REPORT OF THE OFFICE OF INTERMODAL PLANNING AND INVESTMENT

Master Rail Plan for The Port of Virginia (SJR 69, 2014)

TO THE GOVERNOR AND THE GENERAL ASSEMBLY OF VIRGINIA

SENATE DOCUMENT NO. 12

COMMONWEALTH OF VIRGINIA
RICHMOND
2015

Office of
INTERMODAL
Planning and Investment

MEMORANDUM

To: **Joint Legislative Audit and Review Committee**

From: **The Office of Intermodal Planning and Investment**
The Virginia Department of Rail and Public Transportation
The Port of Virginia

Date: **May 14, 2015**

Subject: **Senate Joint Resolution 69: Master Rail Plan for the Port of Virginia**

This correspondence is to provide notification that the Office of Intermodal Planning and Investment (OIPI), in consultation with the Department of Rail and Public Transportation (DRPT) and the Virginia Port Authority (VPA), has completed the enclosed Master Rail Plan for the Port of Virginia.

In March 2014, the Virginia General Assembly passed Senate Joint Resolution 69 (SJR 69), directing OIPI to develop a Master Rail Plan for the principal facilities of the Port of Virginia with the objective of improving the Port's overall competitive position through improved rail, for the benefit of the Commonwealth and its citizens.

SJR 69 specifically directs that the Master Rail Plan address six specific issues, which it has done so as follows:

1) The status and characteristics of the current rail systems that support the port facilities.

The Master Rail Plan provides an inventory and maps of the Port of Virginia's principal facilities, their associated on-dock rail systems, and the railroad-owned networks that support them:

- *Virginia International Gateway (VIG)*
- *Norfolk International Terminals (NIT)*
- *Portsmouth Marine Terminal (PMT)*
- *Newport News Marine Terminal (NNMT)*
- *Port of Richmond (POR)*
- *Virginia Inland Port (VIP)*
- *Future Craney Island Marine Terminal (CIMT)*

The inventory includes descriptions of the rail facilities, typical rail operations they support, and which railroads have trackage rights at each location and on the railroad-owned networks supporting them.

2) The development of a master rail plan with the flexibility to support both near- and long-term business opportunities at the port facilities.

The Master Rail Plan identifies key features such as infrastructure or services likely to attract various types of port-served industries. It further identifies typical challenges associated with

establishing rail-served industries on the port's terminals and provides recommendations for improving coordination between economic development stakeholders.

3) **The identification of any operational and physical constraints or limitations on providing efficient and competitive dual rail access service to the port facilities and recommendations to mitigate them to the extent practicable.**

The Master Rail Plan documents existing rail access for each of the Port of Virginia's principal facilities. It further describes the various means in which dual rail access exists (or could be established) and the limitations that exist with regard to the access being competitive.

Recommendations to mitigate these limitations are provided, primarily via continued investment in facilities that are already have competitive dual rail access, programs to foster improved operational efficiency, and through possible infrastructure improvements (that would require buy-in from the owning railroad).

4) **The identification of any improvements to rail access to the port facilities and related intermodal facilities to support desired train volumes.**

The Master Rail Plan identifies and recommends several improvements to the rail networks supporting the terminals to support increased rail volume. These improvements would require approval of the owning railroad. The Master Rail Plan also acknowledges that increased rail traffic will have an impact on the surrounding communities and recommends a program be established to assist with mitigation of rail impacts.

5) **The identification of potential increases to the port facilities' intermodal rail throughput capacity as demand increases.**

The Port's capacity to transfer containers between ship lines and railroads to meet increasing demand is an interaction of several elements, many of which have a confidential and/or competitive element with limited transparency. The Master Rail Plan identifies where opportunity is present to increase rail capacity, but further acknowledges that increases to port facility rail capacity requires the careful coordination of multiple stakeholders, including the Port, railroads, and U.S. Customs & Border Protection. Recommendations for improving this coordination are provided as a critical first step.

6) **Strategic recommendations to guide future rail planning and funding decisions to support desired train volumes.**

The Master Rail Plan follows a period of significant capital investment in rail and rail-related facilities, and therefore recommends the focus be on earning an appropriate level or rate of return on those investments through better collaboration among major stakeholders, out of which additional infrastructure improvements may be identified.

The Master Rail Plan also identifies potential capital improvements to consider in light of the more immediate operational, administrative, and strategic decision-making recommendations.

Office of INTERMODAL Planning and Investment

The Office of Intermodal Planning and Investment has identified numerous opportunities to improve collaboration between public and private stakeholders for the benefit of the Commonwealth and its citizens, and looks forward to supporting future efforts to move forward with the recommendations identified within the Master Rail Plan for the Port of Virginia.

The Virginia Office of Intermodal Planning and Investment's Director and Deputy Secretary of Transportation, recognizes and endorses this final plan as certified by his signature below:

Nick Donohue, Deputy Secretary of Transportation & Director, OIPI — 6/8/15 date

The Executive Director of the Port of Virginia recognizes and endorses this plan's completion, as certified by his signature below:

John [illegible], Executive Director, PNV — 5/14/15 date

The Director of the Virginia Department of Rail and Public Transportation recognizes and endorses this plan's completion, as certified by her signature below:

Jennifer Mitchell, Director, DRPT — 4/30/15 date

MASTER RAIL PLAN FOR THE PORT OF VIRGINIA

PRESENTED TO

Office of INTERMODAL Planning and Investment

April 16, 2015

PREPARED BY moffatt & nichol / R.L. Banks & Associates, Inc. ECONOMICS · ENGINEERING · SERVICE PLANNING

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Acronyms

AAPA	American Association of Port Authorities
BCR	Bay Coast Railroad
CA	Chesapeake & Albemarle Railroad
CBP	U.S. Customs and Border Protection
CIDMMA	Craney Island Dredged Material Management Area
CIEE	Craney Island Eastward Expansion
CSX	CSX Transportation
CRY	Norfolk International Terminals' Central Rail Yard
CWRY	Commonwealth Railway
DRPT	Virginia Department of Rail and Public Transportation
NIT	Norfolk International Terminals
NNMT	Newport News Marine Terminal
NPBL	Norfolk and Portsmouth Belt Line Railroad
NS	Norfolk Southern Railway
OIPI	Virginia Office of Intermodal Planning and Investment
PMT	Portsmouth Marine Terminal
POR	Port of Richmond (Richmond Deep Water Terminal)
POV	The Port of Virginia
REF	Rail Enhancement Fund
Ro-Ro	Roll on – Roll off
TEU	Twenty-foot Equivalent Unit
VIG	Virginia International Gateway (former APM Terminal)
VIP	Virginia Inland Port
VIT	Virginia International Terminals, LLC
VPA	Virginia Port Authority
VSRP	Virginia State Rail Plan

Glossary

Break bulk: Goods that must be loaded individually, and not in intermodal containers or bulk.

Bulk: Commodity cargo that is transported unpackaged in large quantities, usually material in either liquid or granular form, such as petroleum/crude oil, grain, coal, or gravel.

Class I railroad: A railroad with annual carrier operating revenues of $250 million or more. In the U.S., Amtrak and seven freight railroads are designated Class I based on 2011 measurements released in 2013.

Class III railroad: Class III railroads are typically local short-line railroads serving a small number of towns and industries or hauling cars for one or more larger railroads. Many Class III railroads were once branch lines of larger railroads or abandoned portions of main lines.

Competitive dual rail access: Rail access where a customer has the opportunity to select between two railroads to transport cargo, on the basis of price, speed of delivery, and/or service quality/reliability, such that the railroads will compete for the service.

Crossover: A pair of switches that connects two parallel rail tracks, allowing a train on one track to cross over to the other.

Deramp: To remove goods or containers from a railroad car using special equipment.

Discretionary rail cargo: Rail cargo that has competitive rail access at multiple ports.

Double track: A railway with one track running each direction.

Double-stack: A form of intermodal freight transport where intermodal containers are stacked two high on railroad cars.

Dual Rail Access: Rail access where a customer may choose from two railroads to move cargo through.

Intermodal container: A standardized reusable steel box used to store and move materials and products in the global containerized intermodal freight transport system that can be moved from one mode of transport to another (from ship, to rail, to truck) without unloading and reloading its contents.

Ramp: A sloping platform situated at the end or beside a track and rising to the level of the floor of the rail cars.

Single stack: A form of intermodal freight transport where intermodal containers are stacked one high on railroad cars.

Trackage/Operating rights: an arrangement between railroads where the owner of the track retains all rights, but allows another company to operate over certain sections of its track. These deals can be long- or short-term; can include the right to serve customers on the line or not; and can be exclusive or not.

Twenty-foot equivalent unit (TEU): An inexact unit of cargo capacity based on the volume of a 20-foot-long intermodal container.

1. EXECUTIVE SUMMARY

The General Assembly initiated through Senate Joint Resolution 69 (SJR 69) the development of a Master Rail Plan for The Port of Virginia. The objective of this Master Rail Plan is to improve the overall competitive position of the Port through improved rail service to Port of Virginia facilities (specifically those owned or leased by the Virginia Port Authority), for the benefit of the Commonwealth and its citizens. The Master Rail Plan does not specifically consider private marine terminals or the bulk rail service (e.g., coal, grain or aggregates) to those terminals.

Rail service, in the context of this plan, is the collective term for the opportunity to transport cargo by rail as part of an overall competitive cost, schedule and service quality structure (against other port locations) and via a system that has sufficient capacity to reliably and safely handle the demand volume.

A summary of specific issues the General Assembly requested be addressed in the Master Rail Plan can be found in **Appendix A**.

1.1. Background

While the Master Rail Plan considers the movement of containerized, bulk, and break bulk cargo through The Port of Virginia, some of the most significant master plan issues relate to the import and export of containers through The Port of Virginia – a highly competitive global industry, as illustrated by Table 1:

Table 1 – U.S. East Coast Port 2013 throughput

SEAPORT	NEW YORK	BALTIMORE	VIRGINIA	CHARLESTON	SAVANNAH	MIAMI
2013 TEU	5,467,345	705,230	2,223,532	1,601,366	3,034,010	901,454
2013 % Rail Cargo	~14%	10% goal	~34%	10% goal	~22%	10% goal

Source: AAPA and individual ports

For over 180 years, the maritime industries of Virginia have been served by multiple rail lines, which have evolved into today's current rail network served by two Class I railroads (Norfolk Southern and CSX Transportation) that connect The Port of Virginia to inland markets, as well as short line railroads that provide local rail service between the Class I railroads and industries. Ownership of the rail network elements and trackage rights agreements between the railroads shape the opportunities available to Virginia industries, including the individual Port of Virginia facilities, to use rail service to their competitive advantage.

Having evolved over more than a century, the rail network serving The Port of Virginia is not a simple grid, and just as The Port of Virginia competes for global cargo, the railroads compete for cargo at The Port of Virginia and the right to move that cargo on their private rail infrastructure. This competition for cargo is

further part of the larger competitive environment where both ship lines and the railroads make strategic decisions regarding vessel schedules and pricing across their entire systems, which include multiple port locations. These decisions ultimately affect the Port's competitiveness but are outside the Port's ability to fully control. Attracting rail cargo to The Port of Virginia is achieved by minimizing the cost and maximizing the reliability of the transfer between the ship lines and the railroads. Figure 1 below begins to illustrate the complexity of the rail network serving The Port of Virginia Hampton Roads facilities.

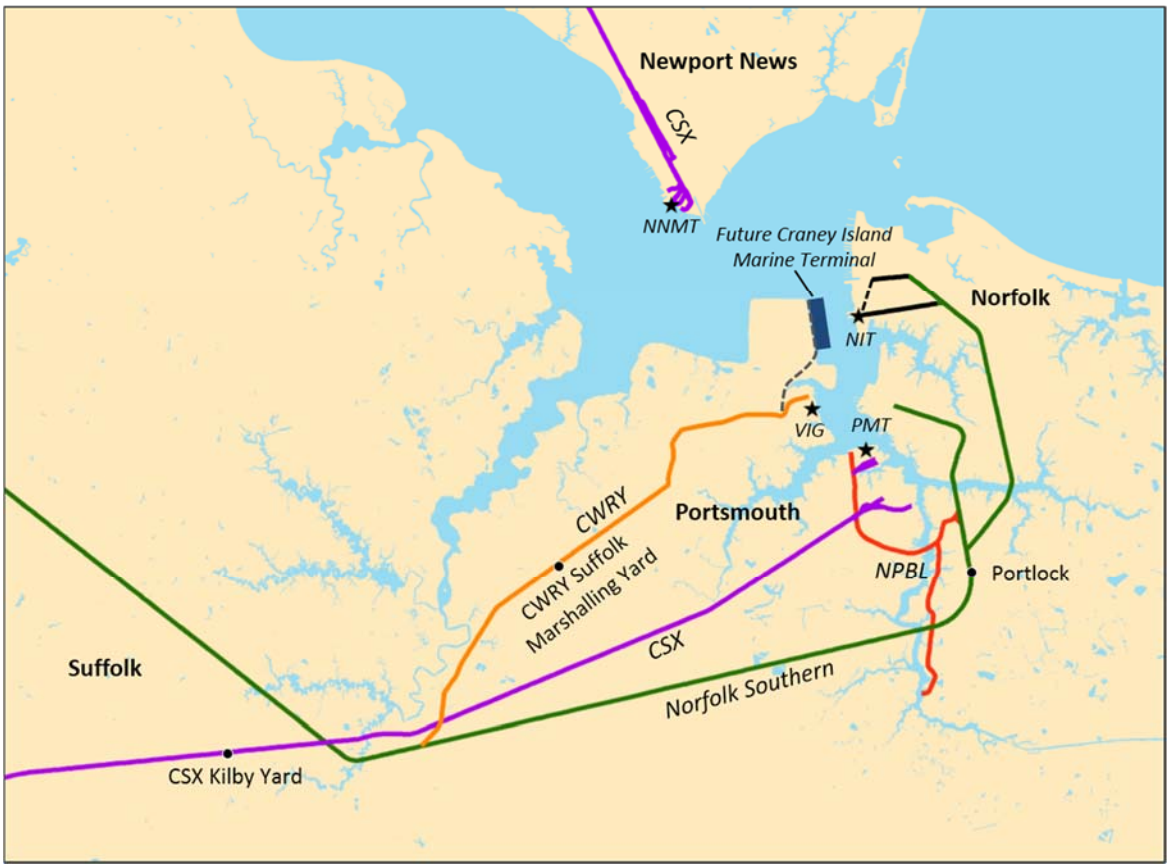

Figure 1 – Primary Hampton Roads rail corridors used by Port of Virginia cargo

Virginia International Terminals (VIT) is the sole operator of the Commonwealth's terminals, allowing it to strategically align activities to the terminals best suited for those activities. Typically, U.S. seaports are "landlord" ports that host privately leased and operated independent terminals that compete against each other. Supported by substantial investments in rail infrastructure, The Port of Virginia is competitively positioned to provide the access to international trade lanes that factor into ship lines' and railroads' strategic decisions to route cargo through a port. This position can be further enhanced through improvements to rail service at the Port facilities and the railroad-owned corridors that convey its cargo to inland markets.

Table 2 illustrates the very significant Commonwealth and federal rail investments that have benefitted The Port of Virginia. Due to the highly competitive nature of the global freight industries, comparable levels of rail investments are underway at or near many of the major U.S. seaports.

Table 2 – Combined Federal & Commonwealth Investments (Approx.) Benefitting the Port of Virginia

Project	Total Public & Private Investment (In and Outside Virginia)	Federal Investment (Virginia)	Commonwealth Investment (Excluding Port Funds)
FHWA-NS Heartland Corridor Doublestack Clearances	$191 M	-	$75.6 M
DRPT-Commonwealth Railway Relocation	$75 M	$15 M	$34.6 M
CSX National Gateway	$850 M	-	$40 M
NS Crescent Corridor	$2,500 M	-	$49.3 M
Norfolk Passenger Rail / Heartland Corridor	$100 M	$15 M	$87 M
On-Dock Rail and Other Supporting Infrastructure	$53 M	-	$22.6 M

Grants and other funding mechanisms offered through the Commonwealth are typically accompanied by commitments to report and achieve specific and quantified performance goals, such as annual rail traffic, travel time reductions, or other metrics tailored to the anticipated benefits of the project. The above investment totals exclude other incentives such as tax credits offered by the Commonwealth to further encourage economic activities that contribute to its goals, including port and rail activities.

1.2. Master Rail Plan

The Master Rail Plan is built on the following major assumptions and findings:

- The vast majority of rail cargo through The Port of Virginia's marine terminals is containerized, intermodal cargo
- Intermodal rail service provides The Port of Virginia an opportunity to access major Midwest markets and new market sectors.
- Norfolk International Terminals (NIT), Virginia International Gateway (VIG), and a planned future marine terminal on Craney Island are The Port of Virginia's primary opportunities for intermodal rail service.

- Other Port facilities have the potential to support development of other rail-served markets, such as agriculture or other commodities.
- Rail-related developments outside The Port of Virginia facilities could have a significant impact, directly or indirectly, on Port facilities and operations.

Planning efforts to support rail freight are complicated by the competitive environment within which this activity takes place, where business plans are closely held by all stakeholders (ship lines, railroads, the Port, and their customers).

The Master Rail Plan therefore identifies impacts, constraints, recommendations and other considerations regarding increased rail traffic on a terminal by terminal basis.

1.3. Master Rail Plan Findings

While this Master Rail Plan is organized around operational and capital improvements at individual marine terminals, it also is based on a pragmatic understanding of competitive dual rail access that is appropriate, affordable and achievable. Two Port of Virginia terminals, NIT and VIG, currently handle the vast majority of containerized cargo, of which, VIG provides competitive dual rail access. At NIT, NS enjoys a competitive advantage as it owns a rail line leading directly into the NIT complex. CSX accesses NIT utilizing the Norfolk and Portsmouth Belt Line Railroad (NPBL), which was formed over 100 years ago by the Class I railroads (of which, NS and CSX are the sole remaining shareholders) to improve level of service to rail-served industries in Hampton Roads. This introduces additional rail operations for CSX to access the terminal. NS's advantage has thus far limited CSX rail demand at NIT to relatively low volume project, bulk, and break-bulk cargo.

The Port and the Commonwealth are managing the reopening of the Portsmouth Marine Terminal and the possibilities of growth at VIG and/or a future marine terminal on Craney Island in such a way as to preserve or promote a climate of competitive dual rail access to the extent feasible (and as may be constrained by trackage rights outside the terminals).

The findings and recommendations of the Master Rail Plan are intended to preserve, promote and enhance the competitiveness of The Port of Virginia, including improvements to competitive dual rail access where practical.

1.3.1. Intermodal Rail

The Port's capacity to transfer containers between the ship lines and railroads at a sufficient level of service to meet customer requirements is an interaction of several elements, each of which may be constrained by different factors. Major capacity elements include:

- Availability and productivity of Port resources (labor, container handling equipment)
- Availability of railroad resources (rail cars, locomotives, crews)
- Availability of U.S. Customs and Border Protection (CBP) resources to screen import cargo
- Alignment of Port, railroad, and CBP resource availabilities

- Port and railroad infrastructure and operational capacity to support the full range of cargo activities
- Impacts of Port and rail activities on the surrounding communities and the affected industries

At The Port of Virginia, the coordination of many of these elements have a private and/or competitive element and are worked through in confidential settings with limited public transparency.

Within this environment, the Master Rail Plan includes the following findings, observations, and related issues:

Table 3 – Summary of Observations

OBSERVATION	DISCUSSION
The Master Rail Plan acknowledges that resource allocations are made outside of the Master Rail Plan by the Port Authority and the General Assembly. Resource allocations by the railroads, both capital and operating, are private business decisions.	The Commonwealth and the U.S. Government have invested more than $300 million in public funds to support rail infrastructure supporting the Port, alongside equivalent federal investments in the Heartland, National Gateway and Crescent rail corridors benefitting the Port.
Trackage rights can introduce complexities to providing dual access to facilities that precludes readily apparent solutions from being viable.	Trackage rights are regulated at the federal level and there is very limited ability to compel a railroad to grant competitive access to another railroad. Existing trackage rights, particularly on the rail networks serving facilities in Hampton Roads, are fairly complicated. It is not uncommon for entities seeking improved rail access to suggest solutions that involve expansion of trackage rights, either due to being unaware of existing rights, or not fully appreciating the magnitude of the request.
U.S. Customs and Border Protection (CBP) personnel work closely with the Port to provide the support necessary to maintain the stream of commerce through the terminal, to the extent their own labor policies and resources can manage. Despite local CBP Field Office's best efforts, these resources are not always sufficient to provide the coverage the Port may require at the marine terminals.	• CBP labor policies and resource availability limit its ability to adjust screening coverage to meet the changing and day-to-day needs of Port operations. • As rail demand increases, additional CBP resources may be necessary to support rail operations at the Port. • Infrastructure improvements at NIT and VIG are available to reduce the manpower resources required to meet CBP screening requirements. • The burden of funding these improvements has shifted to the Port.

OBSERVATION	DISCUSSION
	• The 2014 Consolidated Appropriations Act establishes a possible, but not a definite, mechanism for the Port to provide supplementary funding to CBP.
Alignment of Port, railroad, and CBP resources is typically coordinated at the local level. However, many key decisions affecting local operations are made at the regional or national levels.	• As one example, the schedule for CSX trains at VIG is compressed by the national and regional schedules for passenger trains and to a lesser degree freight trains due to the mainline track capacity shortages between Richmond and Fredericksburg. • The Port and CBP have limited resources to support this schedule, resulting in reduced level of Port and CBP service for CSX cargo. • This places pressure on the Port and CBP to allocate additional resources. • Operational solutions may be feasible if coordinated among all stakeholders.
Investment in rail infrastructure is a common solution to Port rail capacity concerns, but may not be the only solution.	• The Port, the Commonwealth, and railroads routinely plan and invest in infrastructure improvements through their respective capital programs, special appropriations, and dedicated funding sources such as the Rail Enhancement Fund. • Conversely, resources to support coordination of interdependent freight and passenger rail operational services among the railroads, the Port and CBP are generally not available. • An entity focused on supporting freight-related concerns within the state, such as OIPI or a new Office of Freight Planning, as have been successful in other states, may be useful for coordinating and advocating solutions between stakeholders.

OBSERVATION	DISCUSSION
The resources and obligations of the railroads and the Port are focused on supporting the movement of freight and often do not address resultant community or individual business impacts.	• Increasing rail traffic to and from the terminals results in increased traffic delays at rail crossings throughout Southside Hampton Roads. • Southside Hampton Roads rail traffic, including Port intermodal traffic, converges through downtown Suffolk. • Expansion of Commonwealth Railway's infrastructure to support VIG may require relocation of two large water pipelines owned by the City of Norfolk and the City of Portsmouth. • Resources and plans to mitigate community or individual business impacts of Port rail activities are inconsistent and/or deficient. • Clear guidelines to establish grade separation needs and funding would benefit the Port, the surrounding communities, and the railroads.

