,980	18,472	3,565	7,556	31,250	8,961	160,680	404	-393	4
(2010-2040)	14%	55%	26%	25%	41%	64%	28%	20%	39%	13%	21%	32%	49%	39%	1%	-3%	0%

Source: VPDA, LLC compiled with Maryland Department of Business & Economic Development (MDBED) County Economic Facts. 2020 Compound Growth Rate U.S. Census Bureau, Virginia Employment Commission Projected by MDBED.

The peninsula's largest population concentration is along the I-95 corridor through Cecil County, Maryland and New Castle County, Delaware. Convenient access from both counties to I-95 and the Northeast Corridor make this area an attractive place for major employers and distribution hubs. Both counties are within two hours of major east coast markets in New York, New Jersey, Philadelphia, Baltimore and Washington, D.C.

Populations within Cecil and New Castle Counties are supported by the area's major industries. The 2010 Cecil County population of 101,125 accounts for 25% of the nine-county total in Maryland's portion of the study area and is estimated to increase by 64,640 people from 2010 through 2040. The 2010 New Castle County population of 538,734 is the largest in the study area, accounting for 60% of Delaware's statewide population and 40% of the peninsula's overall population. With a projected 2040 population of 614,360, New Castle County will remain the largest concentration in the study area well into the future.

The peninsula's next largest population concentrations occur throughout Kent and Sussex Counties, Delaware, and Wicomico County, Maryland. Each of these counties includes access to many of the main north/south and east/west thoroughfares on the peninsula. Such thoroughfares include the US 13 north/south corridor, as well as connections to US 9, US 50, US 113, DE 1, or MD/DE 404. These routes encompass first-class highway linkages between major metropolitan areas both on and off the peninsula.

Within Kent County, Delaware, the City of Dover serves as the state capital, county seat, and home to numerous commercial, industrial, and institutional developments. Dover is well-served with access to the US 13 and DE 1 corridors and is also the home of a major military freight hub through Dover Air Force Base. Kent County's 2010 population of 165,589 is the third largest in both Delaware and the overall peninsula study area. The estimated 2040 Kent County population of 207,890 reflects a 26% increase (42,301 additional people) from 2010 through 2040 and is the fourth largest incremental increase across the study area.

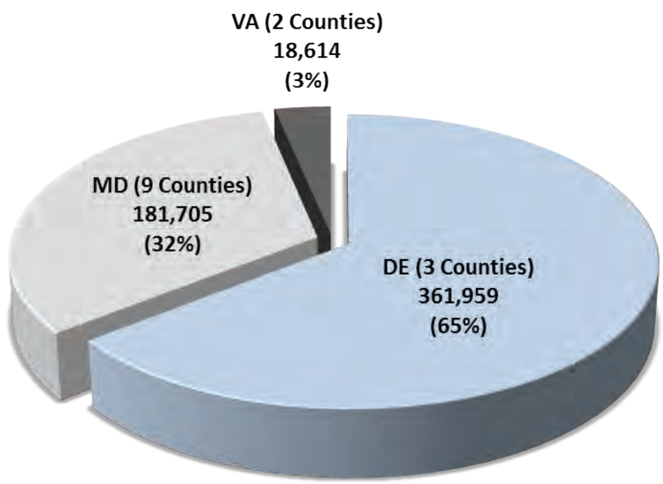
Within Sussex County, Delaware, the City of Seaford is an important trade capital given its proximity to US 13 and access to the Nanticoke River. Corporations have set up industrial hubs in Seaford to take advantage of linkages to major metropolitan areas such as Wilmington and Norfolk. The 2010 Sussex County population of 198,500 represented about a quarter of Delaware's population. The estimated 2040 Sussex County population of 306,949 reflects a 55% increase from 2010 through 2040, which is the second highest percentage increase in the study area (next to Cecil County, Maryland) as well as the second highest incremental increase in the study area (next to New Castle County, Delaware).

Within Wicomico County, Maryland, the City of Salisbury is an important freight hub for importing petroleum and grain and is conveniently located with access to US 13, US 50, and the Wicomico River. The 2010 Wicomico County population of 96,243 makes it the second largest (next to Cecil County) in Maryland's nine-county portion of the study area. The population is estimated to grow by 32% (31,250 additional people) from 2010 through 2040. Wicomico County's 2040 population of 127,493 will retain its ranking as the second largest concentration across Maryland's nine counties.

Households and Income

In 2010 the Delmarva Peninsula encompassed roughly 534,000 households. Near-term projections through 2016 will increase that number by 5% (or 27,000 additional households), raising the 2016 total on the peninsula to 562,000 households. The composition of households is heavily concentrated in major employer market areas. As such, the majority of households are located in Delaware's three-county area versus the eleven more rural counties throughout the Maryland and Virginia portions of the study area (*Exhibit 2.3*).

Exhibit 2.3 – Households on the Delmarva Peninsula (2016)



In 2010 Delaware had a total of 342,200 households, many of which are located in New Castle County. By 2016 that total will increase by 6% (or 19,600 additional households), raising the 2016 total in Delaware to approximately 361,900 households, which comprises about 65% of the study area total. Household growth in Delaware is slightly higher than Maryland, Virginia, and the study area average, but is consistent.

Although Maryland and Virginia have eleven counties in the study area, they are predominately rural with lower population concentrations than those in Delaware. In 2010, there were 173,000 households in Maryland's nine-county area and 19,000 households in the Virginia's two-county area. By 2016, Maryland households are projected to increase by 5% (or 8,500 additional households), while Virginia households are projected to decrease by 3% (or 537 fewer households). In 2016 it is estimated that households in the combined Maryland and Virginia portions of the study area will total just over 200,000 households, or approximately 160,000 less than the estimated total in Delaware's three-county area.

Household income on the peninsula is predominately middle class with 33% of household incomes between $50,000 and $99,999 (*Exhibit 2.4*). The largest increase in household income between 2011 and 2016 is for households earning between $75,000 and $99,999 (*Exhibit 2.5*). Households in this income range are estimated to increase by 34% from 2011 to 2016, resulting in a total of 94,500 households with the majority located in Delaware. Household Income on the peninsula is estimated to have a consistent growth rate from 2011 to 2016 as households ascend the income tiers.

Exhibit 2.4 – Households by Income on the Delmarva Peninsula (2011)

Income Range	DE (3 Counties)		MD (9 Counties)		VA (2 Counties)		Delmarva Peninsula	
	2011 # Households	%	2011 # Households	%	2011 # Households	%	2011 # Households	%
< $15,000	35,499	10.3%	19,248	11.1%	3,914	20.5%	58,661	10.9%
$15,000-$24,999	35,202	10.2%	18,109	10.4%	2,902	15.2%	56,213	10.4%
$25,000-$34,999	33,724	9.8%	17,142	9.8%	2,506	13.1%	53,372	9.9%
$35,000-$49,999	47,493	13.8%	22,651	13.0%	3,261	17.1%	73,405	13.6%
$50,000-$74,999	68,613	19.9%	34,822	20.0%	3,038	15.9%	106,473	19.8%
$75,000-$99,999	45,834	13.3%	22,939	13.2%	1,602	8.4%	70,375	13.1%
$100,000-$149,000	49,056	14.2%	23,555	13.5%	1,265	6.6%	73,876	13.7%
$150,000-$199,999	16,927	4.9%	8,029	4.6%	299	1.6%	25,255	4.7%
$200,000+	12,763	3.7%	7,580	4.4%	281	1.5%	20,624	3.8%
Total Households	345,111	100%	174,075	100%	19,068	100%	538,254	100%

Source: ESRI Business Solutions compiled by VPDA, LLC

Exhibit 2.5 – Change in Household Income on the Delmarva Peninsula (2011-2016)

Income Range	DE (3 Counties)		MD (9 Counties)		VA (2 Counties)		Delmarva Peninsula	
	2011-2016 Change in # Households	% Change	2011-2016 Change in # Households	% Change	2011-2016 Change in # Households	% Change	2011-2016 Change in # Households	% Change
< $15,000	-15	-0.0%	-11	-0.1%	-292	-7.5%	-318	-0.5%
$15,000-$24,999	-7,003	-19.9%	-2,515	-13.9%	-535	-18.4%	-10,053	-17.9%
$25,000-$34,999	-6,292	-18.7%	-2,680	-15.6%	64	2.6%	-8,908	-16.7%
$35,000-$49,999	-6,357	-13.4%	-2,606	-11.5%	-332	-10.2%	-9,295	-12.7%
$50,000-$74,999	2,323	3.4%	-2,659	-7.6%	335	11.0%		-0.0%
$75,000-$99,999	15,831	34.5%	8,131	35.4%	168	10.5%	24,130	34.3%
$100,000-$149,000	10,348	21.1%	6,361	27.0%	83	6.6%	16,792	22.7%
$150,000-$199,999	5,671	33.5%	2,348	29.2%	49	16.4%	8,068	31.9%
$200,000+	2,342	18.3%	1,261	16.6%	6	2.1%	3,609	17.5%
Total Households	16,848	4.9%	7,630	4.4%	-454	-2.4%	24,024	4.5%

Source: ESRI Business Solutions compiled by VPDA, LLC

Employment by Industry

Based on labor force distribution by industry from 2005 through 2011, the top freight dependent industries on the peninsula are construction, manufacturing, natural resources and mining, and trade, transportation and utilities (*Exhibit 2.6*). These groups collectively employ 35% of the civilian employed population (16 years and older) in the study area. Evidence of pre-recession/post-recession impacts are shown in that some of these industries experienced a decrease in the number of employees from 2005 through 2011. However, the percentage of employees for each industry generally remained the same during that time period, and the top freight dependent industries are estimated to rebound with the economy. Trade, transportation and utilities were the largest freight dependent industries on the peninsula in 2011, employing 16.7% of the labor force or over 111,000 employees. Manufacturing was the second largest, employing over 66,000 people in industries such as aerospace, chemicals, and plastic products.

At the county level, the labor force distributions mirror trends for the overall study area. The freight-dependent trade, transportation and utilities group, for example, generally employs the highest number of workers in most of the study area counties, as it did for the study area as a whole. Whether by total number of employees (such as in densely-populated New Castle or Cecil Counties) or as a relative percentage of the local employment types (such as in Caroline County), the potential influence of the trade, transportation and utilities group on the area's economy and related freight requirements is substantial.

Manufacturing is also a top employer on the peninsula overall and at the county level. Manufacturing employs 10% of the working population in the study area with the largest concentration on the upper eastern shore areas (Cecil and New Castle Counties). Some of the study area's largest employers such as W.L. Gore & Associates and DuPont are located in these counties. The majority of the civilian population in the Virginia portion of the study area is also employed in the manufacturing industry. The lower eastern shore areas (Wicomico, Dorchester and Northampton Counties) include a high concentration of employment in natural resources and mining, the majority of which are in the poultry industry and include major employers such as Perdue Farms and Mountaire Farms.

A more detailed look at the top 10 industry sectors by establishment (*Exhibit 2.7*) shows that specialty trade contractors make up the majority of the top freight dependent industry establishments within the overall study area. More than 2,700 specialty trade contractor establishments are located throughout the peninsula. Truck transportation establishments make up the top non-construction related establishments. County business pattern details show that New Castle, Kent, Sussex, Cecil and Wicomico Counties house over 70% of the truck transportation establishments in the study area.

Exhibit 2.6 – Labor Force Distribution by Industry on the Delmarva Peninsula (2005-2011)

Industry	DE (3 Counties)			MD (9 Counties)			VA (2 Counties)			Delmarva Peninsula					
	2005 % Employees	2011 % Employees	2005-2011 % Change	2005 % Employees	2011 % Employees	2005-2011 % Change	2005 % Employees	2012 % Employees	2005-2012 % Change	2005 # Employees	2005 % Employees	2011 # Employees	2011 % Employees	2005-2011 Change in # Employees	2005-2011 % Change in Employees
Construction	7.8%	7.4%	-0.4%	10.9%	4.6%	-6.3%	10.9%	2.5%	-8.4%	57,729	8.9%	48,615	7.3%	-9,114	-15.8%
Manufacturing	9.8%	9.7%	-0.1%	8.9%	9.3%	0.4%	9.0%	16.2%	7.2%	61,703	9.5%	66,496	10.0%	4,793	7.8%
Natural Resources & Mining	1.0%	1.5%	0.5%	2.6%	2.0%	-0.6%	8.0%	8.6%	0.6%	11,444	1.8%	10,688	1.6%	-756	-6.6%
Trade, Transportation & Utilities	16.8%	16.8%	0.0%	16.8%	19.8%	3.0%	8.2%	3.2%	-5.0%	107,009	16.5%	111,249	16.7%	4,240	4.0%
Other	64.6%	64.6%	0.0%	60.8%	64.3%	3.5%	64.0%	69.4%	5.4%	411,882	63.4%	430,662	64.5%	18,780	4.6%
Totals	-	-	-	-	-	-	-	-	-	649,767	-	667,710	-	17,943	2.8%

Source: ACS Population Summary 2005-2009 Percent of Employees compiled by VPDA, LLC. 2011 Percent of Employees provided by Maryland Department of Business and Economic Development/ Factfinder 2 Table NP01 compiled by VPDA, LLC. Note Virginia Source Data from 2012. Note employee references with respect to the civilian employed population, age 16+ years.

Exhibit 2.7 – Top 10 Industry Sectors on the Delmarva Peninsula (2010)

Rank	NAICS Code	NAICS Code Description	DE (3 Counties)			MD (9 Counties)									VA (2 Counties)	
			Kent	New Castle	Sussex	Caroline	Cecil	Dorchester	Kent	Queen Annes	Somerset	Talbot	Wicomico	Worcester	Accomack	Northampton
1	238	Specialty Trade Contractors	240	868	868	77	141	47	46	145	30	100	178	144	43	14
2	236	Construction Buildings	104	339	339	41	73	26	20	84	18	90	72	85	45	15
3	484	Truck Transportation	51	130	130	28	52	30	16	30	15	9	39	14	18	1
4	237	Heavy & Civil Engineering Construction	24	63	63	8	19	9	7	15	5	17	9	11	8	4
5	488	Support Activities for Transportation	12	71	71	15	7	3	1	6	0	6	9	4	1	0
6	332	Fabricated Metal Product Manufacturing	15	63	63	4	5	7	5	6	1	2	11	2	1	1
7	485	Transit and Ground Passenger Transportation	33	32	32	5	15	14	4	8	1	2	28	10	0	0
8	323	Printing and Related Support Activities	4	48	48	1	5	2	3	4	0	3	11	6	0	1
9	311	Food Manufacturing	13	22	22	2	2	18	2	3	5	3	8	6	9	0
10	325	Chemical Manufacturing	6	34	34	3	3	3	3	5	2	4	6	3	2	0

Source: U.S. Census Bureau - 2010 County Business Patterns 3 Digit NAICS Code compiled by VPDA, LLC

2.2 Key Industries and Supply Chains

Overview

The Delmarva Peninsula's economy features a diverse group of industries that includes agriculture, chemical processing, and logistics. A robust profile was created of the industries, supply chains, and their relationships to markets in and around the peninsula. This section identifies the unique economic needs of freight dependent industries that are crucial to the Delmarva economy. Additional economic insights, concerns, or ideas are also highlighted based upon corporate, local government, and other stakeholder perspectives on the current and anticipated freight networks.

Secondary freight movements and commodity flows on the Delmarva Peninsula are a function of population concentrations. Demographic trends such as population, households, and income are major factors in the way freight is moved because consumer-driven freight movement creates important markets where distribution hubs are centered, especially in growing and established places such as New Castle, Cecil, Kent, Sussex, and Wicomico counties. Freight movements and consumer demand on the peninsula have a strong economic correlation which affects overall freight trends.

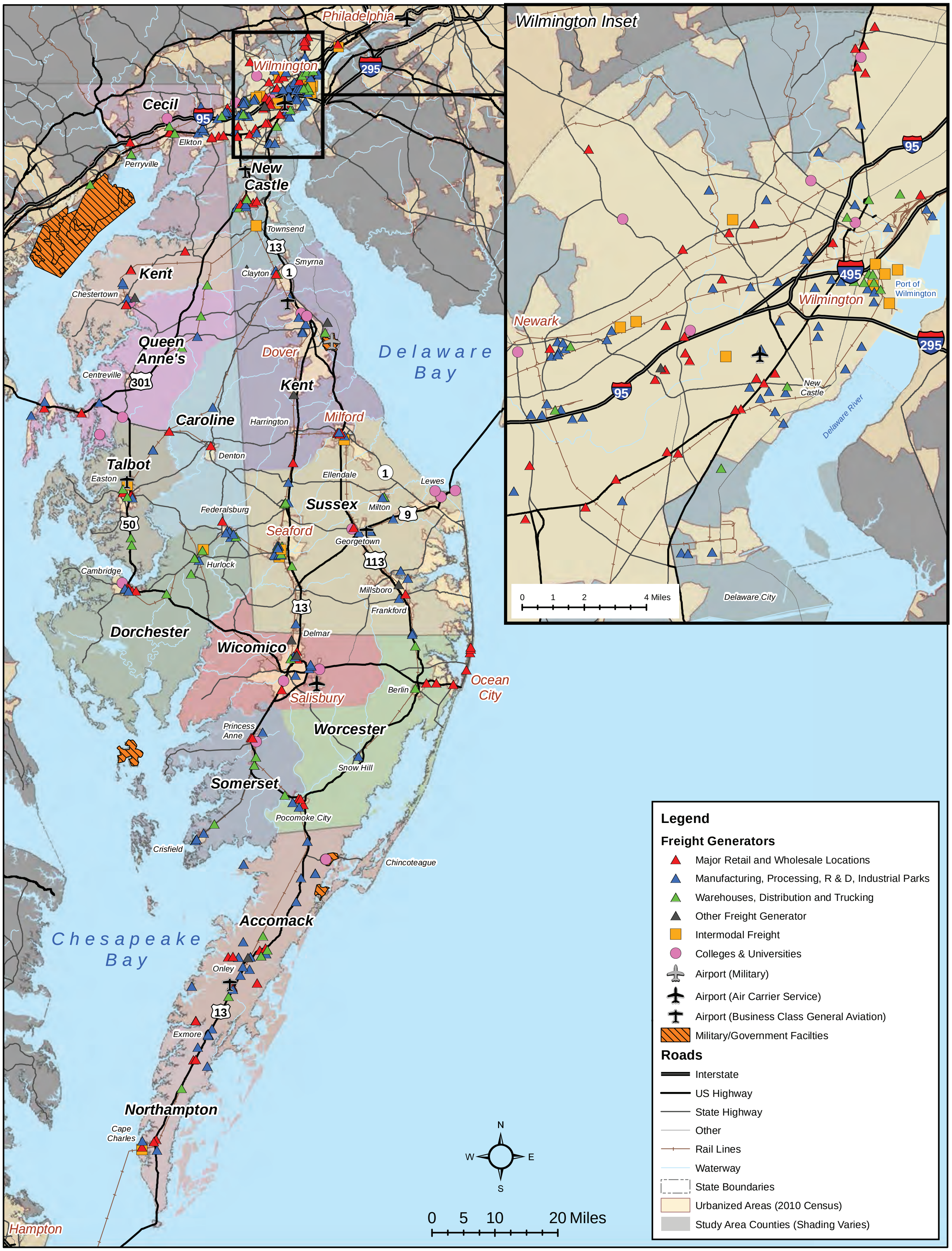
Key industries and supply chains on the peninsula, including freight dependent industries such as manufacturing and agriculture, have industry-specific requirements and strategic logistical approaches to commodity flows. The region's proximity to major transportation infrastructure and access to consumer markets is not overlooked by business interests. The I-95 corridor and other regionally linked roads are desirable business locations because of their intermodal linkages to truck, rail, water, and air transportation assets.

Key Industries

The study area encompasses a diverse group of economic drivers that includes businesses and firms from the chemical, agricultural, military, and other industry sectors. Key Industries range in size from smaller local firms catering to regional markets, to larger global players such as DuPont Chemical. Many of these industries have located on the peninsula based on a variety of historical, natural, and infrastructure considerations. Among those considerations is access to the peninsula's transportation assets as well as its resources. The result is that many of the major freight generating establishments can be found along key motor freight corridors such as I-95 or US 13; near major rail-served areas such as the Northeast Corridor or Delmarva Secondary; clustered around smaller freight hubs with shortline rail and state highway access such as Federalsburg or Hurlock; and in key locations such as Wilmington, Delaware City, Seaford, or Salisbury where multimodal transportation assets converge (*Exhibit 2.8*).

In such areas, major freight dependent industries in Delaware such as DuPont and Astra Zeneca in New Castle County, or Energizer-Playtex and Kraft Foods in Kent County, are located largely due to their proximity or connectivity to I-95. Maryland-based industries such as GORE-Tex, IKEA, Perdue Farms, or Labinal Salisbury; or Virginia-based manufacturing, agricultural, and seafood industries are similarly located to take advantage of the peninsula's available resources and assets. Key industries by county are summarized below.

Exhibit 2.8 – Major Freight Generating Industries on the Delmarva Peninsula



Delaware Industries by County

Kent County: Agriculture is a vital part of Kent County's economy, as well as a prevalence of services and retail (57.9%) as opposed to manufacturing (3.1%). Major employers include Wal-Mart Distribution Center, Energizer-Playtex and Kraft Foods. Dover is the county's largest city and home to the state capitol and county seat. Dover Air Force Base is one of the state's largest employers with over 6,400 military personnel.

New Castle County: The major employers of New Castle County include DuPont, Zeneca, International Specialty, PBF Energy (Delaware City Refinery) and W.L. Gore. Major distribution centers include Amazon.com and Pepsi Cola Bottling. The county provides existing and new businesses with resources to grow. It also provides notable opportunities in pharmaceutical, biotechnology, clean energy, and manufacturing sectors.

Sussex County: Tourism and farming are the dominant forces in Sussex County's economy. Major resort areas line the coast including Lewes, Rehoboth Beach, Dewey Beach, Bethany Beach, and Fenwick Island among others. The county is also renowned for poultry farming and soybean production. Other major employers include NRG Energy, Pats Aircraft LLC, Invista, Sussex County Industrial Airpark, Selbyville Industrial Park, Seaford Industrial Park, and Ross Business Park. Federal Express (FED EX) also operates a major distribution center in the county.

Maryland Industries by County

Caroline County: Caroline County's 670 businesses employ 6,800 workers. Major employers include Hanover Foods, Kraft foods, Maryland Plastics, Solo Cup, and Tri-Gas & Oil.

Cecil County: Cecil County's 1,880 businesses employ 22,200 workers. Key employers include ATK, DuPont Performance Elastomers, General Electric, and W.L. Gore and Associates. Major distribution centers include IKEA District Center, Kenneth O. Lester, and C&S Wholesale Grocers.

Dorchester County: Dorchester County is home to 730 businesses that employ 8,700 workers. Key employers include Amick Farms, Cambridge International, Bloch & Guggenheimer, Interstate Container, and Protenergy Natural Foods.

Kent County: Kent County's 720 businesses employ 6,700 workers. Major businesses include Eastman Chemical, Chester River Health System, Washington College, Dixon Valve & Coupling, LaMotte, and David A. Bramble.

Queen Anne's County: Queen Anne's County's 1,510 businesses employ 11,500 workers. The largest industry sectors in Queen Anne's County include trade, transportation and utilities, leisure and hospitality, education, and health, professional and business services. Major employers include PRS Guitars, S.E.W. Friel, and REEB Millwork.

Somerset County: Somerset County's 430 businesses employ 3,620 workers. The county is a major seafood processor and poultry producer. Major employers include Sysco Eastern Maryland, Southern Connection Seafood, MeTompkin Bay Oyster, Handy International, Mountaire Farms, PNC, and Rubber Set.

Talbot County: Talbot County has 1,620 businesses employing 16,100 workers. United Parcel Services (UPS) operates a major distribution center in the county. The largest employers include Harim USA, Aphena Pharma Solutions, and Lowes.

Wicomico County: Wicomico County is the leading agricultural producing county with 2,560 businesses employing 36,000 workers. Major employers include Perdue Farms, Labinal Salisbury, Jubilant Cadista Pharmaceuticals, Delmarva Power, and K&L Microwave. Pepsi Cola Bottling also operates a major distribution center in the county.

Worcester County: Agriculture and tourism are the largest industries in Worcester County, including major resort areas/activities centered around Ocean City. There are 2,130 businesses employing 19,400 workers in the county. Major private sector employers include Bel-Art Products, Lowes, Hardwire, the Harrison Group, and Royal Plus.

Virginia Industries by County

Accomack County: Two major private employers include Perdue Farms and Tyson food processing plants. Leading employers by industry include manufacturing (3,083 employees) and retail trade (1,352 employees). The county is home to a 360-acre industrial park in Melfa. Other major employers include Branscome, LJT Associates Incorporated, Integrated Microcomputer System, Lockheed Martin, Helena Chemical Company, Manning Masonry, A&N Electrical Co-op, and Ballard Fish and Oyster Company.

Northampton County: Leading employers by industry in Northampton County include agriculture, forestry, fishing and hunting (748), retail trade (453), manufacturing (385) and construction (69). The two major nonmetallic mineral product-manufacturing industries are Bayshore Concrete Products Company and New Ravenna. Other major employers include Ballard Fish and Oyster Company, LFC Agricultural Services, Food Lion, Ballard Brothers Fish Company, Pacific Tomato Growers, and H&M Terry Company.

Business and Distribution Hubs

Truck transportation establishments are heavily dependent on first-class highways and linkages to major metropolitan areas. Nodes and markets in New Castle County and Cecil County are of particular note on the Delmarva Peninsula given their central location along the Northeast Corridor. Both counties are within a two-hour drive of major markets and U.S. population hubs while also providing access to the I-95 corridor and the upper Eastern Shore area of the peninsula. The I-95 corridor is a highly sought after business location with intermodal linkages to truck, rail, water and air assets. All of these factors make New Castle and Cecil Counties major hubs for truck transportation establishments.

Sussex County and Wicomico County are also important nodes and markets in terms of truck transportation establishments. US 13 is the main north-south artery on the peninsula and runs through both counties on the lower eastern shore. Both counties are freight hubs with larger concentrations of population in Seaford and Salisbury. Seaford and Salisbury, with first-class highway linkages to major metropolitan areas on and off the peninsula, combine to have a total of 169 truck transportation establishments that are heavily driven by consumer and business demand on the lower eastern shore. The Port of Salisbury also plays an important supporting role for the area's businesses by providing waterborne transportation access for commodities such as petroleum and grain. The benefits of providing this alternative to motor highway transportation and directly reducing the number of trucks on the road are substantial when compared to estimates that approximately 150 tractor trailer trucks are needed to replace 1 barge.[1]

Sussex and Wicomico Counties also have industrial parks and act as distribution hubs for businesses that are driven by consumer demand. These hubs serve the concentration of nearby counties and businesses on the lower eastern shore. This is particularly important as tourism-related peak season events increase population on the peninsula, and consumer goods must be imported from nearby hubs to accommodate the increased demand. Such hubs are also important when comparing anticipated population growth that is greater than anticipated employment growth, which implies that relatively more freight is shipped into and within the area to serve the population while less freight is shipped out.

[1] Delmarva Water Transport Committee (DWTC); http://www.dwtconline.com/Facts.html

Select Industry/Employer Freight Trends

The peninsula has a variety of major industries as outlined in other sections. These industries have specific freight requirements that are shaped by their particular profiles and business characteristics. For example, the peninsula's largest employers like the Indian River Power Plant and the PBF Refinery have logistics implications that can affect other area businesses. Additionally, expected growth in freight dependent industries – including agribusiness concentrated in the southern half of the peninsula, or manufacturing concentrated in the north – will affect commodity flow and freight trends. The following examples, though not all-inclusive, highlight several common trends relevant to freight and goods movement throughout the study area.

Local Factors: Indian River Power Plant

Between 2010 and 2013, the Indian River Power Plant in Millsboro, Delaware, shut-down three of four coal-fueled generating units as natural gas usage became more prevalent. According to a MDOT Regional Freight Transportation Study Technical Report, it was estimated that the power plant received roughly 9,450 railcars of coal annually. The anticipated shift from coal to natural gas decreases rail demand onto the peninsula, which in turn may reduce the cost efficiencies and economies-of-scale from which other rail customers on the peninsula have historically benefitted. Such losses with reduced rail traffic to Indian River may, however, be at least partly offset by recent rail expansions to Delaware City (see below).

Local Factors: Delaware City Refinery

The PBF Refinery in Delaware City, Delaware, was recently purchased from Valero Energy and has seen an upward incline in production over the last several years. While the refinery has historically imported overseas crude via waterborne tankers, PBF Energy is also investing $57 million to upgrade a rail unloading facility to increase imports via rail from North Dakota and Canada. This logistical change increases the facility's supply chain and transportation options while also bringing an opportunity to offset at least some of the lost rail-related economies-of-scale that may occur with the reduction in coal traffic to the Indian River Power Plant located farther to the south. The expanded rail traffic through densely-populated New Castle County, however, is not without its challenges including, for example, an increase in rail-highway conflicts, at-grade crossing delays, or community concerns regarding noise or safety. At the time of development of this freight plan, DelDOT, WILMAPCO, and related agencies and stakeholders were actively investigating and addressing such issues.

Local Factors: Dogfish Head Craft Brewery

The Dogfish Head Craft Brewery in Milton, Delaware, has a planned expansion that could affect freight movement on the peninsula. Dogfish Head will expand its Milton facility by 26,000 square feet, which will allow the brewery to produce an additional 300,000 barrels of product over the next 10 years. The company will also expand its shipping and receiving plans beyond its existing 102,500 square feet warehouse to obtain raw materials for the brewery. Logistical changes at the brewery will include more motor freight traffic on the peninsula's roads.

Industry Factors: Manufacturing and Chemicals

Manufacturing on the peninsula employed 66,000 workers in 2011, and 7,000 additional employees are anticipated by 2016. Major chemical manufacturers on the peninsula include DuPont, which employs over 8,000 employees worldwide and is expected to increase its national chemical output in 2013 from 0.5% to 2.3%. From 2005 to 2017 it is estimated that manufacturing will have increased the percentage of employees in the study area by as much as 23% on average, which will help to drive the trade, transportation, and utility industries.

Industry Factors: Trade, Transportation and Utilities

From 2005 to 2017 the trade, transportation, and utility industries are expected to increase their percentage of employees in high population concentration areas such as New Castle County. The estimated number of employees working in the trade, transportation, and utility industries by 2017 is 127,000, which is a 21,000 employee increase from a corresponding 2005 level of 105,000 employees.

As trade, transportation, and utility industries rebound from pre-recession levels, a 17% average increase in the percentage of employees in the study area working in these industries will impact commodity flows and existing freight trends. The previously noted increase in manufacturing employees will also likely mean an increase in production, which in turn drives the estimated 21,000 additional trade, transportation, and utility employees, and which could add more truck trips to, from, and on the peninsula. The estimated growth in other freight dependent and non-freight dependent industries will further drive growth in the construction industry as construction is needed for physical growth.

Industry Specific Issues

Geographic Constraints and Multistate Regulations: The unique geography and economy of the Delmarva Peninsula creates industry specific operating constraints for businesses in the region. Travel through this area with its dense congregation of state lines and accompanying differences in regulations can be an onerous process for freight companies. The change in regulations from state to state can be difficult for freight dependent businesses to follow. Congestion and maintenance of major routes can further obstruct the flow of commodities in and around the Peninsula. These delays can be of exceptional concern when they affect freight dependent businesses that include the Peninsula's agriculturally-based and time-sensitive commodities.

Weight Limit and Policy Level Considerations: Secondary freight movement on the peninsula and modal split are also vital to operations at many Delmarva employers. The ability to move more commodities in fewer truck trips is vital to logistics and operations. Federal highway weight limits and the variance in state weight limits on the peninsula are critical issues identified by businesses that utilize trucks for freight movement. Additionally, escalating and fluctuating costs in fuel and tolls can affect all of the freight dependent employers on the peninsula.

Poultry Industry Issues: The Delmarva poultry industry has logistic requirements that vary from Delmarva manufacturers. The poultry industry is dependent on the delivery of fresh products. Bottlenecks and the reliability of rail service on and off the peninsula are logistical obstacles that the poultry industry must work around. For example, the generally slower time-to-market for rail service off the peninsula, operating time restrictions along the Northeast Corridor, or past shut-downs of the Cape Charles - Little Creek Car Float introduce downtime or delays that are simply not viable for fresh food delivery. A significant portion of the poultry industry's domestic delivery is therefore motor freight dependent. Motor freight allows the delivery of fresh products to 50% to 60% of the east coast market. There are, however, multimodal opportunities to export poultry, including refrigerated trucks that transport chicken to the Port of Norfolk to be exported in temperature controlled containers to large overseas markets.

Agribusiness Issues: The Delmarva agribusiness industry primarily utilizes motor freight transportation. The driving factor is that rail costs are typically prohibitive as 75-car trains – typically too large or unachievable for many Delmarva farmers – are needed to receive cost-efficient freight discounts. Regional farmers are concerned with bringing products to local markets, in particular commodities for processing and domestic feed. Large scale poultry farms such as Perdue, which is capable of processing two million tons of grain annually, are large grain consumers whose need for reliable high quantity freight movement is vital to operations.

Reduction in rail service, along with increased costs, would make it difficult for peninsula customers to utilize rail. Access and direct routing are also requirements that agribusiness is in need of due to the nature of the industry and the required freshness of goods. Potential improvements to intermodal access on the peninsula could have significant impacts on current freight trends if it allowed the majority of the Delmarva agribusiness to diversify their logistical plans for shipping/receiving commodities.

Highway Access, Congestion, and Motor Freight Delays: Freight dependent industries that rely on motor freight require maintenance to be performed on secondary roads and bridges to ensure safety. Reoccurring congestion and bottlenecks affect the ability of industries to move freight freely on and off the peninsula. Seasonal tourist-related congestion, including delays across the Bay Bridge and along US 50, US 301, MD/DE 404 and other area roadways, has significant effects on commodity flows by truck. Delays incurred along peninsula roadways inevitably increase the cost of commodities, which are ultimately passed onto consumers. In addition to traffic congestion related delays, regulations on hours of service can further effect goods movement and restrict the delivery of goods during certain times. Regulations on hours of service also increase the need for designated rest areas on the peninsula to ensure safe truck parking.

Waterborne Freight Access: Waterborne freight also plays a significant role in the commodity flows for certain major industries on the peninsula. Barge travel supports the delivery of goods such as grain and petroleum. Waterborne commodity movements require adequate funding and cooperation to keep river corridors dredged and to ensure long-term solutions for obtaining adequate spoils sites for the placement of dredged materials.

2.3 Economic Development Strategies

A review of current economic development strategies on the peninsula included an inventory of area-specific enterprise zones, incentives, and business programs. As an effort to bolster local economies, counties and cities offer incentives for companies to spur development, employment, and innovation. Businesses located in specific areas deemed by local governments to be Enterprise Zones or Historically Underutilized Business (HUB) Zones may be eligible for income tax credits, real property tax credits, or personal property tax credits for job creation. Details by state and county are summarized below.

Delaware Strategies by County

Delaware's economic development is supported by state plans, growth policies, incentives, and programs that aid to create or strengthen jobs, businesses, and business investments. These efforts include support for small businesses, which total 72,132 in the state of Delaware (based on 2011 U.S. Small Business Administration (SBA) figures). They also include support for agriculture as a vital part of Delaware's economy. Specific enterprise zones and business programs in Delaware include:

New Castle County: New Castle County, located on the I-95/Northeast Corridor, allows easy access to Baltimore, Washington, D.C., and Philadelphia. The county participates in the 'Growing Seeds, Growing Jobs' economic development program to support businesses of all sizes. Businesses that invest at least $50,000 in new construction of commercial and manufacturing facilities in unincorporated areas are eligible for three-year property tax abatement. The county also takes part in the Community Economic Development Grants Program, Expanded Buy from your Neighbor Program, Targeted Community Economic Development Program, Investment in Infrastructure, Small Business in Advocate, and Partial Property Tax Exemption Ordinance.

Kent County: Located in the heart of Delaware, Kent County participates in the Delaware Small Business Limited Investment for Financial Traction (LIFT) Program, Delaware Access Program, Delaware Business Finder's Fee Tax Credit, Renewable Energy Facilities Revolving Loan Fund, Delaware Rural Irrigation Program, State Small Business Credit Initiative (SSBCI), and Brownfield's Assistance Program.

Sussex County: Historically, farming has been the dominant force in Sussex County's economy. However, the county is also diversifying with four industrial parks, including the Sussex County Industrial Airpark. Sussex County participates in the state economic development entity programs and offers a $250,000 maximum economic development loan. The county also wishes to promote its agricultural economy by preserving farmland through a zoning overlay district and transfer of development rights program.

Maryland Strategies by County

The Maryland Department of Business and Economic Development identifies 30 enterprise zones throughout the State of Maryland. Businesses in enterprise zones may be eligible for income tax credits, real property tax credits, or personal property tax credits in return for job creations. Specific enterprise zones, incentives, and business programs on the peninsula in Maryland include:

Cecil, Caroline, and Queen Anne's Counties: Each of these counties has incentives and business programs such as real property tax credits and income tax credits for businesses. In addition to tax credit programs, Queen Anne's County participates in the county's revolving loan fund program for qualifying businesses. Caroline County also participates in the One Maryland Program.

Dorchester County: Dorchester County is one of Maryland's largest counties with close proximity to Baltimore and Washington, D.C., which attracts large and small businesses. The County's enterprise zones include 247 acres in Hurlock Industrial Park and 1,329 acres in the City of Cambridge. Additionally, it is a federally designated HUB Zone.

Kent County: Kent County, the study region's second smallest jurisdiction, includes a workforce that specializes in education and health services. The county features four industrial parks with convenient access to intermodal infrastructure facilities. The largest of these parks – Kent County Business Park at Worton – is owned by the jurisdiction itself. The county also has access to SCORE, a non-profit association that provides Eastern Shore entrepreneurs with no-cost, confidential face-to-face and email counseling.

Somerset County: Somerset County is Maryland's southernmost county and a major seafood processor and poultry producer. The county features a 499-acre enterprise zone in Crisfield and a 1,297-acre enterprise zone in Princess Anne. Somerset County also participates in the One Maryland Program, which offers significant tax credits for capital investments to create jobs.

Talbot County: Talbot County's economic development programs and consulting services include the Eastern Shore Entrepreneurship Center (ESEC), the Talbot County Chamber of Commerce, and other state and federal resources. Additionally, Talbot County recently commissioned a study that analyzed economic development potential in the jurisdiction. The study made recommendations for business-friendly initiatives, pursuing target industries by creating new resources for economic development in addition to other strategies.

Wicomico County: Located at the crossing of major highway transportation routes, Wicomico County is a leading agricultural producing county and ranks highest in the state in broiler chicken production. The county features state enterprise zones in Salisbury and Fruitland; major tax credits are available for businesses in these zones. Salisbury-Wicomico Economic Development (SWED) is the leading agency for promotion of economic development activities within the county. SWED is a private membership organization that receives support from local governments. In addition, the county participates in business retention, expansion, and attraction programs to attract new jobs and strengthen existing businesses.

Worcester County: Worcester County, Maryland's only seaside county, features three enterprise zones located in Berlin, Snow Hill, and Pocomoke City. In addition, the entire county is a U.S. SBA designated HUB Zone. Incentives to create jobs include state income and real property tax credits for businesses in the enterprise zones.

Virginia Strategies by County

The Virginia Enterprise Zone (VEZ) Program is a partnership between state and local governments that encourages economic growth, job creation, private investments, and revitalization by supporting existing and new businesses. VEZ coverage would extend to the two counties included in Virginia's portion of the Delmarva Peninsula – Accomack County and Northampton County. Portions of each county are included in enterprise zones. Real Property Investment Grants (RPIG) and Job Creation Grants (JCG) are the two substantial financial incentives to support businesses and expansions through the VEZ.

2.4 Global Economic Perspectives

Overview

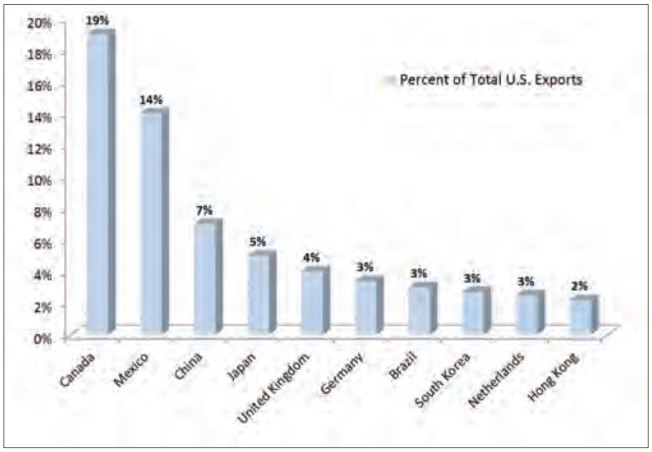
The Delmarva Peninsula functions as one of the key economic components within the country's Mid-Atlantic Region generally comprised of Delaware, Maryland, Virginia, West Virginia, Pennsylvania, New York, and New Jersey. Infrastructure conditions, intermodal access, and cost efficiencies are critical to fulfilling that role from a freight and goods movement perspective. However, the U.S. spends only 1.7% of its GDP on transportation infrastructure; by comparison, Canada spends 4% and China spends 9%. The country's aging infrastructure coupled with funding constraints introduces deficiencies that decrease productivity per worker and cause losses in critical job opportunities in highly-skilled non-transportation sectors throughout the economy. Due to deficient infrastructure, it is estimated that the U.S. economy in 2020 could export $28 billion less in goods potential. For the peninsula to counter such trends or capitalize on future growth opportunities, an efficient multimodal freight network and access to major ports in Wilmington, Baltimore, Philadelphia, and Hampton Roads is crucial. Adding other freight concerns on the peninsula – such as congestion issues, residential encroachments, peak seasonal population spikes, secondary truck traffic increases, freight/passenger traffic conflicts, or motor freight cost increases – further emphasizes the need to address and improve multimodal infrastructure deficiencies. Such strategies will help to enhance the peninsula's economic stability and quality of life, while also better positioning the area to capitalize on future economic opportunities.

Global/National Freight Movements

The American Trucking Association (ATA) indicates that freight tonnage transported in the U.S. dropped by 14.7% in 2009 but rose to 5.4% by 2010 and, post-recession, is anticipated to grow 2.5% per year from 2012 through 2017. The Mid-Atlantic Region in 2010 accounted for 10.7% of total inbound freight, 12.0% of manufactured goods, and 9.0% of other commodities. Inbound and outbound freight were composed of roughly 62% manufactured goods and 37% other commodities. In terms of outbound freight, the region generated 10.5% of the total, 11.8% of manufactured goods, and 8.8% of other commodities. In 2010, inbound freight tonnage for the Mid-Atlantic States surpassed outbound tonnage by 2%.

A 2010 report released by the Research and Innovative Technology Administration (RITA) reveals that U.S. imports in 2008 captured about 13% of world freight exports, of which 55% was ocean borne cargo, 20% was air cargo, and about 25% was carried by land modes of transportation. U.S. exports likewise represent a significant amount of the trading portfolios of the primary trade partners of the United States (*Exhibit 2.9*).

Exhibit 2.9 – Top 10 U.S. Export Destinations



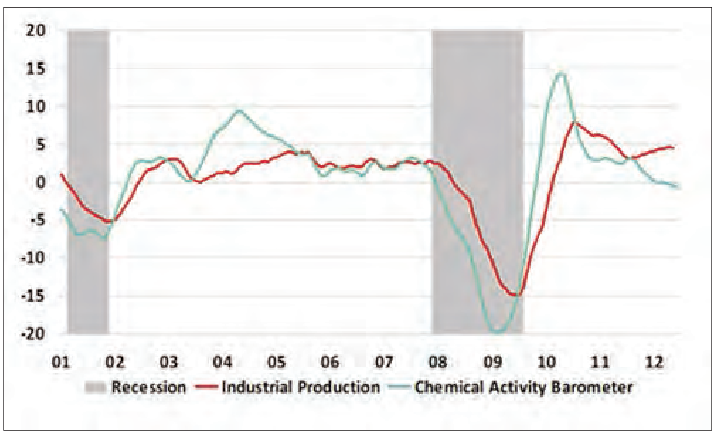
Source: Data compiled from 2012 U.S. Census FT-900

International trade has grown from 5% of Gross Domestic Product (GDP) in 1950, to 20% of GDP in 2000, and is estimated to grow to 50% through 2050. To support the growing population and GDP over time, freight and passenger transportation demands are projected to increase by two and half times by 2050. With the growth of international trade, ports in Wilmington, Baltimore, Philadelphia, and Hampton Roads will be even more critical as multimodal hubs and major assets for the ongoing economic and trade potential of the region.

Focus Area: Chemical Industry

The U.S. chemical industry represents more than 15% of global chemical output. With more than 170 major chemical companies in the country, the chemical industry constitutes 12% of national exports, 25% of national GDP, and shipped more than 759 million tons of products in 2011. The American Chemistry Council (ACC) noted that chemical production in 2012 rose across the Gulf Coast and Ohio Valley Areas, while all other regions saw declines (*Exhibit 2.10*). National chemical output is expected to slow from 3.8% in 2011 to 0.5% in 2012 and then see a hike of 2.3% in 2013. The decline in production can be partly explained by the lower demand that DuPont experienced related to Titanium Dioxide and Photovoltaic markets.

Exhibit 2.10 – Chemical Activity Barometer vs. Industrial Production Index



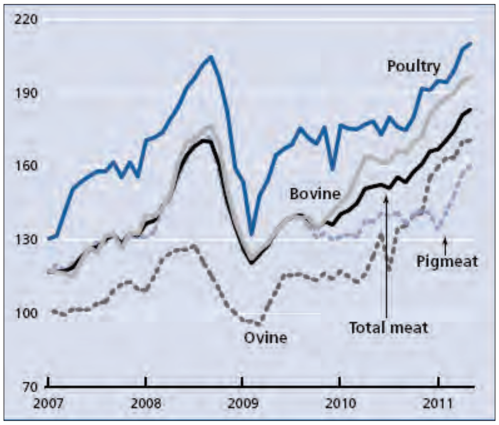
Source: Chem.Info, 2012

Based on a 2013 WILMAPCO study (conducted by IHS analysts) of chemical manufacturing supply chains on the Delmarva Peninsula, additional chemical production is anticipated to be based on shale-influenced natural gas and oil. Ethylene production and products such as methanol, ammonia, and fertilizers will expand. The increase in fertilizer production could be significant for a region where agriculture is a major economic driver. Domestic producers will also be increasingly export-focused on products such as Ethylene, thus making access to the ports and major infrastructure facilities of the Mid-Atlantic Region a critical need for chemical producers. Transportation systems in this region must be efficient and well-maintained to accommodate the anticipated increase in chemical production and exports. Not investing in transportation could result in a missed opportunity for the Delmarva region's chemical industry, and possibly reduced transportation network effectiveness.

Focus Area: Food Manufacturing

The food manufacturing industry accounts for more than 10% of all manufacturing shipments. A report by the Food and Agriculture Organization of the United Nations (FAO) indicates that maize stocks in 2011-2012 dropped dramatically while the sugar industry increased 5.8% over the 2009-2010 seasons. Resulting high feed prices and decreased animal inventories restricted the expansion of global meat production to only 1% in 2011. The increase was driven by gains in the poultry and pig meat sectors. The trading volume of poultry meat grew 2.3% from 2010-2011, and international meat prices have also managed steady increases since January 2011.

Exhibit 2.11 – FAO International Meat Price Indices



Source: FAO Food Outlook, Global Market Analysis, 2011; Note that 2002-2004 = Index of 100

Based on these trends and a growing worldwide demand for soybeans, poultry products, and corn – particularly in emerging markets such as China, who is now the world's largest importer of soybeans – the Delmarva region is positioned to benefit from these burgeoning markets. Therefore it is essential to maintain and build infrastructure that will enhance and streamline access to facilities that will allow the promulgation of Delmarva agriculture and food products.

Focus Area: Transportation Support Activities

The 2002 North American Industry Classification System (NAICS) identifies establishments that provide transportation of passengers and cargo, warehousing and storage for goods, scenic and sightseeing transportation, and support activities related to modes of transportation as components of the transportation industry. The Bureau of Labor Statistics (BLS) suggests that the warehousing and storage sector has the highest job growth rate, expanding almost 25% from 556,000 to 694,000 jobs between 2004 and 2014 (*Exhibit 2.12*). Transit and Ground Transportation is also projected to grow almost 24% from 385,000 to 476,000 jobs. Moderate growth is projected for sectors in trucking, couriers and messengers, sightseeing transportation and support activities for the transportation. Given that the transportation sector is included in an industry category that comprises 16.7% of all working individuals on the peninsula (the highest single proportion per the previous *Exhibit 2.6*), this strong base should indicate growth and stability for the peninsula's transportation labor market.

Exhibit 2.12 – Employment and Output of Transportation Major Sectors (2004-2014)

Industry	Employment				Output			
	Thousands of Jobs		2004-2014 Change		Billions of Constant 2000 Dollars		2004-2014 Change	
	2004	2014	#	%	2004	2014	#	%
Transportation and Warehousing	4,250	4,756	506	11.9%	619	889	270	43.6%
Warehousing and Storage	556	694	138	24.8%	359	565	206	57.4%
Transit and Ground Passenger Transportation	385	476	91	23.6%	309	406	97	31.4%
Scenic and Sightseeing Transportation and Support	112	123	11	9.8%	107	152	45	42.1%
Trucking Transportation, Couriers, Messengers	135	148	13	9.6%	224	317	93	41.5%
Air Transportation	515	560	45	8.7%	130	213	83	63.8%
Water Transportation	57	58	1	1.8%	224	269	45	20.1%
Rail Transportation	224	215	-9	-4.0%	432	599	167	38.7%

Source: Transportation Industry, Department of Labor, 2007

Focus Area: Truck Transportation

ATA projections indicate that the proportion of total freight tonnage transported by truck will rise from 67.0% in 2011, to 68.9% in 2017, to 69.6% by 2023. Truckload (TL) volumes will expand 3.3% per year from 2012-2017, and 1.1% per year from 2018-2023. Less-than-truckload (LTL) volumes are estimated to have an average annual growth of 3.5% from 2012-2017 and 2.3% in 2018-2023. Corresponding percentage growths will be even higher (*Exhibit 2.13*). In short, trucks are and will remain the primary mode of freight transportation across the U.S. and in the Delmarva region.

Exhibit 2.13 – Truck Revenue Forecasts (2011-2023)

Category	Billions of Dollars			Average Annual Growth Rate		
	2011	2017	2023	2012-2017	2018-2023	2012-2023
Truckload	280.2	382.9	464.4	6.1%	3.5%	4.8%
LTL	46.9	68.2	90.7	7.6%	5.5%	6.5%
Private	276.8	355.6	414.0	4.8%	2.7%	3.7%
Total	603.9	806.7	969.0	5.6%	3.4%	4.5%

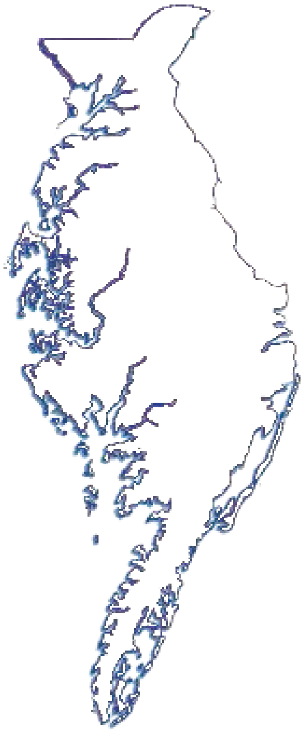
Source: U.S. Freight Transportation Forecast to 2023, ATA, 2012

As consumer demand increases on the peninsula, truck transportation will grow in response to the markets. Coupled with anticipated growth in the peninsula's tourism industry and related peak seasonal congestion, these increases will exacerbate any existing concerns or conflicts between passenger vehicles and freight trucks sharing road space. Additionally, trucking costs can rise rapidly due to increases in fuel, labor and capital costs. Companies such as FedEx Freight, Con-Way Freight, ABF Freight, and UPS have announced recent price increases of 5.9-6.9% due to a surge in operating costs. These increasing costs will have a major impact on the study area given the dominance of motor freight transport and a reliance on the peninsula's warehousing and transportation related industries. It is vital, then, to consider improvements that will enhance operational and cost efficiencies for motor freight transportation throughout the Delmarva Peninsula while also recognizing potential relationships or conflicts with other unique facets of the peninsula, such as peak seasonal tourism demands.

Delmarva Freight Plan

Chapter 3

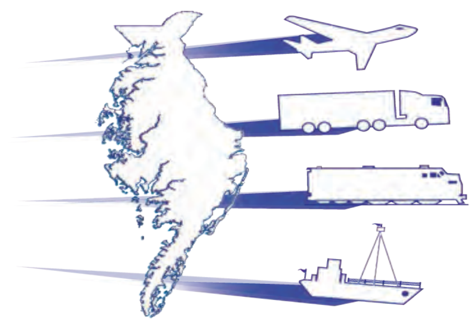
Existing Commodity Flows



Chapter 3

Existing Commodity Flows

Understanding existing commodity flows on and around the Delmarva Peninsula including, for example, what types of freight are moving, by what mode, and to/from where, is an important step toward identifying freight and goods movement patterns, trends, or needs specific to the region. This chapter summarizes the available commodity flow data[1] and establishes a baseline from which to begin developing (in subsequent chapters) a project-specific freight demand model and future freight projections. This summary also highlights potential supply chain perspectives and unique issues related to energy, agriculture, or other productive activity centers that may warrant special attention within the freight planning process.



3.1 Delmarva Freight

Overall Tonnage and Value

Commodity flows on the Delmarva Peninsula[2] in 2011 amounted to approximately 157 million tons valued at over $327 billion (*Exhibit 3.1-Exhibit 3.2*). Of this total, roughly 44% of the tonnage (70 million tons) or 23% of the value ($75 billion) was specific to the project area in terms of inbound freight destined to the peninsula, outbound freight originating from the peninsula, or intercounty freight moving locally/regionally between two locations on the peninsula. The variation in Delmarva's share of tonnage versus value (42% versus 22%) is at least partly attributable to several of the area's leading commodity groups consisting of relatively higher weight but lower value products (e.g., gravel or sand as opposed to computers or cellphones). Pass-thru freight, which travels through the project area without a local origin or destination, makes up the remainder of the freight total. The region's high proportion of pass-thru freight is to be expected given the influence of large volumes of interstate highway and rail traffic through Cecil and New Castle Counties along local segments of the I-95 corridor and the Northeast Corridor.

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[1] Commodity flow data presented in this chapter reflect a compilation of 2011 IHS Transearch® data (including a focus on truck and water modes, commodity type details, and origin-destination details); Delaware rail waybill data from the Surface Transportation Board (including a focus on rail flows); 2011 FAF3-based projections (including a focus on air and pipeline modes, and international imports/exports), and select intercounty flow adjustments relative to project-specific freight demand modeling needs.

[2] For purposes of this chapter, the commodity flows generally reflect the Delmarva Peninsula's 12-county area in Delaware and Maryland only. Accomack and Northampton Counties, Virginia, are not included as they were not detailed in the available Transearch® database. Future chapters and development/application of the project-specific freight demand model will aim to fill-in any potential gaps relative to scenario planning and performance measurements Peninsula-wide.

Exhibit 3.1 – Freight Flow Summary

2011 Freight Flow	By Weight		By Value	
	Tons	Share	Value (Millions)	Share
Inbound	28,884,521	18%	$33,161	10%
Outbound	27,954,253	18%	$31,480	10%
Intercounty	12,798,795	8%	$9,973	3%
Pass-Thru	87,202,316	56%	$252,700	77%
Delmarva Freight (Inbound + Outbound + Intercounty)	69,637,568	44%	$74,613	23%
Total Freight (Delmarva Freight + Pass-Thru)	156,839,884	100%	$327,314	100%

Domestic Trading Partners

The origins and destinations of freight to/from the Delmarva Peninsula span the country and the North American continent (*Exhibit 3.3-Exhibit 3.4*). The most prominent freight flows, however, are concentrated along the U.S. eastern seaboard and throughout major metropolitan areas in the Mid-Atlantic region, particularly in the surrounding states of Maryland, New Jersey, Pennsylvania, and New York. To a lesser extent, prominent flows also stretch throughout the South Atlantic, East North Central, and New England regions, particularly for inbound freight shipped to the peninsula. Roughly 95% of Delmarva's domestic freight activity occurs east of the Mississippi River, including 25% of intercounty freight on the peninsula and 70% freight to and from the surrounding regions, excluding pass-thru freight.

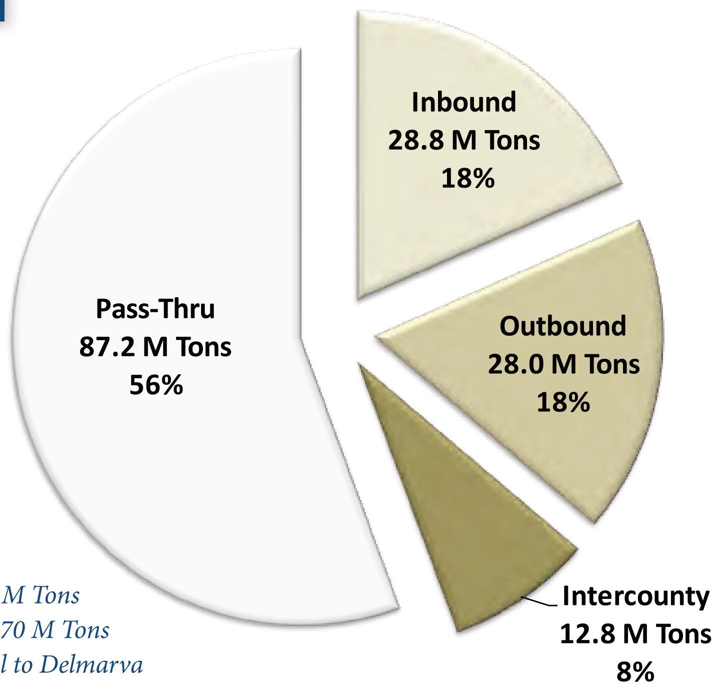
Global Trading Partners

Internationally, the Delmarva Peninsula in 2012 imported roughly 12 million tons ($8.2 billion) of freight and exported almost 2 million tons ($4.9 billion).[3] Leading international trading partners (*Exhibit 3.5-Exhibit 3.6*) generally include Canada, Europe, and Central or South America (i.e., the FAF-based "Rest of the Americas" zone). Additional partners include Southwest and Central Asia, though mostly as foreign origins for Delmarva imports; and to a lesser extent Mexico and Eastern Asia, though mostly as foreign destinations for Delmarva exports. Delmarva's leading imports (*Exhibit 3.7*) include crude petroleum, fuel oils, and – most notably from the Rest of Americas zone – agricultural products; several higher value import groups also include pharmaceuticals, motorized vehicles, and machinery. Delmarva's leading exports (*Exhibit 3.7*) predominately include basic chemicals and plastics/rubber, as well as several higher value commodities such as motorized vehicles and – most notably to the European market – precision instruments, electronics, and machinery.

[3] Based on 2012 import/export data from FHWA's Federal Analysis Framework (FAF3) using FAF zones for Delaware and Remainder of Maryland as the domestic origin/destination.

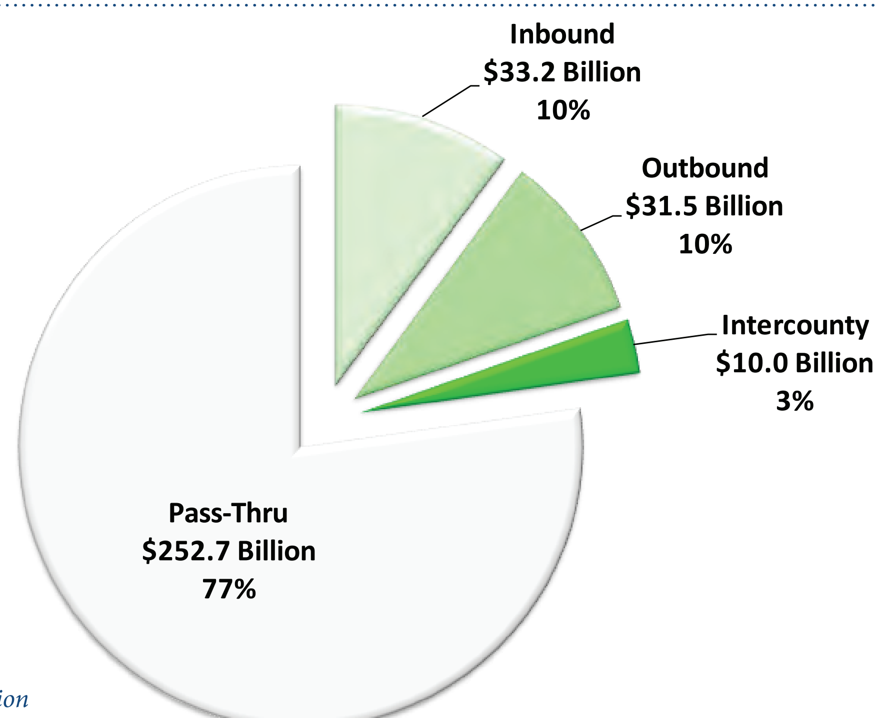
Exhibit 3.2 – Freight Direction

(by Weight)



Total Freight ≈ 157 M Tons ...including just under 70 M Tons (44%) to, from, or internal to Delmarva

(by Value)



Total Freight ≈ $327 Billion ...including just under $75 Billion (23%) to, from, or internal to Delmarva

Exhibit 3.3 – Domestic Trading Partners (Freight Origin)

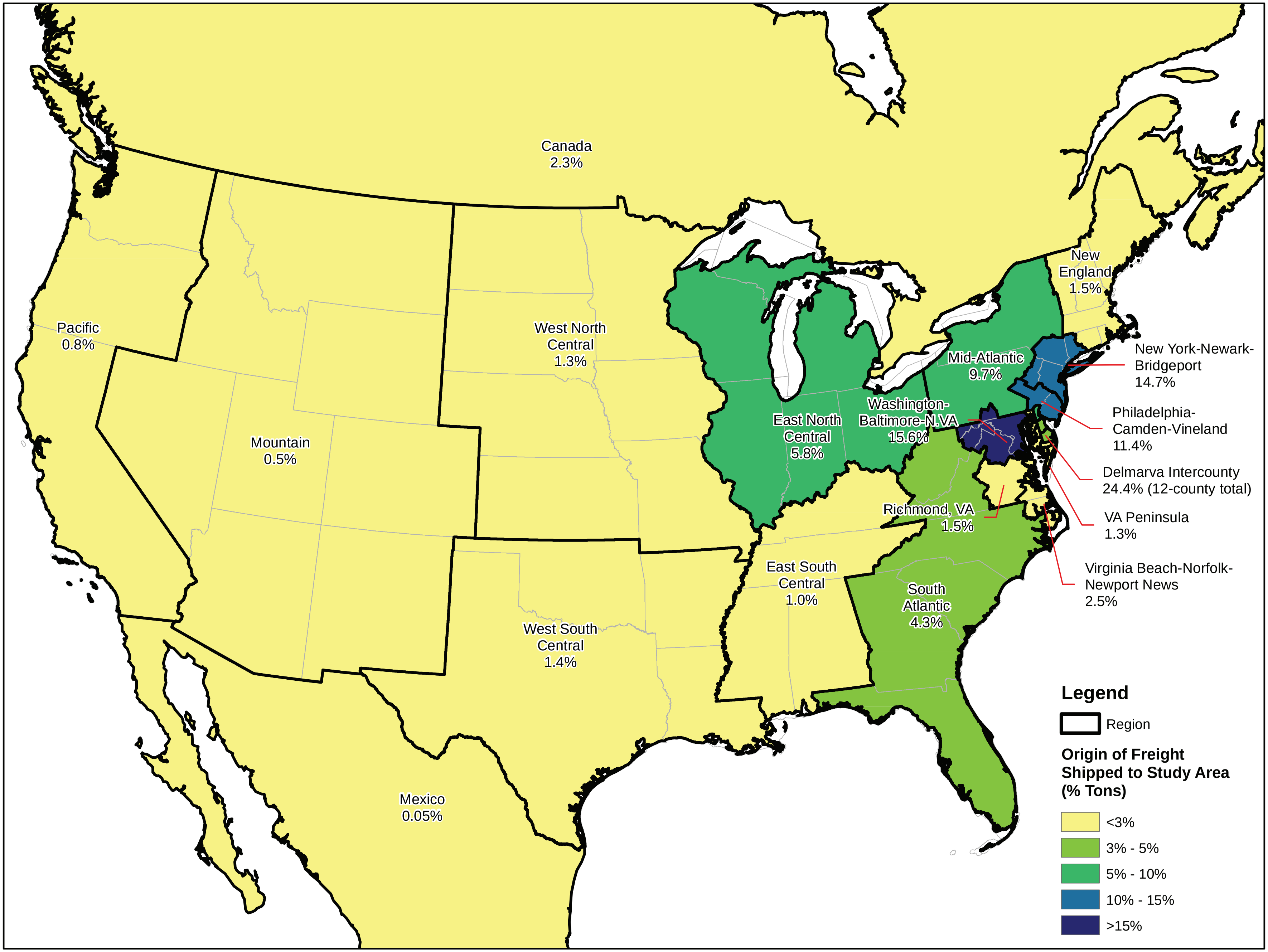


Exhibit 3.4 – Domestic Trading Partners (Freight Destination)

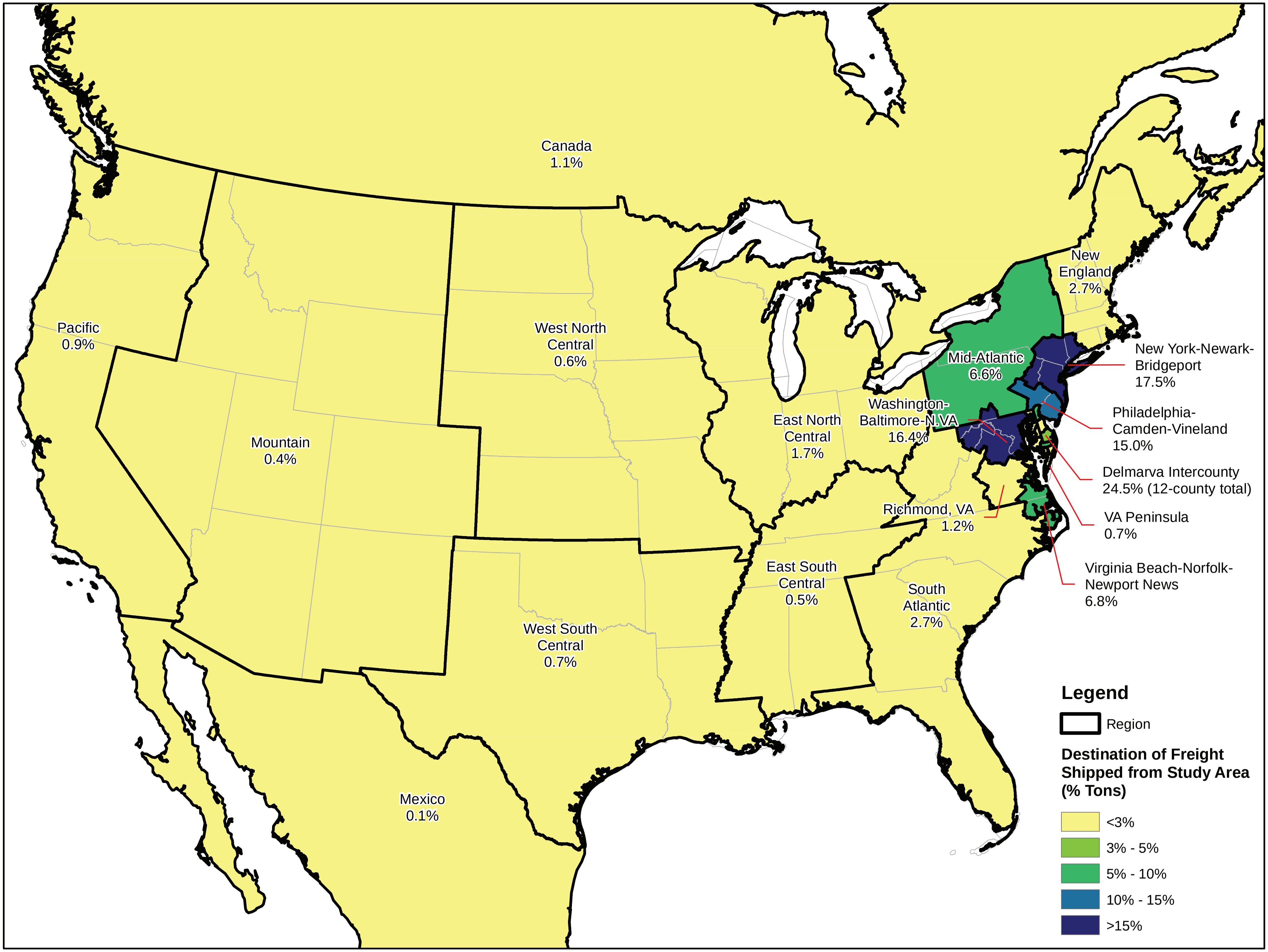
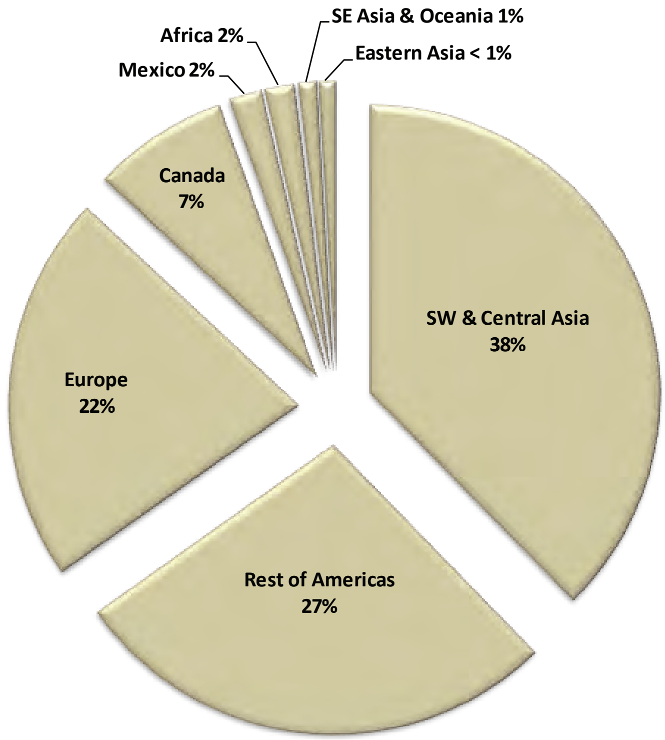


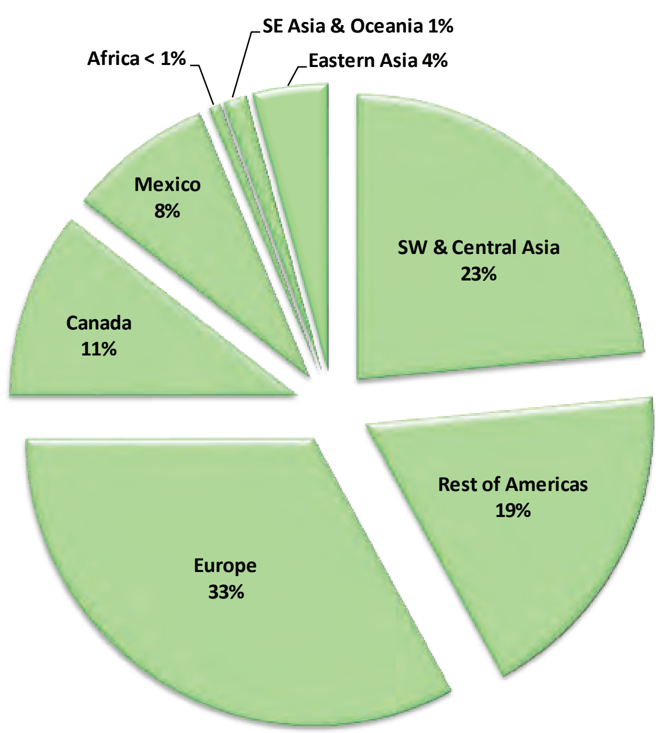
Exhibit 3.5 – International Trading Partners (Foreign Origin of Imports)

(by Weight)



Import Total ≈ 12M Tons

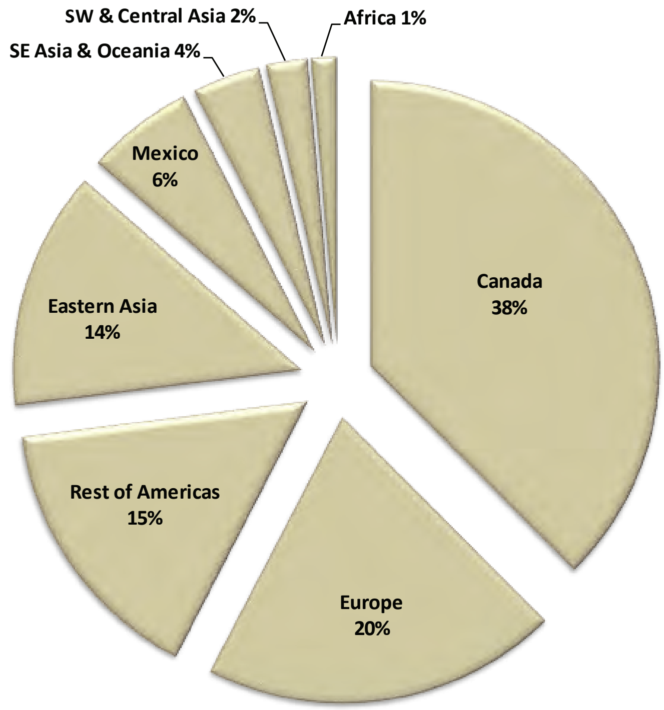
(by Value)



Import Total ≈ $8.2 Billion

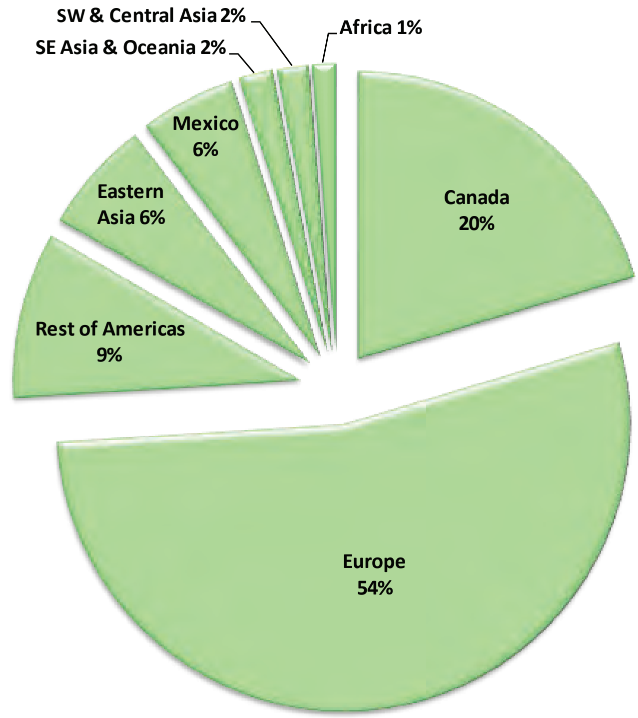
Exhibit 3.6 – International Trading Partners (Foreign Destination of Exports)

(by Weight)



Export Total ≈ 1.8M Tons

(by Value)



Export Total ≈ $4.9 Billion

Exhibit 3.7 – Leading Foreign Import/Export Commodities

Foreign Zone	Delmarva Leading Imports (from Foreign Zone)	Delmarva Leading Exports (to Foreign Zone)
Africa	**Metallic Ores***, **Gasoline**** also Crude Petroleum, Fuel Oils	**Cereal Grains***, **Basic Chemicals***, **Plastics/Rubber****
Canada	**Crude Petroleum***, **Motorized Vehicles**** also Fuel Oils	**Ag Products***, **Motorized Vehicles**** also Basic Chemicals, Chemical Products, Plastics/Rubber
Eastern Asia	**Articles-Base Metal***, **Textiles/Leather**** also Plastics/Rubber, Machinery, Furniture, Misc. Mfg. Products	**Basic Chemicals***, **Plastics/Rubber****, also Meat/Seafood, Precision Instruments
Europe	**Fuel Oils*****, **Pharmaceuticals**** also Machinery, Motorized Vehicles, Basic Chemicals, Plastics/Rubber	**Basic Chemicals***, **Plastics/Rubber****, **Machinery****, **Electronics****, **Precision Instruments****, also Pharmaceuticals
Mexico	**Crude Petroleum***, **Motorized Vehicles**** also Machinery	**Plastics/Rubber***, **Motorized Vehicles**** also Basic Chemicals, Chemical Products, Machinery
Rest of Americas	**Crude Petroleum***** also Ag Products, Machinery, Plastics/Rubber	**Basic Chemicals***, **Motorized Vehicles**** also Foodstuffs, Plastics/Rubber, Newsprint/Paper
SE Asia & Oceania	**Ag Products***, **Furniture**** also Metallic Ores	**Basic Chemicals***, **Plastics/Rubber****, also Motorized Vehicles
SW & Central Asia	**Crude Petroleum***** also Fuel Oils, Textiles/Leather	**Basic Chemicals***** also Plastics/Rubber, Machinery, Electronics, Precision Instruments

Table Source: *2012 FAF3 Import/Export Data Compilation*

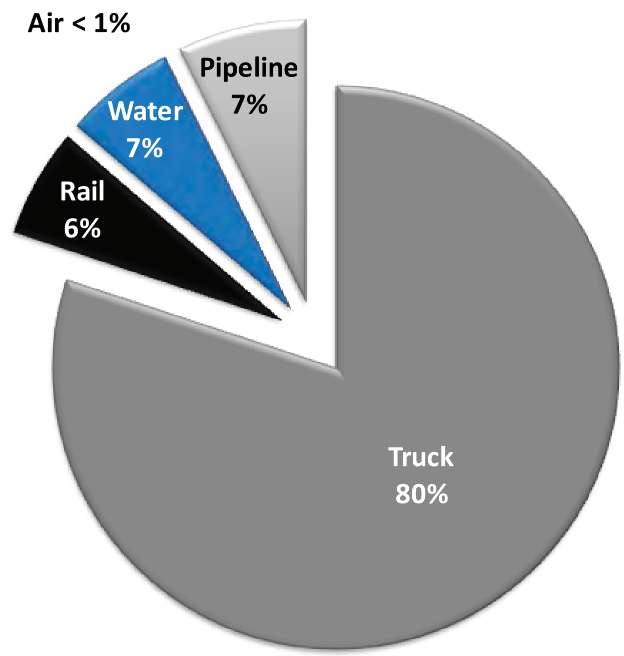
Table Notes:
** **Bold Tan** implies leading commodity by weight*
*** **Bold Green** implies leading commodity by value*
**** **Bold Black** implies leading commodity by both weight and value*

Modal Insights

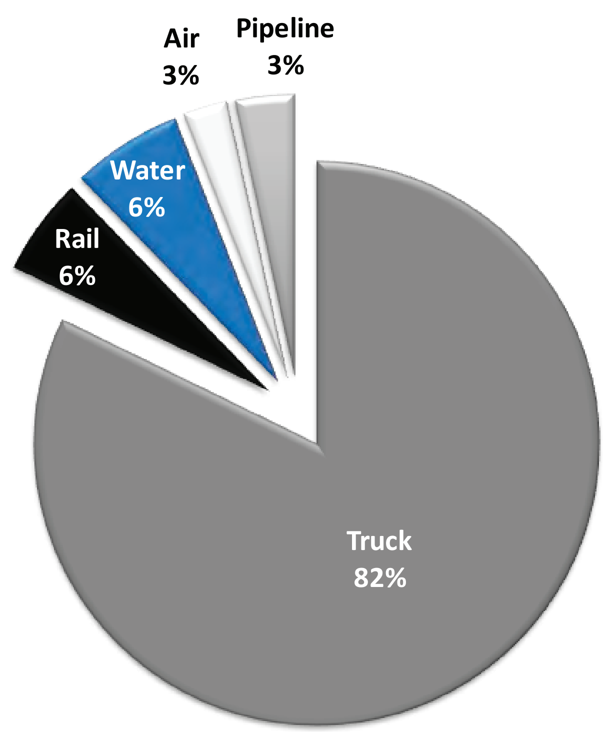
By weight, trucks carry approximately 80% of all goods moved to, from, or on the peninsula; travel by rail, water, or pipeline contributes up to 7% each; and air contributes less than 1% (*Exhibit 3.8*). If considering freight value in lieu of tonnage, air accounts for 3% given a modal tendency toward lower weight and higher value shipments, while rail and water shares each decrease given their typically heavier bulk products. If considering pass-thru freight, truck and rail shares increase slightly given the influence of I-95 and the Northeast Corridor, while water and pipeline shares decrease accordingly. In all cases, however, motor freight truck travel is clearly the dominant mode.