1.3.2. Dual Rail Access

Dual rail access can be provided through several different means. Whether these conditions provide the opportunity for the customer to have the railroads effectively compete with one another is largely dictated by the specifics of the site and the rail network serving it. Table 4 summarizes these various forms and likely constraints to establishing competitive service associated with each. A significant limitation to concepts that seek to provide dual rail access through expansion of trackage rights is that granting such trackage rights is strictly between the railroads and is a matter of interstate commerce outside the jurisdiction of the state to compel.

Table 4 – Constraints to Competitive Dual Rail Service for Various Forms of Dual Rail Access

On-Dock Dual Rail Access Provided By	Physical and Operational Constraints to Competitive Dual Rail Service
Both railroads operating over the same infrastructure (i.e. trackage rights) to a terminal	• Increased complexity to coordinate operations may adversely impact effective capacity of the rail infrastructure and/or cost of operation; may require additional infrastructure to achieve a desired throughput. • Prioritization of traffic between the railroads may not be optimally aligned with the needs of the Port.
Direct access by one railroad and access by the second through an intermediary (short line) NIT: NS, CSX via NPBL PMT: CSX, NS via NPBL POR: CSX, NS via CSX NNMT: CSX, NS via CSX	• Introduces additional operations (costs) for the non-owning railroad to provide rail service due to the need to interchange with a second railroad. • Prioritization of traffic between the railroads may not be effectively aligned with the needs of the Port.
A common carrier (short line) transporting both railroad's trains to a terminal. VIG: Both NS and CSX via CWRY	• Introduces additional operations (costs) to rail service (relative to a single provider) due to the need to interchange with a second railroad. • The impact of this service to the overall competitiveness of the operation is dependent on the nature of underlying service charters or other agreements between the common carrier, port, and Class I railroads. • May require additional infrastructure on part of the short line and/or the terminal to segregate rolling stock.
Separate rail infrastructure for each railroad	• May require significant footprint within terminal to accommodate. • Rail corridor construction is an enormous undertaking, particularly in urbanized areas (significant community impacts).

Measures to mitigate the operational and physical constraints to competitive dual rail access need to be evaluated in terms of the overall competitive position of the Port (i.e. the cost of mitigation vs. the benefit of doing so). Potential means for the Port to improve its competitive position through mitigation of existing rail access conditions is **an overall port-wide approach to competitive dual rail access** that includes:

- Strategic alignment of ship lines, where possible, to maximize availability of rail capacity for those ship lines with significant rail cargo (in consideration of multiple complex factors, of which rail is only one element).
- Ongoing coordination among the Port, railroads, and other stakeholders (e.g. U.S. Customs and Border Protection) to align resources and seek process optimizations that benefit all parties.
- Improved utilization of off-dock intermodal yards via drayage or barge service, if unable to meet demand with on-dock rail.
- For locations where tenant development is being sought (e.g. PMT) and may have tenants served by different railroads, development operating procedures and strategies to coordinate tenant operations and define expectations for level of service.
- Strategic investments in infrastructure where operational constraints cannot be overcome.

1.3.3. Other Rail Opportunities

There is potential to support other rail-served activities at several of the Port's facilities, including Portsmouth Marine Terminal (PMT) and Port of Richmond (POR). To this end, the Master Rail Plan includes the following observations:

- The Port has thus far remained open to a broad range of prospective industries, for example bulk agricultural exports or automobile imports.
- The unique needs of each industry and the potential for operational conflicts limits the opportunity to fully plan development of the Portsmouth or the Richmond terminals without a long-term commitment to one or more targeted industries or activities.
- The Port generally has the capacity and willingness to assist prospective industries with developing on-terminal solutions.
- Other economic development entities may be better positioned and have the necessary resources to assist prospective industries with developing off-terminal elements of a new operation.
- Realization of major industrial development opportunities can be improved through further coordination between on- and off-terminal improvements where proposed operations cannot be wholly accommodated on-terminal.

As with all aspects of transportation, infrastructure and operational needs are driven by public and private land use decisions. The Port has the clear authority to plan, fund and regulate on-terminal land uses. However, seaports are part of a global supply chain connecting disparate activities and bringing producers and consumers together in a competitive and increasingly efficient manner. All seaports are directly affected by the location and intensity of production, distribution and consumption activities outside the individual marine terminal.

Virginia was one of the early pioneers in stimulating rail-related economic development through the Virginia Inland Port in Front Royal. Equivalent opportunities exist today outside the gates of the Portsmouth Marine Terminal and the Port of Richmond. However, the ability, resources, and authorization for such initiatives are likely best found through collaboration among The Port of Virginia, the Virginia Economic Development Partnership, and supporting local and regional agencies, provided the Commonwealth develops clear benchmarks and goals to guide those efforts.

1.4. Recommendations

Traditional transportation plans yield a map with specific capital improvements. ***This Master Rail Plan follows a period of significant capital investment in rail and rail-related facilities, and the immediate priority of this Master Rail Plan is earning an appropriate level or rate of return on those prior rail investments, better collaboration among major stakeholders, and a process for ongoing operational improvements, out of which additional infrastructure improvements may be identified.*** However, this Rail Master Plan also contains a list of potential capital improvements (Recommendation 4) which should be considered in light of the more immediate operational, administrative, and strategic decision making recommendations (Recommendations 1-3).

Recommendation 1: State planning and investment in rail infrastructure serving the Port should maximize utilization of existing rail and rail-related infrastructure among all parties.

- Designate an existing entity (e.g. OIPI) or create a new entity (e.g. Office of Freight Planning) to facilitate continuous and comprehensive coordination efforts among the Port, railroads, passenger rail, U.S. Customs and Border Protection, and other stakeholders to optimize rail service to the Port through improved alignment of schedules and resources. Similar efforts have been successful at other U.S. ports and in the Virginia I-95 rail corridor.
- The Port should provide regular input to, and collaborate with, this entity to evaluate and establish achievable and sustainable goals for rail intermodal service across the entirety of the Port.
- Focus of these efforts should include identification of critical infrastructure needs that are not readily apparent to any one stakeholder, conducting more accurate benefit/cost assessments, development of analytical tools and supporting data collection to support better decision making, and exploring cost-and risk-sharing opportunities.
- Designated entity should also regularly review public funding programs for rail, port, and highway infrastructure and operations to ensure that operational enhancements, such as use of mechanisms to provide supplemental funding to U.S. Customs and Border Protection operations, receive due consideration in such programs.
- A wide variety of performance expectations, performance incentives, and performance standards have been established as justification for public investment in rail infrastructure. The Commonwealth and the Port should ensure, in a transparent and collaborative fashion, that those expectations, incentives and standards all contribute to the overall goals of The Port and the Commonwealth.

Recommendation 2: Develop policies and/or programs to support local infrastructure planning and investment where rail activity occurs.

- Designate a lead individual or entity to explore programs to assist communities with coordination, planning, and funding of improvements to mitigate rail impacts, including quiet zones, crossing safety improvements, and grade-separated crossings, with short-term emphasis on the Commonwealth Railway corridor and Class I corridors in the vicinity of the CWRY interchange.

Similar programs adopted by other states include California's Section 190 Grade Separation Program and North Carolina's Sealed Corridor Project.

- Designate a lead individual or entity (e.g. the entity designated in Recommendation 1) to explore program options for ensuring that existing, rail-served industries are not disadvantaged by other rail projects and programs.
  Establish a process for the Commonwealth to develop guidelines and metrics for use in prioritizing and justifying community and industrial mitigation efforts.

Recommendation 3: Where opportunities to foster Port-served private industrial activities are present, maximize the value of Port assets by improving coordination of on- and off-terminal development.

- Given the value and scarcity of Port property and the access it provides to deep draft vessels, the Port should evaluate, on a case-by-case basis, the extent to which it accommodates prospective private rail-served industrial operations within its terminal boundaries. If the Port determines an attractive operation cannot be wholly accommodated within a terminal, a lead individual or entity such as VEDP or DRPT should be designated to coordinate roles, responsibilities, and resources among stakeholders to evaluate and develop off-terminal rail facilities that could support realization of the opportunity.
- The designated lead individual should use this Master Rail Plan to assist with the identification, coordination, and development of off-terminal needs.
- Off-terminal development plans should seek to support other terminal rail activities where feasible and practical to maximize potential use as rail needs evolve over time.
- Off-terminal rail development plans should preserve the opportunity for competitive dual rail access to the terminal(s) it supports.

Recommendation 4: The Master Rail Plan identifies off-terminal impacts and constraints as intermodal rail traffic increases at NIT, VIG, PMT, and a future marine terminal. The following efforts will support near-term competitive improvements or community relief for intermodal rail activities, provided that the host railroad accepts the improvements and any associated conditions, and that planned terminal expansions occur as currently planned.

4A - Norfolk International Terminal (NIT)

- Double-tracking the rail line between Portlock and NIT would lower operational costs for NS, NPBL, and other railroads that all use the line. NOTE: This recommendation is not currently supported by NS based on existing rail volumes.
- A direct connection between Lambert's Point line used by NPBL and the rail line to NIT once existed; reconstructing it would improve access for NPBL to serve its customers on the Sewell's Point Line. NOTE: This recommendation is not currently supported by NS based on existing rail volumes.
- Establish storage for a complete unit train (i.e. no breaking) on NPBL system in order to more efficiently stage longer trains.

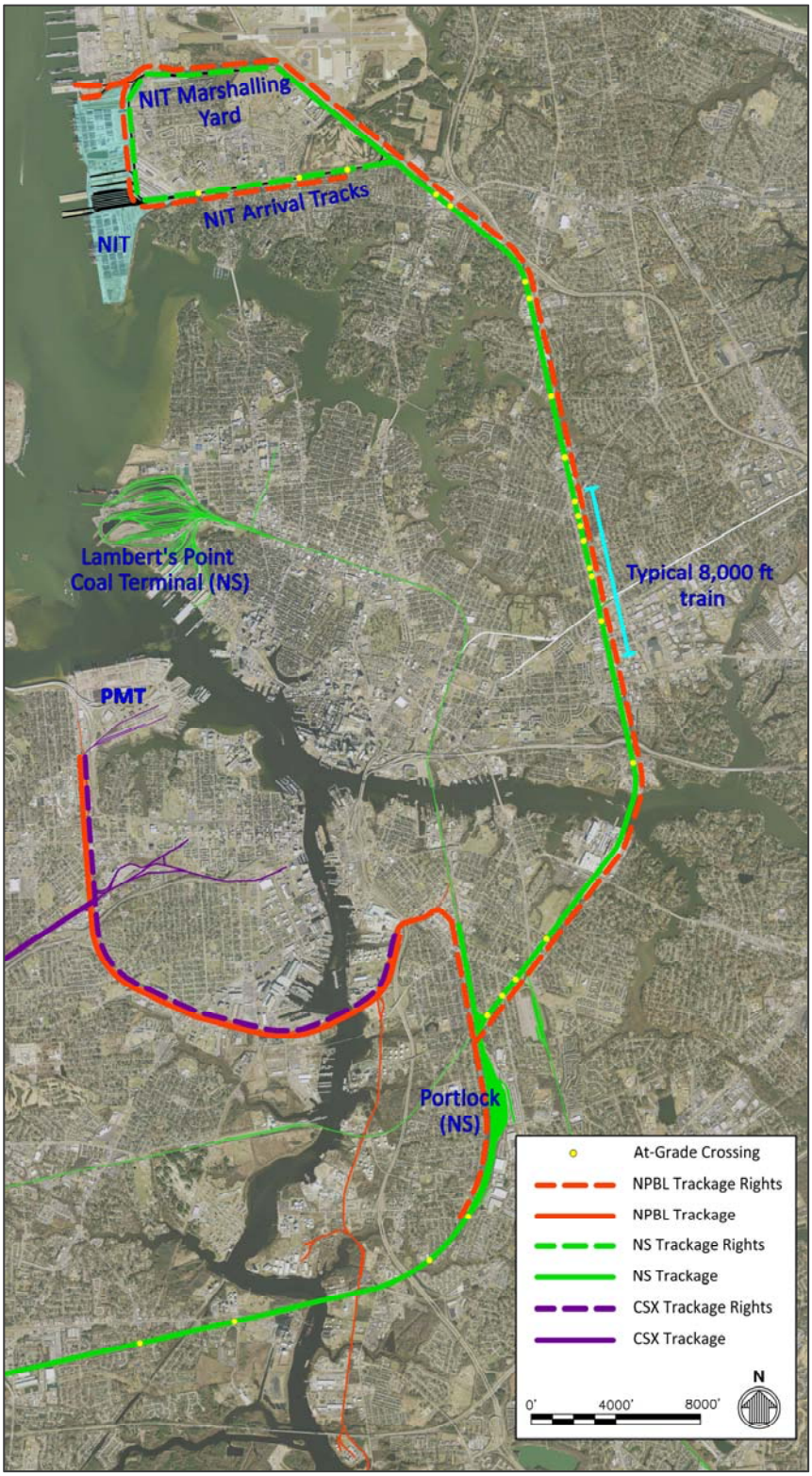

Figure 2 – NIT Overall Rail System

4B - Virginia International Gateway (VIG)

- Commonwealth Railway (CWRY) corridor should be double-tracked along its full length to support increased rail traffic at VIG.
- CWRY's Suffolk Marshalling Yard should have two additional tracks constructed (already partially funded by an REF grant).
- The interchange between CWRY and the Class I railroads in Suffolk should be evaluated for improvements.
- Related community impacts resulting from increased rail traffic should be identified and mitigated through the program described in Recommendation 2.[1]

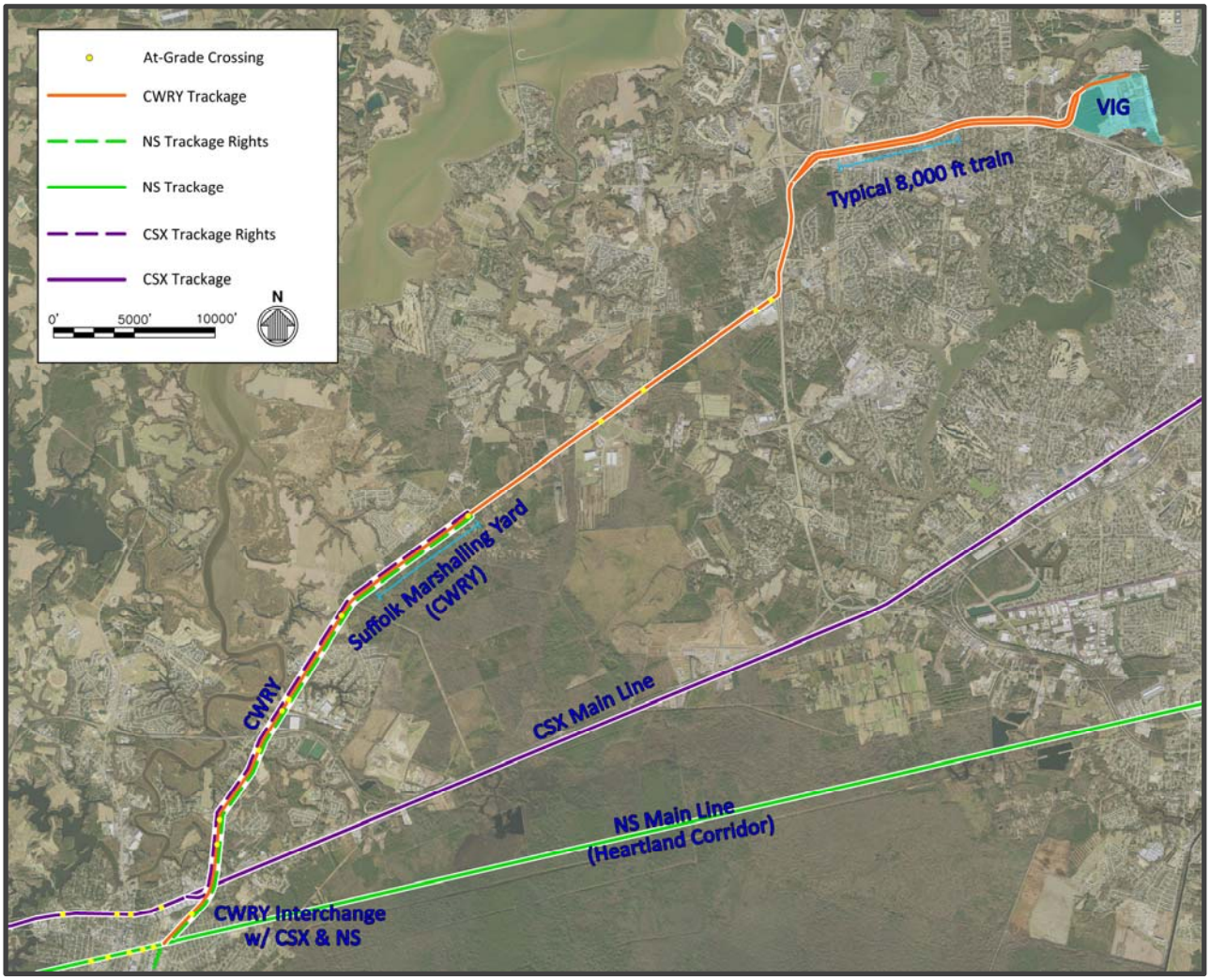

Figure 3 – VIG Overall Rail System

[1]Improvements to mitigate long term traffic mobility impacts resulting from increased rail traffic, including traffic generated by VIG and CIMT have been identified in the *Suffolk Rail Concepts Screening Report*, by Moffatt & Nichol dated March 13, 2015.

4C - Portsmouth Marine Terminal (PMT)

- If competitive rail operations are established at PMT, improvements to circumvent the physical constraints of the Pinner's Point interchange could mitigate some potential rail conflicts. This would likely require off-terminal property to construct.
- There are likely on-terminal solutions to mitigate rail conflicts on the east lead, once Midtown Tunnel construction is complete, but those will depend on any on-terminal activities or users.

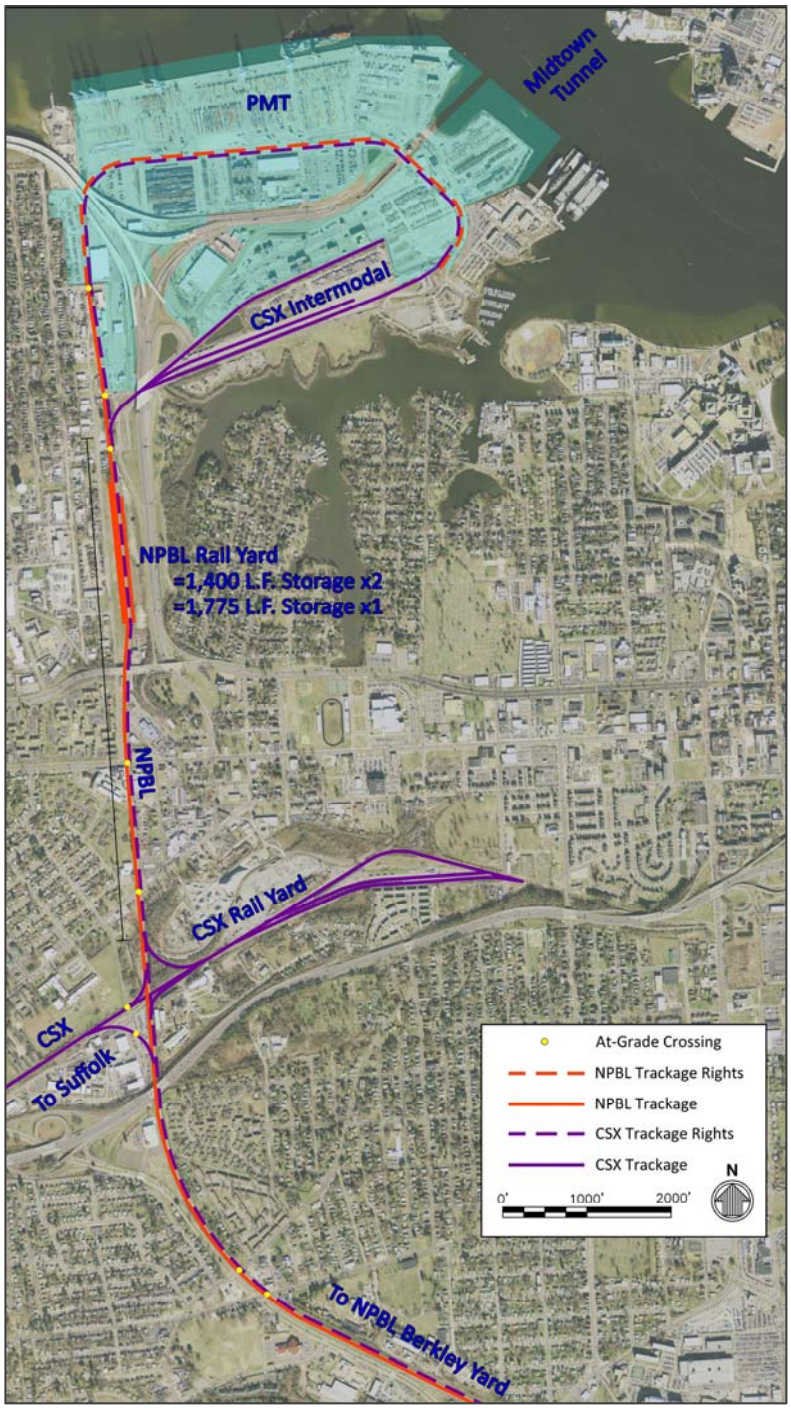

Figure 4 – PMT Overall Rail System

4D - Newport News Marine Terminal (NNMT)

- Engagement with CSX to address vertical clearance restrictions on the Peninsula Subdivision that currently limit the height of rail cars (in particular, multi-level automobile carriers) would allow the Port to more effectively compete for automobile cargo and other breakbulk cargo through NNMT.

4E - Future Craney Island Marine Terminal (CIMT)

- Property for the rail corridor needs to be acquired.
- A significantly larger CWRY marshalling yard will be necessary to support CIMT at full build out. A process to identify potential sites for this yard should be initiated.
- Improvements will be needed near VIG to allow CIMT traffic to pass while trains arrive at or depart from VIG.
- Related community impacts must be identified and resolved[1].

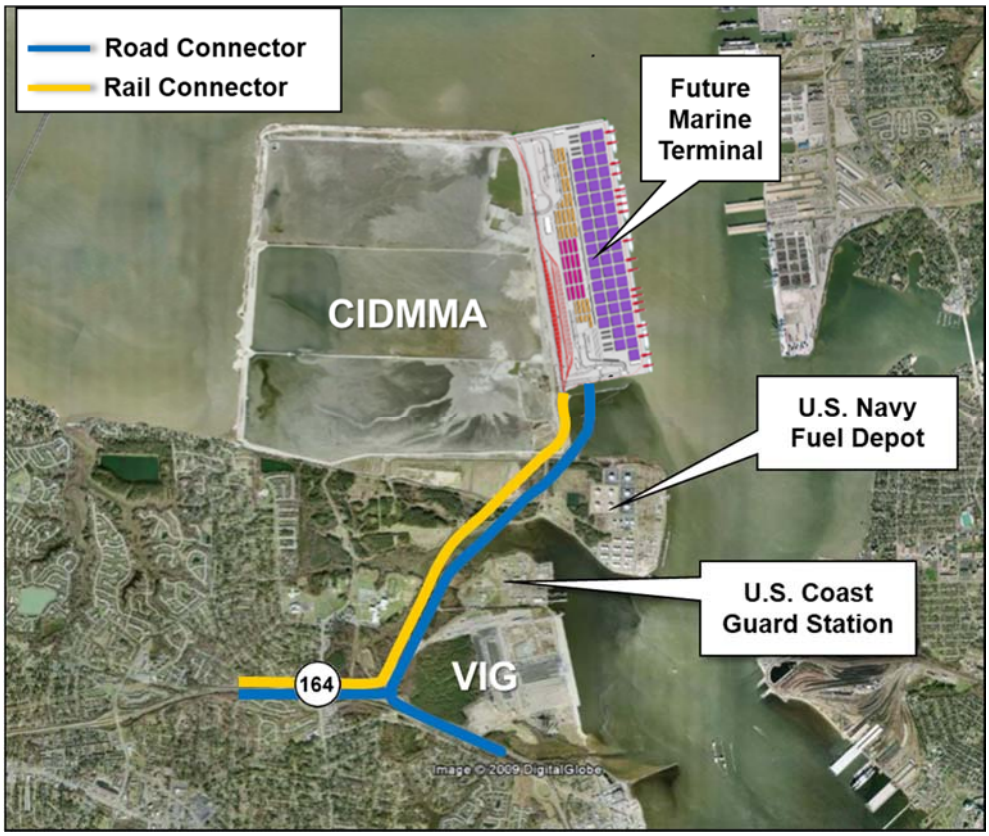

Figure 5 – Craney Island Road and Rail Connector Concept

While the above efforts are intended to improve the competitive position of The Port of Virginia, the improvements recommended herein would be above and beyond the considerable progress made in 2014 to maintain the longstanding success of The Port of Virginia.

[1]Improvements to mitigate long term traffic mobility impacts resulting from increased rail traffic, including traffic generated by VIG and CIMT have been identified in the *Suffolk Rail Concepts Screening Report*, by Moffatt & Nichol dated March 13, 2015.

2. INTRODUCTION

The Virginia General Assembly passed Senate Joint Resolution 69 in March 2014, requesting the Office of Intermodal Planning and Investment (OIPI), in consultation with the Department of Rail and Public Transportation (DRPT) and the Virginia Port Authority (VPA), to develop a Master Rail Plan for the principal facilities of The Port of Virginia. The Port of Virginia facilities considered are shown in Figure 6.

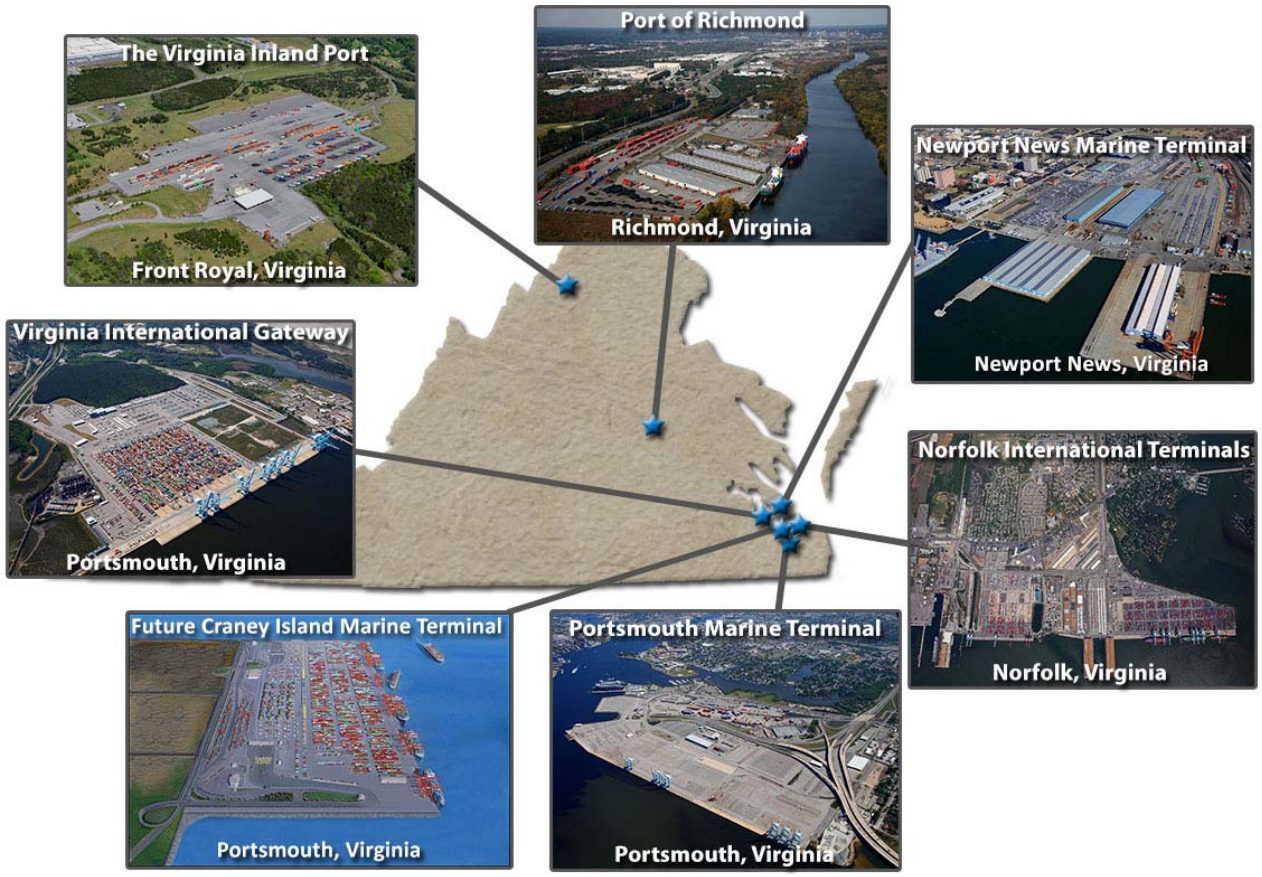

Figure 6 – Current and future Port of Virginia facilities

2.1. Background

The Port of Virginia

The Virginia Port Authority was established by the Commonwealth in 1952 to foster maritime commerce and economic development within Virginia by coordinating and promoting the port activities of the city-owned marine terminals. In the 1970's, the marine terminals (owned by the cities of Newport News, Portsmouth, and Norfolk) were consolidated under the Virginia Port Authority to further bolster their economic development potential and in the 1980's, terminal operations were consolidated through the formation of Virginia International Terminals, Inc. (VIT). In 1989, the Virginia Inland Port (VIP) was created to extend access to the Port inland and in 2010, the VPA began leasing the APM Terminal (now the Virginia International Gateway (VIG) in Portsmouth and the Port of Richmond's Deepwater Terminal (POR). For

the purposes of this report, these facilities and organizations (which have undergone further consolidation in 2014), are referred to as The Port of Virginia. Outside of this report, other documents have used the terms "Port of Virginia" or "Port of Hampton Roads" to refer to all of the maritime industries in Virginia, including but not limited to the coal, agribusiness, dry bulk, oil, and other general cargo terminals.

The organization of The Port of Virginia is somewhat unique in that its terminals work together and provide the opportunity to align ship lines with the terminal resources that best serve their needs. Typically, ports in the U.S. (e.g. LA/Long Beach, NY/NJ), each terminal typically acts as a private entity that competes with the other local terminals for ship calls.

The Railroads

Prior to 1898, Hampton Roads industries, including its myriad marine terminals, were served by eight railroads resulting in significant rail congestion. In 1898, the Norfolk and Portsmouth Belt Line Railroad (NPBL) was formed by these railroads with shares held by each of the interested railroads as a means to improve the level of service for all the rail customers. Since that time, multiple mergers have occurred, resulting in the region having two Class I railroads, Norfolk Southern (NS) and CSX Transportation (CSX). NPBL remains with NS and CSX as the sole shareholders. There are three short line railroads that also operate in the Hampton Roads area: Commonwealth Railway (CWRY), Chesapeake & Albemarle Railroad (CA), and the Bay Coast Railroad (BCR).

The trackage of these railroads extend throughout the Hampton Roads area, with trackage rights agreements and associated rate contracts between the railroads shaping the cost for rail service. Similar conditions are present in Richmond as well. At a high level, the presence of both NS and CSX gives businesses options for accessing inland markets and manufacturing centers. The viability of these options, however, is greatly shaped by the ease (cost) to transfer cargo locally between a railroad and the business. The Port of Virginia terminals, which are located throughout the state, therefore each have different options with regard to competitive rail options.

The rail network serving The Port of Virginia is not a simple grid, and just as The Port of Virginia competes for global cargo, the railroads compete for cargo at The Port of Virginia and the right to move that cargo on their private rail infrastructure. Figure 7 begins to illustrate the complexity of the rail network serving The Port of Virginia's Hampton Roads facilities.

This competition for cargo is further part of the larger competitive environment where both ship lines and the railroads make strategic decisions regarding vessel schedules and pricing. These decisions ultimately affect the Port's competitiveness but are outside the Port's ability to fully control.

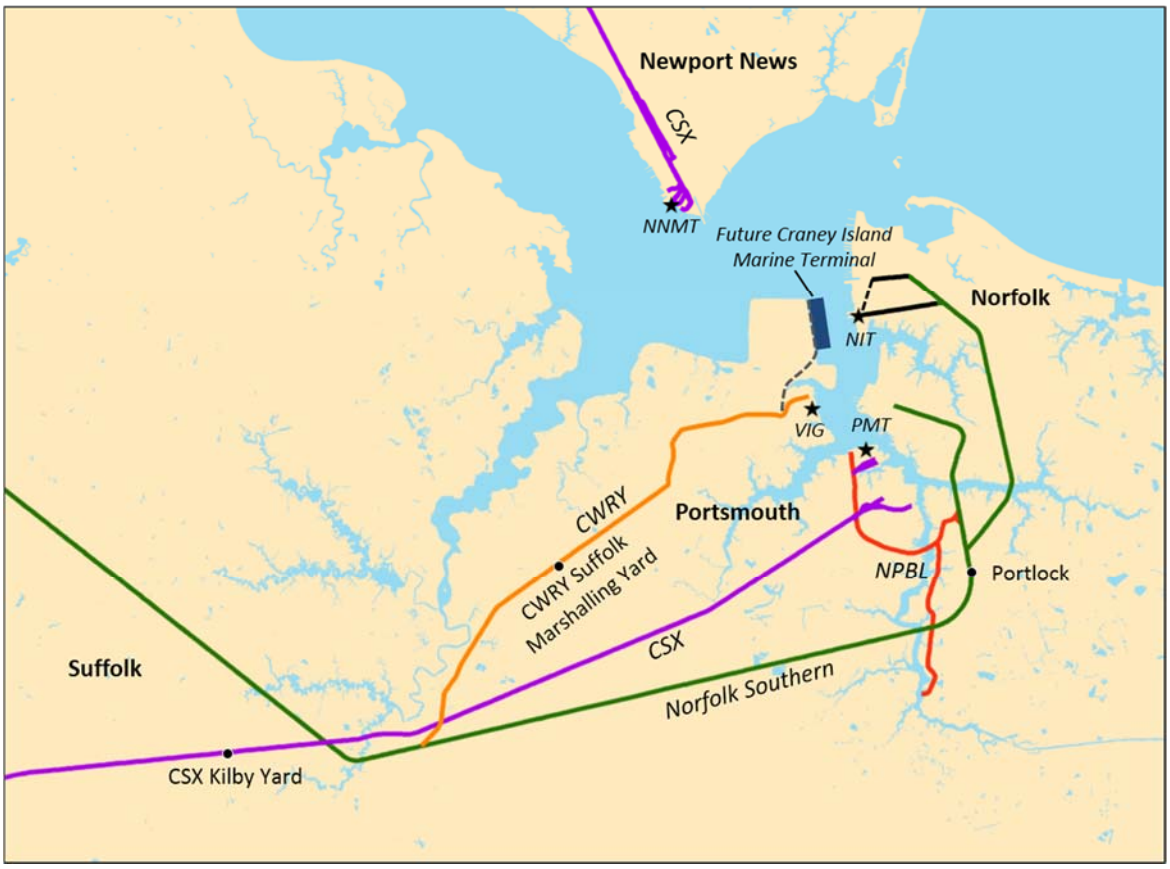

Figure 7 – Primary Hampton Roads rail corridors used by Port of Virginia cargo

While the Master Rail Plan considers the movement of containerized, bulk, and break bulk cargo through The Port of Virginia, some of the most significant master plan issues relate to the import and export of containers through The Port of Virginia – a highly competitive global industry, as illustrated by Table 4.

Table 5 – U.S. East Coast Port 2013 throughput

SEAPORT	NEW YORK	BALTIMORE	VIRGINIA	CHARLESTON	SAVANNAH	MIAMI
2013 TEU	5,467,345	705,230	2,223,532	1,601,366	3,034,010	901,454
2013 % Rail Cargo	~14%	10% goal	~34%	10% goal	~22%	10% goal

Source: AAPA and individual ports

Supported by substantial investments in rail infrastructure, The Port of Virginia is competitively positioned to provide the access to international trade lanes that factor into ship lines' and railroads' strategic decisions to route cargo through a port. This position can be further enhanced through improvements to rail service at the Port facilities and the railroad-owned corridors that convey its cargo to inland markets.

Table 5 illustrates the very significant Commonwealth and federal rail investments that have benefitted The Port of Virginia. Due to the highly competitive nature of the global freight industries, comparable levels of rail investments are underway at or near many of the major U.S. seaports.

Table 6 – Combined Federal & Commonwealth Investments (Approx.) Benefitting the Port of Virginia

Project	Total Public & Private Investment (In and Outside Virginia)	Federal Investment (Virginia)	Commonwealth Investment (Excluding Port Funds)
FHWA-NS Heartland Corridor Doublestack Clearances	$191 M	-	$75.6 M
DRPT-Commonwealth Railway Relocation	$75 M	$15 M	$34.6 M
CSX National Gateway	$850 M	-	$40 M
NS Crescent Corridor	$2,500 M	-	$49.3 M
Norfolk Passenger Rail / Heartland Corridor	$100 M	$15 M	$87 M
On-Dock Rail and Other Supporting Infrastructure	$53 M	-	$22.6 M

Grants and other funding mechanisms offered through the Commonwealth are typically accompanied by commitments to report and achieve specific and quantified performance goals, such as annual rail traffic, travel time reductions, or other metrics tailored to the anticipated benefits of the project. The above investment totals exclude other incentives such as tax credits offered by the Commonwealth to further encourage economic activities that contribute to its goals, including port and rail activities.

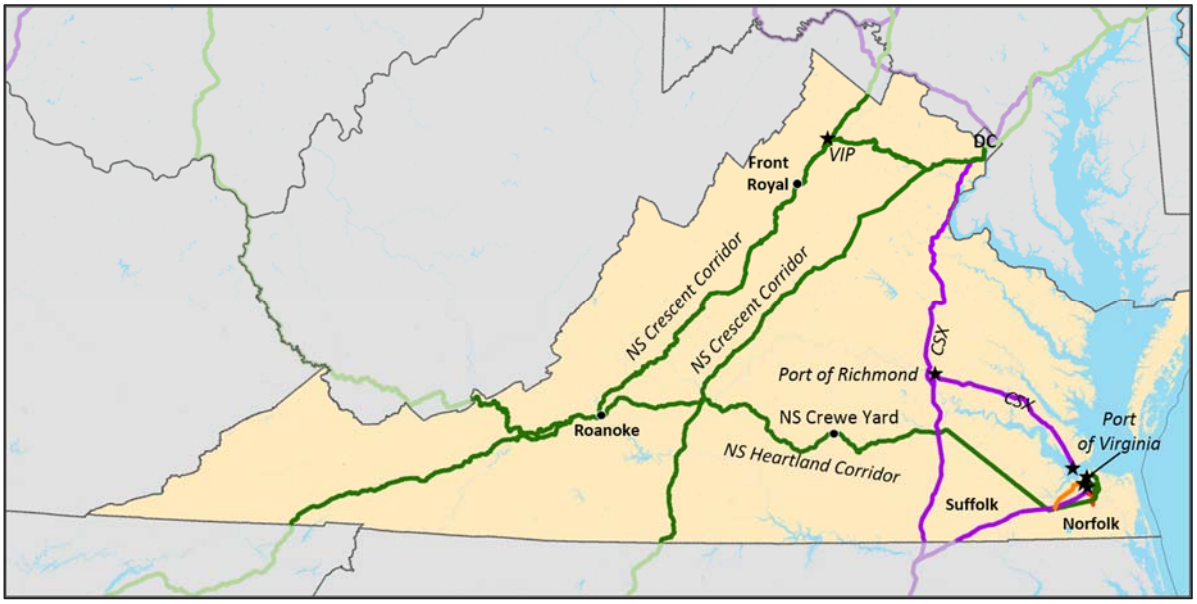

Figure 8 – Primary Virginia rail corridors for Port of Virginia cargo[1]

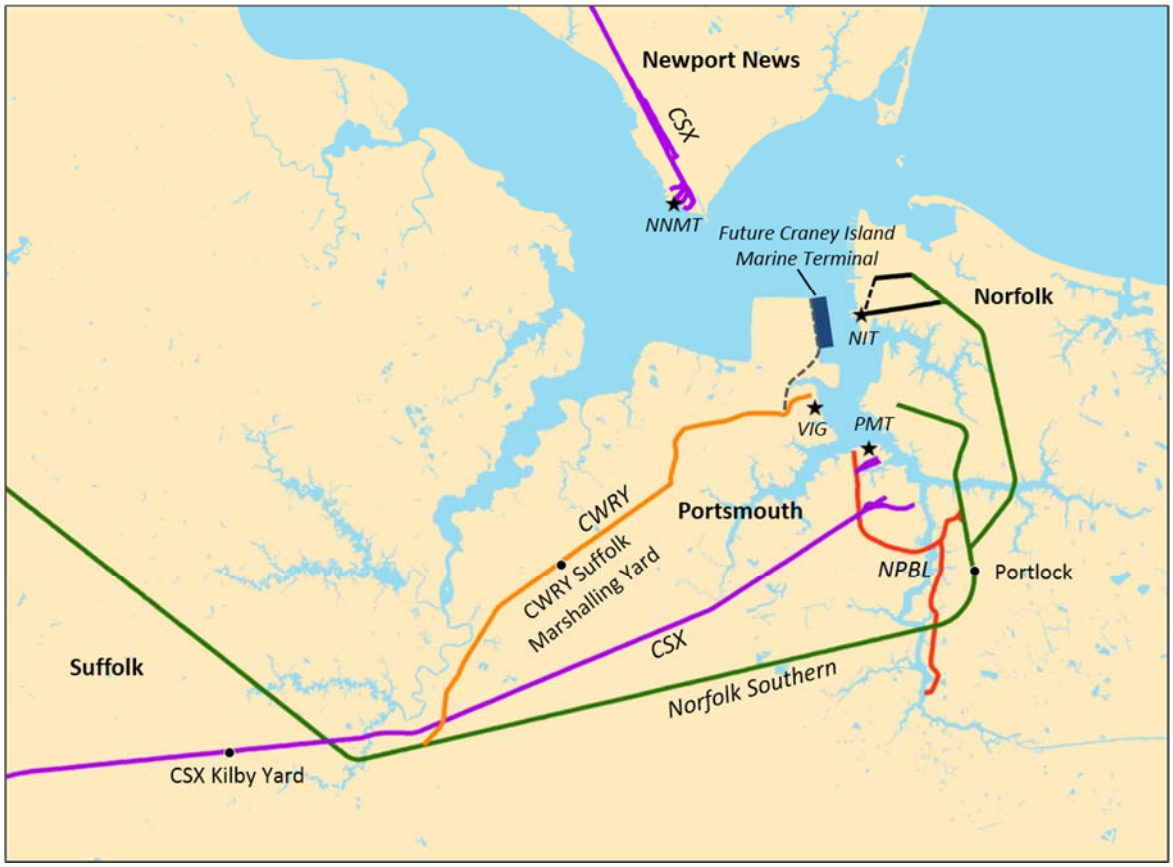

Figure 9 – Primary Hampton Roads rail corridors used by Port of Virginia cargo

[1]Figure 8 depicts the primary corridors used by cargo passing through Virginia Port Authority-owned or operated facilities and is not a complete illustration of the rail corridors within Virginia.

Looking Ahead

Inland rail-served markets (e.g. the population and manufacturing centers in Chicago and Ohio) can be competitively served by multiple East Coast ports (i.e. the total landed cost to transport cargo between ports and these markets by rail is close enough to allow ship lines and railroads consider more than one port facility as the transfer point). This cargo is often referred to as discretionary cargo (i.e. the ship lines, working with the railroads, can choose which port this cargo will pass through to reach its destination). Ship lines shifting container deliveries from New York to Norfolk during Hurricane Sandy and more recently, the severe winter weather in early 2014, illustrates this elasticity of substitution between ports. Attracting discretionary cargo to The Port of Virginia is achieved by minimizing the cost and maximizing the reliability of the transfer between the ship lines and the railroads.

A major trend in ocean shipping is the transition to larger container vessels and the need to minimize the number of port calls to maximize the utilization of ship capacity (i.e. the function of a container ship is to transport cargo. When it is in port, it is not transporting cargo and not earning revenue, so therefore the desire is to minimize its time in port). The Port of Virginia is one of the few East Coast ports capable of accommodating the depth and height of these new, larger vessels. However the road and rail connections may get stressed from the cargo "surges" resulting from these new and larger vessels.