Exhibit 3.8 – Freight Mode

(by Weight)



(by Value)



The overall proportion and directionality of freight flows within any given mode varies (*Exhibit 3.9*). Each mode fills unique roles that are critical to the overall freight transportation system, and it is important to consider those roles in broad qualitative terms in addition to simply tonnage or value-based comparisons. Such details, including additional insights for air, pipeline, or international shipping interests, are expanded elsewhere in this plan (*Chapter 4*), while unique directional traits are summarized below:

- **Truck:** As the dominant mode, the directional split for trucks is similar to that for the overall peninsula, including relatively even inbound/outbound traffic and roughly a third as much as intercounty flow.
- **Rail:** Rail movements are two to four times higher in the inbound (versus outbound) direction, and intercounty rail flows are minimal. Freight flows between the NS Delmarva Secondary and the peninsula's various shortline railroads would generally be included in the overall inbound/outbound data and would not be tracked separately as intercounty flows.
- **Water:** Waterborne freight (specifically via river systems on the Peninsula) is generally evenly split inbound/outbound with negligible intercounty or pass-thru statistics, excluding in this case roughly 10 million tons of waterborne commerce that traverse the Chesapeake and Delaware Canal.
- **Air:** Air freight is also generally evenly split inbound/outbound. However, the limited amount of air freight noted here likely does not reflect the true influence of unknown quantities of military cargo that may pass through Dover Air Force Base – a location noted as providing 25% of the nation's strategic airlift capability and the largest/busiest air freight terminal in the Department of Defense.[4]
- **Pipeline:** Unique in comparison to other modes on the peninsula, pipelines carry a relatively limited selection of commodities, and FAF-based domestic pipeline flows are predominately intercounty. This trend likely reflects a localized network of transfer, storage, or distribution systems that support the peninsula's regional refinery operations, fuel supply sites, or similar distribution networks.

Exhibit 3.9 – Freight Mode (by Direction)

Mode	≈ Delmarva Freight in 2011		Directional Proportion by Weight (by Value)			
	Tons	Value	Pass-Thru	Inbound	Outbound	Intercounty
Truck	56 million	$63 billion	57% (78%)	17% (10%)	19% (10%)	7% (2%)
Rail	4-5 million	$4-5 billion	73% (86%)	22% (10%)	5% (4%)	< 1% (< 1%)
Water*	4-5 million	$4-5 billion	-	46% (35%)	53% (64%)	1% (1%)
Air	20,000-25,000	$2-3 billion	-	55% (38%)	45% (62%)	-
Pipeline	5-6 million	$2-3 billion	-	22% (16%)	7% (5%)	71% (79%)

**does not include international shipping or C & D Canal; see Exhibits 4.17 & 4.18.*

[4] http://www.dover.af.mil/units/index.asp

Commodity Details

The leading commodity groups for the Delmarva Peninsula vary by weight versus value (*Exhibit 3.10-Exhibit 3.11*). However, in either case there are five core groups that make up almost two-thirds of the overall freight flows. These core groups consist of relatively high tonnage/high value freight that includes:

- Petroleum or coal products
- Secondary traffic
- Farm products
- Food or kindred products
- Chemicals or allied products

A list of the top 10 commodities by weight includes the core groups listed above and accounts for 92% of Delmarva's freight by adding 5 additional groups of relatively high tonnage/low value freight that includes:

- Non-metallic minerals
- Clay, concrete, glass, or stone
- Waste or scrap materials
- Lumber or wood products
- Pulp, paper, or allied products

A list of the top 10 commodities by value also includes the core groups listed above and accounts for 84% of Delmarva's freight by adding 5 different groups of relatively low tonnage/high value freight that includes:

- Transportation equipment
- Miscellaneous manufacturing products
- Electrical equipment
- Machinery
- Rubber or miscellaneous plastics

The above groups are based on the two-digit Standard Transportation Commodity Code (STCC) groupings utilized in the project's Transearch® commodity flow data and common in rail freight reporting. A wide variety of detailed commodity types are included as sub-groups under each of the more general two-digit STCC groups. A review of those sub-groups indicates that just a handful of specific commodities often account for the vast majority of each group's overall tonnage or value. These specific commodities also provide a better practical understanding of what types of freight are moving in comparison to the area's business and industry sites. To that end, the prevailing detailed commodity types that generally make-up each of Delmarva's leading commodity groups have been summarized here (*Exhibit 3.12*).

Exhibit 3.10 – Delmarva Top Commodity Groups

Delmarva Top Commodity Groups by Weight

STCC2	Commodity Group	By Weight	
		Tons	Share
29	Petroleum or Coal Products	12,387,836	17.8%
14	Non-Metallic Minerals	11,465,825	16.5%
50	Secondary Traffic	10,815,985	15.5%
01	Farm Products	7,873,138	11.3%
20	Food or Kindred Products	7,355,805	10.6%
28	Chemicals or Allied Products	5,752,320	8.3%
32	Clay, Concrete, Glass, or Stone	4,186,362	6.0%
40	Waste or Scrap Materials	1,869,810	2.7%
24	Lumber or Wood Products	1,539,405	2.2%
26	Pulp, Paper, or Allied Products	787,450	1.1%
-	Other	5,603,633	8.0%
	TOTAL	69,637,568	100.0%

Delmarva Top Commodity Groups by Value

STCC2	Commodity Group	By Value	
		Value (Millions)	Share
50	Secondary Traffic	$11,855	15.9%
28	Chemicals or Allied Products	$10,624	14.2%
20	Food or Kindred Products	$9,809	13.1%
01	Farm Products	$7,635	10.2%
29	Petroleum or Coal Products	$7,319	9.8%
37	Transportation Equipment	$6,961	9.3%
39	Misc Manufacturing Products	$2,453	3.3%
36	Electrical Equipment	$2,207	3.0%
35	Machinery	$2,051	2.7%
30	Rubber or Misc Plastics	$1,778	2.4%
-	Other	$11,919	16.1%
	TOTAL	$74,613	100.0%

- High Tonnage/High Value Group

- High Tonnage/Low Value Group

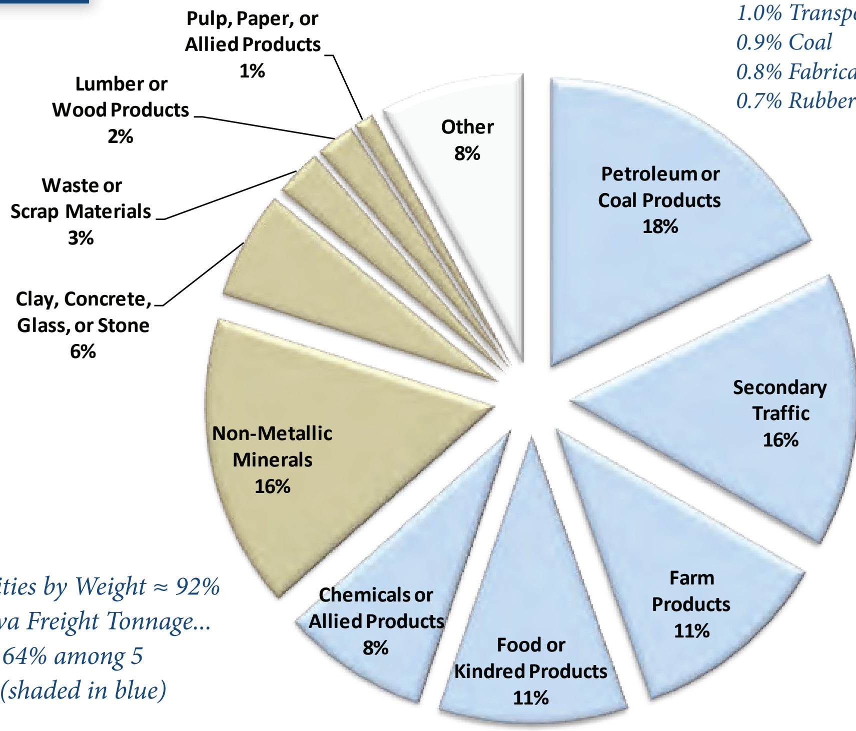
- Low Tonnage/High Value Group

Exhibit 3.11 – Delmarva Top Commodity Groups (with Core Groupings)

(by Weight)

"Other" 8% includes:

1.1% Primary Metal Prod
1.0% Transportation Equipment
0.9% Coal
0.8% Fabricated Metal Prod
0.7% Rubber or Misc Plastics

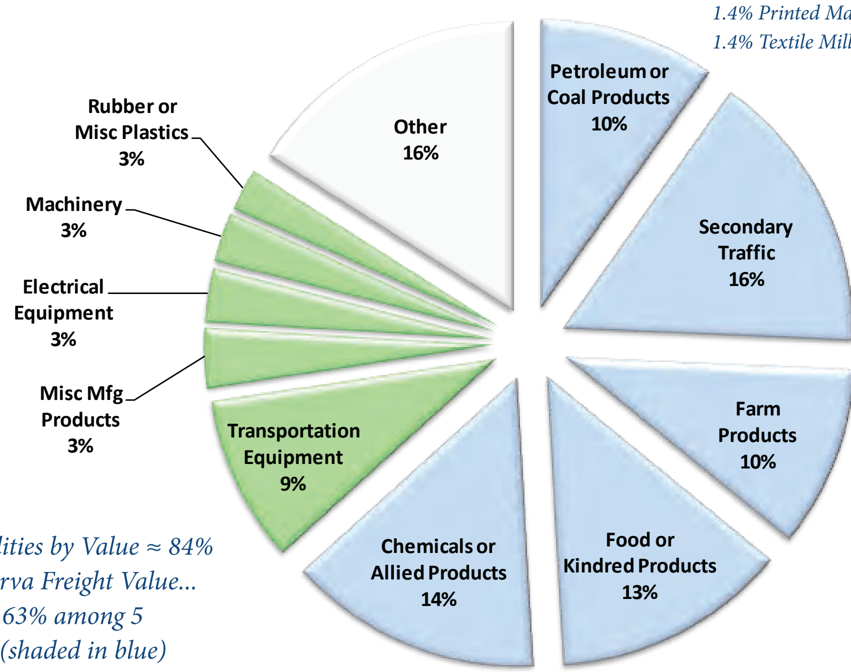


Top 10 Commodities by Weight ≈ 92% of Total Delmarva Freight Tonnage... including 64% among 5 core groups (shaded in blue)

(by Value)

"Other" 16% includes:

2.2% Fabricated Metal Prod
1.9% Instrument, Photo Eq, Optical Eq
1.5% Primary Metal Prod
1.4% Printed Matter
1.4% Textile Mill Prod



Top 10 Commodities by Value ≈ 84% of Total Delmarva Freight Value... including 63% among 5 core groups (shaded in blue)

Exhibit 3.12 – Delmarva Top Commodity Group/Type Details

HIGH TONNAGE/HIGH VALUE

50 Secondary Traffic

- Warehouse and Distribution Center
- Rail Intermodal Drayage

01 Farm Products

- Grain
- Live Poultry
- Tropical Fruits
- Oil Kernels, Nuts, or Seeds
- Misc Field Crops
- Dairy Farm Products

29 Petroleum or Coal Products

- Petroleum Refining Products
- Asphalt Paving Blocks or Mix
- Liquefied Gases, Coal, or Petroleum
- Asphalt Coatings or Felt

20 Food or Kindred Products

- Prepared or Canned Feed
- Processed Poultry or Eggs
- Soft Drinks or Mineral Water
- Dressed Poultry (Fresh or Frozen)
- Canned Fruits, Vegetables, etc.
- Processed Fish Products
- Bread or Other Bakery Products

28 Chemicals or Allied Products

- Misc Industrial Organic Chemicals
- Fertilizers
- Plastic Material or Synthetic Fiber
- Drugs
- Specialty Cleaning Agents

HIGH TONNAGE/LOW VALUE

14 Non-Metallic Minerals

- Gravel or Sand
- Broken Stone or Riprap
- Chemical or Fertilizer Mineral Crude

32 Clay, Concrete, Glass, or Stone

- Ready-Mix Concrete, Wet
- Concrete Products
- Portland Cement
- Misc Glassware, Blown or Pressed
- Cut Stone or Stone Products

40 Waste or Scrap Materials

- Textile Scrap or Sweepings
- Paper Waste or Scrap
- Metal Scrap or Tailings

24 Lumber or Wood Products

- Primary Forest Materials
- Lumber or Dimension Stock
- Misc Sawmill or Planing Mill
- Wood Products, NEC
- Millwork or Cabinet Work

26 Pulp, Paper, or Allied Products

- Paper
- Sanitary Food Containers
- Containers or Boxes, Paper
- Fiber, Paper or Pulpboard

LOW TONNAGE/HIGH VALUE

37 Transportation Equipment

- Motor Vehicle Pats & Accessories
- Missile or Space Vehicle Parts
- Motor Vehicles
- Aircraft Propellers or Parts

39 Misc Manufacturing Products

- Manufactured Products, NEC
- Signs or Advertising Displays
- Musical Instruments or Parts
- Games or Toys
- Sporting or Athletic Goods

36 Electrical Equipment

- Misc Electrical Industrial Equipment
- Misc Electrical Components
- Storage Batteries or Plates
- Telephone or Telegraph Equipment
- Radio or TV Transmitting Equipment

35 Machinery

- Electronic Data Processing Equipment
- Refrigeration Machinery
- Ventilating Equipment
- Misc Internal Combustion Engines
- Farm Machinery or Equipment
- Construction Machinery or Equipment

30 Rubber or Misc Plastics

- Misc Plastic Products
- Misc Fabricated Products
- Tires or Inner Tubes
- Reclaimed Rubber

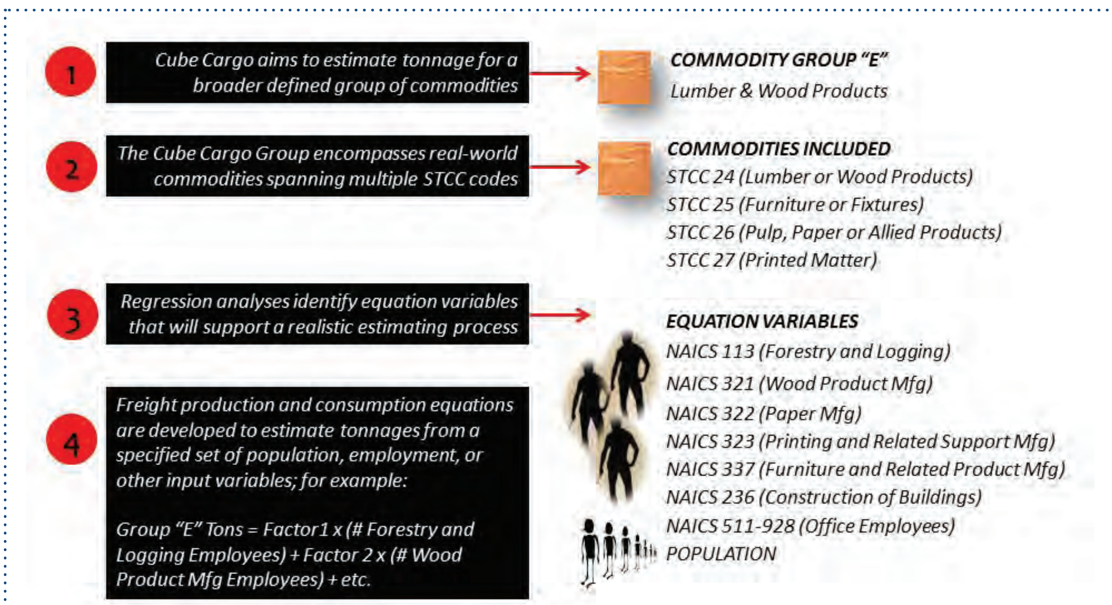
3.2 Commodity Flow Model Perspectives

The Delmarva Freight Plan includes the development and customization of a Commodity Flow Model using the Cube Voyager/Cube Cargo software platform.[5] This model is a powerful tool with the capability to forecast current and future freight movements on the peninsula by commodity group and mode of travel; to accurately capture intermodal transfer of goods and freight system performance; and to test the impacts of trends or decisions in areas such as infrastructure investments, regulation changes, modal enhancements, or industry/employment modifications. To help facilitate and simplify development of that model, the review of existing commodity flows and trends – which thus far in this chapter have been based on STCC groupings from the available data sources – must shift toward consolidating that information into a lesser number of customizable Cargo Model groupings.

As part of the modeling process, each Cargo Model commodity group encompasses a variety of real-world freight traffic in a manner that allows the model to accurately reproduce and predict the amount of freight generated in a specific area based on employment, population, or similar variables (*Exhibit 3.13*). While details of that process are expanded elsewhere in this plan (*Chapter 7*), the important issue here is to organize the existing commodity flow data appropriately. Based on extensive background efforts, 11 Cargo Model commodity groupings have been selected, ranging from Agricultural & Fishing Products to Manufactured Products or Miscellaneous Freight (*Exhibit 3.14*).

The Commodity Flow Model distinguishes between freight production (i.e., tonnage that is created in or originating from an area) and freight consumption (i.e., tonnage that is delivered to or used in an area). The initial model estimates are calibrated to match the net totals of the various STCC-based tonnage data covered in this chapter, including production/consumption targets by Cargo Model commodity group and by county (*Exhibit 3.15-Exhibit 3.16*). Based on these perspectives, the leading Cargo Model commodity groups are as expected including Agricultural & Fishing Products, Ores & Petroleum, Processed Food, and Chemical, Petroleum, or Coal Products. Additionally, and in comparison to previous economic context discussions (*Chapter 2*), the leading counties in terms of overall freight tonnage are also as expected including Kent, New Castle, and Sussex Counties in Delaware; as well as Cecil and Wicomico Counties in Maryland.

Exhibit 3.13 – Sample Process for Development of Cube Cargo Model Commodity Groups



[5] http://www.citilabs.com/products/cube/cube-cargo

Exhibit 3.14 – Cube Cargo Model Commodity Groupings

Commodity Groups (CARGO MODEL)		Commodity Groups (TRANSEARCH)	
Group	**Description**	**STCC2**	**Description**
A	Agricultural & Fishing Products	01	Farm Products
		08	Forest Products
		09	Fresh Fish or Marine Products
B	Ores & Petroleum	10	Metallic Ores
		13	Crude Petrol or Natural Gas
		14	Nonmetallic Minerals
BB	Coal	11	Coal
C	Processed Food	20	Food or Kindred Products
		21	Tobacco Products
D	Textiles & Apparel	22	Textile Mill Products
		23	Apparel or Related Products
E	Lumber & Wood Products	24	Lumber or Wood Products
		25	Furniture or Fixtures
		26	Pulp, Paper or Allied Products
		27	Printed Matter
F	Chemical, Petroleum, or Coal Products	28	Chemicals or Allied Products
		29	Petroleum or Coal Products
		30	Rubber or Misc Plastics
H	Nonmetallic Products	31	Leather or Leather Products
		32	Clay, Concrete, Glass or Stone
I	Machinery & Metal Products	33	Primary Metal Products
		34	Fabricated Metal Products
		35	Machinery
		36	Electrical Equipment
		37	Transportation Equipment
		38	Instruments, Photo Equip, Optical Equip
J	Manufactured Products	19	Ordnance or Accessories
		39	Misc Manufacturing Products
K	Miscellaneous	40	Waste or Scrap Materials
		41	Misc Freight Shipments
		42	Shipping Containers
		43	Mail or Contract Traffic
		46	Misc Mixed Shipments

Exhibit 3.15 – Delmarva Freight Production and Consumption by Cube Cargo Model Commodity Group

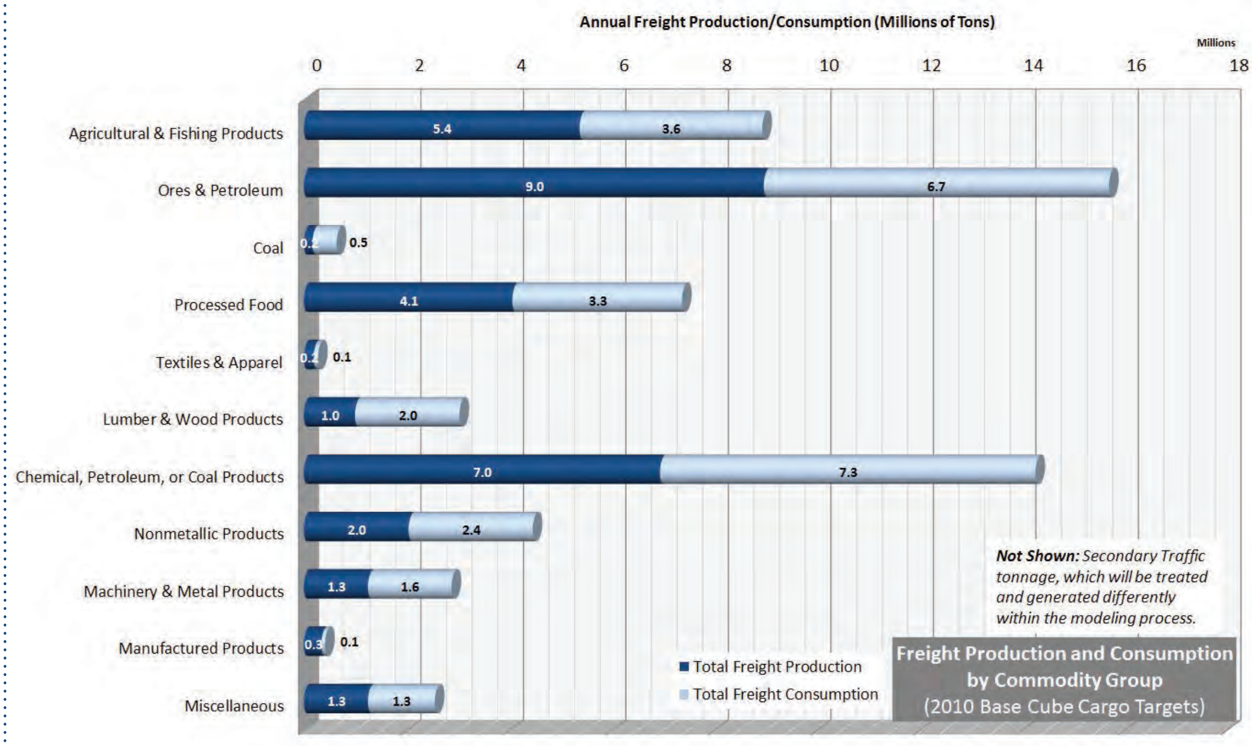
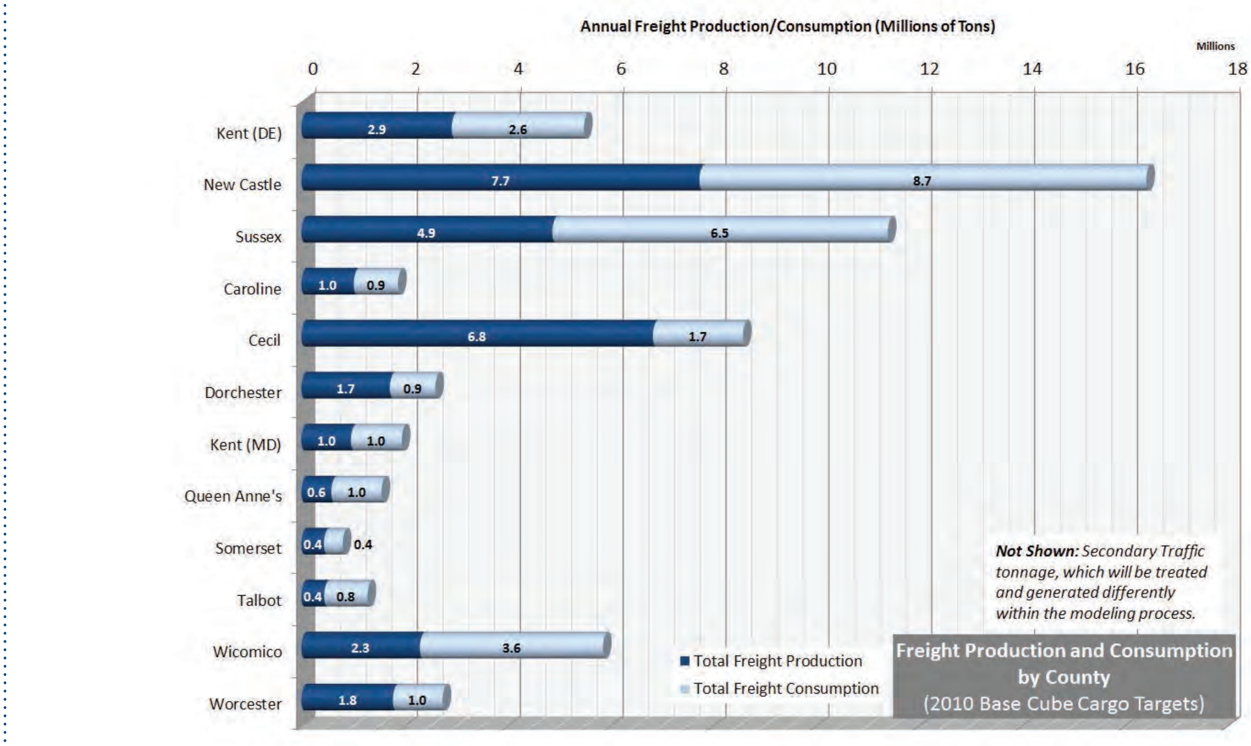


Exhibit 3.16 – Delmarva Freight Production and Consumption by County



3.3 Supply Chain Perspectives

Key Supply Chains

MAP-21 emphasizes a need for increased understanding of a region's key industries and supply chains, including their related transportation modes and potential influence on export activities. *Chapter 2* of this plan provided such insights from an economic and business/industry perspective; a review of the existing commodity flows summarized herein generally confirms those insights. While any of the peninsula's key industries or leading commodity groups fill a supply chain role in some manner, exceptional or unique interests are noted as follows:

Energy Supply Chain: The movement or processing of energy-related products is a major influence on the peninsula. The Petroleum and Coal Products commodity group, for example, ranks highest (by weight) among all others, and crude petroleum or fuel oils are leading imports from six of eight foreign freight zones. Related to the extraction of shale oil or gas reserves, the PBF Refinery in Delaware City receives tremendous amounts of crude oil by rail from the Midwest and Canada, while other industries on the peninsula may supply sand or chemical products for hydraulic fracturing (fracking) in Pennsylvania and beyond. In the wind energy market, the Port of Wilmington serves as an ideal seaport and distribution hub with the specialized equipment and experience needed to transfer massive cargo such wind turbine blades. Other influences by mode are reflected in rail-based coal deliveries to the Indian River Power Plant near Millsboro; gasoline and fuel oil barges along the Wicomico River; lightering operations in Delaware Bay; over 70% of reported pipeline flows as intercounty storage and distribution movements; aviation fuel needed to support Dover AFB's military air cargo mission; and truck transfers ranging from large-scale operations to individual home heating oil deliveries. Combined, these activities are critical supply chain links not only on the peninsula, but also throughout the surrounding region and across the nation.

Agricultural Supply Chain (Including Poultry and Agribusiness): Major agricultural influences and relationships, including those in the poultry and agribusiness industries, are undeniable as they are reflected in several of the peninsula's leading commodity groups. The Farm Products group, for example, reflects large amounts of grain, live poultry, and various field crops; while the Food or Kindred Products group subsequently includes processed, fresh, or frozen poultry and eggs. In related areas, fertilizers or fertilizer components are prominent among the Chemicals or Allied Products group and the Non-Metallic Minerals group; and the peninsula's high-value Machinery group specifically reflects a large proportion of farm machinery or equipment, refrigeration machinery, ventilating equipment, and other potential agricultural support items. The various agricultural and support products are shipped by truck (especially fresh product), by rail (especially grain), and by barge (especially grain along the Wicomico River and liquid fertilizer along the Nanticoke River). Previous economic insights have noted that motor freight trucks allow for the delivery of fresh products to 50-60% of the U.S. east coast market, while frozen poultry may also be a viable international export via the Port of Norfolk or other locations.

Food Products Supply Chain: In addition to the agriculture and poultry industries noted above, supply chains pertaining to the broader manufacturing, processing, or handling and distribution of various food products are also prevalent. The scale and scope of operations vary, ranging from seafood and oyster harvesting, to beverage production and bottling, to large-scale food manufacturing (e.g., Kraft Foods or Hanover Foods). Several niche products including tropical fruits, juices, and concentrates are also imported in large volumes through the Port of Wilmington for well-known brands such as Dole and Chiquita. In related areas, warehousing and distribution facilities such as C&S Wholesale Grocers or Sysco Eastern Maryland help to link the food production aspects with wholesale, retail, and restaurant markets. Packaging products such as sanitary food containers, paper containers, or boxes are also reflected in the Pulp, Paper, or Allied Products group. Packaging relationships may include local supplies or uses far beyond Delmarva's borders including, for example, kraft linerboard exported through Wilmington that may return as boxes filled with tropical fruit.

Chemical Products Supply Chain: Independent of this freight plan, a detailed Delmarva Chemical Supply Chain Analysis study was recently conducted through WILMAPCO to identify key trends and insights relative to this important industry on the peninsula. As a core commodity group in terms of both tonnage and value, typical commodities under the Chemicals or Allied Products group include miscellaneous industrial organic chemicals, fertilizers, plastic material or synthetic fiber, specialty cleaning agents, and drugs or pharmaceuticals. Truck and rail movements are exceptionally important to these products, while air delivery of pharmaceuticals also contributes value. Pharmaceuticals were also identified as accounting for a fair share of import/export trade values with the European market.

Retail Supply Chain: Secondary Traffic – or the movement, typically by truck, of mixed shipments of goods from warehousing or distribution facilities to final destinations – is prominent across the peninsula. While this may accompany any commodity group, it also adds insight into the depth of the region's retail and distribution industry. Traditional storefronts coupled with e-commerce and major distribution facilities such as Amazon, Wal-Mart, or IKEA are contributing factors. Coupled with consumer demands of the broader tourist, hospitality, restaurant, or related industries on the peninsula, the importance of Secondary Traffic flows are apparent.

Other Supply Chains

The key supply chains noted above generally capture the influence of the peninsula's core commodity groups. Other potential interests beyond those core groups may expand to include the following:

Construction: Common Delmarva commodities include aggregates, asphalt, cement, concrete and cut stone products, and other materials that are critical to construction activities in the region.

Transportation Equipment: Despite drastic changes in the region's automotive industry over the past several years, motor vehicles and related parts and accessories are still factors in terms of value on the peninsula. Motorized vehicles are leading import/export commodities for various foreign trading partners. Multimodal access with specialized vehicle processing/storage facilities and roll-on/roll-off (RoRo) shipping capabilities are located at major ports on the peninsula (e.g., Auto-Port, Inc., at the Port of Wilmington) and in the surrounding region (e.g. various public/private terminals in/around the Port of Baltimore and the Port of Virginia).

Miscellaneous Manufacturing: Miscellaneous commercial, industrial, or consumer retail products of various types are manufactured across the peninsula including, for example, products through many of the major employers listed previously in *Chapter 2*. It is anticipated that while each product line has unique raw material, packaging, scrap, or similar commodity influences, all rely on an efficient and effective freight transportation system and related Secondary Traffic or distribution network.

Natural Resource Access

MAP-21 places particular emphasis on infrastructure that is used to access and transport equipment or products related to natural resources such as those found in the mining, agricultural, energy, and timber industries. Adequate freight transportation access is critical to these types of industries and related plans/policies. However, in most cases the potential impacts of heavy freight traffic must also be balanced alongside first/last mile considerations, community interests, or the preservation of local roadway conditions. On the Delmarva Peninsula, potential natural resource access issues may be tied to at least two major interest groups including:

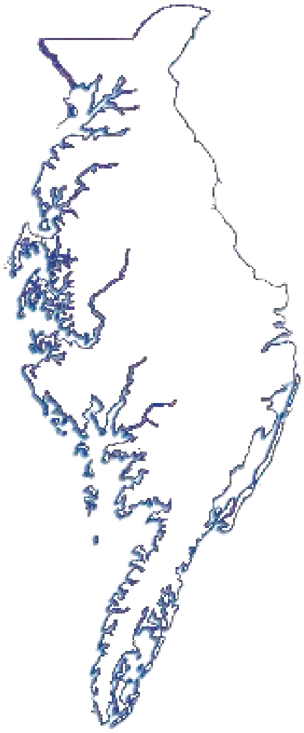
Energy: focusing on any location or resource-specific operations noted in the Energy Supply Chain discussions in the previous section, particularly including access to/from the Port of Wilmington, the PBF Refinery in Delaware City, and the Indian River Power Plant near Millsboro; and along the Wicomico River to/from Salisbury.

Agriculture: focusing on a broad presence of poultry, agribusiness, or other large and small-scale farming operations across several counties and as noted in the agricultural supply chain discussions in the previous section, and including protected fishery/hatchery sites that may be related to the Food Products supply chain, particularly for oyster and seafood harvesting at the southern end of the peninsula.

Delmarva Freight Plan

Chapter 4

Existing Freight Transportation System



Chapter 4

Existing Freight Transportation System

The existing multimodal freight transportation system on the Delmarva Peninsula is comprised of various highway, rail, port/waterway, air, and pipeline assets across each of the 3 states and 14 counties in the project area. Relatively up-to-date inventories or descriptions of this infrastructure have been detailed as part of numerous recent planning efforts including but not limited to:

- 2009 Maryland Statewide Freight Plan
- 2010 Regional Freight Transportation Study for the Delmarva Peninsula
- 2010 Virginia Statewide Multimodal Freight Study, Phase II
- 2011 Delaware State Rail Plan

This section draws from such references to summarize the available freight transportation system and assets by mode while also beginning to identify freight mobility issues, emphasis areas, or related insights for investigation later in the plan.

4.1 Modal Assets

Motor Freight

Motor freight truck movements are clearly the dominant means of freight transportation on, off, and throughout the peninsula. Based on project-specific commodity flow data, trucks carry approximately 80% of the peninsula's overall goods movement tonnage and 82% of the overall value. Truck movements are handled by the peninsula's interstate, U.S. highway, state, and secondary route networks, as well as first/last mile connections along county, municipal, or other local roadways (*Exhibit 4.1 and Exhibit 4.2*).

Exhibit 4.1 – Delmarva Peninsula Roadway Network (by State Highway Designation)

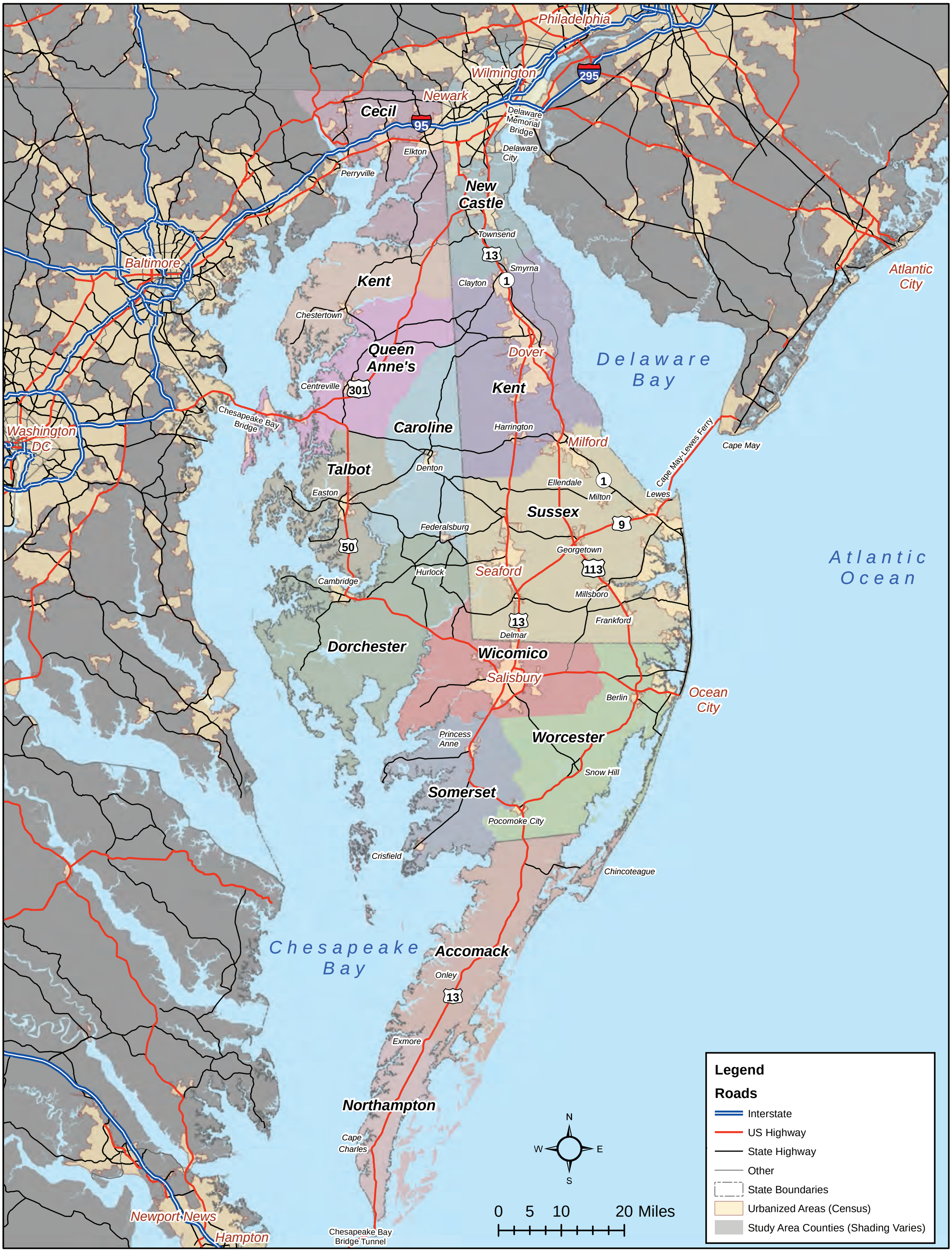
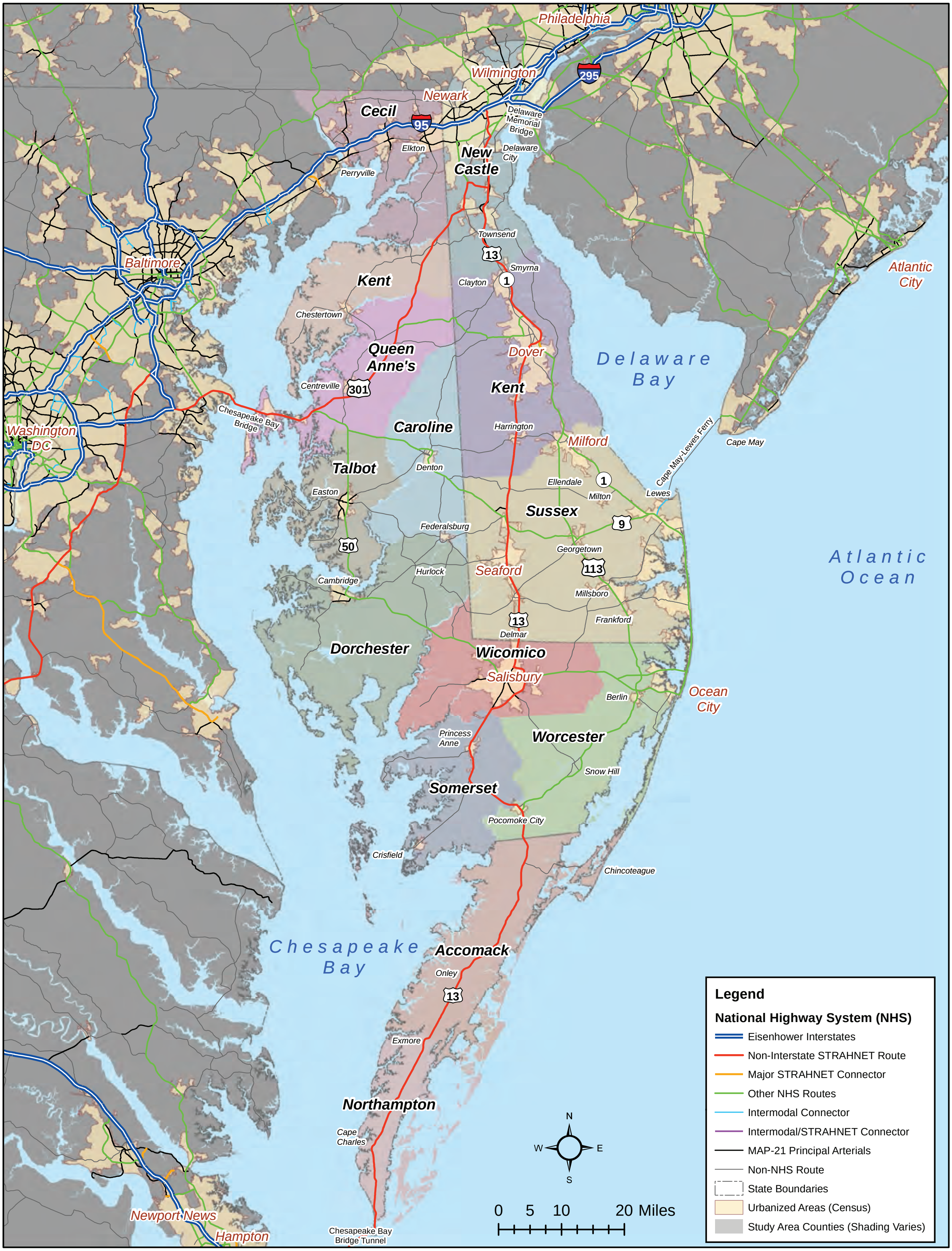


Exhibit 4.2 – Delmarva Peninsula Roadway Network (by NHS Designation)



Key Motor Freight Routes

Interstate 95: I-95 passes through the northern end of the peninsula across Cecil County, Maryland, and New Castle County, Delaware. The interstate corridor is a crucial travel and freight gateway linking the peninsula's major urbanized areas around Newark and Wilmington with the greater Baltimore/Washington and Philadelphia metropolitan areas, while also providing key connections on/off the peninsula and into Pennsylvania and New Jersey. On a broader level, the I-95 corridor connects the peninsula to major markets along the entire U.S. eastern seaboard from Maine to Florida. According to the I-95 Corridor Coalition (*www.i95coalition.org*), this system annually accounts for 5.3 billion tons of freight shipments, 40% (or $4.7 trillion) of the nation's GDP, and 28% (or $197 billion) of all U.S. exports.

Interstate 295: I-295 provides access between Delaware and New Jersey via the Delaware Memorial Bridge. Broader connections run along the southwestern edge of New Jersey toward Trenton, and also include linkages to the New Jersey Turnpike and north toward Newark or New York City.

Interstate 495: I-495 in Delaware links with I-95 and runs parallel to it around the southeast corner of Wilmington. It locally provides access to major freight generators around the Port of Wilmington, Edgemoore, Claymont, and (via connections to US 13) the Port of Marcus Hook in Pennsylvania.

U.S. Route 13: US 13 is included on the National Highway System (NHS) as a non-interstate Strategic Highway Network (STRAHNET) route. It is a vital trunkline that traverses the entire north-south length of the peninsula and connects the Philadelphia and Wilmington areas in the north with mainland Virginia and points south by way of the Chesapeake Bay Bridge-Tunnel. It is a primary travel, business, and freight corridor that links many of the key towns and freight hubs throughout the Peninsula. These linkages encompass most towns through Virginia's Eastern Shore counties; Pocomoke City, Princess Anne, and Salisbury through Maryland; and Delmar, Seaford, Dover, Wilmington, and many others through Delaware.

What is the National Highway System?

The National Highway System (NHS) consists of roadways important to the nation's economy, defense, and mobility. The NHS was developed by the USDOT in cooperation with the states, local officials, and metropolitan planning organizations (MPOs) and includes the following subsystems:

- Interstate: The Eisenhower Interstate System of highways retains its separate identity within the NHS.
- Other Principal Arterials: These are highways in rural and urban areas which provide access between an arterial and a major port, airport, public transportation facility, or other intermodal transportation facility.
- Strategic Highway Network (STRAHNET): This is a network of highways which are important to the United States' strategic defense policy and which provide defense access, continuity and emergency capabilities for defense purposes.
- Major STRAHNET Connectors: These are highways which provide access between major military installations and designated STRAHNET routes.
- Intermodal Connectors: These highways provide access between major intermodal facilities and the other four subsystems making up the NHS.

Source: http://www.fhwa.dot.gov/planning/national_highway_system/

U.S. Route 301: US 301 is a NHS non-interstate STRAHNET route and, coupled with US 50, provides a critical link between the Delmarva Peninsula and mainland Maryland via the William Preston Lane, Jr., Memorial Bay Bridge. West and south of the peninsula, US 301 parallels I-95 from approximately Washington D.C. through Richmond, Virginia, and then south to Florida. On the peninsula, it links the Bay Bridge with US 40 and areas south of Newark, Wilmington, and New Castle.

U.S. Route 50: US 50 is included on the NHS and, coupled with US 301 and MD 90, provides a critical link between the Bay Bridge and Ocean City, Maryland. West of the peninsula, US 50 runs through Washington D.C. and then west over 3000-miles to California, though not as a major freight route. On the peninsula, it links freight hubs in Easton, Cambridge, Salisbury, and Berlin, Maryland, while also providing high-speed access for major tourist traffic flows to beach areas around Ocean City.

U.S. Route 113: US 113 is included on the NHS and provides access to coastal area towns through Sussex County, Delaware, and Worcester County, Maryland. It links with DE 1 in Milford and US 13 in Pocomoke City, ultimately forming portions of a second major north-south route (parallel to US 13) through the peninsula. Town connections include Milford, Ellendale, Georgetown, Millsboro, Dagsboro, Frankford, and Selbyville, Delaware; as well as Berlin, Snow Hill, and Pocomoke City, Maryland. US 113 links with several cross-routes accessing coastal areas from Lewes and Rehoboth Beach to Ocean City, and thus also carries substantial tourist traffic flows.

U.S. Route 9: US 9 on the Delmarva Peninsula runs east-west linking US 13 in Laurel, Delaware, with the Cape May-Lewes Ferry into New Jersey. The route segments between US 113 and DE 1 are included on the NHS, and the link from DE 1 to the ferry is included as a NHS Intermodal Connector. On a broader level, US 9 ultimately runs north-south along the New Jersey coastline before passing west of the Newark, New Jersey and New York City metropolitan areas, then into northern New York. Locally, US 9 connects the towns of Laurel, Georgetown, and Lewes, while also carrying substantial tourist traffic flows to the coastal resort areas.

U.S. Route 40: US 40 enters the peninsula via the Thomas J. Hatem Memorial Bridge over the Susquehanna River and parallels I-95 through Cecil County, Maryland, and New Castle County, Delaware. Various segments of this route are included the NHS or identified as a MAP-21 designated principal arterial. Farther west, US 40 runs through Baltimore and as far away as Utah; farther east, the route overlaps I-295 across the Delaware Memorial Bridge before heading toward Atlantic City, New Jersey. Locally, it connects Elkton, Maryland, and areas near Wilmington and New Castle, Delaware, crossing or overlapping US 301 and US 13 along the way.

State Route 1: DE 1 is a primary north/south route through Delaware between approximately I-95 in Wilmington and the Delaware/Maryland border where it links with MD 528 entering/exiting Ocean City. North of Dover, DE 1 is a tolled highway and a NHS non-interstate STRAHNET route; south of Dover it is also included on the NHS as an "other" route. The highway is a critical link for urbanized areas around Dover and the Dover AFB. It is also the primary route along the Atlantic Coast that serves tourist destinations and recreational areas through Lewes, Rehoboth, and Dewey Beaches; Bethany Beach and Fenwick Island; and south to Ocean City, Maryland.

State Route 404: MD 404 and DE 404 couple to form an east-west NHS route that bisects the peninsula while linking US 50 and traffic flows from the Bay Bridge with US 9, DE 1, and tourist destinations near Lewes and Rehoboth Beaches. Locally, the route connects the towns of Wye Mills, Queen Anne, and Denton, Maryland, as well as Bridgeville, Georgetown, and Lewes, Delaware.

Other Routes: A number of other roadways link the broader transportation network with local freight zones throughout the peninsula including rural town centers on Maryland's Eastern Shore; in western Kent County, Delaware; and in Accomack County, Virginia. Such linkages capture Chestertown (via MD 213 or MD 291), Federalsburg or Hurlock (via MD 16, MD 392, MD 307, MD 318, DE 17, DE 18, and others), and Crisfield (via MD 413), Maryland; as well as Chincoteague, Virginia (via VA 175). Additional routes provide local east/west connections between Sudlersville, Maryland, and areas from Smyrna to Dover (via MD/DE 300, DE 44, and DE 8), and also between Denton, Maryland, and areas from Dover to Milford (via MD 313, MD 311, MD 317, DE 14, and DE 8).

Primary Freight Network

At a broader level, MAP-21 freight provisions also mandate the federal designation of a National Freight Network to assist in strategically directing resources toward improved system performance for efficient movement of freight on highways. The National Freight Network will consist of a Primary Freight Network (PFN) that designates highways that are most critical to the movement of freight, as well as the portions of the Interstate System that are not included as part of the PFN, and Critical Rural Freight Corridors that may be established by each state. The initial draft designation of the PFN (November 2013) reveals very limited coverage on the Delmarva Peninsula, capturing only the interstate system through Cecil and New Castle Counties, and the US 50/301 connection via the Chesapeake Bay Bridge (*Exhibit 4.3*). With such limited coverage and as freight planning efforts on the peninsula continue to evolve, it is vital that each state and applicable freight stakeholders or planning partners diligently self-define the critical components, complexities, and interactions within the region's multimodal freight transportation system.

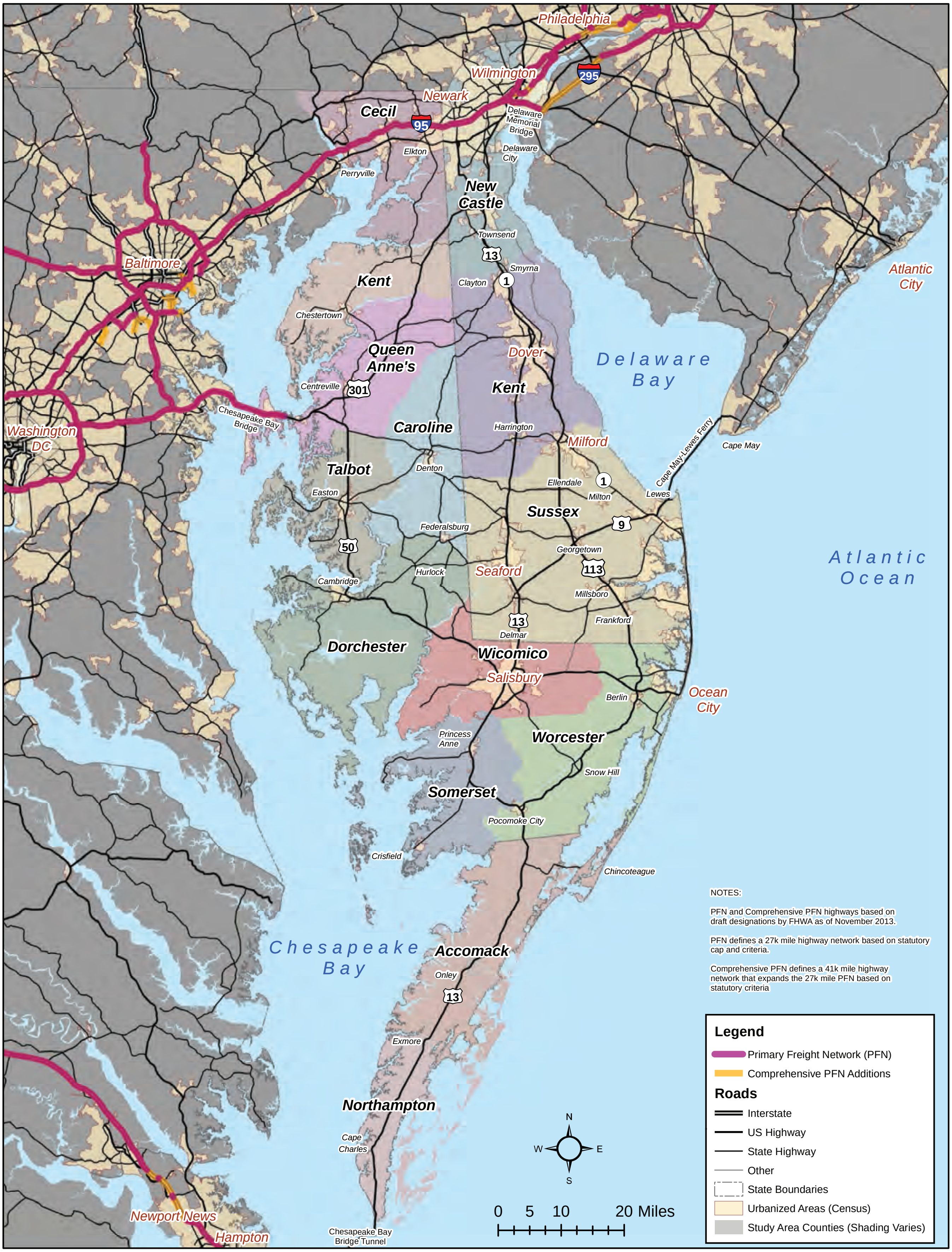
How is the MAP-21 Primary Freight Network (PFN) Designated?

MAP-21 specifies that the Secretary shall consider the following factors in designating a Primary Freight Network that shall be comprised of not more than 27,000 centerline miles of existing roadways that are most critical to the movement of freight:

- The origins and destinations of freight movement in the United States;
- The total freight tonnage and value of freight moved by highways;
- The percentage of annual average daily truck traffic in the annual average daily traffic on principal arterials;
- The annual average daily truck traffic on principal arterials;
- Land and maritime ports of entry;
- Access to energy exploration, development, installation, or productions areas;
- Population centers; and
- Network connectivity

Source: MAP-21 Section 1115. National Freight Policy

Exhibit 4.3 – Delmarva Peninsula Roadway Network (with PFN Designations)



How are MAP-21 Critical Rural Freight Corridors Designated?

MAP-21 specifies that a state may designate a road within the borders of the state as a Critical Rural Freight Corridor if the road:

- Is a rural principal arterial roadway and has a minimum of 25 percent of the annual average daily traffic of the road measured in passenger vehicle equivalent units from trucks (FHWA vehicle class 8 to 13);
- Provides access to energy exploration, development, installation, or production areas;
- Connects the primary freight network, a roadway described by the two preceding bullets, or Interstate System to facilities that handle more than (a) 50,000 20-foot equivalent units per year, or (b) 500,000 tons per year of bulk commodities.

Source: MAP-21 Section 1115. National Freight Policy.

Roadway Characteristics

Additional roadway characteristics, crash data, traffic volumes, truck volumes, and levels of congestion were also reviewed for the peninsula's roadway network (*Exhibit 4.4 through Exhibit 4.12*), including the following:

- Historical crash data was provided by the various state highway agencies for the three-year period from 2009 through 2011. However, given the extensive size and scope of the study area and variations in the way crash data appears to currently be reported, tracked, or stored by each of the individual states on the peninsula, crashes were reviewed at a very cursory county-level for major freight corridors only. Without substantial post-processing and large-scale compilation efforts, the available data cannot be easily used for a fair comparison of conditions across multi-state boundaries.
- Average Annual Daily Traffic (AADT) volumes and Average Daily Truck Traffic (ADTT) volumes for years 2012 and 2040 were derived primarily from available data within DelDOT's existing statewide travel demand model (the Peninsula Model).
- Existing and projected roadway levels-of-service (LOS) were likewise pulled from the Peninsula Model. LOS is an industry-standard method of assigning letter grades A-F to a location to reflect the amount of congestion that motorists perceive to be there. LOS A, B, or C conditions generally represent smooth operations or only minor delays; LOS D conditions introduce more frequent congestion or operational problems; and LOS E or F conditions typically reflect frequent or extensive delays, longer lines of traffic, reduced speeds, less room to maneuver through traffic, or similar conditions that are generally unacceptable to motorists.

Reviews of the above information indicate that while PFN coverage on the peninsula is exceedingly limited, the area's overall roadway network is, in fact, generally well connected and able to provide a reasonable level of access for motor freight travel. However, there are potential areas of concern that may warrant further investigation as this plan evolves. Most issues occur around the peninsula's higher volume roadways or urbanized areas and relate to one or more of the following:

- Physical roadway bottlenecks
- High volume roadway bottlenecks
- High truck traffic corridors
- Crash pattern implications
- Urbanized area congestion
- Secondary route access
- Anticipated growth impacts

Exhibit 4.4 – Select Roadway Characteristics for Key Motor Freight Routes

Roadway	NHS Network	Daily Traffic	Typical # of Lanes	Typical Travel Speed (Model-Based)	Toll Locations	Congested Areas
I-95	NHS Interstate		6 to 8	70	I-95 Newark Toll Plaza I-95 JFK Toll Plaza	Wilmington
I-295	NHS Interstate		6 to 8	70	Delaware Memorial Bridge	Delaware Memorial Bridge
I-495	NHS Interstate		6	70	N/A	Wilmington
US 9	Mix of NHS Other or non-NHS Route	Average Daily Traffic 2012 ADT See Exhibit 4.5	2	50	Cape May-Lewes Ferry	Georgetown to Lewes
US 13	NHS Non-Interstate STRAHNET Route	Average Daily Traffic 2040 ADT See Exhibit 4.6	4 to 6	55 to 60	Bay Bridge-Tunnel	Wilmington; Dover; Seaford; Salis-bury
US 40	Mix of NHS Other or MAP-21 Principal Arterial		4	55	Delaware Memorial Bridge	Elkton; Wilmington
US 50	NHS Other	Average Daily Truck Traffic* 2012 ADTT See Exhibit 4.7	4	65	Bay Bridge	Bay Bridge; Queen Anne's County; Talbot County; Salisbury
US 113	NHS Other	Average Daily Truck Traffic* 2040 ADTT See Exhibit 4.8	4	55 to 60	N/A	Georgetown; Millsboro; Frankford
US 301	NHS Non-Interstate STRAHNET Route		2 to 4	65	Bay Bridge	Bay Bridge; Queen Anne's County
DE 1	Mix of NHS Non-Interstate STRAHNET Route or NHS Other		4	60	DE 1 Biddles Toll Plaza DE 1 Dover Toll Plaza	Wilmington; Dover; Coastal resort areas
MD/DE 404	NHS Other		2	50	N/A	From US 50 to Denton; Georgetown to Lewes

* Note: Truck volumes summarized here based on 2010-2040 DelDOT Peninsula Model estimations

Exhibit 4.5 – Delmarva Peninsula Traffic Volume Summary (2012 AADT)

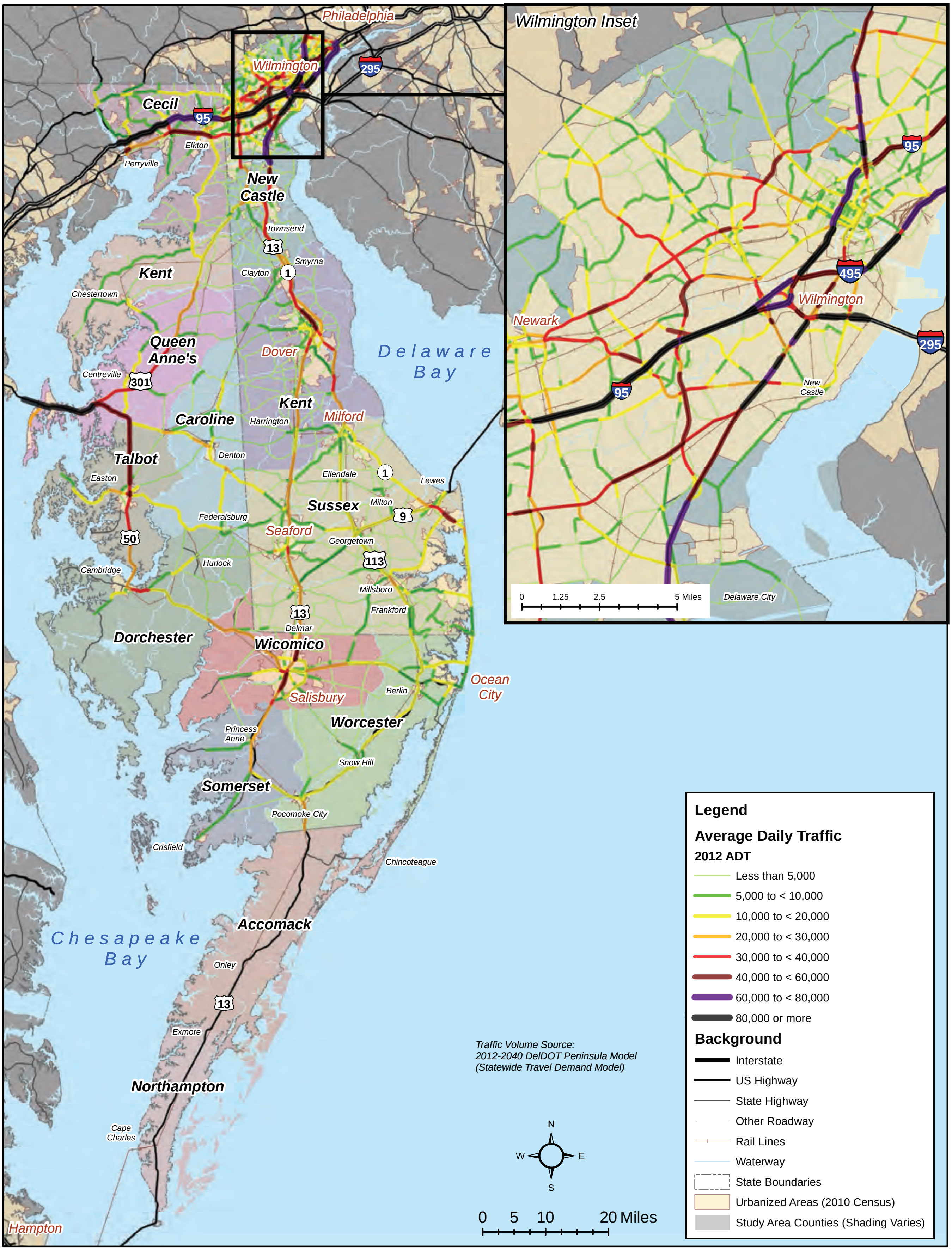


Exhibit 4.6 – Delmarva Peninsula Traffic Volume Summary (2040 AADT)

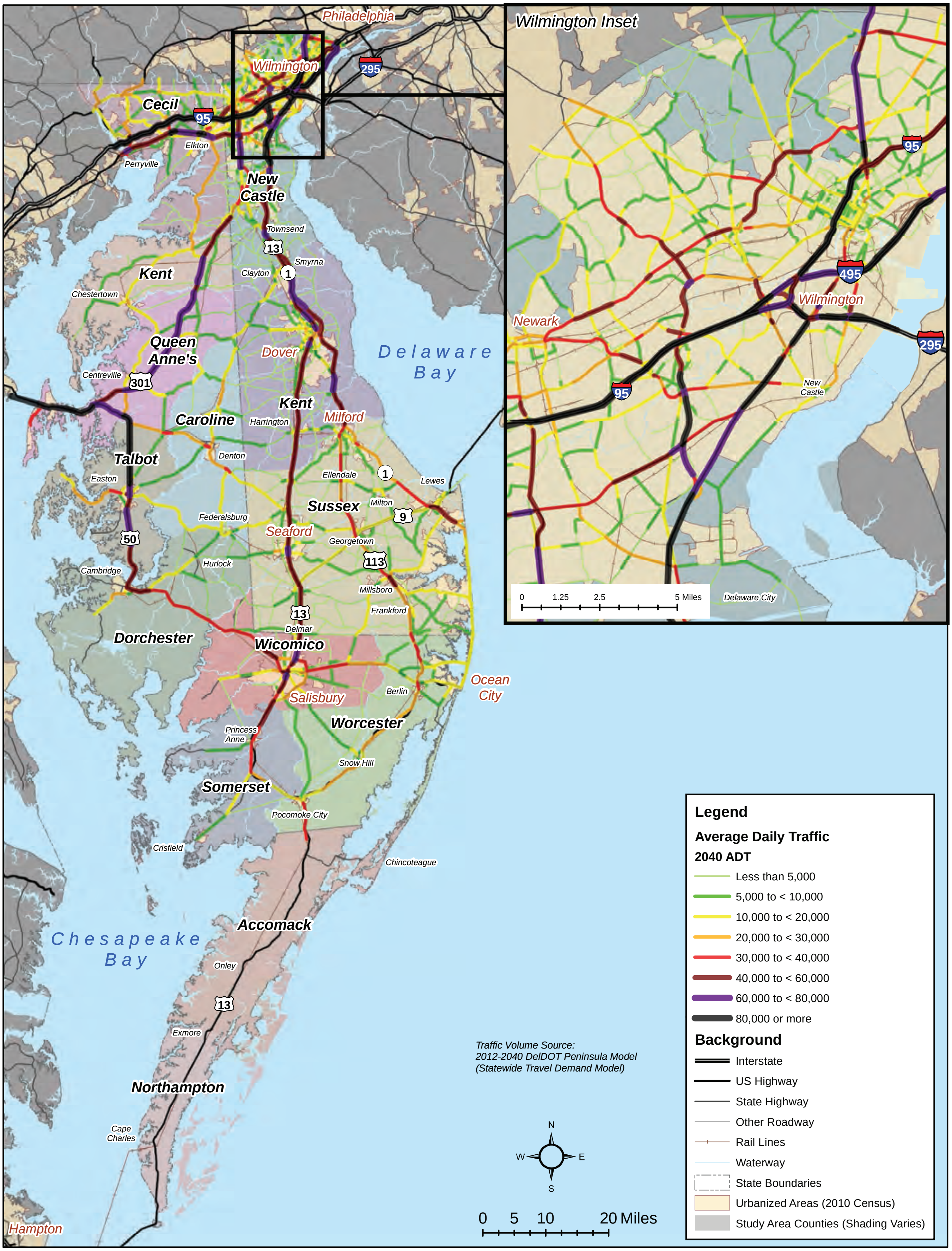


Exhibit 4.7 – Delmarva Peninsula Truck Volume Summary (2012 ADTT)

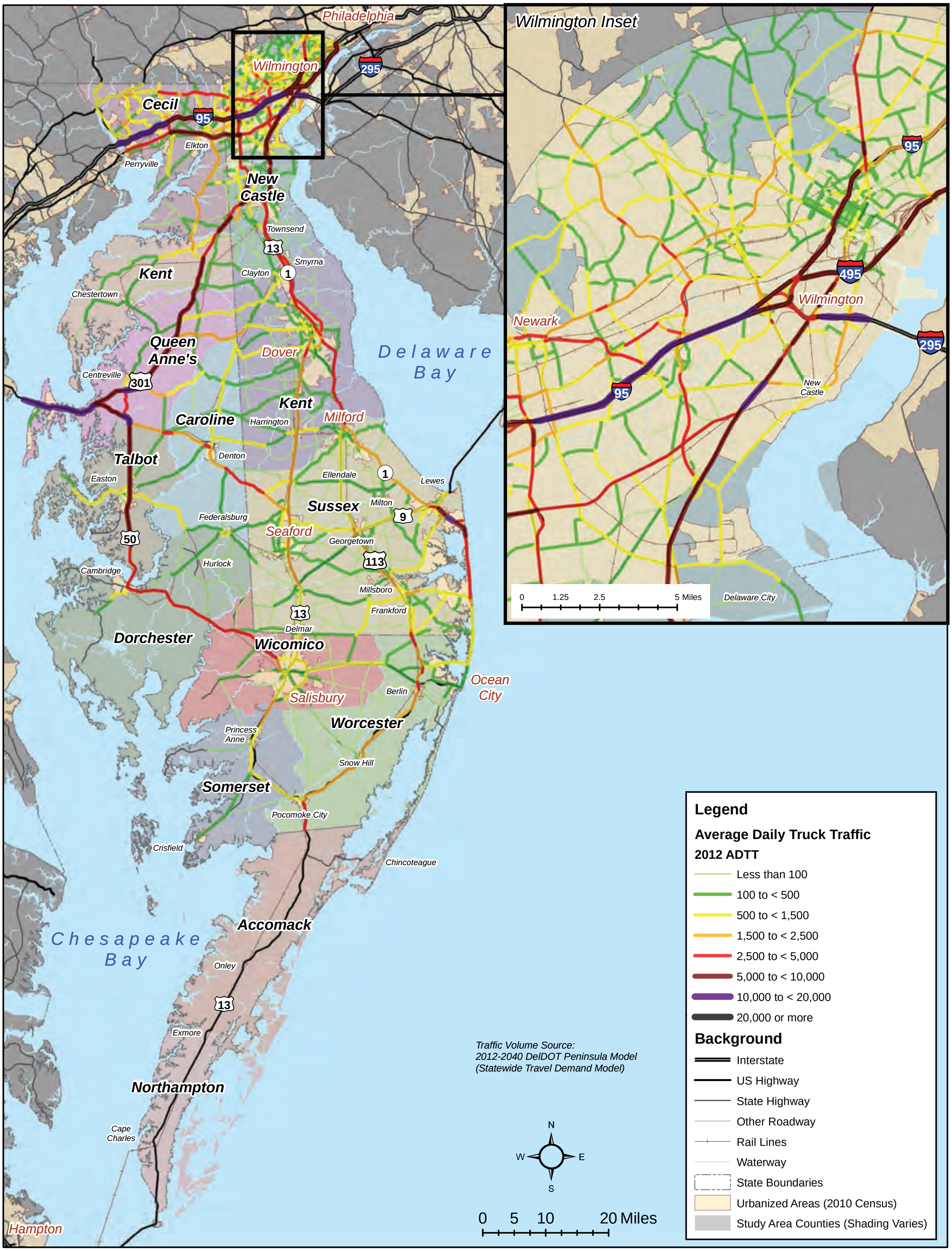


Exhibit 4.8 – Delmarva Peninsula Truck Volume Summary (2040 ADTT)

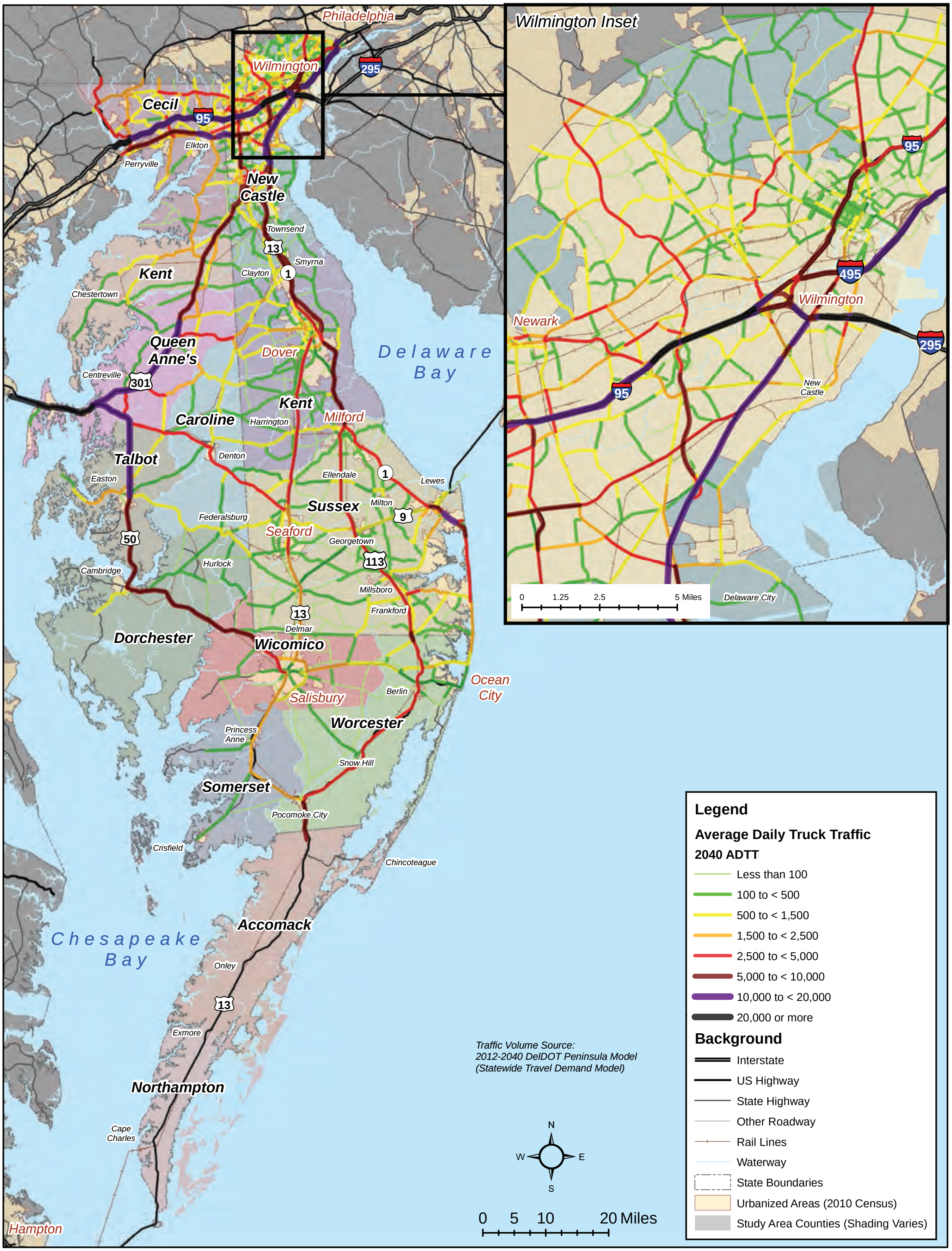


Exhibit 4.9 – Delmarva Peninsula Roadway Congestion Summary (2012 Off-Peak LOS)

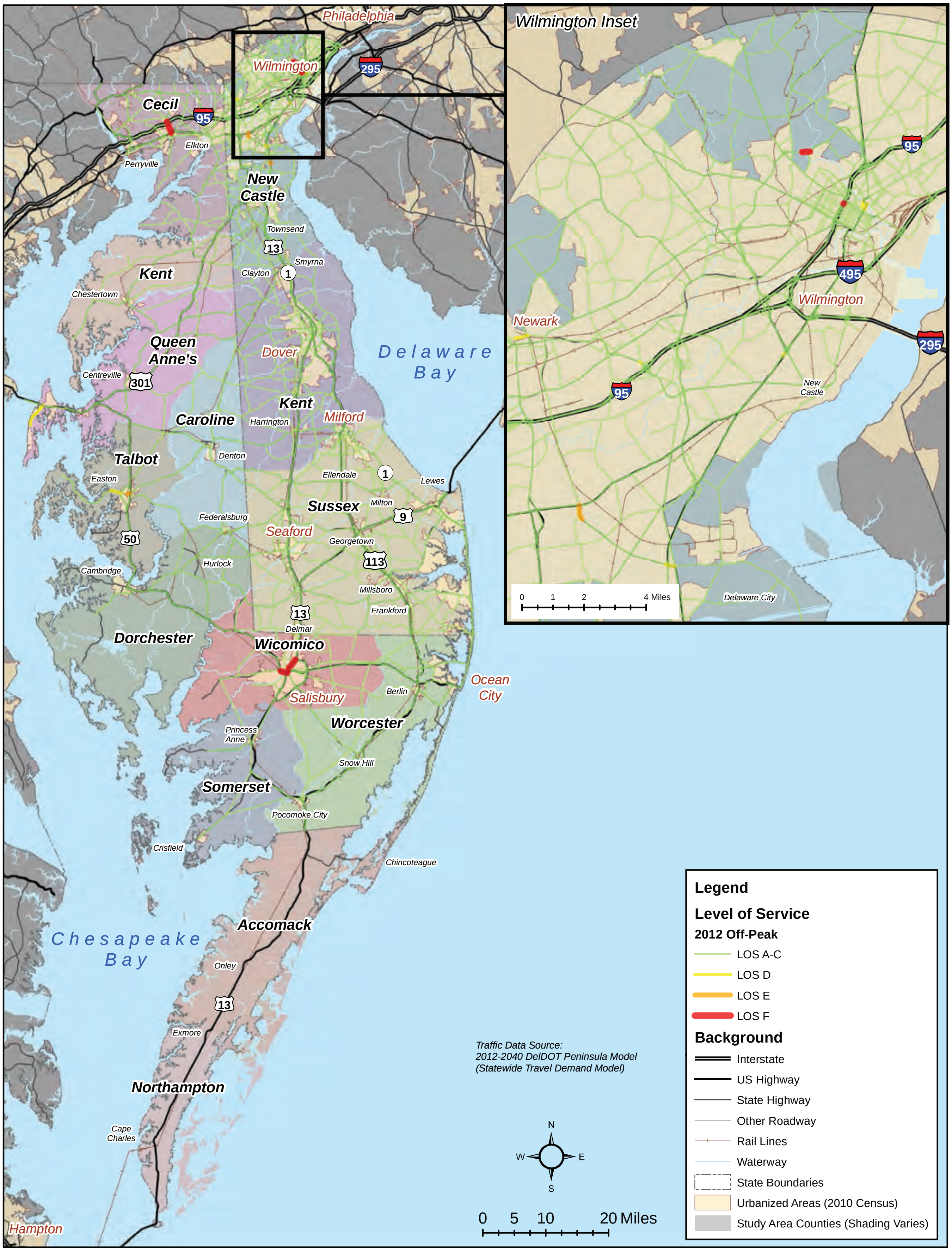


Exhibit 4.10 – Delmarva Peninsula Roadway Congestion Summary (2040 Off-Peak LOS)

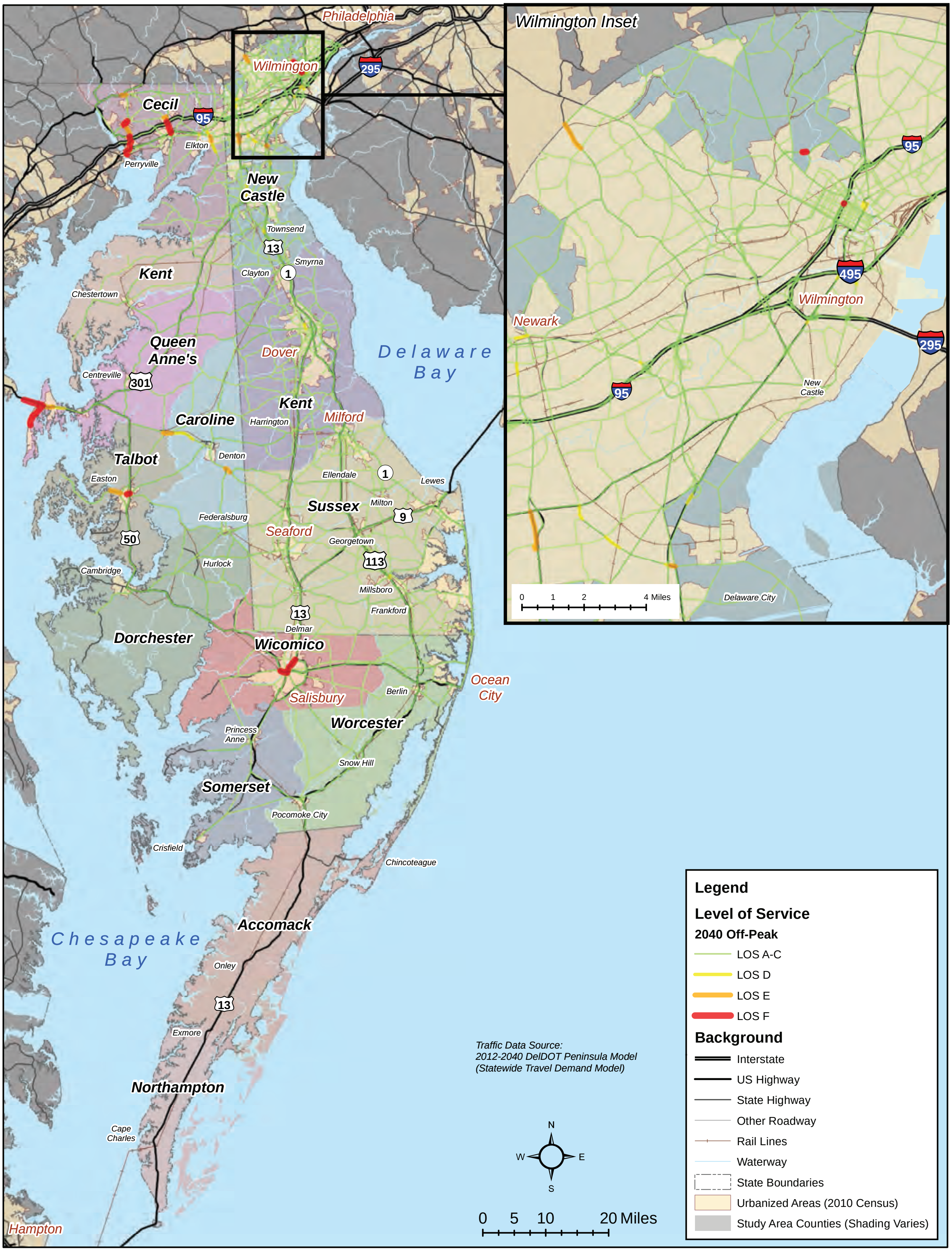


Exhibit 4.11 – Delmarva Peninsula Roadway Congestion Summary (2012 PM Peak LOS)

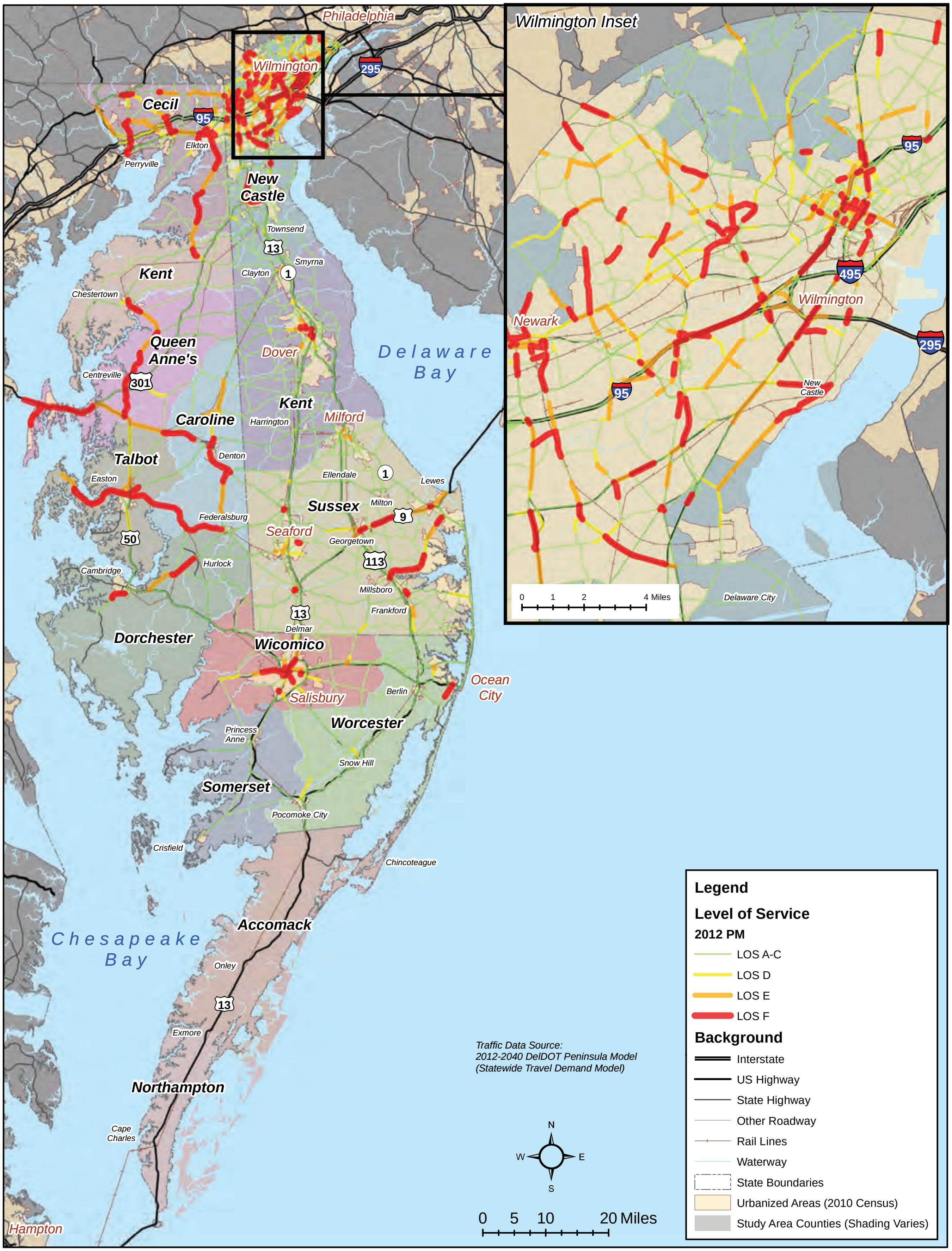
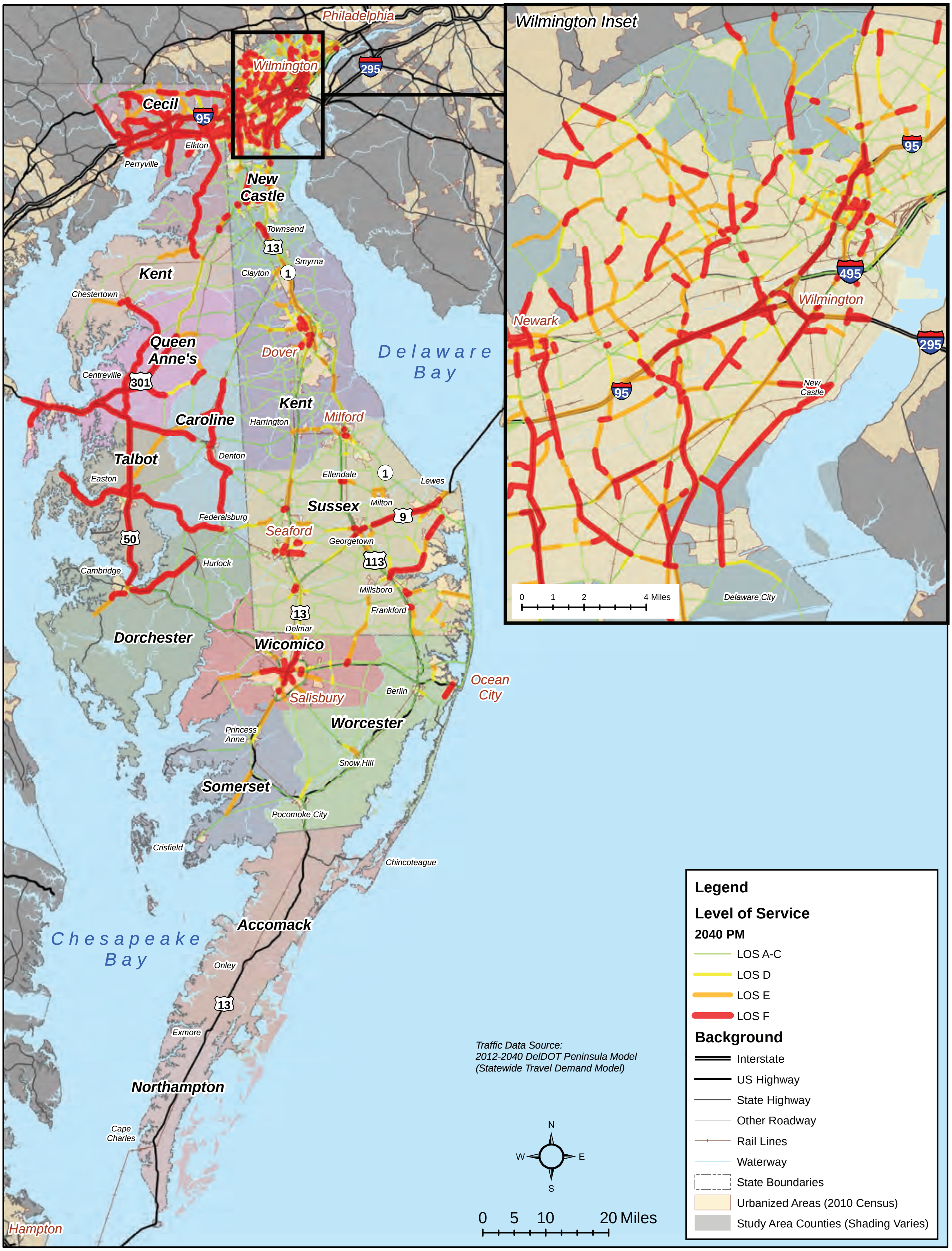


Exhibit 4.12 – Delmarva Peninsula Roadway Congestion Summary (2040 PM Peak LOS)



Rail Freight

Railroad operations on the Delmarva Peninsula provide an efficient transportation system that is critical for supplying and distributing raw materials and other goods for major sectors of the region's economy. The energy, agricultural, chemical, and construction industries all rely heavily on rail-based supply chains, as do a variety of large and small manufacturing and processing industries throughout the area. Project-specific commodity flow data indicates that railroads carry approximately 6% of the peninsula's overall goods movement tonnage or value. Any obstacles to efficiently moving key commodity types such as coal, petroleum or natural gas products, grain, fertilizers, ores or stone by rail could dramatically hinder economic opportunities and transportation effectiveness on the peninsula.