Strategic improvements to rail access and capacity at its terminals will continue to enhance The Port of Virginia's competitiveness. As demand for rail increases at Port facilities, a coordinated effort to support this demand and mitigate impacts to the surrounding communities will be necessary. The General Assembly, in recognition of this interrelationship between Port facilities, the private rail infrastructure supporting it, and the communities within which this activity occurs, initiated this effort to develop a Master Rail Plan for The Port of Virginia.

2.2. Senate Joint Resolution 69

2014 SESSION

ENROLLED

SENATE JOINT RESOLUTION NO. 69

Requesting the Office of Intermodal Planning and Investment to develop a Master Rail Plan for the principal facilities of the Port of Virginia. Report.

Agreed to by the Senate, February 11, 2014
Agreed to by the House of Delegates, March 5, 2014

Senate Joint Resolution 69 (SJR 69) directs OIPI, in consultation with DRPT and VPA, to develop a Master Rail Plan for The Port of Virginia to address the following:

1) The status and characteristics of the current rail systems that support the port facilities.
2) The development of a rail master plan with the flexibility to support both near- and long-term business opportunities at the port facilities.

3) The identification of any operational and physical constraints or limitations on providing efficient and competitive dual rail access service to the port facilities and recommendations to mitigate them to the extent practicable.
4) The identification of any improvements to rail access to the port facilities and related intermodal facilities to support desired train volumes.
5) The identification of potential increases to the port facilities' intermodal rail throughput capacity as demand increases.
6) Strategic recommendations to guide future rail planning and funding decisions to support desired train volumes.

OIPI is further directed to develop the Master Rail Plan with input from Virginia freight rail operators, local governments, regional authorities, other affected entities, and interested parties.

Within the context of the Master Rail Plan, "competitive dual rail access service" is defined as the opportunity to select between two railroads to transport cargo and where each railroad will compete for the service on the basis of price, speed of delivery or service quality/reliability. The assumption is that in this environment, competitive pressure is placed on both railroads to offer the best price schedule and level of service feasible, resulting in the lowest cost or best value to the cargo owner.

2.3. Relationship to the Virginia Statewide Rail Plan

The Virginia Statewide Rail Plan (VSRP) was prepared by DRPT *to provide a defined vision for rail transportation in the Commonwealth of Virginia.* It further provides the formal input for state-funded rail projects into the Commonwealth's Six-Year Improvement Program and the statewide multimodal long-range plan known as VTrans2035. The VSRP addresses both freight and passenger rail needs in the state.

The VSRP was also developed to comply with the federal Passenger Rail Investment and Improvement Act of 2008 (PRIIA), which requires a Federal Railroad Administration-approved state rail plan to qualify for federal rail funding (both passenger and freight projects). This Act is currently under review and reauthorization by Congress.

The Master Rail Plan for The Port of Virginia is intended to assist with subsequent planning efforts of those portions of the state's rail network used to transport cargo to and from The Port of Virginia's facilities. Increasing rail throughput at a specific terminal may need to be supported by off-terminal infrastructure improvements to both support that throughput and to minimize daily community impacts. This plan seeks to describe the relationship between port rail activity, the railroad-owned infrastructure supporting it, and the communities that host these activities.

As The Port and the Commonwealth make decisions on where or if it invests in expanded rail capacity, this document can assist the stakeholders in identifying not only other necessary rail projects, but also the potential road projects (e.g. grade separated crossings) that should be considered.

2.4. Planning Parameters

The Master Rail Plan for The Port of Virginia is an initiative by the Commonwealth of Virginia and therefore available for public review and comment. However, it is important to recognize that the Master Rail Plan for The Port of Virginia is based on coordinating strategic business decisions (namely, capital investments) of private entities that exist in competitive environments (i.e. privately-owned railroads and the commercial function of the Port).

The business plans and contracts behind these decisions or specific intent to pursue certain improvements were not made available to the planning team due to the public nature of this document.

This Master Rail Plan therefore describes the relationships between each Port facility and the supporting rail systems to identify impacts to the off-terminal infrastructure and communities if capacity expansion at individual terminals is pursued without presumption of when or if such expansions will be undertaken.

2.5. Port Facilities

The principal facilities of The Port of Virginia included in this Master Rail Plan are:

Norfolk International Terminals (NIT) in Norfolk. This is The Port of Virginia's largest container terminal. Rail access is provided by Norfolk Southern's (NS) Heartland Corridor, as well as CSX Transportation (CSX) through the Norfolk Portsmouth Belt Line (NPBL).

Portsmouth Marine Terminal (PMT) in Portsmouth. This terminal operated as a container terminal until 2010, when operations were transferred to the recently constructed APMT (now VIG). The terminal was reactivated for container and other cargo operations in September 2014. Rail access is provided by CSX as well as NS (through NPBL).

Newport News Marine Terminal (NNMT) in Newport News. This terminal is operated as a general cargo terminal and primarily handles break bulk, project, and Roll-on–Roll-off (Ro-Ro) cargo, such as automobiles. Rail access is provided by CSX with the ability to transfer to NS in Richmond, VA.

Virginia International Gateway (VIG), formerly APM Terminals Virginia, in Portsmouth. This is a private container terminal currently leased and operated by The Port of Virginia through 2030. In 2014, APM Terminals sold the terminal to Alinda Capital Partners and Universities Superannuation Scheme Limited. Rail access is provided by CSX and NS through an operating agreement with the Commonwealth Railway (CWRY).

Virginia Inland Port (VIP) in Front Royal. This is a rail- and truck- served facility established to improve Port access to inland locations via regular rail service to/from the Hampton Roads marine terminals (primarily NIT). Rail service is provided by NS and the terminal is located along the NS Crescent Corridor.

Port of Richmond (POR) in Richmond. POR (also referred to as Richmond Deepwater Terminal), located on the James River, is owned by the City of Richmond and leased to the Virginia Port Authority. It supports regularly scheduled barge service (James River Barge Service) for containers to APMT and NIT. It also

provides general cargo services including break bulk and bulk handling. Rail access is via CSX's South Yard facility, with operating rights on the terminal lead managed by the City of Richmond.

A **Future Marine Terminal** is planned in the future atop the Craney Island Eastward Expansion to support ongoing growth in container cargo volume over the next several decades.

All of the principal port facilities have rail access to one or more rail services – CWRY, CSX, NPBL, and NS – with CSX and NS ultimately providing access to rail markets outside of Virginia.

2.6. Virginia Rail Corridors Important to The Port of Virginia

Port of Virginia rail traffic is primarily conveyed via the following rail lines within Virginia that link port freight to the major intermodal rail corridors developed by the railroads and on to 16 inland rail destinations.

CSX National Gateway rail network consists of a rail corridor between CSX's intermodal yard in Portsmouth, through Suffolk to its north-south corridor along I-95 in North Carolina. The north-south corridor provides connections to The Port of Virginia's Midwest rail markets via Washington D.C. Upon its completion, the network will support intermodal trains with containers stacked two-high.

Commonwealth Railway (CWRY) owns a rail corridor between VIG and the City of Suffolk, where it connects to CSX's National Gateway and NS's Heartland Corridor. Rail access to the future marine terminal on Craney Island will also be provided via this corridor.

Norfolk and Portsmouth Belt Line Railroad (NPBL) was formed in 1898 by eight Class I railroads (of which, NS and CSX are the sole remaining shareholders) to improve level of service to rail-served Hampton Roads industries. Their rail network is located within the urban areas of Portsmouth and Chesapeake, and functions as a link between PMT, the CSX main line, the CSX intermodal facility, and NPBL's Berkley Yard, NS's Portlock Yard, and NIT. The NPBL rail network also provides rail access to numerous private industries in Hampton Roads.

NS Crescent Corridor is NS's primary north-south intermodal corridor between New Jersey and Louisiana, and is used by The Port of Virginia to access its rail markets in Tennessee and North Carolina. The Virginia Inland Port is also located on this corridor.

NS Heartland Corridor provides double-stack intermodal service between the Portlock rail yard Hampton Roads and NS intermodal facilities in Chicago, IL and Columbus, OH. This corridor passes through

Suffolk to Petersburg and Roanoke, and then westward to Ohio via West Virginia. The Heartland Corridor also intersects with NS's Crescent Corridor in Roanoke.

NS Sewell's Point Line links NS's Portlock rail yard in Chesapeake to NIT in Norfolk.

CSX Peninsula Subdivision (Newport News to Richmond) connects NNMT to CSX's rail network in Richmond.

Two other short-line railroads, Bay Coast Railroad and the Chesapeake & Albemarle Railroad, operate within the Hampton Roads area. The Bay Coast Railroad (BCR) offers rail and rail car barge service across the bay to the eastern shore. They interchange with NS and CSX (via NPBL) at Portlock Yard. The Chesapeake & Albemarle Railroad (CA) is owned by Genesee & Wyoming Inc., with a rail corridor extending into North Carolina. CA likewise interchanges with NS and CSX (via NPBL) at Portlock Yard. Neither BCR nor CA are typically used by The Port of Virginia, but both operate on NS's Sewell's Point Line to access Portlock Yard.

2.7. Master Rail Plan Elements

The Master Rail Plan is structured as follows to serve as a functional planning document. A summary of the plan's findings in context to the specific requests documented in SJR 69 is provided in Appendix A.

- **Section 3:** Rail outlook for The Port of Virginia to document the potential opportunity for rail throughput at The Port of Virginia, if supported by sufficient infrastructure.
- **Sections 4 - 6:** Inventory of the existing rail systems associated with The Port of Virginia facilities and statewide rail corridors important to The Port of Virginia to document the existing environment in which rail service currently operates.
- **Section 7:** Rail access commentary to guide any future planning efforts that seek to establish or expand competitive dual rail access at key Port of Virginia facilities.
- **Section 8:** Findings and strategic recommendations for future planning efforts.

3. RAIL OUTLOOK

3.1. Port Forecast

3.1.1. Intermodal

In conjunction with this Master Rail Plan, The Port of Virginia has developed a projection for containerized rail volume through 2040 as shown on Figure 10. Historical rail volumes are also included for context.

The projection is *unconstrained*, as it reflects the anticipated opportunity for rail cargo through The Port. The extent to which this cargo is pursued must be balance the cost of infrastructure and supporting operations, as well as opportunity costs for serving non-rail customers, against the contribution of rail cargo toward The Port's mission.

The projection anticipates the opportunity for a period of high growth in the near term (~2017) due to the expected opening of CSX's National Gateway for double-stack rail service. Average annual growth rate over the whole planning horizon is approximately 3%.

The projection is bounded by +/- 4% uncertainty.

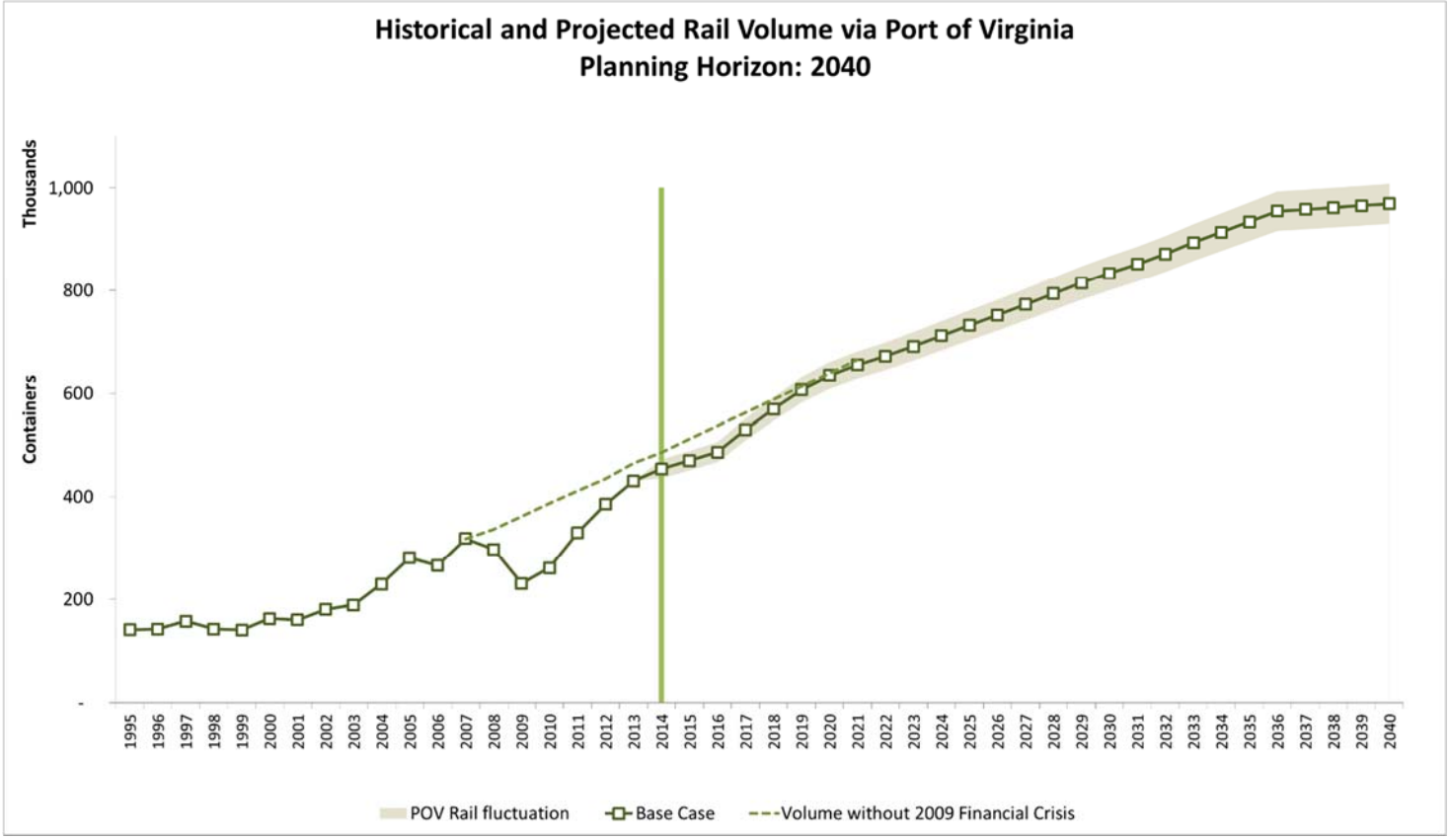

Figure 10 – Historical and Unconstrained Projected Rail Volume via Port of Virginia
Source: The Port of Virginia

3.1.1. Other Rail Cargo

Intermodal rail cargo is the dominant rail traffic generated at Port facilities. Other rail cargo is anticipated but The Port generally does not provide specific projections unless related to a specific commercial opportunity. Overall, The Port typically projects that its non-containerized rail cargo growth will be consistent with Gross Domestic Product (GDP) growth, excluding unforeseen establishment of any major rail-served industry at one of its terminals.

3.2. Private Industry Opportunities

There are opportunities on selected Port of Virginia facilities to accommodate private industry tenants and foster economic development through increased rail/maritime commerce. For industries seeking rail service, specific needs will vary depending on the industry and what defines their competitive environment. Refer to Appendix B for general descriptions of individual industry preferences.

4. PORT AND STATE RAIL INVENTORY

Sections 5 and 6 describes the general rail infrastructure and rail operations associated with the principal facilities of The Port of Virginia. Capacities of the facilities are discussed but not quantified. Rail capacity of a marine terminal is the net result of numerous conditions both on and off the terminal and thus actual capacity is dependent on the specific set of conditions that are present. Estimates of capacity can therefore differ depending on the assumed set of conditions.

Rail capacity of a marine terminal is the net result of numerous conditions both on and off the terminal. Conditions impacting capacity beyond that suggested by the infrastructure include, but are not limited to:

- Availability of labor, container handling equipment, and other associated resources during periods of peak cargo volume.
- U.S. Customs and Border Protection cargo screening processes and protocols.
- The type and condition of cargo (i.e. certain goods tend to require additional screening or processing before they can be cleared to leave the terminal).
- The magnitude of imbalance between import and export cargo volume.
- Operational cost/pricing necessary to sustain a given throughput, and the market response to the associated pricing.
- Utilization of rail car capacity and train crew availability.
- Frequency and length of train traffic, particularly along segments where multiple railroads operate across each other's routes.
- Ability to coordinate arrival and departure of ships, trains, and trucks.
- The degree to which cargo volume is dependent on the time of year (seasonality).

The ability for a terminal operation to handle rail containers is typically constrained by how many "lifts" the operation can do in a given time period. A lift represents a machine handling a container, regardless of the size of the container. Capacity in this report is therefore expressed in containers.

Since standard containers come in 20-ft, 40-ft, and 45-ft lengths, another common metric is the twenty-foot equivalent unit (TEU), which expresses container volume in terms of 20-ft containers (i.e. a 40-ft container is equal to 2 TEU; 45-ft containers are typically also equated to 2 TEU). Expressing throughput in TEUs is useful for evaluating physical storage constraints of a terminal or the train itself (e.g. a double-stack rail car well holds up to 4 TEUs).

The conversion between containers or lifts, and TEUs is unique to the cargo mix at a given terminal. For Port of Virginia terminals, the ratio typically ranges from approximately 1.63 TEUs per container for rail containers to 1.73 TEUs per container for overall terminal throughput (truck and rail traffic).

Train throughput is typically constrained by train length, number of tracks, train volume, and train speed. This is controlled by infrastructure constraints such as the length of passing sidings, the type of signal

systems in place and the geometry of rail curves, the total weight of the cargo, and the ability of locomotive engines to maintain speeds across hilly terrain.

All of these factors must culminate in conditions that result in a total landed cost to the shipper for a desired level of service that is lower than the cost to move the container by truck or barge from another seaport. To establish new rail destinations, a decision that ultimately rests with the railroad, there must also be a confident forecast of sufficient rail demand to establish rail service.

5. NEAR-TERMINAL RAIL SYSTEMS

5.1. Norfolk International Terminals – Sewell's Point Line

Norfolk International Terminals (NIT)

- Largest Port of Virginia container terminal
- On-dock intermodal service via NS
- Industrial rail service provided by NPBL
- CSX access via NPBL
- 280,000 rail containers in 2013
- 39% total throughput is rail

Located in Hampton Roads Harbor on 567 acres along the Elizabeth and Lafayette Rivers, Norfolk International Terminals (NIT) is The Port of Virginia's largest terminal, with a total of six berths dredged to 50', served by 14 Super Post-Panamax / Suez-Class ship-to-shore cranes. The terminal is primarily a container terminal, but also handles break bulk and project cargo for selected ship lines.

Figure 11 – NIT aerial

NIT's rail connection is NS's Sewell's Point Line, which links the terminal to NS's Portlock Yard, from which the Heartland Corridor originates. It also provides rail access to the former Ford plant and other industrial properties in Chesapeake and Norfolk.

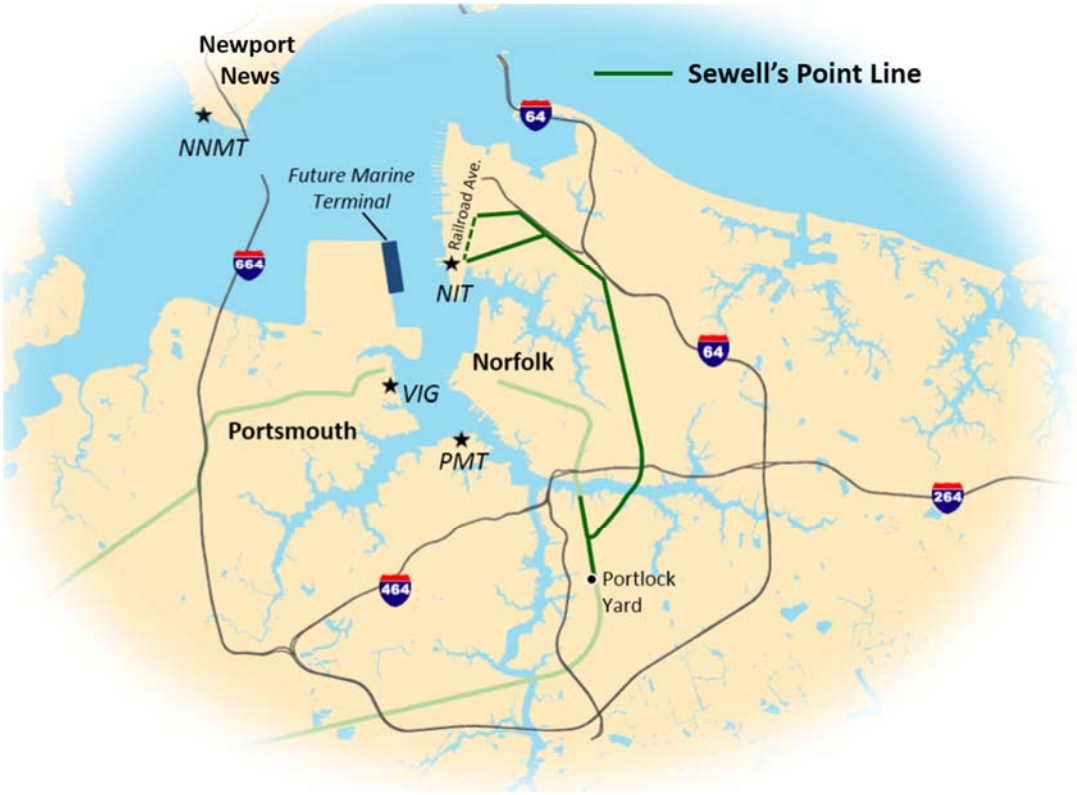

Figure 12 – Sewell's Point Line

5.1.1. Throughput

NS currently has up to four scheduled train arrivals and four scheduled train departures at NIT per day. Additional rail throughput may also be achieved by draying containers to off-terminal intermodal yards operated by NS and CSX. Rail throughput at NIT in 2013 was approximately 280,000 containers, and represented approximately 39% of total terminal throughput. Rail cargo during this period was approximately 59% export and 41% import. Rail throughput has continued to grow.

Sewell's Point Line currently supports an average of 10 to 15 trains per day, with slightly higher traffic closer to Portlock. These are primarily the intermodal trains from NIT, but several other rail-served industries are also located on the line and served by NS and NPBL. Chesapeake & Albemarle Railroad and the Bay Coast Railroad traffic also travel on segments of this corridor.

Additional rail activities, including Lambert's Point coal trains (which may generate up to 50 train movements per day according to FRA's Rail Crossing Inventory) and Norfolk's Amtrak service (approximately 4 train movements per week day), also converge at the Portlock Yard to access the Heartland Corridor. Improvements to Portlock Yard have been recently constructed (partially funded by the State) to help mitigate rail congestion.

Branch of the Elizabeth River is the only major water crossing. Vessel traffic on this segment of the Eastern Branch is fairly light and does not significantly impact use of the bridge. A shorter double track fixed bridge crosses the Lafayette River. The last 1.4-mile segment to NIT's arrival track is single tracked.

The two Port-owned arrival tracks can be used to stage arriving NS intermodal trains until they are ready to be unloaded at the terminal. Though each track is approximately 6,600 L.F. long, the effective storage length is reduced due to at-grade crossings. Each track has two effective storage sections (approximately 3,800 L.F. and 1,400 L.F. for a total of 5,200 L.F. of storage on each track) due to the Diven Street at-grade crossing, which requires an 820 L.F. clear zone when rail cars are stored on the tracks. A second at-grade crossing (Ruthven Street) is located near the east end of the arrival tracks and prevents an additional 580 L.F. on each track from being usable as storage. At the west end, the arrival tracks converge into a single track bisects the intersection of Hampton Boulevard and Terminal Boulevard to connect the arrival tracks to the terminal.

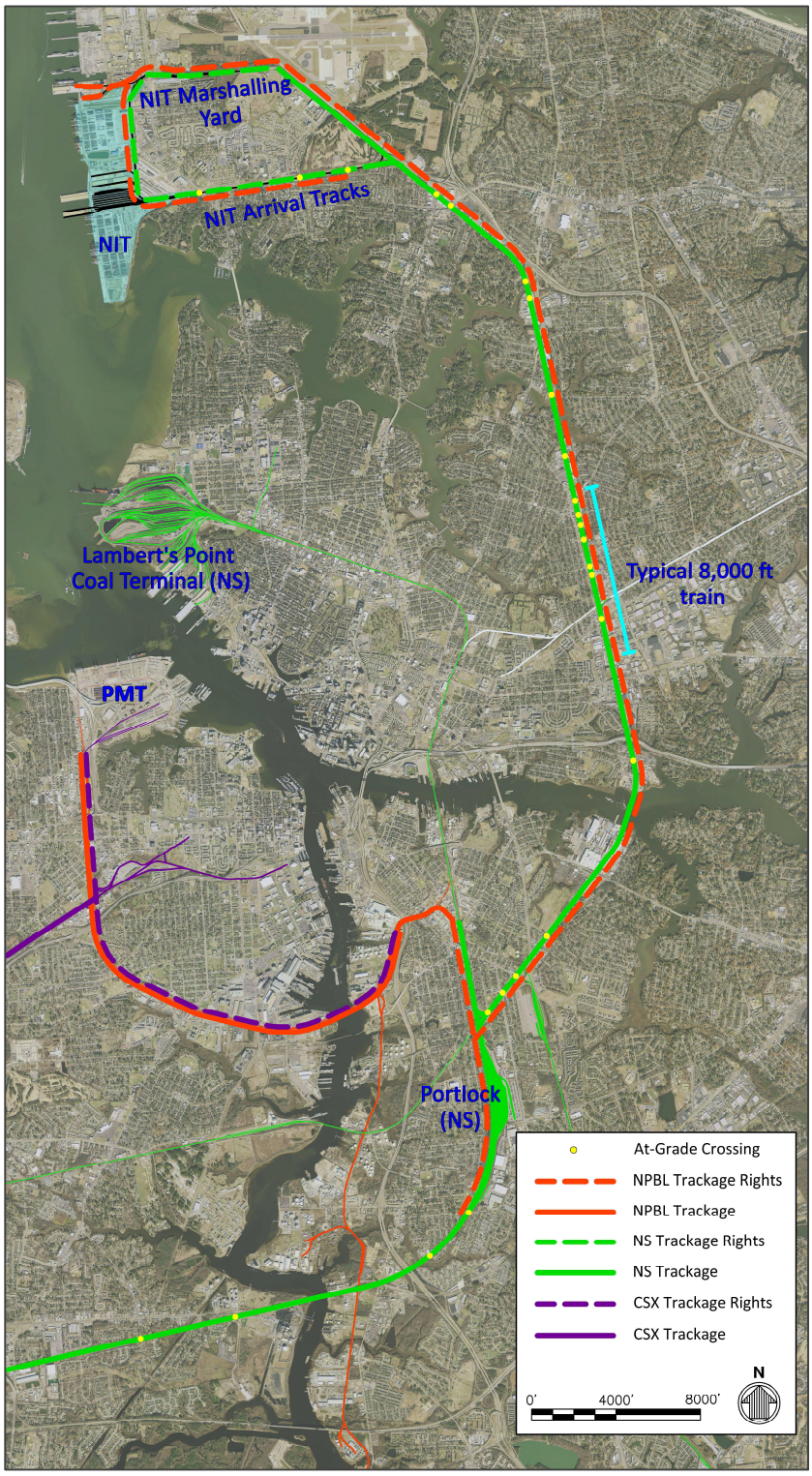

Figure 13 – NIT Overall Rail System

bisects the intersection of Hampton Boulevard and Terminal Boulevard to connect the arrival tracks to the terminal.

NIT's rail system has a loop track configuration that allows rail operations based on rail traffic generally moving through the terminal in one direction. This type of operation is typically easier to manage and supports efficient use of rail infrastructure. Within the terminal, the Central Rail Yard and various storage tracks branch off the loop track along Railroad Avenue. Rail containers are primarily loaded and unloaded within the terminal's Central Rail Yard (CRY). The CRY consists of 12 tracks, each with an effective working length of approximately 1,500 L.F. (~1/4 to 1/5 of a typical intermodal train serving the terminal). Port-owned arrival tracks adjacent to its south gate and a Port-owned marshalling yard adjacent to its north gate further support on-dock rail operations.

The Port-owned marshalling yard provides additional trackage for storing and assembling departing trains. The marshalling yard consists of five tracks, two of which are reserved for NPBL access to Lehigh Cement and Lineage RCS Norfolk, a cold storage facility located on Pier 3. A soon-to-be completed grade separation project at the north will eliminate an at-grade rail crossing on the busy Hampton Boulevard, which also serves Norfolk Naval Station. The east end of the marshalling yard converges onto the Sewell's Point Line which circles back to a junction with the NIT arrival track lead (referred to as Quartermaster Junction).

Figure 14 –NIT On-Dock Rail System

5.1.3. Port-Related Rail Operations

Intermodal rail makes up the vast majority of rail traffic at NIT. The Port coordinates with Norfolk Southern to deliver trains from Portlock. Arriving trains are positioned on the arrival tracks outside of the terminal by Norfolk Southern or directly brought on terminal. Port resources are used to move rail strings between storage and working tracks, as well as the subsequent unloading and loading of containers. The Port currently has a standing agreement with the City of Norfolk to not pull trains across Hampton Boulevard during peak traffic hours.

Within the terminal, the Port relies on U.S. Customs and Border Protection personnel and equipment to screen all import containers prior to being loaded onto a rail car. This majority of this screening occurs while the container is being moved to the train for loading to minimize the number of times the container must be handled on terminal (which in turn minimizes the cost to the Port).

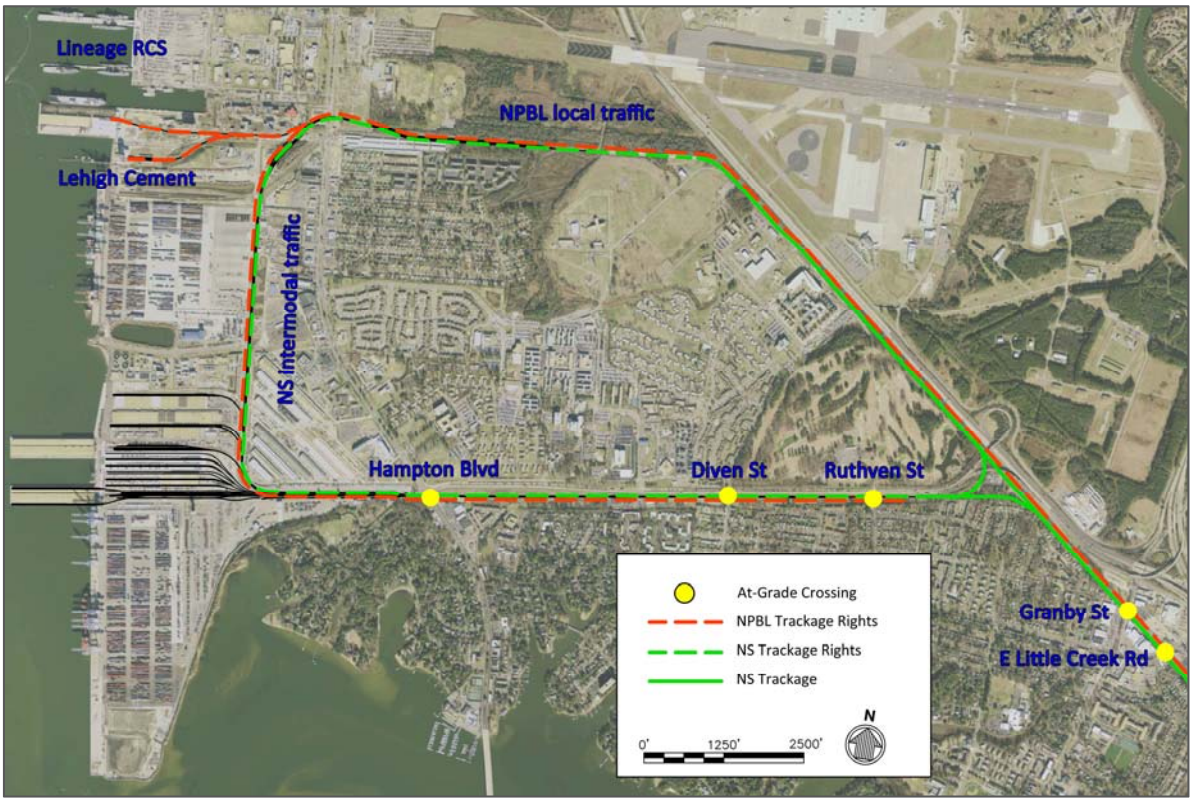

Figure 15 – NIT Rail Operations

Loaded railcar strings are assembled into full length trains along Railroad Avenue on the terminal by the Port, which then coordinates with Norfolk Southern to depart the train out the north tracks to Portlock, where NS may add strings of domestic cargo. Completion of the Hampton Boulevard – Greenbrier grade separation projection will improve connectivity with the Port's adjacent marshalling yard and eliminate the restrictions on blocking Hampton Boulevard traffic.

Trains departing Portlock will pass through Crewe, VA, where NS has a large rail yard. This rail yard is used for combining rail strings from NIT and VIG. A private industry, Lehigh Portland Cement, and a Port tenant, Lineage RCS Norfolk at Pier 3, each operate rail-served facilities adjacent to the North Terminal. Rail access is via a lead off of the north tracks with rail service provided by NPBL. NPBL also uses the north lead to deliver CSX rail to NIT, primarily for project cargo such as large electrical transformers. Project cargo operations typically use the Pier 1 tracks or other on-terminal tracks, excluding the CRY.

5.1.4. Trackage Rights and Access

Norfolk Southern owns the Sewell's Point Line between their Portlock Yard and the NIT marshalling yard, as well as the turnouts onto the NIT arrival tracks. NPBL has trackage rights on the rail line, through the NIT marshalling yard, and into NIT via the north end, where it may operate within the terminal and onto the arrival tracks via the south lead, excluding use of the Quartermaster Junction turnouts onto the NIT arrival tracks, which are typically only used by NS intermodal trains.

NPBL's trackage rights also permit construction of their own rail leads to their customers, including the Port. The 99-year agreement establishing NPBL's trackage rights is set to expire in 2017. Per discussions with NPBL, they anticipate their trackage rights will be retained through a follow-on agreement, however no guarantee or written undertaking has been made.

The NIT marshalling yard was formerly owned by NPBL, purchased by the Port in 2010, and subsequently reconstructed in coordination with the Hampton Boulevard Grade Separation project. As part of the purchase agreement, NPBL retains trackage rights through the marshalling yard to its customers. This agreement provides for a dedicated thru track and a runaround track, which NPBL uses to push rail cars onto the facilities after pulling them from their Berkley Yard.

CSX has access to NIT via NPBL by interchanging at NPBL's Berkley Yard, who charges a flat per-car rate for delivery to the terminal. This arrangement introduces additional operations and costs for CSX traffic which would need to be mitigated in order to establish competitive intermodal rail access to NIT (see Table 6). Regularly scheduled operations would need to be further integrated into the existing train schedules and may introduce service issues that would necessitate additional trackage for staging and train movements. CSX has existing service to NIT via NPBL for low volume rail service such as project, break bulk, and bulk cargo.

NS did not identify any immediate concerns with capacity on the Sewell's Point Line, though acknowledged it could be an issue in the future. A higher share of imported containers likely would require additional CBP resources.

Table 7 – Summary of Dual Rail Access Operations at NIT

NIT DUAL RAIL ACCESS OPERATIONS	
Norfolk Southern	**CSX**
Portlock Yard provides nearby staging for NS intermodal trains to/from NIT	Must interchange with NPBL at Berkley Yard
Direct access to terminal	Rail configuration at the north end of Portlock constrains direct NPBL traffic flow between Berkley Yard and Sewell's Point Line; typically requires entry into Portlock Yard and shifting locomotive to opposite end of train.
	NPBL traffic subject to NS prioritization on Sewell's Point Line (as well as BCR and CA traffic); very limited passing capacity available.
	NPBL access into NIT is counter to the Port's on-terminal intermodal traffic flow.

5.1.5. Competitive Enhancements

The following improvement concepts were considered as part of the development of the Master Rail Plan to improve The Port of Virginia's competitive position among other ports:

- Fostering competitive dual rail service
- Improving existing rail access and operations
- Improving community tolerance of Port activities
- Continued effort to maximize utilization of existing rail resources

The intent of these improvement concepts is to support further discussion among the Port, stakeholders and the railroads, as implementation of such improvements will require close coordination among stakeholders, and, in the case of trackage improvements, approval by the owning entity.

5.1.5.1. NIT Concept 1 - Independent Railroad Access

Competitive on-dock dual rail access (i.e. direct rail access by two Class I railroads that would support the Port's competitive position against other East Coast ports) at NIT through the construction of dedicated trackage from NIT to CSX rail lines would minimize impacts to the existing rail service. However, this rail

line would need to be constructed through the urbanized heart of Hampton Roads, with multiple road and water crossings, including a major water crossing over the heavily trafficked Elizabeth River. No specific alignments were explored as part of this effort.

NIT would likewise require substantial infrastructure improvements to accommodate and operationally support independent rail access. This project would be a major undertaking with significant impacts to the Norfolk, Chesapeake, and Portsmouth communities, and would need to be justified by an equally substantial benefit to the Port. Given the magnitude of rail throughput already supported by NIT, it is uncertain that the incremental benefits of pursuing this concept would be sufficient to justify the cost.

5.1.5.2. NIT Concept 2 - Rail Traffic Flow Improvements

Improvements to NPBL and Sewell's Point Line systems may lessen the operational costs associated with intermodal service:

- Establish an unconstrained direct connection between NPBL and Sewell's Point Line to allow NPBL to move directly onto the track without first pulling into Portlock and shifting the locomotive.
- Construct a unit train length siding to support improved staging of additional intermodal trains near NIT.
- Double tracking Sewell's Point Line, including the Eastern Branch Bridge, to improve the fluid movement of all rail traffic (NS, NPBL, CA, and BCR).

An additional benefit that some or all of the above improvements would provide is to reduce the impact of increased rail traffic generated by NIT to the rail service of local industries.

Implementation of such improvements would require close coordination and ultimate approval from the owning railroads. The Port would also be a key stakeholder and would need to carefully evaluate the net effect of such service on its overall competitive position, particularly if there would be any anticipated adverse impacts to existing levels of service.

The costs of these improvements would need to be weighed against their overall benefits.

5.1.5.3. NIT Concept 3 - Drayage

Off-dock solutions are another approach to expanding rail access. Such solutions could consider an expanded over-the-road drayage program or a cross harbor barge service to access CSX intermodal facilities.

The major challenge to implementing these solutions is making them financially sustainable, either as standalone operations (very difficult) or as part of a broader approach that seeks overall sustainability in exchange for subsidizing selective elements (more feasible, but still difficult at a large scale). Expansion or improvements to CSX's intermodal facilities may also assist with these efforts. Absent financial sustainability and substantial volume, it is unlikely this approach could exert significant competitive pressures.

5.1.5.4. NIT Concept 4 - Long Term Capacity Growth

Expansion of other Port rail capacity – VIG's expansion and eventual construction of a future marine terminal on Craney Island with competitive dual rail access – further augments the Port's ability to strategically align ship lines with the terminals that best suit their needs (in consideration of multiple complex factors, of which rail service is only one element).

5.1.5.5. NIT Concept 5 – Crossing Safety/Separation Improvements

A substantial amount of the rail infrastructure supporting NIT is owned and operated by the Port providing the opportunity for the Port to optimize its operations through internal projects. NS investments in the Sewell's Point Line have likewise been focused on supporting intermodal rail traffic to NIT, as it is the predominant rail activity on the line.

As rail traffic increases (and in consideration of any Port decision to expand rail capacity at NIT), the Port, as a state agency, may have pressure placed upon it by impacted residents and industries to restrict rail operations (such as the existing limits to Hampton Boulevard crossings). Early efforts to mitigate these impacts will support the Port's focus on efficiency of its rail operations. Of particular concern are:

- The City of Norfolk, which maintains 12 at-grade crossings along the Sewell's Point Line. There are also three at-grade crossings along the arrival tracks into NIT, including Hampton Blvd. Two private industries are also accessed by at-grade crossings.
- The City of Chesapeake, which maintains four at-grade crossings along the Sewell's Point Line.
- The City of Suffolk, through which rail traffic generated by Southside Hampton Roads converges and where there are numerous at-grade crossings.

Safety improvements to highway crossings, including improved warning systems, construction of grade-separated crossings, and/or crossing closures will help mitigate the impacts of more frequent and/or longer crossing blockages due to passing trains (along with other benefits such as improved safety and quality of life).

Planning of these efforts, if coordinated with the railroads and Ports, may also provide the opportunity to improve the efficiency of rail operations by strategic placement of staging sites for longer trains and elimination of the need to split trains into smaller sections (such as in the case of the arrival tracks at NIT).

Local transportation project funding priorities are, in part, generated by planning tools such as HRTPO's Project Prioritization Tool based on quantified benefits and costs. Robust traffic data and projections to define roadway projects are readily available or easily collected, and modelling resources are readily available to support follow-on analysis.

Rail traffic data is available through the Federal Railroad Administration, but current tools to use this data to assess crossing projects may not accurately quantify the costs and benefits relating to traffic flow impacts (existing tools such as GradeDec are focused on safety issues). This introduces challenges to cities seeking to define projects sufficiently enough to be evaluated in the prioritization process.

In the face of limited funding and staff resources, municipalities may currently avoid investigating such projects in favor of projects that generate more immediate and better understood benefits, resulting in an underrepresentation of rail safety and community mitigation projects. Localities may further have difficulty generating public support for projects that, in the opinion of the locality's citizens, should not be the locality's sole responsibility to fund.

5.1.5.6. NIT Concept 6 - U.S. Customs and Border Protection

U.S. Customs and Border Protection (CBP) personnel work very closely with Port operations to provide the level of support necessary to maintain the stream of commerce through the terminal.

Despite the local CBP efforts, these resources are not always sufficient to provide the coverage the Port may require at NIT. As rail demand increases, additional U.S. Customs and Border Protection resources may be necessary to support rail operations.

Infrastructure and technology improvements can reduce the manpower resources required to meet the federal screening requirements. During initial inception of the screening program, these improvements were substantially funded by the Department of Homeland Security (DHS), but as the program has matured and budgets have become more constrained, funding of these improvements has shifted to the Port.

Requests for increased CBP manpower require justification that may be difficult to establish, particularly in the early stages of growth when the needs are not continuous.

5.1.6. Recommendations to Improve Rail Competitiveness at NIT

Of the concepts identified above, the following are immediately recommended to support improved rail competitiveness at NIT. It is recommended the remaining concepts be coordinated between the Port and railroads if needed to support the Port's strategic growth strategies.

Strategic Port Growth: Expansion of capacity at VIG and the construction of the future marine terminal on Craney Island will augment the Port's ability to strategically align ship lines with the terminals best suited to meet their needs need while growing overall Port capacity to meet growing demand.

Rail Crossing Improvement Program: Increased rail impacts to the local communities can adversely affect Port competitiveness if such impacts lead to operational restrictions or reduced public support for projects that benefit the Port. Responsibility for infrastructure alternatives to operational restrictions generally rests with the localities. These communities have moderate to severe fiscal stress.

The Commonwealth should establish a program that provides the technical and funding resources to specifically assist communities with planning and/or construction of grade separated crossings and other crossing safety improvements, specifically:

- Update/establish the methodology and supporting resources to improve the ability of localities to more easily and accurately define the need for rail crossing safety and congestion projects.

- Establish a program to provide financial assistance and/or training to communities to evaluate crossing projects using the above guidance and tools that does not impact locality's current transportation funding.
- Consider appropriating a separate funding source to provide funding support to a selected number of the highest priority rail crossing projects, as identified by the above evaluation.

An example of a targeted funding program is California's Proposition 1B Grade Separation Program, which dedicated $250 million to grade separations and leveraged an additional $750 million in local and private funds for grade separation projects. California has a separate grade crossing Section 190 safety program.

Another example includes North Carolina's "Sealed Corridor Project," which focused on eliminating or improving crossings along its heavy rail corridors to the benefit of both freight and passenger rail (as well as vehicle traffic). The state also has ongoing efforts to update criteria for evaluating benefits and costs to prioritize grade separation projects, including differentiation between rural and urban candidate sites.

This program should be administered by an entity with the resources necessary to integrate the transportation mobility, safety, and freight network elements that would be critical to appropriately prioritizing candidate projects.

U.S. Customs and Border Protection Resources

As demand increases, the Port may need additional U.S. Customs and Border Protection resources to maintain the level of service to its customers. Currently, the Port works with the local Field Office to formalize and justify requests for these resources as they are needed.

In the event that U.S. Customs and Border Protection is unable to allocate funding to support the requested increases, Section 560 of the Consolidated Appropriations Act, 2014 has authorized U.S. Customs and Border Protection to accept "donations of real property, personal property (including monetary donations) and non-personal services" from private sector and government entities.

If CBP is unable to get necessary additional resources, state support, through the above described "donation" process, may need to be considered as a possible, but not a definite, mechanism to provide the necessary CBP resources. This support would need to be evaluated against potential adverse competitive impacts.