Major freight carriers include Norfolk Southern Corporation and CSX Transportation, which provide freight rail access between the peninsula and essentially the entire eastern portion of the U.S. Extended service into Canada or Mexico is also possible via connections with other major railroads. Five shortline railroads provide local/regional freight access throughout the peninsula. Passenger rail service is also available through the peninsula's northern counties via Amtrak's Northeast Corridor (NEC) as well as commuter service operated by the Southeastern Pennsylvania Transportation Authority (SEPTA). Detailed railroad descriptions may be found in DelDOT's 2011 Delaware State Rail Plan and through the internet links below; freight rail summaries are as follows (including *Exhibit 4.13* through *Exhibit 4.16*).

CSX Transportation (CSXT) *(http://csx.com/)*: CSX runs freight rail service through Cecil and New Castle Counties as part of a broader line segment paralleling the NEC and linking Baltimore with Philadelphia. From the peninsula's perspective, most CSX freight is through-traffic. However, major freight transfer facilities in the Wilmington area include the CSX Wilsmere Yard and a TransFlo Bulk Terminal. Indirect access to the Port of Wilmington can also be accommodated via the NS West Yard. Typical commodities include plastics, ores, sulfur, and industrial waste among others.

Norfolk Southern (NS) *(http://www.nscorp.com/)*: NS runs freight rail service via access rights over the NEC and is the primary rail freight provider for the peninsula. Major lines include the NS Delmarva Secondary from Newark to Pocomoke City (where it connects with the BCRR), the NS Indian River Secondary from Harrington to Frankford (where it connects with the MDDE), and the NS New Castle Secondary from Wilmington to Porter. A number of major freight transfer facilities are provided in the Newark-Wilmington area and along the Delmarva Secondary near Dover, Harrington, and Seaford. Typical commodities include grain, oils, stone, chemicals, paper, wood products, and petroleum products among others.

Wilmington & Western Railway (WWRC) *(http://www.wwrr.com/)*: The WWRC connects with the CSX mainline near Wilmington and heads roughly 10-miles north to Hockessin, Delaware. Though historically a freight line, the WWRC currently serves primarily as a scenic tourist railroad.

East Penn Railroad (ESPN) *(http://eastpennrr.com/)*: The ESPN connects with the CSX mainline at Elsmere Junction and heads north to link with a 114-mile shortline network in southeast Pennsylvania. Transloading service connections include cold storage, grain, and petroleum sites among others.

Maryland & Delaware Railroad (MDDE) *(http://www.mdde.com/)*: The MDDE connects with the NS secondary lines in multiple locations and operates a 120-mile shortline network on the peninsula through several counties in Delaware and Maryland. MDDE operations include the Chestertown Line (from Townsend to Chestertown), Centreville Line (from Townsend to Centreville), Seaford Line (from Seaford to Cambridge), and Snow Hill Line (from Frankford to Snow Hill). Typical commodities include corn/grain, stone, fertilizers, propane, and miscellaneous manufacturing products among others.

Delaware Coast Line Railroad (DCLR) *(http://www.delmarvarails.com/info_DCLR.html)*: The 23-mile DCLR network connects with the NS Indian River Secondary at two locations in Sussex County. The two separate lines run from Ellendale to Milton and from Georgetown to Lewes. Typical commodities include grain, propane, and chemicals among others.

Bay Coast Railroad (BCRR) *(http://www.varail.com/baycoast.htm)*: The BCRR essentially extends the NS Delmarva Secondary approximately 70-miles from Pocomoke City, Maryland, to the southern tip of the peninsula in Cape Charles, Virginia. By way of a unique carfloat operation that moves railcars over water on specialized barges powered by tugboats, the BCRR runs 26 additional miles across the Chesapeake Bay from Cape Charles to Little Creek, Virginia, near Norfolk. From the Norfolk side, the Little Creek Yard provides connections to NS operations via the Portlock Yard and Norfolk-Portsmouth Belt Line for access to CSXT. Typical commodities include coal, stone, grain, propane, concrete, and chemicals among others.

Reviews of the above information indicate that rail freight service on the Delmarva Peninsula currently reaches at least 12 of the 14 counties in the study area and provides access to major national carriers as well as Canada and Mexico. However, there are potential areas of concern that may warrant further investigation. Issues related to maintenance, infrastructure, or an overall need to ensure rail's viability as a cost-effective and competitive transportation option may include:

- Railroad bottlenecks
- Railroad operating restrictions
- Height/width clearances
- Track capacity/weight limits
- Rail accessibility and economies of scale
- Maintenance and funding
- Land use preservation

Exhibit 4.13 – Delmarva Peninsula Railroad Network

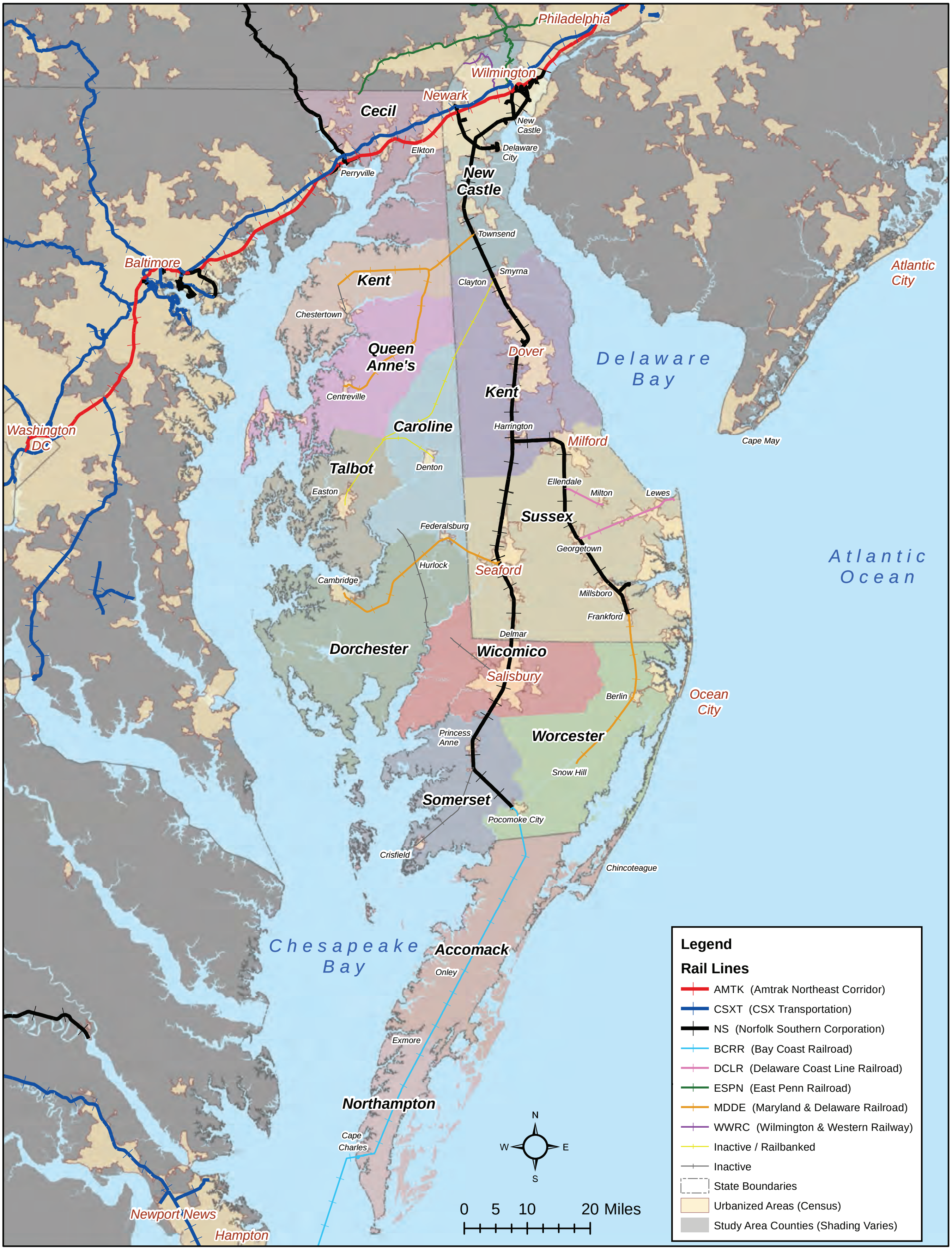


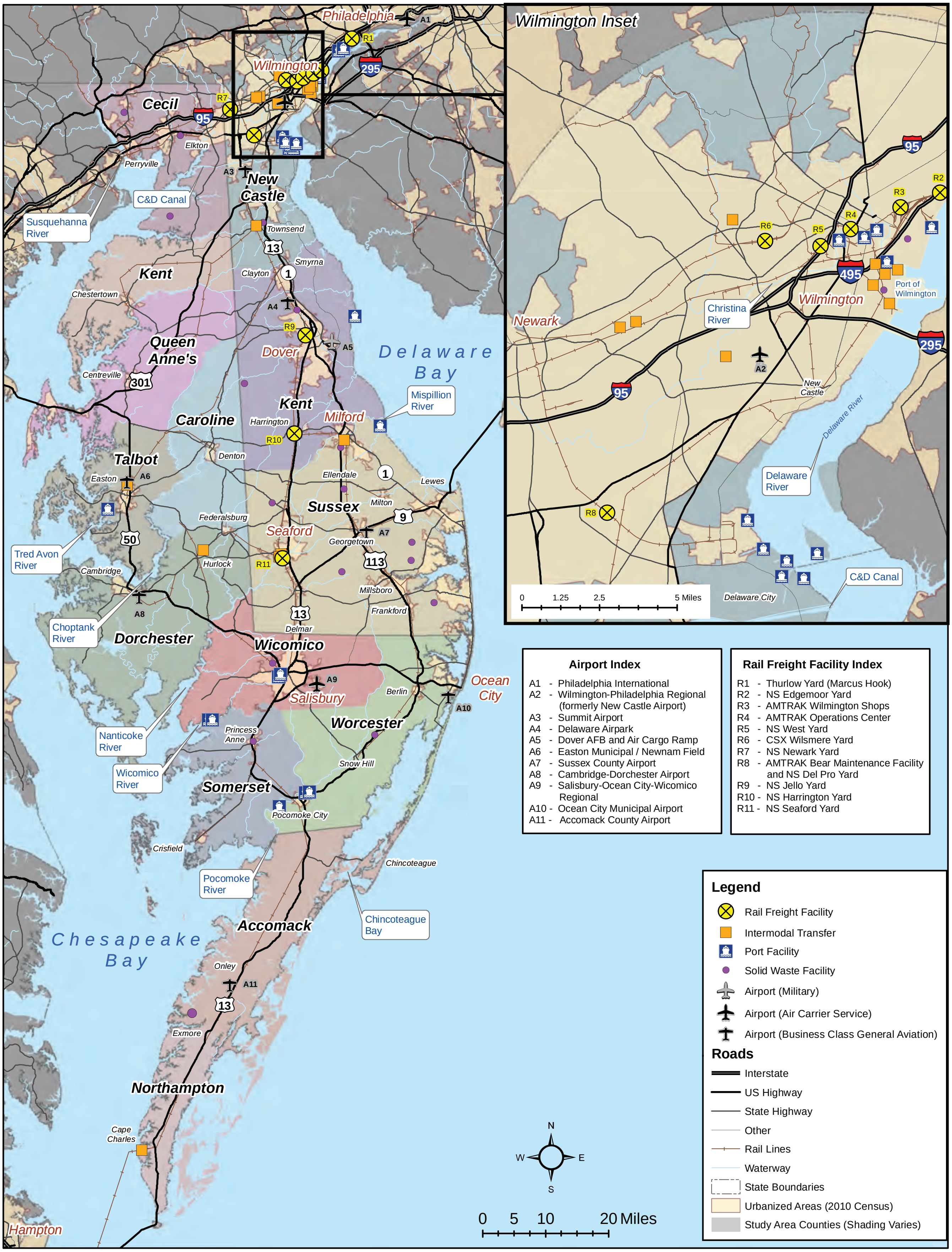
Exhibit 4.14 – CSX Transportation System Map

Source: http://www.csx.com/index.cfm/customers/maps/csx-system-map/

Exhibit 4.15 – Norfolk Southern System Map

Source: http://www.nscorp.com/nscportal/nscorp/map.html

Exhibit 4.16 – Delmarva Peninsula Major Freight Transfer Facilities (Rail, Port, Airport, and Solid Waste)



Waterborne Freight

Located on the Atlantic Coast and connected to the Delaware Bay, Chesapeake Bay, and numerous inland waterway systems, waterborne freight is obviously a crucial component of the Delmarva Peninsula's economy and freight network. The area boasts numerous port facilities and river systems (see previous *Exhibit 4.16*). Major shipping ports at Wilmington and New Castle alone accounted for over 10 million tons of cargo in 2011; nearby ports in the surrounding states captured an additional 190 million tons (*Exhibit 4.17*). Much of the traffic to these surrounding ports utilize the Delaware River or the peninsula's Chesapeake & Delaware Canal, and roughly three million additional tons travel along the region's smaller river systems to inland locations such as the Ports of Salisbury, Seaford, or Pocomoke City (*Exhibit 4.18*).

The Chesapeake and Delaware Canal, often called the C&D Canal, connects the Delaware River to the Chesapeake Bay and Port of Baltimore. The waterway, a channel 35 feet deep and 450 feet wide, extends from Reedy Point on the Delaware River about 41 miles below Philadelphia. The Army Corps of Engineers Philadelphia District maintains the canal as well as the five high span bridges that cross it: Reedy Point, SR 1, Summit, St. Georges and Chesapeake City bridges. The C&D canal carries 40 percent of the shipping traffic in and out of the Port of Baltimore.

Source: http://www.nap.usace.army.mil/Missions/CivilWorks/ChesapeakeDelawareCanal.aspx

The focal point of the peninsula's international port activity occurs at the Diamond State Port Corporation's (DSPC) Port of Wilmington and at nearby facilities in New Castle and Delaware City. The Port of Wilmington handles over 5 million tons and 400 ships annually with a variety of cargoes, including several niche markets such as perishable cargo, automobiles, or livestock.[1] The port boasts North America's largest dock-side refrigerated complex and is the nation's leading hub for importing bananas, fresh fruits, and juice concentrates. The port includes secure storage and processing facilities to handle extensive domestic or foreign automobile exports; is the east coast's largest exporter of live cattle to foreign markets; and provides the capability to handle unique specialty cargoes such as wind turbine blades, oversized generators, rocket booster modules, or brewery tanks.

The Port of Wilmington: Today's facility is a world-class marine terminal encompassing 308 acres, offering 10 operating deep-water berths, over 1,000,000 square feet of temperature controlled and dry warehouse space, sophisticated cargo handling equipment and an experienced and very capable workforce; all of which have created an impressive worldwide reputation for Delaware's port.

Source: Port of Wilmington, Delaware; Port Illustrated Newsletter, Summer 2013 Edition (Vol. 20, No.1); http://portofwilmington.com/HTML/our_port/port_illustrated/pi_summer2013.pdf

[1] http://portofwilmington.com/

Exhibit 4.17 – Commodity Tonnage for Principal Ports on/around the Delmarva Peninsula

Port	2011 Commodity Tonnage				
	Total	Domestic	Foreign	Imports	Exports
Wilmington, DE	**5,628,807**	1,246,918	4,381,889	3,446,432	935,457
New Castle, DE	**5,049,845**	3,210,809	1,839,036	1,799,606	39,430
Baltimore, MD	**44,865,703**	8,100,274	36,765,429	13,222,656	23,542,773
Marcus Hook, PA	**18,826,013**	7,685,396	11,140,617	10,474,234	666,383
Philadelphia, PA	**30,631,987**	11,010,701	19,621,286	18,867,225	754,061
Camden-Gloucester, NJ	**6,196,937**	2,427,309	3,769,628	2,868,589	901,039
Paulsboro, NJ	**17,582,921**	5,702,890	11,880,031	10,395,077	1,484,954
Norfolk Harbor, VA	**47,352,771**	6,491,011	40,861,760	9,385,884	31,475,876
Newport News, VA	**25,200,668**	3,423,639	21,777,029	286,555	21,490,474

Source: U.S. Army Corps of Engineers, Institute for Water Resources, Navigation Data Center; U.S. Waterway Data, Principal Ports of the United States; USACE Principal Ports file for 2011; http://www.navigationdatacenter.us/data/datappor.htm

Exhibit 4.18 – Commodity Tonnage for Waterway Systems on/around the Delmarva Peninsula

Waterway System	Commodity Tonnage					Typical Commodity Types
	All Traffic Directions	Receipts	Shipments	Through or Intrawaterway	% Foreign	
Delaware River	**92,001,377**	58,468,711	12,780,344	20,752,322	67%	Coal & Lignite; Crude Petroleum; Petroleum Products; Chemicals and Related Products; Gypsum; Iron & Steel Scrap; Primary Manufactured Goods; Bananas; Fruits & Nuts; Other Food & Farm Products; Manufactured Equipment
Chesapeake and Delaware Canal	**10,038,460**	0	0	10,038,460	21%	Coal & Lignite; Petroleum Products; Chemicals and Related Products; Gypsum; Sand & Gravel; Cement & Concrete; Sugar; Vehicles & Parts; Other Manufactured Products
Susquehanna River	**1,249,327**	0	1,249,327	0	0%	Sand & Gravel
Wicomico River	**1,064,830**	1,021,630	43,200	0	0%	Gasoline; Distillate Fuel Oil; Alcohols; Sand & Gravel; Grain; Soybeans; Vegetable Products; Animal Feed
Nanticoke River	**653,357**	187,743	465,614	0	0%	Residual Fuel Oil; Fertilizers; Sand & Gravel; Fabricated Metal Products; Grain; Soybeans; Other Food & Farm Products
Pocomoke River	**569,650**	120,434	449,216	0	0%	Asphalt, Tar & Pitch; Sand & Gravel; Slag
Choptank River	**91,132**	2,825	0	88,307	0%	Sand & Gravel; Marine Shells
Tred Avon River	**88,307**	88,307	0	0	0%	Sand & Gravel
Mispillion River	**14,453**	0	14,453	0	0%	Manufactured Products
Chincoteague Bay	**1,855**	0	0	1,855	0%	Sand & Gravel

Source: U.S. Army Corps of Engineers, Institute for Water Resources, Navigation Data Center 2011 Waterborne Commerce of the United States (WCUS), Waterways and Harbors on the Atlantic Coast; http://www.navigationdatacenter.us/wcsc/webpub11/webpubpart-1.htm

Notable among the peninsula's inland waterway systems are the Wicomico, Nanticoke, and Pocomoke Rivers, and to a lesser extent the Choptank, Tred Avon, and Mispillion Rivers (*Exhibit 4.16 and Exhibit 4.18*). Inland waterway traffic and related inland port activities are particularly important to supply chains throughout Delmarva's southern areas including Sussex County in Delaware and Wicomico, Somerset, and Worcester Counties in Maryland. Major freight partners and interests in these areas are largely reflected by the membership roster for the Delmarva Water Transport Committee (DWTC), including a broad variety of commodity shippers/receivers, petroleum distributors, state/county/municipal governments, marine carriers, and others.[2] Specific river/port activities include:

Wicomico River: The Wicomico River links with the Port of Salisbury, Maryland, and receives a variety of commodities that are critical for regional supply chains in the petroleum industry (e.g., gasoline and distillate fuel oil) and agriculture industry (e.g., grain, soybeans, vegetable products, and animal feed). The river carries predominately inbound freight including approximately 65% as petroleum products, 20% as grains, and 15% as aggregates.

Nanticoke River: The Nanticoke River links with Seaford, Delaware, and carries approximately 30% inbound and 70% outbound freight. Most of the river's freight pertains to agriculture, including 60% as grain and 10% as liquid fertilizer, plus 30% as aggregates.

Pocomoke River: The Pocomoke River links with Pocomoke City, Maryland, and carries approximately 20% inbound and 80% outbound freight. The river carries predominately aggregates (e.g., sand, gravel, slag) and related materials (e.g. asphalt, tar & pitch) that support much of the area's roadway construction industry.

The Port of Salisbury, in Historic Downtown Salisbury, is the second largest port in Maryland. It has a 150' wide channel and 14' deep mean tide from the Bay to Salisbury. Over $200 million in goods are transported annually consisting of grain, petroleum, and building aggregates. Approximately 1.7 million tons of product ships on the Wicomico River with over 500 barge trips to deliver product. Petroleum products make up 51% of the tonnage total.

Source: http://swed.org/business/transportation/

In addition to Delmarva's local/regional waterway systems, notable projects having broader global/regional implications on waterborne freight include:

Panama Canal Expansion Project: Ongoing expansion of the Panama Canal will construct two new sets of locks, widen/deepen existing navigational channels, and open a new access channel. The resulting facilities, estimated to open by mid-2015, will accommodate larger container ships up to 13,000 TEU through the Panama Canal. Relevant to Delmarva's regional interests, the Ports at Baltimore and Norfolk both have channels that can accommodate these larger ships.

Delaware River Deepening Project: Ongoing dredging will increase the Delaware River channel depth from 40 to 45 feet across 102-miles of the channel from Camden, New Jersey, to the Atlantic Ocean. Just over 60% complete to-date, the deepening would allow larger or more heavily-loaded ships to access port areas in Wilmington, Philadelphia, and South Jersey.

[2] http://dwtconline.com/Membership.html

M-95 Marine Highway: The USDOT Maritime Administration's "Marine Highway system currently includes 21 all-water Marine Highway Routes that serve as extensions of the surface transportation system and promote short sea transportation. Increasing the use of marine transportation on the commercially navigable waterways can offer relief to landside corridors that suffer from traffic congestion, excessive air emissions or other environmental concerns and challenges."[3] Relevant to the Delmarva study area and related operations, one of the major corridors includes the M-95 Marine Highway that essentially parallels the I-95 corridor up and down the east coast between Maine and Florida (*Exhibit 4.19*).

While any specific impacts of the above projects can only be assumed at this time, there is clearly a potential for them to modify shipping patterns, volumes, or schedules to U.S. east coast ports to some degree. In addition to ports, any changes in overall waterborne freight and goods movement patterns may, in turn, impact related motor freight or rail traffic serving the various ports in and around the Delmarva region.

In general, waterborne freight transportation assets on the peninsula are numerous, varied, and provide a robust system to help support the region's industries. In addition to global/regional questions surrounding the Panama Canal and Delaware River projects noted above, other potential investigations to ensure efficient and accessible waterborne commerce benefits on the peninsula may include:

- Truck-to-port access/capacity improvements (e.g., bottleneck reduction, staging areas)
- Rail-to-port access/capacity improvements (e.g., double-stack clearance)
- Containerized service expansion possibilities/implications
- Marine highway concept possibilities/implications
- River dredging constraints/requirements
- Spoils site issues for dredged materials

[3] http://www.marad.dot.gov/ships_shipping_landing_page/mhi_home/mhi_home.htm

Exhibit 4.19 – M-95 Marine Highway Corridor

M-95 Marine Highway Corridor

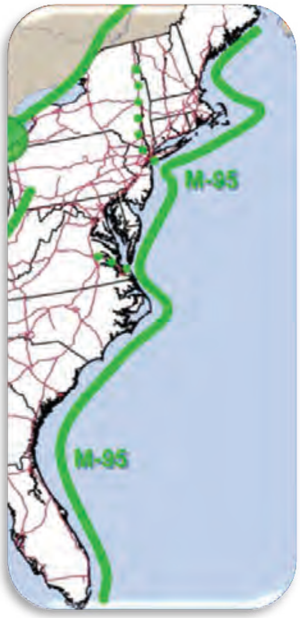
Sponsor: **Interstate-95 Corridor Coalition**

Supporters: Council of State Governments' Eastern Regional Conference, Commonwealth of PA, NJDOT, CT DOT, CT Maritime Commission, Florida DOT, East Central FL RPC, Space Coast Transportation Planning Authority, Economic Development Commission of Florida's Space Coast, DE Valley RPC, DE River & Bay Authority, SE Regional Planning & Economic Dev Commission, Richmond Regional RPC, NJ Transportation Planning Authority, NY Metropolitan Transportation Council, NYCDOT, NYSDOT, Port of Baltimore, NC Ports, Port of Mass., Port of New Bedford, MA, City of New London, CT, Philadelphia Regional Port Authority, MD Port Commission, Philadelphia Regional Port Authority, ME Port Authority, Port Authority of NY & NJ, Port Canaveral, FL, SC State Port Authority, VA Port Authority, Port of Davisville, RI, Jaxport, FL, and the Maritime Association of the Port of New York & New Jersey.

Landside Corridor Served: Interstate-95

Corridor Description:

The M-95 Corridor includes the Atlantic Ocean coastal waters, Atlantic Intracoastal Waterway, and connecting commercial navigation channels, ports, and harbors. It stretches from Miami, FL to Portland, ME and spans 15 states. It connects to the M-87 Connector and the M-90 Corridor near New York City; and the M-64 Connector at Norfolk, VA.



Attributes:

The 1,925 mile-long I-95 Corridor is the major North-South landside freight corridor on the East Coast. The U.S. Department of Transportation identified more than a dozen major freight truck bottlenecks along this route, along with significant critical rail congestion along the upper portions. Projections of future freight volumes indicate increasing freight congestion challenges, with limited opportunity to increase landside capacity.

The Corridor is home to 15 of the largest 50 marine ports in the United States (as ranked by total throughput). These ports handle approximately 582 million short tons of cargo, or 26 percent of the national total. Much of this freight begins or ends its journey with an I-95 transit. Fortunately, the East Coast also possesses a host of waterways, bays, rivers, and the Atlantic coast itself. The Corridor is also lined with less congested, smaller niche ports that could play a vital part in the developing marine highway service network. While several Marine Highway operations already serve this corridor, there is significant opportunity for expansion to help address growing congestion, reduce greenhouse gas emissions, conserve energy, and lower landside infrastructure maintenance costs.

Source: USDOT Maritime Administration website:
http://www.marad.dot.gov/documents/MHI_Route_Designation_Description_Page.pdf

Airborne Freight

Current civilian air cargo operations on the Delmarva Peninsula are primarily limited to smaller business/corporate levels of airborne freight activity. Project-specific commodity flow data indicates that less than 1% of the peninsula's overall goods movement tonnage and 3% of the overall value move via air. However, the peninsula's highway transportation network provides relatively easy access to several major airborne freight hubs in the surrounding region. While convenient access to those facilities is of great benefit, that same convenience and proximity coupled with issues of market sharing or competition are also likely factors as to why there is not a larger air cargo presence directly on the peninsula.

Despite their somewhat limited role compared to other modes of freight transportation on the peninsula or the region's surrounding international airports, airborne freight movements remain an important component of the peninsula's overall economic base and supply chain system. In many cases, local business/industrial park developments are situated on or near key airport facilities. Notable airports relative to the interests of this freight plan and excluding small general aviation sites are listed below and on previous *Exhibit 4.16*. Detailed information for each site may also be found in the corresponding state's aviation system plan from the DelDOT Office of Aeronautics, Maryland Aviation Administration, or Virginia Department of Aviation.

- **Military**: Dover AFB and Air Cargo Ramp (formerly known as the Civil Air Terminal (CAT))
- **Air Carrier Service**: Wilmington-Philadelphia Regional Airport (formerly New Castle Airport, Delaware); Salisbury-Ocean City-Wicomico Regional Airport (Maryland); also convenient off-peninsula access to major airports in the surrounding region including Baltimore/Washington International (Maryland); Philadelphia International (Pennsylvania); Norfolk International, Newport News-Williamsburg International, Washington Dulles International, and Ronald Reagan Washington National (Virginia); and Atlantic City International (New Jersey)
- **Business Class General Aviation**: Summit Airport, Delaware Airpark, and Sussex County Airport (Delaware); Easton Municipal-Newnam Field; Cambridge-Dorchester Regional Airport' Ocean City Municipal Airport (Maryland); and Accomack County Airport (Virginia)

Of special freight interest among the peninsula's airports is the Air Cargo Ramp located adjacent to and sharing runway usage with Dover AFB. Civilian aircraft operations via the Air Cargo Ramp are constrained by the primacy of the base's heavy-lift military air transport mission and/or typically involve contracted civilian aircraft in direct support of military operations. However, under special-use agreements and with prior permissions and approvals, limited civilian operations can be accommodated. Such operations include airport access that is instrumental in facilitating NASCAR events at nearby Dover International Speedway.

Possible Air Cargo Ramp expansion scenarios have been a subject in several recent or ongoing studies such as DelDOT's September 2012 *Delaware Aviation System Plan Update: Draft Phase II Report,* or the January 2013 *Dover/Kent County MPO Metropolitan Transportation Plan 2040 Update*. Varying details in these studies indicate a goal of obtaining full joint-use access for public/civilian air cargo operations at Dover AFB, including development of a 115-acre Kent County AeroPark adjacent to the Air Cargo Ramp and the base perimeter. Achieving these goals, however, is partly contingent on several factors in addition to the current operating constraints imposed by the military mission. Such factors include the potential outcome of any future Base Realignment and Closure (BRAC) scenarios at Dover AFB, as well as any capital improvement requirements, costs, or environmental impacts related to civilian air cargo expansion. Success would also depend on capturing and maintaining a viable local market for high-value imports/exports that would utilize an expanded Air Cargo Ramp in lieu of conveniently located existing facilities in the surrounding region – such as the UPS facilities in Philadelphia, Pennsylvania, or FedEx facilities in Salisbury, Maryland. If, when, or to what degree the Air Cargo Ramp is ultimately expanded would also influence what types of improvements may be needed (and when) for other elements of the peninsula's freight transportation network including, for example, roadway, truck access, or parking upgrades to feed the ramp location, or the type and degree of improvements at nearby airport facilities such as Delaware Airpark.

Pipeline

Pipeline assets on the Delmarva Peninsula were reviewed on a county-specific basis using the online GIS-based National Pipeline Mapping System (NPMS) maintained by the USDOT's Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS).[4] The NPMS public datasets include the location of interstate and intrastate hazardous liquid trunklines, hazardous liquid low-stress lines, and gas transmission pipelines.

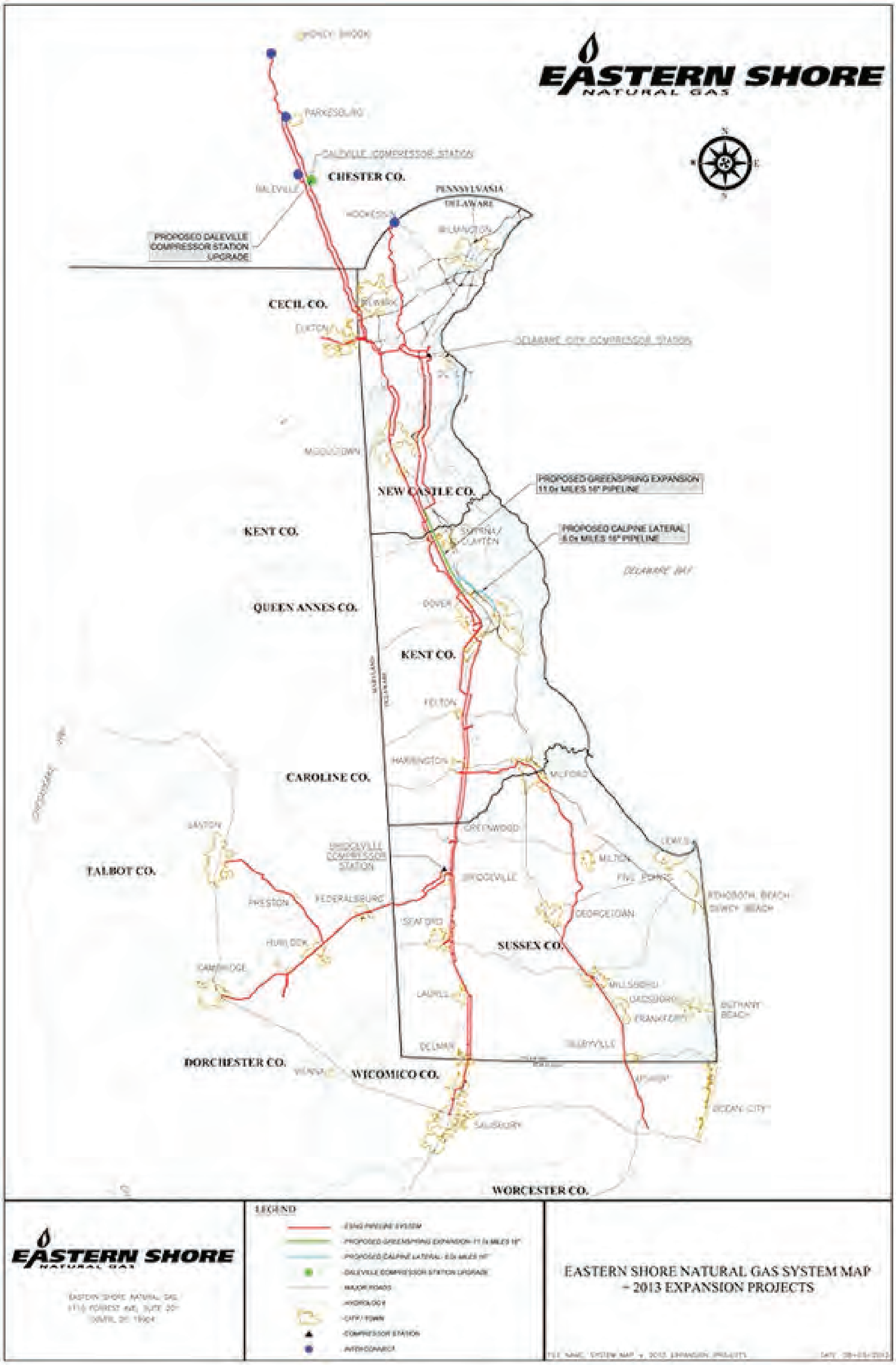
Natural Gas Transmission

Based on NPMS data, the majority of pipeline assets on the peninsula are utilized for natural gas transmission under the jurisdiction of the Eastern Shore Natural Gas Company (ESNG).[5] ESNG assets include approximately 438 miles of pipeline and 90 delivery point stations to transport natural gas to local distribution companies, industries, and electric power generators throughout the peninsula (*Exhibit 4.20*). Their primary trunklines generally parallel the US 13 corridor from Delaware City to Salisbury and include branch networks that connect Harrington to Berlin, Bridgeville to Cambridge, and Hurlock to Easton. Upstream pipeline interconnections occur in Honey Brook, Pennsylvania (with Texas Eastern Transmission, LP), Parkesburg, Pennsylvania and Hockessin, Delaware (with Transcontinental Gas Pipe Line Company), and Daleville, Pennsylvania (with Columbia Gas Transmission, LLC).

In addition to ESNG assets, a number of other gas transmission lines run through the northern end of the peninsula. In New Castle County, these include natural gas pipelines operated by Delmarva Power & Light Company and Cherry Island Renewable Energy, LLC, as well as municipal landfill gas pipelines operated by Delaware Solid Waste Authority. On a broader basis, pipeline segments or connections in New Castle County and Cecil County link with major national networks operated by Columbia Gas Transmission Corporation and Transcontinental Gas Pipeline Company (Transco) (*Exhibit 4.21* and *Exhibit 4.22*). The Columbia Gas network includes 12,000-miles of pipeline across 10 states, links with one of North America's largest underground natural gas storage systems, and ties with the Gulf Coast as part of the Columbia Gulf Transmission Line operated by their parent-company, the Columbia Pipeline Group.[6] The Transco network includes 10,200 miles of pipeline across 12 states, links southern Texas and the Gulf Coast with major metropolitan areas in Pennsylvania, New Jersey, and New York City, and operates under as part of the broader group of Williams Companies, Inc.[7]

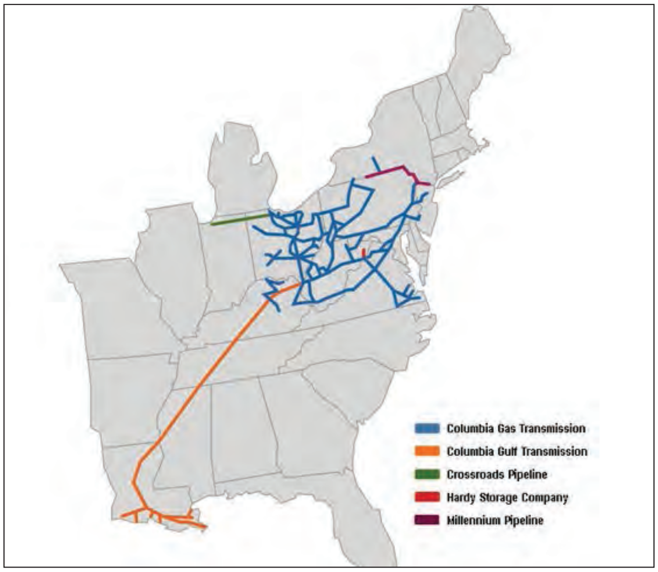
[4] NPMS, https://www.npms.phmsa.dot.gov/
[5] ESNG, http://www.esng.com/
[6] http://www.columbiapipelinegroup.com/en/home.aspx
[7] http://co.williams.com/

Exhibit 4.20 – Natural Gas Pipeline System (Eastern Shore Natural Gas)



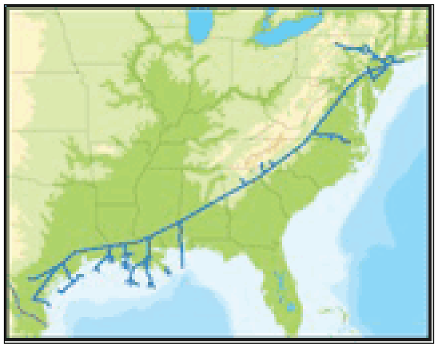
Source: http://www.esng.com/pipeline-zone-map/

Exhibit 4.21 – Natural Gas Pipeline System (Columbia Pipeline Group)



Source: http://www.columbiapipelinegroup.com/en/about-us.aspx

Exhibit 4.22 – Natural Gas Pipeline System (Transco)



Source: http://co.williams.com/williams/operations/gas-pipeline/transco/

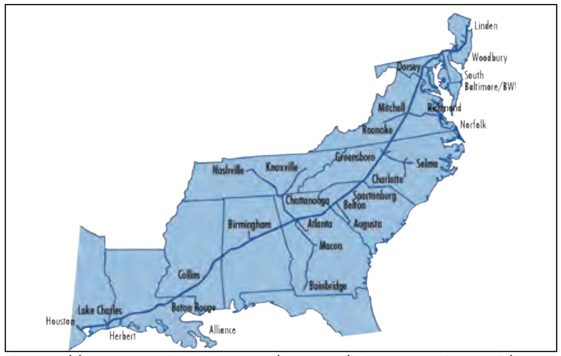
Refined Petroleum Products

NPMS data also identified several pipelines on the peninsula that transport various Highly Volatile Liquid (HVL) or non-HVL products such as liquefied petroleum gas or other refined petroleum products. Most of these assets are located in New Castle County or Cecil County. They generally run parallel to US 13 or I-495 and center on refined crude oil products and terminal/storage operations around Delaware City, Wilmington, or Marcus Hook. Pipeline operators in these areas include Delaware Pipeline Company, LLC; Magellan Terminals Holdings, LP; Colonial Pipeline Company; Sunoco Pipeline, LP; and Sunoco, Inc. (R&M). Both Colonial and Sunoco link with national pipeline networks spanning multiple states between New York and Texas (*Exhibit 4.23* and *Exhibit 4.24*). Sunoco Logistics is also in the process of expanding connections to Marcus Hook with their Mariner East Pipeline Project.

Further south in Kent County, Delaware, additional pipeline assets carry or store non-HVL products under the operation of Delaware Storage and Pipeline Company. Based out of the Dover area, the company provides for-hire bulk storage, terminal, and pipeline services to the petroleum industry.[8]

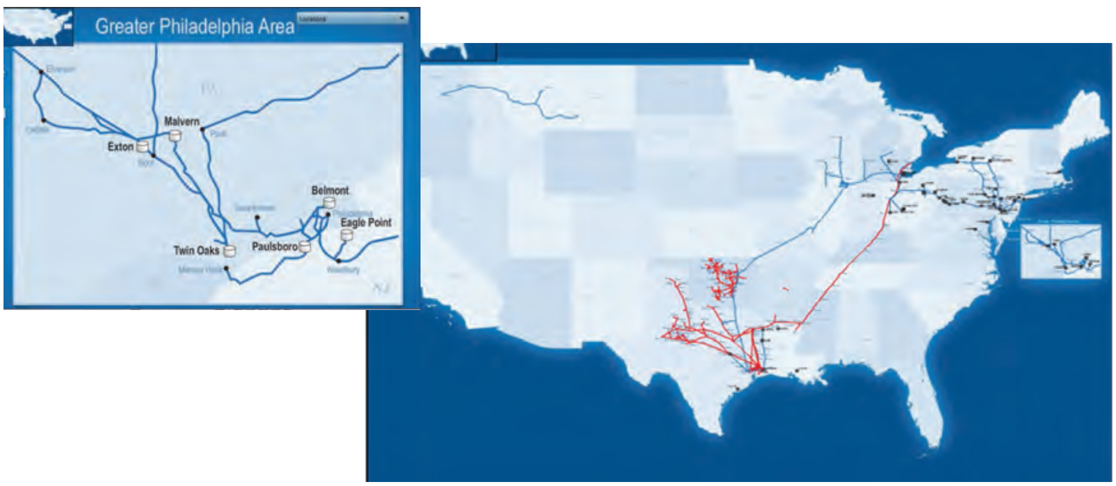
[8] http://delawarespc.com/

Exhibit 4.23 – Hazardous Liquids Pipeline System (Colonial Pipeline Company)



Source: http://www.colpipe.com/home/about-colonial/system-map

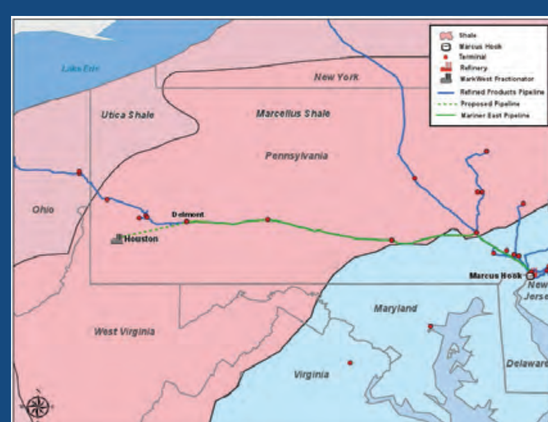
Exhibit 4.24 – Hazardous Liquids Pipeline System (Sunoco Logistics)



Source: http://www.sunocologistics.com/Customers/Business-Lines/Asset-Map/130/

Project Mariner East

Project Mariner East is a pipeline project to deliver propane and ethane from the liquid-rich Marcellus Shale areas in Western Pennsylvania to the Marcus Hook facility, where it will be processed, stored, and distributed to various domestic and waterborne markets. The project is anticipated to have an initial capacity to transport approximately 70,000 barrels per day of natural gas liquids and can be scaled to support higher volumes as needed. Mariner East is expected to have the ability to transport propane by the second half of 2014, and is scheduled to be fully operational to deliver propane and ethane in the first half of 2015. A second phase of the overall project will also extend the pipeline's reach into Marcellus and Utica Shale areas in West Virginia and Eastern Ohio by the end of 2016.



Source: http://www.sunocologistics.com/Customers/Business-Lines/Natural-Gas-Liquids-NGLs/NGL-Projects/208/

4.2 Freight Logistics Nodes and Support Facilities

Critical to the modal assets summarized thus far are key freight logistics nodes and support facilities that round out the peninsula's overall freight transportation system.

Freight Logistics Nodes

Freight logistics nodes encompass major warehousing sites, distribution centers, and intermodal/multimodal freight transfer facilities. Important nodes on the Delmarva Peninsula have been detailed in previous sections of this plan (*Exhibit 2.8*, *Exhibit 4.16*) and generally include the following:

- 59 warehousing/distribution facilities or major trucking/freight forwarding locations such as Walmart, Amazon, Ikea, Perdue AgriBusiness, Pepsi-Cola Bottling, or C&S Wholesale Grocers
- 10 major rail yards for NS, CSX, and others (including Amtrak's operations and maintenance facilities) in the Wilmington/Newark area as well as Dover, Harrington, Seaford, or Cape Charles.
- 17 miscellaneous intermodal transfer sites including, for example, the CSX Transflo facility, Delaware Cold Storage, Claymont Steel, numerous grain storage locations, or miscellaneous rail facilities
- 23 port locations, including major facilities in Wilmington, New Castle, Delaware City, and Salisbury
- 8 business class/general aviation airports or larger including New Castle, Dover AFB Air Cargo Ramp, or Salisbury-Ocean City-Wicomico Regional
- 20 solid waste facilities including major landfills and transfer/collection stations

In addition to the above – and a key component to this project's development of a regional freight forecasting model using the Cube Cargo software – this freight plan accounts for the influence of freight-focused activity centers at both a more detailed local level and a broader regional level. Freight projections and assignments at the local level were developed using existing economic/employment data within finely detailed traffic analysis zones consistent with other MPO level data and DelDOT's existing travel demand based Peninsula Model. Previous "major employer" discussions in *Chapter 2* have explicitly identified over 100 sizeable retail or wholesale sites throughout the peninsula, over 160 miscellaneous manufacturing, processing, research & development, or industrial sites, and more than 30 colleges, universities, or other substantial freight generators.

On a broader level, critical intermodal facilities in the region surrounding the peninsula also influence the mode of transportation or freight routing on/off the peninsula. As such, additional regional logistics nodes are included in the Cargo Model as needed to help reflect larger-scale global shifts in freight patterns. Examples of such nodes include major port facilities from New York to Florida, regional rail hubs or intermodal yards in adjacent states such as the NS Enola Yard in Pennsylvania, or surrounding international airports such as BWI or Washington Dulles that are easily accessible from the peninsula.

Freight or "Transport" Logistics Nodes in the Cube Cargo Model Process:

Transport logistics nodes (TLN) are places such as major goods yards, multi-modal terminals, railway stations, and ports, where trip chaining occurs. The Transport Logistics Node model examines the matrices created by the long-haul modal choice model and partitions them into direct transport and transport chain matrices. The goods in the direct transport matrices will be transported directly from their initial origin to their final destination. The goods in the transport chain matrices are divided into two segments: from origin to the TLN and from the TLN to the destination. Of these two sections, one will be classified as long-haul and the other will be classified as short-haul.

Source: http://www.citilabs.com/products/cube/cube-cargo/cube-cargo-methodology

Freight Support Facilities

Freight support facilities are an additional component vital to the day-in/day-out operations of the freight and goods movement system. Notable types of support facilities relevant to the Delmarva Peninsula could include any of the following:

- Truck rest stops or parking areas
- Truck loading zones or staging areas
- Truck weigh and inspection stations (TWIS) or virtual weigh stations (VWS)
- Rail-highway at-grade crossings
- Rail passing sidings, interchange sidings, industry sidings, or loading ramps
- Port infrastructure including berths, terminals, or storage
- Inland port infrastructure and related facilities
- Airport infrastructure including aircraft cargo ramps, parking areas, or storage
- Freight-focused loading equipment, cranes, elevators, or vehicle ramps
- Freight-focused monitoring, information, or safety/security systems
- Freight-focused maintenance facilities

Several of the above are addressed by specific mode, area, or facility plans that are far more in-depth than the broader scope/scale of this regional freight plan. For example, master planning by the Port of Wilmington, details in the *Delaware State Rail Plan*, recommendations in state-specific aviation system plans, the *Improving Freight Movement in Delaware Central Business Districts* study by the University of Delaware's Institute for Public Administration, or other targeted efforts typically address local short and long-term improvement needs. Based on a thorough document review, stakeholder outreach, and ongoing agency coordination, pertinent insights from such sources will be considered as this freight plan advances through the project-specific modeling and scenario planning efforts.

Of further interest to motor freight transportation on the Delmarva Peninsula is the area's participation in and support for the Commercial Vehicle Information Systems Network (CVISN) program. Through this program, Delaware and Maryland have successfully implemented PrePass and Drivewyze technology at select locations to allow automated electronic validation of truckers' weight, safety, or credential requirements. CVISN efforts have also supported the installation and planned expansion of VWS sites and other TWIS improvements at various locations (*Exhibit 4.25*). Such locations include targeted monitoring efforts related to commercial vehicle operations and enforcement along the heavily traveled US 301 corridor and nearby alternate routes.

CVISN Summary:

CVISN is a nationwide program managed by the Federal Motor Carrier Safety Administration (FMCSA) that aims to improve motor freight safety and efficiency through the use of information systems, communications networks, and related intelligent transportation systems (ITS) that support commercial vehicle operations.

CVISN is trying to improve safety and efficiency by:

- Giving roadside officers the information they need
- Screening entities on the road electronically so that safe and legal drivers/carriers have expedited trips
- Streamlining the credentialing process
- Sharing data across the nation for safety checks, credentials checks, and state-to-state fee processing

Benefits of CVISN include:

- Safety, security, efficiency
- 24/7 access to e-credentialing services
- Roadside access to current information
- Safe and legal operators bypass weigh stations
- Scarce enforcement resources focused better
- Increase in administrative responsiveness
- Standardized interfaces and simpler data sharing
- Automated processes and reduced costs

Source: http://www.fmcsa.dot.gov/facts-research/cvisn/faq.htm

Exhibit 4.25 – TWIS and VWS Facilities on the Delmarva Peninsula

Route	Approximate Location	County	State	Existing	Planned
Truck Weigh and Inspection Stations (TWIS)					
I-95	Perryville	Cecil	MD	X	
US 13 (NB)	Smyrna	Kent	DE	X	
US 13	Delmar	Wicomico	MD	X	
US 13	New Church	Accomack	VA	X	
US 40	Perryville	Cecil	MD	X	
US 50 (EB)	Vienna	Dorchester	MD	X	
US 301 (NB)	Middletown	New Castle	DE	X	
US 301 (SB)	Cecilton/Warwick	Cecil	MD	X	
Virtual Weigh Stations (VWS)/Existing					
US 50	Bay Bridge	Queen Anne’s	MD	X	
MD 213 (SB)	Georgetown/Galena	Kent	MD	X	
Virtual Weigh Stations (VWS)/Planned					
US 13 (NB)	Smyrna	Kent	DE		X
US 13 (NB)	Pocomoke City	Worcester	MD		X
US 50 (WB)	Bay Bridge (Expand from 1-Lane to 2-Lane Coverage)	Queen Anne’s	MD		X
DE 1 (NB)	Smyrna	Kent	DE		X
DE 6	Millington Rd/West of Smyrna	Kent	DE		X
DE 299	Warwick Rd/West of Middletown	New Castle	DE		X
DE 300	Sudlersville Rd/West of Smyrna	Kent	DE		X
MD 213 (NB)	Galena	Kent	MD		X

4.3 System Summary

Combining the inventory of modal assets and infrastructure across the Delmarva Peninsula with previous reviews of major industry/business locations and related economic development patterns helps to identify how the peninsula's overall freight transportation system fits within local, regional, and national goods movement perspectives.

Freight Corridors

While the overall multimodal freight transportation system is extensive, varied, and complex, it can also be grouped more simplistically as functioning in terms of key freight corridors. This perspective encompasses six key freight corridors that capture the majority of freight flows that enter, exit, pass-through, or travel within the peninsula while also connecting most of the urbanized areas throughout the peninsula (*Exhibit 4.26* through *Exhibit 4.32*). These corridors include:

North/South Corridors

- North/South: I-95 "Metro" Freight Corridor
- North/South: US 301 "Bay" Freight Corridor
- North/South: DE 1/US 13/US 113 "Coastal" Freight Corridor

East/West Corridors

- East/West: US 202/DE 41 "Piedmont" Freight Corridor
- East/West: US 50 "Ocean City" Freight Corridor
- East/West: Route 404 "Lewes" Freight Corridor

Local Freight Zones

The peninsula may also be viewed as having six local freight zones that essentially fill-in the gaps around or in between the key freight corridors listed above (*Exhibit 4.26*). These zones capture secondary highway or rail connections that link the key freight corridors, provide access to smaller hubs of freight activity, or otherwise accommodate intra-county goods movement on the peninsula. Local freight zones generally include geographic areas and transportation connections linking:

- Chestertown
- Sudlersville-Smyrna-Dover
- Denton-Dover-Milford
- Federalsburg-Hurlock
- Crisfield
- Chincoteague

Freight Gateways

The peninsula, by definition, includes a limited number of geographic access points. Within the overall system, then, there are several crucial freight gateways that tie the Delmarva Peninsula into a broader regional, national, or international goods movement context. Notable gateways in the study area include:

Motor Freight Gateways

- I-95/Maryland Gateway, including Susquehanna River crossings via the I-95 Millard E. Tydings Memorial Bridge as well as well as the US 40 Thomas J. Hatem Memorial Bridge
- I-95/Pennsylvania Gateway, including access to/from Philadelphia and points north
- I-295/New Jersey Gateway, including the Delaware Memorial Bridge crossing
- US 50/301 Bay Bridge Gateway, including the William Preston Lane, Jr., Memorial Bay Bridge crossing
- US 13/Virginia Gateway, including the Chesapeake Bay Bridge-Tunnel crossing
- US 9/Cape May Gateway, including the Cape May-Lewes Ferry crossing

Waterborne Freight Gateways

- Chesapeake Bay
- Delaware Bay/Delaware River

Rail Freight Gateways

- Northeast Corridor and related NS and CSX parallel or connecting lines
- BCRR's Cape Charles Carfloat

Air Freight Gateways

- Numerous airports on the peninsula, primarily including Wilmington-Philadelphia Regional, Dover AFB Air Cargo Ramp, and Salisbury-Ocean City-Wicomico Regional

Exhibit 4.26 – Major Freight Corridors, Zones, and Gateways on the Delmarva Peninsula

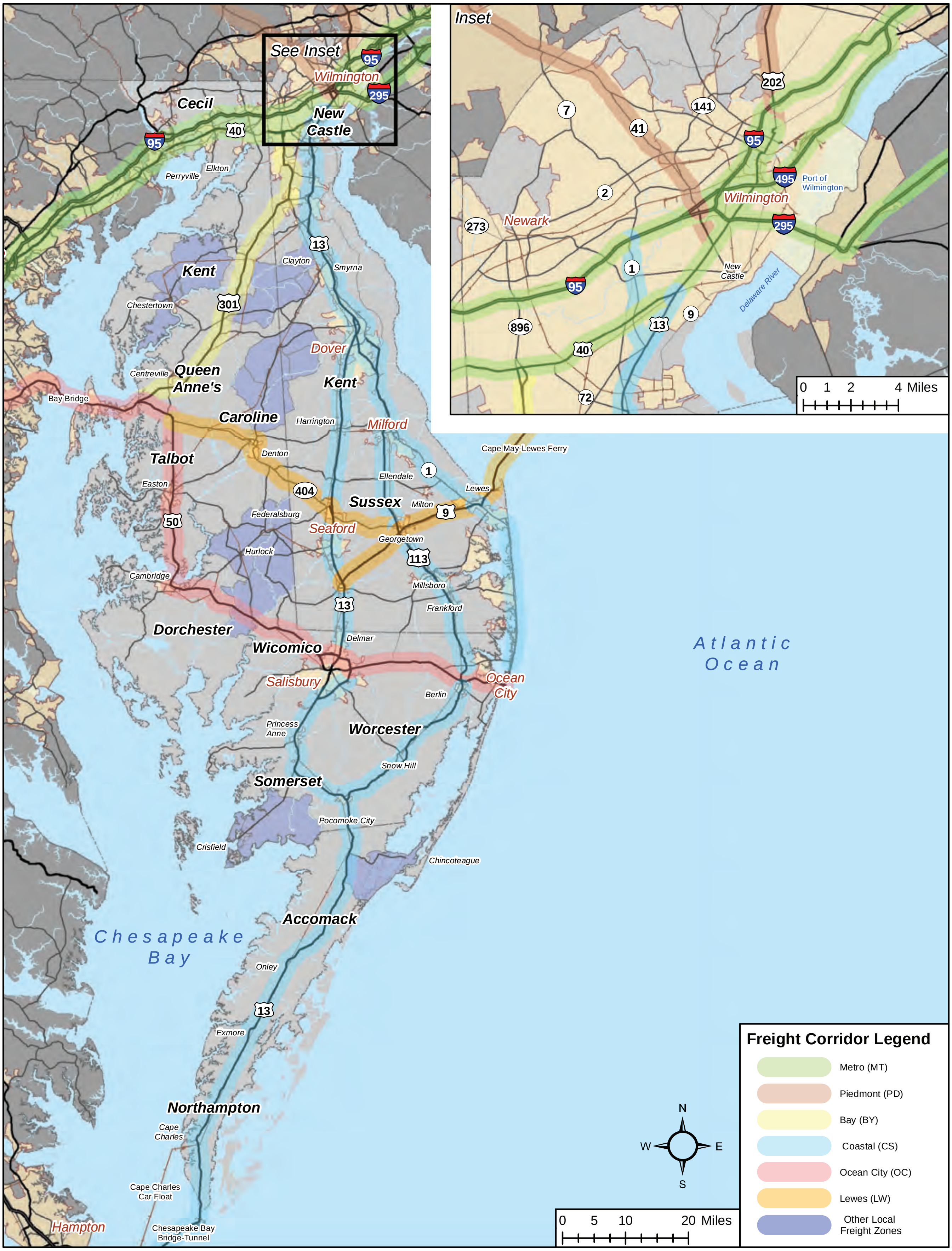


Exhibit 4.27 – Summary of I-95 "Metro" Freight Corridor

I-95 "Metro" Freight Corridor	
Primary Roadways:	- I-95 - I-295 - I-495 - US 40
Regional Freight Hubs	- Northern Delmarva Peninsula - Baltimore/Washington metro - Philadelphia metro - U.S. Eastern Seaboard (Maine to Florida)
Project Area Freight Hubs	- Elkton, Cecil County, MD; - Newark-Wilmington-Edgemoor-Claymont- New Castle-Delaware City, DE - Deepwater, NJ (DuPont)
Key Roadway Junctions	- ***Other Freight Corridors:*** US 301; US 202/DE 41; DE 1/US 13/US 113; also access to New Jersey Turnpike (via I-295) - ***Local Connections:*** US 202 (to Pennsylvania); MD 222 (Perryville); MD 279 (Elkton); DE 2, DE 896 (Newark); DE 141 (Newport-New Castle); Port access via Terminal Avenue and 12th Street/Edgemoor Rd - ***Special Facilities:*** Millard E. Tydings Memorial Bridge (I-95); Thomas J. Hatem Memorial Bridge (US 40); Delaware Memorial Bridge (I-295/US 40); I-95 and US 40 Toll Facilities; I-95 and US 40 TWIS (Perryville)
Rail Access	- ***Class I Service:*** Parallel NS, CSX, and Amtrak operations via the Northeast Corridor - ***Major Rail Yards:*** NS Newark, Del Pro, West, and Edgemoor Yards; CSX Wilsmere Yard; Amtrak Bear Maintenance Facility, Operations Center, and Wilmington Shops; Thurlow Yard (Marcus Hook) - ***Shortline Service:*** ESPN (Elsmere Junction); WWRC (Landenberg Junction)
Port Access	- ***Major Ports:*** Port of Wilmington and Port of Marcus Hook; also Port of Philadelphia and Port of Baltimore - ***River Systems:*** Delaware River/Bay; Christina River (Wilmington); Susquehanna River (Perryville/Havre de Grace)
Airport Access	- ***Project Area:*** Wilmington-Philadelphia Regional - ***Extended Area:*** Philadelphia Int'l; Baltimore/Washington Int'l; Washington/Dulles Int'l; Atlantic City Int'l

Exhibit 4.28 – Summary of US 301 "Bay" Freight Corridor

US 301 "Bay" Freight Corridor	
Primary Roadways:	- US 301 - US 50
Regional Freight Hubs	- Northern/Northwestern Delmarva Peninsula - Baltimore/Washington metro - Richmond metro - U.S. south Atlantic states
Project Area Freight Hubs	- Wilmington-New Castle-Newark-Middletown, DE - Massey-Millington-Sudlersville-Centreville-Chestertown, MD
Key Roadway Junctions	- ***Other Freight Corridors:*** US 50; MD/DE 404; DE 1/US 13/US 113; I-95; US 202/DE 41 - ***Local Connections:*** US 40 (New Castle); DE 896 (Newark); DE 299 (Middletown); MD 313 (Massey); MD 291, DE 6 (Millington-Smyrna); MD 300, DE 300 (Sudlersville-Smyrna); MD 213 (Centreville) - ***Special Facilities:*** William Preston Lane, Jr. Memorial Bay Bridge (US 50/301); US 301 TWIS (Middletown and Cecilton/Warwick); Existing VWS (US 50 WB/Bay Bridge; MD 213/Georgetown-Galena); Planned VWS (US 50 EB/Bay Bridge; DE6, DE 299, DE 300, MD 213 in Kent, New Castle, or Cecil Counties)
Rail Access	- ***Class I Service:*** Indirect access by way of connection to the I-95 Freight Corridor - ***Major Rail Yards:*** Indirect access to NS Del Pro Yard and facilities near Delaware City - ***Shortline Service:*** MDDE Centreville Line; MDDE Chestertown Line
Port Access	- ***Major Ports:*** Indirect access to Port of Wilmington, Delaware City, and Port of Baltimore - ***Other Water Access:*** Chesapeake Bay area (Anne Arundel and Queen Anne's Counties, MD)
Airport Access	- ***Project Area:*** Wilmington-Philadelphia Regional; Easton Municipal/Newnam Field - ***Extended Area:*** Baltimore/Washington Int'l; Washington/Dulles Int'l

Exhibit 4.29 – Summary of DE 1/US 13/US 113 “Coastal” Freight Corridor

DE 1/US 13/US 113 “Coastal” Freight Corridor	
Primary Roadways:	- DE 1 - US 13 - US 113 - MD 528
Regional Freight Hubs	- Eastern/Coastal/Southern Delmarva Peninsula - Philadelphia metro; - Hampton Roads metro; - Extended areas via linkage w/the I-95 Corridor
Project Area Freight Hubs	- Wilmington-New Castle-Delaware City-Townsend-Smyrna-Clayton-Dover, DE - ***Continued via US 13:*** Harrington-Seaford-Delmar, DE; Salisbury-Princess Anne-Pocomoke City, MD; Accomack-Northampton Counties, VA - ***Continued via US 113:*** Milford-Ellendale-Georgetown-Millsboro-Dagsboro-Frankford-Selbyville, DE; Berlin-Snow Hill-Pocomoke City, MD - ***Continued via DE 1/MD 528:*** Milford-Lewes Beach-Rehoboth Beach-Dewey Beach-Bethany Beach-Fenwick Island, DE; Ocean City, MD
Key Roadway Junctions	- ***Other Freight Corridors:*** I-95; US 202/DE 41; US 301; MD/DE 404; US 50 - ***Local Connections:*** DE 18 (Bridgeville-Lewes); DE 24 (Millsboro-Rehoboth Beach); MD 12 (Salisbury-Snow Hill); MD 413 (to Crisfield); VA 175 (to Chincoteague); - ***Special Facilities:*** Chesapeake Bay Bridge-Tunnel; DE 1 Toll Facilities; US 13 TWIS (Smyrna, Delmar, New Church); Planned VWS (US 13/Smyrna-Delmar-Pocomoke City; DE 1/Smyrna)
Rail Access	- ***Class I Service:*** Parallel NS lines via the Delmarva Secondary, Harrington South Branch, and Indian River Secondary - ***Major Rail Yards:*** NS Del Pro, Jello, Harrington, and Seaford Yards - ***Shortline Service (MDDE):*** Snow Hill Line; Junction w/Chestertown and Centreville Lines; Junction w/Seaford Line - ***Shortline Service (DCLR):*** Junction w/Milton Line; Junction w/Lewes Line - ***Shortline Service (BCRR):*** Pocomoke City to Cape Charles, including carfloat operations to/from Little Creek, VA
Port Access	- ***Major Ports:*** Port of Wilmington; also Port of Virginia (Hampton Roads) - ***River Systems:*** Nanticoke River (Seaford); Wicomico River (Salisbury); Pocomoke River (Pocomoke City) - ***Other Water Access:*** Cape May-Lewes Ferry; Indian River Inlet; DE-MD coastal/resort areas
Airport Access	- ***Project Area:*** Wilmington-Philadelphia Regional; Dover AFB/CAT; Sussex Co.; Salisbury-Ocean City-Wicomico Regional; Accomack Co. - ***Extended Area:*** Philadelphia Int’l; Norfolk Int’l

Exhibit 4.30 – Summary of US 50 "Ocean City" Freight Corridor

US 50 "Ocean City" Freight Corridor	
Primary Roadways:	- US 50 - MD 90
Regional Freight Hubs	- Central/South Central Delmarva Peninsula - Baltimore/Washington metro
Project Area Freight Hubs	- Chestertown-Easton-Cambridge-Salisbury-Berlin-Ocean City, MD
Key Roadway Junctions	- ***Other Freight Corridors:*** US 301; MD/DE 404; DE1/US 13/US 113 - ***Local Connections:*** MD 328 (Easton-Denton); MD 16/392/307 (Hurlock-Federalsburg); MD 12 (Salisbury-Pocomoke City) - ***Special Facilities:*** William Preston Lane, Jr. Memorial Bay Bridge (US 50/301); US 50 TWIS (Vienna); Existing VWS (US 50 WB/Bay Bridge); Planned VWS (US 50 EB/Bay Bridge)
Rail Access	- ***Class I Service:*** Local (Salisbury) junction w/NS Delmarva Secondary, Harrington South Branch - ***Shortline Service:*** Local junctions w/MDDE Seaford Line (in Cambridge) and MDDE Snow Hill Line (in Berlin)
Port Access	- ***Major Ports:*** Indirect access to Port of Baltimore - ***River Systems:*** Choptank River (Cambridge); Nanticoke River (Vienna); Wicomico River (Salisbury) - ***Other Water Access:*** Chesapeake Bay area (Anne Arundel and Queen Anne's Counties, MD)
Airport Access	- ***Project Area:*** Easton Municipal/Newnam Field; Salisbury-Ocean City-Wicomico Regional - ***Extended Area:*** Baltimore/Washington Int'l; Washington/Dulles Int'l

Exhibit 4.31 – Summary of Route 404 "Lewes" Freight Corridor

MD/DE 404 "Lewes" Freight Corridor	
Primary Roadways:	- MD 404 - DE 404 - US 9
Regional Freight Hubs	- Central Delmarva Peninsula - Baltimore/Washington metro (via connection to US 50/301) - Atlantic City/Jersey Shore area (via connection to ferry service)
Project Area Freight Hubs	- Wye Mills-Queen Anne-Denton, MD - Bridgeville-Laurel-Georgetown-Lewes, DE
Key Roadway Junctions	- ***Other Freight Corridors:*** US 301; US 50; DE 1/US 13/US 113 - ***Local Connections:*** MD 328, MD 313 (Denton); DE 18 (Bridgeville) - ***Special Facilities:*** William Preston Lane, Jr. Memorial Bay Bridge (US 50/301); Cape May-Lewes Ferry (US 9)
Rail Access	- ***Class I Service:*** Local (Bridgeville) junction w/NS Delmarva Secondary, Harrington South Branch; Local (Georgetown) junction w/NS Indian River Secondary - ***Major Rail Yards:*** Nearby access to Seaford facilities, including NS Seaford Yard - ***Shortline Service (MDDE):*** Nearby access to MDDE Seaford Line - ***Shortline Service (DCLR):*** DCLR Milton Line; DCLR Lewes Line
Port Access	- ***Major Ports:*** Indirect access to Port of Baltimore - ***River Systems:*** Choptank River (Denton); Nanticoke River (Seaford) - ***Other Water Access:*** Cape May-Lewes Ferry; DE-NJ coastal/resort areas
Airport Access	- ***Project Area:*** Sussex County - ***Extended Area:*** Baltimore/Washington Int'l; Washington/Dulles Int'l; Cape May County; Atlantic City Int'l

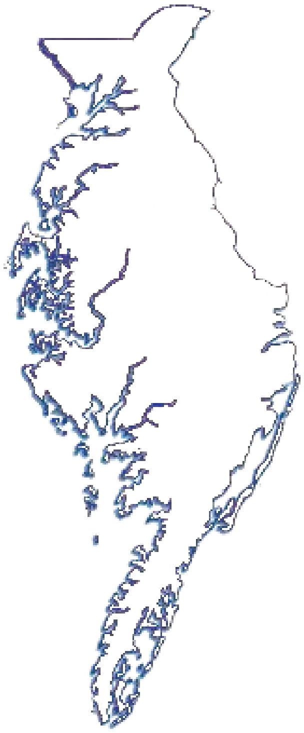
Exhibit 4.32 – Summary of US 202/DE 41 “Piedmont” Freight Corridor

US 202/DE 41 “Piedmont” Freight Corridor	
Primary Roadways:	- US 202 - DE/PA 41 - Pennsylvania linkages to I-76, US 30, and US 322
Regional Freight Hubs	- Northern Delmarva Peninsula - Lancaster/York/Harrisburg area (via I-76, US 30, US 322) - Pittsburgh metro (via I-76, US 30) - U.S. Midwest markets (via linkage to I-70, I-80)
Project Area Freight Hubs	- Hockessin-Elsmere-Newport-Stanton-Talleyville, DE - Newark-Wilmington, DE and extended areas via connection to other freight corridors
Key Roadway Junctions	- ***Other Freight Corridors:*** I-95; US 301; DE 1/US 13/US 113 - ***Local Connections:*** DE 2, 7, 48, and 62 (between Newark and Wilmington); DE 92 and 141 (north of Wilmington); PA 100 (linking US 202 to US 30 and I-76 through Exton, PA) - ***Special Facilities:*** Pennsylvania Turnpike (I-76)
Rail Access	- ***Class I Service:*** Junction with I-95 Freight Corridor; also NS access into Pennsylvania (Perryville to Harrisburg) - ***Major Rail Yards:*** Access to most NS, CSX, and AMTRAK rail yards/facilities in Wilmington/Newark metro; also access to major facilities in Harrisburg, PA, area including NS Enola Yard, Harrisburg Intermodal Terminal, Rutherford Intermodal Terminal, and Triple Crown Services - ***Shortline Services:*** WWRC access from CSX lines to Hockessin, DE; ESPN access from NS lines into Pennsylvania
Port Access	- ***Major Ports:*** Port of Wilmington - ***River Systems:*** Susquehanna River (Perryville/Havre de Grace to Harrisburg)
Airport Access	- ***Project Area:*** Wilmington-Philadelphia Regional - ***Extended Area:*** Harrisburg International/Olmsted Field

Delmarva Freight Plan

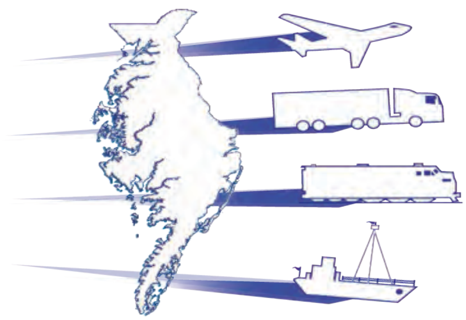
Chapter 5

Existing Freight Planning Resources



Chapter 5
Existing Freight Planning Resources

Several existing freight programs and planning/coordination efforts involving federal, state, county, and local agencies and the private sector operate across the Delmarva Peninsula. Such efforts help to support, enhance, and expand freight and goods movement opportunities locally, regionally, and beyond. Targeted programs such as CVISN or rail/port/airport planning efforts focus almost exclusively on freight infrastructure and operations, while broader programs such as trade zone designations or each state's transportation improvement program yield indirect opportunities and benefits. While not intended to be all-inclusive, this chapter highlights key programs, coordination efforts, and other resources relevant to the overall context of this freight plan.