5.2. Portsmouth Marine Terminal

Portsmouth Marine Terminal (PMT)

- Port of Virginia container/mixed-use terminal reopened in September 2014
- CSX and NS (via NPBL) access
- CSX intermodal yard adjacent to terminal
- NPBL rail yard located to the south of the terminal
- Rail activity is currently limited to project cargo but may be expanded to support future rail-served industrial development

Portsmouth Marine Terminal (PMT) occupies approximately 285 acres on the west bank of the Elizabeth River. PMT operated as a container terminal until VPA began leasing APM Terminals Virginia (now the Virginia International Gateway) in 2010. Existing PMT customers were transferred to VIG to take advantage of the more modern and efficient terminal, and major terminal operations at PMT ceased in early 2011. In September 2014, PMT was reactivated for container and project cargo operations, with portions of the terminal remaining available for development of tenant industries. The terminal has 4,530 feet of wharf with a nominal 43-foot berth depth.

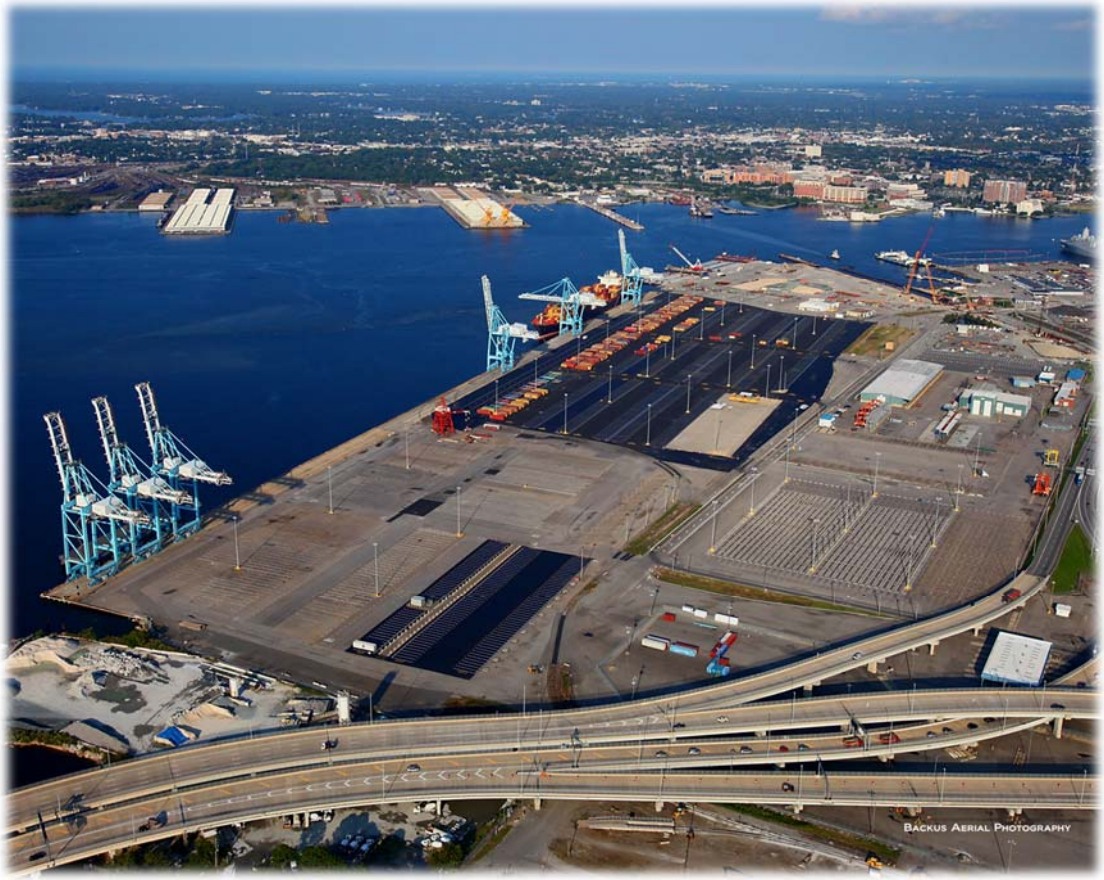

Figure 16 – PMT aerial

5.2.1. Throughput

Capacity to provide additional rail service to PMT will be highly dependent on the nature of the individual rail operations established at PMT.

The single track rail between CSX's main line to PMT establishes a significant chokepoint, as this line is used by CSX to access its intermodal facility, and would potentially be used by both NPBL and CSX to access PMT. The potential development of NPBL customers along the rail lead would also impact rail capacity at PMT.

While NPBL and CSX provide services over the same trackage, it is inevitable that delays will develop due to normal switching operations carried out along the line by both carriers. For industrial activities with sensitive rail schedules, this inherent conflict effectively reduces capacity as the industry must allocate more time to each train to account for the uncertainties of the rail schedule. These delays could potentially affect CSX customers on NPBL.

5.2.2. Rail System Infrastructure

A single track segment of NPBL's rail network links PMT to CSX and NS (via NPBL) rail systems. Off of this single track, CSX operates an intermodal yard adjacent to the terminal to the south, through which a second lead into PMT on the east end once existed. An NPBL rail yard is located to the south of the terminal as well.

Historically, the internal rail system connected the two leads accessing the terminal. Most of this rail, including the east lead, was abandoned in place or locally demolished to support other terminal activities.

The alignments of the rail leads into the terminal are constrained at both ends. The east lead is constrained by elements of the Midtown Tunnel, including the crossing location and the vent buildings. Construction of the second Midtown Tunnel is underway until 2017, which may further constrain rail concepts desired in the near term. The west lead is constrained horizontally and vertically by the Pinner's Point highway interchange system, which was constructed over the rail lead.

5.2.3. Port-Related Rail Operations

The Port currently does not provide on-dock intermodal rail service at PMT; rail containers are drayed by truck to or from other facilities that provide this service. Project cargo rail operations have resumed with the re-opening of the terminal on an as-needed basis.

5.2.4. Trackage Rights and Access

Dual rail access to the PMT is provided in two forms and provides a competitive offering for The Port:

- NPBL is owned by and has access to both CSX and NS
- CSX and NPBL both have direct access to the terminal

The single track to the terminal and CSX's intermodal yard is owned by NPBL, with CSX having trackage rights. This provides NS with access to the terminal via interchange with NPBL. Rail traffic on this segment is managed by NPBL.

South of the terminal, CSX owns a turnout and intermodal yard, out of which the former east rail lead extended into PMT (and which can be restored by the Port if necessary to support rail operations). NPBL does not have trackage rights into CSX's intermodal yard.

CSX can directly access the terminal via the west lead and the east lead. CSX is also presently leasing the NPBL yard south of the terminal to support its intermodal yard operations.

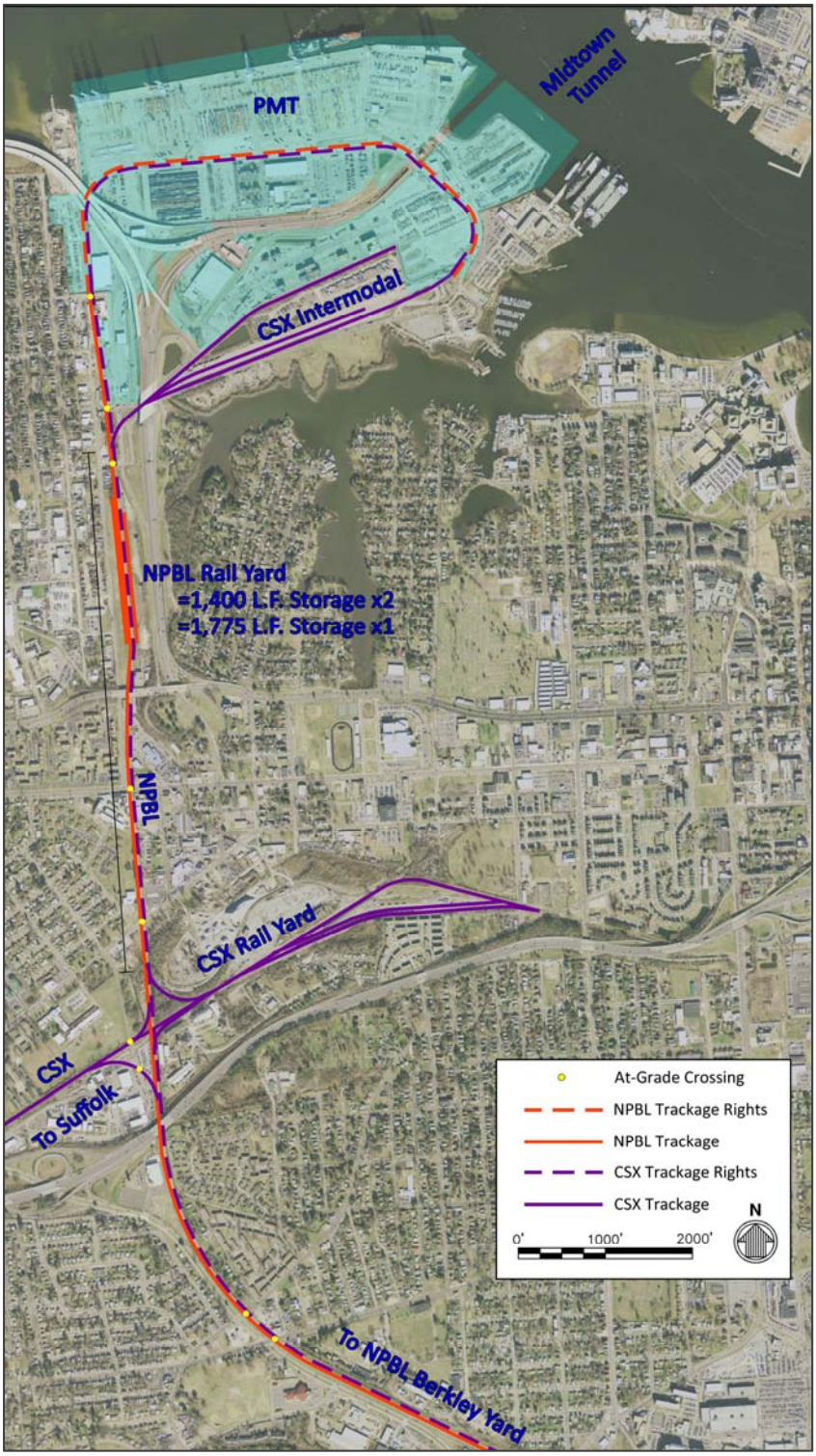

Figure 17 – PMT Overall Rail System

Table 8 – Summary of Dual Rail Access Operations at PMT

PMT Dual Rail Access Operations	
Norfolk Southern	**CSX**
Must interchange with NPBL at Portlock	Can stage traffic at Kilby or local rail yard.
Access to PMT (thru NPBL) via west lead only	Direct access to PMT via trackage rights on NPBL's line (and subsequent access to both east and west leads)
	CSX traffic subject to NPBL traffic prioritization on NPBL's system.

5.2.5. Competitive Enhancements

5.2.5.1. PMT Concept 1 – Enhancing Private Industry Development Potential

The Port envisions PMT as a mixed-use terminal, supporting container operations and private industry tenants, some of whom may require rail service. The opportunity for dual rail access is an attractive feature of the terminal, but the value of that feature is highly sensitive to the:

- Rail needs of the industries
- Number of rail-served industries on terminal
- Configuration of rail infrastructure serving those industries
- Approach through which the Port chooses to manage on-terminal rail service
- Level of rail activity at private industries in the vicinity of, but outside the terminal

The constraints to rail infrastructure at PMT may require trade-offs between operational efficiency and access by both railroads, resulting in the following dynamic:

- Where tenants focus on optimizing their operations, they may have to design for the operations of one railroad. This may adversely impact the ability for the other railroad to efficiently serve that same tenant or other terminal tenants.
- Where tenants focus on maintaining the opportunity for rail service by both railroads, the operational efficiency and/or quality of service of that same tenant or other terminal tenants may be adversely impacted.

How dual rail access will be used as a competitive benefit in this setting must be evaluated by the Port and may require making decisions that are detrimental to dual rail access, but improve overall Port operations and profitability.

Complicating industrial development further is that the value of a port facility is derived from its ability to maximize the transfer of cargo between ship and shore. It is therefore in the Port's interest to minimize the footprint of facilities that do not directly contribute to this activity. As terminal space is also a scarce resource, it may be infeasible to fully accommodate a prospective industry's needs fully within the terminal. In these cases, offsite facility development must be coordinated.

5.2.5.2. PMT Concept 2 - Improvements to Support Concurrent Rail Activities

Rail access to the available development areas within the terminal are constrained by the Pinner's Point highway interchange structures on the west, and tunnel construction on east (thru 2017), where currently only single tracks can be accommodated. These two sections have frequently been identified as critical segments to support multiple tenant rail operations and thus are a possible constraint to accommodating two railroads.

Preliminary concepts to improve access on the west side and circumvent the physical constraints of the Pinner's Point highway interchange require acquisition of off-terminal properties to accommodate a second on-terminal lead. This access could be further improved by construction of a second track on NPBL's system.

Upon conclusion of tunnel construction, it is likely that the Port and railroads will be able to identify solutions to mitigate the constraints on the east lead to improve on-terminal rail traffic flow by both railroads.

The need for any of these improvements are dictated by the specific operations of the industries and would be more thoroughly identified as part of a coordinated industrial development effort (see below). Improvements on railroad-owned right-of-way would require approval by the owning railroad.

5.2.5.3. PMT Concept 3 - Crossing Safety/Separation Improvements

The 2005 City of Portsmouth Comprehensive Plan, Destination 2025, identifies as a key issue the need to minimize the impacts of rail traffic generated by waterfront industrial uses on Portsmouth's local streets and neighborhoods (with specific attention being given to the then-proposed VIG terminal and future marine terminal on Craney Island). In proximity to PMT and NPBL's system, the following projects are active:

- A project to widen Turnpike Rd along the segment that includes the at-grade crossing over NPBL's track is currently on VDOT's Six Year Improvement Program (SYIP), but does not include construction of a grade separation.
- The Martin Luther King Extension is a component of the Midtown and Downtown Tunnel projects and would improve access between I-264 (Downtown Tunnel) and State Route 58 (Midtown Tunnel). This project may divert some traffic away from existing at-grade crossings and is part of VDOT's SYIP.

No other projects involving the NPBL line have been identified on long range transportation plans. However, additional local rail-served industries could impact traffic, mobility, and the community, and may warrant mitigation projects.

If unit train rail service to PMT is sought, mitigating improvements such as grade separation projects outside the terminal will need to be explored to reduce impacts to the adjacent neighborhoods and overall traffic mobility, particularly if arrival and/or departure switching activities are going to occur off-terminal.

5.2.6. Recommendations to Improve Rail Competitiveness at PMT

Terminal Master Plan: Industrial development at PMT should be bolstered by a coordinated effort among the Commonwealth, the Port, municipalities, and railroads working towards a common vision of what type of industrial activity is desired. A recommended framework for this is as follows:

- The Port, with assistance and input from the Virginia Economic Development Partnership (VEDP), should identify the type of Port activities that generate the most benefit to Commonwealth.
- The Port should coordinate with the railroads to develop a master plan (or plans) for the terminal that accommodates those specific activities, including identification of any off-terminal needs.
- A lead entity, such as VEDP, should be designated to coordinate planning efforts by the municipalities and railroads to develop a master plan for identified off-terminal needs.

These efforts result in a concept that VEDP, Port, and other economic development agencies can market to the industries they seek to attract.

Rail Crossing Improvement Program: Consistent with the NIT-related recommendation, increased rail impacts to the local communities can adversely affect Port competitiveness if such impacts lead to operational restrictions or reduced public support for projects that benefit the Port. The Rail Crossing Improvement Program to mitigate rail impacts, as described in Sections 5.1.5/5.1.6, is recommended.

5.3. Newport News Marine Terminal – CSX Peninsula Subdivision

Newport News Marine Terminal (NNMT)

- General cargo and roll-on/roll-off terminal
- Rail activity is tenant break bulk and occasional project cargo
- Direct CSX access
- CSX line to Richmond, where there is opportunity to interchange with NS

Newport News Marine Terminal (NNMT) is The Port of Virginia's primary break bulk and roll-on/roll-off facility. The terminal occupies approximately 165 acres on the north bank of the James River. The facility has two piers with four vessel berths.

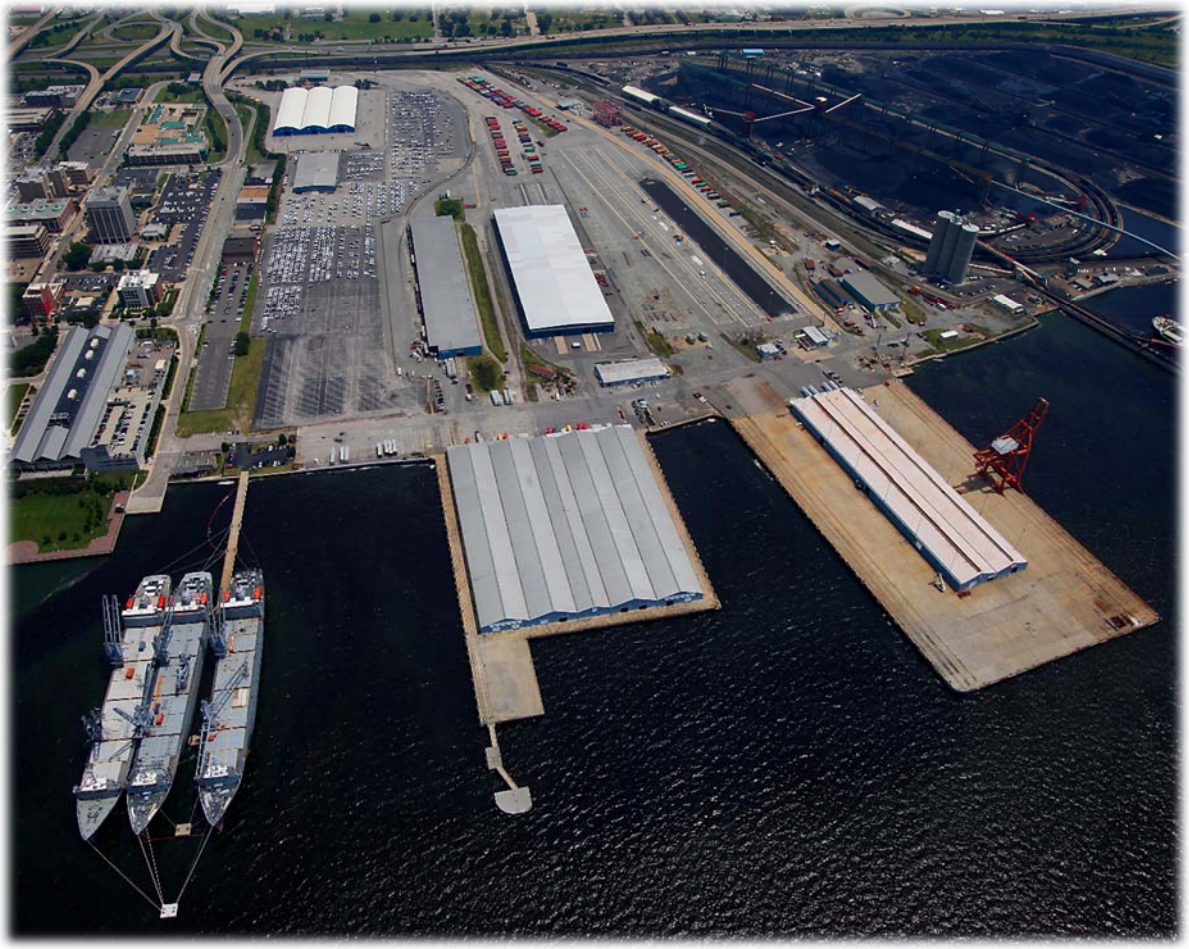

Figure 18 – NNMT aerial

In 2009, the Port consolidated various general cargo handling operations at NNMT, where it maintains several warehouses and a storage area for automobile imports.

5.3.1. Rail System Infrastructure

NNMT's on-terminal rail infrastructure consists of several dead-end rail spurs that access the terminal through two rail gates off of CSX's Peninsula Subdivision trackage that serves the adjacent coal terminals.

The Peninsula subdivision rail corridor runs between the Newport News coal terminals (adjacent to NNMT) and the CSX Fulton Yard in Richmond, approximately 70 rail miles away. The corridor is configured for fluid movement of trains with several passing sidings and nearly all urban road crossings being grade-separated.

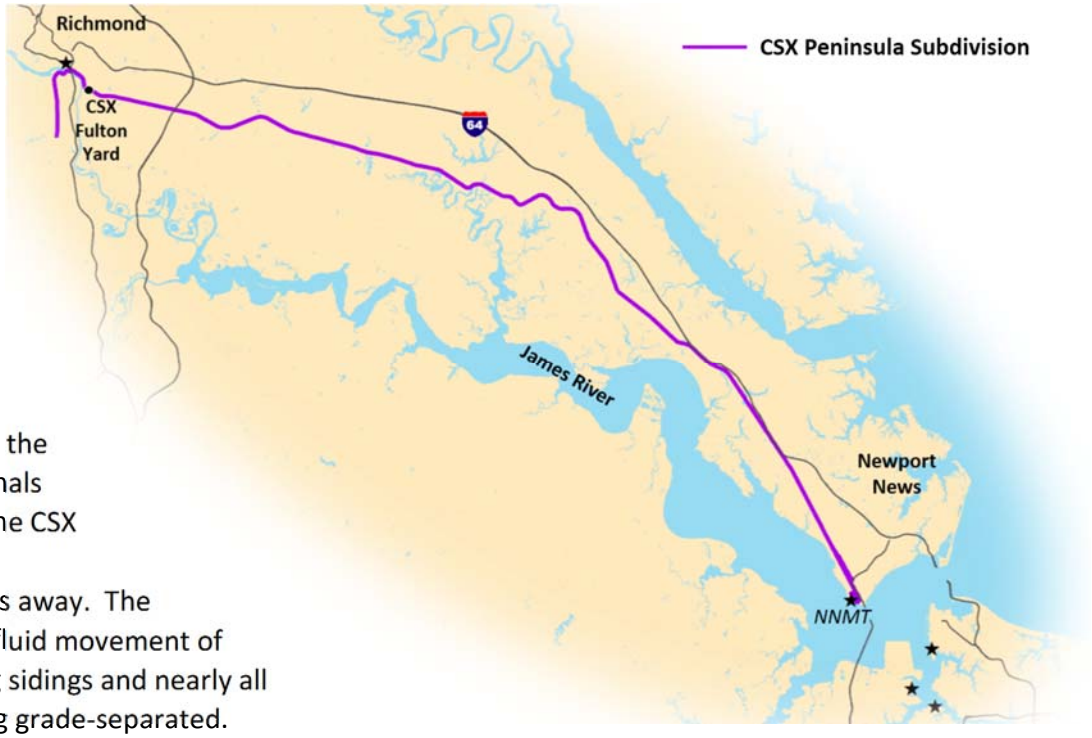

Figure 19 – CSX Peninsula Subdivision

5.3.2. Port-Related Rail Operations

Rail service is coordinated by the Port with CSX and typically consists of tenant break bulk operations approximately three times per week and project cargo on an as-needed basis.

5.3.3. Trackage Rights and Access

The terminal is directly connected to the CSX rail system and can connect to the NS system through switching operations available in Richmond.

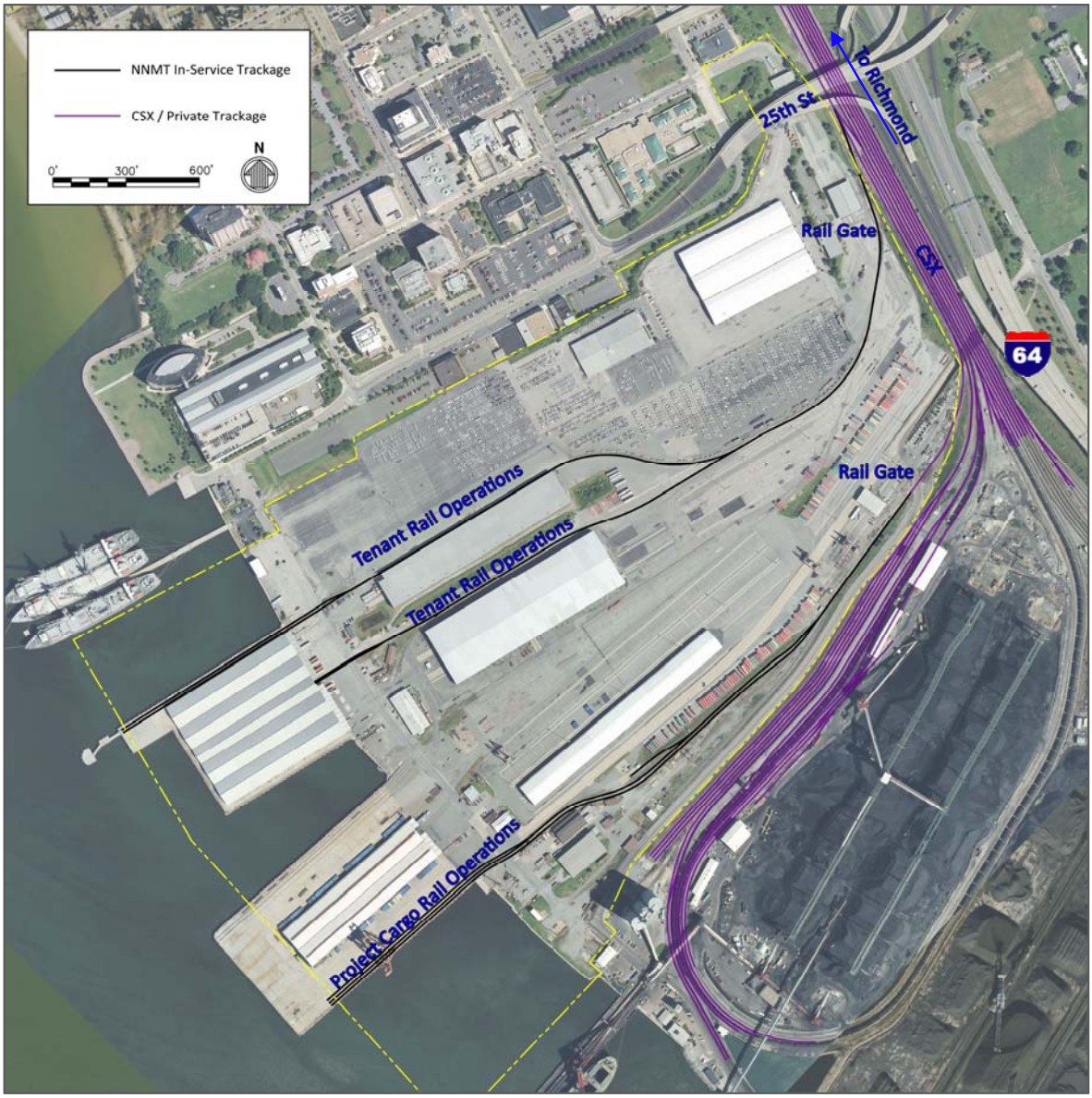

Figure 20 – NNMT Overall Rail System

5.3.4. Competitive Enhancements

There are no competing rail assets in the vicinity of Newport News Marine Terminal to support competitive dual rail access to the terminal.

On terminal, the Port may consider rail improvements to meet the needs of its industrial tenants or Port operations. CSX has indicated their rail corridor (Peninsula Subdivision) has capacity to potentially support increased rail activity at the terminal. There are vertical clearance restrictions west of Fulton Yard that would need to be evaluated if cargo opportunities required taller rail cars. CSX has indicated that

clearance improvements have been identified to relax the clearance restrictions and can be initiated when justified.

5.3.5. Recommendations to Improve Rail Competitiveness at NNMT

Improvements to relax the clearance restrictions may support attracting additional automobile cargo through NNMT that is otherwise diverted due to these restrictions. Since automobile contracts are frequently re-bid, there may be little willingness to otherwise entertain an opportunity that requires capital improvements unless such improvements are executed preemptively. Clearance improvements may also improve the attractiveness for other cargo types that likewise would not consider locations requiring off-terminal capital improvements.

The Master Rail Plan does not recommend any improvements otherwise designed to foster rail competiveness and expand rail capacity. Other off-terminal improvement needs are not anticipated based on the Port's current utilization of NNMT. The CSX rail corridor is highly segregated from surface traffic through numerous grade-separated crossings and elimination of almost all at-grade crossings. Coal traffic to the adjacent coal terminals is the dominant rail traffic; minor increases to port rail traffic is unlikely to generate new concerns from either CSX or the community.

As cargo commodity markets change, there have been public and private entities interested in major rail infrastructure improvements to serve import and export markets through The Port of Virginia and/or other east coast ports. Such improvements, if ever implemented, will warrant a reassessment of cargo operations at NNMT.

5.4. Virginia International Gateway – Commonwealth Railway

Virginia International Gateway (VIG)

- Port of Virginia semi-automated container terminal
- On-dock intermodal service by CSX and NS access via CWRY
- Terminal Master Plan supports expansion of rail capacity
- Over 150,000 rail containers in 2013

Virginia International Gateway (VIG), formerly APM Terminals Virginia, is a marine container terminal located along the Elizabeth River in Portsmouth. The facility was commissioned in September 2007, leased to the Virginia Port Authority in 2010, and subsequently sold to Alinda Capital Partners and Universities Superannuation Scheme, Ltd in 2014.

The terminal is designed to service super post-Panamax class vessels, and is accessible by a 50-foot navigation channel, the interstate highway system, and both Class I railroads (CSX and NS) via the Commonwealth Railway. The terminal is constructed as a semi-automated operation, with a mix of manual and automated container handling equipment. Its design is unique in that many of the terminal's operations are performed remotely from a centralized terminal operations center.

Figure 21 – VIG aerial

The container wharf has a total of three berths, and the terminal is equipped with a fleet of eight super post-Panamax class ship-to-shore cranes capable of handling the largest container vessels. The backlands consist of an approximately 65-acre semi-automated rail-mounted gantry (RMG) stacked container storage yard plus additional storage area for stacked empty containers, wheeled refrigerated containers, wheeled intermodal staging, chassis storage, and wheeled oversized loads. Rail service is via an on-terminal intermodal yard.

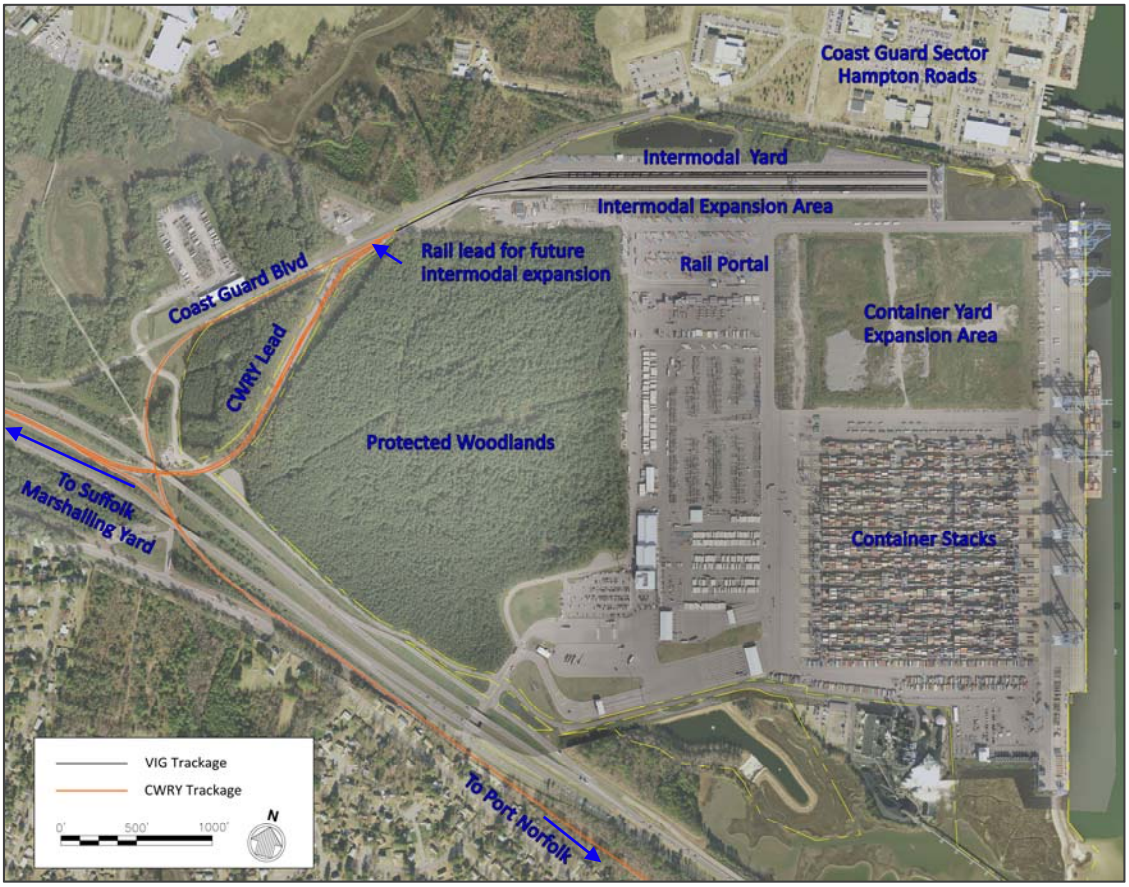

Figure 22 – VIG On-Dock Rail System

5.4.1. Throughput

NS and CSX each typically have one scheduled arrival and one scheduled departure per day via CWRY. Rail throughput in 2013 was approximately 150,000 containers and has continued to grow. The VIG terminal has planned expansion areas within the terminal to increase its capacity if/when the capacity is necessary to support the Port's commercial strategies.

During a study of VIG's intermodal yard operations in 2012, total train-feet handled at the terminal was approximately 60% CSX / 40% NS, suggesting a viable competitive environment exists in that both railroads are able to get similar quantities/lengths of trains to the terminal. Utilization of those trains for container throughput, however, is subject to a number of factors, including system-wide stack height,

import/export balance, and availability of resources. The Port has limited or no ability to control or influence many of these factors.

5.4.2. Rail System Infrastructure

Rail service to VIG is provided by Commonwealth Railway (CWRY), which owns (some segments are under long-term lease from the State) and operates a rail corridor between the terminal and the main lines of CSX and NS.

The CWRY corridor is approximately 19-miles between the terminal and the main lines of CSX and NS. Approximately 5 miles of the corridor was relocated to the median of S.R. 164 and I-664 to eliminate several at-grade crossings, with 3.8 miles immediately outside VIG subsequently double tracked before transitioning to a single track to a marshalling yard in Suffolk, approximately 10 miles from the terminal, with two 8,000 foot sidings.

Figure 23 – Commonwealth Railway

There is sufficient right-of-way at the Suffolk Marshalling Yard to construct two additional 8,000 foot sidings, though doing so will necessitate relocating two large raw water pipelines owned by the City of Norfolk and the City of Portsmouth. A Department of Rail and Public Transportation Rail Enhancement Fund Grant has been awarded to CWRY to partially fund the track construction, but does not include any funding for the pipeline relocations. The terms and conditions cost of any such relocations have not been fully evaluated.

The segment between the marshalling yard and the CSX and NS main lines is likewise single track. The interchange between CWRY and CSX and NS is located near downtown Suffolk.

A future alignment concept extends the CWRY corridor to provide rail service to the future marine terminal planned on Craney Island.

The existing terminal tracks are accessed via a single track lead which branches into an intermodal yard with six working tracks each with an effective working length of approximately 2,350 feet (approximately 1/3 to 1/4 of a typical intermodal train serving the terminal). A second lead is in place for a planned expansion of the terminal's intermodal yard, but currently terminates outside the terminal. There is available space within the terminal to accommodate additional trackage and other container operations.

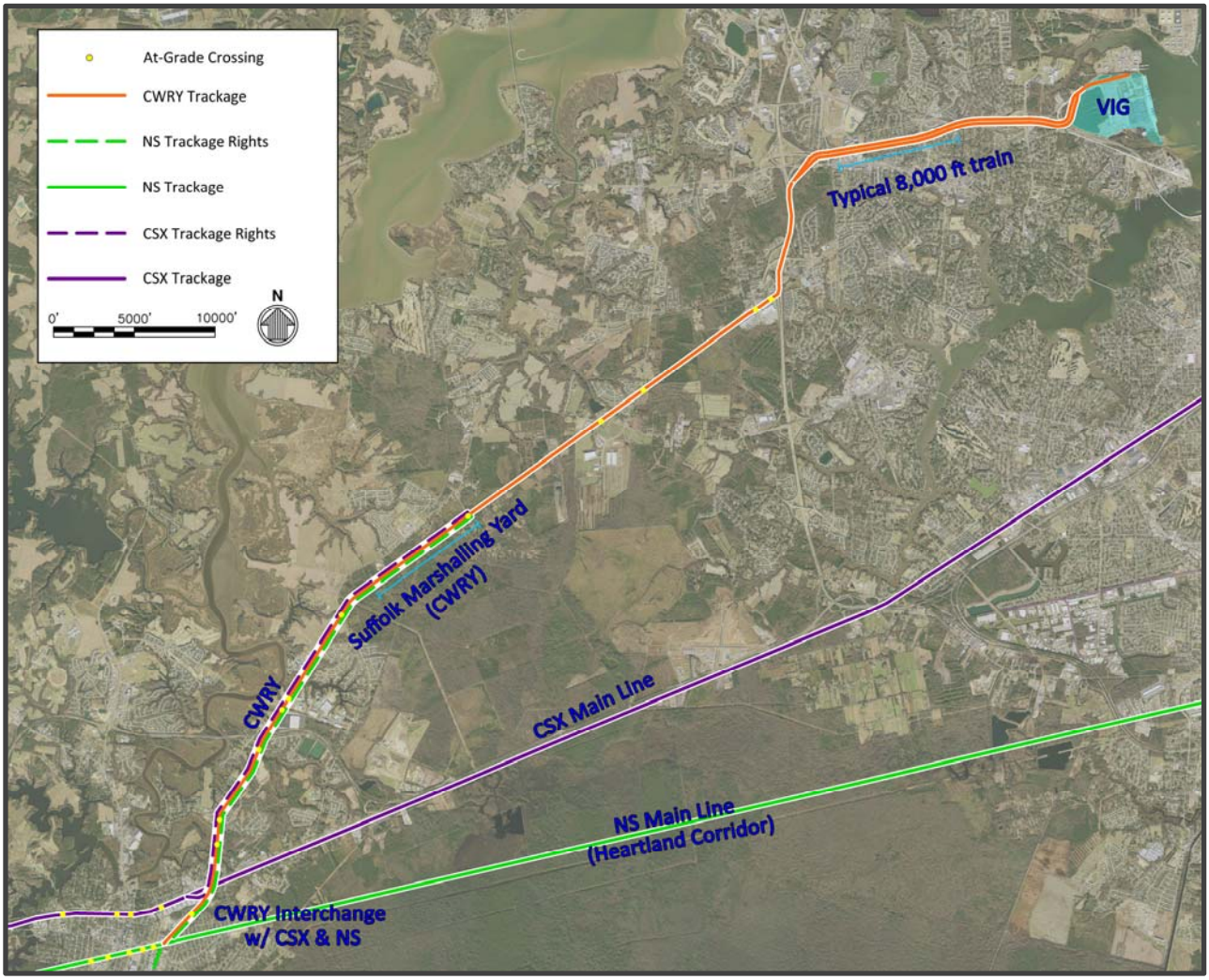

Figure 24 – VIG Overall Rail System

5.4.3. Port-Related Rail Operations

Rail traffic at VIG is almost exclusively intermodal traffic.

Commonwealth Railway is a Class III short line railroad owned by Genesee & Wyoming, Inc. and primarily provides intermodal service to VIG, though it does provide service to a few smaller customers as well. It provides competitive dual rail access to VIG for CSX and NS.

VIG rail operations are highly reliant on non-Port trackage and railroad resources, in sharp contrast to NIT's rail operations, where the Port owns extensive on- and near-terminal trackage and uses Port resources to shift rail strings within that trackage.

With the presence of only working tracks on the terminal, the Port coordinates with CWRY to deliver CSX and NS trains from the CWRY Suffolk Marshalling Yard onto the working tracks and subsequently depart loaded trains.

CWRY typically pulls the arriving (export-loaded) train onto the double track segment of the corridor, detaches, and then uses the locomotive to assemble and depart the on-terminal import rail strings. After extracting the departing rail strings, the locomotive is in position to push the arriving train onto the terminal tracks. The locomotive then reconnects to the departing train and pulls to the Suffolk Marshalling Yard for exchange with CSX or NS.

Similar to NIT, Port resources are used to load and unload the trains once they are delivered to the intermodal yard by CWRY, with U.S. Customs and Border Protection responsible for screening import containers prior to loading onto the train. As with NIT, this screening preferably occurs while containers are being moved to the intermodal yard to minimize rehandling costs.

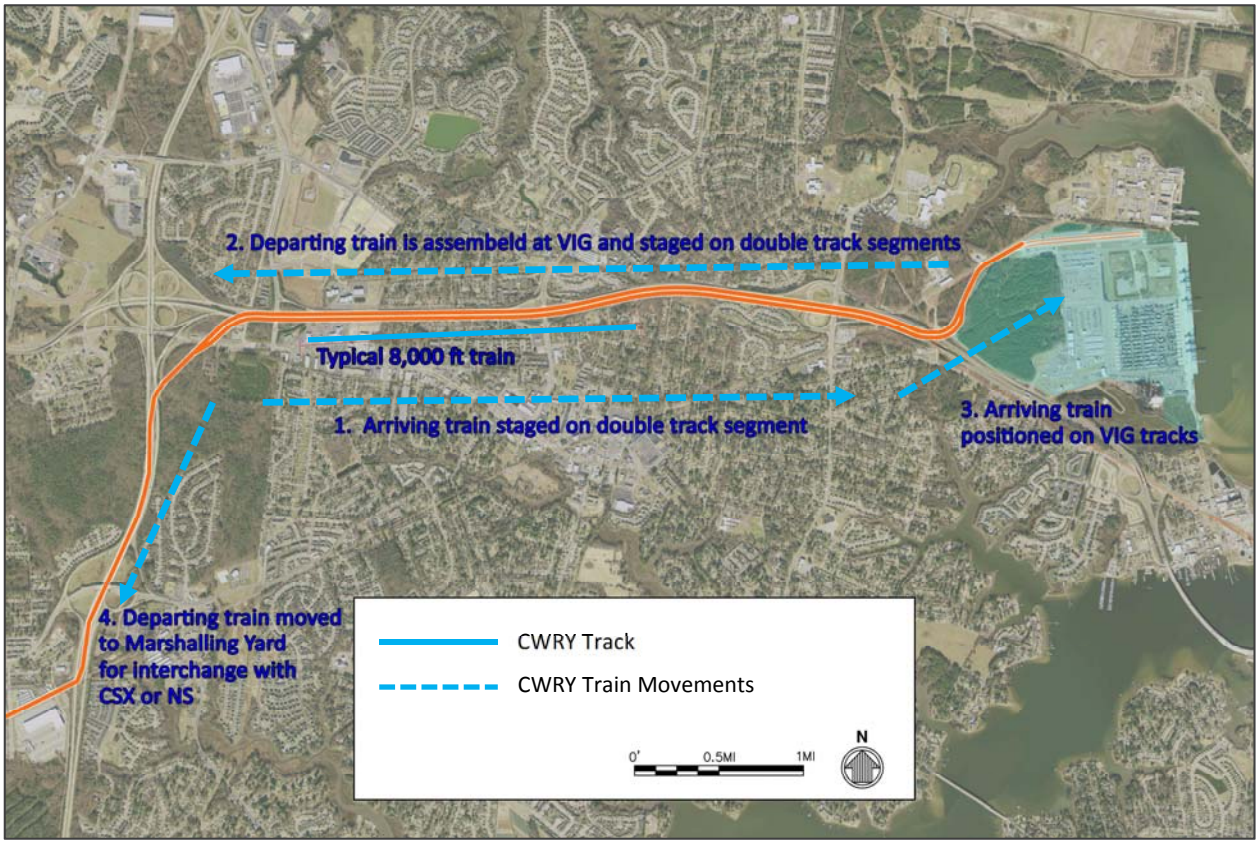

Figure 25 – VIG Rail Operations

5.4.4. Trackage Rights and Access

CWRY is a Class III short-line railroad that provides rail service to VIG and access to CSX and NS. CSX and NS have operating rights from their respective main lines to the Suffolk Marshalling Yard, where the trains are interchanged with CWRY, who then moves them to and from VIG.

5.4.5. Competitive Enhancements

The following improvement concepts were considered as part of the development of the Master Rail Plan to improve The Port of Virginia's competitive position among other ports:

- Improving existing rail access
- Improving community tolerance of Port activities
- Increasing utilization of existing rail resources

The intent of these improvement concepts is to support further discussion between the Port and the railroads, as implementation of such improvements will require close coordination between stakeholders, and, in the case of trackage improvements, approval by the owning entity.