5.1 Freight Institutions

Effective planning, management, and operation of the peninsula's multimodal freight system require cooperative efforts and partnerships between freight-related institutions, agencies, infrastructure owners, and regulatory authorities. At the federal level, lead public agencies are generally housed within the U.S. Department of Transportation (*Exhibit 5.1*) or the U.S. Army Corps of Engineers.

Exhibit 5.1 – USDOT Operating Administrations

USDOT Operating Administrations		
OST	Office of the Secretary	*http://www.dot.gov/administrations*
OIG	Office of the Inspector General	*https://www.oig.dot.gov/*
FAA	Federal Aviation Administration	*http://www.faa.gov/*
FHWA	Federal Highway Administration	*http://www.fhwa.dot.gov/w*
FMCSA	Federal Motor Carrier Safety Administration	*http://www.fmcsa.dot.gov/*
FRA	Federal Railroad Administration	*http://www.fra.dot.gov/*
FTA	Federal Transit Administration	*http://www.fta.dot.gov/*
MARAD	Maritime Administration	*http://www.marad.dot.gov/*
NHTSA	National Highway Traffic Safety Administration	*http://www.nhtsa.gov/*
PHMSA	Pipeline and Hazardous Materials Safety Administration	*http://www.phmsa.dot.gov/*
RITA	Research and Innovative Technology Administration	*http://www.rita.dot.gov/*
SLSDC	Saint Lawrence Seaway Development Corporation	*http://www.seaway.dot.gov/*
STB	Surface Transportation Board	*http://www.stb.dot.gov/*

At the state level and below, the Peninsula's geographic, political, and jurisdictional boundaries introduce a myriad of agencies and responsibilities. This mix presents a somewhat unique level of complexity in terms of orchestrating a comprehensive systemwide freight plan. Many of the lead agencies are housed within DelDOT, MDOT, and VDOT. However, responsibilities span other state agencies in ways that vary depending on each state's governing and regulatory structures. Efforts also span MPO planning partners on and around the peninsula, capture local jurisdictions or governing bodies, and encompass a variety of private sector partners both large and small. Key agencies and organizations are highlighted below (*Exhibit 5.2*).

Exhibit 5.2 – Delmarva Peninsula Agencies with Key Freight Planning and/or Support Roles

Jurisdiction	Abbreviation	Organization
DE (DelDOT)	**DelDOT**	DelDOT Division of Planning
DE (DelDOT)	**DelDOT**	DelDOT Division of Maintenance & Operations
DE (DelDOT)	**DelDOT**	DelDOT Division of Transportation Solutions
DE (DelDOT)	**DelDOT**	DelDOT Office of Aeronautics
DE (DelDOT)	**DE DMV**	Delaware Division of Motor Vehicles
DE (DelDOT)	**DTC**	Delaware Transit Corporation
DE (DelDOT)	**DTA**	Delaware Transportation Authority
DE (State Police)	**DSP**	Delaware State Police
DE (State Police)	**DSP CVEU**	DSP Commercial Vehicle Enforcement Unit
DE (State Police)	**DSP TEU**	DSP Truck Enforcement Unit
DE (State Police)	**DSP MCSAP**	DSP Motor Carrier Safety Assistance Program
DE (Other)	**DRBA**	Delaware River & Bay Authority
DE (Other)	**DSPC**	Diamond State Port Corporation
MD (MDOT)	**MDOT OFM**	MDOT Secretary's Office/Office of Freight and Multimodalism
MD (MDOT)	**SHA RIPD**	MD State Highway Administration/Regional and Intermodal Planning Division
MD (MDOT)	**SHA MCD**	MD State Highway Administration/Motor Carrier Division
MD (MDOT)	**MVA**	Maryland Motor Vehicle Administration
MD (MDOT)	**MAA**	Maryland Aviation Administration
MD (MDOT)	**MTA**	Maryland Transit Administration
MD (MDOT)	**MPA**	Maryland Port Administration
MD (Other)	**MDTA**	Maryland Transportation Authority
MD (Other)	**MDTA CVSU**	Maryland Transportation Authority/Commercial Vehicle Safety Unit
MD (State Police)	**MSP**	Maryland State Police
MD (State Police)	**MSP CVED**	Maryland State Police/Commercial Vehicle Enforcement Division

Exhibit 5.2 – Delmarva Peninsula Agencies with Key Freight Planning and/or Support Roles (Continued)

Jurisdiction	Abbreviation	Organization
VA (VDOT)	**VDOT**	VDOT Multimodal Transportation Planning Office
VA (Other)	**VA CTB**	Virginia Commonwealth Transportation Board
VA (Other)	**VA DMV**	Virginia Department of Motor Vehicles
VA (Other)	**VA DRPT**	Virginia Department of Rail and Public Transportation
VA (Other)	**VPA**	Virginia Port Authority
VA (Other)	**VIT**	Virginia International Terminals, LLC
VA (Other)	**VDA**	Virginia Department of Aviation
VA (Other)	**VA OIPI**	Virginia Office of Intermodal Planning and Investment
VA (State Police)	**VSP**	Virginia State Police
MPO (Study Area)	**DKMPO**	Dover/Kent County Metropolitan Planning Organization
MPO (Study Area)	**WILMAPCO**	Wilmington Area Planning Council
MPO (Study Area)	**S/WMPO**	Salisbury/Wicomico Metropolitan Planning Organization
MPO (Buffer Area)	**BMC**	Baltimore Metropolitan Council
MPO (Buffer Area)	**DVRPC**	Delaware Valley Regional Planning Commission
MPO (Buffer Area)	**HRTPO**	Hampton Roads Transportation Planning Organization
MPO (Buffer Area)	**MWCOG**	Metropolitan Washington Council of Governments
MPO (Buffer Area)	**RAMPO**	Richmond Area Metropolitan Planning Organization
MPO (Buffer Area)	**SJTPO**	South Jersey Transportation Planning Organization
Public/Private	**DWTC**	Delmarva Water Transport Committee
Public/Private	**DMTA**	Delaware Motor Transport Association
Public/Private	**MMTA**	Maryland Motor Truck Association
Public/Private	**VTA**	Virginia Trucking Association
Public/Private	-	I-95 Corridor Coalition
Public/Private	-	Northeast Corridor Commission
Public/Private	**TCI**	Transportation & Climate Initiative
Private	-	Private Sector/Freight Generating Industries (Chapter 2 and Exhibit 2.8)
Private	-	Private Sector/Rail, Port, Airport Facilities (Chapter 4 and Exhibits 4.13-4.17)

Delaware Agencies

DelDOT Operating Divisions: Multimodal freight interests are covered throughout DelDOT's operating divisions. The Office of the Secretary provides leadership and long-range transportation plan support. The Division of Planning oversees the state's comprehensive transportation planning and permitting processes while supporting inter/intra-agency efforts with transportation and land-use related data, data collection, analysis and advice. Overlapping freight interests in terms of designing, building, and maintaining the overall system are also inherent within the Division of Maintenance & Operations and the Division of Transportation Solutions. Other more specific modal elements include:

- Delaware Division of Motor Vehicles (DE DMV), which handles commercial drivers' licensing and truck registrations while also helping to ensure and support continuous operation of the state's toll facilities and toll network/toll collection improvements
- DelDOT Office of Aeronautics, which operates under the Division of Planning and is responsible for planning, coordination, and implementation of improvements to the state's public use airport system
- Delaware Transit Corporation (DTC) which operates as both a division within DelDOT and a subsidiary of the Delaware Transportation Authority funded by the state's Transportation Trust Fund (TTF), and which owns/oversees various public transit systems/services and passenger rail, freight rail, or airport facilities within the state

Delaware Transportation Authority (DTA): DTA operates under the auspices of DelDOT and is charged with ensuring an efficient multimodal transportation system within the state. DTA owns toll facilities along the Delaware Turnpike (tolled portions of I-95) and State Route 1, works through the DTC to support public transportation services, and administers Delaware's TTF.

Delaware River & Bay Authority (DRBA): DRBA is a multi-state agency focusing on key transportation links and related economic development opportunities across portions of Delaware and New Jersey. Within Delaware, DRBA-operated facilities include the Delaware Memorial Bridge, Cape May-Lewes Ferry, Wilmington-Philadelphia Regional Airport, Civil Air Terminal at Dover AFB, and Delaware Airpark. DRBA funding support includes bridge, ferry operation, and airport revenues.

Diamond State Port Corporation (DSPC): DSPC is a corporate entity of the state of Delaware that owns and operates the Port of Wilmington. DSPC and port operations are supported by Delaware's General Fund, and large capital projects are occasionally funded from the TTF.

Delaware State Police (DSP): In addition to general traffic enforcement and safety support, DSP's Commercial Vehicle Enforcement Unit (CVEU) integrates proactive and reactive enforcement specific to commercial vehicles. In addition, DSP's Truck Enforcement Unit (TEU) operates the Blackbird and US 301 weigh station facilities in New Castle County, as well as a number of portable scales to ensure vehicle weight and size checks. DSP's Motor Carrier Safety Assistance Program (MCSAP) further supports commercial vehicle inspections and vehicle/operator compliance throughout the state.

Maryland Agencies

MDOT Modal Administrations: State freight-related institutions are housed within MDOT across its various modal administrations. Each modal administration is controlled by the governor through an executive level Secretary of Transportation. Projects and programs in each mode and at The Secretary's Office are funded through the consolidated TTF. Within the Secretary's Office, freight issues are handled by the Office of Freight and Multimodalism (OFM). In addition to overarching freight planning, OFM oversees the operation and project planning for the state-owned shortline railroads, intercity passenger rail projects that have an impact on freight movement along the Northeast Corridor, innovative truck parking solutions, and management of public-private freight initiatives. More specific modal elements include:

- State Highway Administration (SHA), which handles highway freight planning and project oversight through the Regional Planning and Intermodal Division, and trucking safety and highway weight enforcement through the Motor Carrier Division.
- Maryland Motor Vehicle Administration (MVA), which handles commercial drivers' licensing and truck registration
- Maryland Aviation Administration (MAA), which oversees cargo and passenger movement at the BWI Thurgood Marshall Airport and the Martin State Airport
- Maryland Transit Administration (MTA), which is responsible for Maryland state-owned shortline railroad infrastructure that is primarily located on the Eastern Shore
- Maryland Port Administration (MPA), which is freight driven and focuses on bulk cargo, containers, and roll-on/roll-off cars and equipment. MPA operates public marine terminals and coordinates with privately-owned marine terminals.

Maryland Transportation Authority (MDTA): MDTA is an independent agency responsible for managing, operating and improving Maryland's toll facilities, including highways, bridges, and tunnels. MDTA also holds an interest in shortline rail operations near the Port of Baltimore. As a separate toll revenue entity, MDTA has its own bonding capacity for toll related projects. The MDTA Police's Commercial Vehicle Safety Unit is responsible for performing truck and safety inspections, post-crash inspections, and enforcement activities at all facilities under their jurisdiction.

Maryland State Police (MSP): In addition to general traffic enforcement and safety support, MSP's Commercial Vehicle Enforcement Division (CVED) is the lead agency for truck and bus safety compliance and enforcement in Maryland.

Virginia Agencies

VDOT Operating Offices: Commonwealth transportation and freight planning efforts are housed within VDOT's various operating offices, divisions, and districts. Freight efforts are included within the Multimodal Transportation Planning Office and are supported by a variety of commonwealth agencies as listed below.

Virginia Commonwealth Transportation Board (VA CTB): Appointed by the governor, the 17-member CTB establishes the administrative policies for Virginia's transportation system. The board allocates highway funding to specific projects, locates routes, and provides funding for airports, seaports and public transportation.

Virginia Department of Motor Vehicles (VA DMV): The DMV handles motor carrier and commercial licensing, registration, and credential compliance, as well as truck size and weight enforcement. Field operations include permanent Motor Carrier Service Center sites such as the facility along US 13 in New Church, Accomack County, Virginia; as well as a mobile operations unit designated NOMAD to perform truck safety and weight inspections with mobile crews and in conjunction with law enforcement.

Virginia Department of Rail and Public Transportation (VA DRPT): Divisions within DRPT focus on rail, public transportation, and commuter services within the commonwealth. DRPT's Rail Division supports both passenger and freight rail in Virginia through funding and advocacy for rail improvements, industrial access and preservation projects. Funding access through DRPT includes Virginia's Rail Enhancement Fund, Rail Industrial Access Grants, and Rail Preservation Grants.

Virginia Port Authority (VPA): VPA is a political subdivision of the commonwealth that maintains a service agreement with Virginia International Terminals LLC (VIT) to operate its state-owned ports. Facilities under their jurisdiction include marine terminals at Norfolk International Terminals (NIT), Portsmouth Marine Terminal (PMT), and Newport News Marine Terminal (NNMT), as well the Virginia Inland Port (VIP), an inland intermodal facility located in Front Royal, Virginia.

Virginia Department of Aviation (VDA): VDA oversees the commonwealth's aviation system and related safety, security, and economic development issues and opportunities. Specific tasks include updating the Virginia Air Transportation System Plan (VATSP) to support and develop growth of the Commonwealth's 66 public airports.

Virginia Office of Intermodal Planning and Investment (VA OIPI): The OIPI functions within the Office of the Secretary of Transportation and is tasked with maintaining and coordinating a multimodal working group consisting of the lead planners for each mode of transportation and the policy advisors of every agency within the Secretariat, including those listed above plus the Motor Vehicle Dealer Board and the Virginia Commercial Space Flight Authority. Freight-specific planning oversight includes Virginia's statewide long-range multimodal policy plan (VTrans) and the Virginia Multimodal Freight Plan.

Virginia State Police (VSP): VSP supports general highway and vehicle enforcement through a number of field offices within the Bureau of Field Operations (BFO), Bureau of Criminal Investigation (BCI), and the commonwealth's overall vehicle safety inspection program.

Metropolitan Planning Organizations

Given the varied local, regional, and national issues affecting freight and goods movement, MPOs can fill a unique role in helping to support or advance freight planning efforts and coordination across broad jurisdictional boundaries. These organizations help to link a detailed understanding of specific local/regional issues with statewide or systemwide freight planning efforts and between public and private sector stakeholders. Direct MPO planning partners on the peninsula include WILMAPCO, DKMPO, and S/WMPO with geographic areas as follows:

WILMAPCO: covering New Castle County in Delaware, and Cecil County in Maryland

DKMPO: covering Kent County in Delaware, including all of Milford and Smyrna

S/WMPO: covering portions of Wicomico County in Maryland (including Salisbury, Fruitland, and Delmar) and portions of Sussex County in Delaware (including Delmar)

In addition to the peninsula's direct MPO planning partners and with respect to freight movements across the region, there are a number of MPOs that cover a wider buffer area surrounding the peninsula. Geographic areas covered by these organizations include:

Baltimore Metropolitan Council (BMC): covering Anne Arundel, Baltimore, Carroll, Harford and Howard counties in Maryland; as well as Baltimore City

Delaware Valley Regional Planning Commission (DVRPC): covering Bucks, Chester, Delaware, Montgomery, and Philadelphia counties in Pennsylvania; and Burlington, Camden, Gloucester and Mercer counties in New Jersey

Hampton Roads Transportation Planning Organization (HRTPO): covering portions of southeastern Virginia including Gloucester, Isle of Wight, James City, and York Counties; and the cities of Chesapeake, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach, and Williamsburg

National Capital Region Transportation Planning Board (NCRTPB): covering Washington, D.C., and the surrounding jurisdictions as one of three boards within the Metropolitan Washington Council of Governments (MWCOG). Jurisdictions in Maryland include Charles, Frederick, Montgomery, and Prince George's counties; as well as the cities of Bowie, College Park, Frederick, Gaithersburg, Greenbelt, Rockville, and Takoma Park. Jurisdictions in Virginia include Arlington, Fairfax, Loudoun, and Prince William counties; as well as the cities of Alexandria, Fairfax, Falls Church, Manassas, and Manassas Park.

Richmond Area Metropolitan Planning Organization (RAMPO): covering Charles City, Chesterfield, Goochland, Hanover, Henrico, New Kent, and Powhatan counties in Virginia; as well as the Town of Ashland and the City of Richmond

South Jersey Transportation Planning Organization (SJTPO): covering Atlantic, Cape May, Cumberland, and Salem counties in southern New Jersey

Private Sector

Private transportation infrastructure owners, operators, and related parties are inherently critical to freight and goods movement across the peninsula's transportation system. Key private sector involvement is highlighted below; collectively, this involvement contributes substantial private investments to maintain, enhance, or expand critical components of the peninsula's economic and freight transportation engines.

Business and Industry: Chapter 2 of this plan highlighted major employers and freight generating industries including transportation logistics providers, distribution centers such as Amazon or Walmart, energy production facilities such as the Delaware City Refinery, and key players in the chemical, agricultural, food processing, poultry, seafood, or manufacturing industries among many others.

Transportation Infrastructure Owners/Operators: Chapter 4 of this plan summarized major transportation partners such as Norfolk Southern, CSX, shortline rail operators, Dover AFB, and a variety of air, port, rail, and transfer facilities.

Collaborative Organizations: Groups such as the Delmarva Water Transport Committee and the I-95 Corridor Coalition provide an additional formal means through which to merge private and public coordination efforts with regard to freight-focused interests critical to the study area.

5.2 Coordination Activities

Amongst the key freight planning institutions, stakeholders, and partners, a number of efforts currently take place within and across agency or jurisdictional boundaries to help facilitate and coordinate freight planning activities on the peninsula and throughout the surrounding region. While some of these efforts include formal groups or operating/cost sharing agreements, many simply involve ongoing collaboration to address key issues and to foster enhanced planning, monitoring, or promoting of freight and economic-related interests. Specific groups or activities include:

State and MPO Collaboration: DelDOT, MDOT, and VDOT each partner with their region's various MPOs to address freight initiatives. MPO leadership on the peninsula includes WILMAPCO, DKMPO, and S/WMPO, though activities extend across the region to include DVRPC, BMC, and MWCOG/NCRTPB among others. Collaboration includes joint freight planning activities such as regional freight studies, defining freight corridors and priorities, or identifying projects and programs; CVISN efforts and related truck weight enforcement or commercial vehicle credentialing; and public/private freight advisory groups and meetings, including periodic attendance at key events such as:

- Delmarva Freight & Goods Movement Working Group
  http://www.wilmapco.org/delmarva/
- DVRPC Goods Movement Task Force (quarterly meetings)
  http://www.dvrpc.org/Freight/DVGMTF.htm
- BMC Freight Movement Task Force (quarterly meetings)
  http://www.baltometro.org/multi-modal-planning/freight-movement-task-force
- MWCOG Transportation Planning Board Freight Subcommittee (bi-monthly meetings)
  http://www.mwcog.org/transportation/committee/committee/default.asp?COMMITTEE_ID=231
- AASHTO/FWHA Freight Transportation Partnership Meetings (biennial meetings)
  http://www.ops.fhwa.dot.gov/freight/partnership.htm

Delmarva Freight Summit/Delmarva Freight & Goods Movement Working Group: Development of this freight plan coincided with ongoing efforts spearheaded by WILMAPCO, DelDOT, and MDOT to launch a regularly-scheduled Delmarva Freight Summit focusing on the needs and interests of the peninsula. This forum built on past successes of the Delmarva Rail Summit with an expansion to address all modes of freight and goods movement. Coordination efforts also branched out to establish and encourage participation in a separate series of periodic meetings of a Delmarva Freight & Goods Movement Working Group. This group and related efforts will provide additional opportunities to share and gain insights specific to the needs and concerns of freight stakeholders across the Delmarva Peninsula while also working in-line with MAP-21's emphasis on establishing a state freight advisory committee to foster a collaborative freight planning process.

Delmarva Water Transport Committee (DWTC): DWTC is a non-profit organization with headquarters in Salisbury, Maryland. Its mission is to encourage the continuation and further development of waterborne commerce on the rivers, bays and harbors of the Delmarva Peninsula through the promotion of adequate dredging, safe navigation, and maintenance and development of harbor and river terminals in such a manner as to protect and conserve the environment. Coordination efforts span members and partners from the U.S. Coast Guard, USACE, and state or municipal governments to numerous commodity shippers/receivers, petroleum distributors, marine carriers, construction/engineering firms, consultants, and financial institutions.[1]

MDOT and MDDE Collaboration: The Maryland and Delaware Railroad (MDDE) provides rail service to Maryland's Eastern Shore via the Chestertown, Centreville, Seaford, and Snow Hill lines that connect with the NS Delmarva Secondary at three points in Delaware (see previous *Chapter 4*). MDDE is owner/operator of the Snow Hill line, but operates on Maryland state-owned rail lines along the Chestertown, Centreville, and Seaford routes. Since 1982, collaborative efforts between MDOT and MDDE have seen the investment of over $2 million in state funds to rehabilitate the railroad right-of-way and bridge structures. MDDE is working to further upgrade the Snow Hill line to accommodate 286,000 pound rail cars and, with MDOT, has pursued grant options and additional economic development assistance.

Trucking Associations: The commercial trucking industry throughout the region is served and represented by state-specific advocacy groups including the Delaware Motor Transport Association (DMTA), Maryland Motor Truck Association (MMTA), and Virginia Trucking Association (VTA). Each group aims to lobby for and enhance industry-specific interests and issues; fleet management practices; safety and security conditions; business efficiencies, image, or opportunities; and related educational programs.

Heavy Vehicle License Plate Inc. (HELP): HELP is a public/private company partnering with DelDOT and other states to provide Delaware with Pre-Pass commercial vehicle screening technology at no cost to the state; user fees are paid to HELP by motor carriers and other users of the equipment. The Pre-Pass technology enables qualified motor carriers to electronically comply with state safety, weight, and credential requirements and bypass designated weigh stations under certain conditions.

[1] http://www.dwtconline.com

I-95 Corridor Coalition: This coalition is an alliance of transportation agencies, toll authorities, and related organizations, including public safety, from Maine to Florida. The coalition works together to accelerate transportation improvements across jurisdictions and modes. It operates through a variety of Committees including, for example, freight-focus areas within the Intermodal Freight & Passenger Movement Committee and the Commercial Vehicle Operations Subcommittee.[2]

NEC Commission: The Northeast Corridor Infrastructure and Operations Advisory Commission (NEC Commission) focuses on the challenges of coordinating, financing, and implementing major improvements across multiple jurisdictions that influence NEC freight and passenger rail movements throughout the Northeast region of the United States. The NEC Commission is comprised of members from each of the NEC states, Amtrak, and the U.S. Department of Transportation. Specific roles involve coordinating strategic long-term planning with NEC stakeholders, as well as making annual recommendations to Congress.[3]

Transportation and Climate Initiative (TCI): TCI is a regional collaboration of 11 Northeast and Mid-Atlantic states and the District of Columbia that seeks to develop a clean energy economy and reduce oil dependence and greenhouse gas emissions from the transportation sector. Recognizing that nearly one third of all greenhouse gas emissions come from the transportation sector, participating states have started taking action in four core areas: clean vehicles and fuels, sustainable communities, freight efficiency, and information and communication technologies. TCI's Freight Efficiency workgroup seeks to identify and advance regional initiatives to promote sustainable economic development, minimize traffic congestion, and reduce greenhouse gas emissions through more efficient goods movement and technology.[4]

5.3 Project Funding and Revenue Sources

Lacking a dedicated, sustainable funding source for multimodal freight improvements, efforts currently draw from a variety of available resources. Typical federal, state, or other sources include:

Federal Formula Programs

The nation's Highway Trust Fund (HTF) provides federal funding eligibility for highway freight transportation projects. The HTF itself is sustained mostly by federal motor fuel taxes, though ongoing research and debates continue to explore options to enhance/ensure its future solvency. With the creation of MAP-21 and from a freight planning perspective, HTF funds are allocated through five formula programs as follows:

National Highway Performance Program (NHPP): NHPP Funds are used to support, maintain, and enhance existing or new facilities that are specifically part of the National Highway System (NHS). Eligible projects must likewise be part of the NHS. Freight benefits may be achieved on a broader perspective with project types such as NHS segment construction, reconstruction, resurfacing, etc., as well as improvements to NHS operations, highway safety, or infrastructure-based ITS capital.

Surface Transportation Program (STP): STP is a flexible fund for preservation and improvement of any federal-aid highway, bridge or tunnel projects on any public road, plus other pedestrian, bicycle, or transit applications. Any general highway improvement will potentially yield freight benefits, as will eligibility for projects such as truck parking facilities, advanced truck stop electrification, infrastructure-based ITS capital improvements, or congestion pricing and related strategies. STP also allows for surface transportation infrastructure improvements in port terminals for direct intermodal interchange, transfer, and port access.

[2] http://i95coalition.org
[3] http://www.nec-commission.com/
[4] http://www.transportationandclimate.org/

Highway Safety Improvement Program (HSIP): HSIP funds target highway safety improvement strategies, activities, or projects on a public road that are consistent with a statewide Strategic Highway Safety Plan (SHSP) to identify and improve hazardous roadway locations or features. Safety improvements often benefit all traffic, including freight. Truck parking improvements are also eligible for HSIP funds.

Congestion Mitigation and Air Quality Improvement (CMAQ) Program: CMAQ funds focus on transportation projects that maintain or improve air quality and reduce air pollution. Freight interests and benefits may overlap with operational or corridor type improvements (e.g., improved signalization, turning lanes, transportation systems management), as well as incident response, ITS, real-time traveler information, or similar efforts. Advanced truck stop electrification systems, diesel retrofits, or facilities serving electric or natural gas-fueled vehicles are also eligible for CMAQ funds.

Metropolitan Planning Program: Funds from this program support MPO efforts to establish and use a performance-based transportation planning approach consistent with MAP-21 objectives. Such processes will foster informed decision-making, including potential freight considerations, relative to long-range transportation planning or transportation improvement program outcomes.

Other Federal Funding Programs

Federal funding sources beyond the five primary formula programs listed above may also provide freight opportunities to varying extents as listed on below.

MAP-21 Federal Share Increase: Though not a program, per se, MAP-21 provisions make projects to improve freight movement eligible for a share of up to 95% for an Interstate System project or 90% for a non-Interstate System project. Eligible projects must make a demonstrable improvement in the efficiency of freight movement and be identified as part of a statewide freight plan per Section 1118 of MAP-21.

MAP-21
Moving Ahead for Progress in the 21st Century

Transportation Infrastructure Finance and Innovation Act (TIFIA) Program: The TIFIA program provides federal assistance in the form of loans or lines of credit to enhance the ability of project sponsors to invest the necessary capital into large-scale, complex, or regionally/nationally significant transportation improvements. TIFIA eligibility covers a broad variety of surface transportation projects including highway and multimodal/intermodal improvements. Exceptional freight benefits may include rail, port, intermodal facility, or surface transportation projects that are specifically related to access and direct intermodal transfers.

Transportation Investment Generating Economic Recovery (TIGER) Program: Originally created as part of the American Recovery and Reinvestment Act of 2009 (ARRA), TIGER allocations have continued annually as a discretionary grant program funded through federal general revenues. This highly-competitive program focuses on supporting road, rail, transit, or port projects that yield significant national, metropolitan, or regional impacts and that face multimodal, multi-jurisdictional, or otherwise challenging funding constraints. Freight successes within the TIGER program have been substantial – WILMAPCO has noted that the last cycle of the program (Tiger V) included 25 freight-related projects representing 43% of the overall funding.

TIGER GRANTS

Projects of National & Regional Significance (PNRS): This competitive program focuses on supporting critical, high-cost surface transportation capital projects that will help to accomplish national goals, including national/regional economic benefits. Large scale, multi-jurisdictional efforts with the potential for substantial freight benefits would be eligible under the PNRS program, and USDOT/FHWA continue to be interested in the identification of potential projects despite the uncertainties surrounding future PNRS allocations. PNRS funding has not been appropriated in the current federal fiscal year.

Railway Highway Crossings: Funded with a set-aside from HSIP, this program funds safety improvements to reduce the number of fatalities, injuries, and crashes at public grade crossings.

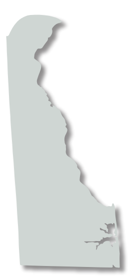
FRA Supported Railroad Funding: A variety of mode-specific grant and loan programs are supported by the FRA to fund passenger and freight rail infrastructure improvements encompassing safety, congestion relief, expansions, and upgrades. These programs include, among others, the High-Speed Intercity Passenger Rail Program (HSIPR), the Rail Line Relocation & Improvement Capital Grant Program (RLR), and the Railroad Rehabilitation & Improvement Financing (RRIF) Program.[5]

FAA Airport Improvement Program (AIP): The AIP is a mode-specific program managed by the FAA, funded by the federal Airport and Airway Trust Fund (AATF), and dedicated to providing grants for the planning and development of public-use airports that are included in the National Plan of Integrated Airport Systems (NPIAS). AIP funds are distributed based on a prioritization of critical airport development and associated capital needs as identified by the national Airports Capital Improvement Plan (ACIP).

Waterborne Revenue Sources: At the federal level, the Harbor Maintenance Trust Fund (HMTF) compiles revenues that congress may use to invest in waterborne freight transportation maintenance and improvements. The HMTF is funded by the Harbor Maintenance Tax (HMT) and focuses on port maintenance dredging, though funds must be specifically appropriated by Congress.

State Transportation Trust Funds

State funding for multimodal freight transportation projects, including state match dollars for the various federal programs listed above, are primarily derived from each state's Transportation Trust Fund (TTF). These funding sources are generally pooled and flexible resources as follows:

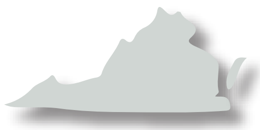


Delaware TTF: This fund serves Delaware as a consolidated source of revenue that provides a flexible means for operating or funding transportation projects or expenditures across the state, including specific agency operations such as DTA or DTC. Revenue sources include motor fuel taxes, state toll collection, vehicle document and registration fees, operator license and titling fees, and others. Though DelDOT does not typically program state funds exclusively for freight-related transportation projects, freight benefits may accompany various road/highway projects that are funded through the TTF, and large capital projects such as for DSPC have occasionally been included. There are, however, restrictions; Delaware, for example, cannot invest in private railroad infrastructure without State Legislative authorization.

Maryland TTF: MDOT has a dedicated, mode-neutral funding source in the Maryland TTF, which is a pooled fund supported by motor vehicle excise taxes and vehicle fees, fuel tax revenues and a portion of the state sales and corporate income taxes. None of these revenue streams are tied directly to a stove piped program or project. Using

[5] http://www.fra.dot.gov/Page/P0021

this flexible fund, MDOT can and does apply state funding to intermodal freight projects. The Maryland TTF allows MDOT to direct resources to priority projects and encourages multimodal solutions.



Virginia TTF: Virginia's TTF is one component of a broader Commonwealth Transportation Fund (CTF) that also includes the Highway Maintenance and Operating Fund (HMOF), the Priority Transportation Fund (PTF), and other state or federal fund sources and bonds. TTF revenues draw from general sales and use taxes, motor vehicle sales taxes, gas taxes, motor vehicle registration fees, and other sources. Unlike the more mode-neutral structures in Delaware and Maryland, Virginia's TTF is distributed by formula to distinct groupings for highway, port, airport, and public transportation improvements. Each separate fund is likewise managed by a separate entity including VDOT's Construction Fund, VPA's Port Fund, the Aviation Board's Airport Fund, and the DRPT's Mass Transit Fund.

Other Funding Sources

Funding beyond that listed above includes various grant or loan programs, mode-specific sources, or other efforts that support and encourage public-private partnerships and investments in freight-related transportation improvements or economic development. Such sources may include:

Virginia Transportation Infrastructure Bank (VTIB): VTIB is an additional sub-fund of Virginia's TTF that is a special non-reverting, revolving loan fund. It was created to make loans, grants, or financial assistance to eligible localities or private entities to finance transportation projects and encourage the investment of both public and private funds into eligible projects. Eligible projects include toll facilities; mass transit; freight, passenger, and commuter rail, including rolling stock; port and airport and other transportation facilities.

Virginia Transportation Partnership Opportunity Fund (TPOF): TPOF is an additional grant, loan, or financial assistance program that may be used by Virginia's Governor to encourage the development of transportation projects or provide monies to address the transportation aspects of economic development opportunities. The program's focus spans modes but aims to support projects, studies, and activities beyond the funding capability of existing programs.

Virginia Rail Funding: The Virginia DRPT administers rail funding through an additional tier of programs that include the Rail Enhancement Fund – the commonwealth's first ever dedicated source of monies for passenger and freight rail infrastructure improvements. Additional programs include Rail Industrial Access Grants and Rail Preservation Grants. The former focuses on the construction or improvement of railroad tracks and facilities to link industrial or commercial sites where freight rail service connections to common carriers are needed. The latter provides funding for Virginia's shortline railroads.

Operating Revenues: Certain agencies or opportunities draw from operating revenues, tolls, or fees from various transportation elements including roadway, bridge, ferry, or airport facilities. DRBA, for example, is funded primarily through specific operating revenues under their jurisdiction. WILMAPCO has also noted that attempts have been made to pay for projects using future toll revenues such as those projected for US 301. Investments from such sources may be subject to restrictions. DRBA, for example, follows a process outlined by special resolution (DRBA Resolution 94-16) that limits their investments in any single project to $500,000 for each 50 new jobs created by the investment as certified by a business plan.[6]

Private Sector: The incredible value and benefit of private sector investments made toward privately-owned and/or operated freight infrastructure cannot be over emphasized. Such investments make possible critical

[6] http://www.drba.net/EconomicDevelopment/FundingOpportunities.aspx

components of the peninsula's overall economic and freight transportation engines. A recent report from the House Committee on Transportation & Infrastructure noted, for example, that in 2011 freight railroads invested over $23 billion in capital expenditures to improve and expand their networks. Private investments affect infrastructure across all modes; business and industry assets including logistics, warehousing, and distribution facilities; and operations or ITS support such as the Pre-Pass technology provided to states via HELP, Inc.

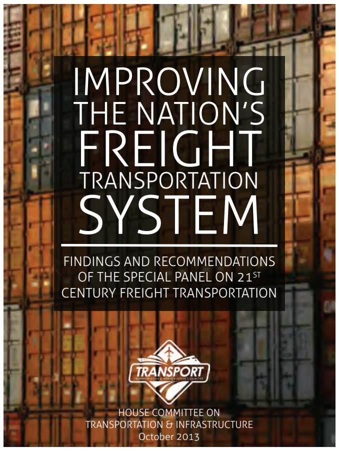
Public-Private Partnerships (P3): P3s are contractual agreements formed between a public agency and private sector entity that allow for innovative funding possibilities and/or greater private sector participation in the delivery and financing of transportation projects. DelDOT and MDOT have utilized P3 approaches to successfully implement freight-related projects. Delaware, for example, entered into an agreement with NS in 2002 to invest in the replacement of NS's Shellpot Bridge, and NS is in turn reimbursing the state through rail car tolls exacted for each crossing of the bridge. Maryland's P3 efforts have likewise allowed for the planning and construction of large projects, including the partnership between MDOT and Ports America Chesapeake to improve infrastructure at the Seagirt Marine Terminal at the Port of Baltimore. Virginia also has implemented and continues to plan for a number of large-scale P3 projects under the leadership of the Virginia Office of Transportation Public-Private Partnerships.

Public-Private Partnerships

Innovative Program Delivery

FHWA encourages the consideration of public-private partnerships (P3s) in the development of transportation improvements. Early involvement of the private sector can bring creativity, efficiency, and capital to address complex transportation problems facing State and local governments. FHWA's Office of Innovative Program Delivery (IPD) provides information and expertise in the use of different P3 approaches, and assistance in using tools including the SEP-15 program, private activity bonds (PABs), and the TIFIA Federal credit program to facilitate P3 projects.

Source: http://www.fhwa.dot.gov/ipd/p3/index.htm



Future Prospects: While needs will almost certainly outpace available funding, the search for reliable and enhanced revenue options will continue into the future. Efforts of the Congressional Committee on Transportation and Infrastructure in 2013 explored revenue options in the document "Improving the Nation's Freight Transportation System: Findings and Recommendations of the Special Panel on 21st Century Freight Transportation." Concepts for generating revenues to pay for freight-related projects included various tax or user fee modifications, vehicle miles traveled (VMT) fees, congestion pricing, gas/diesel tax increases, heavy vehicle use tax increases and indexing, customs duties and fees, freight waybill taxes, weight-distance taxes, container taxes, trust fund refinements, innovative financing options, and encouragement of P3 opportunities. Committee efforts in 2014 also established a special panel to focus on the use of and opportunities for P3s across all modes of transportation, economic development, public buildings, water, and maritime infrastructure and equipment.[7] Though future authorizations, revenue possibilities, or other programs will likely continue in a state of evolution beyond completion of this freight plan, it is clear that discussions will benefit from cooperation and communication at all levels and across all stakeholder groups.

[7] http://transportation.house.gov/

5.4 Capital Plans and Programs

Current and potential funding and investment plans vary across the peninsula's three-state area. As noted in the introduction to this plan, several of the formal programs were referenced as part of an extensive document review effort. Key plans specific to advancing freight policies and/or programming freight-related projects on the Delmarva Peninsula are highlighted below.

Statewide Long-Range Transportation Plans/Capital Investment Plans: these efforts review transportation needs and requirements 20 to 25 years into the future and establish the goals, principles, policies, performance measures, and actions that shape future transportation investments. The long-range plan generally outlines guidance and strategies to address areas such as economic growth, safety, congestion, air quality, and public mobility in line with the needs and priorities of the state and its local jurisdictions and citizens. Subsequently, these plans help to inform the development of nearer-term capital investment plans that outline all projects or programs that the state will be advancing in some aspect (e.g., from planning, design, right-of-way acquisition, construction, maintaining, or upgrading) over a six-year period, the first four years of which typically encompass the state-specific transportation improvement program. Included are:

- Delaware Long-Range Transportation Plan (LRTP)
- Delaware Capital Transportation Program (DE CTP)
- Maryland Transportation Plan (MTP)
- Maryland Consolidated Transportation Program (MD CTP)
- Virginia State Highway Plan
- Virginia Statewide Multimodal Plan
- Virginia Six-Year Improvement Program (SYIP)

Local/Regional Area Long-Range Transportation Plans: these planning documents detail the needs and priorities of smaller regions throughout the Delmarva Peninsula, setting forth a relevant course of action that is specific to each area's local transportation investments and decisions, while also helping to inform issues that may be folded into broader statewide planning efforts. Included are:

- WILMAPCO's Regional Transportation Plan
- DKMPO's Metropolitan Transportation Plan
- S/WMPO's Long-Range Transportation Plan
- Virginia's Small Urban Area Transportation Plans
- Virginia's Rural Regional Long-Range Plans

Multimodal Freight Plans: these multimodal freight-focused plans integrate new and existing sources of information to yield a high-level overview of the freight transportation system in its entirety, while also providing overlapping guidance that points back to or helps to inform more detail planning or programming efforts. Included are:

- Delmarva Freight Plan
- Maryland's Statewide Freight Plan
- SHA/MDTA's Freight Implementation Plan/Final Report
- Virginia Statewide Multimodal Freight Study

Rail System Plans: these mode-specific plans detail the basis for federal and state investments into freight and passenger rail infrastructure. Efforts in these and other freight-focused plans encompass major railroad and shortline improvements, priority efforts such as the Chesapeake Connector project to add a third track along Amtrak's NEC in Cecil County, or larger-scale regional support for initiatives such as the NS Heartland or Crescent Corridors and the CSX National Gateway. Included are:

- Delaware State Rail Plan
- Maryland State Rail Plan
- MTA's Freight Lines Strategic Plan
- Virginia Statewide Rail Plan
- Northeast Corridor Infrastructure Master Plan

Aviation System Plans: these state-specific plans detail the type, location, timing, extent, and cost of airport development to preserve and expand a safe and efficient system of airports. Future investments typically detail FAA grant support and specific improvements, for example, to expand runways at Delaware Airpark or Sussex County Airport, or to enhance airport business and commercial air service (via Frontier Airlines) at Wilmington-Philadelphia Regional Airport. Affecting the Peninsula are:

- Delaware Aviation System Plan
- Maryland Aviation System Plan
- Virginia Air Transportation System Plan

Port/Waterway Plans: these mode-specific plans focus on maintenance and improvement of the Peninsula's port, channel, and inland waterway systems and infrastructure, including dredging operations. Included are:

- Port of Wilmington's Strategic Master Plan
- MPA's Vision and Strategic Plans
- VPA Strategic Plans
- USACE Navigation or related programs

5.5 Planned Projects and Developments

Building from the available plans and activities noted above, it was important for this Delmarva Freight Plan to clearly establish a list of committed transportation improvements that are or will be programmed for future implementation regardless of the outcome of this freight plan. Future project commitment assumptions (for the purposes of this study) were limited to larger-scale efforts that could impact the capacity, connectivity, operations, or other substantial elements of the overall freight transportation system, particularly with respect to the anticipated scenario planning analyses that will be detailed in subsequent chapters. Identified projects will be assumed in the future trendline or "no-build" transportation system and establish the starting point from which other longer-term project or policy recommendations may be investigated. Committed projects were identified through a review of numerous existing planning documents and vetted through the freight plan's advisory team. Assumed projects for the future trendline conditions are summarized below (*Exhibit 5.3* and *Exhibit 5.4*).

In addition to future project commitments specific to the Delmarva Peninsula, future analyses and scenario planning efforts may consider projects of national/regional significance as applicable in the development or assessment of what-if scenarios and yet-to-be-determined improvements. As noted previously, federal appropriations to the PNRS program ended in 2013, and future allocations or commitments are uncertain. However, a brief review of previous allocations revealed six PNRS projects[8] of interest in terms of their potential to influence freight activities around the Delmarva Peninsula, including:

- Liberty Corridor (8-County Region in New Jersey)
- Cross Harbor Freight Movement Project (New York, New York)
- US 422 Widening and Interchange Improvements (Montgomery County, Pennsylvania)
- I-80 Interchange Improvements (Monroe County, Pennsylvania)
- Rail Relocation to Route 164/I-64 Rail Corridor (Portsmouth and Chesapeake, Virginia)
- Heartland Corridor Intermodal Freight Facility Improvements (Virginia, West Virginia, Ohio)

Additional long-term projects or developments that are not currently assumed to be programmed with committed funding may be re-visited during the scenario planning analyses and development of recommendations that will be detailed in subsequent chapters of this plan. Potential projects may be drawn from longer-term commitments, lists of aspirations, or possible TIGER proposals that may be identified by the various state and local/regional planning agencies and long-range transportation plans.

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[8] http://ops.fhwa.dot.gov/freight/policy/rpt_congress/pnrs12rptcong/index.htm.

Exhibit 5.3 – Future Project Commitment Assumptions on the Delmarva Peninsula (Map)

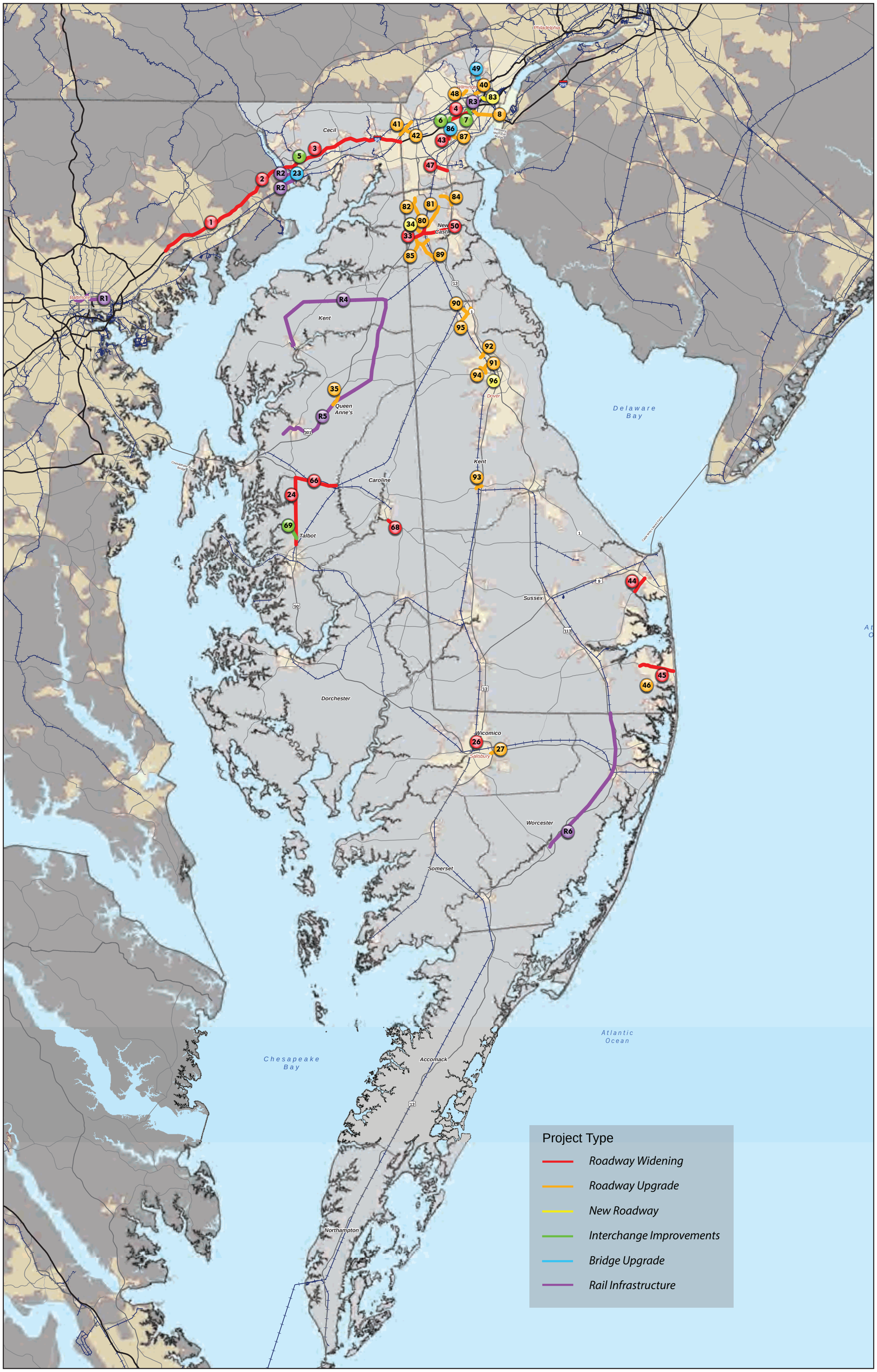


Exhibit 5.4 – Future Project Commitment Assumptions on the Delmarva Peninsula (Table)

Map ID	Route	Project Type [a] and Description		State (County)	Source [b]
Interstate Routes					
1	I-95	WID	Reconstruct and widen I-95 - MdTA Section 200	MD (Baltimore / Harford)	3
2	I-95	WID	Reconstruct and widen I-95 - MdTA Section 300	MD (Harford / Cecil)	3
3	I-95	WID	Reconstruct and widen I-95 - MdTA Section 400	MD (Cecil)	3, 5 (LT)
4	I-95	WID	I-95 / SR 1 to SR 141 - Widening to Add 5th Lane	DE (New Castle)	1
5	I-95	INT	I-95 / Belvedere Road New Interchange	MD (Cecil)	3
6	I-95	INT	I-95 / SR 1 Interchange Ramp	DE (New Castle)	1
7	I-95	INT	I-95 / US 202 Interchange Ramp	DE (New Castle)	1
8	I-295	UPG	I-295 Improvements, I-95 to Memorial Bridge	DE (New Castle)	1
US Routes					
23	US 40	BRG	MDTA Thomas J. Hatem Memorial Bridge (ORT lanes w/ truck capability)	MD (Cecil)	4
24	US 50	WID	Reconstruct and widen US 50 - MD 404 to MD 322	MD (Talbot)	3
26	US 50	WID	Construct an additional lane from US 50 onto Salisbury Bypass	MD (Wicomico)	4
27	US 50	UPG	US 50 at US 13 (Signalize US 50 WB off-ramp and improve US 13 NB weave)	MD (Wicomico)	4
33	US 301	WID	US 301, Peterson Road to Levels Road	DE (New Castle)	1
34	US 301	NEW	US 301, MD State Line to SR 1 (Mainline)	DE (New Castle)	1, 5 (ST)
35	US 301	UPG	US 301 Bay Country Rest Area - Truck Parking	MD (Queen Anne's)	4
DE State Routes					
40	DE 2	UPG	SR 2, SR 100 to Broom Street	DE (New Castle)	1
41	DE 2	UPG	SR 2, Elkton Road, MD Line to Casho Mill	DE (New Castle)	1, 5 (ST)
42	DE 4	UPG	SR 4, Christina Pkwy, SR 2 to SR 896 (eastbound)	DE (New Castle)	1, 5 (ST)
43	DE 7	WID	SR 7, Newtown Road to SR 273	DE (New Castle)	1
44	DE 24	WID	SR 24, SR 1 to Love Creek	DE (Sussex)	1
45	DE 26	WID	SR 26, SR 1 to Omar Road	DE (Sussex)	1
46	DE 54	UPG	SR 54 Improvements (Center Left Turn Lane)	DE (Sussex)	1
47	DE 72	WID	SR 72, McCoy Road to SR 71	DE (New Castle)	1, 5 (ST)
48	DE 141	UPG	SR 141, Kirkwood Highway to Faulkland Road	DE (New Castle)	1
49	DE 141	BRG	Tyler McConnell Bridge, SR 141, Montchannin Rd to Alapocas Rd	DE (New Castle)	1, 5 (MT)
50	DE 299	WID	SR 299, SR 1 to Catherine Street	DE (New Castle)	1, 5 (ST)
MD State Routes					
66	MD 404	WID	Upgrade existing MD 404 to a 4 lane divided highway with access control from US 50 to MD 404 Business	MD (Queen Anne's / Talbot)	4
68	MD 404	WID	Reconstruct and widen MD 404 - Queen Anne's Co. line to MD 404 Bus	MD (Caroline)	3
69	MD 662	INT	Intersection and capacity improvements - MD 662 at US 50 / MD 309	MD (Talbot)	4

Exhibit 5.4 – Future Project Commitment Assumptions on the Delmarva Peninsula (Table Continued)

Map ID	Route	Project Type[a] and Description[b]		State (County)	
Other Routes					
80	Other	UPG	Bunker Hill Road, Choptank Road to US 301	DE (New Castle)	1
81	Other	UPG	Cedar Lane Road, North Broad Street to SR 896	DE (New Castle)	1
82	Other	UPG	Choptank Road, Bunker Hill Road to Bethel Church Road	DE (New Castle)	1
83	Other	NEW	Christina River Bridge	DE (New Castle)	1, 5 (ST)
84	Other	UPG	Hyetts Corner Road, Jamison Corner Road to US 13	DE (New Castle)	1
85	Other	UPG	Levels Road, Strawberry Lane to US 301	DE (New Castle)	1
86	Other	BRG	Road A Bridge	DE (New Castle)	1
87	Other	UPG	School Bell Road, SR 7 to US 13	DE (New Castle)	1
88	Other	UPG	St. Anne's Church Road, Levels Road to SR 71	DE (New Castle)	1
89	Other	UPG	Wiggins Mill Road, St. Anne's Road to Pine Tree Road	DE (New Castle)	1
90	Other	UPG	Carter Road, SR 300 to Sunnyside Road	DE (Kent)	1
91	Other	UPG	College Road, SR 15 to Kenton Road	DE (Kent)	1
92	Other	UPG	Denny's Road, McKee Road to US 13	DE (Kent)	1
93	Other	UPG	Harrington Truck Route, SR 14 to US 13	DE (Kent)	1
94	Other	UPG	Kenton Road, SR 8 to Fire School Road	DE (Kent)	1
95	Other	UPG	Sunnyside Road, US 13 to SR 300	DE (Kent)	1
96	Other	NEW	West Dover Connector, North Street to US 13	DE (Kent)	1
Rail Infrastructure					
R1	Amtrak	RRI	Improve clearance, alignment, and grade through B&P and Union Tunnels, FRA Tunnel Study Phase 2	MD (Baltimore City)	3
R2	Amtrak	RRI	Rehabilitate bridge over Susquehanna River	MD (Baltimore)	3
R3	Amtrak	RRI	Yard to Ragan Interlockings - New Third Track	DE (New Castle)	2
R4	MDDE	RRI	286k rail upgrade - Massey to Worton	MD (Kent)	3
RS	MDDE	RRI	286k rail upgrade - Massey to Centreville	MD (Queen Anne's)	3
R6	MDDE	RRI	286k rail upgrade - Snow Hill Line, Frankford to Snow Hill	DE/MD (Sussex / Worcester)	3

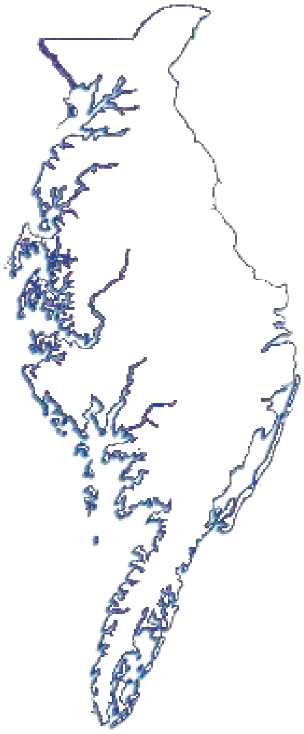
[a] **Project Type:**
WID = Roadway Widening
UPG = Roadway Upgrade
NEW = New Roadway
INT = Interchange Improvement
BRG = Bridge Upgrade
RRI = Rail Infrastructure

[b] **Project Sources:**
1. Delaware Long Range Transportation Plan, 2010
2. Northeast Corridor Infrastructure Master Plan
3. Maryland Statewide Freight Plan, 2009
4. Maryland Freight Implementation Plan, April 2012
5. WILMAPCO 2040 Regional Transportation Plan Project List (ST/Short-Term; MT/Medium-Term; LT/Long-Term)

Delmarva Freight Plan

Chapter 6

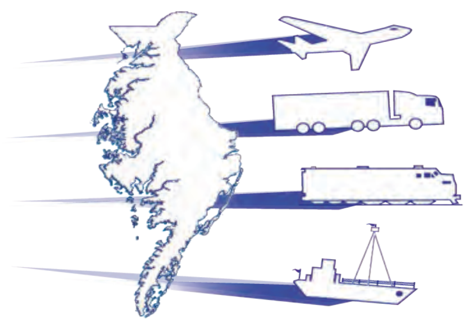
Freight Trends, Needs, & Issues



Chapter 6

Freight Trends, Needs & Issues

This chapter serves as a transition from identifying the current state of the Peninsula's freight and goods movement system and related trends, needs, and issues, to preparing for a detailed assessment of that system and potential improvement scenarios in the latter half of this plan. This transition includes a high-level summary of key areas of concern and areas of opportunity, as well as a more detailed look at unique issues within focus areas corresponding to the plan's categorical goals that include:



- Economic Vitality
- Freight Connectivity, Mobility, and Accessibility
- Safety and Security
- System Management, Operations, and Maintenance
- Sustainability and Environmental Stewardship

6.1 Key Areas

Broadly based on stakeholder insights and background document reviews, freight planning issues for the Delmarva Peninsula can be grouped into key areas of concern or areas of opportunity (*Exhibit 6.1-Exhibit 6.2*). Areas of concern generally reflect mode-specific issues, needs, or questions surrounding major freight movements or freight hubs, specific components of the freight transportation infrastructure, or freight-related policies. Areas of opportunity generally reflect business and industry issues or other economic development trends, including the potential for economic expansion or the potential for "missed" market opportunities depending on the robustness of the available freight and goods movement system.

Areas of Concern

Motor Freight: As the dominant mode of freight transportation, planning efforts to maintain or improve the efficiency, connectivity, safety, and cost-effectiveness of motor freight truck travel are clearly justified. Specific motor freight issues include:

- Highway-rail grade crossings and an emphasis on safe and efficient access for all users
- Seasonal or tourist-based congestion and related conflicts with (or impacts to) freight traffic
- Secondary road or bridge conditions and required first/last mile freight access
- Fuel taxes, toll rates, or weight limits and any freight impacts of inconsistencies across states
- Parking and rest areas with adequate capacity and services to support freight traffic

Exhibit 6.1 – Summary Freight-Related Areas of Concern

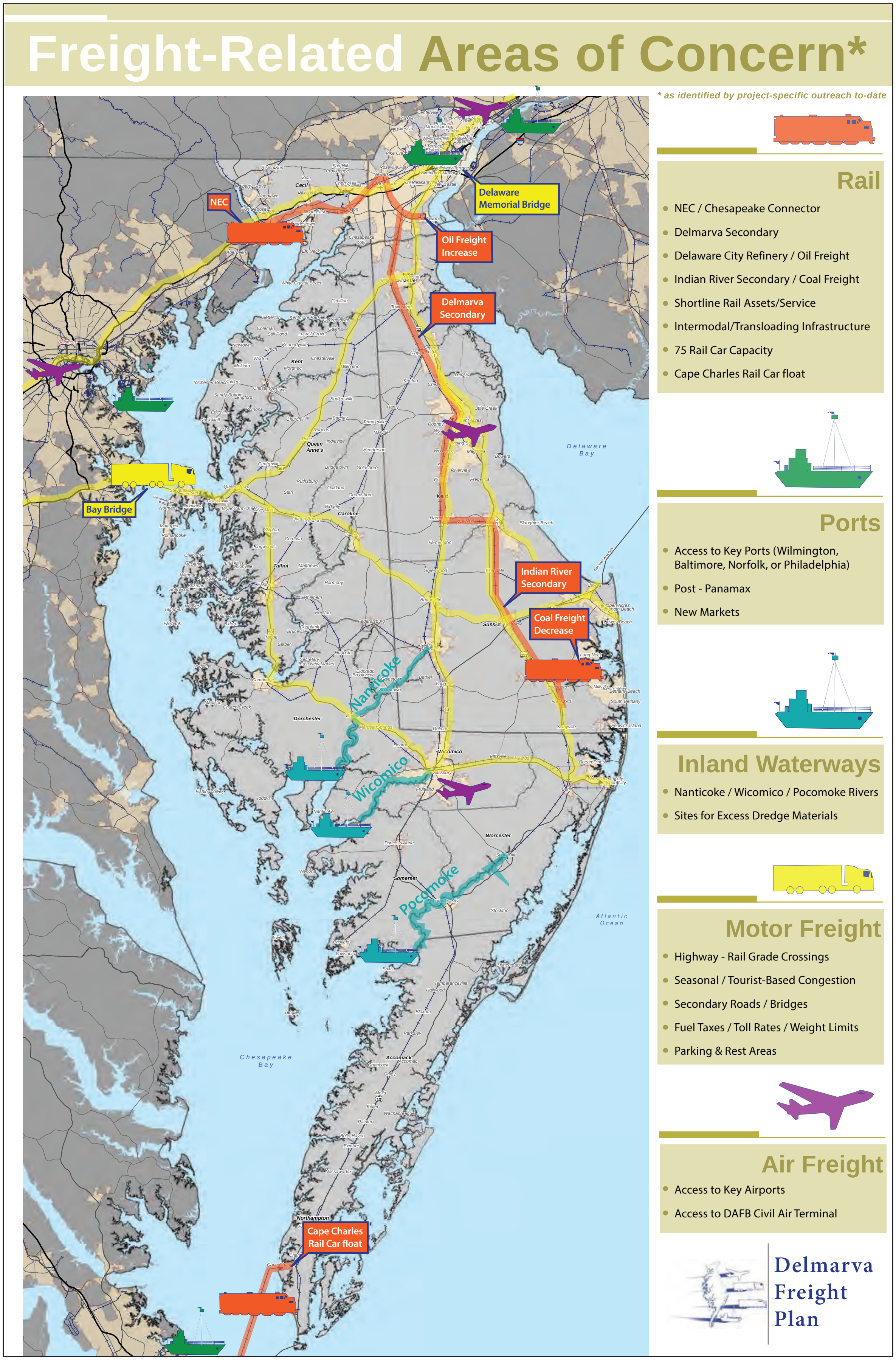
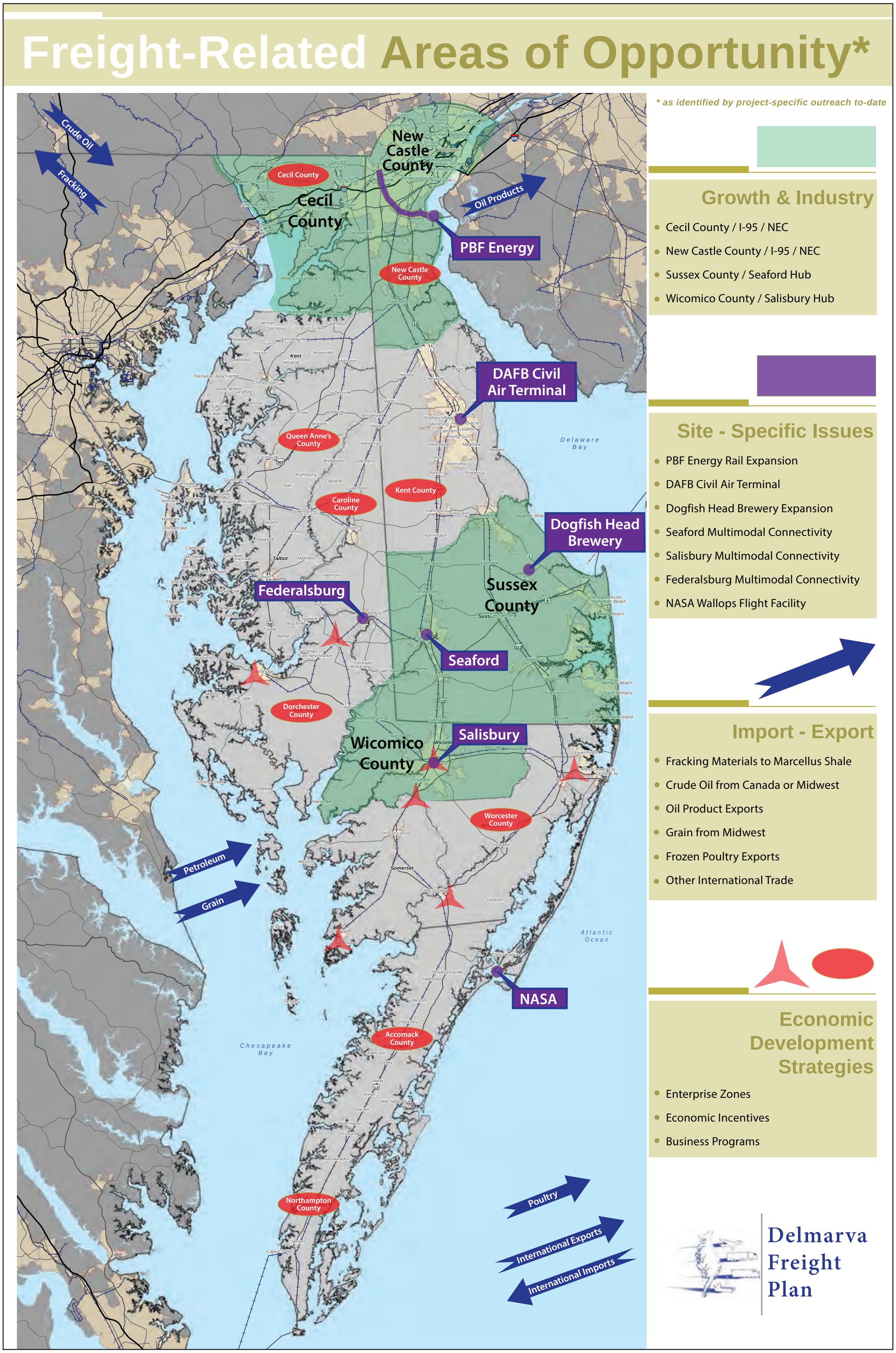


Exhibit 6.2 – Summary Freight-Related Areas of Opportunity



Rail: As a critical mode for the transport of petroleum, coal, grain, stone, and several other key commodities, and particularly in the face of ongoing changes in natural resource and energy production markets, there is an apparent need to maintain and enhance the region's rail infrastructure to help ensure continued access to safe, cost-efficient rail service. Specific rail freight issues include:

- NEC rail freight delays or access constraints
- Chesapeake Connector project emphasis and potential benefits
- Delmarva Secondary operations or cost-efficiencies in light of potential coal freight reductions
- Indian River Secondary operations and the direct impact of potential coal freight reductions
- Delaware City Refinery and the direct or indirect impacts of increased oil freight railcars
- Preservation of short line rail assets and service
- Need for increased intermodal and transloading infrastructure
- 75 railcar capacity and related issues pertaining to access, cost efficiencies, or economies of scale
- Cape Charles Rail Car Float and potential system redundancy or resilience needs

Ports: Vital to international imports/exports as well as major economic influences and supply chains, port interests and related freight planning efforts center on issues such as:

- Efficient access to key ports including Wilmington, Baltimore, Norfolk, or Philadelphia
- Effect of Post-Panamax traffic on freight volumes or patterns on/around the peninsula
- New import/export market opportunities and related effects on overall freight traffic

Inland Waterways: As an effective means for transporting petroleum, grain, aggregates, or other commodities, barge movements are a crucial multimodal link in key regional supply chains. Inland waterway issues appear to center on appropriate funding, scheduling, and logistical support for dredging and channel maintenance, including:

- Dredging for continued access along the Nanticoke, Wicomico, and Pocomoke Rivers
- Dredging for continued operation of the C&D Canal
- Identification of suitable sites for excess dredge materials

Air Freight: Transport of typically high-value, time-sensitive shipments by air fulfills a unique role in the overall freight and goods movement system. Local air freight considerations include a focus on:

- Access to major air hubs just outside the peninsula (e.g., Baltimore, Philadelphia)
- Access to key airports and business/corporate activities on the peninsula
- Access and development opportunities for Dover AFB Air Cargo Ramp

Areas of Opportunity

Growth and Industry: Economic insights indicate that much of the anticipated future growth opportunities will overlap with existing developed areas and business/industry hubs. Key areas span the following:

- New Castle, Kent, and Sussex Counties in Delaware
- Cecil and Wicomico Counties in Maryland
- Emphasis along the I-95/Northeast Corridor
- Emphasis around localized hubs including Seaford, Delaware; and Salisbury, Maryland

Economic Development Strategies: As an effort to bolster local economies, counties and cities across the peninsula offer various incentives to spur development, employment, and innovation. Thus, in addition to the geographical areas noted above, future growth opportunities may overlap any designated Enterprise Zones, HUB Zones, or other areas offering such incentives or business programs (detailed per *Chapter 2*).

Site-Specific Issues: In addition to general growth activity, site-specific opportunities and direct/indirect development impacts are anticipated in various locations including, but not limited to, the following:

- PBF Energy's expansion of refining operations and related rail-traffic at Delaware City Refinery
- Potential development opportunities for DAFB Air Cargo Ramp (formerly Civil Air Terminal)
- Dogfish Head Brewery expansion in Milton, Delaware
- Seaford, Delaware, hub activities and multimodal truck/rail/water opportunities
- Salisbury, Maryland, hub activities and multimodal truck/rail/water/air opportunities
- Federalsburg, Maryland, hub activities and multimodal truck/rail opportunities
- NASA Wallops Flight Facility and potential space/aerospace or related technology influences

Import/Export Activities: Recent or potential future changes in import/export opportunities link the peninsula with broader supply chains at the regional, national, and international levels. Unique interests include, but are not limited to, the following:

- Export of fracking sand, chemicals, etc., to Marcellus or other shale oil/gas extraction areas
- Import of crude oil from Canada, North Dakota, or other Midwest areas
- Export of oil products domestically or internationally via expanded regional refinery operations
- Import of grain from Midwest or other areas in support of poultry or agribusiness expansions
- Export of frozen poultry products to international markets
- Other international trade increases or changes in trade patterns via local/regional port access

6.2 Economic Vitality

Delmarva's Economic Vitality goal overlaps national freight policy guidance to improve the contribution of the freight transportation system to economic efficiency, productivity, and competitiveness. Focus areas on the peninsula include efforts to ensure mode choice and competition; preserve land use compatibility adjacent to freight infrastructure; recognize growth areas and secondary traffic/population-based freight patterns; support specific economic activities or targeted industries; and enhance regional port access.

Supply Chain Positioning

Chapters 2 and 3 of this plan devoted much attention to the economic details that drive freight movements on the peninsula and overarching highlights are again listed here. These perspectives are exceptionally important in terms of informing the overall freight and scenario planning efforts – including future alternatives development, route improvements, modal support, etc. – with respect to broader economic interests and potential benefits in regional supply chain positioning.

System Efficiencies: Streamlining of transportation regulations, diversification of logistical plans, and support for efficient multimodal options and multimodal geographical hubs are anticipated to become even more critical for the ongoing economic and trade potential of the region.

Growth Opportunities: Industry-specific growth opportunities – such as expansion in agribusiness or chemical products, promulgation of Delmarva agriculture and value-added food products, or growth in international trade through regional ports – require an efficient and well-maintained multimodal transportation system to minimize the potential for "missed" opportunities.

Core Commodity Groups: Though the specific types of freight moving in the region vary widely, five core commodity groups make up almost two-thirds of the peninsula's freight, including petroleum or coal products, secondary traffic, farm products, food or kindred products, and chemicals or allied products.

Key Supply Chains: Exceptional supply chain interests generally encompass the peninsula's top commodity groups and span energy, agriculture, poultry and agribusiness, food products, chemical products, and retail industries, as well as construction, transportation equipment, and manufacturing industries.

Land Use Issues

Land Use Compatibility: Land use policies, decisions, and related factors influence the potential relationships or conflicts that may occur between existing/future developments and the freight movements that must serve or pass by the local communities. In support of economic growth and development opportunities, state and regional planning interests include the preservation of critical freight infrastructure and freight-oriented land uses in key industrial areas and adjacent to rail corridors.

Local Land Use Decisions: Despite state and regional interests, land use decisions typically fall under the jurisdiction of county or municipal governments that are not aware of or do not give priority to freight interests. Local decisions, therefore, may lead to residential encroachment or land use incompatibilities in freight-critical areas that slowly erode the feasibility or local economic benefits of operating or expanding freight-centric industries in those areas. Such decisions may also increase residential and freight community conflicts, both real and perceived, often based on unrealistic expectations from one or both sides of the issue with regard to noise, aesthetics, truck or rail traffic impacts, etc.

Delaware Land Use Oversight: Delaware specifically is a Home Rule state, and DelDOT does not have jurisdiction over local land use decisions with the exception of certain authorities under State Code to help prevent runway obstructions in public use airport areas. Both DelDOT and WILMAPCO have a particular interest in preserving land use compatibility along critical rail freight corridors but, in areas such as New Castle County, have found these issues to be challenging.

Maryland Land Use Oversight: Maryland land use decisions are likewise determined by the individual counties, though with guidance from the Maryland Department of Planning and its Plan Maryland document. Successes in protecting industrial land from residential encroachment have been achieved. For example, in Baltimore City's recent zoning overhaul, a Maritime Industry Zoning Overlay District was preserved, thus protecting industrial land uses around the Port of Baltimore.

Hidden Impacts

Freight-Dependent Industry Migration: There is concern regarding a general migration of freight-dependent businesses off the peninsula, as some counties opt to focus more on non-freight related economic development (i.e. health care, biotech, tourism and recreation). Coupled with changes in freight markets, such migration elevates fears regarding the viability of certain freight services. For example, in order to sustain cost-efficient rail services and justify reinvestments in rail infrastructure, there is a need for additional businesses throughout the region that are reliant on rail transportation.

Reduced Modal Options: Aging infrastructure, maintenance needs, funding constraints, land use conflicts, or similar factors that may negatively affect any existing mode of freight transportation on the Peninsula could have serious implications on the area's broader economic prospects. In the peninsula's rail network, for example, the Seaford Swing Bridge has been identified as essential to NS Delmarva operations, yet the bridge is well over 100 years old with questionable track structure, electronics, and technology. In the peninsula's water network, there are ongoing concerns regarding inadequate dredge funding, a failure to secure sites for excess dredge materials, or delayed completion of channel maintenance. Failures or shortcomings in the existing rail or water networks could reduce or eliminate rail or barge travel along portions of the overall freight transportation network, resulting in immediate impacts to local businesses and supply chain. A short-term increase in truck traffic and related conflicts would be inevitable, and a potential long-term impact of reduced or relocated economic opportunities would be likely.

6.3 Freight Connectivity, Mobility and Accessibility

Delmarva's Freight Connectivity, Mobility, and Accessibility goal overlaps national freight policy guidance to reduce congestion on the freight transportation system. Focus areas on the peninsula include efforts to recognize broader mobility improvements in light of the region's unique seasonal or tourist-based congestion patterns; enhance connectivity to/from the peninsula as a region with limited geographical points of access; and support strategic multimodal improvements to broaden freight system accessibility and efficiency.

Network Connectivity

Primary Freight Network (PFN): The draft initial designation of MAP-21's PFN includes very limited coverage on the Delmarva Peninsula, capturing only the interstate system through Cecil and New Castle Counties, and US 50/301 entering via the Chesapeake Bay Bridge (see details per *Exhibit 4.3)*. As such, it is vital that each state, in cooperation with area stakeholders and planning partners, diligently self-define the critical components within the region's multimodal freight system.

Peninsula-Specific Freight Network: Separate from federal PFN designations, effective planning must focus on a more complete version of the overall peninsula-specific freight network. This Delmarva Freight Plan lays the groundwork for such a network by broadly defining major north/south and east/west corridors, local freight zones, and freight gateways (see *Chapter 4*and *Exhibit 4.26-Exhibit 4.32*).

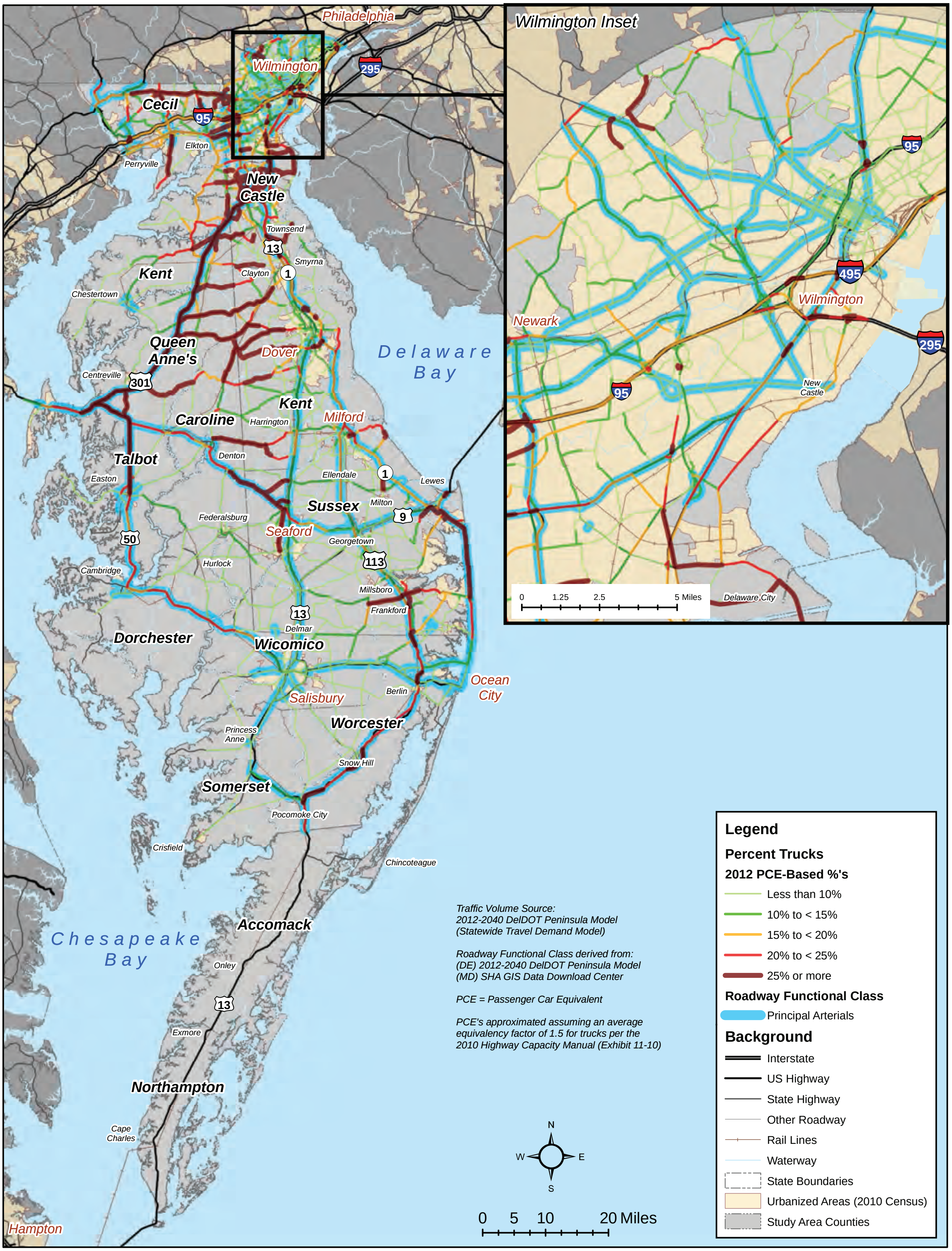
Critical Rural Freight Corridors (CRFC): States may designate CRFC routes based on criteria specified under Section 1115 of MAP-21 (see details per *Chapter 4*). These criteria consider truck percentages along rural principal arterials, access to energy areas, and other connectivity issues relative to substantial freight generating facilities. A cursory review of estimated truck percentages (*Exhibit 6.3*) indicates that some rural segments along the following principal arterials may meet the 25% truck criteria required for CRFC designation:

- US 50 (between the Bay Bridge and Salisbury)
- US 301 (between the Bay Bridge and Middletown)
- MD/DE 404 (between the Bay Bridge and Seaford)
- US 113 (between Frankford and Pocomoke City)

Other Rural Truck Routes: Stakeholder feedback generally noted that truck traffic appears to overload the area's rural roads. Such concerns likely stem from trucks serving the peninsula's expansive agriculture, poultry, and food products industries, coupled with several east/west rural connections (e.g., between US 301 and US 13/DE 1), service to and from local freight zones (see previous *Exhibit 4.26*), or first/last mile travel to specific freight generating sites. Such routes include a mix of minor arterials, collector roads, and local roads that, barring the presence of major local freight generators or very specific connectivity issues, would not typically qualify for CRFC designation. Rural routes that carry a higher proportion of trucks (*Exhibit 6.3*) include:

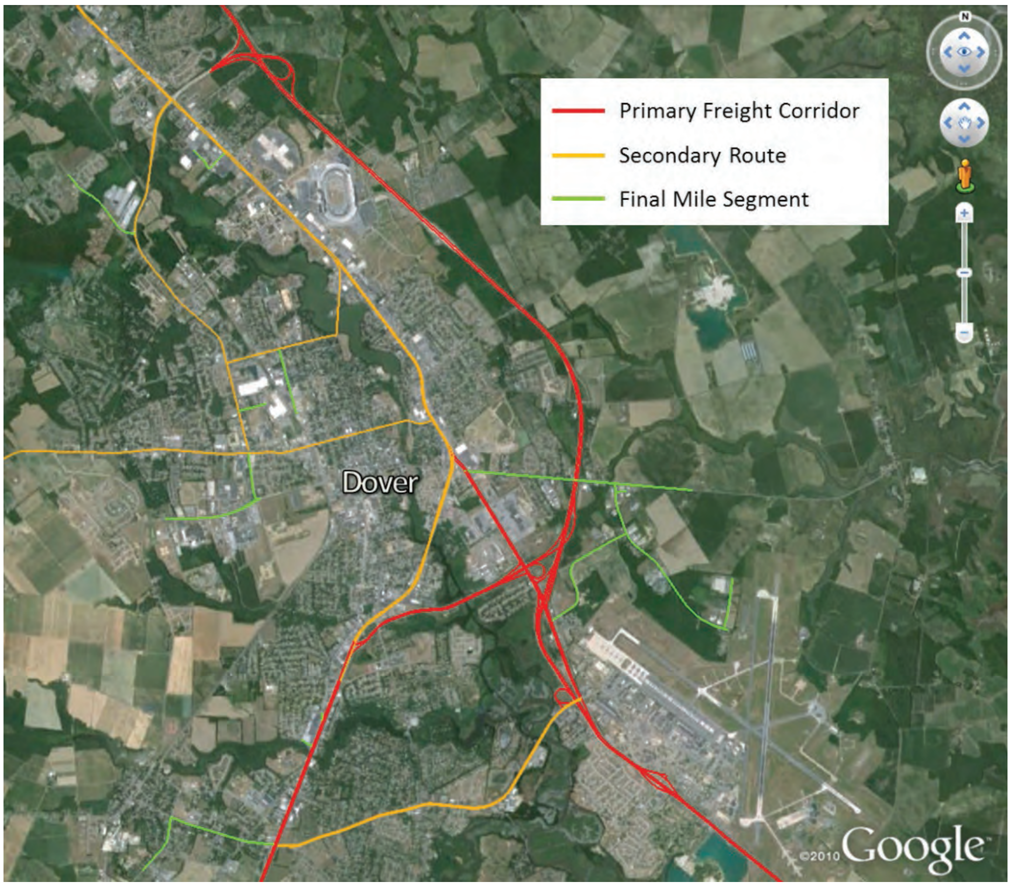
- MD 213/290 and Sassafras Caldwell Rd/Caldwell Corner Rd (between Galena and Townsend)
- MD 291 and DE 6 (from US 301 toward Clayton and Smyrna)
- MD 300 and DE 300 (from US 301 toward Smyrna)
- MD 302 and DE 8/11/44 (from US 301 toward Smyrna/Dover)
- MD 304/311 and DE 10 (from US 301 toward Dover)
- MD 317 and DE 14 (from MD 404 toward Harrington)
- DE 36 (from DE 404 toward Greenwood)
- DE 26 (from DE 30 toward Dagsboro)

Exhibit 6.3 – Estimated 2012 Truck Percentages (in Passenger Car Equivalents)



First/Last Mile Facilities: At a more detailed-level and in a manner that will supplement the corridor-based perspectives referenced above, WILMAPCO has recently undertaken a focused effort toward inventorying critical first/last mile facilities (also referred to as "final mile" segments) throughout Delaware (*Exhibit 6.4*). These facilities often include lesser routes (i.e., collectors or local roads versus interstates or arterials) on which freight/passenger vehicle conflicts and negative public perception of truck traffic may be much greater while regular maintenance activities, geometric design standards, or the potential for roadway or safety improvements may be much lower. Each connection, however, is necessary for local businesses and industries to survive. WILMAPCO's inventories will help to further an understanding of the locations, roles, needs, and importance of the area's first/last mile facilities.

Exhibit 6.4 – Sample WILMAPCO First/Last Mile Inventory (Dover Area)



Source: WILMAPCO Statewide Freight Priority Network (DRAFT);
http://www.wilmapco.org/delmarva/

Multimodal/Intermodal Connections: While the peninsula offers a broad selection of modal options, some stakeholder feedback indicated that the existing infrastructure is not entirely accommodating in terms of switching between modes or fostering competition between different modes. For example:

- Local drayage services and linkages for rail or airborne cargo may be needed.
- Multimodal truck/rail/water transfer options may be limited.
- Required economies-of-scale may constrain rail access or cost-effectiveness for smaller industries.
- Rail schedules and delays may not be conducive to time-sensitive or perishable product deliveries.

Traffic Congestion

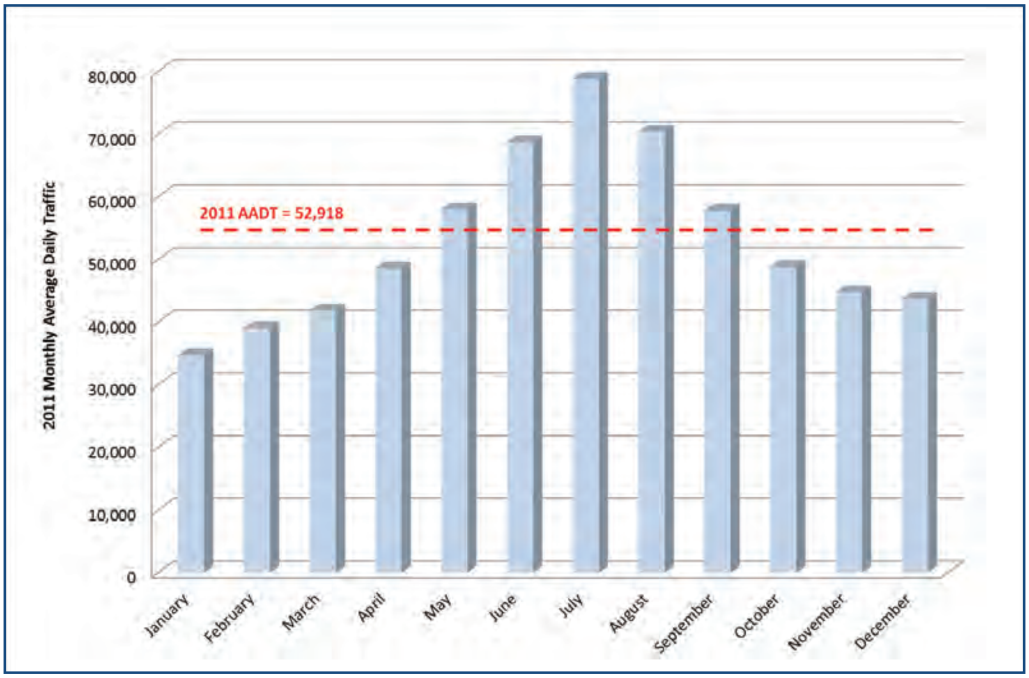
General Traffic Congestion: Though DelDOT, MDOT, VDOT, and many other agencies work tirelessly toward addressing the region's worst congestion issues, the flow of goods movement is inevitably affected by recurring congestion (i.e., peak period commuter or peak seasonal tourist traffic) as well as non-recurring congestion (i.e., related to construction, traffic incidents, or special events). While not exclusive to urban areas, urban area congestion is often worse due to higher traffic volumes, more prevalent commuter peaks, bottlenecks near city/town centers, or frequent first/last mile traffic.

Regional Metropolitan Area Congestion: Motor freight entry/exit points for the Delmarva Peninsula are, on a broader basis, associated with travel through or around Philadelphia, Baltimore, Washington, D.C., and Norfolk. These major metropolitan areas each experience their own substantial levels of traffic congestion, construction impacts, crash incidents, major special events, or other factors that influence travel delays or the reliability/predictability of trip planning. Such factors through these major metropolitan areas can, therefore, substantially impact regional freight movements on and off the peninsula, further emphasizing the importance of a broad regional perspective in freight planning.

Urban Area Congestion: Previous exhibits (*Exhibit 4.9-Exhibit 4.12*) demonstrated that pockets of congestion during peak travel periods are, not surprisingly, found in many of the peninsula's urban areas or city/town centers. Notable pockets today include areas feeding the I-95 corridor, the Chesapeake Bay Bridge, and throughout Wilmington-Newark, Dover, and Salisbury. Future congestion is expected to increase in virtually all locations and will additionally impact Townsend, Seaford, and Georgetown, among others. While both recurring and non-recurring congestion will delay first/last mile freight movements and local deliveries, frequent delays may also contribute to undesirable truck diversions to secondary or local routes as drivers attempt to avoid congestion along main roads. Incident-related congestion that results in closures or detours may also have significant implications on freight routing, again diverting trucks to less than ideal corridors and potentially increasing conflicts with other business or residential areas.

Peak Seasonal Conflicts: Tourism is a major industry on the peninsula, and peak season traffic can more than double in some locations versus off-season flows (*Exhibit 6.5*). Impacts are especially prevalent for major access points at the Chesapeake Bay Bridge or along I-95, and along primary routes to coastal resort areas from Lewes, Delaware to Ocean City, Maryland. Increased traffic volumes and congestion directly obstruct freight movements, while increased consumer demands and a higher seasonal population require more goods to be delivered. Such issues affect both pass-thru and peninsula-bound freight along regional and local corridors; likely influence broader logistics, warehousing, or inventory tactics; and affect first/last mile deliveries in the resort areas (e.g., food, beverage, or propane deliveries delayed in beach traffic).

Exhibit 6.5 – Sample Peak Season Traffic Variation (along DE 1)



Source: DelDOT Traffic Summary 2011; ATR Station 8076 (DE 1 North of Ocean Outlets); www.deldot.gov

Time Sensitive Commodity Impacts: Considering the peninsula's expansive agriculture, poultry, and food products industries, excessive congestion is an exceptional concern when it affects freight delivery of time-sensitive or perishable commodities. For example, poultry trucks stuck in summer traffic have contributed to high poultry mortality rates en route to processing.

Passenger Linkages and Conflicts

Northeast Corridor Freight Access Constraints: The freight window for moving Norfolk Southern (NS) freight trains down the Port Road Branch and onto/across the NEC/Amtrak passenger lines is normally restricted to hours between 10:00 PM and 6:00 AM. Additional speed restrictions and unscheduled Amtrak maintenance periodically shrink the freight window even further, causing an interruption of NS freight shipments. Delaware and Maryland have been studying a Chesapeake Connector project that would allow for NS trains to cross over Amtrak's lines without interfering with passenger rail movements.

At-Grade Rail Crossing Delays: With the additional rail traffic serving expanded operations at PBF Energy's Delaware City Refinery, periodic train blockages of at-grade rail/highway crossings have increased, including crossings of major travel routes such as US 40/Pulaski Highway. Crossing delays and secondary impacts to traffic access, diversions, or emergency response planning are some of the issues that could occur when 100-car trains are staged in the Newark area. Lengthy delays can also be problematic in light of a Delaware law that allows trains to block crossings for no more than 10 minutes at a time, with some exceptions for emergencies.

Air Cargo Ramp Constraints: Civilian aircraft operations via the Air Cargo Ramp at Dover AFB are constrained by the primacy of the base's heavy-lift military air transport mission. Limited civilian operations can be accommodated via special-use agreements and pre-approvals. However, recent planning concepts have included a potential goal of obtaining full joint-use access for public/civilian air cargo operations in conjunction with an adjacent Kent County AeroPark development.

6.4 Safety and Security

Delmarva's Safety and Security goal overlaps national freight policy guidance to improve related aspects and resilience of the freight transportation system. Focus areas on the peninsula include efforts that recognize the regional/national significance of I-95 and the Northeast Corridor; enhance system redundancy with respect to the peninsula's geographic point of access limitations; and support the unique needs of the regions governmental, military, or international shipping communities.

Safety Planning

Crash Prevention/Mitigation: As noted in Chapter 4 and without substantial post-processing or compilation efforts, differences in how crash data may be reported, tracked, or handled by each state on the peninsula introduce difficulties when attempting to apply the data with respect to freight interests across a multi-state area. However, Delaware, Maryland, and Virginia each maintain a state-specific Highway Safety Improvement Program (HSIP). The HSIP programs focus on identifying and prioritizing safety improvements that will reduce highway fatalities and severe injuries, and include related efforts for highway-rail grade crossing improvements. Though not a dedicated freight program, HSIP efforts benefit all roadway users including long-haul, short-haul, and first/last mile trucks.

Freight Operations and Technology: Comprehensive coverage of freight-related technology applications such as the Oversize/Overweight (OS/OW) Permit System or CVISN programs help to support safe freight operations and consistent restrictions. Within this realm, stakeholders have expressed a need to enhance and expand the deployment of high-speed weigh-in-motion technology as an alternative means of freight enforcement.

Emergency Planning

Agency Coordination: Stakeholders noted that emergency planning and response span jurisdictional boundaries; and ongoing communications, coordination, data-sharing, or related efforts are essential. Larger-scale incidents such as security threats or cargo aircraft crashes, for example, involve incident response at the state and federal levels including the Delaware TMC or Delaware Emergency Management Agency (DEMA), the Maryland Coordinated Highways Action Response Team (CHART) or Maryland Emergency Management Agency, the FBI, Dover AFB, or Homeland Security.

Evacuation Planning: Local and broader-scale state or regional evacuation plans are important for select locations or scenarios, as are freight impacts or influences including post-incident supply or recovery operations. Examples include hurricane evacuation planning for coastal areas, or nuclear plant evacuation planning such as for nearby Salem, New Jersey.

First-Responder Capabilities: Maintaining and enhancing incident first-responder capabilities are ongoing exercises that must also consider the changing nature of commodity types or patterns throughout the region. Key commodities and anticipated growth areas include a variety of petroleum products, chemical products, or related hazardous materials. Additional freight traffic, such as railcars to the Delaware City Refinery, may also increase incident-related risks or conflicts if not properly addressed.

Land Use Considerations: From a land use perspective, an increase in freight traffic or freight-related conflicts and delays may affect normal travel times within a community as well as emergency response times or routes and, therefore, may require community-specific mitigations. Flooding, storms, or other natural disasters may also trigger freight detours or contingency plans that in turn influence the local land use environment. Emergency response plans for hazardous material incidents or potential man-made disasters (e.g., terrorist attacks) may also require customization based on the local land use environment.

Hazardous Materials

Site-Specific Hazardous Material Issues: Where freight activities involve hazardous materials, planning efforts should continue to monitor and enhance emergency response efforts. Such issues may focus on cargo routing for Dover AFB, the barging of oil and other refined products out of Delaware City, or the monitoring of at-grade rail crossing delays versus petroleum rail traffic in New Castle County.

Hazardous Materials Tracking: A partnership with security authorities for tracking of hazardous materials needs to be established considering social and environmental exposure, natural and man-made disasters, anticipated disruptions of traffic and business, and related economic impacts.

Security Screening: Exploration of public-private partnership opportunities may help to identify trade-offs, cost benefits, or other interests relative to increasing route or mode options and security screening for the transportation of hazardous materials.

Homeland Security

Agency Coordination: With the potential scope of homeland security, it is important that freight planning, implementation, or management/operations efforts be cognizant of (and coordinated with) broader security interests where applicable. Coordination may involve state enforcement and protection agencies or federal agencies such as the Department of Homeland Security (DHS), the Nuclear Regulatory Commission, or Dover AFB. Broader requirements or restrictions may impact routing, tracking, licensing, monitoring, or enforcement of transporters of certain types of materials.

Cargo Security and Inspection: With an international port and air presence, cargo security and screening in relationship with the DHS's U.S. Customs and Border Protection (CBP) or Immigration and Customs Enforcement (ICE) agencies are essential. Issues range from basic cargo theft prevention or agricultural screening to broader security interests (e.g., combatting terrorist threats) or humanitarian issues (e.g., human smuggling/trafficking or pandemic threats). From a freight planning and infrastructure perspective, industry-wide research includes a focus on transportation operations, ITS technologies, or other cost-effective mechanisms that state DOTs may be able to use to support security-related efforts.[1]

Asset Protection: An improved understanding of freight movements, key transportation infrastructure, pinch points, or critical systems will help to inform regional asset protection and risk assessments, thus benefitting emergency or security planning efforts by local, state, and federal agencies.

6.5 System Management, Operations and Maintenance

Delmarva's System Management, Operations, and Maintenance goal overlaps national freight policy guidance to use advanced technology, performance management, innovation, competition, and accountability in operating and maintaining the freight transportation system while also improving its state of good repair. Focus areas on the peninsula include efforts to enhance policies affecting truck parking and rest areas, weight limits, taxes, tolls, or other motor freight issues; address physical improvements on secondary roads and bridges critical to first/last mile connections; and support dredging operations and the preservation of suitable sites for excess dredge materials.

[1] Transportation Research Board (TRB) Subcommittee ABE40-2 – Risk and Resilience Assessment and Planning; TRB Research Needs Statement: The Role of Transportation Operations and ITS Technologies in Supporting Homeland Security and Humanitarian Affairs, December 2013, http://rns.trb.org/dproject.asp?n=35885.

Jurisdictional Relationships

Land Use in Operations Planning: Land use and freight traffic relationships are important in terms of advanced planning for everyday system operations as well as unexpected circumstances. For example, rail crossing delays, truck loading and deliveries, or first/last mile traffic can be influenced by, or can influence, local land use and business activities, potentially affecting the economic potential of an area if conflicts frequently exist. The local land use environment must also be considered in the development of emergency response or contingency planning for unusual events such as floods or storms, hazardous material incidents, or man-made disasters. Ongoing coordination and communication between planning partners and stakeholders, and across jurisdictional boundaries, is crucial to maintaining positive relationships and mutual benefits between freight and land use.

Infrastructure Ownership: As certain critical components of the overall freight transportation system are privately-owned – bridges owned by railroads, for example – or span different agency jurisdictions, broad cooperative planning efforts and potential public/private partnership solutions are needed.

Management Needs: To keep pace with anticipated freight growth and the rapid integration of operations and planning in regards to the use of ITS, there is a perceived need at the management level for a more integrated and strategic alignment of statewide activities and other public/private partners to improve and expand freight-related efforts.

ITS Integration: While current state freight-related programs focus on weight enforcement (e.g. CVSIN, Pre-Pass, Virtual Weigh-in-Motion), the ITS component is not fully integrated with operations. The lack of integration creates difficulties in funding freight-related initiatives. Interests include a comprehensive approach in terms of reflecting a better inclusion of performance metrics and policies for rural areas, or for truly capitalizing on freight's potential to enhance the economic vitality of the state and the region.

Proprietary Issues: Technological solutions including ITS and enforcement-related systems are provided by a limited number of companies. The exclusive or proprietary nature of these systems limits the level of open competition that may otherwise help states to negotiate costs or maintenance services.

Truck Policies

Hours-of-Service Impacts: Recent changes in Hours-of-Service (HOS) regulations for truck drivers generally increase constraints on restart limitations, rest breaks, on-duty time, or penalties for motor freight drivers (*Exhibit 6.6*). These changes elevate the importance of providing adequate truck parking, staging, and related access needs in key locations.

Truck Parking Areas: Possible truck parking issues or needs, including additional capacity for overnight truck parking and smaller time frame staging areas, were noted for the following locations:

- In Delaware along the I-95 corridor and any of the east/west routes that connect to I-95
- In Kent County, Delaware
- On Maryland's Eastern Shore near the Chesapeake Bay Bridge
- Along US 301 near the Maryland/Delaware line
- Around Salisbury, Maryland
- In and around the Port of Wilmington[2]
- Along US 13 in Accomack and Northampton Counties, Virginia

[2] WILMAPCO, Port of Wilmington Truck Parking Study, July 2013, http://www.wilmapco.org/truckparking/Port_Final_July14.pdf

Exhibit 6.6 – Summary of Hours-of-Service (HOS) Regulations (as of July 1, 2013)

PROPERTY-CARRYING DRIVERS
11-Hour Driving Limit May drive a maximum of 11 hours after 10 consecutive hours off duty.
14-Hour Limit May not drive beyond the 14th consecutive hour after coming on duty, following 10 consecutive hours off duty. Off-duty time does not extend the 14-hour period.
Rest Breaks May drive only if 8 hours or less have passed since end of driver's last off-duty or sleeper berth period of at least 30 minutes. [49 CFR 397.5 mandatory "in attendance" time may be included in break if no other duties performed]
60/70-Hour On-Duty Limit May not drive after 60/70 hours on duty in 7/8 consecutive days. A driver may restart a 7/8 consecutive day period after taking 34 or more consecutive hours off duty. Must include two periods from 1 a.m. to 5 a.m. home terminal time, and may only be used once per week, or 168 hours, measured from the beginning of the previous restart.
Sleeper Berth Provision Drivers using the sleeper berth provision must take at least 8 consecutive hours in the sleeper berth, plus a separate 2 consecutive hours either in the sleeper berth, off duty, or any combination of the two.

Source: USDOT Federal Motor Carrier Safety Administration; http://www.fmcsa.dot.gov

Local Delivery Restrictions: Truck parking or loading zone access, delivery route or hour restrictions, anti-idling restrictions, or related issues are relevant to discussions in any urban area. Stakeholders have noted specifically that Main Street delivery restrictions in Newark, Delaware, are an issue.

Agricultural Freight: Stakeholders have raised concerns regarding rural agricultural trucks, including questions on how to best balance or manage heavy load freight usage versus roadway/pavement conditions, route planning, tracking needs, regulations, or permitting. It was also noted that a unified permitting process for agricultural trucks does not currently exist between Delaware, Maryland, and Virginia.

Pavement Management

Pavement Management Program: Consideration of heavy vehicle traffic is typically accounted for in pavement management decision-making. In Delaware, for example, the pavement management program reviews all state-maintained non-suburban roads and associated conditions. Known heavy vehicle traffic on roadways being considered for rehabilitation will affect priority rankings on the rehabilitation list, as well as the selection of treatments or materials to help minimize deterioration.

Resilience and System Impacts: Roadway and pavement deterioration versus investments of new construction or maintenance may not be fully analyzed or understood in terms of the resilience of specific structures or the impact on the overall freight transportation system (e.g., in terms of added congestion, detour time, or risk of failure). Such perspectives may help to reduce accelerated deterioration of new or existing pavements and to better manage issues related to permitting, rural truck traffic, heavier trucks, weight limits, or route restrictions.

Recycled Materials: When practical, cost effective, and not detrimental to long-term pavement performance, DelDOT allows specified recycled materials in its roadway construction projects. Locations in need of some structural rehabilitation may also be considered for full-depth reclamation or cold-in-place recycling which utilizes in-place materials to rebuild the roadway structure.

Technologies and ITS

ITS Monitoring for Freight Activity: Transportation operations must begin to include freight ITS systems on a broader corridor or regional perspective for effective monitoring, control, information gathering, and integration with planning and the private sector. Proper monitoring will help to reduce or respond to potential impacts of freight traffic increases including, for example, daily travel delays, detour route issues, or incident/emergency planning approaches.

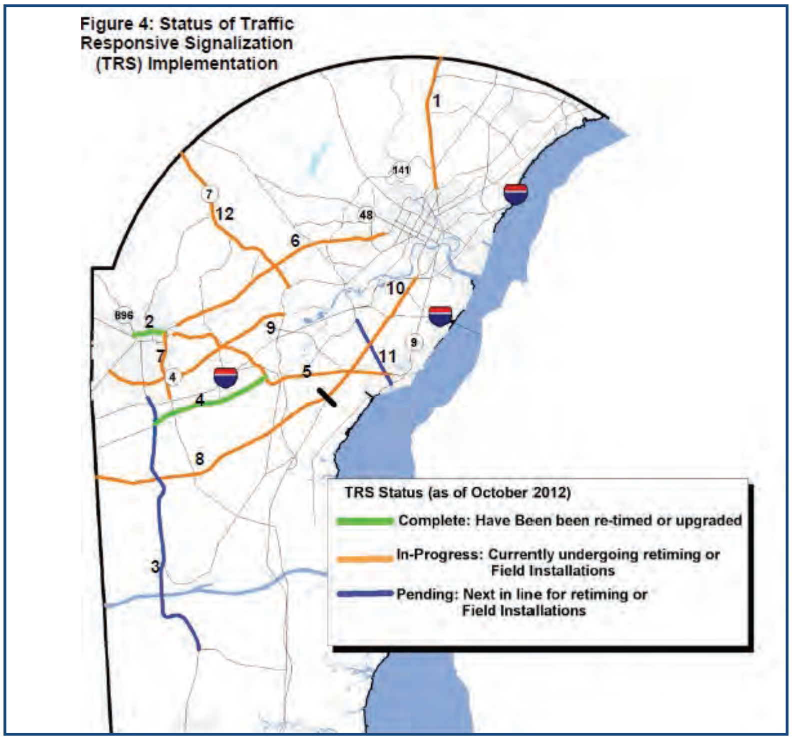
ITS Monitoring for Safety/Security: As previously detailed under Safety/Security discussions, ITS and related technologies support efforts including overweight permitting, security screening, and cargo inspection.

Weight and Safety Enforcement: Stakeholders have noted that continued research and "high speed" technologies are needed for enforcement programs. Specifically in the realm of weight and safety enforcement, DelDOT will be constructing additional Virtual Weigh Stations (VWS) initially located across southern New Castle County, while MDOT has installed VWS technology at several locations along freight routes on the Eastern Shore, including on the Bay Bridge (see previous *Exhibit 4.25*). The added VWS systems will greatly enhance commercial weight and safety enforcement, and programs may expand in the future, potentially capturing, for example, the I-95/495 corridors or portions of Sussex County.

All Electronic Tolling (AET): Freight implications and benefits will also be included in locations under consideration for AET systems. Maryland, for example, is implementing AET on toll facilities owned by MdTA. The US 40 Thomas J. Hatem Memorial Bridge's toll plaza will be the first to have its cash tolls eliminated and replaced with electronic tolling sometime in 2014.

Traffic Responsive Signalization (TRS): TRS is a method of traffic signal management that uses advanced technology (including special signal controllers, traffic sensors, and computer algorithms) to adjust traffic signal timings based on current demands and directional traffic volumes. This method can react to fluctuating traffic volumes in order to reduce signal-related congestion and delays for all vehicles along a corridor, including trucks and related freight or delivery activities. Ongoing efforts through DelDOT, DelDOT's TMC, and WILMAPCO have focused on planning or implementing the latest TRS technologies along several key corridors including, for example, various routes in New Castle County (*Exhibit 6.7*). Future expansions are likely in other areas throughout the state.

Exhibit 6.7 – WILMAPCO Traffic Responsive Signalization Corridors



Source: WILMAPCO Congestion Management System updates;
http://www.wilmapco.org/cms/

Waterway Dredging

Federally-Allocated Funding for Dredging: Funding constraints relative to dredging operations has the potential to dramatically change supply chains and related business, industry, or economic factors. Constraints are particularly challenging for waterways that transport less than one-million tons annually (e.g., the Pocomoke River). Below that threshold, a river falls onto a shortlist of locations competing for scarce leftover (versus designated) federal funds. There is concern that the tonnage-based formula for allocating federal funds can be problematic in that tonnage alone may not truly reflect other major economic drivers such as fishing, tourism, or light-weight special transports (e.g., wind turbine components). Delayed dredging may contribute to a further decline in barge traffic, which further reduces tonnage and subsequently accelerates a downward spiral of additional funding and travel constraints. The Pocomoke River, for example, is thought to be at a critical point for dredging to maintain barge travel that carries a large supply of aggregate materials for state road construction. If such barges were restricted, impacts would include a direct increase in industry costs and truck deliveries, as well as a possible increase in the material costs for future roadway projects.

Excess Dredge Material Sites: Identification of sites to store or dispose of excess dredge materials is crucial to dredging operations along the region's inland waterway systems. Though dredging is a federally-mandated maintenance activity, county agencies are typically responsible for procuring property that will be ready, open, and suitable per USACE requirements to handle the excess dredge materials. Locating suitable sites can be a complicated and time-intensive process. Difficulties include finding sites in close proximity to the planned dredging area, avoiding off-limits wetland areas, and encountering delays or public resistance often related to inflated property values, costly leasing agreements, or environmental concerns based on false or incomplete assumptions. While procurement of a former golf course property has recently provided a longer-term solution for the Nanticoke River, the Wicomico and Pocomoke Rivers and C&D Canal have not been as fortunate. Most recently, agencies have struggled to identify a new site specifically for the lower section of the Wicomico River in time for the 2015 dredging cycle. Technical and programmatic assistance from DelDOT, MDOT, or focused organizations such as DWTC are essential to continuing the excess dredge material site location process.

6.6 Sustainability and Environmental Stewardship

Delmarva's Sustainability and Environmental Stewardship goal overlaps national freight policy guidance to reduce adverse environmental and community impacts of the freight transportation system. Focus areas on the peninsula include efforts to support improvements that balance consumer demands and freight flows with seasonal or tourist-based variability and quality of life; and enhance the flexibility and resiliency of the freight transportation system to meet changing global energy demands or sources.

Air Quality Issues

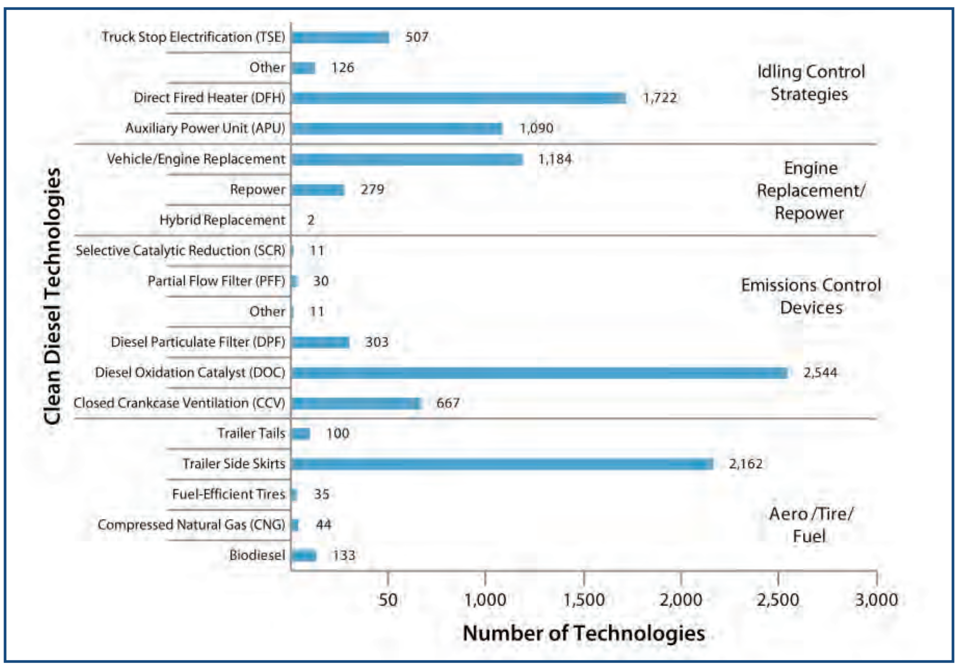
Emissions Control and Monitoring: Stakeholders noted that the Air Quality Control Program and police truck enforcement activities are not fully integrated or equipped in specific locations or facilities to help maximize a reduction of emissions for climate change plans. Additional testing, filters, rest area improvements, or similar may be needed to enhance or expand emissions control and monitoring.

Truck Idling Regulations: Anti-idling efforts aim to reduce truck emissions to the benefit of improving air quality and protecting public health. Each state on the peninsula places different limits on the amount of time a heavy duty motor vehicle may operate when not in motion. Barring special exemptions, idling restrictions range from 3 minutes in Delaware, to 5 minutes in Maryland, to 10 minutes for diesel vehicles (3 minutes for all other vehicles) in commercial or residential urban areas in Virginia.[3]

Truck Stop Electrification (TSE): Stakeholders have supported interest in TSE sites in which drivers utilize fee-based parking/rest area equipment to provide heat, air conditioning, electricity, or other connections for in-cab operations without having to idle the truck engines. TSE facilities are currently in operation along I-95 at the Pilot Flying J Travel Plaza in Elkton, MD; along I-95 at the Delaware Welcome and Travel Center in Christiana, DE; and along US 13 at the Smyrna Rest Area.

Truck Efficiencies: Advancements in truck and fuel technologies are important when considering any environmental or air quality issues as modern truck fleets are continually becoming cleaner. Emission rates for trucks have fallen based on the use of ultra-low sulfur fuels, engine and emissions control technologies, and fleet turnover and modernization efforts. Various clean diesel technologies have also been a recent focus of grant programs administered by the U.S. Environmental Protection Agency (EPA) as part of the Diesel Emissions Reduction Act (DERA) (*Exhibit 6.8*). The U.S. Department of Energy Clean Cities Program has provided grant funding to the Maryland Energy Administration for over 100 idle reduction and energy efficient engine retrofits.

Exhibit 6.8 – Technologies Used in the FY 2009/2010 DERA Grant Program



Source: EPA; Second Report to Congress: Highlights of the Diesel Emissions Reduction Program, December 2012.

[3]American Transportation Research Institute (ATRI); Compendium of Idling Regulations; November 2013; http://www.atri-online.org/research/idling/ATRI_Idling_Compendium

Water Resource Issues

Dredging-Related Issues: While dredging operations and the need to identify suitable sites for excess dredge materials have been noted previously as topical concerns, the placement of excess dredge materials may also encounter water, wetlands, or other environmental issues that are an inherent part of the overall dredge management process.

Spills Control: Spills control on the peninsula is exceptionally critical given the importance of the area's water environments (e.g., the Chesapeake Bay) versus common commodities (e.g., petroleum, petroleum products, chemical products). Specific areas of concern may focus on barge lightering operations in the Delaware River, or on increasing Delaware City refinery traffic.

Sea-Level Rise (SLR): SLR Adaptation Planning on the peninsula has been a focus of several agencies including, for example, the Delaware Department of Natural Resources and Environmental Control (DNREC), the Maryland Commission on Climate Change, or WILMAPCO by way of a July 2011 transportation vulnerability assessment. Planning efforts recognize a need to conduct and track vulnerability assessments of key infrastructure that may be impacted by flooding, inundation, or storm impacts as a result of future sea-level rise. From a multimodal freight perspective, potential infrastructure impacts include critical freight-carrying roadway segments, bridges, low-lying rail lines, tunnels, port facilities, or navigable channels.

Community Issues

Land Use Conflicts: As previously noted under discussions for Land Use Issues, appropriate policies, planning, oversight, and decision-making are important to ensuring land use compatibility between freight and non-freight uses, including existing or future community development activities. Intentionally minimizing potential conflicts and balancing freight, economic, and community needs with a myriad of quality of life issues is not, however, an easy task with a clearly defined path forward.

First/Last Mile Conflicts: As previously noted under discussions for Network Connectivity, first/last mile facilities are necessary for local businesses and industries to survive, but often include collectors and local roads on which freight/passenger vehicle conflicts and negative public perception of truck traffic may be much greater. Likewise, truck access to local communities requires a balancing act of serving main street, school or residential needs while simultaneously accommodating local business/industry access and deliveries that are crucial for community and regional livelihoods.

Port Conflicts: As hubs of freight activity, ports and surrounding communities are often affected by increased levels of truck traffic, truck noise, or pollution. The EPA, in fact, has recently focused on port activities as part of their Ports Initiative, including efforts intended to build a more sustainable ports system, create healthy air quality for communities, and reduce climate risk.[4] Specifically on the peninsula, the Southbridge Community near the Port of Wilmington has experienced truck traffic conflicts that have been the subject of recent traffic study and planning efforts with WILMAPCO, the South Wilmington Planning Network, and other planning partners and stakeholders.

[4]http://www.epa.gov/otaq/ports/ports-initiative.htm

Other Environmental Planning

From a planning perspective there is interest on preserving the peninsula's rail and barge networks and increasing rail/barge dependent customers to help justify and enhance the local viability of those modes. From an environmental perspective and in terms of truck traffic or congestion impacts there are clearly benefits to moving large tonnages of freight by more energy-efficient rail or barge options versus the dramatically higher number of trucks that would be needed to carry the same loads. A recent study for the U.S. Department of Energy (DOE)[5] indicates, for example, that rail uses approximately 1/10th the amount of energy (per ton-mile of freight) as a similar movement by truck.[6]

Subsequent chapters of this Delmarva Freight Plan transition into scenario planning efforts that attempt to gain insights into potential mode-shift benefits or impacts under different sets of future assumptions. While an ideal finding would identify practical opportunities to influence truck-to-rail mode shifts, it is understood that realistically affecting such shifts faces several constraints. Research by Cambridge Systematics for the same U.S. DOE study noted above identifies several constraining factors:

- While opportunities may exist to reduce energy usage and greenhouse gas (GHG) emissions by improving the efficiency of truck, rail, and water freight operations, research suggests that truck-to-rail mode shift possibilities are mostly limited to freight moving in the 250 to 750 mile range.
- Despite any mode-shift potential in the mileage range noted above, it is also clear that "service differentiation limits opportunities for shifting freight from one mode to another, because the different modes are not perfect substitutes for one another." Peninsula-specific examples of this constraint would include first/last mile rural agricultural traffic, truckloads of live poultry, or perishable fruit leaving the Port of Wilmington, all of which occur almost exclusively via truck freight.
- The study further indicates that "major mode shifts are unlikely without substantial changes in costs or strong regulatory measures." Such measures may include fuel pricing and taxes, user fees, truck hour-of-service regulations, truck size/weight limits, as well as infrastructure and operational improvements. Many of these policies require changes or legislation at the federal level and can only be influenced, but not controlled, at the local, state, or regional level.

[5]Cambridge Systematics for the U.S. Department of Energy, Transportation Energy Future Series: Freight Transportation Modal Shares: Scenarios for a Low-Carbon Future, March 2013.

[6]Based on British thermal unit (Btu) energy estimates (listed in the above reference) of 4 Btu per ton-mile for truck versus 0.4 for rail and 0.5 for water.

6.7 Summary Perspective

Issues presented in this chapter were organized within focus areas corresponding to the plan's categorical goals; summary lists are presented below (*Exhibits 6.9-6.10*). Subsequent chapters will detail various performance measure, modeling, and scenario planning assumptions to help assess the impact and/or influence of these issues. This assessment, coupled with related considerations documented throughout this plan, will ultimately support the development and selection of freight policy and project assumptions to create the recommended action plan.

Exhibit 6.9 – Freight Planning Issues (Overview)

Economic Vitality	
1	**Supply Chain Positioning**
2	**Import/Export Opportunities**
3	**Land Use Issues**
4	**Site-specific Issues**
5	**Hidden Impacts**
Freight Connectivity, Mobility and Accessibility	
6	**Truck Network Connectivity**
7	**Multimodal Network Connectivity**
8	**Traffic Congestion**
9	**Passenger Linkages and Conflicts**
Safety and Security	
10	**Safety Planning**
11	**Emergency Planning**
12	**Hazardous Materials**
13	**Homeland Security**
System Management, Operations and Maintenance	
14	**Jurisdictional Relationships**
15	**Truck Policies**
16	**Pavement Management**
17	**Technologies and ITS**
18	**Waterway Dredging**
Sustainability and Environmental Stewardship	
19	**Air Quality Issues**
20	**Water Resource Issues**
21	**Community Issues**
22	**Other Environmental Planning**

Exhibit 6.10 – Freight Planning Issues (by Focus Area)

Economic Vitality	
1	**Supply Chain Positioning**
a.	Growth areas (anticipated or incentivized)
b.	System efficiencies
c.	Core commodity groups*
d.	Key supply chains*
2	**Import/Export Opportunities**
a.	Import of Midwest/Canadian crude
b.	Import of Midwest/other grain
c.	Export of fracking support materials
d.	Export of oil products
e.	Export of frozen poultry
f.	International trade pattern changes
3	**Land Use Issues**
a.	Land use compatibility
b.	Local land use decisions
c.	State land use oversight
4	**Site-specific Issues**
a.	Freight hubs or Local Freight Zones
b.	PBF Energy Refinery
c.	Dover AFB Air Cargo Ramp
d.	Dogfish Head Brewery
e.	NASA Wallops Flight Facility
5	**Hidden Impacts**
a.	Freight-dependent industry migration
b.	Reduced Modal Options
c.	Delmarva Secondary (vs. coal or oil freight)
d.	Indian River Secondary (vs. coal freight)
e.	Post-Panamax influence

Freight Connectivity, Mobility and Accessibility	
6	**Truck Network Connectivity**
a.	Primary Freight Network
b.	Peninsula freight network
c.	Critical Rural Freight Corridors*
d.	Other rural truck routes*
e.	First/last mile facilities
f.	Secondary road/bridge conditions
7	**Multimodal Network Connectivity**
a.	Rail accessibility
b.	Rail schedules/delays
c.	Rail cost effectiveness/economies of scale
d.	Cape Charles Rail Carfloat
e.	Access to regional air hubs
f.	Access to peninsula-specific air hubs
g.	Access to key ports
h.	Local drayage services
i.	Multimodal transfer options
8	**Traffic Congestion**
a.	General traffic congestion
b.	Regional metropolitan area congestion
c.	Urban area congestion
d.	Peak seasonal conflicts
e.	Time sensitive commodity impacts
9	**Passenger Linkages and Conflicts**
a.	NEC freight access constraints
b.	Chesapeake Connector
c.	At-grade rail crossings
d.	Air Cargo Ramp constraints

Exhibit 6.10 – Freight Planning Issues (by Focus Area) (Continued)

Safety and Security	
10	**Safety Planning**
a.	Crash prevention/mitigation
b.	Freight operations and technology
11	**Emergency Planning**
a.	Agency coordination
b.	Evacuation planning
c.	First-responder capabilities
d.	Land use considerations
12	**Hazardous Materials**
a.	Site-specific hazardous material issues
b.	Hazmat tracking
c.	Hazmat security screening
13	**Homeland Security**
a.	Agency coordination
b.	Cargo security and inspection
c.	Asset protection

System Management, Operations and Maintenance	
14	**Jurisdictional Relationships**
a.	Land use in operations planning
b.	Infrastructure ownership
c.	Management needs
d.	ITS integration
e.	Proprietary issues
15	**Truck Policies**
a.	Hours-of-service impacts
b.	Truck parking and rest areas*
c.	Local delivery restrictions
d.	Agricultural freight
e.	Motor freight costs (fuel, tolls)
f.	Motor freight weight limits
16	**Pavement Management**
a.	Pavement management program
b.	Resilience and system impacts
c.	Recycled materials
17	**Technologies and ITS**
a.	ITS monitoring for freight/rail activity
b.	ITS monitoring for safety/security
c.	Weight and safety enforcement
d.	All Electronic Tolling (AET)
e.	Traffic Responsive Signalization (TRS)
18	**Waterway Dredging**
a.	Federally-allocated funding for dredging
b.	Excess dredge material sites
c.	Site-specific dredging issues*

Exhibit 6.10 – Freight Planning Issues (by Focus Area) (Continued)

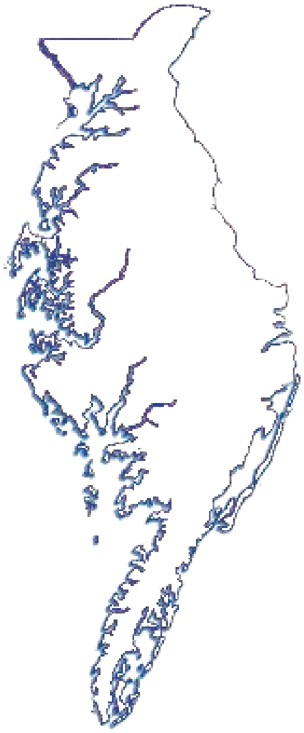
Sustainability and Environmental Stewardship	
19	**Air Quality Issues**
a.	Emissions control and monitoring
b.	Truck idling regulations
c.	Truck Stop Electrification (TSE)
d.	Truck efficiencies
20	**Water Resource Issues**
a.	Dredging-related issues
b.	Spills control
c.	Sea-Level Rise (SLR)
21	**Community Issues**
a.	Land use conflicts
b.	First/last mile conflicts
c.	Port conflicts
22	**Other Environmental Planning**
a.	Modal shifts and barge usage
b.	Modal shifts and rail usage

* *See Chapter 6 details for candidate types, routes, locations, etc.*

Delmarva Freight Plan

Chapter 7

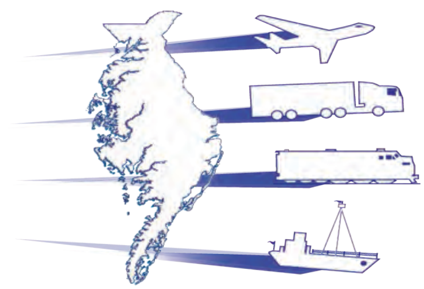
Future Freight Planning Scenarios



Chapter 7

Future Freight Planning Scenarios

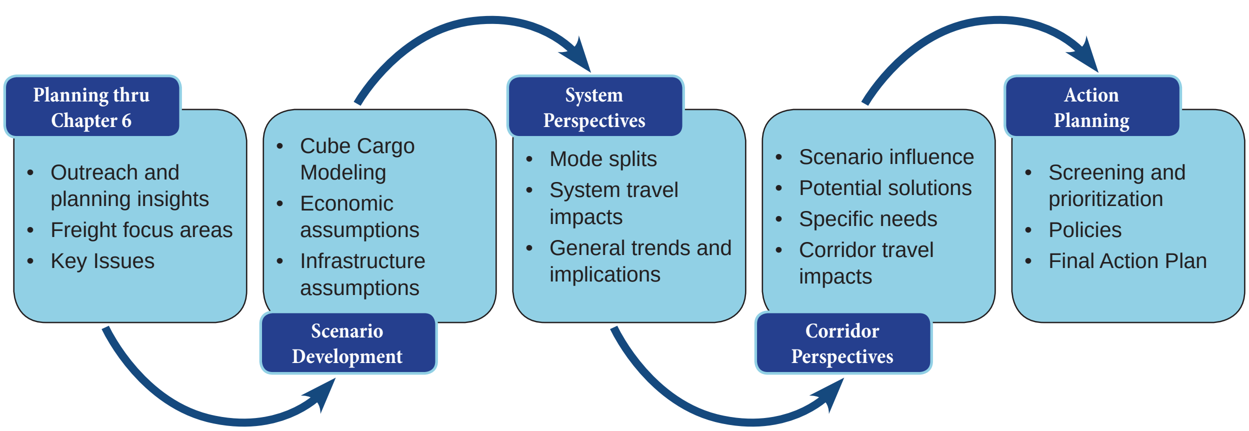
An evaluation of future freight planning scenarios was completed to explore "what-if" types of questions by way of "methodically-constructed stories about alternative futures in which today's decisions might play out."[1] Each scenario assumed a combination of changes that to varying degrees may be within an agency's control (e.g. transportation investments) or beyond an agency's control (e.g. regional economic influences). Evaluating how such changes might impact the freight transportation system helped to describe futures to which the DOTs, MPOs, and other stakeholders can better prepare to react, ultimately fostering more informed decision-making, effective infrastructure planning, and relevant policy guidance.



7.1 Scenario Planning Process

The scenario planning process (*Exhibit 7.1*) encompassed a qualitative/quantitative review of how the freight transportation system might perform under different scenarios by combining stakeholder guidance on future trends and issues with general study insights, commodity details, and the project's Cube Cargo commodity flow model. Background planning efforts and key issues from previous chapters drove the selection of interests that would be reflected in specific scenarios. These interests were then defined by a series of economic and infrastructure related assumptions that could be coded into the Cube Cargo model. The model was re-analyzed for each scenario, and revised model output was compiled to compare performance measurements at the system level for the overall peninsula, and at the corridor level for key freight corridors serving the area. These perspectives supported the identification of freight-related needs, scenario influences, and project or policy solutions that were subsequently crafted into the final action plan.

Exhibit 7.1 – Scenario Planning Process



[1] Caplice, C., and S. Phadnis. 2013. NCHRP Report 750: Strategic Issues Facing Transportation; Volume 1: Scenario Planning for Freight Transportation Infrastructure Investment. Transportation Research Board.

7.2 Scenario Development

Freight planning outreach, coordination, and study efforts identified an initial set of economic and infrastructure related factors that were incorporated into six scenarios as follows:

- 2010 Baseline
- 2040 Trendline (or Future No-Build)
- 2040 Multimodal Constraint (with Trendline Growth)
- 2040 Multimodal Constraint (with Accelerated Growth)
- 2040 Multimodal Enhancement (with Trendline Growth)
- 2040 Multimodal Enhancement (with Accelerated Growth)

Scenario Definitions

2010 Baseline corresponds to "existing" conditions on the peninsula, matched in this case to a snapshot in time of approximately calendar year 2010 based on the dates of the population, demographic, freight, or other data sets used throughout this study and as a source for the Baseline commodity flow model.

2040 Trendline, alternately referred to as the Future No-Build, assumes that population, households, and employment levels on the peninsula will increase or decrease in a manner consistent with today's trends and expectations. From an infrastructure perspective, the available highway, rail, water, or other transportation networks on the peninsula are assumed to be essentially the same as they are today, with the exception of completing/adding select committed transportation improvements (*Chapter 5*) that are or will be programmed for implementation by 2040.

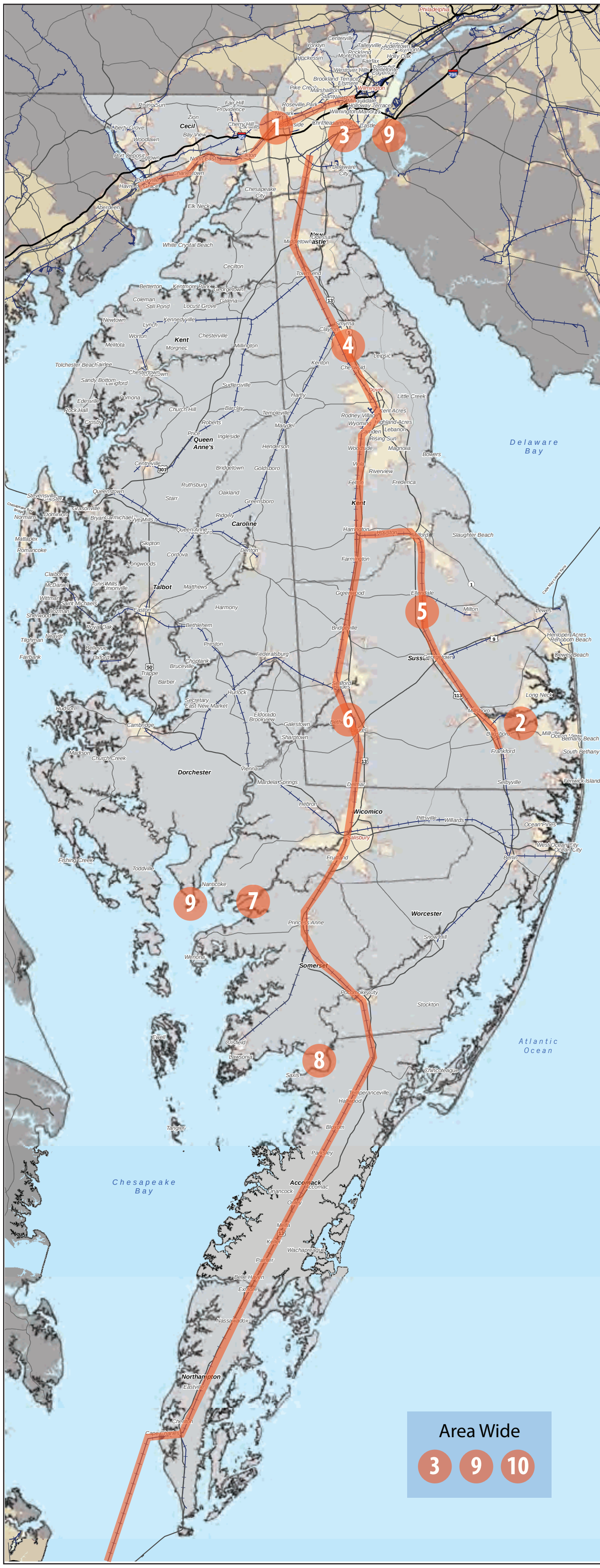
2040 Multimodal Constraint (with Trendline Growth) explores a loss or reduction of key multimodal freight transportation elements or opportunities on the peninsula (*Exhibit 7.2*). Infrastructure changes focus primarily on constraints to the rail and barge transportation networks, which invariably increases reliance on truck transportation and the highway network. Future population, household, and employment growth assumptions in this scenario match those assumed in the 2040 Trendline.

2040 Multimodal Constraint (with Accelerated Growth) explores the same infrastructure constraints as the related scenario above, but in this case assumes a more expansive future economic climate on the peninsula. Economic growth beyond that projected for the 2040 Trendline is assumed to come from a general background increase (or decreased rate of decline) in overall population, household, and employment levels, coupled with growth surges in targeted industries and due to market shifts or productivity improvements.

2040 Multimodal Enhancement (with Trendline Growth) explores an improvement or expansion of key multimodal transportation elements or opportunities on and around the peninsula (*Exhibit 7.3*). Infrastructure changes focus primarily on operational or intermodal access improvements that maintain or refine the peninsula's current highway, rail, and barge transportation networks. The influences of potentially significant regional multimodal shifts are also incorporated including, for example, substantial increases in freight activity at the Delaware City Refinery and through the Ports of Wilmington, Baltimore, and Norfolk. With the exception of these added regional shifts, future population, household, and employment growth assumptions in this scenario match those assumed in the 2040 Trendline.

2040 Multimodal Enhancement (with Accelerated Growth) explores the same infrastructure enhancements and regional multimodal shifts as the related scenario above, but in this case assumes a more expansive future economic climate on the peninsula. Economic growth beyond that projected for the 2040 Trendline is assumed to occur at the same levels and for the same reasons as those noted in the 2040 Multimodal Constraint (with Accelerated Growth) scenario.

Exhibit 7.2 – Multimodal Constraint Scenario Overview



What would the future look like if freight transportation on the peninsula was constrained by a loss or reduction of key multimodal elements or opportunities?

For example, WHAT IF…

1 … freight rail access across/along the NEC continues to be restricted to a narrow window of time?

2 … coal freight demand to the Indian River power plant ceased?

3 … at-grade rail / highway crossing conflicts increased?

4 … the NS Delmarva Secondary became a shortline railroad (from Porter to Seaford)?

5 … the NS Indian River Secondary became a shortline railroad (from Harrington to Frankford)?

6 … rail operations south of Seaford effectively ceased due to key infrastructure failures (e.g. Seaford rail bridge or BCRR car float)?

7 … Wicomico River barge travel was restricted due to funding / dredging constraints?

8 … Pocomoke River barge travel was restricted due to funding / dredging constraints?

9 … oil and gas imports/exports had fewer transport options?

10 … truck volumes and roadway maintenance needs increased substantially?

Constraint Scenario w/ Trendline Growth:

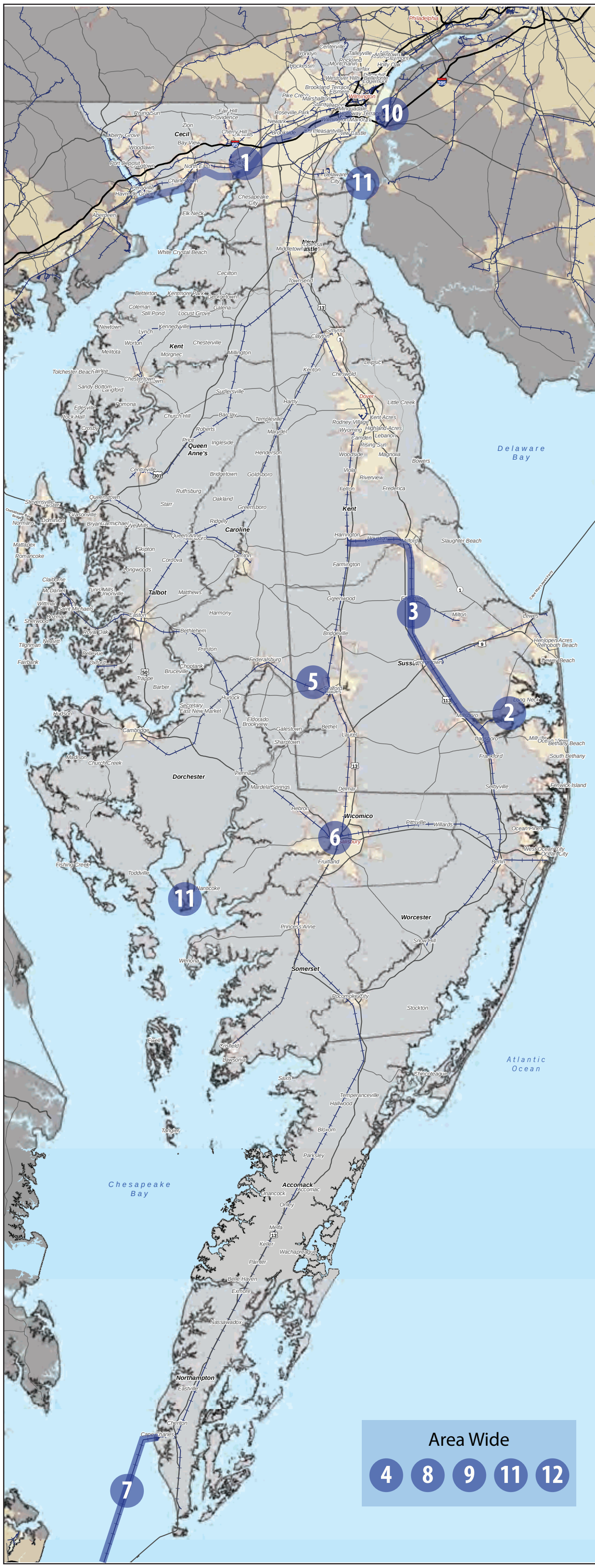
What would this future look like in 2040 with trendline economic or demographic changes?

Constraint Scenario w/ Accelerated Employment:

What would this future look like in 2040 with accelerated employment growth in certain industries?

Delmarva Freight Plan

Exhibit 7.3 – Multimodal Enhancement Scenario Overview



What would the future look like if freight transportation on the peninsula was enhanced or expanded by key multimodal elements or opportunities?

For example, WHAT IF…

1. … a completed Chesapeake Connector expanded freight rail access along/across the NEC?
2. … coal freight losses to the Indian River power plant were offset by other/new rail demand?
3. … the NS Indian River Secondary became a shortline railroad (from Harrington to Frankford)?
4. … the peninsula's rail and shortline rail networks were enhanced (e.g., removal of speed/weight restrictions or bottlenecks)?
5. … the Seaford Rail Bridge was reconstructed?
6. … a new intermodal facility was strategically located (e.g. near Newark, Seaford, Delmar, or Salisbury)?
7. … BCRR car float operations were stabilized or expanded?
8. … Post-Panamax shipping trends directly impacted the region (e.g., via Baltimore or Norfolk)?
9. … short sea shipping opportunities or the marine highway concept flourished?
10. … the Port of Wilmington developed a new container facility?
11. … oil and gas imports/exports had more transport options?
12. … higher freight volumes increased conflicts with other users (e.g., barges versus recreational water or waterfront property access; or trucks versus seasonal tourism)?

Enhancement Scenario w/ Trendline Growth:

What would this future look like in 2040 with trendline economic or demographic changes?

Enhancement Scenario w/ Accelerated Employment:

What would this future look like in 2040 with accelerated employment growth in certain industries?

Delmarva Freight Plan

Future Growth Assumptions

Variations in the level of future economic growth between scenarios were defined in terms of population, household, and employment changes that were incorporated into the project's Cube Cargo model. Considering the internal workings of the model, these changes affected future estimates of freight production and consumption on the peninsula in two primary ways:

- **Coarse Zone Analysis:** at a broader county level the county-specific population, household, and employment inputs directly influence the types and amounts of freight that are produced or consumed in each county. Details such as the specific categories of employment needed by the model to estimate its 11 different commodity groups (*Chapter 3*) were derived during the model development and calibration/validation process. Once calibrated to match the 2010 Baseline conditions, the model utilized the same freight-generating equations to estimate future freight tonnage for each county based on the revised population, household, and employment estimates in each scenario.

- **Fine Zone Analysis:** at a more detailed traffic analysis zone (TAZ) level corresponding to the model's smaller areas that make-up each county, similar inputs also influenced the distribution of freight production and consumption throughout each county. In effect, assumptions at the coarse zone level dictate "how much" freight travels to/from each county, whereas assumptions at the fine zone level dictate "where" in the county that freight begins/ends its trip.

Trendline Growth

Baseline and Trendline estimates of the population, household, and employment levels and related growth factors on the peninsula were derived from a combination of 2010 County Business Pattern (CBP) data from the U.S. Census Bureau and WILMAPCO's 2010-2040 regional projections for growth and development. Overall for the study area, the 2040 Trendline Growth scenario reflected a 28% increase in population and a 30% increase in employment versus Baseline conditions (*Exhibit 7.4*). The corresponding model-generated annual freight estimates increased by approximately 70-80% versus Baseline conditions (*Exhibit 7.5-Exhibit 7.6*).

Exhibit 7.4 – Trendline and Accelerated Growth Comparison

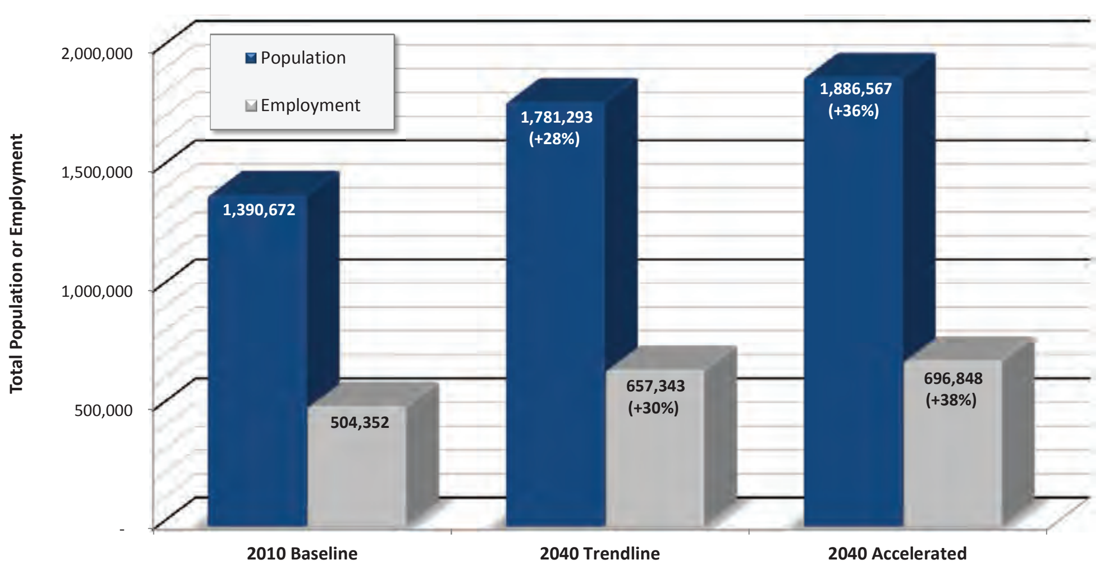


Exhibit 7.5 – 2040 Trendline Freight Production and Consumption by Cube Cargo Model Commodity Group

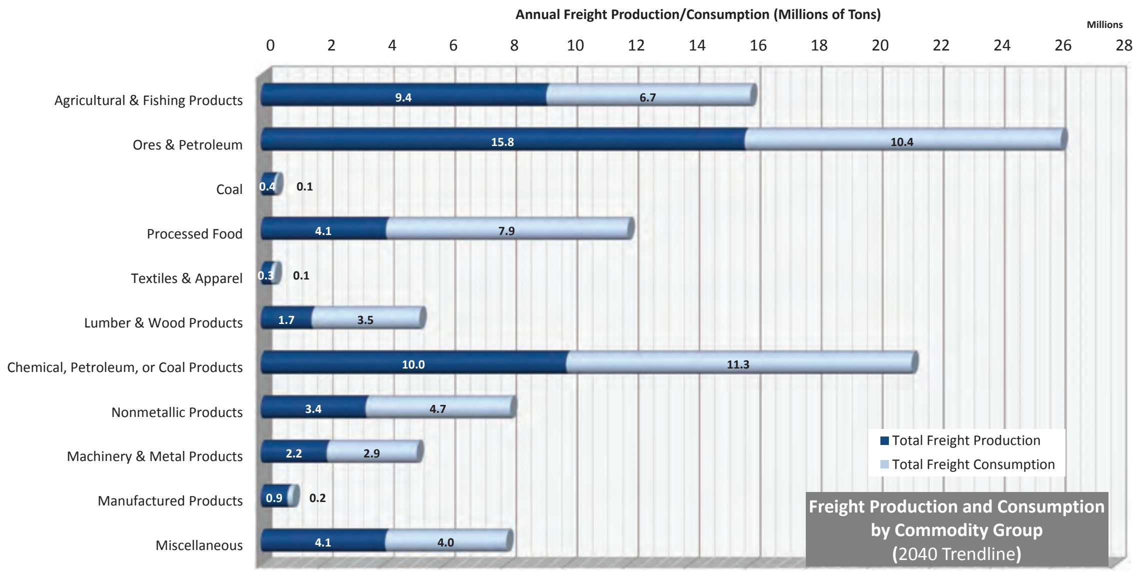
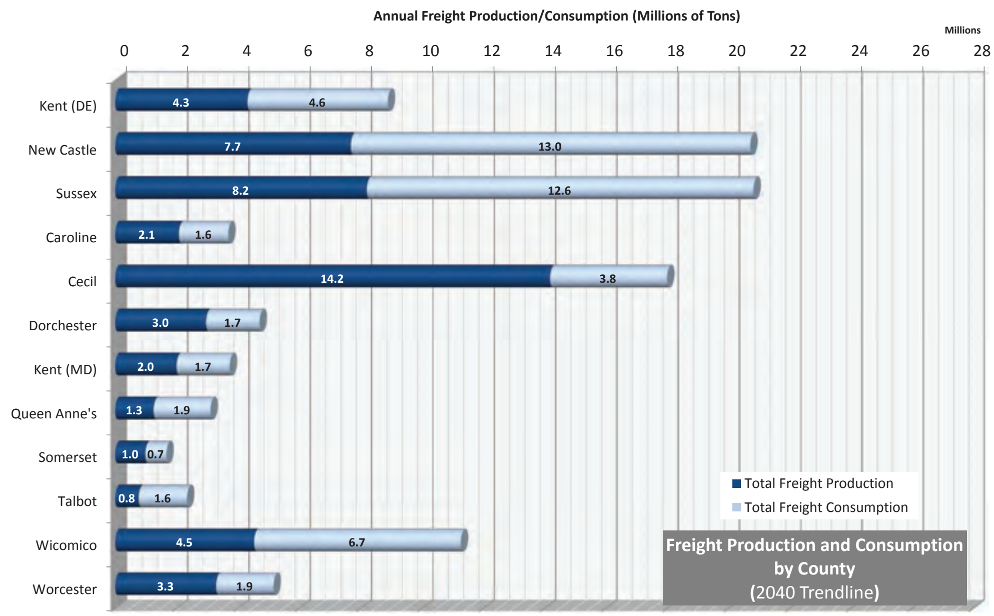


Exhibit 7.6 – 2040 Trendline Freight Production and Consumption by County



Accelerated Growth

The 2040 Accelerated Growth scenario reflected a number of changes derived from the study's economic research (*Chapter 2*), outreach discussions, and related questions or insights. These changes effectively assumed accelerated growth in four categories:

- **Background Growth:** population, household, and employment growth across all counties was assumed to occur at a 20% improved rate versus the Trendline. Population and households, specifically, were also further increased proportional to (and in support of) other employment growth that was assumed to occur due to the targeted industry or market shift assumptions noted below.

- **Targeted Industries:** employment growth in a select set of targeted industries that were deemed critical to the peninsula was assumed to occur at a 40% improved rate versus the Trendline. Specific industries included food manufacturing, petroleum and coal products, chemical manufacturing, fabricated metals, transportation & utilities, and wholesale trade.

- **Market Shifts:** a 5% additive surge in employment growth was applied to certain industries to reflect potential market shifts that could increase future poultry exports, agribusiness or grain imports, agriculture and higher-value crop or added-value food products, a chemical industry rebound, or related construction activities. Specific industries included agriculture, food manufacturing, petroleum and coal products, chemical manufacturing, and construction.

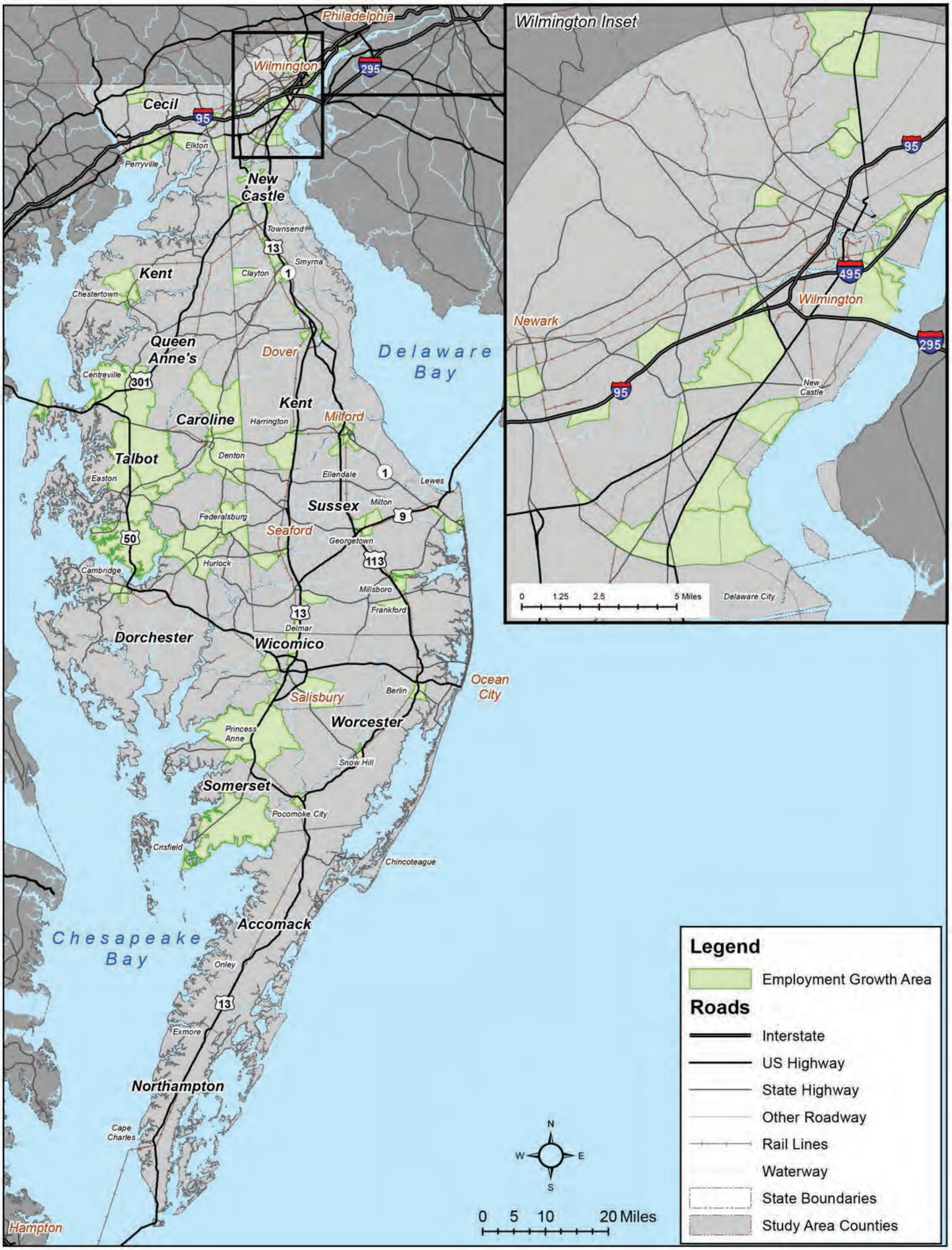
- **Productivity Factors:** a marginal increase in certain productivity factors within the commodity flow model (i.e., essentially influencing how much freight can be generated per employee) was applied to reflect future productivity increases within wholesale trade and truck, rail, or water transportation.

Overall for the study area, the 2040 Accelerated Growth scenario reflected a 36% increase in population and a 38% increase in employment versus Baseline conditions (previous *Exhibit 7.4*), or approximately 8% more growth than the Trendline scenario. The corresponding model-generated annual freight estimates were essentially double those of the Baseline, or approximately 14% additional growth versus the Trendline.

In terms of locating future growth throughout the peninsula, population and household growth was generally distributed proportionally versus the existing or projected totals at the county-level based on CBP data or at the TAZ-level based on WILMAPCO data. Employment growth in the Trendline scenario was likewise distributed; however, additional employment growth in the Accelerated scenario was manually distributed based on a series of assumptions. These assumptions helped to locate the accelerated growth in areas where it would be reasonable for additional freight activity to occur (*Exhibit 7.7*) based on:

- High volume employment areas
- High proportional growth areas
- Major employment or freight transfer hubs
- Surrounding transportation infrastructure
- Surrounding land use patterns
- Industrial parks, enterprise zones, or other incentive areas

Exhibit 7.7 – Accelerated Employment Growth Areas



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7.3 System Perspectives

System perspectives cover a broad snapshot of differences between scenarios and help to support the identification of policy or performance monitoring needs. Though system level distinctions between scenarios were often subtle, perspectives included model-based performance data that generally summarized the following:

- **Mode Splits**, focusing on freight tonnage by truck, rail, or barge[2] (*Exhibit 7.8*)
- **Travel Times**, focusing on representative travel to/from the Bay Bridge (*Exhibit 7.9*)
- **Truck VHT**, as a combined measure of truck volumes, travel times, and delays (*Exhibit 7.10*)
- **Annual Truck Costs**, focusing on vehicle and driver related costs (*Exhibit 7.11*)

Mode Splits

Key insights relative to tonnage and mode split data (*Exhibit 7.8*) include:

Truck Dominance: Freight movement by truck is clearly the dominant mode across all scenarios, typically moving around 80% of all goods, versus 12-15% by rail and only 5-8% by water in any future scenario.

Mode Shift Potential: At the system level, multimodal infrastructure changes – whether constraints such as barge restrictions or enhancements such as improved rail access – do not have an overwhelming influence on the overall mode split. In part, this is likely attributable to the potential influence area of improvements on the peninsula versus the national/international reach of freight and goods movement. Relative to trips between very distant locations such as Chicago or Canada, for example, improvements on the peninsula may not, by themselves, provide sufficient benefits to alter the overall route or mode choice of a given freight movement. This does not, however, negate potential local/regional benefits for the peninsula or the need to support future growth and economic opportunities, nor does it reflect subtle differences that may be more relevant to corridor-specific operations that will be discussed in the pages ahead.

Multimodal Role in Growth Management: Despite a relatively low level of sensitivity in terms of shifting which modes of freight travel may be utilized today, efficient multimodal access will help to manage the overall freight system and related truck traffic increases in each future scenario. This would be especially true in light of notable growth under the two Accelerated scenarios – each showing a 14-16% annual freight increase by truck (10-12M additional tons) versus the 2040 Trendline. It would also be true in both Enhancement scenarios in which 30-49% tonnage increases via rail/water modes effectively yield a nominal decrease in the proportion of freight moving by truck (78% by truck with enhancements versus 83% without).

Economic Competitiveness: Quantitative insights aside, an overarching fact is that the ability to move Delmarva freight by rail or barge efficiently is inherently valuable to the peninsula's existing and future industry-specific needs, economic competitiveness, and its ability to help enable or accommodate future freight-related growth.

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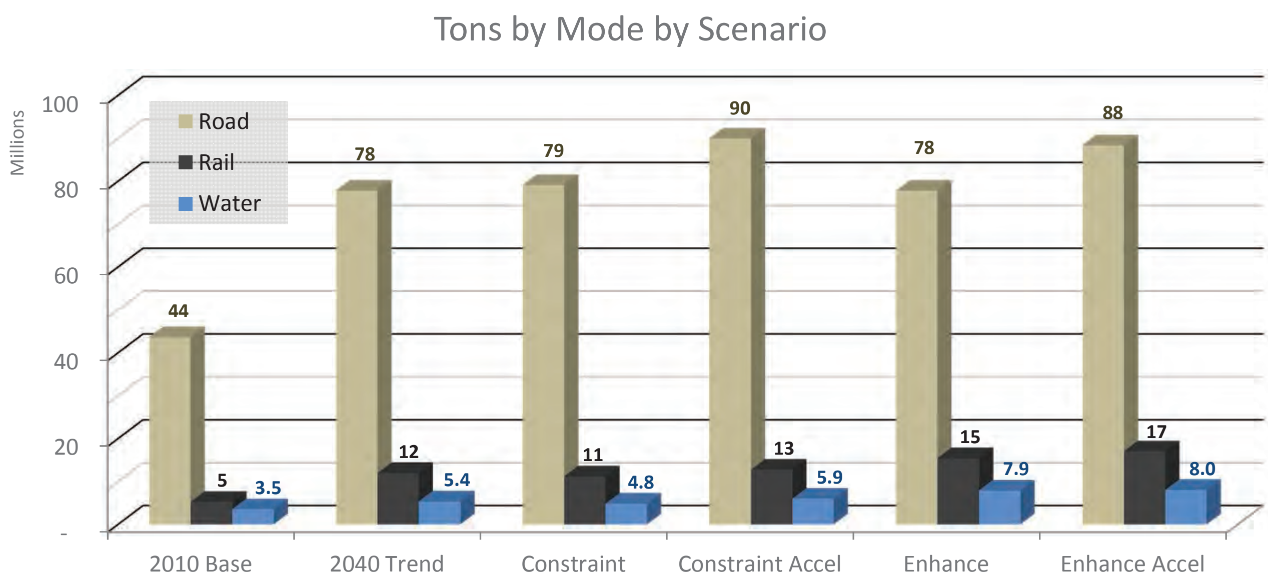
[2] Model-based performance data compares only freight movements via road, rail, or water (i.e., river barge) systems that are coded and analyzed within the Cube Cargo model. This does not include cargo movements by air or commodity flows exclusively by pipeline. The water tonnages reported here also do not include shipping volumes to/from major regional/international ports such as the Port of Wilmington, although the landside component of this port traffic would be reflected in the reported truck tonnages.

Exhibit 7.8 – System Performance Summary – Tonnage and Mode Splits



MTon by Mode	2010 Base	2040 Trend	Constraint	Constraint Accel	Enhance	Enhance Accel
Road	43.7	77.8	79.1	90.0	77.7	88.4
Rail	5.2	11.9	11.2	12.7	15.4	17.0
Water	3.5	5.4	4.8	5.9	7.9	8.0
TOTAL	**52.4**	**95.1**	**95.1**	**108.6**	**101.1**	**113.4**

% Change in Ton by Mode	2010 Base	2040 Trend	Constraint	Constraint Accel	Enhance	Enhance Accel
Road	-	78%	2%	16%	0%	14%
Rail	-	127%	-6%	7%	30%	43%
Water	-	53%	-10%	11%	47%	49%
TOTAL	**-**	**81%**	**0%**	**14%**	**6%**	**19%**

** % change in 2040 Trendline as compared to 2010 Baseline; % change in other scenarios as compared to 2040 Trendline*

Mode Split	2010 Base	2040 Trend	Constraint	Constraint Accel	Enhance	Enhance Accel
Road	83%	82%	83%	83%	77%	78%
Rail	10%	13%	12%	12%	15%	15%
Water	7%	6%	5%	5%	8%	7%
TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Travel Times

Key insights relative to travel time data (*Exhibit 7.9*) include:

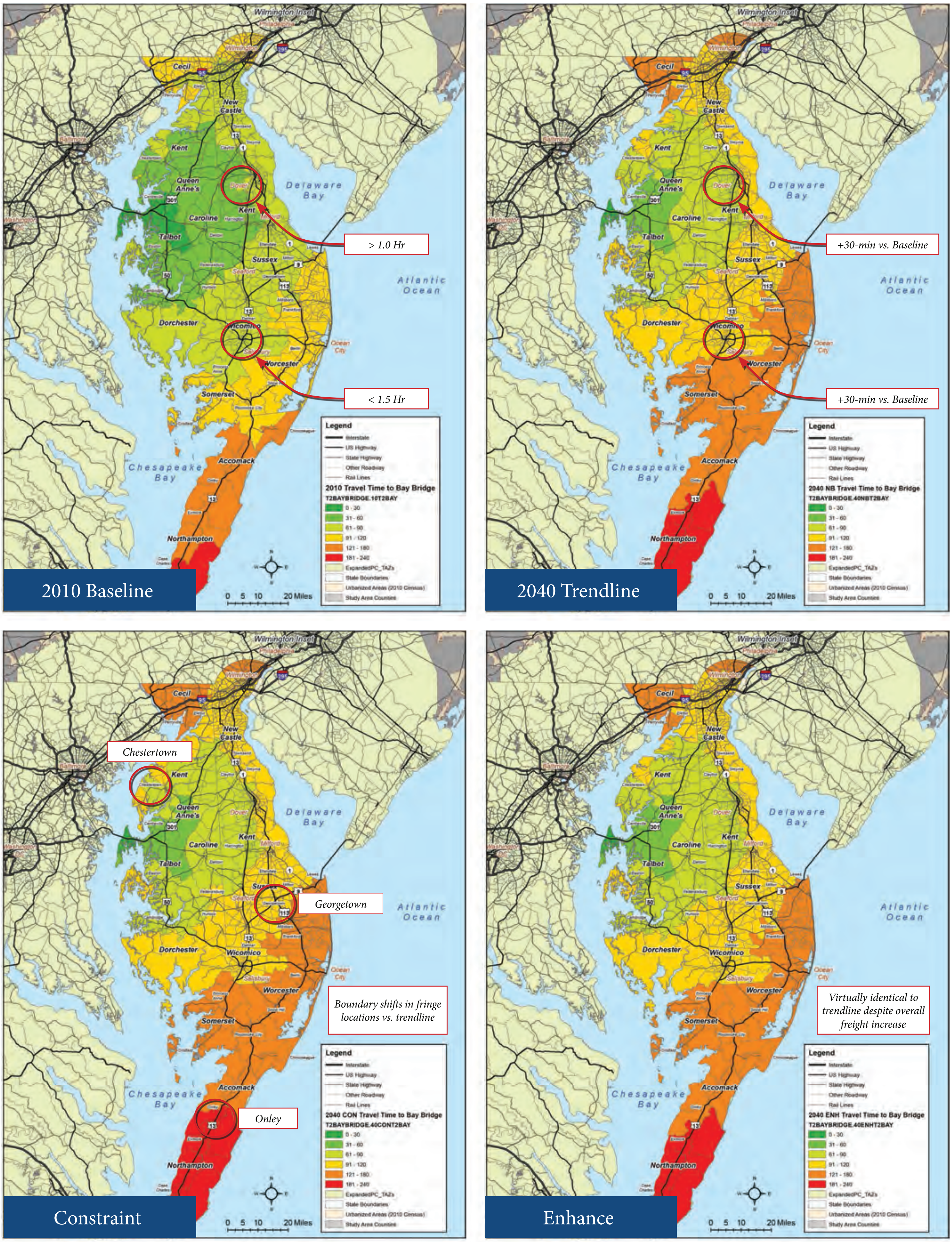
Future Congestion: Future changes in travel time vary by location and scenario, though in general an added 15-30 minutes between the Bay Bridge and key freight hubs such as Dover or Salisbury are anticipated by 2040 with Trendline growth. Barring additional improvements, most of the congestion and delay increases are expected to occur or expand in areas that are currently experiencing congestion today.

Constraints and Additional Local Freight Hub Impacts: The Multimodal Constraint scenario inevitably increases dependency on freight transportation by truck, which adds to roadway demands and congestion throughout the region. While system level travel times in the Constraint scenario only nominally degrade versus the 2040 Trendline, negative impacts and less convenient access will likely become more apparent for many smaller freights hubs at the fringes of the peninsula including, for example, areas east of Georgetown, Delaware; around Chestertown, Maryland; or south of Onley, Virginia.

Enhancements and Travel Time Management: Travel times under the Multimodal Enhancement scenario, particularly at the system level, are anticipated to be virtually identical to the 2040 Trendline. While not an immediately apparent benefit, this “holding steady” trend occurs alongside an overall increase in the amount of freight that moves through the system, illustrating an advantage of the enhanced rail or water networks.

Freight and Overall Transportation Planning: System travel times are generally influenced far more by the dominance of passenger car travel than by freight. Such influence is exacerbated through busy urban areas or during periods of peak seasonal congestion, neither of which are fully reflected in the scenarios analyzed here. Considering the conflicts between congestion and freight travel or logistics in the Delmarva region, it is vital that both freight planning and overall transportation planning be closely and thoroughly coordinated as part of the region’s planning processes at the federal, state, MPO, corridor, or other local levels.

Exhibit 7.9 – System Performance Summary – Travel Times to/from Bay Bridge



Truck VHT

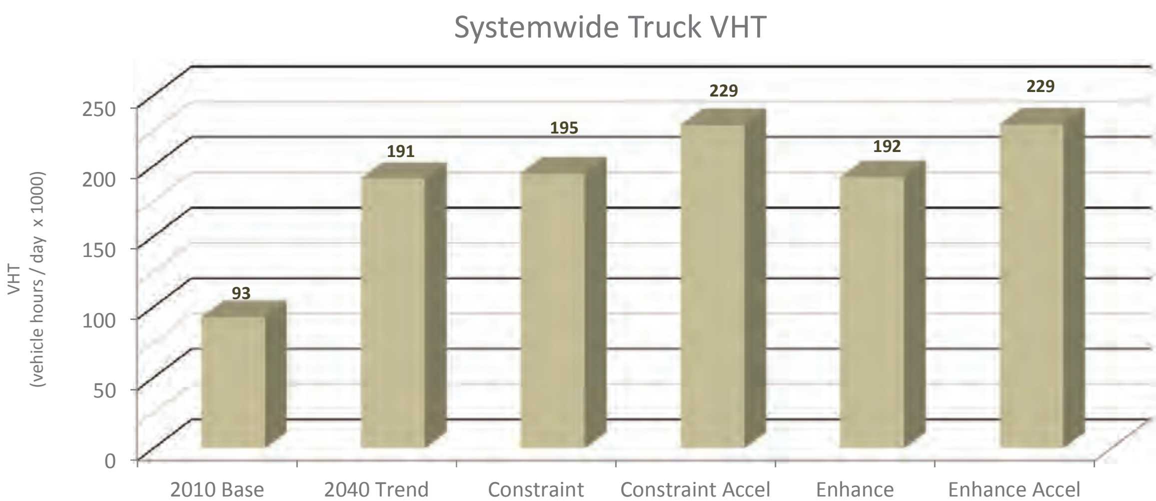
Key insights relative to truck VHT details (*Exhibit 7.10*) include:

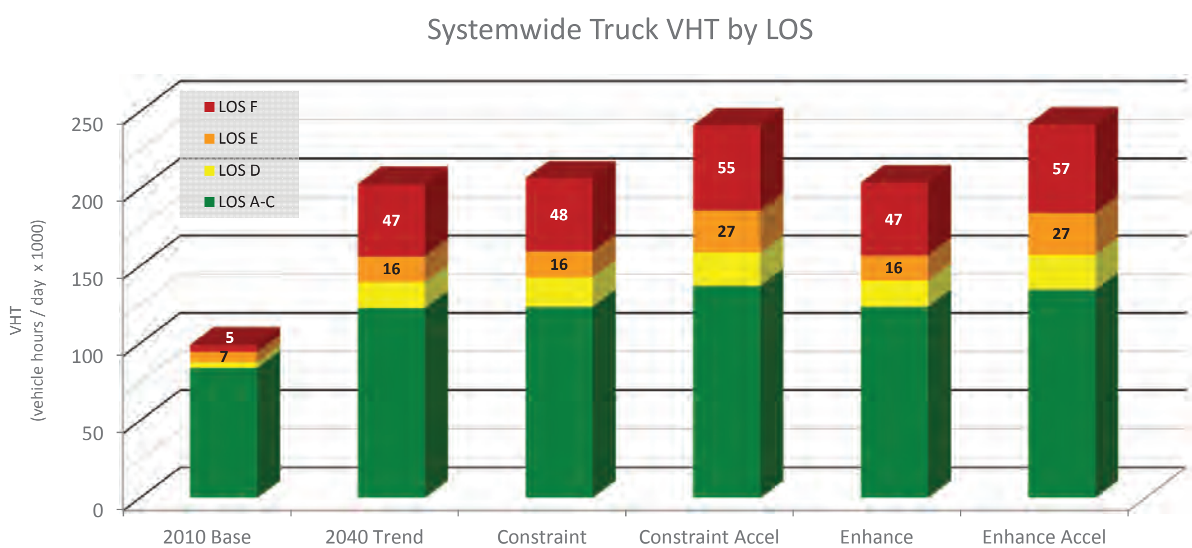
Future Truck Congestion: With future increases in truck volumes and background roadway congestion, system level truck VHT is anticipated to approximately double by year 2040. Given current and projected travel demands, VHT impacts will also disproportionately occur under borderline or less than acceptable travel conditions (i.e. congested levels-of-service D, E, or F), further exacerbating regional congestion levels.

Infrastructure Influence: Versus the 2040 Trendline, only nominal VHT impacts of 2% or less are anticipated in either the Constraint or Enhancement scenarios with matching growth assumptions. Consistent with previous findings, this nominal change reinforces a lower level of sensitivity to potential mode shifts in the immediate area on the basis of infrastructure changes alone (i.e., without a corresponding assumption of added business market or similar economic influences).

Accelerated Growth Influence: In contrast to any of the scenarios with trendline growth, substantial truck VHT increases of approximately 20% occur in either the Constraint or Enhancement scenarios with Accelerated Growth. While the accelerated growth reflects a more positive economic climate, the additional VHT – almost all of which occurs under congested LOS E/F conditions – reflects some of the potential impacts of the additional truck traffic needed to support such growth.

Exhibit 7.10 – System Performance Summary – Truck VHT Details





Measure	2010 Base	2040 Trend	Constraint	Constraint Accel	Enhance	Enhance Accel
VHT (1000 Hours/Day)	93	191	195	229	192	229
% Change in VHT	-	106%	2%	20%	0%	20%

** % change in 2040 Trendline as compared to 2010 Baseline; % change in other scenarios as compared to 2040 Trendline*

Truck Costs

Key insights relative to annual truck cost estimates[3] (*Exhibit 7.11*) include:

General Trends: In terms of the potential vehicle and driver related costs of moving freight, trends between scenarios are similar to those for VHT – including nominal differences between any scenarios with trendline growth, versus larger differences with accelerated growth.

Constraint Impacts: In comparison to the 2040 Trendline, the forced reliance on truck transportation under the Multimodal Constraint scenario increases annual truck costs by approximately $64 million.

Enhancement Savings: In comparison to the 2040 Trendline, the availability of improved infrastructure under the Multimodal Enhancement scenario reduces annual truck costs by approximately $15 million. Potential savings versus the Constraint scenarios range from $55 to $79 million annually.

Other System Insights

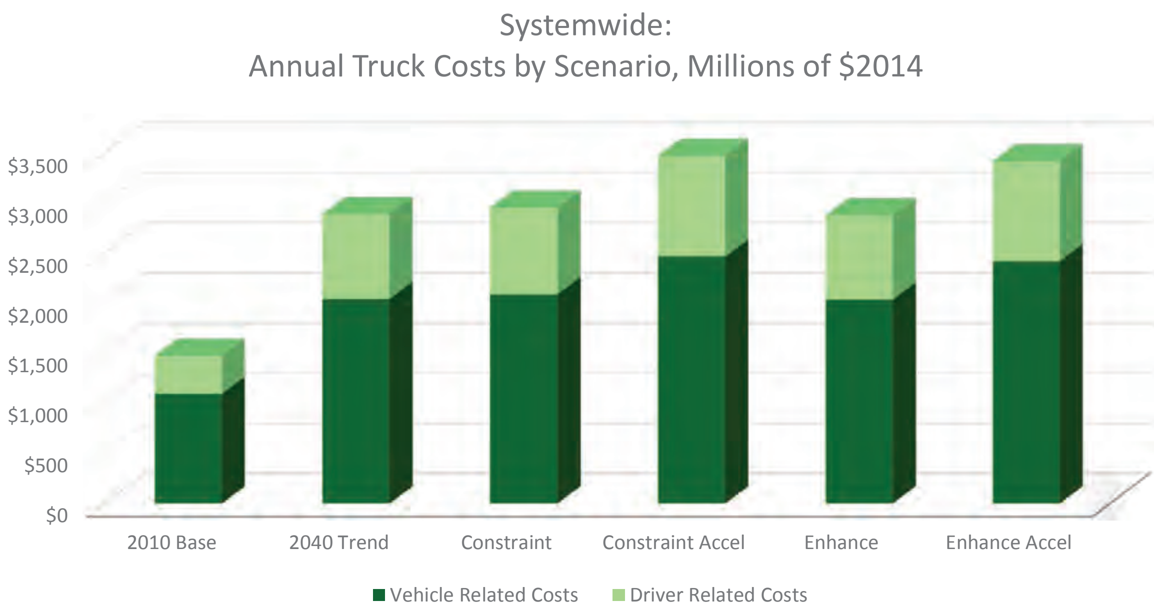
Additional key system level insights that are anticipated to be critical under all scenarios include:

Management, Operations, and Maintenance: All future scenarios will see an increase in truck traffic. This increase will, in turn, affect future roadway management, operations, and maintenance needs, as well as related issues such as freight inspection, safety monitoring, or enforcement requirements. Constraint scenarios that shift more truck traffic onto the highway system will further impact these types of activities. Accelerated growth scenarios, though they reflect a more positive economic outlook, will likewise add to such impacts with an additional increase in truck traffic needed to support the accelerated growth.

Logistics, Distribution, and Warehousing: As future congestion increases, travel time reliability will likely decrease and impacts related to truck costs, first/last mile access, just-in-time (JIT) deliveries, or similar truck transportation issues may become more volatile. As such, planning for efficient logistics, warehousing, and distribution centers relative to population and employment markets on the peninsula may require more intense or innovative efforts. Addressing such issues will be important in all future scenarios whether due to the impacts of background growth in the Trendline scenario, additional freight activity in the Accelerated scenarios, increased reliance on truck transportation in the Constraint scenarios, or a change in trends or opportunities in the Enhancement scenarios.

[3] Truck costs, in this case, include vehicle related costs (e.g. fuel, truck/trailer lease or purchase payments, repair/maintenance, truck insurance premiums, permits/licenses, tires, tolls) monetized at approximately $1.18 per mile versus model-based truck VMT data, plus driver related costs (e.g. driver wages and benefits) monetized at $24.27 per hour versus model-based truck VHT data. Underlying cost assumptions are primarily sourced from American Transportation Research Institute (ATRI) data, adjusted to year 2014 dollars for the Northeast Region, and annualized assuming 250 working days versus daily model estimates.

Exhibit 7.11 – System Performance Summary – Annual Truck Costs



Cost (Millions of $2014)	2010 Base	2040 Trend	Constraint	Constraint Accel	Enhance	Enhance Accel
Vehicle Related Costs	$1,095	$2,043	$2,089	$2,463	$2,033	$2,420
Driver Related Costs	$381	$844	$862	$1,007	$839	$995
Total Truck Costs	**$1,475**	**$2,887**	**$2,951**	**$3,470**	**$2,872**	**$3,415**

Change in Cost	2010 Base	2040 Trend	Constraint	Constraint Accel	Enhance	Enhance Accel
Vehicle Related Costs	-	$948	$46	$419	-$10	$377
Driver Related Costs	-	$463	$18	$163	-$5	$151
Total Truck Costs	**-**	**$1,412**	**$64**	**$583**	**-$15**	**$528**

** change in 2040 Trendline as compared to 2010 Baseline; change in other scenarios as compared to 2040 Trendline*

7.4 Corridor Perspectives

Moving to a more detailed level than the overall system findings described above, corridor perspectives focus on potential scenario impacts along the key freight corridors identified by this plan. These efforts identify general issues that may be especially relevant to a given corridor (*Exhibit 7.12*), while also capturing roadway or segment-specific insights to help support planning, screening, and prioritization of future transportation improvements. Model-based performance data for each corridor summarizes Truck VHT and Annual Truck Costs in a fashion similar to the system approach, but adds Truck Delay per Mile and Truck Vehicle-Miles-Traveled (VMT) for additional comparisons. Specific corridors and performance summary datasets include:

- I-95 Metro Freight Corridor (*Exhibit 7.13*)
- US 301 Bay Freight Corridor (*Exhibit 7.14*)
- US 50 Ocean City Freight Corridor (*Exhibit 7.15*)
- US 13/113 and DE 1 Coastal Freight Corridor (*Exhibit 7.16*)
- US 202 and DE 41 Piedmont Freight Corridor (*Exhibit 7.17*)
- MD/DE 404 and US 9 Lewes Freight Corridor (*Exhibit 7.18*)

Exhibit 7.12 – Relevant General Issues by Corridor

Corridor Insights, Issues, or Sensitivities	Metro	Bay	Ocean City	Coastal	Piedmont	Lewes
Truck Cost Sensitivity to Accelerated Scenario*	+3% $37M	+34% $75M	+11% $25M	+38% $395M		
Truck Cost Sensitivity to Constraint Scenario*			+16% $36M			+25% $13M
Development patterns or warehousing shifts	✓					
Regional alternate routes or system redundancy		✓		✓		
Peak season traffic, tourism and freight conflicts			✓	✓		✓
Community and freight access conflicts	✓	✓			✓	✓
Multi-jurisdictional cooperation	✓				✓	✓
Oversize or special freight movements	✓			✓		
Technology advancements (ITS, VWS, autonomous vehicles)	✓	✓		✓		

** shown as a % increase and equivalent $ value increase in truck costs based on VHT and VMT changes vs. the 2040 Trendline*

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I-95 Metro Freight Corridor

Given the regional/national significance of I-95 coupled with a predominance of through-freight, linkages to major urban areas, and the sheer volume of traffic that it carries, the relative impacts of (and differences between) the scenarios analyzed in this plan were minimal. However, performance data including truck delay, VMT, VHT, and related costs were substantially higher for I-95 than for all other freight corridors on the peninsula. Future growth in all scenarios is expected to increase congestion levels as evidenced, for example, by scenario output showing that the majority of truck VHT increases will likely occur at failing or overcapacity traffic conditions (LOS F). Notable considerations include the following:

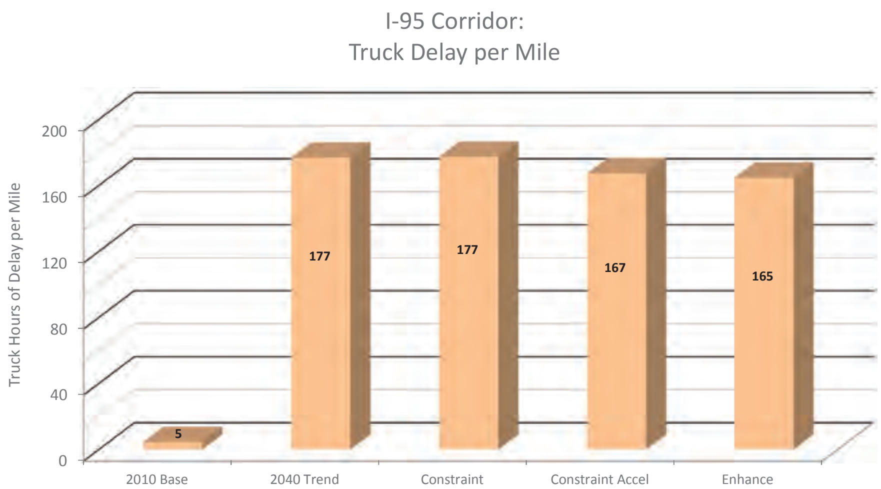
Accelerated Growth Impacts: I-95 is somewhat sensitive to the Accelerated Growth scenarios, which show a 3-4% increase in truck VMT. As a major truck route feeding the peninsula as a whole, as well as key freight hubs in Cecil and New Castle counties, the corridor can be expected to carry a substantial portion of any truck increases that may accompany future economic growth.

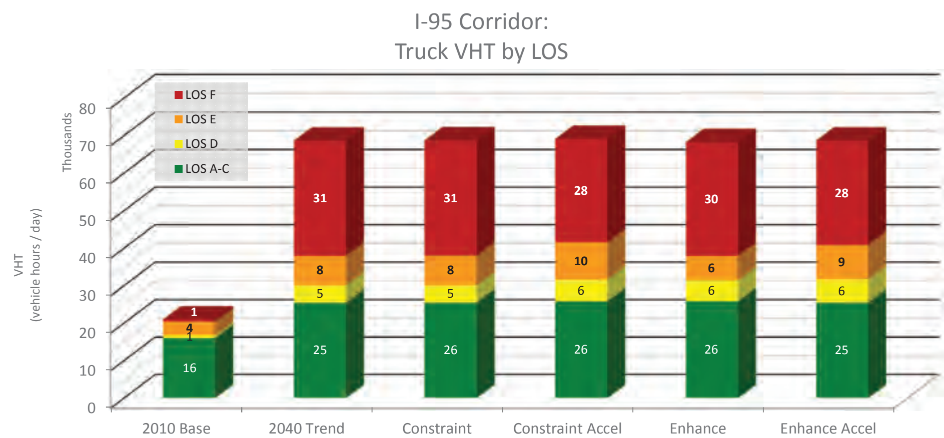
Management Strategies: With increasing congestion along the I-95 corridor and throughout the surrounding urbanized areas, effective planning and management strategies will become increasingly important over time. Examples include managing future development patterns, optimizing access to warehousing or distribution facilities, or balancing first/last mile freight needs with community interests to minimize potential conflicts.

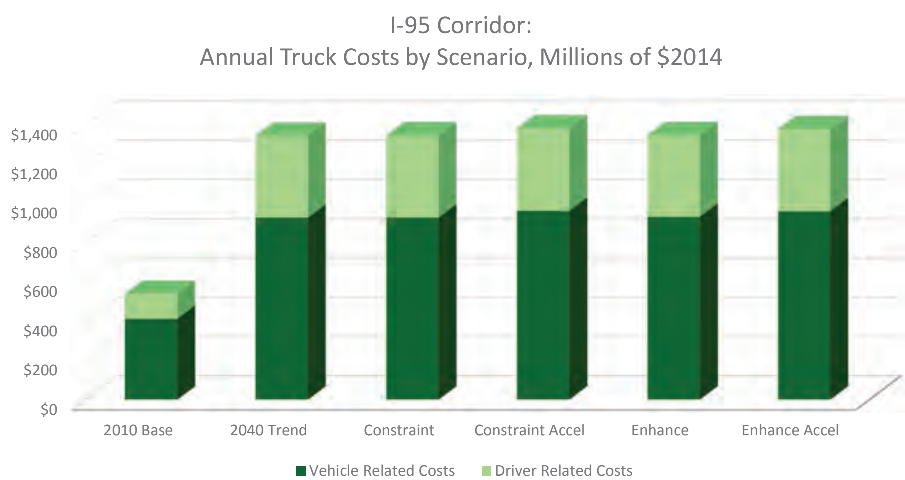
Innovative Technologies: Given the significance of the I-95 corridor and the degree of potential traffic and freight increases, special attention to innovative or technological solutions will also become increasingly important over time. Future advances in ITS, virtual weigh and inspection stations, tolling strategies, or similar technologies may find very relevant applications along this corridor. Developments related to autonomous vehicle technology – whether in terms of passenger car influences or possibly future freight applications – may also give rise to unknown implications on how the future corridor can or should operate.

Cooperative Planning: The I-95 corridor on the peninsula clearly supports a much broader transportation system, and the impacts or benefits of large-scale changes within that system can certainly have implications that extend beyond typical jurisdictional boundaries through Delaware or Cecil County, Maryland. This system influence plus the challenges and possibilities noted above collectively emphasize the need to encourage cooperative multi-jurisdictional/multi-agency planning efforts for the I-95 corridor on a very broad regional scale. Such efforts encompass the missions of organizations like the I-95 Corridor Coalition, NEC Commission, or TCI (see Chapter 5). Cooperative interests also encompass larger-scale multimodal opportunities that affect or benefit the corridor. Example possibilities identified by this plan include enhanced rail access via the Chesapeake Connector, regional port expansion concepts south of the Port of Wilmington, or larger scale port activity implications due to future Post-Panamax influences (i.e., that may affect I-95 freight flows across the Peninsula between Baltimore, Philadelphia, New York, or other major metropolitan areas).

Exhibit 7.13 – Corridor Performance Summary – I-95 Metro Freight Corridor







I-95	2010 Base	2040 Trend	Constraint	Constraint Accel	Enhance	Enhance Accel
Truck VMT	1,392,765	3,138,996	3,140,151	3,255,217	3,155,164	3,248,450
% Change	-	*125%*	*0%*	*4%*	*1%*	*3%*
Truck VHT	20,979	68,627	68,717	69,116	68,274	68,695
% Change	-	*227%*	*0%*	*1%*	*-1%*	*0%*

** % change in 2040 Trendline as compared to 2010 Baseline; in all other scenarios as compared to 2040 Trendline.*

US 301 Bay Freight Corridor

Performance data for the US 301 freight corridor imply varying levels of sensitivity to economic influences under the Accelerated Growth scenarios, as well as infrastructure changes under the Multimodal Enhancement scenario. Findings in both cases are likely influenced by US 301's linkage to the Bay Bridge, its role as a major freight route serving the peninsula, and its system-wide potential to function as an alternate to I-95, particularly in light of future project commitment assumptions that include completion of the US 301 freeway sections connecting to DE 1. Notable insights include the following:

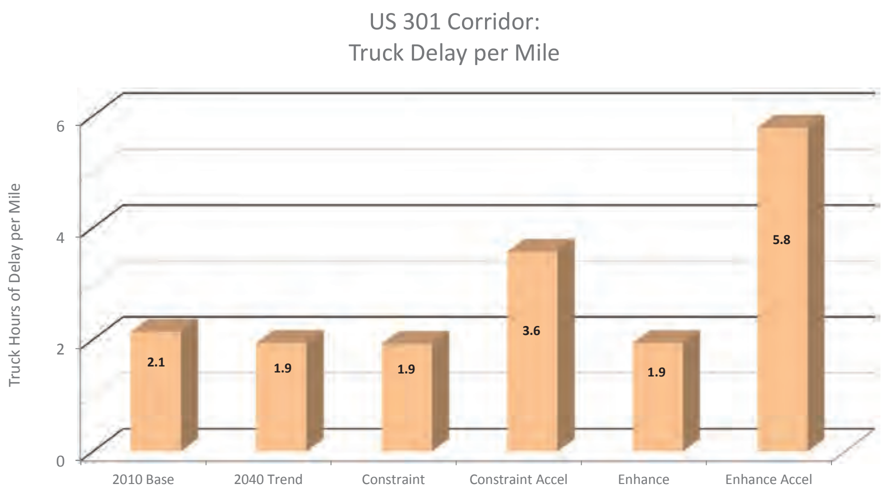
Accelerated Growth Impacts: US 301 is exceptionally sensitive to the Accelerated Growth scenarios, which show truck VMT and VHT increases of approximately 30% or more versus the 2040 Trendline. The route feeds various freight hubs and assumed growth areas, so it can be expected to carry a portion of any truck increases that may accompany future growth. Additionally, if system-wide growth exacerbates congestion along I-95, US 301 is likely to become more attractive as a regional alternate route, effectively working in parallel with the I-95 corridor to serve access to, from, or across the peninsula.

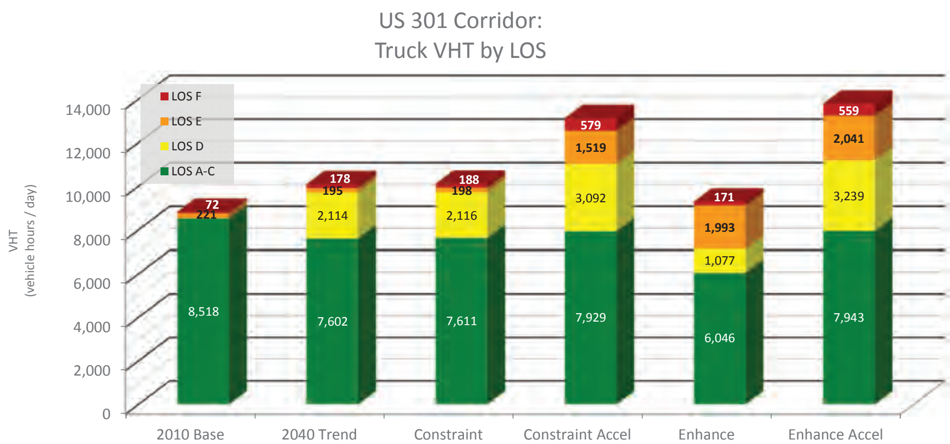
Multimodal Enhancement Benefits: US 301 would likely experience some travel benefits under the Multimodal Enhancement scenario, which shows an 8% reduction in truck VMT and VHT along the corridor, or an annual truck cost reduction of approximately $17-18 million versus the 2040 Trendline and Constraint scenarios. As with the accelerated growth impacts, changes are likely attributable to the influence of local freight hubs as well as system-wide implications – in this case, potentially a lesser amount of traffic diverted to the US 301 corridor as a result of improved multimodal access and related benefits in other locations.

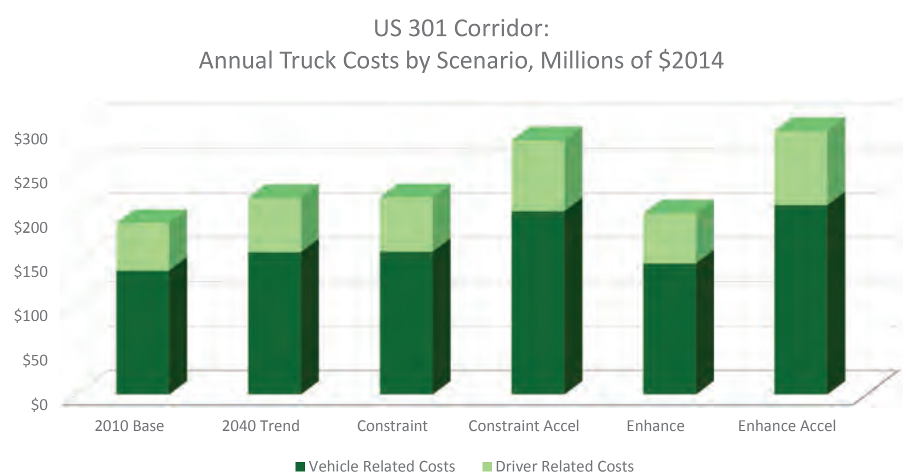
Community Freight Access: First/last mile freight access and potential community conflicts through several local freight hubs along the corridor will be important issues to monitor, particularly under any scenarios that either expand local freight-related economic developments or influence regional traffic shifts to the area. Example locations include connections to US 301 near Middletown or Odessa, as well as hubs along MD 213 in Centreville or Chestertown, or related travels along DE 896.

Truck Enforcement: Commercial vehicle safety, inspections, and enforcement have been identified by Delaware and Maryland as important issues along the US 301 corridor and nearby connecting routes including, for example, east-west access toward Smyrna or Dover. Any scenario that adds or diverts additional truck traffic to this corridor is likely to add to existing concerns. It will, therefore, become increasingly important to support effective truck route management strategies and infrastructure improvements such as VWS or other CVISN opportunities.

Exhibit 7.14 – Corridor Performance Summary – US 301 Bay Freight Corridor







US 301	2010 Base	2040 Trend	Constraint	Constraint Accel	Enhance	Enhance Accel
Truck VMT	472,198	543,000	544,395	699,619	500,082	722,462
% Change	-	*15%*	*0%*	*29%*	*-8%*	*33%*
Truck VHT	8,824	10,089	10,113	13,119	9,287	13,782
% Change	-	*14%*	*0%*	*30%*	*-8%*	*37%*

** % change in 2040 Trendline as compared to 2010 Baseline; in all other scenarios as compared to 2040 Trendline.*

US 50 Ocean City Freight Corridor

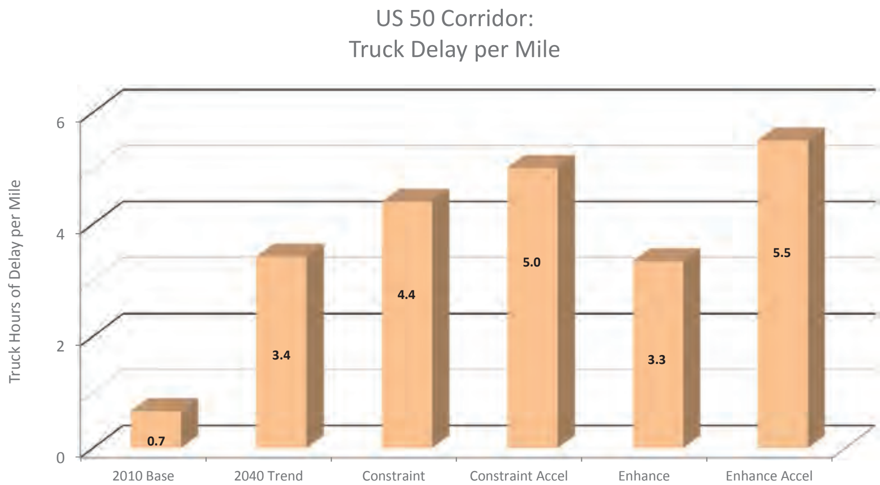
Performance data for the US 50 freight corridor imply notable levels of sensitivity to infrastructure changes under the Multimodal Constraint scenario, as well as economic influences under the Accelerated Growth scenarios. In the former case, given key assumptions in the Constraint scenario that impacted rail access south of Seaford and barge access to Salisbury and Pocomoke, US 50 could bear the brunt of any additional truck traffic diverted from other modal opportunities. In the latter, with connections to the Bay Bridge and freight access to central and southern portions of the peninsula, US 50 is shown to be a vital component of the area's economic engine. Other specific insights include the following:

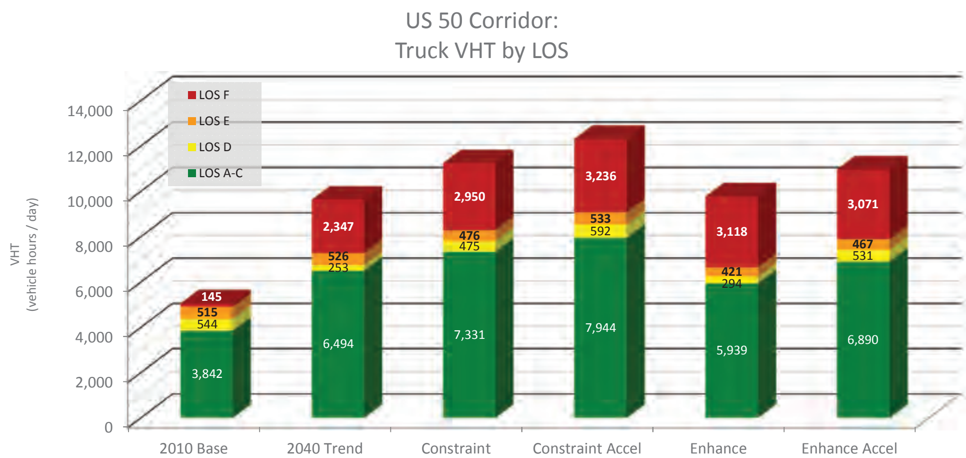
Multimodal Constraint Impacts: Sensitivities to the Constraint scenario's reduction in barge and rail opportunities were estimated to yield a 16-17% increase in truck VMT or VHT along US 50, or an equivalent increase in truck transportation costs of approximately $36 million per year versus the 2040 Trendline. Specific assumptions within the Cube Cargo model diverted more than 1.5 million tons of freight from barges alone, potentially adding thousands of trucks to the highway network. Realistically, however, such changes could also result in much farther-reaching implications in terms of negative impacts to the viability of existing or future freight related business activities in this corridor.

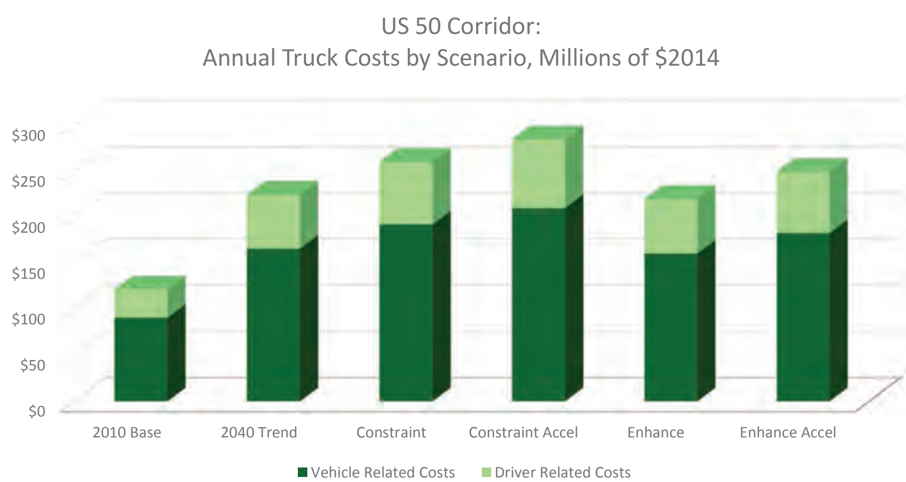
Accelerated Growth Impacts: US 50's sensitivity to the Accelerated Growth scenarios appear as an additional increase in truck VMT or VHT of at least 10%, as well as notable increases in truck delay. As such, proactively and strategically managing issues such as congestion near the Bay Bridge, interchange operations, roadway access, or overall corridor safety will become increasingly important as a means of supporting future growth potential.

Peak Season Traffic Impacts: In both of the above situations, tourism demands and related peak season traffic surges will continue to present challenges to the efficient movement of freight throughout the corridor area. Connecting the Bay Bridge with coastal resort areas around Ocean City, such impacts along US 50 are inevitable. Potential conflicts affect freight movements to/from hub areas such as Easton, Cambridge, Salisbury, or Berlin; as well as first/last mile access directly to the coastal resorts; as well as local/rural agriculture trucking activities in between.

Exhibit 7.15 – Corridor Performance Summary – US 50 Ocean City Freight Corridor







US 50	2010 Base	2040 Trend	Constraint	Constraint Accel	Enhance	Enhance Accel
Truck VMT	306,890	561,051	649,468	710,017	543,125	618,028
% Change	-	*83%*	*16%*	*27%*	*-3%*	*10%*
Truck VHT	5,046	9,621	11,232	12,304	9,771	10,960
% Change	-	*91%*	*17%*	*28%*	*2%*	*14%*

** % change in 2040 Trendline as compared to 2010 Baseline; in all other scenarios as compared to 2040 Trendline.*

US 13/113 and DE 1 Coastal Freight Corridor

Performance data for the Coastal Freight Corridor primarily implies sensitivity to economic increases under the Accelerated Growth scenarios. As the key north/south trunkline serving the peninsula, the US 13, US 113, and DE 1 corridors serve many of the areas busiest freight hubs, coastal resorts, and assumed growth areas. Specific insights include the following:

Accelerated Growth Impacts: Economic influences in the Accelerated Growth scenario yield an estimated VMT and VHT increase of around 40% versus the 2040 Trendline. Relative to other freight corridors on the peninsula, such a substantial increase can be partly attributed to the sheer mileage and geographic coverage of the Coastal Freight Corridor. Nonetheless, its connectivity to key locations through all three states as well as interconnectivity with each of the other studied freight corridors reflects a critical role in supporting future economic development opportunities in the region.

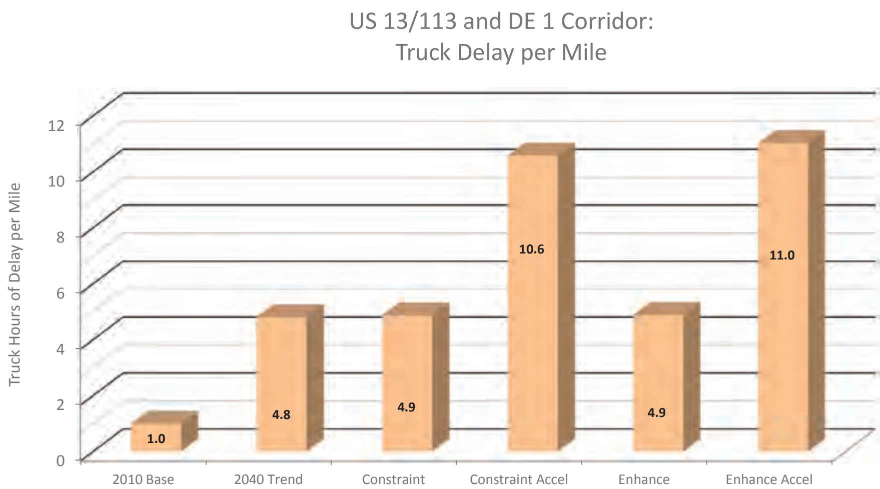
Peak Season Traffic Impacts: Similar to the US 50 corridor, the Coastal Freight corridor is notably impacted by tourism demands and related peak season traffic surges that will continue to present challenges to the efficient movement of freight throughout the area. Such impacts are inevitable given the corridors linkage of coastal resort areas to key regional access points via I-95 in the north or the US 13 Chesapeake Bay Bridge and Tunnel in the south. Potential conflicts may be especially noticeable through larger freight hubs such as Dover, along US 113 from Milford to Millsboro, and along DE 1 to and through the coastal resort locations.

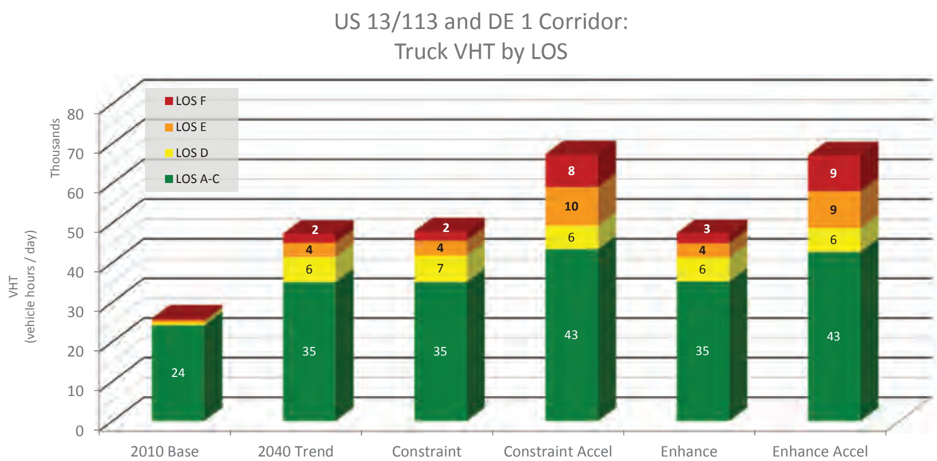
Rail Choices and System Redundancy: From a broader perspective, the Coastal Freight Corridor includes key rail infrastructure that enhances freight transportation options and system redundancies. Included, for example, are the NS Delmarva Secondary, NS Harrington South line, and BCRR shortline operations that collectively parallel US 13 throughout the peninsula. The NS Indian River Secondary and MDDE shortline operations provide additional services parallel to US 113; while various local freight hubs are also linked by additional MDDE or DCLR shortline operations. Alternate rail access onto the peninsula can also be achieved from the south via BCRR carfloat operations across the Chesapeake Bay. Limiting any of these components could affect future economic competitiveness or related opportunities on the peninsula in ways beyond the implications of the scenario results quantified here.

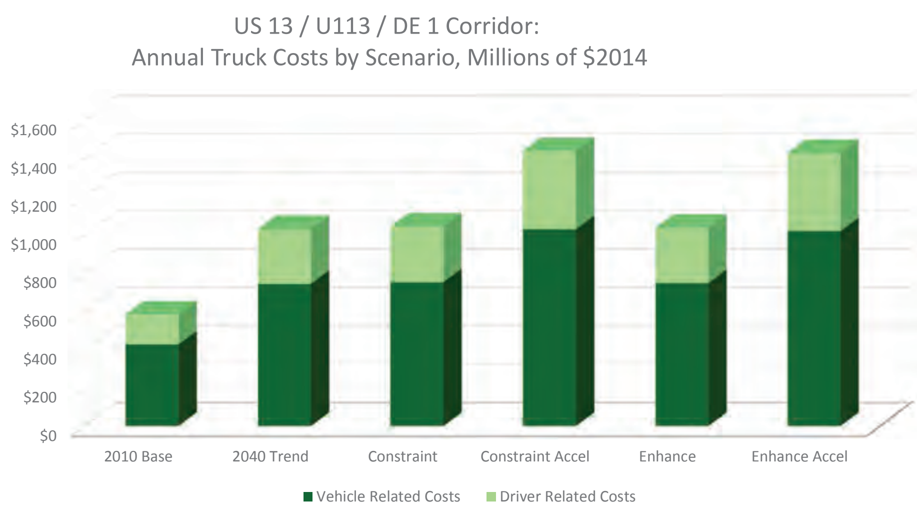
Truck Enforcement: With existing and/or planned truck weigh and inspection stations (or virtual weigh stations) in all three states, commercial vehicle safety and enforcement is a key component along the Coastal Freight Corridor. The future importance of these efforts is only anticipated to increase in light of the accelerated growth or peak season traffic impacts noted above.

Special Freight Needs: Unique activities along the Coastal Freight Corridor periodically introduce special freight needs that must be integrated within the area's overall transportation planning efforts. Three key locations include the Port of Wilmington, Dover Air Force Base, and the NASA Wallops Flight Facility. Freight movements may include oversize, overweight, or other unique cargo that potentially requires special permitting, handling, screening, routing, escorting, etc. to move materials ranging from wind turbine blades to rocket booster cores to military freight.

Exhibit 7.16 – Corridor Performance Summary – US 13/113 and DE 1 Coastal Freight Corridor







US 13/113 and DE 1	2010 Base	2040 Trend	Constraint	Constraint Accel	Enhance	Enhance Accel
Truck VMT	1,441,880	2,516,627	2,548,737	3,484,124	2,530,513	3,450,146
% Change	-	*75%*	*1%*	*38%*	*1%*	*37%*
Truck VHT	25,860	47,253	47,880	67,284	47,397	67,028
% Change	-	*83%*	*1%*	*42%*	*0%*	*42%*

** % change in 2040 Trendline as compared to 2010 Baseline; in all other scenarios as compared to 2040 Trendline.*

US 202 and DE 41 Piedmont Freight Corridor

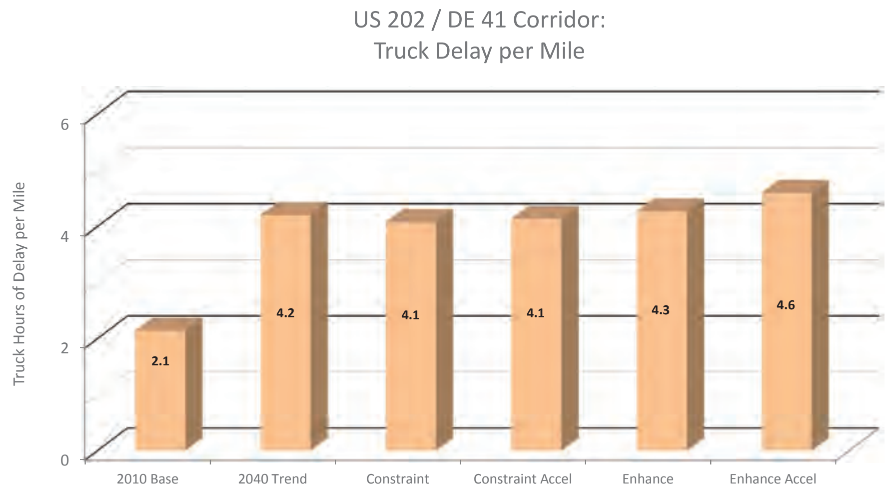
Relative to other freight corridors on the peninsula, the US 202 and DE 41 Piedmont corridor did not appear to be exceptionally sensitive to the scenarios analyzed in this plan. That trend can largely be attributed to the fact that most of the key scenario assumptions were geographically distant from the Piedmont corridor's location at the northern tip of the peninsula, or their regional influence was directed more along the I-95 corridor than it was into southeastern Pennsylvania. Notable insights include the following:

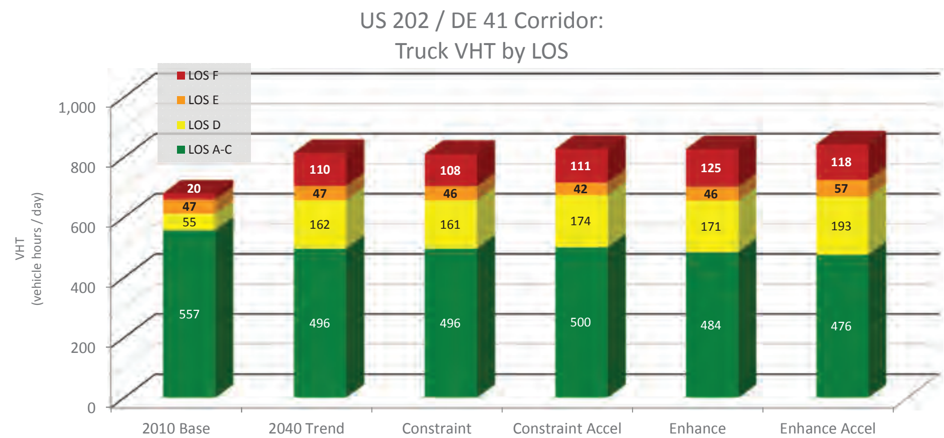
Accelerated Growth Impacts: A nominal sensitivity to the Accelerated Growth scenario appears in estimated VMT or VHT increases of 4% or less. However, the Piedmont Corridor does provide numerous connections between Pennsylvania and freight-centric urbanized areas in northern New Castle County, including Newark and Wilmington; plus nearby access to the I-95 corridor; plus access into northern Cecil County if connectivity to MD 273 is considered. As such, future freight related economic developments, increases in background congestion, or related influences on circulation between local areas (e.g., along DE state routes 2, 7, 48, or 141) will be important issues to monitor.

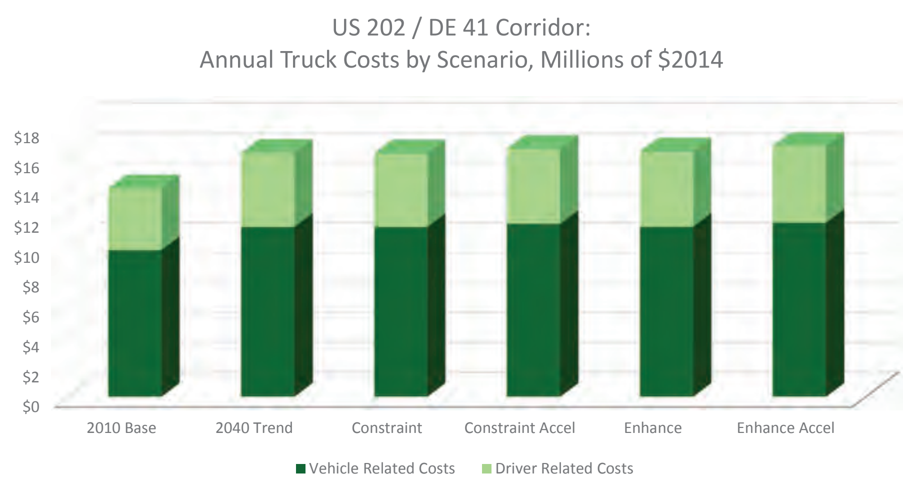
Community Freight Access: Considering the numerous residential areas and local communities throughout the northern portion of New Castle County, balancing community interests with potential freight access needs will likely be an ongoing challenge for this corridor. Such challenges may encompass through-freight connections into Pennsylvania (e.g., via DE 41) as well as first/last mile access throughout the area.

Multi-Jurisdictional Planning: Given the Piedmont Corridor's reach into Pennsylvania, including access to US 1, US 30, I-76, and various communities from Lancaster to King of Prussia, multi-jurisdictional cooperation between adjacent states (DelDOT and PennDOT) and MPOs (WILMAPCO and DVRPC) would be relevant to corridor-specific freight planning efforts in this area. Identifying a consistent vision, approach, priorities, or typical solutions for the broader multi-state corridor area will help to support future economic opportunities or freight transportation needs while managing any potential growth or community impacts such as those noted above.

Exhibit 7.17 – Corridor Performance Summary – US 202 and DE 41 Piedmont Freight Corridor







US 202 / DE 41	2010 Base	2040 Trend	Constraint	Constraint Accel	Enhance	Enhance Accel
Truck VMT	33,192	38,428	38,400	39,113	38,473	39,412
% Change	-	*16%*	*0%*	*2%*	*0%*	*3%*
Truck VHT	680	815	811	828	827	844
% Change	-	*20%*	*0%*	*2%*	*2%*	*4%*

** % change in 2040 Trendline as compared to 2010 Baseline; in all other scenarios as compared to 2040 Trendline.*

MD/DE 404 and US 9 Lewes Freight Corridor

Performance data for the MD/DE 404 Lewes Freight Corridor imply notable levels of sensitivity to infrastructure changes under the Multimodal Constraint scenario. Given key scenario assumptions that impacted rail access south of Seaford and barge access to Salisbury and Pocomoke, the location of this corridor makes it a likely candidate to pick-up additional traffic diverted as a result of fewer modal opportunities in the area. Specific insights include the following:

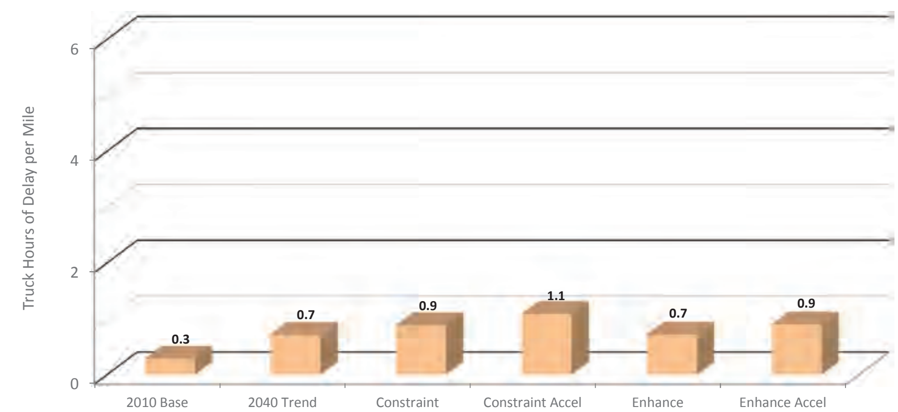
- **Multimodal Constraint Impacts**: Sensitivities to the Constraint scenario's reduction in barge and rail opportunities were estimated to yield a 25% increase in truck VMT or VHT along MD/DE 404, or an equivalent increase in truck transportation costs of approximately $13 million per year versus the 2040 Trendline. Such increases are in addition to similar impacts described previously for the US 50 Ocean City Freight Corridor located just to the south. Diverted traffic impacts, in this case, could result from a combination of adding truck movements due to a change in rail or barge opportunities, or adding passenger car movements that may divert from US 50 as a result of increased congestion along that corridor in the same scenario.

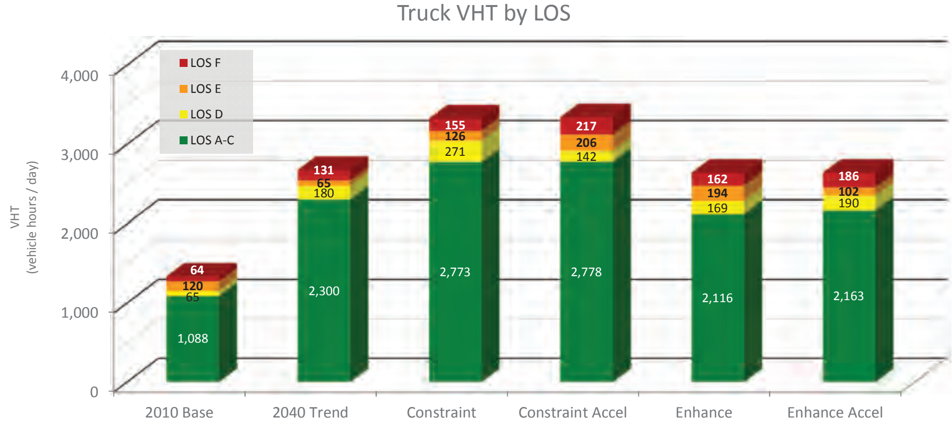
- **Peak Season Traffic Impacts**: Similar to other corridors with connections to the peninsula's coastal resort areas – in this case directly from US 50 near the Bay Bridge to DE 1 near Lewes and Rehoboth Beaches – tourism demands and related peak season traffic surges will inevitably present challenges to the efficient movement of freight throughout the corridor area. Integrating freight considerations into general transportation planning efforts will become increasingly important.

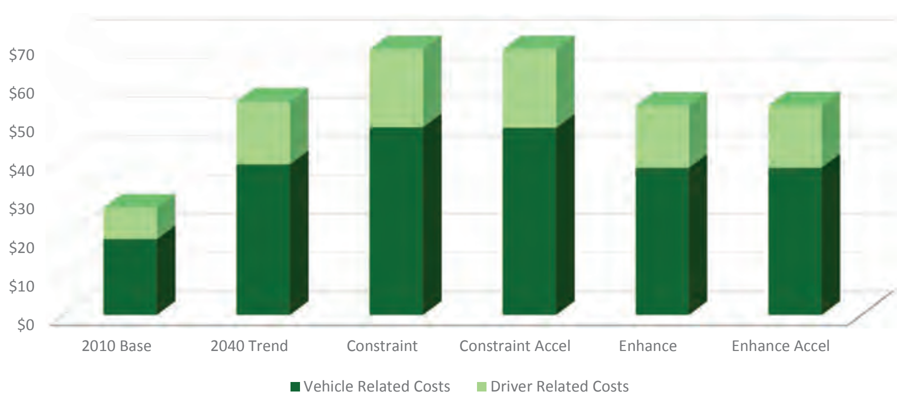
- **Community Freight Access**: First/last mile freight access and potential community conflicts through several local freight hubs along the corridor will be important issues to monitor, particularly in light of the potential impacts noted above. Potential conflicts affect freight movements to/from hub areas such as Denton, Federalsburg, Seaford, or Georgetown; as well as first/last mile access directly to the coastal resorts; as well as local/rural agriculture trucking activities in between.

- **Multi-Jurisdictional Planning**: Given the Lewes Corridor's east-west reach across Maryland and Delaware, including access to various local freight hubs along the way, multi-jurisdictional cooperation between state agencies would be relevant to corridor-specific freight planning efforts in this area. Identifying a consistent vision for the broader multi-state corridor area will help to support local economic developments or freight transportation needs while managing any potential impacts such as those noted above. Clearly defining the specific role that MD/DE 404 can or should play in terms freight movements may, in this case, impact decisions related to truck routing, truck restrictions, community access needs, or long-term upgrade planning.

Exhibit 7.18 – Corridor Performance Summary – MD/DE 404 and US 9 Freight Corridor







MD/DE 404	2010 Base	2040 Trend	Constraint	Constraint Accel	Enhance	Enhance Accel
Truck VMT	66,334	131,893	164,317	163,936	128,929	128,976
% Change	-	*99%*	*25%*	*24%*	*-2%*	*-2%*
Truck VHT	1,337	2,675	3,326	3,342	2,640	2,642
% Change	-	*100%*	*24%*	*25%*	*-1%*	*-1%*

** % change in 2040 Trendline as compared to 2010 Baseline; in all other scenarios as compared to 2040 Trendline.*

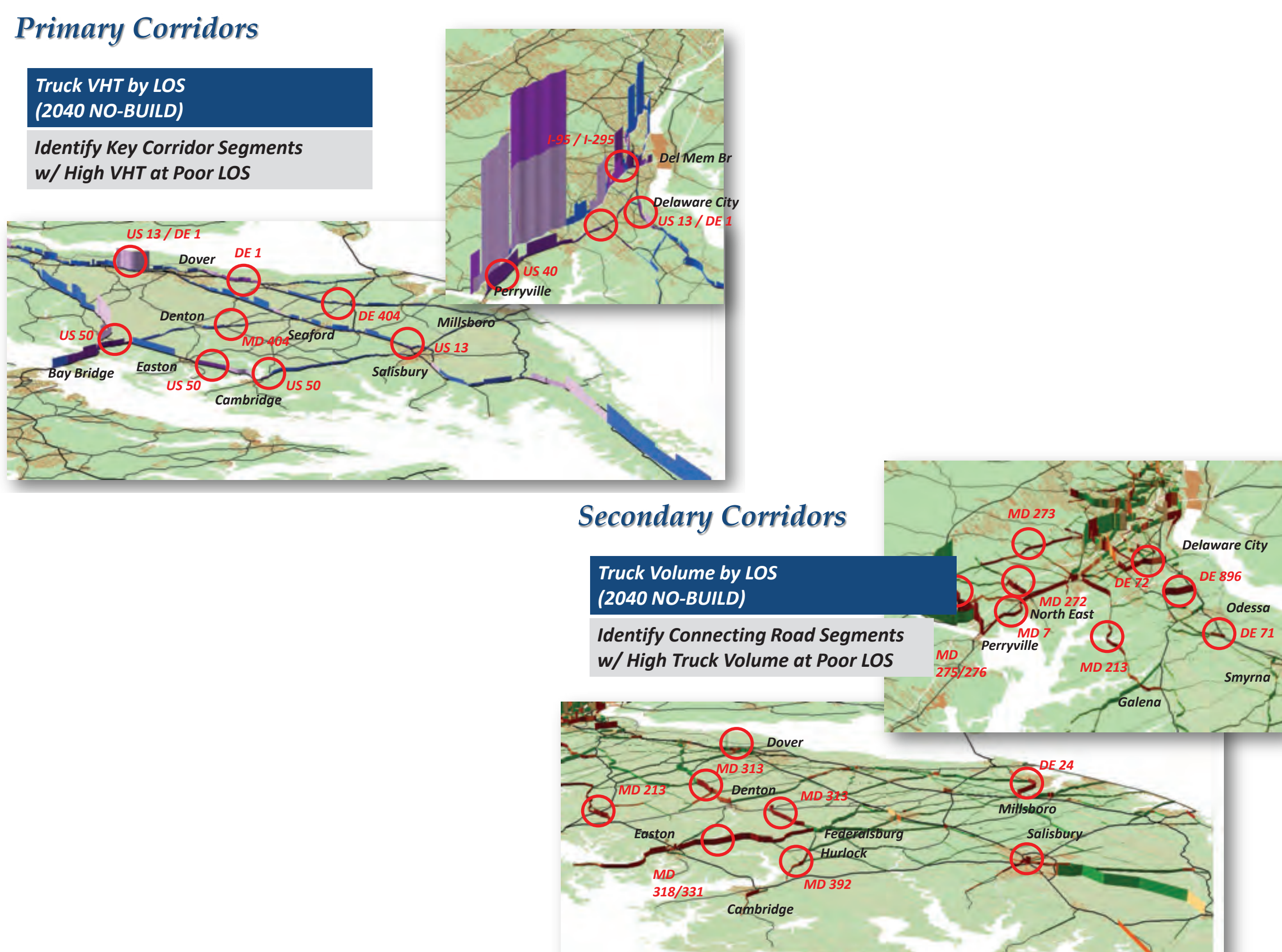
Additional Corridor Details

In addition to the system and corridor level insights summarized above, detailed model performance data at the corridor segment level was reviewed to help identify future congestion or bottleneck sites that may impact truck traffic. These reviews focused on impacts under the 2040 Trendline scenario and, in the interest of narrowing locations to those relevant to trucks versus typical passenger car congestion, included the following:

- **Truck VHT by LOS**: for the six primary freight corridors identified by this plan, detail reviews highlighted specific roadway segments experiencing higher truck VHT at poor levels-of-service.
- **Truck Volume by LOS**: for secondary roadways that connected to the primary freight corridors, detail reviews highlighted specific roadway segments carrying higher truck volumes at poor levels-of-service.

All such reviews were accomplished using 3D GIS graphics to visually represent the performance data (*Exhibit 7.19*). By this method, the height of the displayed data bars represented the order-of-magnitude of the truck VHT or truck volume on each segment, whereas the color shading represented the segment's level-of-service. Visually reviewing the combined results helped to supplement a list of potential areas of concern and the development of candidate project locations. These locations were subsequently incorporated into the project planning, screening, and prioritization process detailed in the final phase of this freight plan.

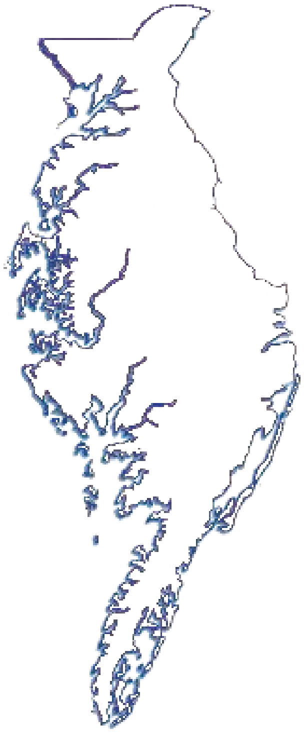
Exhibit 7.19 – Corridor Performance Summary – Sample 3D GIS Segment Data



Delmarva Freight Plan

Chapter 8

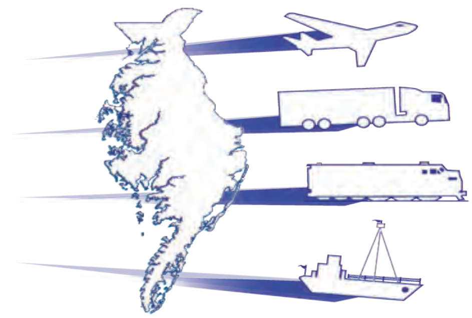
Freight Project Guidance



Chapter 8

Freight Project Guidance

Building on details throughout this plan, including the previous summaries of freight trends, needs, issues, and scenario planning insights, closing efforts focus on a compilation of action planning elements that will help to support freight and goods movement opportunities and transportation systems throughout the Delmarva region. These elements may be referenced individually or integrated within the broader planning programs and strategies that are managed by the peninsula's federal, state, MPO, and other public/private partners tasked with overseeing their respective operations, systems, or jurisdictions. Actions outlined below encompass project planning guidance; the subsequent chapter will add policy level guidance, future performance monitoring considerations, and future freight plan maintenance or update interests.



8.1 Project Candidates

A shortlist of project candidates having the potential to influence freight transportation was compiled in cooperation with input from the freight plan's project advisory group and with reference to the plan's various document reviews, stakeholder outreach efforts, and technical analyses. This list includes current anticipated project commitments (*Chapter 5*), relevant project aspirations or unfunded needs from other planning documents, and additional needs as identified throughout the course of this freight plan. A summary of all project candidates has been organized by corridor (map *Exhibit 8.1*; index *Exhibit 8.2*); additional details are provided in the project screening and prioritization summaries that follow.

It may be observed that most of the freight plan's project candidates are not exclusively freight-related. However, the project screening and prioritization efforts developed here provide a customized perspective to help reveal general candidates having the most potential to influence freight transportation conditions or opportunities relative to the peninsula's freight focus areas. It may also be observed that most of the project candidates are oriented to the roadway network. In part, this reflects the fact that the largest component of the freight transportation system over which DelDOT, MDOT, or VDOT can exercise any direct control is the roadway network (e.g., versus private rail, port, pipeline, warehousing, or similar infrastructure). However, this orientation should not be construed as lacking a multimodal perspective; rather, candidate selection and subsequent screening/prioritization efforts included a strong focus on enhancing overall access and connectivity to the area's multimodal hubs and facilities. This approach works alongside key multimodal policy guidance and separate private infrastructure plans (e.g., the Port of Wilmington's strategic master plan) to encompass the overall freight and goods movement system while also recognizing that – except in unique cases and excluding pipeline – freight by any mode typically moves by truck for at least some portion of its overall journey.

Exhibit 8.1 – Summary Project Candidates Map

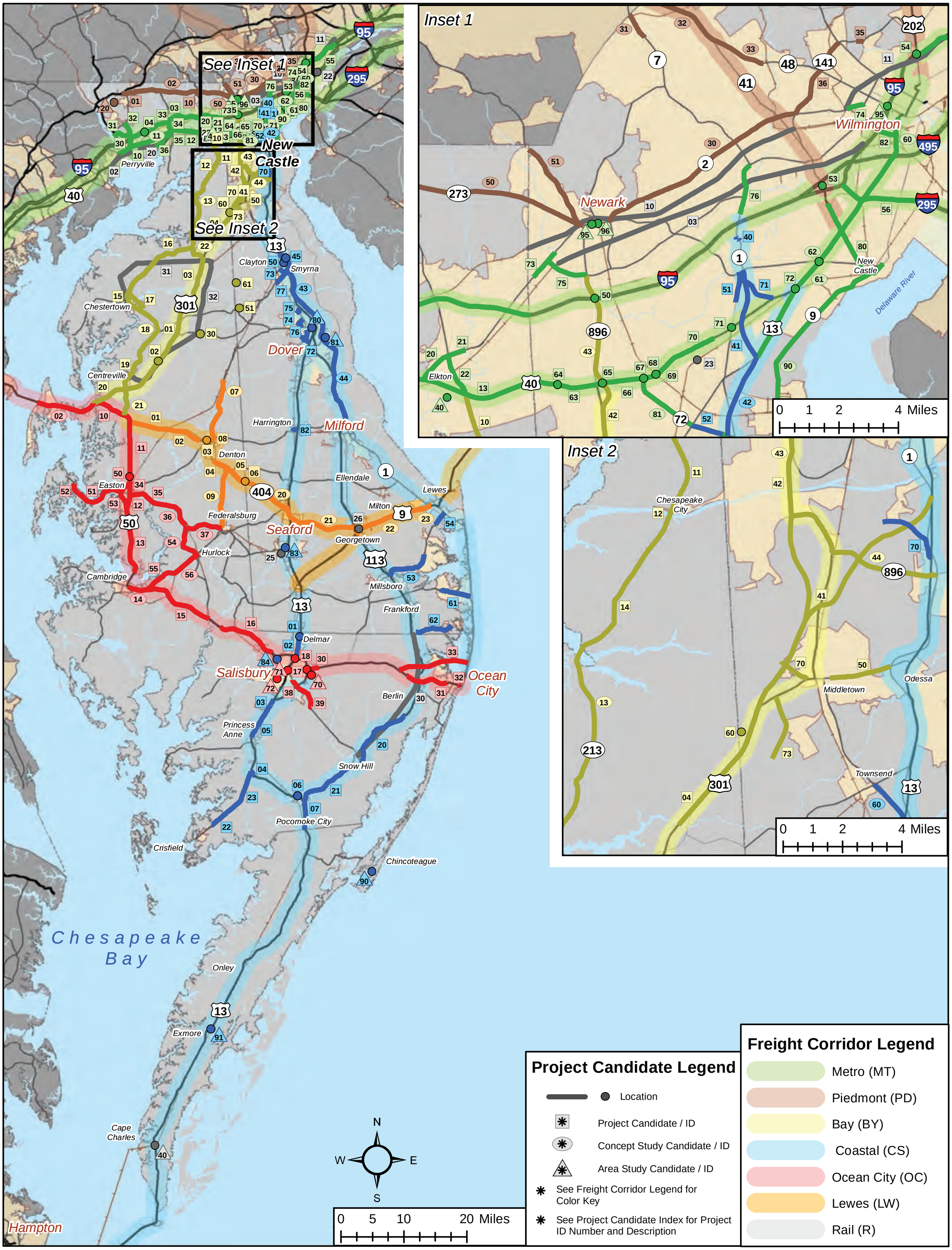


Exhibit 8.2 – Summary Project Candidates Index

Index #	Route / Area	Limits	Description
I-95 Metro (MT) Freight Corridor			
MARYLAND			
MT 03	I-95	MdTA Section 400	Reconstruct and widen
MT 04	I-95	at Belvedere Rd	New interchange
MT 10	US 40	MdTA Thomas J. Hatem Mem Br	Convert to All Electronic Tolling and rehab approach roadways
MT 11	US 40	MD 222 to MD 272	Corridor Study / Concept Design for roadway or capacity upgrades
MT 12	US 40	MD 272 to MD 279	Divided highway reconstruct
MT 13	US 40	MD 279 to DE Line	Divided highway reconstruct
MT 20	MD 279	US 40 to MD 213	Divided highway reconstruct
MT 21	MD 279	MD 213 to MD 316	Multi-lane urban reconstruct
MT 22	MD 213	US 40 to MD 279	Multi-lane uban reconstruct
MT 30	MD 222	US 40 to MD 275	Multi-lane urban reconstruct, widening of MD 222 bridge over I-95, and potential Coudon Rd extension
MT 31	MD 222	MD 275 to MD 276	Reconstruct
MT 32	MD 275	MD 222 to MD 276	Divided highway reconstruct
MT 33	MD 272	Lums Rd to MD 274 / Seahawk Dr	Reconstruct
MT 34	MD 272	US 40 to Lums Rd	Widen
MT 35	MD 272	US 40 to N Main St / N Maudlin Ave	Multi-lane urban reconstruct to beginning of couplet south of US 40
MT 36	MD 7	Charlestown to MD 272	Two-lane reconstruct
MT 40	Local Area	Elkton	Freight Management Study, including route signage and truck restrictions
DELAWARE			
MT 50	I-95	at DE 896	Major interchange reconstruction
MT 53	I-95	at DE 141	Phase I / Phase II interchange projects
MT 54	I-95	at US 202	Interchange improvements
MT 55	I-95	US 202 to I-495 / DE 92	Widen from 4 to 6 lanes
MT 56	I-295	I-95 to Delaware Memorial Br	Improvements
MT 60	US 13	I-495 to Christiana River	Corridor Study / Concept Design for freight management upgrades
MT 61	US 13	DE1 to I-495	Corridor Study / Concept Design for roadway or capacity upgrades
MT 62	US 13	at DE 273	Interchange Feasibility Study / Concept Design
MT 63	US 40	MD Line to DE 896	Roadway or capacity upgrades
MT 64	US 40	at Pleasant Valley Rd	Intersection improvements
MT 65	US 40	at DE 896	New interchange
MT 66	US 40	DE 896 to DE 72	Roadway or capacity upgrades
MT 67	US 40	at DE 72	Intersection improvements
MT 68	US 40	at NS Rail Crossing (Bear, DE)	At-grade highway-rail crossing improvement and/or grade separation
MT 69	US 40	DE 72 to Salem Church Rd	Roadway or capacity upgrades
MT 70	US 40	Salem Church Rd to Walther Rd	Corridor widening (4 to 6 lanes)
MT 71	US 40	at DE 7	New interchange
MT 72	US 40	at US 13	New interchange
MT 73	DE 2	MD Line to Casho Mill	Upgrades
MT 74	DE 2	DE 100 to Broom St	Upgrades
MT 75	DE 4	DE 2 to DE 896	Eastbound widening
MT 76	DE 7	Churchmans Rd to Limestone Rd	Signalized corridor improvements and regular optimization
MT 80	DE 141	DE 37 to DE 9	Retiming and/or field installations for traffic responsive signal operations
MT 81	DE 72	US 40 to US 13	Corridor Study / Concept Design for freight management upgrades
MT 82	Proposed	Christina River Bridge	New bridge
MT 90	DE 9	DE 72 to DE 273	Corridor Study / Concept Design for freight management upgrades (approximately Delaware City to New Castle)
MT 95	Local Area	Newark	Freight Management Study
MT 96	Local Area	Newark	Intermodal Center Feasibility Study
MT 97	Local Area	Wilmington	Freight Management Study, including route signage study

Exhibit 8.2 – Summary Project Candidates Index (Continued)

Index #	Route / Area	Limits	Description
US 301 Bay (BY) Freight Corridor			
MARYLAND			
BY 01	US 301	US 50 to Kent Co Line	Access control improvements and interchanges
BY 02	US 301	Bay County Rest Area	Truck Parking
BY 03	US 301	Queen Anne's Co Line to MD 313	Divided highway reconstruct w/ interchanges
BY 04	US 301	Kent Co Line to DE Line	Access control improvements; Potential MD 299 intersection improvements
BY 10	MD 213	US 40 to Frenchtown Rd	Widening, including potential major reconstruction and improvements at the MD 213 / US 40 intersection
BY 11	MD 213	Frenchtown Rd to Basil Ave	Reconstruction and potential widening (approximately from south of Elkton to Chesapeake City)
BY 12	MD 213	at C&D Canal	Widening of MD 213 bridge over C&D Canal
BY 13	MD 213	Basil Ave to MD 290 / MD 313	Corridor Study / Concept Design for freight management upgrades (approximately between Chesapeake City and Galena)
BY 15	MD 213	MD 291 to MD 297	Multi-lane reconstruct (north of Chestertown)
BY 16	MD 213	Cross Street to MD 291	Multi-lane urban reconstruct (Chestertown)
BY 17	MD 213	MD 297 to MD 544	Two-lane construction of new access controlled boulevard including bridge over Chester River
BY 18	MD 213	MD 291 to MD 305	Corridor Study / Concept Design for freight management upgrades (approximately between Chestertown and Centreville)
BY 19	MD 213	at MD 304 and S Liberty St / Commerce St couplet	Urban corridor improvements through Centreville (geometric, signal, pkg, signing, pvmt mkg, utility placement upgrades)
BY 20	MD 213	US 301 to S Liberty St / Commerce St couplet	Multi-lane reconstruct (south of Centreville)
BY 21	MD 213	US 50 to US 301	Corridor Study / Concept Design for freight management upgrades
BY 22	MD 313	US 301 to MD 213	Corridor Study / Concept Design for freight management upgrades (approximately between US 301 to Galena)
BY 30	MD 302	East of Barclay	Planned VWS
DELAWARE			
BY 41	US 301	MD Line to DE 1	New four-lane expressway
BY 42	DE 896	DE 2 to Boyds Corner Rd	Retiming and/or field installations for traffic responsive signal operations
BY 43	DE 896	C&D Canal to US 40	Corridor Study / Concept Design for roadway or capacity upgrades (potentially including widening from 4 to 6 lanes)
BY 44	DE 896	US 301 to DE 1	Corridor Study / Concept Design for freight management upgrades
BY 50	DE 299	DE 1 to Catherine St	Widening
BY 51	DE 300	West of Smyrna	Planned VWS
BY 60	DE 299	West of Middletown	Planned VWS
BY 61	DE 6	West of Smyrna	Planned VWS
BY 70	Bunker Hill Rd	Choptank Rd to US 301	Upgrade
BY 73	Levels Rd	Strawberry Lane to US 301	Upgrade

US 50 Ocean City (OC) Freight Corridor			
MARYLAND			
OC 02	US 50/301	Bay Bridge to US 50/301 Split	Corridor Study / Concept Design for freight management upgrades
OC 10	US 50	US 50/301 Split to MD 404	Divided highway reconstruct w/ access control improvements and interchanges
OC 11	US 50	MD 404 to MD 322	Reconstruct and widen
OC 12	US 50	MD 322 (north) to MD 322 (south) of Easton	Divided highway reconstruct (through Easton area)
OC 13	US 50	MD 322 south of Easton to Choptank River Br	Access control improvements (south of Easton through Trappe)
OC 14	US 50	MD 16 (Church Ck Rd) to MD 16 (Mt Holly Rd)	Corridor Study / Concept Design for freight mgmt upgrades (along US 50 / MD 16 overlap segments east of Cambridge)
OC 15	US 50	MD 16 (Mt Holly Rd) to MD 331	Access control improvements (approximately east of Cambridge to Vienna)
OC 16	US 50	MD 731A to White Lowe Rd	Access control improvements
OC 17	US 50	at Salisbury Bypass	Construct an additional lane from US 50 onto Salisbury Bypass
OC 18	US 50	at US 13	Signalize US 50 WB off-ramp and improve US 13 NB weave
OC 30	US 50	Salisbury Bypass to east of Walston Switch Rd	Divided highway reconstruct including interchanges
OC 31	US 50	MD 346 to Herring Creek	US 50 access control improvements with interchange at MD 589
OC 32	US 50	Bridge over Sinepuxent Bay	Bridge construct / reconstruct
OC 33	MD 90	US 50 to MD 528	Freeway reconstruct (Ocean City area)
OC 34	MD 331	US 50 to Chillcut Rd	Multi-lane urban reconstruct
OC 35	MD 331	Bridge over Choptank River	Bridge construction
OC 36	MD 331	US 50 to MD 318	Corridor Study / Concept Design for freight management upgrades (approximately Easton to Ellwood)
OC 37	MD 318	MD 331 to MD 313	Corridor Study / Concept Design for freight management upgrades (approximately east of Preston to Federalsburg)
OC 38	MD 12	US 13 Bypass to Johnson Rd	Multi-lane urban reconstruct
OC 39	MD 12	Worcester Co Line to south of US 113 Bypass	Two-lane reconstruct
OC 50	MD 662	at US 50 / MD 309	Intersection and capacity improvements
OC 51	MD 33	Lincoln Ave to MD 322	Multi-lane reconstruct (approximately east of Saint Michaels to Easton)
OC 52	MD 33	Yacht Club Rd to Lincoln Ave	Two-lane reconstruct
OC 53	MD 322	US 50 (south) to US 50 (north) of Easton	Divided highway reconstruct (through Easton area)
OC 54	MD 331	MD 318 to MD 392	Corridor Study / Concept Design for freight management upgrades (approximately Ellwood to Hurlock)
OC 55	MD 16	US 50 to MD 16 / MD 392 junction	Divided highway reconstruct (approximately US 50 to East New Market)
OC 56	MD 392	MD 16 / MD 392 junction to MD 331	Corridor Study / Concept Design for freight management upgrades (approximately East New Market to Hurlock)
OC 70	Local Area	Salisbury	Airport Access Study / Concept Design for new connection of Airport Rd to US 50
OC 71	Local Area	Salisbury	Freight Management Study
OC 72	Local Area	Salisbury / Wicomico River	Wicomico River Port Development Study

Exhibit 8.2 – Summary Project Candidates Index (Continued)

Index #	Route / Area	Limits	Description
US 13/113 and DE 1 Coastal (CS) Freight Corridor			
MARYLAND			
CS 01	US 13	near Delmar	Planned VWS
CS 02	US 13	Salisbury Bypass to DE Line	Divided highway reconstruct with access control improvements
CS 03	US 13	Somerset Co Line to US 13 Bus	Divided highway reconstruct including interchanges
CS 04	US 13	MD 673A to MD 413	Access control improvements
CS 05	US 13	MD 362 to Wicomico Co Line	Divided highway reconstruct
CS 06	US 13	Northbound near Pocomoke City	Planned VWS
CS 07	US 13	VA Line to US 113	Access control improvements
CS 20	US 113	MD 12 to end Divided Hwy south of Berlin	Divided highway reconstruct including interchange at MD 12 and access improvements
CS 21	US 113	US 13 to US 113 Bus south of Snow Hill	Access control improvements
CS 22	MD 413	N Somerset Ave to MD 667	Divided highway reconstruct
CS 23	MD 413	MD 667 at Whites Rd to US 13	Divided highway reconstruct
DELAWARE			
CS 40	Road A	Bridge	Improvement
CS 41	DE 1	Tybouts Corner to DE 273	Widening from four to six lanes (approx. Tybouts Corner just north of the DE 1 / US 13 split to DE 273 / Christiana Rd)
CS 42	DE 1 / US 13	DE 72 to DE 71	Corridor Study / Concept Design for freight management upgrades (along DE 1 / US 13 overlap segments)
CS 43	DE 1	Puncheon Run Conn (Dover) to US 13 (Smyrna)	Corridor Study / Concept Design for freight management upgrades (Exit 97 south of Dover to Exit 119 north of Smyrna)
CS 44	DE 1	US 113 (Milford) to Puncheon Run Conn (Dover)	Corridor Study / Concept Design for freight management upgrades (DE 1 / US 113 split in Milford to Exit 97 south of Dover)
CS 45	DE 1	Northbound near Smyrna	Planned VWS
CS 50	US 13	Northbound near Smyrna	Planned VWS
CS 51	DE 7	Newtown Rd to DE 273	Widen
CS 52	DE 72	McCoy Rd to DE 71	Widen 2 to 4 lanes
CS 53	DE 24	US 113 to DE 23	Corridor Study / Concept Design for freight management upgrades (approximately Millsboro east to DE 23)
CS 54	DE 24	DE 1 to Love Creek	Widen
CS 60	DE 71	US 13 to Pine Tree Rd / Main St	Corridor Study / Concept Design for freight management upgrades (approximately US 13 north to Townsend)
CS 61	DE 26	DE 1 to Omar Rd	Widen
CS 62	DE 54	East of US 113	Center turn lane upgrades
CS 70	Hyetts Corner Rd	Jamison Corner Rd to US 13	Upgrade
CS 71	School Bell Rd	DE 7 to US 13	Upgrade
CS 72	W Dover Connector	North St to US 13	New roadway
CS 73	Carter Rd	DE 300 to Sunnyside Rd	Upgrade
CS 74	College Rd	DE 15 to Kenton Rd	Upgrade
CS 75	Denny's Rd	McKee Rd to US 13	Upgrade
CS 76	Kenton Rd	DE 8 to Fire School Rd	Upgrade
CS 77	Sunnyside Rd	US 13 to DE 300	Upgrade
CS 80	Local Area	Dover	Freight Management Study
CS 81	Local Area	Dover	Expansion of Air Cargo Ramp at Dover AFB and adjacent development potential (e.g., Kent County AeroPark)
CS 82	Local Area	Harrington	Truck Route Updgrade (DE 14 to US 13)
CS 83	Local Area	Seaford	Freight Management Study
CS 84	Local Area	Southern Delmarva	Intermodal Center Feasibility Study
VIRGINIA			
CS 90	Local Area	Wallops Island / Chincoteague	Freight Access Study
CS 91	Local Area	Accomack and Northampton County	US 13 Truck Parking Study

Exhibit 8.2 – Summary Project Candidates Index (Continued)

Index #	Route / Area	Limits	Description
US 202 / DE 41 Piedmont (PD) Freight Corridor			
MARYLAND			
PD 01	MD 273	East Limits of Rising Sun to Sylmar Rd	Two-lane reconstruct
PD 02	MD 273	US 1 to DE Line	Corridor Study / Concept Design for freight management upgrades (approximately Rising Sun to DE Line)
PD 10	MD 213	Providence Rd to MD 273	Two-lane reconstruct
PD 20	Local Area	Western Cecil County	Freight Management Study (incl. MD 222, MD 276, and access to I-95, US 1, US 222, Conowingo, Rising Sun, and PA)
DELAWARE			
PD 30	DE 2	DE 273 to DE 141	Corridor Study / Concept Design for freight managment upgrades
PD 31	DE 7	Valley Rd to PA Line	Corridor Study / Concept Design for freight management upgrades (w/ continuation into PA along SR 3013 to PA 41)
PD 32	DE 41	DE 48 to PA Line	Corridor Study / Concept Design for freight management upgrades (w/ continuation into PA along PA 41 to SR 3013)
PD 33	DE 48	Hercules Rd to DE 41	Corridor Study / Concept Design for freight management upgrades and potential roadway widening
PD 35	DE 141	Tyler McConnell Bridge	Construct Tyler McConnell Bridge (over Brandywine Creek) and DE 141 tie-ins (approx Montchannin Rd to Alapocas Rd
PD 36	DE 141	DE 2 to DE 52	Signalized corridor improvements and regular optimization
PD 50	DE 273	MD Line to DE 896	Corridor Study / Concept Design for freight management upgrades
PD 51	DE 896	DE 273 to MD Line	Corridor Study / Concept Design for freight management upgrades
MD/DE 404 and US 9 Freight Corridor			
MARYLAND			
LW 01	MD 404	US 50 to MD 404 Bus	Upgrade existing MD 404 to a 4 lane divided highway with access control
LW 02	MD 404	Queen Anne's Co Line to MD 404 Bus	Reconstruct and widen MD 404
LW 03	MD 404	at MD 328	Construct interchange at junction of MD 404 and MD 328 in Denton
LW 04	MD 404	MD 16 (Harmony Rd) to MD 16 (Greenwood Rd)	Divided hwy reconstruction and potential widening w/ access control improvements (along MD 404 / MD 16 overlap seg.)
LW 05	MD 404	MD 16 (Harmony Rd) to DE Line	Divided hwy reconstruction w/ access control improvements
LW 06	MD 404	Denton Area	Future VWS
LW 07	MD 313	MD 317 to MD 287	Corridor Study / Concept Design for freight management upgrades (approximately north of Denton to Goldsboro)
LW 08	MD 313	MD 404 to MD 317	Multi-lane reconstruction (Denton area)
LW 09	MD 313	MD 318 to MD 404	Corridor Study / Concept Design for freight management upgrades (approximately Federalsburg to MD 404)
DELAWARE			
LW 20	DE 404	MD Line to US 13	Corridor Study / Concept Design for freight management upgrades (including peak season traffic influence)
LW 21	DE 404	US 13 to US 113	Corridor Study / Concept Design for freight management upgrades (including peak season traffic influence)
LW 22	US 9 / US 9 Tk	US 113 to DE 5	Corridor Study / Concept Design for freight management upgrades (including peak season traffic influence)
LW 23	US 9	DE 5 to DE 1	Corridor Study / Concept Design for freight management upgrades (including peak season traffic influence)
Delmarva Rail			
Amtrak			
R 01	Amtrak	Baltimore City	FRA Tunnel Study Phase 2; Improve clearance, alignment, and grade through B&P and Union Tunnels
R 02	Amtrak	Susquehanna River Bridge	Rehabilitate bridge
R 03	Amtrak	Yard to Ragan Interlockings	New third track
CSX Transportation			
R 10	CSX	MD Line to to Landenberg Junction	Double Tracking of 9.9 miles of existing CSX line
R 11	CSX	Elsmere to PA Line	Double Tracking of 9.1 miles of existing CSX line
Norfolk-Southern			
R 20	NS	Chesapeake Connector	New third track from Prince to Bacon Interlockings
R 22	NS	Edgemoor Yard	Raise yard from 2 to 6 feet elevation to reduce frequency of flooding-related service disruptions.
R 23	NS	Edgemoor Yard	Relocation of NS Edgemoor Yard to a location around Bear or Porter to centralize north end operations
R 25	NS	at Seaford Rail Bridge	Rail bridge replacement and/or modernization across Nanticoke River
R 26	NS	Georgetown Siding	Install one-track switch in the Indian River Secondary Line and construct small siding adjacent to Georgetown Station
Maryland and Delaware Railroad			
R 30	MDDE	Frankford to Snow Hill	286k rail upgrade of Snow Hill Line
R 31	MDDE	Massey to Worton	286k rail upgrade
R 32	MDDE	Massey to Centreville	286k rail upgrade
Bay Coast Railroad			
R 40	BCRR	Cape Charles to Pocomoke City	Feasibility or Market Study of multimodal service enhancements (track, carfloat operations, rail access, maintenance)

8.2 Assessment Methodologies

Two stages of project assessments were completed as part of this freight plan. The first – **project screening** – was primarily a qualitative exercise that addressed all project candidates in each of the three states across the peninsula. The second – **project prioritization** – was more of a quantitative exercise that addressed candidates in the state of Delaware only. The prioritization stage, in this case, was directed specifically at supporting future DelDOT and Delaware State planning efforts. Project candidates in Maryland and Virginia fall under different jurisdictional authorities and, as such, would be subject to separate prioritization processes that may be in use by those jurisdictions (e.g., as per the *2009 Maryland Statewide Freight Plan* or *2012 Maryland Freight Implementation Plan*).

For the purposes of this freight plan, efforts in both the screening and prioritization stage were specifically geared toward assessing freight-related benefits and should not be construed as a broader judgment of potential general transportation benefits. Any candidate that screens "low", for example, would only do so in this case through the lens of freight interests or relative freight benefits; candidates may have other merits that are simply beyond the scope or focus of this freight plan.

Project Screening

Project screening efforts reviewed candidates and concepts to qualitatively assess their potential influence on enhancing freight and goods movement. Candidates were screened from two overall perspectives:

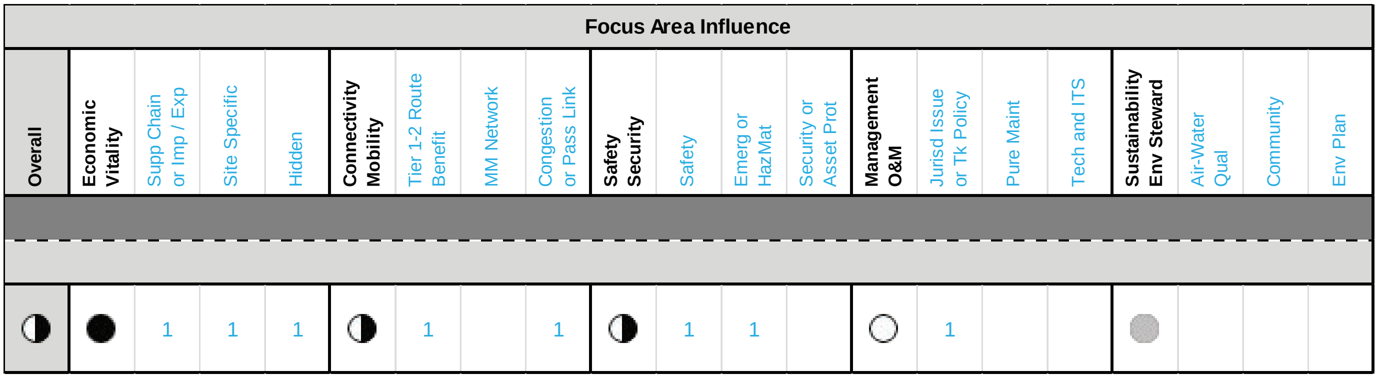
1. **Focus Area Influence**: This assessment explored the extent to which each project candidate might influence topics of interest within the freight plan's focus areas of economic vitality; freight mobility, connectivity and accessibility; safety and security; system management, operations and maintenance; and sustainability and environmental stewardship (see *Chapter 6* and previous *Exhibit 6.10*). Influence ratings from "nominal" to "high" were qualitatively assigned based on the number of issues that were potentially affected within each focus area category and across all categories (*Exhibit 8.3*).

2. **Scenario Influence**: This assessment explored the relative extent to which the need for each project candidate might vary under each of the future scenarios evaluated by this plan (see *Chapter 7*). Influence ratings from "nominal" to "high" were first assigned to the future Trendline scenario based on a comparison of existing and projected level-of-service failures at each project location (*Exhibit 8.4*)[1] Remaining scenarios were subsequently flagged if the Cube Cargo modeling efforts identified further changes in level-of-service or at least a 10% change in truck VHT.

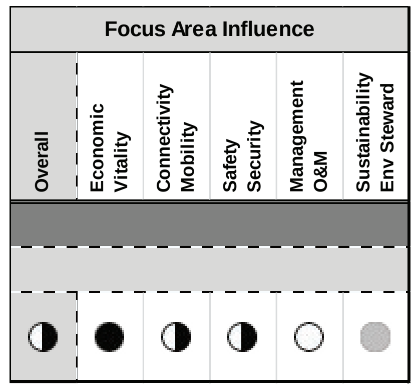
While a fairly broad-based assessment, the summary intent of this screening exercise aimed to reasonably filter which project candidates could have a greater or lesser potential freight influence versus the specific interests and concerns throughout the Delmarva region, both in general and against the backdrop of a variety of unknown futures.

[1] LOS results were compared on a pass/fail basis. High ratings encompassed existing Baseline failures, as well as locations where anticipated project commitments did not mitigate future Trendline failures. Moderate ratings included failures that did not appear until the future year, or passing locations that already assumed an anticipated project commitment. Low ratings typically encompassed passing locations in both the existing and future years without any anticipated project commitment.

Exhibit 8.3 – Project Screening Criteria for Focus Area Influence



Each candidate is flagged (YES=1, NO=0) to qualitatively assess its potential to influence specific freight issues within each focus area category and overall



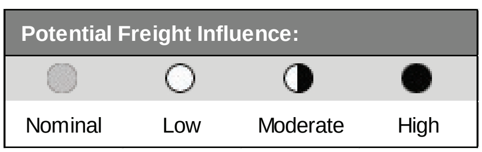
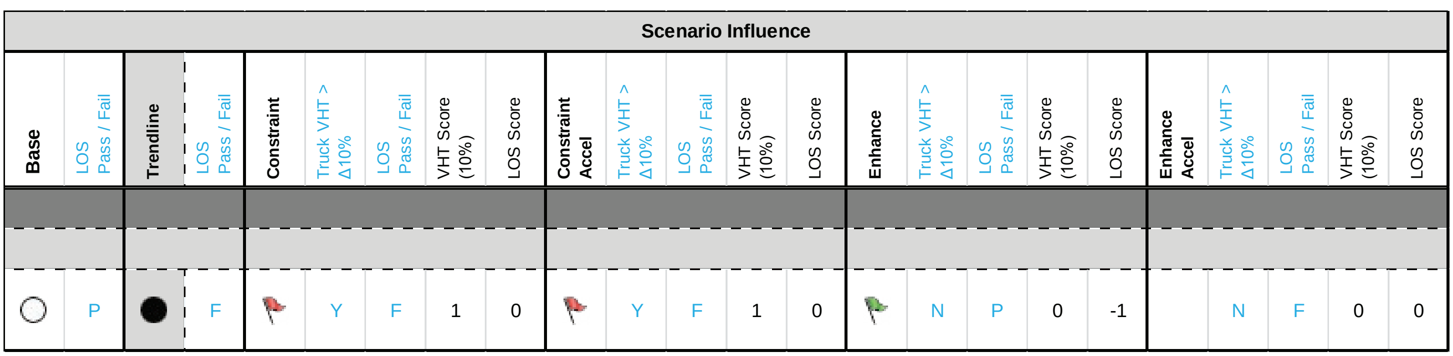
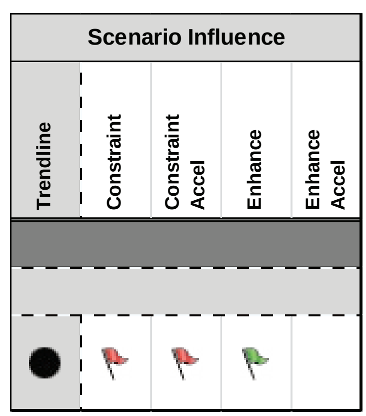
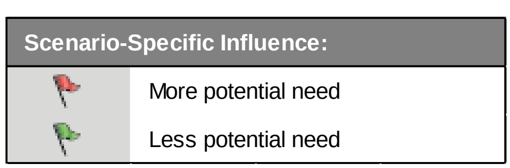


Exhibit 8.4 – Project Screening Criteria for Scenario Influence



Relative changes in LOS and truck VHT are assessed at each project location under each scenario to estimate the potential scenario influence relative to project need





Project Prioritization

Moving beyond project screening and in-line with the performance-based objectives of MAP-21, project candidates within the state of Delaware were further evaluated using a detailed qualitative/quantitative process to measure their merits against established priorities. Though similar to rating systems used to support, for example, DelDOT's Capital Transportation Program (CTP), the process here was customized to align with freight planning needs and interests. Individual projects were rated according to a variety of weighted evaluation criteria (*Exhibit 8.5*) that referenced the freight plan's key focus areas, project screening results, and available quantitative data from, for example, Cube Cargo modeling efforts. Resulting scores allowed for detailed rankings of all candidates to help establish the relative top priorities and key project or study lists that have been summarized in the pages ahead.

Exhibit 8.5 – Project Prioritization Criteria and Rating Scales

Weight / Category / Criteria		Criteria Rating Scale			
		0.00	0.25	0.50	1.00
15%	**Economic Vitality**				
20%	**Focus Area Influence** (category-specific per project screening results)	*Nominal*	*Low*	*Moderate*	*High*
20%	**Scenario Influence*** (per project screening results)	*1*	*2-3*	*4-5*	*6-7*
60%	**Freight Generators** (within 1-mile buffer of project location)	*0*	*1-5*	*6-10*	*>10*
25%	**Freight Connectivity, Mobility and Accessibility**				
20%	**Focus Area Influence** (category-specific per project screening results)	*Nominal*	*Low*	*Moderate*	*High*
50%	**LOS / Base** (at project location)	*A-C*	*D*	*E*	*F*
30%	**LOS / No-Build** (at project location)	*A-C*	*D*	*E*	*F*
30%	**Safety and Security**				
20%	**Focus Area Influence** (category-specific per project screening results)	*Nominal*	*Low*	*Moderate*	*High*
80%	**Fatal Crashes involving Large Trucks** (number within 3-year period per NHTSA FARS data)	*0*	*1*	*2*	*≥3*
20%	**System Management, Operations and Maintenance**				
20%	**Focus Area Influence** (category-specific per project screening results)	*Nominal*	*Low*	*Moderate*	*High*
80%	**Average Daily Truck Traffic** (at project location for Base year conditions)	*0-100; or 100-1000***	*1,000-2,500*	*2,500-7,500*	*>7,500*
10%	**Sustainability and Environmental Stewardship**				
20%	**Focus Area Influence** (category-specific per project screening results)	*Nominal*	*Low*	*Moderate*	*High*
80%	**Congested Travel Speed** (as a % of free-flow speed for modeled peak period)	*>90%*	*60-90%*	*30-60%*	*<30%*

Table Notes:

* *Nominal, Low, Moderate, or High (per No-Build screening results) rated at 0, 1, 2, or 3; additional +1 for each flagged scenario*

** *ADTT < 100 rated at 0.00; ADTT of 100-1000 rated at 0.125*

8.3 Screening Results and Corridor Summaries

Project candidate screening results were summarized by corridor, by state, and by network tier (as defined by *Exhibit 8.6*). General overview information was also compiled to highlight focal routes and their typical types of improvements; focal connections between corridors, freight hubs, and the surrounding region; and notable multimodal visions or opportunities that should be considered alongside future planning or development activities that may impact each corridor. Specific corridors and summary results include:

- I-95 Metro Freight Corridor (map *Exhibit 8.7*; index *Exhibit 8.8*)
- US 301 Bay Freight Corridor (map *Exhibit 8.9*; index *Exhibit 8.10*)
- US 50 Ocean City Freight Corridor (map *Exhibit 8.11*; index *Exhibit 8.12*)
- US 13/113 and DE 1 Coastal Freight Corridor (map *Exhibit 8.13*; index *Exhibit 8.14*)
- US 202 and DE 41 Piedmont Freight Corridor (map *Exhibit 8.15*; index *Exhibit 8.16*)
- MD/DE 404 and US 9 Lewes Freight Corridor (map *Exhibit 8.17*; index *Exhibit 8.18*)
- Rail Project Candidates (map *Exhibit 8.19*; index *Exhibit 8.20*)

Exhibit 8.6 – Project Screening Legend and Key

Potential Freight Influence:			
◍	○	◑	●
Nominal	Low	Moderate	High

Scenario-Specific Influence:	
🚩 (red flag)	More potential need
(green flag)	Less potential need

Commitment Tier:	
1	Anticipated Project Commitment
2	Documented Project Aspiration
3	General Planning Concept
4	Proposed Study

Network Tier:	
1F	State Primary on Federal PFN*
1S	State Primary
2	State Secondary
3	Other Freight or FLM** Connection
4	Not Categorized

County Codes:		
NCC	New Castle County	DE
KTD	Kent County (DE)	DE
SSX	Sussex County	DE
BCY	Baltimore City	MD
CEC	Cecil County	MD
KTM	Kent County (MD)	MD
QUE	Queen Anne's County	MD
CAR	Caroline County	MD
TAL	Talbot County	MD
DOR	Dorchester County	MD
WIC	Wicomico County	MD
WOR	Worcester County	MD
SOM	Somerset County	MD
ACC	Accomack County	VA
NOR	Northampton County	VA

* PFN = Primary Freight Network

** FLM = First/Last Mile

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Metro Freight Corridor

- **Focal Routes and Typical Improvement Types**
  - » I-95, I-295, I-495: capacity, interchanges, interconnectivity
  - » US 40, US 13: operations, interconnectivity
- **Focal Connections**
  - » Freight Corridors: Piedmont, Bay, and Coastal Corridors
  - » Freight Hubs: Cecil County and New Castle County
  - » Regional: Surrounding metro areas and U.S. East Coast
- **Multimodal Visions or Opportunities**
  - » Rail: NS and CSX operations, Chesapeake Connector Project, US 40 Rail Overpass, Edgemoor Yard Site Improvements
  - » Water: Port of Wilmington expansion, Post-Panamax or M-95 influences
  - » Air: Wilmington-Philadelphia Regional
  - » Pipeline: Project Mariner East

Key Studies per Exhibits 8.7-8.8:

MT 60/61/62: US 13; DE 1 to Wilmington

MT 95/97: Freight Management Areas

MT 81: DE 72; US 40 to US 13

Key Projects per Exhibits 8.7-8.8:

MT 50: I-95 @ DE 896 (interchange)

MT 56: I-295; I-95 to DE Memorial Bridge (upgrade)

MT 03: I-95; MDTA Sect 400 (reconstruct & widen)

MT 53: I-95 @ DE 141 (interchange)

MT 72: US 40 @ US 13 (interchange)

Exhibit 8.7 – I-95 Metro Freight Corridor – Project Candidates Map

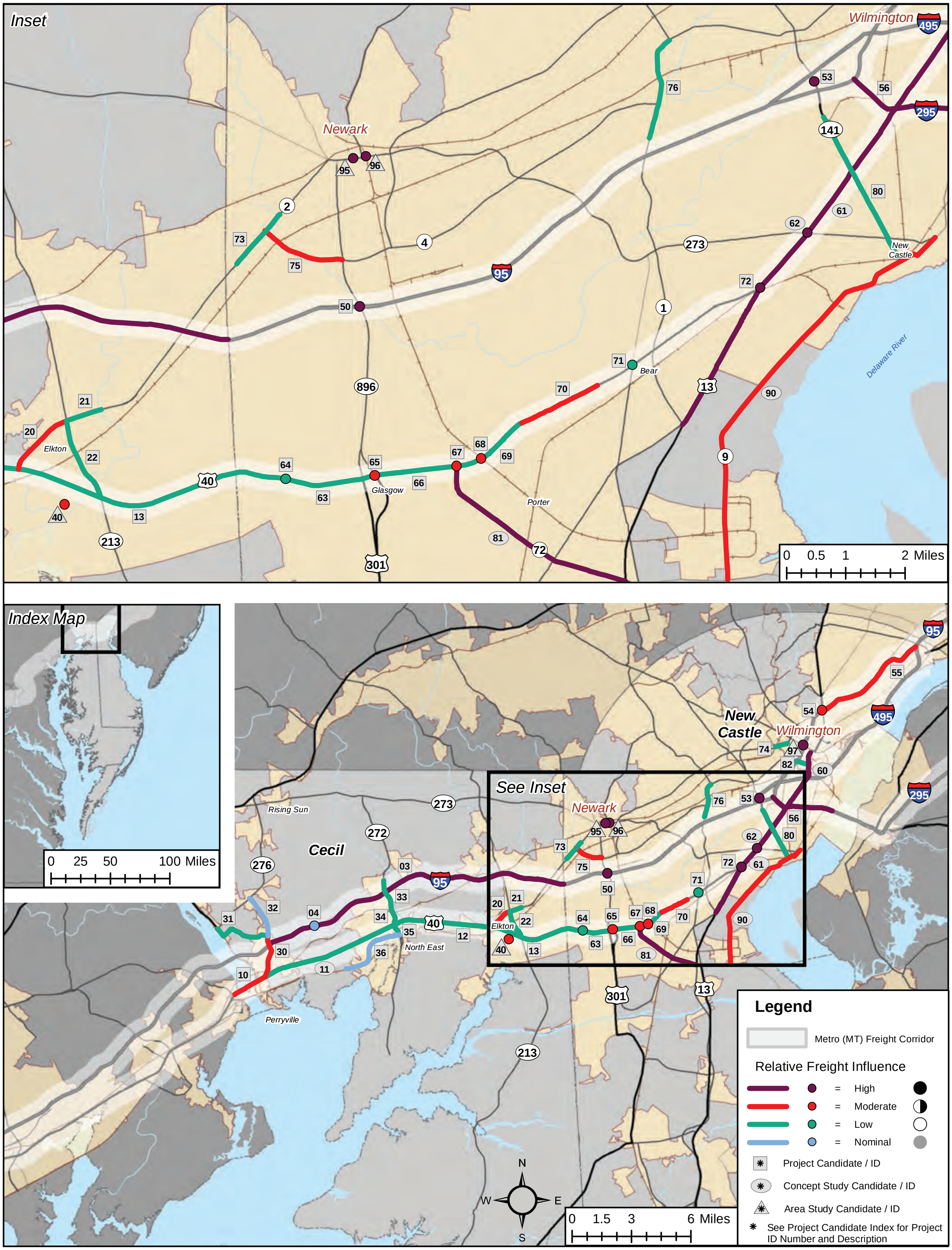

Exhibit 8.8 – I-95 Metro Freight Corridor – Project Screening Summary

Candidate Project Details								Focus Area Influence						Scenario Influence				
Index #	Route / Area	Limits	Description	State	County	Commit Tier	Network Tier	Overall	Economic Vitality	Connectivity Mobility	Safety Security	Management O&M	Sustainability Env Steward	Trendline	Constraint	Constraint Accel	Enhance	Enhance Accel
MARYLAND																		
Tier 1F Routes (State Primary on Federal PFN)																		
MT 03	I-95	MdTA Section 400	Reconstruct and widen	MD	CEC	2	1F	●	●	●	●	◐	○	◐				
MT 04	I-95	at Belvedere Rd	New interchange	MD	CEC	2	1F	◌	◌	○	◌	◌	○	◐				
Tier 1S Routes (State Primary)																		
MT 10	US 40	MdTA Thomas J. Hatem Mem Br	Convert to All Electronic Tolling and rehab approach roadways	MD	CEC	1	1S	◐	◐	●	●	◐	○	●				⚑
MT 11	US 40	MD 222 to MD 272	Corridor Study / Concept Design for roadway or capacity upgrades	MD	CEC	4	1S	○	●	◐	○	◌	◌	◐				
MT 12	US 40	MD 272 to MD 279	Divided highway reconstruct	MD	CEC	2	1S	○	◐	◐	◐	○	◌	●				⚑
MT 13	US 40	MD 279 to DE Line	Divided highway reconstruct	MD	CEC	2	1S	○	○	◐	○	○	◌	◐				⚑
Tier 2 Routes (State Secondary)																		
MT 20	MD 279	US 40 to MD 213	Divided highway reconstruct	MD	CEC	2	2	◐	○	◐	○	◐	◐	●		⚑		⚑
MT 21	MD 279	MD 213 to MD 316	Multi-lane urban reconstruct	MD	CEC	2	2	○	◌	○	○	○	○	○		⚑		⚑
MT 22	MD 213	US 40 to MD 279	Multi-lane uban reconstruct	MD	CEC	2	2	○	◐	◐	○	○	○	●		⚑		⚑
Tier 3 Routes (Other Freight or FLM Connections)																		
MT 30	MD 222	US 40 to MD 275	Multi-lane urban reconstruct, widening of MD 222 bridge over I-95, and potential Coudon Rd extension	MD	CEC	2	3	◐	●	◐	○	◐	◐	●				
MT 31	MD 222	MD 275 to MD 276	Reconstruct	MD	CEC	2	3	○	○	◌	○	○	○	○				
MT 32	MD 275	MD 222 to MD 276	Divided highway reconstruct	MD	CEC	2	3	◌	◌	○	○	○	◌	●				
MT 33	MD 272	Lums Rd to MD 274 / Seahawk Dr	Reconstruct	MD	CEC	2	3	○	○	○	○	○	◌	●				
MT 34	MD 272	US 40 to Lums Rd	Widen	MD	CEC	2	3	○	○	○	○	○	○	●				
MT 35	MD 272	US 40 to N Main St / N Maudlin Ave	Multi-lane urban reconstruct to beginning of couplet south of US 40	MD	CEC	2	3	○	◌	○	○	○	○	◐	⚑	⚑	⚑	⚑
MT 36	MD 7	Charlestown to MD 272	Two-lane reconstruct	MD	CEC	2	3	◌	◌	○	○	○	◌	◐		⚑		⚑

Exhibit 8.8 – I-95 Metro Freight Corridor – Project Screening Summary (Continued)

Candidate Project Details								Focus Area Influence						Scenario Influence				
Index #	Route / Area	Limits	Description	State	County	Commit Tier	Network Tier	Overall	Economic Vitality	Connectivity Mobility	Safety Security	Management O&M	Sustainability Env Steward	Trendline	Constraint	Constraint Accel	Enhance	Enhance Accel
Other Details																		
MT 40	**Area Study**	Elkton	Freight Management Study, including route signage and truck restrictions	MD	CEC	3	4	◐	◐	○	◐	◐	○	●		🚩		🚩
DELAWARE																		
Tier 1F Routes (State Primary on Federal PFN)																		
MT 50	**I-95**	at DE 896	Major interchange reconstruction	DE	NCC	2	1F	◐	◐	●	●	○	◌	●				
MT 53	**I-95**	at DE 141	Phase I / Phase II interchange projects	DE	NCC	2	1F	◐	◐	●	◐	○	◌	●				🚩
MT 54	**I-95**	at US 202	Interchange improvements	DE	NCC	1	1F	○	◐	◐	◐	○	◌	●		🚩		🚩
MT 55	**I-95**	US 202 to I-495 / DE 92	Widen from 4 to 6 lanes	DE	NCC	2	1F	●	●	●	●	◐	○	○		🚩		🚩
MT 56	**I-295**	I-95 to Delaware Memorial Br	Improvements	DE	NCC	1	1F	●	●	●	●	◐	○	●		🚩		🚩
Tier 1S Routes (State Primary)																		
MT 60	**US 13**	I-495 to Christiana River	Corridor Study / Concept Design for freight management upgrades	DE	NCC	3	1S	◐	◐	◐	○	○	◐	●				
MT 61	**US 13**	DE1 to I-495	Corridor Study / Concept Design for roadway or capacity upgrades	DE	NCC	3	1S	●	●	●	●	◐	○	●		🚩		🚩
MT 62	**US 13**	at DE 273	Interchange Feasibility Study / Concept Design	DE	NCC	4	1S	◐	●	●	◐	◌	◌	◐		🚩		🚩
MT 63	**US 40**	MD Line to DE 896	Roadway or capacity upgrades	DE	NCC	3	1S	○	○	◐	◐	○	○	◐		🚩		🚩
MT 64	**US 40**	at Pleasant Valley Rd	Intersection improvements	DE	NCC	2	1S	○	○	◐	○	○	○	◐		🚩		🚩
MT 65	**US 40**	at DE 896	New interchange	DE	NCC	3	1S	◐	◐	●	●	◌	◌	○		🚩		🚩
MT 66	**US 40**	DE 896 to DE 72	Roadway or capacity upgrades	DE	NCC	3	1S	◐	●	◐	◐	○	◌	○		🚩		🚩
MT 67	**US 40**	at DE 72	Intersection improvements	DE	NCC	2	1S	◐	◐	●	○	○	○	◐				🚩
MT 68	**US 40**	at NS Rail Crossing (Bear, DE)	At-grade highway-rail crossing improvement and/or grade separation	DE	NCC	3	1S	●	◐	●	●	◐	●	○				🚩
MT 69	**US 40**	DE 72 to Salem Church Rd	Roadway or capacity upgrades	DE	NCC	3	1S	○	○	◐	○	○	◌	○		🚩		🚩
MT 70	**US 40**	Salem Church Rd to Walther Rd	Corridor widening (4 to 6 lanes)	DE	NCC	2	1S	○	○	◐	○	○	○	◐				🚩

Exhibit 8.8 – I-95 Metro Freight Corridor – Project Screening Summary (Continued)

Candidate Project Details								Focus Area Influence						Scenario Influence				
Index #	Route / Area	Limits	Description	State	County	Commit Tier	Network Tier	Overall	Economic Vitality	Connectivity Mobility	Safety Security	Management O&M	Sustainability Env Steward	Trendline	Constraint	Constraint Accel	Enhance	Enhance Accel
MT 71	**US 40**	at DE 7	New interchange	DE	NCC	3	1S	○	○	◑	○	◍	◍	○		⚑		⚑
MT 72	**US 40**	at US 13	New interchange	DE	NCC	3	1S	◑	●	●	◑	◍	◍	◑		⚑		⚑
MT 73	**DE 2**	MD Line to Casho Mill	Upgrades	DE	NCC	1	1S	○	○	○	○	○	○	◑		⚑		⚑
MT 74	**DE 2**	DE 100 to Broom St	Upgrades	DE	NCC	1	1S	○	◍	○	○	○	○	◑		⚑		⚑
MT 75	**DE 4**	DE 2 to DE 896	Eastbound widening	DE	NCC	1	1S	○	◍	◑	○	○	◑	●	⚑	⚑	⚑	⚑
MT 76	**DE 7**	Churchmans Rd to Limestone Rd	Signalized corridor improvements and regular optimization	DE	NCC	2	1S	○	○	◑	○	○	◑	◑		⚑		⚑
Tier 2 Routes (State Secondary)																		
MT 80	**DE 141**	DE 37 to DE 9	Retiming and/or field installations for traffic responsive signal operations	DE	NCC	2	2	○	○	○	○	○	◑	○		⚑		⚑
MT 81	**DE 72**	US 40 to US 13	Corridor Study / Concept Design for freight management upgrades	DE	NCC	4	2	◑	◑	●	◑	○	○	●		⚑		
MT 82	**Proposed**	Christina River Bridge	New bridge	DE	NCC	1	2	○	◍	◑	◑	◑	○	◑				
Tier 3 Routes (Other Freight or FLM Connections)																		
MT 90	**DE 9**	DE 72 to DE 273	Corridor Study / Concept Design for freight management upgrades (approximately Delaware City to New Castle)	DE	NCC	4	3	○	○	○	◍	○	○	●		⚑	⚑	⚑
Other Details																		
MT 95	**Area Study**	Newark	Freight Management Study	DE	NCC	4	4	○	○	○	◑	◑	○	●		⚑		⚑
MT 96	**Area Study**	Newark	Intermodal Center Feasibility Study	DE	NCC	4	4	◑	◑	◑	○	◑	○	●		⚑		⚑
MT 97	**Area Study**	Wilmington	Freight Management Study, including route signage study	DE	NCC	3	4	◑	◑	◑	◑	◑	◑	●		⚑		⚑

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Bay Freight Corridor

- **Focal Routes and Typical Improvement Types**
  - » US 301: access control, interchanges, new expressway
  - » MD 213, DE 896: capacity, upgrades, operations, bridge widening
- **Focal Connections**
  - » Freight Corridors: Metro and Coastal Corridors
  - » Freight Hubs: Dover, Smyrna, Centreville, Chestertown
  - » Regional: US 50/US 301 Bay Bridge area
- **Multimodal Visions or Opportunities**
  - » Rail: MDDE Chestertown and Centreville Lines (286k upgrade)
  - » Water: Post-Panamax or M-95 influences
  - » Air: --
  - » Pipeline: --

Key Studies per Exhibits 8.9-8.10:

BY 44: DE 896; US 301 to DE 1

BY 43: DE 896; C&D Canal to US 40

BY 13: MD 213; Basil Ave to MD 290/MD 313

Key Projects per Exhibits 8.9-8.10:

BY 42: DE 896; DE 2 to Boyds Corner Rd (signals)

BY 41: US 301; MD Line to DE 1 (new expressway)

BY 50: DE 299; DE 1 to Catherine St (widen)

BY 02: US 301; Bay County Rest Area (truck parking)

BY 10: MD 213; Frenchtown Rd to Basil Ave (reconstruct)

Exhibit 8.9 – US 301 Bay Freight Corridor – Project Candidates Map

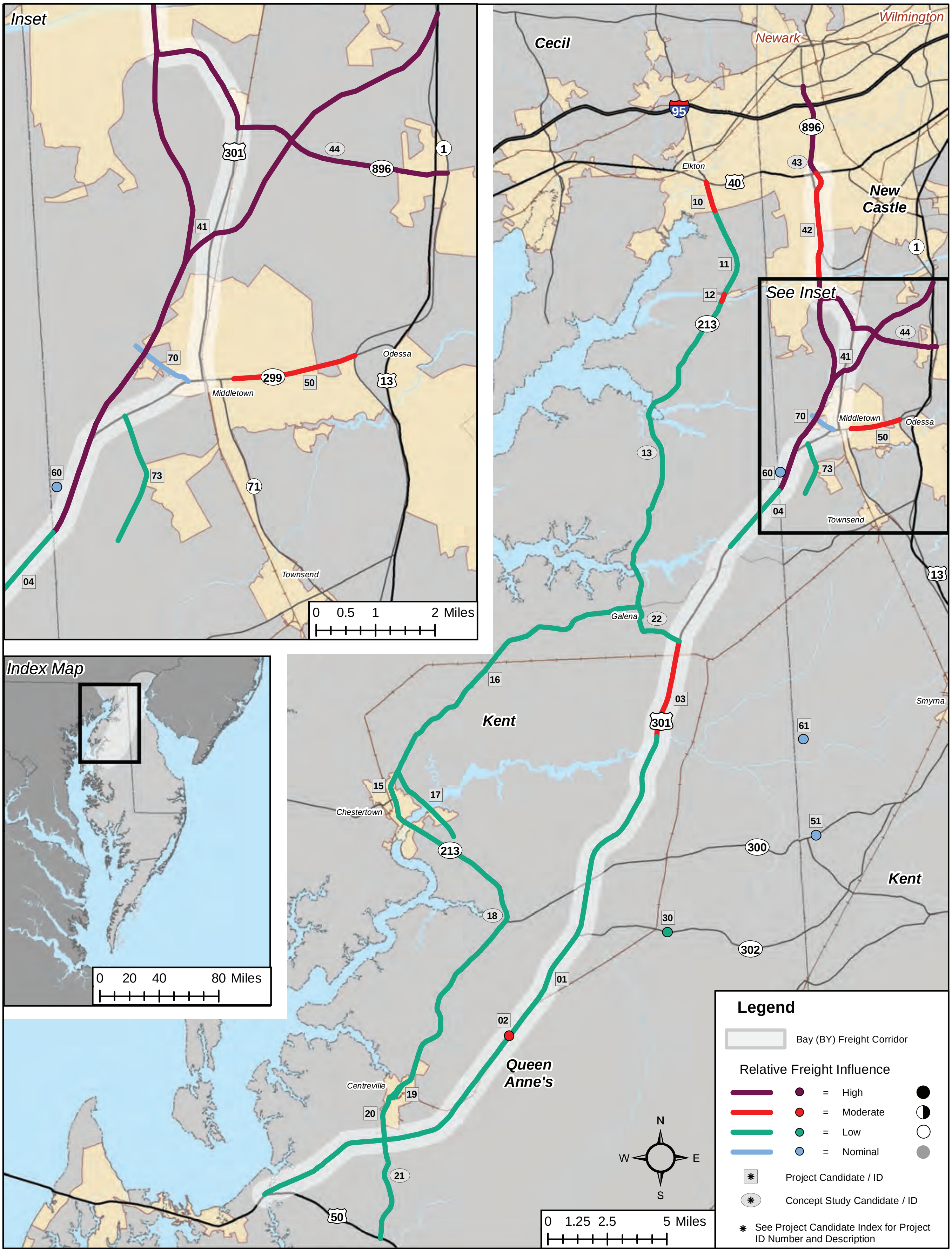

Exhibit 8.10 – US 301 Bay Freight Corridor – Project Screening Summary

Candidate Project Details								Focus Area Influence						Scenario Influence				
Index #	Route / Area	Limits	Description	State	County	Commit Tier	Network Tier	Overall	Economic Vitality	Connectivity Mobility	Safety Security	Management O&M	Sustainability Env Steward	Trendline	Constraint	Constraint Accel	Enhance	Enhance Accel
MARYLAND																		
Tier 1S Routes (State Primary)																		
BY 01	US 301	US 50 to Kent Co Line	Access control improvements and interchanges	MD	QUE	2	1S	○	●	◐	○	○	◍	○		⚑		⚑
BY 02	US 301	Bay County Rest Area	Truck Parking	MD	QUE	1	1S	◐	○	◐	◐	◐	◐	◐		⚑		⚑
BY 03	US 301	Queen Anne's Co Line to MD 313	Divided highway reconstruct w/ interchanges	MD	KTM	2	1S	◐	●	◐	○	◐	○	○		⚑		⚑
BY 04	US 301	Kent Co Line to DE Line	Access control improvements; Potential MD 299 intersection improvements	MD	CEC	2	1S	○	●	◐	○	○	◍	○		⚑		⚑
Tier 2 Routes (State Secondary)																		
BY 10	MD 213	US 40 to Frenchtown Rd	Widening, including potential major reconstruction and improvements at the MD 213 / US 40 intersection	MD	CEC	2	2	◐	◐	◐	◐	○	○	●		⚑		⚑
BY 11	MD 213	Frenchtown Rd to Basil Ave	Reconstruction and potential widening (approximately from south of Elkton to Chesapeake City)	MD	CEC	2	2	○	◐	◐	○	○	○	●		⚑		⚑
BY 12	MD 213	at C&D Canal	Widening of MD 213 bridge over C&D Canal	MD	CEC	3	2	◐	◐	◐	●	◐	○	●		⚑		⚑
BY 13	MD 213	Basil Ave to MD 290 / MD 313	Corridor Study / Concept Design for freight management upgrades (approximately between Chesapeake City and Galena)	MD	CEC KTM	4	2	○	◐	◐	○	○	◍	●		⚑		⚑
BY 15	MD 213	MD 291 to MD 297	Multi-lane reconstruct (north of Chestertown)	MD	KTM	2	2	○	○	○	○	○	◍	○		⚑		⚑
BY 16	MD 213	Cross Street to MD 291	Multi-lane urban reconstruct (Chestertown)	MD	KTM	2	2	○	○	◐	○	○	○	○		⚑		⚑
BY 17	MD 213	MD 297 to MD 544	Two-lane construction of new access controlled boulevard including bridge over Chester River	MD	KTM QUE	2	2	○	○	◐	◐	○	○	○		⚑		⚑
BY 18	MD 213	MD 291 to MD 305	Corridor Study / Concept Design for freight management upgrades (approximately between Chestertown and Centreville)	MD	KTM QUE	4	2	○	○	◐	○	○	◍	◐		⚑		⚑
BY 19	MD 213	at MD 304 and S Liberty St / Commerce St couplet	Urban corridor improvements through Centreville (geometric, signal, parking, signing, pavement marking, and utility placement upgrades)	MD	QUE	2	2	○	○	◐	○	◐	○	◐		⚑		⚑
BY 20	MD 213	US 301 to S Liberty St / Commerce St couplet	Multi-lane reconstruct (south of Centreville)	MD	QUE	2	2	○	○	◐	○	○	◍	◐		⚑		⚑
BY 21	MD 213	US 50 to US 301	Corridor Study / Concept Design for freight management upgrades	MD	QUE	4	2	○	◐	◐	○	○	◍	◐		⚑		⚑
BY 22	MD 313	US 301 to MD 213	Corridor Study / Concept Design for freight management upgrades (approximately between US 301 to Galena)	MD	KTM	4	2	○	◐	◐	○	○	◍	◐		⚑		⚑

Exhibit 8.10 – US 301 Bay Freight Corridor – Project Screening Summary (Continued)

Candidate Project Details								Focus Area Influence						Scenario Influence				
Index #	Route / Area	Limits	Description	State	County	Commit Tier	Network Tier	Overall	Economic Vitality	Connectivity Mobility	Safety Security	Management O&M	Sustainability Env Steward	Trendline	Constraint	Constraint Accel	Enhance	Enhance Accel
Tier 3 Routes (Other Freight or FLM Connections)																		
BY 30	**MD 302**	East of Barclay	Planned VWS	MD	QUE	2	3	○	○	◍	◑	◑	◍	○				
DELAWARE																		
Tier 1S Routes (State Primary)																		
BY 41	**US 301**	MD Line to DE 1	New four-lane expressway	DE	NCC	1	1S	●	●	●	●	◑	○	●		⚑		⚑
BY 42	**DE 896**	DE 2 to Boyds Corner Rd	Retiming and/or field installations for traffic responsive signal operations	DE	NCC	2	1S	◑	○	●	○	○	◑	◑		⚑		⚑
BY 43	**DE 896**	C&D Canal to US 40	Corridor Study / Concept Design for roadway or capacity upgrades (potentially including widening from 4 to 6 lanes)	DE	NCC	4	1S	○	◑	◑	○	○	○	◑		⚑		⚑
BY 44	**DE 896**	US 301 to DE 1	Corridor Study / Concept Design for freight management upgrades	DE	NCC	4	1S	○	◑	●	○	○	◍	●		⚑		⚑
Tier 2 Routes (State Secondary)																		
BY 50	**DE 299**	DE 1 to Catherine St	Widening	DE	NCC	1	2	○	○	◑	○	○	○	●		⚑		⚑
BY 51	**DE 300**	West of Smyrna	Planned VWS	DE	KTD	3	2	○	○	○	◑	◑	◍	○				
Tier 3 Routes (Other Freight or FLM Connections)																		
BY 60	**DE 299**	West of Middletown	Planned VWS	DE	NCC	3	3	○	○	◍	◑	◑	◍	○				
BY 61	**DE 6**	West of Smyrna	Planned VWS	DE	KTD	3	3	○	○	◍	◑	◑	◍	○				
Other Details																		
BY 70	**Bunker Hill Rd**	Choptank Rd to US 301	Upgrade	DE	NCC	1	4	○	○	◍	○	○	○	◑			⚑	
BY 73	**Levels Rd**	Strawberry Lane to US 301	Upgrade	DE	NCC	1	4	◍	◍	◍	○	○	○	◑		⚑		⚑

Ocean City Freight Corridor

- **Focal Routes and Typical Improvement Types**
  - » US 50, MD 90: operations (Bay Bridge), capacity, upgrades, access control, bridges
- **Focal Connections**
  - » Freight Corridors: Coastal Corridor
  - » Freight Hubs: Easton, Federalsburg, Hurlock, Salisbury
  - » Regional: US 50/US 301 Bay Bridge area
- **Multimodal Visions or Opportunities**
  - » Rail: Southern Delmarva Intermodal Center
  - » Water: Wicomico River ports, long-term river dredging plans
  - » Air: Easton-Newnam, Salisbury-Ocean City-Wicomico Regional, Ocean City Municipal
  - » Pipeline: --

Key Studies per Exhibits 8.11-8.12:

OC 02: US 50/301; Bay Bridge to Split

OC 14: US 50; MD 16 Overlap Segments

OC 70/71: Salisbury Freight Management & Airport Connectivity

OC 72: Wicomico River Port Development Study

Key Projects per Exhibits 8.11-8.12:

OC 10: US 50; US 50/301 Split to MD 404 (reconstruct)

OC 18: US 50 @ US 13 (signal and ramp weave issue)

OC 17: US 50 @ Salisbury Bypass (additional lane)

OC 12: US 50; MD 322 north-south of Easton (reconstruct)

OC 13: US 50; MD 322 to Choptank River (access control)

Exhibit 8.11 – US 50 Ocean City Freight Corridor – Project Candidates Map

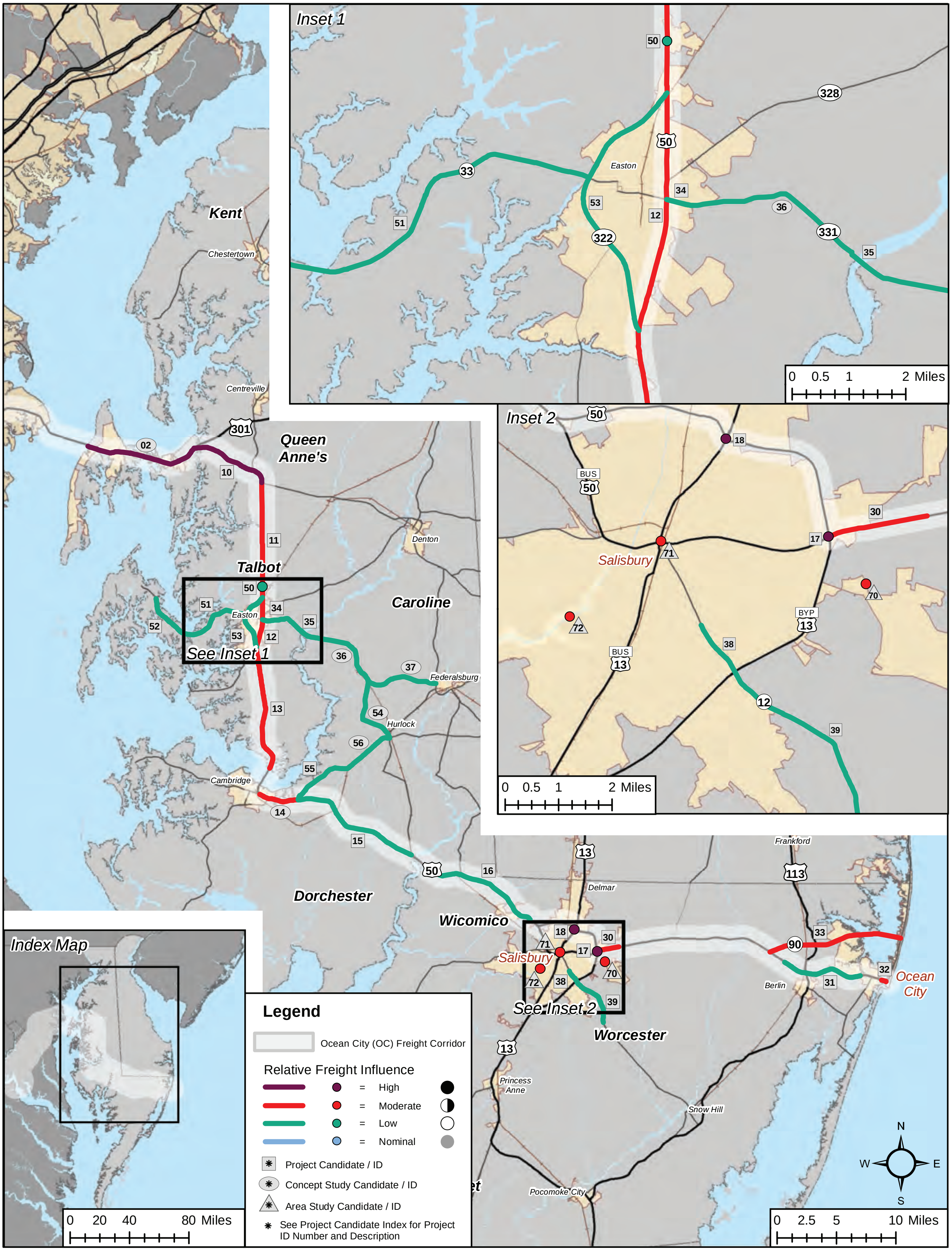

Exhibit 8.12 – US 50 Ocean City Freight Corridor – Project Screening Summary

Candidate Project Details								Focus Area Influence						Scenario Influence				
Index #	Route / Area	Limits	Description	State	County	Commit Tier	Network Tier	Overall	Economic Vitality	Connectivity Mobility	Safety Security	Management O&M	Sustainability Env Steward	Trendline	Constraint	Constraint Accel	Enhance	Enhance Accel
MARYLAND																		
Tier 1F Routes (State Primary on Federal PFN)																		
OC 02	**US 50/301**	Bay Bridge to US 50/301 Split	Corridor Study / Concept Design for freight management upgrades	MD	QUE	4	1F	●	●	●	●	◑	◑	●	⚑	⚑		
Tier 1S Routes (State Primary)																		
OC 10	**US 50**	US 50/301 Split to MD 404	Divided highway reconstruct w/ access control improvements and interchanges	MD	QUE	2	1S	●	●	●	◑	◑	◑	◑	⚑	⚑		
OC 11	**US 50**	MD 404 to MD 322	Reconstruct and widen	MD	TAL	2	1S	◑	●	◑	◑	○	○	○		⚑		⚑
OC 12	**US 50**	MD 322 (north) to MD 322 (south) of Easton	Divided highway reconstruct (through Easton area)	MD	TAL	2	1S	◑	●	●	○	○	◑	◑	⚑	⚑		⚑
OC 13	**US 50**	MD 322 south of Easton to Choptank River Bridge	Access control improvements (south of Easton through Trappe)	MD	TAL	2	1S	◑	●	●	○	○	○	◑	⚑	⚑		⚑
OC 14	**US 50**	MD 16 (Church Creek Rd) to MD 16 (Mt Holly Rd)	Corridor Study / Concept Design for freight management upgrades (approximately along US 50 / MD 16 overlap segments east of Cambridge)	MD	DOR	4	1S	◑	●	●	○	○	◑	○	⚑	⚑		
OC 15	**US 50**	MD 16 (Mt Holly Rd) to MD 331	Access control improvements (approximately east of Cambridge to Vienna)	MD	DOR	2	1S	○	●	◑	○	○	◍	○	⚑	⚑		
OC 16	**US 50**	MD 731A to White Lowe Rd	Access control improvements	MD	WIC	2	1S	○	●	◑	○	○	◍	○	⚑			
OC 17	**US 50**	at Salisbury Bypass	Construct an additional lane from US 50 onto Salisbury Bypass	MD	WIC	2	1S	●	●	●	◑	○	●	○		⚑		⚑
OC 18	**US 50**	at US 13	Signalize US 50 WB off-ramp and improve US 13 NB weave	MD	WIC	2	1S	●	●	●	◑	○	●	◑		⚑		⚑
Tier 2 Routes (State Secondary)																		
OC 30	**US 50**	Salisbury Bypass to east of Walston Switch Rd	Divided highway reconstruct including interchanges	MD	WIC	2	2	◑	◑	●	◑	◑	○	○				
OC 31	**US 50**	MD 346 to Herring Creek	US 50 access control improvements with interchange at MD 589	MD	WOR	2	2	○	◑	◑	○	○	◍	○				
OC 32	**US 50**	Bridge over Sinepuxent Bay	Bridge construct / reconstruct	MD	WOR	2	2	◑	◑	◑	◑	○	○	○				
OC 33	**MD 90**	US 50 to MD 528	Freeway reconstruct (Ocean City area)	MD	WOR	2	2	◑	◑	◑	◑	○	○	○				
OC 34	**MD 331**	US 50 to Chillcut Rd	Multi-lane urban reconstruct	MD	TAL	2	2	○	○	●	○	○	◍	●	⚑			
OC 35	**MD 331**	Bridge over Choptank River	Bridge construction	MD	TAL CAR	2	2	○	○	●	◑	○	◍	○				
OC 36	**MD 331**	US 50 to MD 318	Corridor Study / Concept Design for freight management upgrades (approximately Easton to Ellwood)	MD	TAL CAR	4	2	○	○	●	○	○	◍	○				

Exhibit 8.12 – US 50 Ocean City Freight Corridor – Project Screening Summary (Continued)

Candidate Project Details								Focus Area Influence						Scenario Influence				
Index #	Route / Area	Limits	Description	State	County	Commit Tier	Network Tier	Overall	Economic Vitality	Connectivity Mobility	Safety Security	Management O&M	Sustainability Env Steward	Trendline	Constraint	Constraint Accel	Enhance	Enhance Accel
OC 37	MD 318	MD 331 to MD 313	Corridor Study / Concept Design for freight management upgrades (approximately east of Preston to Federalsburg)	MD	TAL CAR DOR	4	2	○	○	◑	○	○	◍	●				
OC 38	MD 12	US 13 Bypass to Johnson Rd	Multi-lane urban reconstruct	MD	WIC	2	2	○	○	◑	○	○	○	◑				
OC 39	MD 12	Worcester Co Line to south of US 113 Bypass	Two-lane reconstruct	MD	WIC	2	2	○	○	●	○	○	◍	◑		🚩		🚩
Tier 3 Routes (Other Freight or FLM Connections)																		
OC 50	MD 662	at US 50 / MD 309	Intersection and capacity improvements	MD	TAL	2	3	○	○	◑	○	○	◍	○		🚩		🚩
OC 51	MD 33	Lincoln Ave to MD 322	Multi-lane reconstruct (approximately east of Saint Michaels to Easton)	MD	TAL	2	3	○	○	○	○	○	◍	●				
OC 52	MD 33	Yacht Club Rd to Lincoln Ave	Two-lane reconstruct	MD	TAL	2	3	○	○	○	○	○	◍	●				
OC 53	MD 322	US 50 (south) to US 50 (north) of Easton	Divided highway reconstruct (through Easton area)	MD	TAL	2	3	○	○	◑	○	○	○	◑		🚩		🚩
OC 54	MD 331	MD 318 to MD 392	Corridor Study / Concept Design for freight management upgrades (approximately Ellwood to Hurlock)	MD	CAR DOR	4	3	○	○	○	○	○	◍	○				
OC 55	MD 16	US 50 to MD 16 / MD 392 junction	Divided highway reconstruct (approximately US 50 to East New Market)	MD	DOR	2	3	○	○	◑	○	○	○	◑				
OC 56	MD 392	MD 16 / MD 392 junction to MD 331	Corridor Study / Concept Design for freight management upgrades (approximately East New Market to Hurlock)	MD	DOR	4	3	○	○	◑	○	○	○	●				
Other Details																		
OC 70	Area Study	Salisbury	Airport Access Study / Concept Design for new connection of Airport Rd to US 50	MD	WIC	3	4	◑	◑	◑	◑	○	◑	○		🚩		🚩
OC 71	Area Study	Salisbury	Freight Management Study	MD	WIC	4	4	◑	○	◑	◑	◑	◑	◑		🚩		🚩
OC 72	Area Study	Salisbury / Wicomico River	Port Development Study	MD	WIC	4	4	◑	●	○	◑	○	●	◑		🚩		🚩

Coastal Freight Corridor

- **Focal Routes and Typical Improvement Types**
  - » US 13, US 113: upgrades, interchanges, truck parking, access control
  - » DE 1: widening (north of US 13 split); freight management areas
- **Focal Connections**
  - » Freight Corridors: Ocean City, Lewes, Bay, and Metro Corridors
  - » Freight Hubs: Delaware City area, Dover, resort areas, numerous local freight hubs
  - » Regional: Access to I-95 Metro Corridor and Virginia's Chesapeake Bay Bridge/Tunnel
- **Multimodal Visions or Opportunities**
  - » Rail: NS access, Seaford rail bridge upgrade, Southern Delmarva Intermodal Center, MDDE Snow Hill Line (286k upgrade), BCRR upgrades, siding expansions
  - » Water: Nanticoke, Wicomico, and Pocomoke Rivers; Post-Panama or M-95 influences; linkage to Cape May-Lewes Ferry
  - » Air: Dover Air Cargo Ramp, Salisbury-Ocean City-Wicomico Regional, Sussex County Airport, Accomack County Airport
  - » Pipeline: --

Key Studies per Exhibits 8.13-8.14:

CS 42: DE 1/US 13; DE 72 to DE 71

CS 43: DE 1; Dover to Smyrna

CS 53: DE 24; US 113 to DE 23

CS 80: Freight Management Study/Dover

CS 83: Freight Management Study/Seaford

CS 90: Freight Access Study/Chincoteague-Wallops Island

Key Projects per Exhibits 8.13-8.14:

CS 41: DE 1; Tybouts Corner to DE 273 (widen)

CS 52: DE 72; McCoy Rd to DE 71 (widen)

CS 51: DE 7; Newtown Rd to DE 273 (widen)

CS 02: US 13; Salisbury Bypass to DE Line (reconstruct)

CS 03: US 13; Somerset Co Line to US 13 Bus (reconstruct)

Exhibit 8.13 – US 13/113 and DE 1 Coastal Freight Corridor – Project Candidates Map

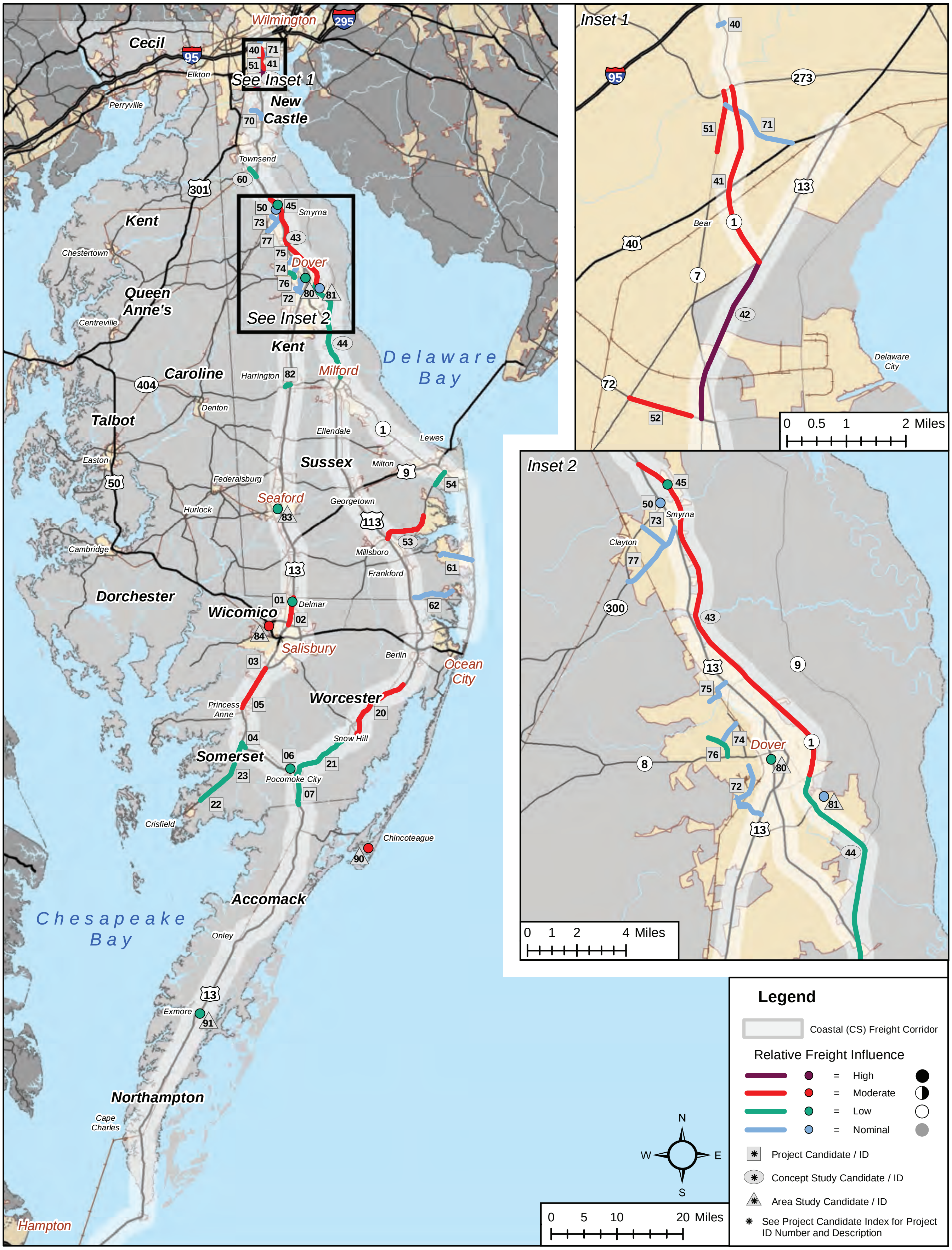

Exhibit 8.14 – US 13/113 and DE 1 Coastal Freight Corridor – Project Screening Summary

Candidate Project Details								Focus Area Influence						Scenario Influence				
Index #	Route / Area	Limits	Description	State	County	Commit Tier	Network Tier	Overall	Economic Vitality	Connectivity Mobility	Safety Security	Management O&M	Sustainability Env Steward	Trendline	Constraint	Constraint Accel	Enhance	Enhance Accel
MARYLAND																		
Tier 1S Routes (State Primary)																		
CS 01	**US 13**	near Delmar	Planned VWS	MD	WIC	2	1S	○	○	○	◐	◐	○	○		🚩		🚩
CS 02	**US 13**	Salisbury Bypass to DE Line	Divided highway reconstruct with access control improvements	MD	WIC	2	1S	◐	●	●	○	○	◐	◐		🚩		🚩
CS 03	**US 13**	Somerset Co Line to US 13 Bus	Divided highway reconstruct including interchanges	MD	WIC	2	1S	◐	●	◐	○	○	○	○		🚩		🚩
CS 04	**US 13**	MD 673A to MD 413	Access control improvements	MD	SOM	2	1S	○	●	◐	○	◍	◍	○				
CS 05	**US 13**	MD 362 to Wicomico Co Line	Divided highway reconstruct	MD	SOM	2	1S	◐	●	◐	○	○	○	○				
CS 06	**US 13**	Northbound near Pocomoke City	Planned VWS	MD	WOR	1	1S	○	○	○	◐	◐	○	◐				
CS 07	**US 13**	VA Line to US 113	Access control improvements	MD	WOR	2	1S	○	●	◐	○	◍	◍	○				
Tier 2 Routes (State Secondary)																		
CS 20	**US 113**	MD 12 to end Divided Hwy south of Berlin	Divided highway reconstruct including interchange at MD 12 and access improvements	MD	WOR	2	2	◐	●	◐	○	○	○	○				
CS 21	**US 113**	US 13 to US 113 Bus south of Snow Hill	Access control improvements	MD	WOR	2	2	○	●	◐	○	◍	○	○				
CS 22	**MD 413**	N Somerset Ave to MD 667	Divided highway reconstruct	MD	SOM	2	2	○	○	○	○	○	◍	○		🚩		🚩
CS 23	**MD 413**	MD 667 at Whites Rd to US 13	Divided highway reconstruct	MD	SOM	2	2	○	○	◐	○	○	○	◐				
DELAWARE																		
Tier 1S Routes (State Primary)																		
CS 40	**Road A**	Bridge	Improvement	DE	NCC	1	1S	○	○	◐	○	○	○	◐		🚩		🚩
CS 41	**DE 1**	Tybouts Corner to DE 273	Widening from four to six lanes (approximately Tybouts Corner just north of the DE 1 / US 13 split to DE 273 / Christiana Rd)	DE	NCC	2	1S	●	●	●	●	○	◐	○		🚩		🚩
CS 42	**DE 1 / US 13**	DE 72 to DE 71	Corridor Study / Concept Design for freight management upgrades (approximately along DE 1 / US 13 overlap segments)	DE	NCC	4	1S	◐	●	●	◐	◍	○	◐		🚩		🚩
CS 43	**DE 1**	Puncheon Run Connector (Dover) to US 13 (Smyrna)	Corridor Study / Concept Design for freight management upgrades (approximately Exit 97 south of Dover to Exit 119 north of Smyrna)	DE	NCC	4	1S	◐	●	●	◐	◍	○	○		🚩		🚩
CS 44	**DE 1**	US 113 (Milford) to Puncheon Run Connnector (Dover)	Corridor Study / Concept Design for freight management upgrades (approximately DE 1 / US 113 split in Milford to Exit 97 south of Dover)	DE	NCC	4	1S	◐	●	●	○	◍	○	◐		🚩		🚩

Exhibit 8.14 – US 13/113 and DE 1 Coastal Freight Corridor – Project Screening Summary (Continued)

Candidate Project Details								Focus Area Influence						Scenario Influence				
Index #	Route / Area	Limits	Description	State	County	Commit Tier	Network Tier	Overall	Economic Vitality	Connectivity Mobility	Safety Security	Management O&M	Sustainability Env Steward	Trendline	Constraint	Constraint Accel	Enhance	Enhance Accel
CS 45	DE 1	Northbound near Smyrna	Planned VWS	DE	KTD	3	1S	○	○	○	◑	◑	○	○		⚑		⚑
Tier 2 Routes (State Secondary)																		
CS 50	US 13	Northbound near Smyrna	Planned VWS	DE	KTD	3	2	○	○	○	◑	◑	○	○		⚑		⚑
CS 51	DE 7	Newtown Rd to DE 273	Widen	DE	NCC	1	2	◑	○	◑	○	◑	◑	●		⚑		⚑
CS 52	DE 72	McCoy Rd to DE 71	Widen 2 to 4 lanes	DE	NCC	1	2	◑	◑	●	◑	○	○	●		⚑		⚑
CS 53	DE 24	US 113 to DE 23	Corridor Study / Concept Design for freight management upgrades (approximately Millsboro east to DE 23)	DE	SSX	4	2	○	○	◑	○	○	◑	●				
CS 54	DE 24	DE 1 to Love Creek	Widen	DE	SSX	1	2	○	○	◑	◑	○	○	●				
Tier 3 Routes (Other Freight or FLM Connections)																		
CS 60	DE 71	US 13 to Pine Tree Rd / Main St	Corridor Study / Concept Design for freight management upgrades (approximately US 13 north to Townsend)	DE	NCC	4	3	○	○	○	○	○	○	◑		⚑		
CS 61	DE 26	DE 1 to Omar Rd	Widen	DE	SSX	1	3	○	○	○	◑	○	○	◑				
CS 62	DE 54	East of US 113	Center turn lane upgrades	DE	SSX	1	3	○	○	○	○	○	○	◑				
Other Details																		
CS 70	Hyetts Corner Rd	Jamison Corner Rd to US 13	Upgrade	DE	NCC	1	4	◍	◍	◍	○	○	○	◑		⚑		⚑
CS 71	School Bell Rd	DE 7 to US 13	Upgrade	DE	NCC	1	4	◍	◍	◍	○	○	○	◑		⚑		⚑
CS 72	W Dover Connector	North St to US 13	New roadway	DE	KTD	1	4	◍	○	◍	○	◍	○	◑				
CS 73	Carter Rd	DE 300 to Sunnyside Rd	Upgrade	DE	KTD	1	4	◍	◍	◍	○	○	○	◑		⚑		⚑
CS 74	College Rd	DE 15 to Kenton Rd	Upgrade	DE	KTD	1	4	◍	◍	◍	○	○	○	◑		⚑		⚑
CS 75	Denny's Rd	McKee Rd to US 13	Upgrade	DE	KTD	1	4	◍	◍	◍	○	○	○	◑				
CS 76	Kenton Rd	DE 8 to Fire School Rd	Upgrade	DE	KTD	1	4	◍	◍	◍	○	○	○	●				
CS 77	Sunnyside Rd	US 13 to DE 300	Upgrade	DE	KTD	1	4	◍	◍	◍	○	○	○	◑		⚑		⚑

Exhibit 8.14 – US 13/113 and DE 1 Coastal Freight Corridor – Project Screening Summary (Continued)

Candidate Project Details								Focus Area Influence						Scenario Influence				
Index #	Route / Area	Limits	Description	State	County	Commit Tier	Network Tier	Overall	Economic Vitality	Connectivity Mobility	Safety Security	Management O&M	Sustainability Env Steward	Trendline	Constraint	Constraint Accel	Enhance	Enhance Accel
CS 80	**Area Study**	Dover	Freight Management Study	DE	KTD	4	4	◐	◐	●	◐	○	○	○		🚩		🚩
CS 81	**Area Study**	Dover	Expansion of Air Cargo Ramp at Dover AFB and adjacent development potential (e.g., Kent County AeroPark)	DE	KTD	3	4	○	◐	◐	○	○	○	○		🚩		🚩
CS 82	**Area Study**	Harrington	Truck Route Updgrade (DE 14 to US 13)	DE	KTD	1	4	◐	◐	○	◐	◐	○	◐	🚩	🚩		🚩
CS 83	**Area Study**	Seaford	Freight Management Study	DE	SSX	4	4	◐	●	●	◐	○	◐	○		🚩		🚩
CS 84	**Area Study**	Southern Delmarva	Intermodal Center Feasibility Study	MD	WIC	4	4	◐	◐	◐	○	◐	○	◐		🚩		🚩
VIRGINIA																		
Tier 1S Routes (State Primary)																		
CS 90	**Area Study**	Chincoteague-Wallops Island	Freight Access Study	VA	ACC	4	3	◐	◐	◐	◐	○	○	○				
CS 91	**US 13**	Accomack-Northampton Co.	Truck Parking Study	VA	ACC NOR	4	1S	○	○	◐	○	◐	○	○				

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Piedmont Freight Corridor

- **Focal Routes and Typical Improvement Types**
  - DE 41, DE 48, DE 7: freight management upgrades, potential widening (DE 48)
  - DE 2, DE 1: upgrades, operations, bridge widening
- **Focal Connections**
  - Freight Corridors: Metro (including surrounding urban areas)
  - Freight Hubs: Northern Cecil County (including MD 273)
  - Regional: PA/MD access into Newark; PA access to Lancaster
- **Multimodal Visions or Opportunities**
  - Rail: Northeast Corridor (CSX, NS, and related rail yard, transfer, or support facilities); Shortline opportunities to/from Pennsylvania via WWRC or ESPN
  - Water: --
  - Air: --
  - Pipeline: --

Key Studies per Exhibits 8.15-8.16:

PD 32: DE 41; DE 48 to PA Line

PD 30: DE 2; DE 273 to DE 141

PD 31: DE 7; Valley Rd to PA Line

PD 33: DE 48; Hercules Rd to DE 41

PD 51: DE 896; DE 273 to MD Line

Key Projects per Exhibits 8.15-8.16:

PD 35: DE 141; Tyler McConnell Bridge

PD 36: DE 141; DE 2 to DE 52 (signals)

Exhibit 8.15 – US 202 and DE 41 Piedmont Freight Corridor – Project Candidates Map

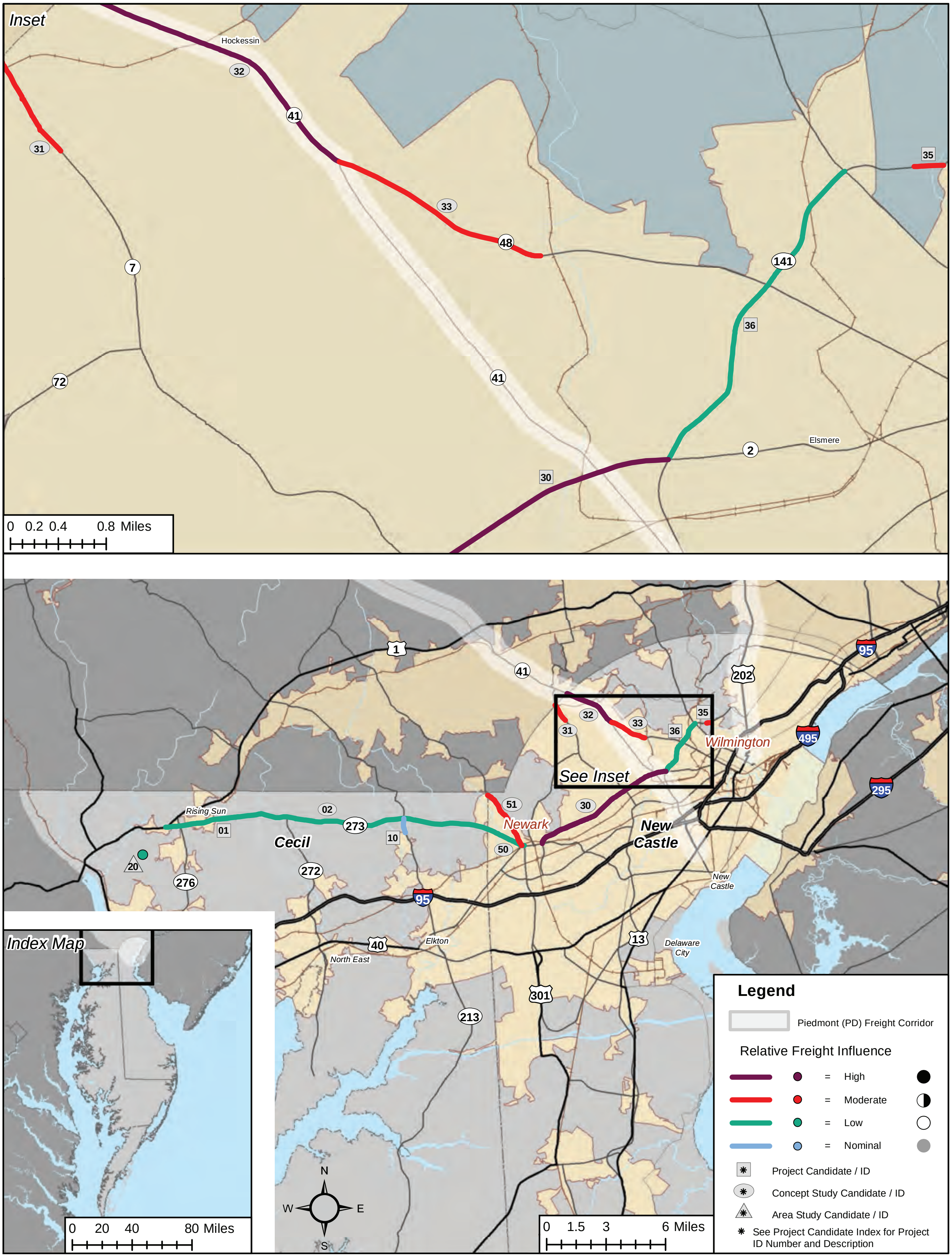

Exhibit 8.16 – US 202 and DE 41 Piedmont Freight Corridor – Project Screening Summary

Candidate Project Details								Focus Area Influence						Scenario Influence				
Index #	Route / Area	Limits	Description	State	County	Commit Tier	Network Tier	Overall	Economic Vitality	Connectivity Mobility	Safety Security	Management O&M	Sustainability Env Steward	Trendline	Constraint	Constraint Accel	Enhance	Enhance Accel
MARYLAND																		
Tier 2 Routes (State Secondary)																		
PD 01	**MD 273**	East Limits of Rising Sun to Sylmar Rd	Two-lane reconstruct	MD	CEC	2	2	○	○	◑	○	○	○	○				
PD 02	**MD 273**	US 1 to DE Line	Corridor Study / Concept Design for freight management upgrades (approximately Rising Sun to DE Line)	MD	CEC	4	2	○	○	◑	○	○	○	●				
Tier 3 Routes (Other Freight or FLM Connections)																		
PD 10	**MD 213**	Providence Rd to MD 273	Two-lane reconstruct	MD	CEC	2	3	● (grey)	● (grey)	● (grey)	○	○	● (grey)	○				
Other Details																		
PD 20	**Area Study**	Western Cecil County	Freight Management Study (including MD 222, MD 276, and related access to I-95, US 1, US 222, Conowingo, Rising Sun, and PA)	MD	CEC	4	4	○	◑	◑	○	○	○	◑				
DELAWARE																		
Tier 1S Routes (State Primary)																		
PD 30	**DE 2**	DE 273 to DE 141	Corridor Study / Concept Design for freight managment upgrades	DE	NCC	4	1S	◑	○	●	◑	○	○	◑		🚩		🚩
PD 31	**DE 7**	Valley Rd to PA Line	Corridor Study / Concept Design for freight management upgrades (w/ potential continuation into PA along SR 3013 to PA 41)	DE	NCC	4	1S	○	◑	◑	○	○	○	●				
PD 32	**DE 41**	DE 48 to PA Line	Corridor Study / Concept Design for freight management upgrades (w/ potential continuation into PA along PA 41 to SR 3013)	DE	NCC	4	1S	◑	◑	●	○	○	○	●				
PD 33	**DE 48**	Hercules Rd to DE 41	Corridor Study / Concept Design for freight management upgrades and potential roadway widening	DE	NCC	4	1S	◑	◑	●	○	○	○	●		🚩		🚩
PD 35	**DE 141**	Tyler McConnell Bridge	Construct/reconstruct Tyler McConnell Bridge (over Brandywine Creek) and DE 141 tie-ins between approximately Montchannin Rd to Alapocas Rd	DE	NCC	1	1S	◑	○	◑	◑	◑	○	●		🚩		🚩
PD 36	**DE 141**	DE 2 to DE 52	Signalized corridor improvements and regular optimization	DE	NCC	2	1S	○	○	◑	○	○	○	◑		🚩		
Tier 2 Routes (State Secondary)																		
PD 50	**DE 273**	MD Line to DE 896	Corridor Study / Concept Design for freight management upgrades	DE	NCC	4	2	○	○	◑	○	○	○	●				🚩
PD 51	**DE 896**	DE 273 to MD Line	Corridor Study / Concept Design for freight management upgrades	DE	NCC	4	2	○	○	◑	○	○	○	●				

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Lewes Freight Corridor

- **Focal Routes and Typical Improvement Types**
  - » MD/DE 404: upgrades, access control, and widening
  - » US 9, US 9 Truck: freight management upgrades
- **Focal Connections**
  - » Freight Corridors: Ocean City, Bay, Coastal
  - » Freight Hubs: Federalsburg, Denton, Georgetown, resort areas
  - » Regional: Access to US 50/301 Bay Bridge
- **Multimodal Visions or Opportunities**
  - » Rail: --
  - » Water: Cape May-Lewes Ferry connectivity
  - » Air: Sussex County Airport connectivity
  - » Pipeline: --

Key Studies per Exhibits 8.17-8.18:

LW 22: US 9/US 9 TRK; US 113 to DE 5

LW 20: DE 404; MD Line to US 13

Key Projects per Exhibits 8.17-8.18:

LW 01: MD 404; US 50 to MD 404 Bus (upgrade w/access control)

LW 02: MD 404; Queen Anne's Co to MD 404 Bus (reconstruct & widen)

LW 04: MD 404; MD 16 Overlap Segments (reconstruct w/access control)

LW 05: MD 404; MD 16 to DE Line (reconstruct w/access control)

Exhibit 8.17 – MD/DE 404 and US 9 Lewes Freight Corridor – Project Candidates Map

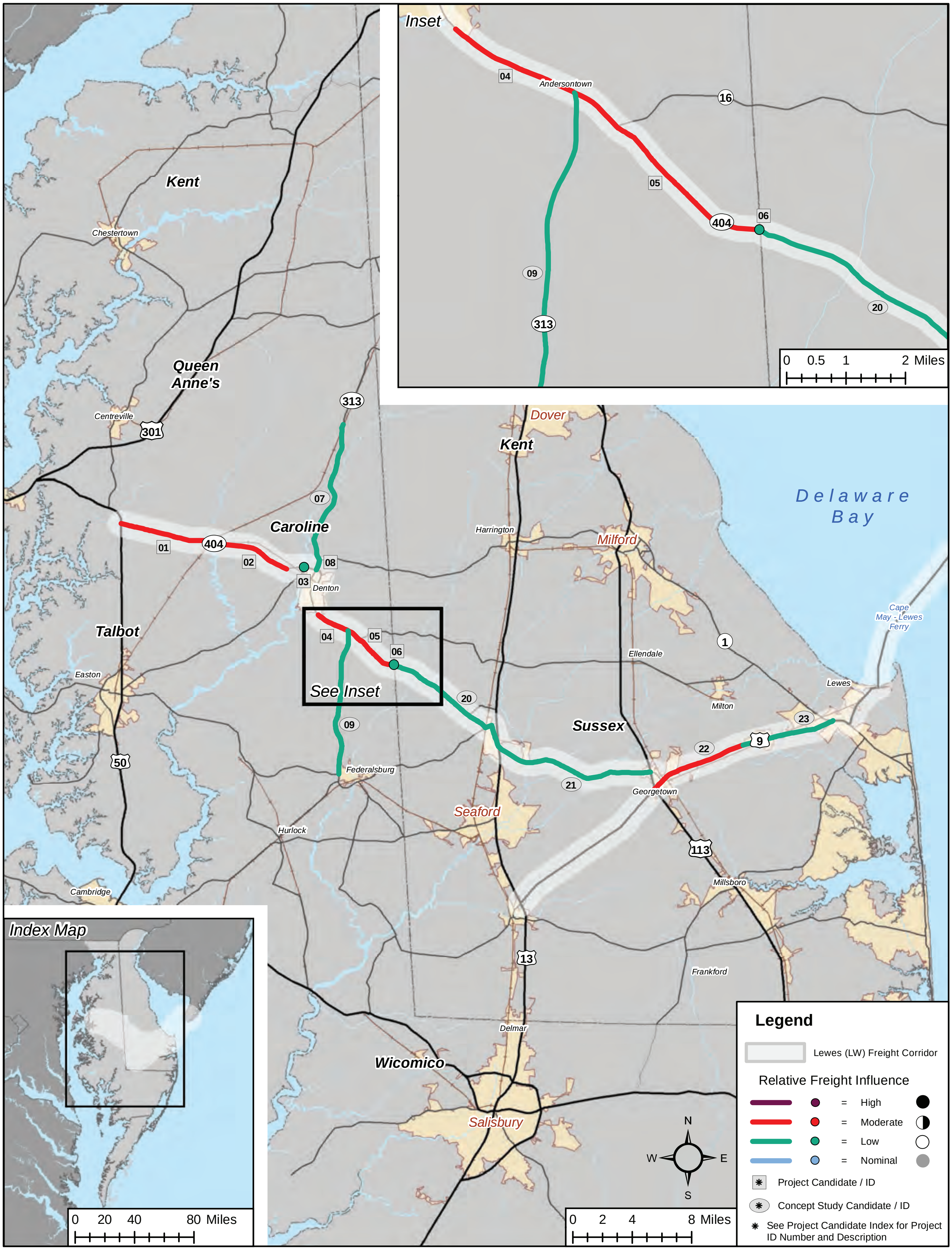


Exhibit 8.18 – MD/DE 404 and US 9 Lewes Freight Corridor – Project Screening Summary

Candidate Project Details								Focus Area Influence						Scenario Influence				
Index #	Route / Area	Limits	Description	State	County	Commit Tier	Network Tier	Overall	Economic Vitality	Connectivity Mobility	Safety Security	Management O&M	Sustainability Env Steward	Trendline	Constraint	Constraint Accel	Enhance	Enhance Accel
MARYLAND																		
Tier 2 Routes (State Secondary)																		
LW 01	**MD 404**	US 50 to MD 404 Bus	Upgrade existing MD 404 to a 4 lane divided highway with access control	MD	QUE TAL	1	2	◑	◑	◑	◑	◑	◍	◑				
LW 02	**MD 404**	Queen Anne's Co Line to MD 404 Bus	Reconstruct and widen MD 404	MD	CAR	1	2	◑	◑	●	◑	◑	◍	●	⚑	⚑		
LW 03	**MD 404**	at MD 328	Construct interchange at junction of MD 404 and MD 328 in Denton	MD	CAR	2	2	○	○	◑	◑	○	○	○		⚑		
LW 04	**MD 404**	MD 16 (Harmony Rd) to MD 16 (Greenwood Rd)	Divided hwy reconstruction and potential widening w/ access control improvements (approximately along MD 404 / MD 16 overlap segments)	MD	CAR	2	2	◑	◑	●	◑	◑	◍	●	⚑	⚑		⚑
LW 05	**MD 404**	MD 16 (Harmony Rd) to DE Line	Divided hwy reconstruction w/ access control improvements	MD	CAR	2	2	◑	◑	●	◑	◑	◍	●	⚑	⚑		
LW 06	**MD 404**	Denton Area	Future VWS	MD	CAR	4	2	○	○	○	◑	◑	◍	○	⚑	⚑		
LW 07	**MD 313**	MD 317 to MD 287	Corridor Study / Concept Design for freight management upgrades (approximately north of Denton to Goldsboro)	MD	CAR	4	2	○	○	◑	○	○	◍	●		⚑		⚑
LW 08	**MD 313**	MD 404 to MD 317	Multi-lane reconstruction (Denton area)	MD	CAR	2	2	○	○	◑	○	○	○	●		⚑		⚑
LW 09	**MD 313**	MD 318 to MD 404	Corridor Study / Concept Design for freight management upgrades (approximately Federalsburg to MD 404)	MD	CAR	4	2	○	○	◑	○	○	○	●		⚑		⚑
DELAWARE																		
Tier 1S Routes (State Primary)																		
LW 20	**DE 404**	MD Line to US 13	Corridor Study / Concept Design for freight management upgrades (including peak season traffic influence)	DE	SSX	4	1S	◑	◑	●	◑	○	◍	○	⚑	⚑		
LW 21	**DE 404**	US 13 to US 113	Corridor Study / Concept Design for freight management upgrades (including peak season traffic influence)	DE	SSX	4	1S	◑	◑	●	◑	○	◍	○	⚑	⚑		
LW 22	**US 9 and US 9 TRK**	US 113 to DE 5	Corridor Study / Concept Design for freight management upgrades (including peak season traffic influence)	DE	SSX	4	1S	◑	◑	◑	◑	○	○	●				
LW 23	**US 9**	DE 5 to DE 1	Corridor Study / Concept Design for freight management upgrades (including peak season traffic influence)	DE	SSX	4	1S	○	◑	◑	◑	○	◍	◑				

Rail Project Candidates

Though generally noted in conjunction with the corridor highlights above, individual rail project candidates were also reviewed in comparison to the project's overall screening criteria (map *Exhibit 8.19*; index *Exhibit 8.20*). Considering the much broader system perspectives and private jurisdictional authorities typically involved with rail improvements, many of the rail project candidates were referenced directly from more specific sources including, for example, the Delaware State Rail Plan. It is anticipated that future support or implementation of any such projects will require coordination with overall rail system planning efforts under the operating or ownership jurisdictions of the various private rail entities (e.g., Amtrak, CSX, NS, and various shortline railroads) as well as federal or state rail agencies.

Exhibit 8.19 – Rail Project Candidates Map

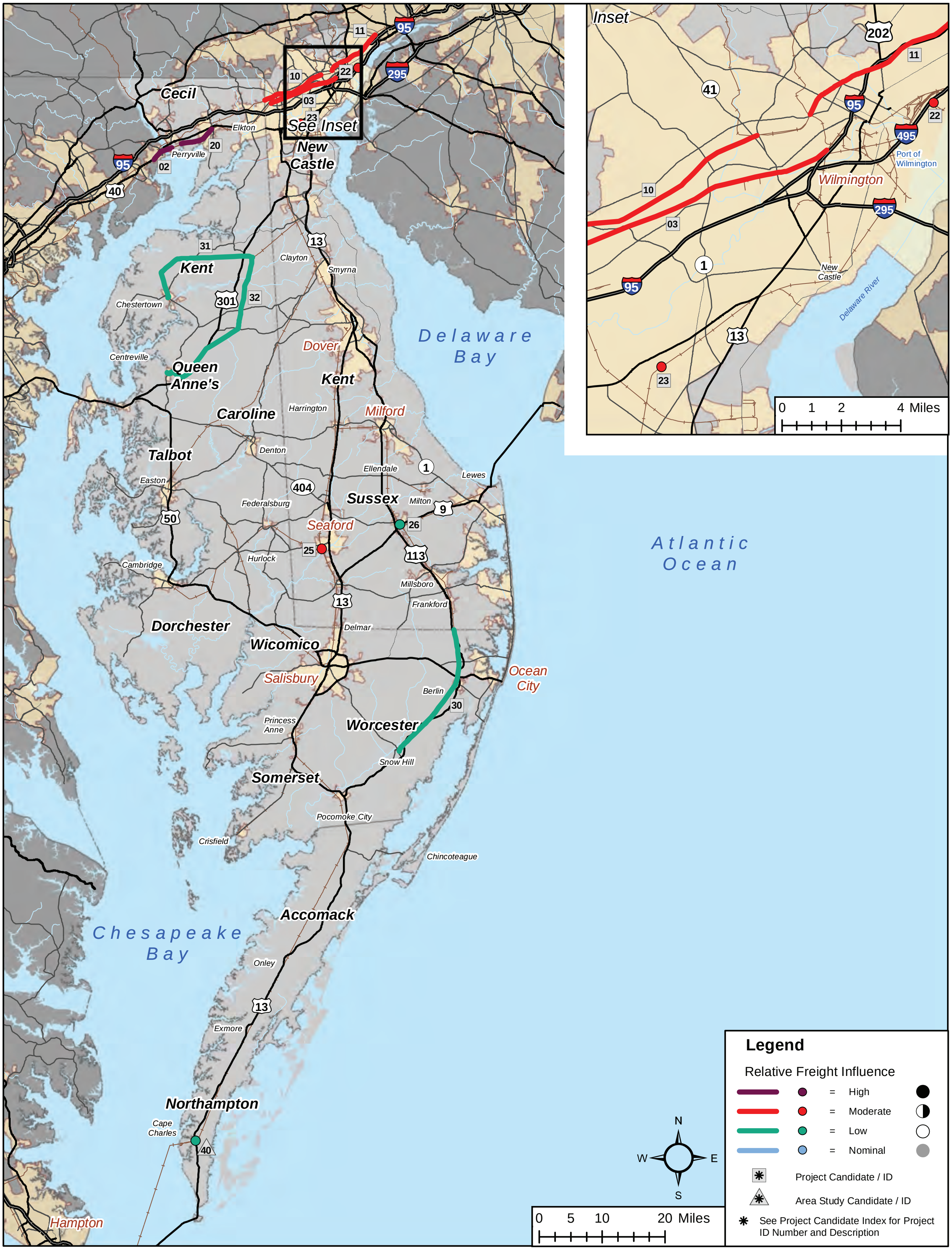


Exhibit 8.20 – Rail Project Screening Summary

Index #	Route / Area	Limits	Description	State	County	Commit Tier	Network Tier	Overall	Economic Vitality	Connectivity Mobility	Safety Security	Management O&M	Sustainability Env Steward	Trendline	Constraint	Constraint Accel	Enhance	Enhance Accel
DELMARVA RAIL																		
Amtrak																		
R 01	Amtrak	Baltimore City	FRA Tunnel Study Phase 2; Improve clearance, alignment, and grade through B&P and Union Tunnels	MD	BCY	3	1	●	●	●	●	◑	○	●			⚑	⚑
R 02	Amtrak	Susquehanna River Bridge	Rehabilitate bridge	MD	BAL	3	1	●	●	●	●	◑	○	●			⚑	⚑
R 03	Amtrak	Yard to Ragan Interlockings	New third track	DE	NCC	1	1	◑	●	●	◑	◑	○	●			⚑	⚑
CSX																		
R 10	CSX	MD Line to to Landenberg Junction	Double Tracking of 9.9 miles of existing CSX line	DE	NCC	3	1	◑	●	●	◑	◑	○	◑			⚑	⚑
R 11	CSX	Elsmere to PA Line	Double Tracking of 9.1 miles of existing CSX line	DE	NCC	3	1	◑	●	●	◑	◑	○	◑			⚑	⚑
NS																		
R 20	NS	Chesapeake Connector	New third track from Prince to Bacon Interlockings	MD	CEC	3	1	●	●	●	◑	◑	◑	◑		⚑	⚑	⚑
R 22	NS	Edgemoor Yard	Raise yard from 2 to 6 feet elevation to reduce frequency of flooding-related service disruptions.	DE	NCC	2	1	◑	◑	◑	◑	○	◑	●		⚑	⚑	⚑
R 23	NS	Edgemoor Yard	Relocation of NS Edgemoor Yard to a location around Bear or Porter to centralize north end operations	DE	NCC	3	1	◑	◑	◑	◑	◑	◑	◑		⚑	⚑	⚑
R 25	NS	at Seaford Rail Bridge	Rail bridge replacement and/or modernization across Nanticoke River	DE	SSX	4	1	◑	●	◑	●	◑	○	○			⚑	⚑
R 26	NS	Georgetown Siding	Install one-track switch in the Indian River Secondary Line and construct a small siding adjacent to the Georgetown Station	DE	SSX	3	1	○	◑	◑	○	○	○	◑			⚑	⚑
MDDE																		
R 30	MDDE	Frankford to Snow Hill	286k rail upgrade of Snow Hill Line	MD-DE	WOR SSX	1	2	○	◑	○	○	◑	○	●			⚑	⚑
R 31	MDDE	Massey to Worton	286k rail upgrade	MD	KTM	2	2	○	◑	○	○	◑	○	●			⚑	⚑
R 32	MDDE	Massey to Centreville	286k rail upgrade	MD	QUE	2	2	○	◑	○	○	◑	○	●			⚑	⚑
BCRR																		
R 40	BCRR	Cape Charles to Pocomoke City	Feasibility or Market Study of multimodal service enhancements (e.g., track upgrades, carfloat operations, rail access, maintenance programs)	MD-VA	WOR ACC NOR	4	2	○	◑	○	○	◑	○	○			⚑	⚑

8.4 Freight Prioritization Summary

Supplementing the screening results from above, the project prioritization stage adds additional insights based on the more quantitative, performance-based process that was applied to Delaware project candidates only. With these insights, the summary compilations on the following pages (*Exhibit 8.21* through *Exhibit 8.31*) identify and group the leading anticipated freight priorities for Delaware. Key Maryland and Virginia candidates are similarly compiled for ease of reference, though solely based on previous screening efforts, reiterating that priority implications for non-Delaware projects are ultimately subject to their own respective jurisdictional processes. Leading project candidates are identified/grouped as follows:

- *Delaware Key Projects w/Anticipated Commitments:* includes Tier 1 project possibilities for which funding and implementation are currently anticipated as part of other formal transportation plans. Ensuring, supporting, or advancing the timeline for implementation of such projects would provide overlapping benefits to freight movement on the peninsula.
- *Delaware Key Projects w/Unfunded Aspirations*: includes Tier 2 or 3 project possibilities that are identified as unfunded future aspirations in other formal transportation plans. Exploring future funding and formal planning/programming opportunities to implement such projects would provide overlapping benefits to freight movement on the peninsula.
- *Delaware Key Projects w/Planned VWS Focus*: highlights proposed VWS sites that provide focused benefits to safety, management and operations, and truck enforcement; but that may otherwise be underrated within the strict confines of the prioritization process relative to candidates having broader-reaching regional influences.
- *Delaware Targeted Studies w/Corridor or Concept Design Focus*: includes Tier 3 or 4 study candidates that require additional investigation to define location-specific issues, potential solutions, or new project candidate possibilities. Studies may be pursued internally by agency staff, or externally through contracts that advertise specific corridor study needs.
- *Delaware Targeted Studies w/Area-wide Focus*: highlights areas that may benefit from an investigation of localized urban freight details including, for example, first/last mile connectivity, local congestion or community conflicts, truck parking or loading strategies, or site-specific safety, intersection, or geometric improvement needs.
- *Delaware Key Multimodal Candidates*: highlights key multimodal interests based on overall freight planning insights and in support of subsequent policy level perspectives.
- *Maryland or Virginia Key Candidates*: summarizes key project, study, or multimodal candidates in Maryland or Virginia based on a review and compilation of previous screening efforts.

Exhibit 8.21 – Key Project Candidates Map

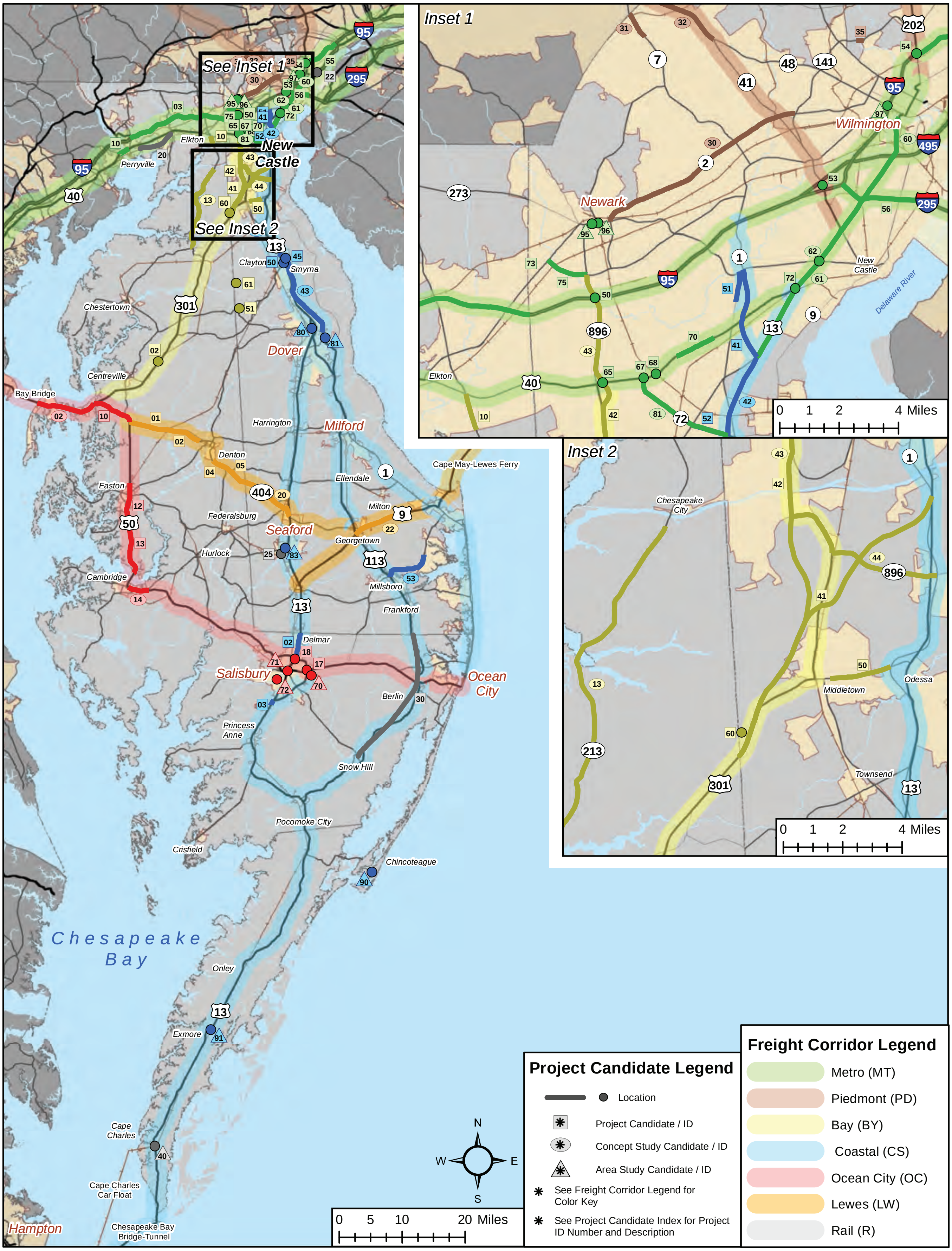


Exhibit 8.22 – Delaware Key Projects w/ Anticipated Commitments

ID	Route/Area	Limits	Description
MT 54	I-95	at US 202	Interchange improvements
MT 56	**I-295**	**I-95 to DE Memorial Bridge**	**Improvements**
MT 75	DE 4	DE 2 to DE 896	Eastbound widening
BY 41	**US 301**	**MD Line to DE 1**	**New 4-lane expressway**
BY 50	DE 299	DE 1 to Catherine St	Widen
CS 51	DE 7	Newtown Rd to DE 273	Widen
CS 52	DE 72	McCoy Rd to DE 71	Widen from 2 to 4 lanes
PD 35	DE 141	Tyler McConnell Bridge	Construct bridge and DE 141 tie-ins

Exhibit 8.23 – Delaware Key Projects w/ Unfunded Aspirations

ID	Route/Area	Limits	Description
MT 50	**I-95**	**at DE 896**	**Major interchange reconstruction**
MT 53	**I-95**	**at DE 141**	**Phase I and II interchange projects**
MT 55	I-95	US 202 to I-495/DE 2	Widen from 4 to 6 lanes
MT 65	US 40	at DE 896	New interchange
MT 67	US 40	at DE 72	Intersection improvements
MT 68	US 40	at NS Rail Crossing (Bear, DE)	Grade separation
MT 70	US 40	Salem Church Rd to Walther Rd	Widen from 4 to 6 lanes
MT 72	**US 40**	**at US 13**	**New interchange**
BY 42	**DE 896**	**DE 2 to Boyds Corner Rd**	**Signal retiming and/or upgrades**
CS 41	DE 1	Tybouts Corner to DE 273	Widen from 4 to 6 lanes

Exhibit 8.24 – Delaware Key Projects w/ Planned VWS Focus

ID	Route/Area	Limits	Description
BY 51	DE 300	West of Smyrna	Planned VWS
BY 60	DE 299	West of Middletown	Planned VWS
BY 61	DE 6	West of Smyrna	Planned VWS
CS 45	DE 1	Northbound near Smyrna	Planned VWS
CS 50	US 13	Northbound near Smyrna	Planned VWS

* **BOLD** *text indicates High Priority Rating per screening/prioritization efforts*

Exhibit 8.25 – Delaware Targeted Studies w/ Corridor or Concept Design Focus

ID	Route/Area	Limits	Study Focus
MT 60	**US 13**	**I-495 to Christiana River**	**Freight management upgrades**
MT 61	**US 13**	**DE 1 to I-495**	**Roadway or capacity upgrades**
MT 62	**US 13**	**at DE 273**	**Interchange feasibility**
MT 81	**DE 72**	**US 40 to US 13**	**Freight management upgrades**
BY 43	DE 896	C&D Canal to US 40	Roadway or capacity upgrades
BY 44	**DE 896**	**US 301 to DE 1**	**Freight management upgrades**
CS 42	**DE 1/US 13**	**DE 72 to DE 71**	**Freight management upgrades**
CS 43	DE 1	Dover (Exit 97) to Smyrna (Exit 119)	Freight management upgrades
CS 53	DE 24	US 113 to DE 23	Freight management upgrades
PD 30	**DE 2**	**DE 273 to DE 141**	**Freight management upgrades**
PD 31	DE 7	Valley Rd to PA Line	Freight management upgrades
PD 32	**DE 41**	**DE 48 to PA Line**	**Freight management upgrades**
LW 20	DE 404	MD Line to US 113	Freight management upgrades
LW 22	US 9/US 9 Tk	US 113 to DE 5	Freight management upgrades

Exhibit 8.26 – Delaware Targeted Studies w/ Area-wide Focus

ID	Route/Area	Limits	Study Focus
MT 95	Newark	Area study and/or upgrades	Freight management
MT 97	Wilmington	Area study and/or upgrades	Freight management, route signage
CS 80	Dover	Area study and/or upgrades	Freight management
CS 83	Seaford	Area study and/or upgrades	Freight management

Exhibit 8.27 – Delaware Key Multimodal Candidates

ID	Route/Area	Limits	Description
MT 96	Newark	Area study	Intermodal center feasibility
CS 81	Dover	Area study	Air cargo ramp, Aero Park development
R 20	**NS/NEC**	**Prince to Bacon interlocking**	**Chesapeake Connector**
R 22	NS	Edgemoor Yard	Flood mitigation; raise yard 2-6 feet
R 25	NS	Seaford Rail Bridge	Bridge replacement or modernization

* **BOLD** *text indicates High Priority Rating per screening/prioritization efforts*

Exhibit 8.28 – Maryland Key Project Candidates

ID	Route/Area	Limits	Description
MT 03	**I-95**	**MdTA Section 400**	**Reconstruct and widen**
MT 10	US 40	MdTA Thomas J. Hatem Memorial Bridge	All-electronic tolling; rehab approaches
BY 02	US 301	Bay County Rest Area	Truck parking
BY 10	MD 213	US 40 to Frenchtown Rd	Widen; US 40 intersection improvements
OC 10	**US 50**	**US 50/301 Split to MD 404**	**Divided hwy reconstruct; access control**
OC 12	US 50	MD 322 N/S of Easton	Divided hwy reconstruct
OC 13	US 50	MD 322 S of Easton to Choptank River Br	Access control improvements
OC 17	**US 50**	**at Salisbury Bypass**	**Additional lane from US 50 onto Bypass**
OC 18	**US 50**	**US 50 WB off-ramp at US 13**	**Signalize ramp; improve US 13 NB weave**
CS 02	US 13	Salisbury Bypass to DE Line	Divided hwy reconstruct w/access control
CS 03	US 13	Somerset Co Line to US 13 Bus	Divided hwy reconstruct w/interchanges
LW 01	MD 404	US 50 to MD 404 Bus	Upgrade w/access control
LW 02	MD 404	Queen Anne's Co Line to MD 404 Bus	Reconstruct and widen
LW 04	MD 404	MD 16 (Harmony Rd to Greenwood Rd)	Reconstruct w/access control
LW 05	MD 404	MD 16 (Harmony Rd) to DE Line	Reconstruct w/access control

Exhibit 8.29 – Maryland Key Study Candidates

ID	Route/Area	Limits	Study Focus
BY 13	MD 213	Basil Ave to MD 290/MD 313	Freight management upgrades
OC 02	**US 50/301**	**Bay Bridge to US 50/301 Split**	**Freight management upgrades**
OC 14	US 50	MD 16 (Church Ck Rd to Mt Holly Rd)	Freight management upgrades
OC 71	Salisbury	Area study	Freight management upgrades

Exhibit 8.30 – Maryland Key Multimodal Candidates

ID	Route/Area	Limits	Study Focus
OC 70	Salisbury	Area study; Airport Rd to US 50	Airport access study; new connection
OC 72	Salisbury	Area study; Wicomico River	Wicomico River port development study
R 30	MDDE	Frankford to Snow Hill Line	286k rail upgrade

Exhibit 8.31 – Virginia Key Study Candidates

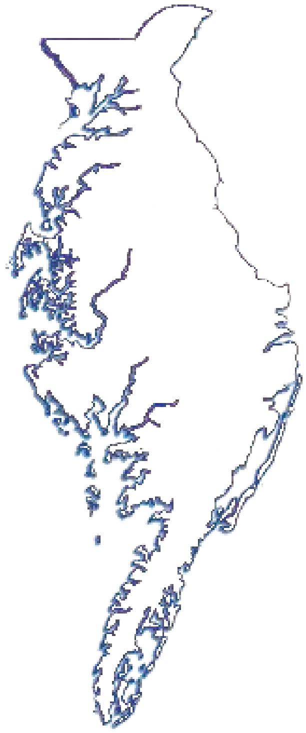
ID	Route/Area	Limits	Study Focus
CS 90	Accomack Co	Wallops Island/Chincoteague	Freight access study
CS 91	US 13	Accomack and Northampton Counties	US 13 truck parking study
R 40	BCRR	Cape Charles to Pocomoke City	Multimodal service enhancement study

** **BOLD** text indicates High Priority Rating per screening/prioritization efforts*

Delmarva Freight Plan

Chapter 9

Freight Policy Guidance and Beyond



Chapter 9

Freight Policy Guidance and Beyond

Building on the project guidance from the previous chapter, details below summarize general policy perspectives that will play an equally crucial role in helping to guide the course of freight related activities on the peninsula and highlight future freight actions. This policy guidance generally aims to encompass the previously identified key issues, stakeholder concerns, and focus areas. It also closes with a series of next steps to consider beyond completion of this plan relative to performance monitoring, future updates or further research.

9.1 Guiding Principles

Align with strategic freight goals: Ongoing freight planning and related general transportation planning and decisions on the Delmarva Peninsula should align with or help to support the overarching strategic goals summarized by this plan (*Exhibit 9.1*; see also *Chapter 1*). These goals reflect consistency with National Freight Policy while highlighting several of the most important strategic issues for the peninsula.

Enhance peninsula-specific freight focus areas: Ongoing planning efforts and decision-making should also aim to address or improve the numerous issues summarized by this plan as freight focus areas (see *Chapter 6* and *Exhibits 6.9-6.10*). The focus area discussions provide a level of background detail needed to better understand and potentially act upon the strategic goals.

Integrate freight-related project planning insights: Project planning and programming efforts that impact the Delmarva Peninsula should reference and, where possible, incorporate project guidance as identified by this plan (see *Chapter 8*). The freight plan is not a formal programming document, does not have authority to commit priorities or funding for any jurisdiction, and makes no attempt to supplant any broader transportation planning requirements or processes of the state, MPO, or other transportation entities serving the peninsula. However, insights from the freight plan's screening and prioritization efforts serve as a valuable reference in terms of potentially supporting or enhancing future decision-making by such entities within their respective processes and regardless of jurisdiction.

Foster multi-jurisdictional freight coordination: While freight transportation system planning will always benefit from effective coordination across jurisdictional boundaries, this fact is critical on the Delmarva Peninsula. The statement that freight "knows no boundaries" certainly rings true across the separate multimodal transportation systems, regulations, and requirements of the peninsula's 3 states, 14 counties, multiple MPOs, numerous local jurisdictions, and a wide variety of other public/private partners or stakeholders that own, operate, or utilize essentially all potential modes of freight transportation. Adding to these complexities are the peninsula's geographical constraints with limited points of access; its role amidst significant transportation corridors with connections to major metropolitan areas in the surrounding region; or the potentially challenging freight-related needs of unique customers such as the tourist industry, international ports, Dover AFB, or NASA Wallops Flight Facility, among others.

Continued planning efforts should build upon the recent successes of the Delmarva Freight Summit meetings, Delmarva Freight and Goods Movement Working Group meetings, and other activities that have fostered open and proactive discussions between public and private freight stakeholders, industries, interest groups, infrastructure owners, and local communities. Though the specific needs and interests of the various players may not always align, their potential abilities to successfully influence the peninsula's future are clearly intertwined.

Exhibit 9.1 – Strategic Freight Goals for the Delmarva Peninsula

Economic Vitality

Improve the contribution of the freight transportation system to economic efficiency, productivity, and competitiveness

- *Support efforts to preserve existing multimodal freight-transportation infrastructure to ensure mode choice and competition between modes*
- *Support efforts to preserve land use compatibility adjacent to freight infrastructure throughout the peninsula*
- *Support strategically-located or planned improvements that recognize existing and projected population concentrations, employment and development, and related secondary traffic/population-based freight patterns*
- *Support efforts that address changes in economic activities (local, regional, national, or global) or growth in targeted industries*
- *Support efforts to enhance access to and from major regional ports and international shipping opportunities in multiple surrounding states*

Freight Connectivity, Mobility & Accessibility

Reduce congestion on the freight transportation system

- *Enhance freight mobility through broader transportation improvements that recognize the unique seasonal or tourist-based congestion aspects of travel to, from, and within the Delmarva Peninsula*
- *Enhance freight network connectivity with an emphasis on the unique needs and constraints related to serving the Delmarva Peninsula's limited geographical points of access*
- *Enhance opportunities for accessing and utilizing the freight transportation network on the peninsula through strategic multimodal infrastructure improvements*

Safety & Security

Improve the safety, security, and resilience of the freight transportation system

- *Support improvements that recognize the criticality and regional/national freight significance of I-95 and the Northeast Corridor*
- *Support improvements that enhance system redundancy with respect to I-95 and the Northeast Corridor and with respect to the geographical point of access limitations of the peninsula*
- *Support improvements that recognize the presence and unique needs of the region's governmental, military, or international shipping communities*

System Management, Operations & Maintenance

Improve the state of good repair of the freight transportation system

Use advanced technology, performance management, innovation, competition, and accountability in operating and maintaining the freight transportation system

- *Enhance policies and opportunities related to truck parking and rest areas, weight limits, taxes, tolls, or other motor freight issues*
- *Support efforts to address physical improvements on secondary roads and bridges critical to motor freight access throughout the peninsula*
- *Support efforts to maintain or enhance dredging operations and the identification and preservation of adequate disposal sites for excess dredge materials*

Sustainability & Environmental Stewardship

Reduce adverse environmental and community impacts of the freight transportation system

- *Support improvements that recognize the unique relationships between consumer demand and commodity flows on the peninsula with respect to seasonal or tourist-based variability and quality of life*
- *Support efforts to improve the flexibility and resiliency of the freight transportation system to meet changing global energy demands or sources*

Bold	*- National Freight Policy Goals*
Italics	*- Focus details for Delmarva Peninsula*

9.2 General Policy Perspectives

Economic Vitality

Focus on regional supply chain positioning: Foster potential economic growth in anticipated or incentivized growth areas, and within the peninsula's core commodity groups or key supply chains. Such interests may span the energy, agriculture, poultry and agribusiness, food products (including value-added food production), chemical products, and retail industries, among others. Specific actions should enhance the economic and trade potential of the region while minimizing the potential for "missed" opportunities. Examples may include regulatory planning to streamline multi-jurisdictional transportation regulations; industry-specific planning to diversify logistical plans; or transportation planning to support efficient and well-maintained multimodal options, multimodal geographic hubs, and industry-specific freight access needs.

Support trade and market expansion opportunities: Track anticipated trends having substantial domestic or international trade implications, including inbound crude oil or grains, or outbound fracking support materials, refined oil products, or frozen poultry. Broader opportunities may also include support for the U.S. Foreign Trade Zone program to encourage, facilitate, and expedite participation in international trade, and in coordination with the Delaware Economic Development Office (DEDO) and regional port systems.

Enhance regional port access and opportunities: Recognize that with an anticipated growth in international trade, access to Wilmington, Baltimore, Hampton Roads, or other regional port locations will become even more critical to serve multimodal hubs and major assets that support the ongoing economic and trade potential of the region. Specific coordination efforts should investigate future public-private venture interests to potentially expand the Port of Wilmington to the south in the vicinity of a 176-acre site in Riveredge Industrial Park in New Castle[1]. General port-related coordination should also track potential marine highway or short-sea shipping opportunities that may develop in the future, particularly in light of increasing congestion levels along the I-95 corridor and throughout east coast metropolitan areas.

Consider area-specific strategies and opportunities: Track key business/industry trends and notable site development needs, particularly as they affect any of the peninsula's major freight hubs or local freight zones. Specific locations may include, for example, area near PBF Energy Refinery, Dover AFB, or NASA Wallops Flight Facility; and within Wicomico County as related to S/WMPO's Wicomico River Port Development Study.

Discuss land use issues and implications: Coordinate with and educate the region's planning officials on the importance of preserving critical infrastructure and freight-oriented land uses in key freight or rail corridors and industrial areas. Planning and decision-making should aim to minimize residential encroachments while also managing real and perceived conflicts or expectations between the residential and freight communities.

Reflect market access and logistics trends or needs: Consider the impacts of future congestion on freight efficiencies and infrastructure investment decisions in general, and on "just-in-time" distribution facilities or services specifically. Strategies should aim to avoid any competitive business disadvantages on the peninsula and should consider the potential influence of trends in e-commerce; warehousing, distribution, or fulfillment centers; and consumer-direct or aggregated delivery services (e.g., e-Bay Now or Amazon Lockers).

[1] Milford, Maureen; "A New Vision for Port of Wilmington"; The News Journal; www.delawareonline.com; July 14, 2014.

Freight Connectivity, Mobility, and Accessibility

Detail the peninsula's freight network: Continue to define and refine a freight network for the Delmarva Peninsula, building on this plan, WILMAPCO's classifications, and in coordination with DelDOT, MDOT, and VDOT. Further detail the network inventory by adding/mapping technical data such as road widths, bridge loads, weight limits, height restrictions, operating restrictions, etc., and by compiling all information into a readily-accessible format that can be referenced by or distributed to a broad audience. Consider the freight network tier designations as referenced within this plan including:

- *Tier 1F* – State Primary Freight Corridor (included on the Federal PFN)
- *Tier 1S* – State Primary Freight Corridor (not included on the Federal PFN)
- *Tier 2* – State Secondary Freight Corridor
- *Tier 3* – First/Last Mile or other potential freight-relevant connection
- *Tier 4* – not categorized

Formalize the peninsula's roadway freight network: Where appropriate, supplement the peninsula's roadway freight network definition with potential formal designations such as the following:

- *Federal PFN* – Coordinate with future revisions or additions to the Federal PFN, adding critical linkages, if possible, such as the Bay Bridge to Salisbury via US 50, or the Bay Bridge to Middletown via US 301 (and potentially extending to I-95 via the future US 301 expressway and portions of DE 1).

- *Critical Rural or Urban Freight Corridors* – Consider potential candidates per MAP 21's guidelines for Critical Rural Freight Corridors. Track future updates to federal freight planning guidance relative to the possibility of a new Critical Urban Freight Corridor designation.

- *Signed Truck Routes* – Coordinate any potential changes to existing or new signed truck routes on the peninsula with the appropriate agency requirements (e.g., review and approval processes, roadway or pavement design criteria, signing or safety needs, etc.). It is not the intent of the freight corridor designations or discussions in this plan to preclude or supersede any agency-specific requirements.

Enhance multimodal/intermodal connections: Recognize the need to provide efficient access to key multimodal freight hubs in order to link the roadway network with rail, water, air, or pipeline transportation systems. Reference and maintain consistency with mode-specific rail, aviation, or port planning documents.

Manage traffic congestion and access: Support comprehensive transportation planning and management activities relative to alleviating traffic congestion in general, and specifically in key freight corridors, bottleneck locations, and freight hubs, as well as during peak season travel conditions. Where possible, integrate the freight-related project screening and prioritization insights identified by this plan. Emphasize operational improvements such as traffic signal optimization or ITS. Further recognize the potentially unique impacts of congestion on the peninsula relative to industry-specific needs (e.g., time-sensitive agriculture, poultry, or food product deliveries) or peak season demands (e.g., logistics, inventory, or distribution shifts).

Minimize freight/passenger conflicts: Support efforts to minimize freight and passenger travel conflicts at key locations while enhancing the flexibility of the freight system to move products efficiently and on-time. Support projects such as the Chesapeake Connector; grade-separation of critical rail crossings (e.g., US 40 in Bear, Delaware); or other strategies that would mutually benefit freight and public travel needs or conditions.

Safety and Security

Integrate freight interests throughout safety planning activities: Coordinate across agencies and jurisdictions to ensure that freight interests are reflected throughout safety planning activities such as crash prevention or mitigation programs, rail safety programs, or relative to freight operations and technology applications such as the Oversize/Overweight (OS/OW) Permit System or CVISN programs. Supplement existing HSIP program considerations by potentially exploring a standardized method of truck-related crash data assessments or periodic summaries for the peninsula, which in turn would require a simplified method to efficiently compile/compare separate crash datasets from Delaware, Maryland, and Virginia.

Integrate freight interests throughout emergency planning activities: Coordinate across agencies and jurisdictions to ensure that freight interests are reflected throughout safety, security, and emergency planning activities at all levels. Support inter-agency meetings, training opportunities, mock exercises, or first-responder capabilities that help to optimize communications, coordination, data-sharing, or related practices, while also considering the specific freight types, patterns, or modes on the peninsula. At a broader level, consider freight movement issues relative to evacuation planning, post-incident supply or recovery operations, emergency freight routes or freight detours, and surrounding community access or impacts.

Focus on overweight and hazardous materials: Support efforts to explore the identification of typical overweight or hazardous material freight routes in conjunction with ongoing and future CVISN initiatives or related truck monitoring and enforcement interests. Include a focus on site-specific hazardous material issues, overweight or hazardous materials tracking, and security screening options relative to the key freight activities or routes on the peninsula.

Support Homeland Security efforts relative to peninsula-specific freight activities: Coordinate with federal, state, and local agencies to help inform efforts and needs relative to security management and operations, cargo screening or inspection technologies, cargo theft protection, and broader security interests. Discuss key freight movements, infrastructure, pinch points, or critical systems relative to asset protection. Support ITS technologies or other cost-savings mechanisms that state DOTs may be able to deploy in support of security-related efforts.

System Management, Operations, and Maintenance

Strengthen jurisdictional relationships and collaboration: Ensure effective collaboration with all parties responsible for managing, operating, and maintaining various components of the freight transportation system. Include a focus on issues that affect land use and freight traffic relationships (e.g., rail crossing or traffic signal programs); that involve private freight infrastructure or potential public/private partnership opportunities; that influence staffing, training, management, or organizational needs; or that potentially enhance the deployment or integration of ITS solutions both geographically and within or between agencies.

Review and monitor truck policies and peninsula-wide implications: Consider policy enhancements that will help to manage the operational and cost efficiencies of motor freight transportation throughout the peninsula while also accounting for potential relationships or conflicts with federal, state, or local policy limitations. Recognize policy implications versus the various unique facets of the peninsula such as its limited geographical points of access, coverage across three separate states with varying statewide policies, a diverse mix of urban area freight hubs and rural agricultural activities, or a pronounced peak season traffic demand.

Multi-jurisdictional discussions of key truck regulations and their impact on the peninsula may focus on:

- Federal Hours-of-service regulations versus additional needs for truck parking or rest areas
- Multi-state cooperation/collaboration on truck weight limit, idling, or similar restrictions
- Multi-state cooperation/collaboration on designated truck routes and mapping across the peninsula
- Reviews of local truck parking or delivery policies and restrictions

Consider truck traffic needs or impacts during roadway maintenance and construction activities: Recognize potential freight system issues such as permitting, rural truck traffic, overweight/oversize trucks, weight limits or route restrictions that may require special attention during the construction planning process. Monitor changes in heavy vehicle traffic patterns, particularly along identified freight corridors, to continue to support pavement design and management programs and related decision-making that account for such traffic. Similarly emphasize bridge maintenance and reconstruction along critical freight routes.

Expand the use of technologies in freight system management and operations: Expand capabilities both in direct freight applications and where mutual benefits may be achieved alongside general passenger travel. Specific opportunities on the peninsula may include the following:

- Support ongoing freight initiatives such as the statewide deployment of Weigh-in-Motion (WIM) devices, multi-state CVISN efforts (*see related call-out box*), or other freight safety/ security screening interests.
- Support mutually-beneficial ITS applications such as All Electronic Tolling (AET), adaptive signal systems, or real-time traffic and construction reporting systems.
- Consider partnering with universities or other entities to research and develop alternate technological solutions that may reduce reliance on existing proprietary ITS systems. Encourage market ideas and competition to improve flexibility or cost efficiencies for system procurement options and maintenance needs.

Explore long-term solutions to waterway dredging needs on the peninsula: Focus on the identification of adequate disposal sites for excess dredge materials, as well as broader discussions relative to federally-allocated dredge funding shortfalls and the potential need for alternate funding arrangements or cost-sharing options. Consider supporting research into the re-use of dredged materials, as well as improvements to environmental education to foster public relations and a more complete understanding of dredging impacts and disposal site needs or opportunities.

Ongoing CVISN Initiatives

Delaware is in the process of implementing a comprehensive commercial vehicle weight and safety enforcement program. The State currently utilizes state-of-the–art, web-based technology to perform e-credentialing of registration and tax payments; the State also conducts e-screening for safety performance through the PrePass® system installed at the Middletown Scale House on US-301 near the Delaware-Maryland State line. Projects in development include an aggressive virtual weigh station (VWS) program and development of systems and applications to enhance roadside inspection and enforcement activities. Delaware reports all credentialing and safety information into a national database that gives the credential issuers and enforcement officers' real-time information. These systems have been paid for with substantial assistance from the federal Commercial Vehicle Information Systems Network (CVISN) and the Performance Registration information Management (PRISM) programs.

Although Delaware, Maryland, and Virginia have made significant investments in commercial vehicle enforcement, much remains to be done. Commodity flows identified in this report indicate that additional study is warranted in enhanced safety technology, particularly in the identification of truck cargo and the ability to identify hazardous cargo at the scale houses, at roadside enforcement and in response to an incident. With the completion of VWS locations in southern New Castle County and adjacent counties in Maryland, Delaware and its partners need to identify additional freight corridors where commodity flows indicate a need for heightened commercial vehicle enforcement.

One large truck population continues to move outside of Delaware's enhanced weight and safety enforcement capabilities. Currently all interstate commercial vehicles over 26,000 pounds are subject to enhanced enforcement and inspection at the scale houses. This captures approximately 8,400 vehicles. Meanwhile, there are an additional 19,000 plus vehicles in Delaware weighing between 10,000 and 80,000 pounds that are registered as intrastate operators that do not leave the state. These intrastate trucks are subject to the same level of safety enforcement as your family car. The magnitude of the safety problem associated with these vehicles is unknown; however, if they mirror the interstate commercial vehicle fleet, nearly a quarter of these intrastate vehicles are operating unsafe vehicles that may require being put out of service. Including all vehicles above 10,000 pounds (both interstate and intrastate) in the interstate commercial vehicle weight and safety enforcement program should be studied, with the understanding that PRISM grant funds are available to implement such a program.

Sustainability and Environmental Stewardship

Implement strategies to reduce freight's impact on air quality: Consider expansion of emissions control and monitoring efforts in conjunction with broader truck enforcement and inspection activities. Review state-specific variations in truck idling regulations and the potential benefits or impacts of implementing consistent multi-state regulations across the Delmarva Peninsula. Support targeted initiatives such as an expansion of Truck Stop Electrification (TSE) facilities as well as general advancements in truck, fuel, or clean diesel technologies, including coordination with programmatic efforts through the EPA and the Mid-Atlantic Diesel Collaborative (*see related call-out box*).

Mid-Atlantic Diesel Collaborative

EPA's National Clean Diesel Campaign (NCDC) promotes clean air strategies and partnerships to reduce diesel emissions. Within this campaign are Regional Clean Diesel Collaboratives, including coverage on the Delmarva Peninsula under the jurisdiction of the Mid-Atlantic Diesel Collaborative (MDC).

The MDC is a partnership between leaders from federal, state, and local government, the private sector, and environmental groups in Delaware, Maryland, Virginia, Pennsylvania, West Virginia, and the District of Columbia. The MDC's mission and purpose is to leverage resources and expertise to reduce diesel emissions to protect public health throughout the Mid-Atlantic Region; promote collaboration and coordination among projects within the Region; and raise awareness of activities underway and the need for additional diesel emission reduction projects in the Region. Strategies employed by the MDC and their partners aim to:

- Facilitate the education and awareness of key constituent groups in the Region about diesel pollution as a public health and quality of life issue, and ways to improve air quality.
- Provide a forum for diverse stakeholders to exchange ideas to reduce diesel emissions in the Region.
- Implement projects throughout the Region by leveraging funds from a variety of sources to achieve measurable emissions reductions and create momentum for future diesel emission reductions.
- Promote, review and publicly recognize voluntary projects and strategies in the Mid-Atlantic region that increase the availability and use of verified technologies, idling reduction technologies, emission reducing fuels, and employ practices and habits to reduce fuel consumption.
- Encourage participation in the Collaborative.
- Share information and expertise to facilitate administration of projects to reduce diesel emissions throughout the Region.

Sources: http://www.epa.gov/cleandiesel/index.htm; http://dieselmidatlantic.org/

Support efforts to research and manage freight's relationship with water resources: Continue to proactively manage water, wetlands, or other environmental issues as an inherent part of the overall waterway dredge management process. Monitor and plan for critical spills control issues, particularly in light of the importance of the area's Chesapeake Bay or Delaware Bay water environments.

Continue to investigate freight issues relative to Sea-Level Rise (SLR) adaptation planning: Conduct and track vulnerability assessments of key freight infrastructure that may be impacted by flooding, inundation, or storm impacts as a result of future sea-level rise. Include a focus on critical freight-carrying roadway segments, bridges, low-lying rail lines, tunnels, port facilities, or navigable channels.

Balance freight operations and key community, land use, or quality of life issues: Refer to guidance in FHWA's *Freight and Land Use Handbook*[2] to integrate appropriate and coordinated land use policies, effective transportation systems and services, effective operations and management policies, and continuous education and outreach to ensure that freight is a "good neighbor" to communities across the peninsula. Review and consider freight needs or implications relative to local first/last mile route connections, when considering land use or zoning modifications, when developing project or roadway design criteria, or when exploring Complete Streets initiatives, road diets, or similar types of corridor modifications. Include a focus on communities surrounding key freight transportation hubs or port locations, as well as coordination with programmatic efforts through the EPA Ports Initiative (*see related call-out box*).

EPA Ports Initiative

The Ports Initiative vision is to develop and implement environmentally sustainable port strategies. These strategies will identify opportunities and find solutions to create healthy air quality in communities and reduce climate risk, while supporting jobs and the economy.

Ports are the main gateway for US trade and are critical to the economies of many cities and regions. In recent years, there has been a growing emphasis on the globalization of trade and the transportation infrastructure needed to support it. As our nation adapts to meet these demands, it is important to consider what this growth means for the environment.

Over the years, EPA has been working with ports through a number of programs. Through its Ports Initiative, EPA explores effectively partnering with port stakeholders to identify opportunities and find and fund solutions that create more sustainable ports systems by:

- encouraging environmental progress at ports and reducing climate risk
- supporting operational and technological improvements to increase efficiency
- improving community health and air quality
- encouraging sustainable economic development that supports our economy and jobs

Source: http://www2.epa.gov/ports-initiative/about-ports-initiative

[2] FHWA Freight and Land Use Handbook; April 2012; http://www.ops.fhwa.dot.gov/publications/fhwahop12006/index.htm

9.3 Beyond the Freight Plan

Effective freight planning must continue beyond the research, analyses, projects, and policies summarized throughout this document. The exact course of future efforts will inevitably vary depending on changes in statutory requirements, local or regional freight and industry trends, technological developments, or other such influences; and specific planning activities will involve agencies, stakeholders, and planning partners at all levels. Key follow-up actions summarized below focus on anticipated needs relative to freight system performance monitoring, strategic implementation actions, and future plan enhancement options.

Freight System Performance Monitoring

Requirements and Challenges

MAP-21 establishes performance measurement and performance monitoring (*see related call-out box*) as key features to support decision-making processes that will help to invest resources in projects that collectively will make progress toward the achievement of national planning goals in seven overall areas, including freight movement and economic vitality. Research and technical efforts in this Delmarva Freight Plan lay the groundwork toward complying with these provisions; however, five key challenges remain:

1. *Statutory Schedule:* Given USDOTs' statutory schedule for the subject requirements, the ultimate rules and specific performance measurement details have yet to be finalized. Moving forward, it will be important for USDOT to offer a fair level of flexibility to states both in terms of measuring data that will be relevant to state-specific needs, and to allow adequate time to potentially adjust existing processes (such as those discussed here) to fully comply with the ultimate rulings.

2. *Multi-State Challenges:* As the Delmarva Peninsula covers a multi-state/multi-jurisdictional area, inconsistencies that may affect performance monitoring efforts are inevitable. Issues or conflicts may arise with data availability, format, or ownership; differing program requirements in each state; or the organizational structure of those responsible for monitoring. Additional efforts may also be needed to either aggregate or disaggregate datasets – depending on their source – for direct application into each state's performance monitoring programs.

3. *Performance Measure Refinements:* Though an initial set of freight-related performance measures will be identified, additional research and agency/stakeholder coordination beyond the scope of this freight plan will be required in some cases to fully implement and/or finalize these suggestions. The process should not be expected to be perfect in its very first outing; rather it will likely benefit from subsequent revisions based on trends or lessons learned throughout its usage. Refinements may also ultimately hinge on data availability, data consistency, private stakeholders' willingness or ability to share data, or the feasibility or practicality of maintaining and updating such information over the long-term.

4. *Performance Target Refinements:* Performance targets may likewise benefit from refinements over a longer period to ensure that they are reasonable, realistic, and meaningful versus state-specific needs. The process of establishing targets should ultimately be flexible enough to adjust to the final USDOT rulings, the final set of state-specific measures, and actual future data trends.

MAP-21 Performance Measure Requirements:

Requires the Secretary, in consultation with States, metropolitan planning organizations (MPOs), and other stakeholders, to establish performance measures in the areas listed below. Provides for DOT to establish such measures within 18 months of enactment, and prohibits DOT from establishing additional performance measures. [§1203; 23 USC 150(c)]

- Pavement condition on the Interstate System and on remainder of the National Highway System (NHS)
- Performance of the Interstate System and the remainder of the NHS
- Bridge condition on the NHS
- Fatalities and serious injuries – both number and rate per vehicle mile traveled – on all public roads
- Traffic congestion
- On-road mobile source emissions
- Freight movement on the Interstate System

MAP-21 Freight Performance Monitoring Requirements:

Requires DOT (within a broader rulemaking on performance) to establish measures for States to use to assess freight movement on the Interstate System. [§1203; 23 USC 150(c)]

Requires each State to set performance targets in relation to these measures and integrate the targets within its planning processes. States must also report periodically on their progress in relation to the targets and on how they are addressing congestion at freight bottlenecks. [§1201, 1203; 23 USC 135(d)(2), 135(f)(7), 150(d)-(e)]

Requires each MPO to set performance targets in relation to the freight measures, integrate these targets within their planning processes, and report periodically on their progress in relation to these targets. [§1201; 23 USC 134(h)(2), 134(i)(2)(C)]

Source: http://www.fhwa.dot.gov/map21/factsheets/

5. *Impacts of Regional Influences on System Performance:* MAP-21 accountability measures and the notion of making significant progress toward achieving performance targets must recognize the unique geographical location of the Delmarva Peninsula relative to the surrounding region. From a systems perspective, insights from regional analysis conducted as part of this plan confirm the practical observation that major transportation investments on the peninsula can influence regional traffic pattern shifts beyond the peninsula. For example, substantial improvements along I-95 may induce a regional shift off of US 1 (in southeastern Pennsylvania) in favor of I-95. Conversely, major improvements to the Bay Bridge may induce a regional shift off of I-95 (as far back as Washington D.C.) in order to avoid congestion in the Baltimore region. These effects emphasize the need for continued regional planning, as well as the need to account for these impacts in planning for regionally significant local projects.

Depending on the performance measures or targets in play, these types of regional traffic shifts have the potential to reduce the local system benefits of the transportation investments made while providing a significant benefit to the overall regional transportation system. While the Delmarva Peninsula is certainly not the only location in the U.S. with a transportation system so interconnected with the surrounding region, it may be exceptionally sensitive to regional influences given the make-up of travel between the adjacent metropolitan areas (e.g., Norfolk, Washington D.C., Baltimore, Philadelphia, and New York) due to the impact of the I-95 and US 301 corridors, which collectively make up almost 20% of the peninsula's overall VMT, or 35% of the truck VMT. As such, it will be exceptionally important to not just set the appropriate performance measures and targets, but to also maintain a systems perspective alongside any future insights that they may provide relative to tracking overall progress toward the intended performance targets.

Performance Measures

An initial set of performance measures for monitoring the freight environment on the Delmarva Peninsula generally, and in the state of Delaware specifically, was compiled based on the research and technical efforts of this plan as well as an informal review of recent similar practices in other statewide freight planning efforts[3]. At least 36 tentative measures were retained and, consistent with other components of this plan, were organized by major focus area category ranging from Economic Vitality to Sustainability and Environmental Stewardship (*Exhibit 9.2*).

Potential sources and, where available, baseline data and background assumptions were included in the list of performance measures. It will be necessary to view performance monitoring as an ongoing effort to be continued beyond the confines of this document as many of the proposed measures – noted in *Exhibit 9.2* as To-Be-Determined (TBD) – will require additional agency/stakeholder coordination, refined data details, or documentation of future implementation trends to finalize their baseline values. Several measures may also require reference to or integration with broader non-freight related planning efforts including, for example, topics on background traffic congestion, pavement and bridge conditions, or traffic signal operations. It is anticipated that DelDOT Planning, their MPO planning partners, and other participants involved with the Delmarva Freight & Goods Movement Working Group contain the necessary personnel and resources to champion future efforts to fill-in and/or refine the initial set of measures proposed here.

Performance Targets

MAP-21 further requires the establishment of performance targets in relation to the performance measures, integration of the targets within state and MPO planning processes, and periodic reports on progress in relation to the targets. While this plan proposes an initial set of performance measures, it does not attempt to establish the corresponding set of performance targets. As with finalization of the measures themselves, it is anticipated that setting such targets will be an ongoing effort until the final USDOT ruling. Reiterating previous discussions related to potential challenges, the process of establishing targets should ultimately be flexible enough to adjust to the final USDOT rulings, the final set of state-specific measures, and actual future trends.

[3] Notable reviews referenced a 2011 *Transportation Performance Scorecard* from the Virginia Office of Intermodal Planning and Investment; a 2013 *Maryland Freight System Performance Annual Report* from MDOT; a March 2014 *MAP-21 Performance Report* from Florida DOT; and a June 2014 draft of the *Washington State Freight Mobility Plan* from Washington State DOT.

Exhibit 9.2 – Performance Monitoring Measures

Measures for Economic Vitality	Baseline Data	Background Assumptions
Population level	**1.39M**	2010, 14-county basis w/ 902,823 in DE + 442,296 in MD + 45,553 in VA
Employment level	**504k**	2010, 14-county basis w/ 359,026 in DE + 130,865 in MD + 14,461 in VA
Source: TBD in conjunction w/ broader planning programs; baseline data above from freight plan Exhibit 7.4 and related scenario planning efforts		
Delmarva freight total tonnage	**69.6M**	2011, 12-county basis w/ 28.8M inbound + 28.0M outbound + 12.8M internal; not incl. 87.2M pass-thru
Delmarva freight total value	**$74.6B**	2011, 12-county basis w/ 33.2B inbound + 31.5B outbound + 10.0B internal; not incl. 252.7B pass-thru
Delmarva freight inbound/outbound freight ratio (by weight)	**1.03**	2011, 12-county basis w/ 28,884,251 inbound vs. 27,954,253 outbound
Source: TBD in conjunction w/ future commodity data updates; baseline data above from freight plan Exhibits 3.1-3.2 and related Transearch, Waybill, and FAF data summaries		
Port of Wilmington annual cargo tonnage	**5.6M**	2011 basis w/ 5,628, 807 tons
Port of Wilmington foreign cargo tonnage	**4.4M**	2011 basis w/ 1,246,918 domestic + 4,381,889 foreign
Port of Wilmington foreign import/export ratio	**3.68**	2011 basis w/ 3,446,432 imports + 935,457 exports
Source: USACE Navigation Data Center or Diamond State Port Corporation; baseline data above from freight plan Exhibit 4.17 and related USACE principal ports data summaries		
Waterborne freight tonnage along freight-significant river systems	**2.3M**	2011 basis w/ 1,064,830 via Wicomico River + 653,357 via Nanticoke River + 569,650 via Pocomoke River
Inbound/outbound freight ratio along freight-significant river systems	**1.39**	2011 basis w/ 1,329,807 inbound vs. 958,030 outbound via the Wicomico, Nanticoke, and Pocomoke Rivers
Source: USACE Navigation Data Center or Delmarva Water Transport Committee; baseline data above from freight plan Exhibit 4.18 and USACE waterborne commerce data summaries		

Measures for Freight Connectivity, Mobility, and Accessibility	Baseline Data	Background Assumptions
Travel time and/or delay in freight-significant corridors	**TBD**	-
Travel time and/or delay between benchmark destinations	**TBD**	-
Source: TBD pending future coordination w/ broader state or MPO planning programs; refer also to freight plan Exhibit 7.9 and other Chapter 7 system or corridor-specific modeling summaries		
Truck share of Delmarva freight total tonnage	**83%**	2010 basis vs. 10% rail + 7% river barge; does not reflect air, pipeline, or major regional port shipping
Source: TBD in conjunction w/ future commodity data updates; baseline data above from freight plan Exhibit 7.8 and related scenario planning efforts		
Daily Truck VMT	**5.3M**	2010 basis for truck miles traveled per model run data
Daily Truck VHT	**93k**	2010 basis for truck hours traveled per model run data
Percent of truck VHT at LOS E/F	**11%**	2010 basis for truck hours traveled at LOS E/F vs. total truck VHT per model run data
Daily system truck delay	**5.5k**	2010 basis for system truck delay hours per model run data
Percent of road mileage at congested speeds < 60% of free-flow speeds	**5%**	2010 basis per model run data for typical weekday PM peak periods
Source: DelDOT Cube Cargo / Cube Voyager model; baseline data above from freight plan Chapter 7 and related scenario planning efforts; additional corridor details available throughout Chapter 7		
Percent of rail network capable of supporting 286k	**TBD**	-
Port of Wilmington average truck turn-around time	**TBD**	-
Source: TBD pending future coordination (e.g., w/ state rail agencies, rail owner/operators, Diamond State Port Corporation)		

Exhibit 9.2 – Performance Monitoring Measures (Continued)

Measures for Safety and Security	Baseline Data	Background Assumptions
Number of total crashes involving large trucks	**TBD**	-
Number of fatal crashes involving large trucks	**18**	3-year average (2011-2013), 14-county basis w/ annual fatal counts per NHTSA FARS data
Number of persons injured in crashes involving large trucks	**TBD**	-
Source: TBD pending future coordination (e.g., w/ state crash reporting programs and available system data); baseline fatal crash counts from online NHTSA FARS database		
Number of total crashes at public highway-rail crossings	**8**	3-year average (2011-2013), 14-county basis w/ annual crash counts per FRA WBAPS data
Number of public highway-rail crossing improvements implemented	**TBD**	-
Source: TBD pending future coordination (e.g., w/ state rail agencies or rail owners/operators); baseline crash counts from online FRA Web Accident Prediction System		
Number of commercial vehicle inspections performed	**TBD**	-
Source: TBD pending future coordination (e.g., w/ applicable state agencies or enforcement personnel)		

Measures for System Management, Operations, and Maintenance	Baseline Data	Background Assumptions
Pavement conditions summary	**TBD**	-
Bridge conditions summary	**TBD**	-
Source: TBD pending future coordination w/ broader state or MPO planning programs		
Number of VWS or WIM sites added (or in operation)	**TBD**	-
Number of truck parking spaces available	**TBD**	-
Number of traffic signals updated or retimed	**TBD**	-
Source: TBD pending future coordination (e.g., w/ applicable state agencies and/or MPOs, as well as progress tracking subsequent to this freight plan)		
Dredge material placement capacity remaining	**TBD**	Anticipate a focus on the Nanticoke, Pocomoke, and Wicomico Rivers
Percent of key waterway mileage at federally-authorized depth	**TBD**	Anticipate a focus on the Nanticoke, Pocomoke, and Wicomico Rivers
Source: TBD pending future coordination (e.g., w/ USACE, Delmarva Water Transport Committee)		
Number (or value) of high/moderate priority freight actions implemented	**TBD**	Anticipate tracking and/or referencing projects or actions throughout freight plan Chapters 8 and 9
Mileage (or value) of rail enhancements implemented	**TBD**	TBD
Source: TBD pending future coordination (e.g., w/ state planning or MPOs, state rail agencies, rail owners/operators, as well as progress tracking subsequent to this freight plan)		

Measures for Sustainability and Environmental Stewardship	Baseline Data	Background Assumptions
Number (or value) of emissions reducing actions implemented	**TBD**	-
Source: TBD pending future coordination (e.g., w/ applicable state agencies or the Mid-Atlantic Diesel Collaborative)		

Strategic Implementation Actions

To support the implementation of projects, policies, or related activities outlined by this plan while also generally continuing to advance the state of freight planning on the peninsula, a number of strategic follow-up planning actions will be required. As with previous discussions on performance monitoring, it is anticipated that the peninsula's state, MPO, or regional planning partners and efforts through the Delmarva Freight & Goods Movement Working Group will be able to identify the necessary personnel and resources to champion such actions including, but not limited to, the following:

Encourage the State Freight Advisory Committee: Continue outreach and coordination through the Delmarva Freight & Goods Movement Working Group meetings and annual Delmarva Freight Summits.

Finalize performance measures: Complete and/or refine the initial set of performance monitoring measures and baseline data assumptions documented in this plan. Coordinate refinements with other statewide planning programs and broader non-freight related planning efforts as required.

Set initial performance targets: Set realistic, reasonable, and meaningful performance targets in conjunction with the selection of final performance monitoring measures.

Prepare for performance reporting: Establish realistic schedules, assignment responsibilities, and report templates to facilitate future performance monitoring updates and related reporting needs.

Refine future performance monitoring details: Consider future needs or opportunities to further refine performance measures or targets over a longer period. Catalysts for change may include compliance needs based on final federal statutory rulings, integration needs alongside other statewide planning programs, or new opportunities with future expansion or implementation efforts (e.g., additional access to WIM site data, statewide travel time monitoring datasets, GIS dashboards, etc.). In conjunction with these efforts, consider a review of newer data sources, applications, or limitations by way of a dedicated project, a group action within the Delmarva Freight Advisory Working Group, or a focused Delmarva Freight Transportation Data Convention[4].

Track future implementation details: Develop summary tracking tools, lists, spreadsheets, etc., and assign responsibilities for periodically updating the status of projects or studies on the screening and prioritization lists developed by this plan. To further document broader freight planning efforts and to help support future performance reporting needs, similarly track general freight related actions, decisions, meetings, policies, strategies, or related investments that may be advanced or implemented subsequent to completion of this freight plan.

Enhance integration within statewide planning processes: Consider a review of other formal planning processes such as the statewide prioritization process for Delaware's Comprehensive Transportation Plan (CTP) to identify potential enhancements that could be made within those processes given the newest available information compiled by this freight plan.

[4] As recommended by BEACON at Salisbury University in an August 2011 draft Freight Transportation Study Conducted for the Salisbury/Wicomico Metropolitan Planning Organization.

Inform future funding and implementation decisions: Incorporate insights from the freight plan's project screening and prioritization efforts into broader discussions relative to formal project planning, programming, or funding decisions. Likewise consider the identification of key freight project candidates for which each state and/or their planning partners may wish to pursue unique freight-eligible funding opportunities including, for example, MAP-21's increased federal match percentage, TIGER grants, public/private partnerships, or similar options.

Maintain compliance with federal freight planning revisions: Monitor federal-level proposals and reauthorization modifications that would influence freight planning requirements, program details, or project funding opportunities. Potential examples include future extensions or revisions to current MAP-21 freight guidelines, adoption of freight provisions within The GROW AMERICA Act, re-defining of the federal Primary Freight Network (PFN) and/or its purpose, or revival of the Projects of National and Regional Significance (PNRS) program. Continue to update state and regional freight planning perspectives in compliance with any new or revised programs, particularly as it may be beneficial to state needs or priorities including, for example revisions pertaining to:

- Multimodal freight incentive programs
- National freight infrastructure programs
- Multimodal redefinition of the National Freight Network
- Formal designation of new Critical Rural or Critical Urban Freight Corridors
- Formal designation of new Intermodal Connectors
- Statewide freight advisory committee roles and responsibilities

Future Plan Enhancement Options

To further advance the state of freight planning on the peninsula while also maintaining or enhancing key components relative to future plan updates, a number of additional freight planning enhancements may also be considered. Whereas the previous list of strategic implementation actions focused primarily on management, application, or integration of the plan; the potential enhancements discussed here focus more on discrete add-on components that would supplement or expand the scope of the current plan including, but not limited to, the following:

Maintain future commodity flow data: Determine a reasonable schedule, area, and approach for updating commodity flow data in conjunction with future freight plan maintenance, Cube Cargo model maintenance, or other targeted freight studies. The primary data source for this plan relied on 2011 IHS Transearch data by county for the 12-county area in Delaware and Maryland only, supplemented with STB rail waybill data for Delaware, as well as a variety of 2011/2012 projections from FHWA's FAF-3 dataset. Future revisions should reassess as-needed the required data geography and level of detail versus specific update or modeling needs, as well as potential implications of FHWA's future development of the FAF-4 dataset and beyond.

Maintain the Cube Cargo model: Integrate the Cube Cargo commodity flow model that was developed as part of this freight plan with applicable planning processes or applications for DelDOT, WILMAPCO, or their planning partners. Update the model as-needed in conjunction with future freight plan maintenance, commodity flow data updates, or refined population and employment projections. Consider additional applications of the model as a tool to support overall regional planning including system level assessments of future project impacts, additional scenario evaluations, or similar efforts.

Investigate additional freight planning scenarios: Consider the development and assessment of additional freight planning scenarios in conjunction with future planning needs or interests. Example scenario refinements could explore issues related to:

- Modified growth levels or locations
- Sea-level rise adaptation planning
- Peak season congestion conflicts
- Motor freight cost sensitivities
- Motor freight weight limits or payload equivalency factors

Study key supply chains: To gain a more in-depth understanding of key supply chains and related needs or opportunities relevant to the peninsula, consider supporting additional targeted supply chain studies similar to efforts through WILMAPCO that were recently completed for Delmarva's chemical products industry. Other key supply chains noted in this plan encompass industries related to energy, agriculture (including poultry and agribusiness), food products, and retail (including related warehousing/distribution facilities); or to a lesser degree construction, transportation equipment, and miscellaneous manufacturing.

Study potential expansion of CVISN's VWS coverage: Consider a targeted effort to identify additional freight corridors where commodity flows indicate a need for heightened commercial vehicle enforcement. Expansion interests may include a focus on overweight or hazardous material truck travel patterns, which would require a more in-depth review of applicable commodity flows, enforcement/inspection activities, route restrictions, or similar details.

Study potential expansion of CVISN's enforcement coverage: Consider a targeted study to include all vehicles above 10,000 pounds (both interstate and intrastate) in the interstate commercial vehicle weight and safety enforcement program. PRISM grant funds may be available to implement such a program.

Evaluate strategies for compiling multistate crash data: Explore options for developing an efficient and effective approach to compiling and assessing truck crash details from multiple crash reporting systems across the peninsula's tri-state area. Efforts would require a more in-depth review of state-specific crash reporting details, data request or confidentiality concerns, data consistency issues, or similar details.

Integrate dashboard summaries: Explore options to integrate GIS data and dashboard summaries in conjunction with ongoing freight system performance monitoring or as related to broader statewide planning efforts. Consider partnerships with local universities to support such efforts, coupled with a state-of-the-practice review of similar applications such as VDOT's Performance Reporting System for Projects and Programs *(*http://dashboard.virginiadot.org/*)*.

Develop a mapping and data platform to summarize Delmarva's freight environment: Explore options for the detailed development of a robust, publicly accessible, mapping and data inventory tool to compile relevant details for a broad understanding and presentation of the freight environment on the Delmarva Peninsula. Consider partnerships with local universities to support such efforts, coupled with a state-of-the-practice review of similar applications such as DVRPC's Philly Freight Finder *(*http://www.dvrpc.org/webmaps/PhillyFreightFinder/*)*.

9.4 Closing

The Delmarva Freight Plan was aimed at supporting key national freight planning goals in compliance with MAP-21, while also providing a broad assessment of local and regional freight planning needs. This approach was paired with the development of a Cube Cargo commodity flow model to support ongoing and future planning efforts in the region, alongside customized freight scenario testing to help inform decision-making in the face of unknown futures. The plan further included a comprehensive project screening and prioritization process to help evaluate projects having the most potential to influence the freight system, while also providing data-oriented elements that may be used to help pursue freight-specific funding options for those projects. Capping these efforts were generalized summaries of freight policies, performance monitoring needs, strategic implementation actions, and future plan enhancement options that will ultimately help to support the region's freight planning efforts now, tomorrow, and into the future.

While completion of this plan may be considered a milestone amongst freight planning activities on the Delmarva Peninsula, it is undoubtedly not an end. Rather it should serve as a catalyst that helps to continue the momentum of a renewed emphasis on freight and goods movement planning that must continue well beyond the confines of this document.

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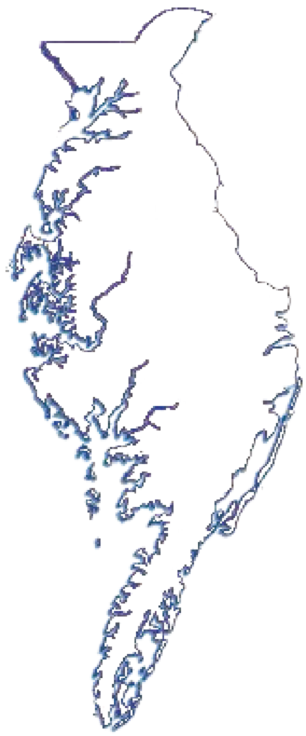

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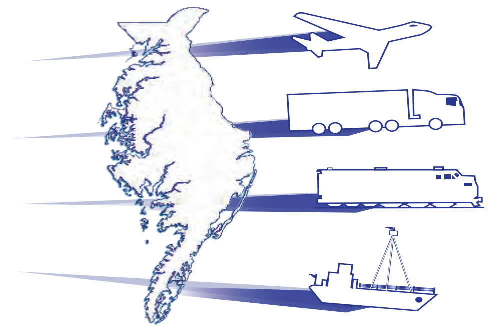

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