5.4.5.1. VIG Concept 1 - Rail Traffic Flow Improvements

The fluid movement of trains between VIG, its marshalling yard, and on to NS and CSX main lines is a critical element of VIG's ability to provide competitive rail service. Currently, there is sufficient capacity to provide rail service to the existing VIG rail infrastructure. As rail capacity at VIG is expanded, additional improvements on the CWRY corridor will be necessary to support fluid movement of trains and the ability to respond to the needs of the Port.

As rail traffic increases, the single track segment between the marshalling yard and the double track segment will become a constraint to providing responsive service to VIG. Double tracking this segment will permit two way traffic along the corridor. Additional sidings and other improvements may be necessary to accommodate non-Port industrial traffic.

The marshalling yard will likewise become a constraint for coordinating the arrival and departure of Class I trains. Construction of two additional storage tracks (nominally 8,000 L.F. each) will support improved interchange operations, however, two raw water pipelines owned by the City of Norfolk and the City of Portsmouth are parallel to and within the yard's expansion footprint. Construction of additional tracks will likely necessitate relocating the pipelines. A Rail Enhancement Fund grant from DRPT has been authorized to support construction of the two additional tracks; funding for the pipeline relocations has not been identified. The terms and conditions cost of any such relocations have not been fully evaluated.

Additional marshalling yard locations may also need to be considered if site constraints at the existing location limit its expansion potential.

Operation of the interchange tracks and its link to the marshalling yard will need to be evaluated as rail traffic increases. Congestion at this location will be a function of the schedules of NS, CSX, CWRY, and VIG; and will likely require rail improvements to mitigate. The connection between CWRY and CSX, in particular, currently inhibits train speed due to the severe curve, grade, and line of sight geometries. Even though CSX and CWRY coordinate incoming and exiting trains, the limited sight distance of this curve requires CSX to travel very slowly from their line to CWRY across the Main Street and Moore Avenue crossings. The single track corridor between the interchange and the Suffolk Marshalling Yard further constrains rail capacity.

Construction of the future marine terminal to be served by the CWRY corridor will necessitate further improvements and is discussed in Section 5.7.

5.4.5.2. VIG Concept 2 – Crossing Safety/Separation Improvements

The City of Suffolk, which maintains 8 at-grade crossings along the CWRY rail corridor, plus an additional 10 at-grade crossings in the immediate vicinity of the interchange between CWRY, NS, and CSX, frequently fields complaints from its citizens on the impacts of existing rail activity and is therefore very concerned about future rail impacts from increased Port activity, as well as ongoing residential and commercial development.

These concerns and associated mitigation concepts are documented in the *Suffolk Rail Concepts Screening Report*, by Moffatt & Nichol dated March 13, 2015. Concurrently, the City is in the process of updating its comprehensive plan and intends to include additional focus on mitigating the impacts of rail and surface traffic resulting from regional growth in their community.

The goal of these two efforts is to develop a cohesive vision for supporting traffic mobility through strategic grade separation projects, as well as identifying a plan for prioritizing, funding, and executing these projects.

5.4.5.3. VIG Concept 3 – U.S. Customs and Border Protection

Accommodation of competitive dual rail access at VIG imparts other challenges to the Port and Commonwealth Railway. Management of two train schedules (especially if there are delays or other variances) and separate inventories of rolling stock is complex and often requires more trackage and resources to achieve the target throughput. Performing these operations against a backdrop of similarly fluctuating ship line schedules and customer demands further complicates operations.

As with NIT, U.S. Customs and Border Protection personnel at VIG work very closely with the Port to provide the level of support necessary to maintain the stream of commerce through the terminal. However, these resources are not always sufficient to provide the coverage the Port may require at VIG. As rail demand increases, additional U.S. Customs and Border Protection resources may be necessary to support rail operations.

5.4.6. Recommendations to improve rail competitiveness at VIG

Of the concepts identified above, the following are immediately recommended to support improved rail competitiveness at VIG. It is recommended the remaining concepts be coordinated among the Port, railroads and stakeholders if needed to support the Port's strategic growth strategies, provided the many commercial issues are identified and resolved.

Commonwealth Railway Improvements: Double tracking the entire CWRY corridor between VIG and the Suffolk Marshalling Yard in conjunction with a VIG rail expansion is recommended to ensure the rail capacity of VIG can be fully utilized. This improvement is further necessary to support rail traffic generated by the future marine terminal on Craney Island.

As traffic increases, improvements to the interchange tracks and connecting rail segment between the Class I railroad main lines and the Suffolk Marshalling Yard should also be improved to support the Class I rail operations serving VIG. This improvement may also contribute towards lessening community impacts associated with slow-moving trains navigating the interchange.

Rail Crossing Improvement Program: This recommendation is consistent with the recommendations provided for NIT and PMT. The City of Suffolk, in particular, has identified improvements on Finney Avenue and between Shoulders Hill Road and Nansemond Parkway (North Suffolk Connector) to help mitigate rail impacts. Numerous other rail crossings are also of concern and have been identified in the *Suffolk Rail Concepts Screening Report*, by Moffatt & Nichol, dated March 13, 2015.

U.S. Customs and Border Protection Resources: This recommendation is consistent with the recommendation provided for NIT.

As demand increases, the Port may need additional U.S. Customs and Border Protection resources to maintain the level of service to its customers. Currently, the Port works with the local Field Office to formalize and justify requests for these resources as they are needed.

In the event that U.S. Customs and Border Protection is unable to allocate funding to support the requested increases, Section 560 of the Consolidated Appropriations Act, 2014 has authorized U.S. Customs and Border Protection to accept "donations of real property, personal property (including monetary donations) and non-personal services" from private sector and government entities.

If CBP is unable to get necessary additional resources, state support, through the above described "donation" process, may need to be considered as a possible, but not a definite, mechanism to provide the necessary CBP resources. This support would need to be evaluated against potential adverse competitive impacts.

5.5. Virginia Inland Port

Virginia Inland Port (VIP)

- The Port of Virginia's intermodal container transfer facility in Front Royal, VA
- NS rail service from NIT and VIG
- Rail track runs adjacent to NS Crescent Corridor

The Virginia Inland Port (VIP) is an intermodal container transfer facility in Front Royal (Warren County) owned by The Port of Virginia. VIP occupies approximately 161 acres and is approximately 60 miles west of Washington D.C. The terminal brings The Port of Virginia 220 miles closer to inland markets and enhances service to the Washington D.C. / Baltimore Metro Region through regularly scheduled rail service to the terminals in Hampton Roads. VIP also consolidates and containerizes local cargo for export.

5.5.1. Throughput

Current throughput is approximately 35,000 containers per year. Rail strings to and from VIP piggyback on other NS trains, thus capacity is largely controlled by the number of working tracks, frequency of that service, along with the train lengths established by NS.

5.5.2. Rail System Infrastructure

The single rail lead into VIP connects directly to NS's double-tracked Crescent Corridor via a wye junction that allows arrival and departure from either direction. On terminal, the lead splits into five working tracks that then converge to a single dead end tail track at the west end of the terminal.

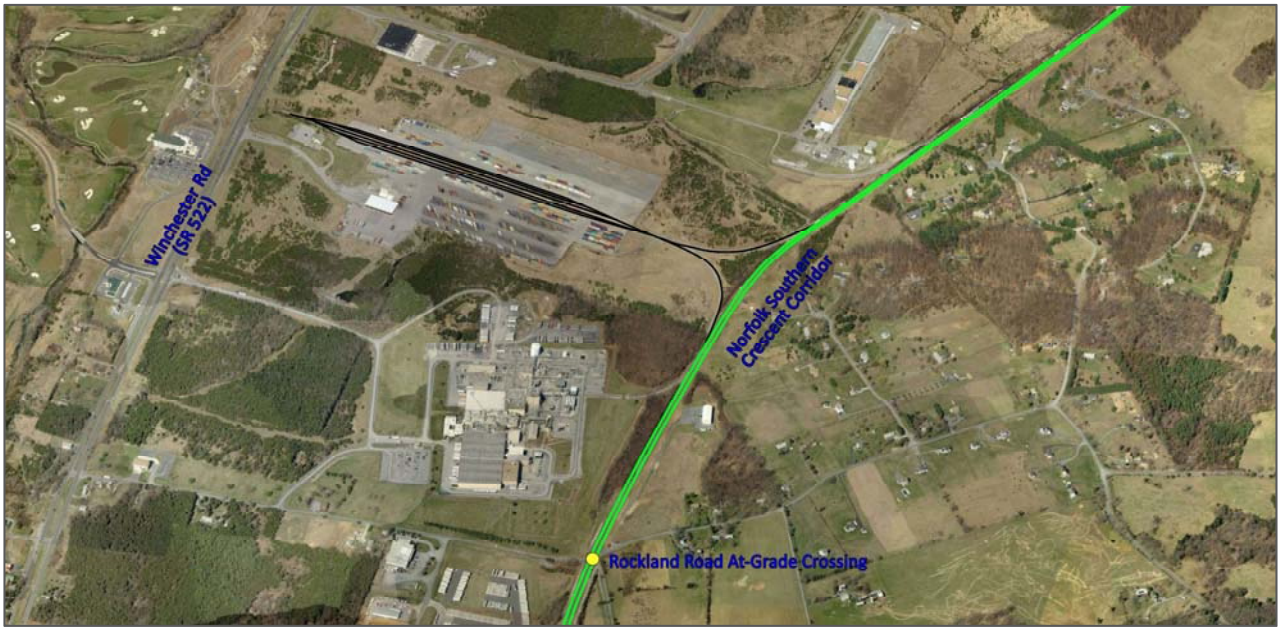

Figure 26 – VIP On-Dock Rail System

5.5.3. Port-Related Rail Operations

NS provides regularly scheduled intermodal service between NIT and VIP and is responsible for arriving and departing the trains, as coordinated with the Port. NS further breaks each string at one or two locations to facilitate movement of container handling equipment between the tracks and the container yards.

Port resources are used to unload and load the rail cars. Since import containers are screened by U.S. Customs and Border Protection at NIT, this activity is not present at VIP.

5.5.4. Trackage Rights and Access

This facility is connected to NS's Crescent Corridor main line.

5.5.5. Competitive Enhancements

The location and configuration of the terminal precludes any practical measures to establish rail access with a competing railroad.

Additional rail capacity at VIP is generated through coordinated commercial decisions between NS and the Port, and may need to be supported by additional working tracks. Off-terminal rail infrastructure improvement needs, if any, would likely be related to deconflicting train arrival or departure operations at VIP with NS's mainline traffic. As rail traffic increases, mitigation of community impacts from increased rail and surface traffic at the Rockland Road and Fairground Road at-grade crossings (to the southeast and northeast of VIP, respectively) will be increasingly sought. Warren County has expressed concern regarding the Rockland Road crossing due to the mounting rail backups they have observed that restrict access to the approximately 450 homes in the Rockland area. They have also observed increased blockages of the Fairground Road crossing.

The Rockland Road (Rte. 658) crossing is typically blocked while NS is assembling a train for departure, as it is located approximately 3,400 track-feet from the VIP working tracks. When blocked, this also impacts the response time of Fire and Rescue personnel located at the fire station on Rockland Road, making the blocked access a health and safety issue to the community. A Rockland Road grade separation project is identified as a recommended regional roadway improvement in the VDOT 2035 Small Urban Area Transportation Study, but is not currently listed on long range transportation plans.

5.5.6. Recommendations to Improve Rail Competitiveness at VIP

NS did not indicate any specific concerns regarding impacts to NS's mainline rail traffic, but could become a concern in the future. Consistent with other terminals that support rail operations, a state program to provide resources for planning and executing railroad crossing improvements to mitigate rail impacts is recommended, as Warren County has also expressed concern about the impacts of rail to local traffic and emergency vehicle access.

5.6. Port of Richmond (Richmond Deepwater Terminal)

Port of Richmond (POR)

- Virginia Port Authority-leased container, break bulk, and bulk terminal
- Regularly scheduled container barge service (The 64 Express) between POR, NIT, and VIG provides inland access to the marine terminals.
- CSX direct access; ability to interchange with NS via CSX

The Port of Richmond (also referred to as the Richmond Deep Water Terminal) is located on approximately 121 acres along the west bank of the James River south of the City of Richmond. The facility is owned by the City of Richmond and leased by The Port of Virginia under an agreement that began in July 2011. The facility has a 1,570 foot wharf available for berthing and handles containers, break bulk, and bulk cargos.

Figure 27 – Port of Richmond

The James River Barge Service provides regularly scheduled container-on-barge service between the Port of Richmond and the Hampton Roads container terminals (NIT and VIG).

5.6.1. Throughput

The grain export operation was initiated in 2014 and is anticipated to handle approximately 2,500 rail cars over the fall and winter season. Other onsite rail operations handle approximately 240 to 360 rail cars per year.

5.6.2. Rail System Infrastructure

An approximately 3.5-mile long single rail lead connects the Richmond Deep Water Terminal to CSX's South Yard rail yard. There is a 1,500-foot and a 2,850-foot siding located along the lead as well, though they are in need of rehabilitation. The 2,850-foot siding previously had an additional siding, though it has been abandoned. Numerous private industry rail leads are also located on the terminal lead, though most do not currently support active rail operations. The other major rail user is an ethanol operation located near the lead's connection to South Yard.

On terminal, the rail lead has a short (~800-foot) siding which converges to a dead-end tail track. Two rail spurs diverge into four storage tracks (~650-foot each) to warehouses. There is also a dead-end rail spur to a former maintenance shed and siding (that historically accessed the wharf).

Rehabilitation efforts to the rail lead, and more extensive improvements to the on-terminal track, were performed in 2013 and 2014.

The Port also recently constructed a rail car unloading pit and installed a rail scale on terminal to support a grain export operation.

5.6.3. Port-Related Rail Operations

The primary rail operation at POR is the recent establishment of a single car grain export operation. This operation transfers soy beans and other grain products from relatively short strings of rail cars to barges for transport to private terminals in Hampton Roads. Rail cars are consolidated at CSX yards and then delivered as 30 – 40 car strings to the terminal for unloading. It is anticipated that the terminal will be able to unload one string per day during peak season (September – March).

The terminal also currently supports transloading containers of plywood brought in by barge from the Hampton Roads marine terminals to boxcars for subsequent delivery to an inland customer. Rail volume associated with this operation is currently relatively small compared to the grain operations (20 – 30 rail cars per month).

The terminal has supported similar operations in the past with rubber, steel, and other break bulk cargo.

5.6.4. Trackage Rights and Access

The rail lead between the terminal and CSX rail yard is owned by the City of Richmond, which grants operating rights via a service contract. NS and CSX rail traffic must be interchanged with the City's selected rail provider to deliver to the terminal. The City is currently contracted with CSX to provide this rail service.

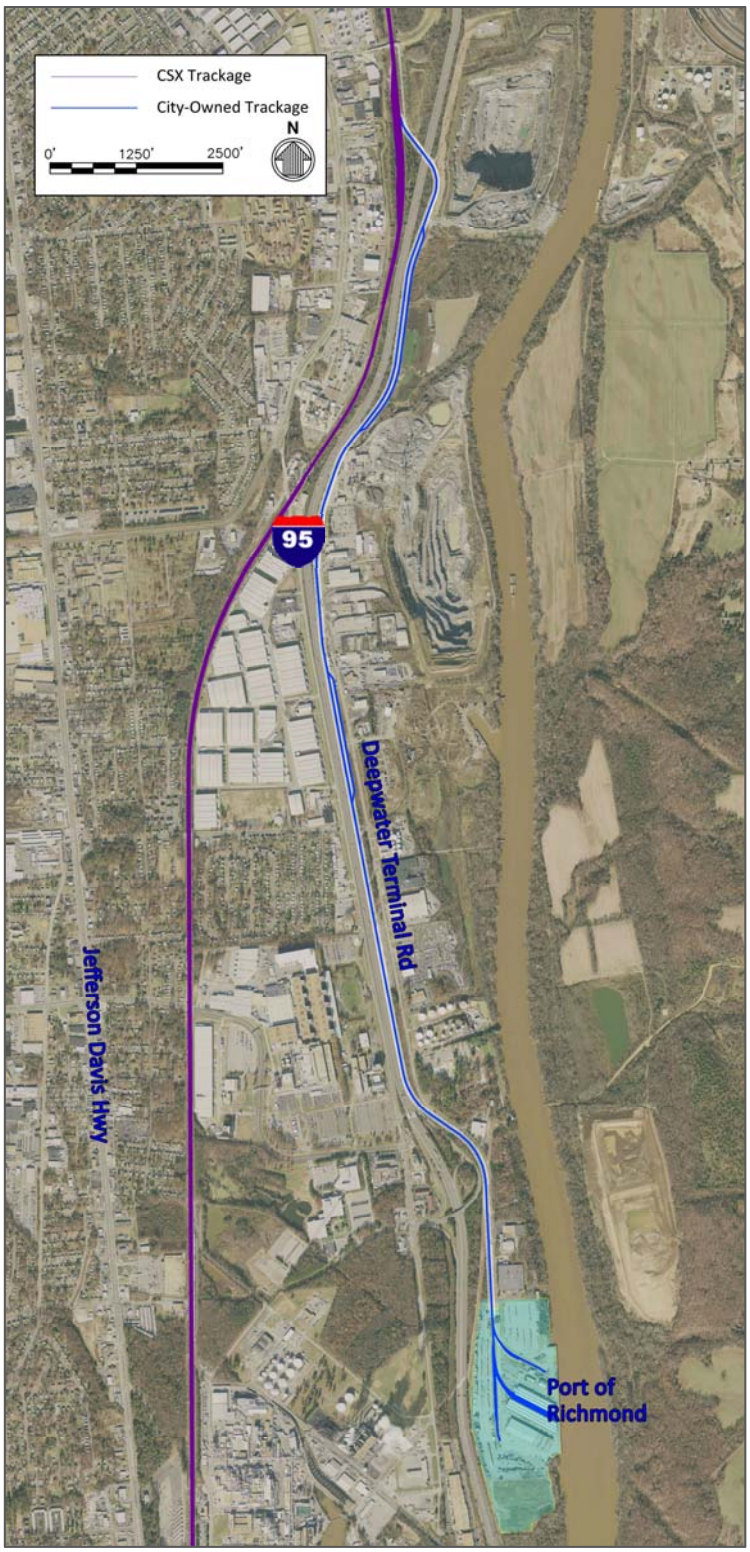

Figure 28 – Port of Richmond Overall Rail System

5.6.5. Competitive Enhancements

The following improvement concepts were considered as part of the development of the Master Rail Plan to increase the utilization and economic contributions of the Port of Richmond facility.

The intent of these improvement concepts is to support further discussion among the Port, the City of Richmond, railroads, and other economic development stakeholders as implementation of such improvements will require close coordination between stakeholders, and, in the case of trackage improvements, approval by the owning entity.

5.6.5.1. POR Concept 1 – Rail Capacity Improvements

The seasonal grain operation effectively places the terminal at its rail capacity during peak grain season, diminishing opportunities to support other year-round rail operations.

The Port continues to evaluate concepts to expand rail capacity at the Port of Richmond, as there is continued demand for rail service. Concepts have typically been focused on improvements inside the terminal perimeter, but there may be opportunities for off-terminal improvements along the City-owned rail lead.

5.6.5.2. POR Concept 2 – Establishing Competitive Dual Rail Access

Rail service to the Port is established via agreement with the City of Richmond, providing the opportunity to serve the facility by either CSX or NS (who has trackage rights into CSX's rail yard). Concepts to establish rail service by both railroads may be feasible, but the costs and benefits have not been quantified or evaluated. Of particular concern if such an effort is initiated is the availability of rail infrastructure needed to support two separate rail operations.

5.6.5.3. POR Concept 3 – Enhancing Private Industry Development Potential

Rail and road access to the Port of Richmond is segregated from residential and commercial activities by the Interstate 95 corridor, thereby avoiding many of the common issues associated with seeking to increase activity levels. Several private industrial properties are located along the road and rail corridor that accesses the terminal.

The close proximity of industrial sites and absence of non-industrial activities presents the opportunity for coordinated on- and off-terminal industrial development efforts that offer close access to shipping via the James River.

5.6.5.4. POR Concept 4 – Deepwater Terminal Railroad Freight Improvement Plan

The City of Richmond has previously developed a concept to extend the existing rail lead to the north of its connection to CSX's rail yard at Goode Street to provide additional rail access to an industrial site as well as connect to an existing NS rail spur (Rocketts Spur).

5.6.6. Recommendations to Improve Rail Competitiveness at POR

Comprehensive Industrial Master Plan: Industrial development at POR and on the adjacent properties should be bolstered by a coordinated effort among the Port, the City of Richmond, and railroads working towards a common vision of what type of industrial activity is desired. A recommended framework for this is similar to that recommended for PMT:

- The Port should work with the City of Richmond and Virginia Economic Development Partnership (VEDP) to identify the type of terminal activities that generate the most benefit to Commonwealth and the City of Richmond and that are compatible with the river terminal.
- The Port should further work with the City of Richmond to integrate any near-terminal development efforts with on-terminal activities.
- The Port should coordinate with their rail provider(s) and the City to develop a rail plan (or plans) for the terminal that accommodates those specific activities.

These efforts result in a concept that VEDP, Port, and other economic development agencies can market to the industries they seek to attract.

5.7. Future Marine Terminal

5.7.1. Conceptual Rail System Infrastructure

The future marine terminal on Craney Island is envisioned to be a state-of-the-art terminal that makes use of semi-automated stacking cranes to maximize container storage capacity, similar to the system used at VIG. The project represents a substantial increase in The Port of Virginia's overall capacity, with the full build out capacity being on par with the combined capacity of NIT and a fully built out VIG terminal. It is proposed to be constructed on reclaimed land created in the joint State and Federal Craney Island Eastward Expansion (CIEE) project, which constructs additional dredged material storage cells at the U.S. Army Corps of Engineer's Craney Island Dredged Material Management Area.

The current design objective is to provide sufficient rail capacity for up to 50% of total terminal throughput.

The footprint of the conceptual marine terminal supports use of long (~6,000 L.F.) working track lengths, while the use of widespan (6 to 8 tracks) gantry cranes to load/unload from a single side would improve efficiency by reducing the number of rail moves needed during assembly or disassembly (e.g. needing to break a full length train into multiple strings to fit onto the working tracks, or to provide crossings for dray vehicles).

Conceptual rail access would be via an extension of the double-tracked CWRY corridor from VIG, which would be constructed as part of the Craney Island Road and Rail Connector. This would provide the terminal with competitive dual rail access to both NS and CSX in the same manner as VIG.

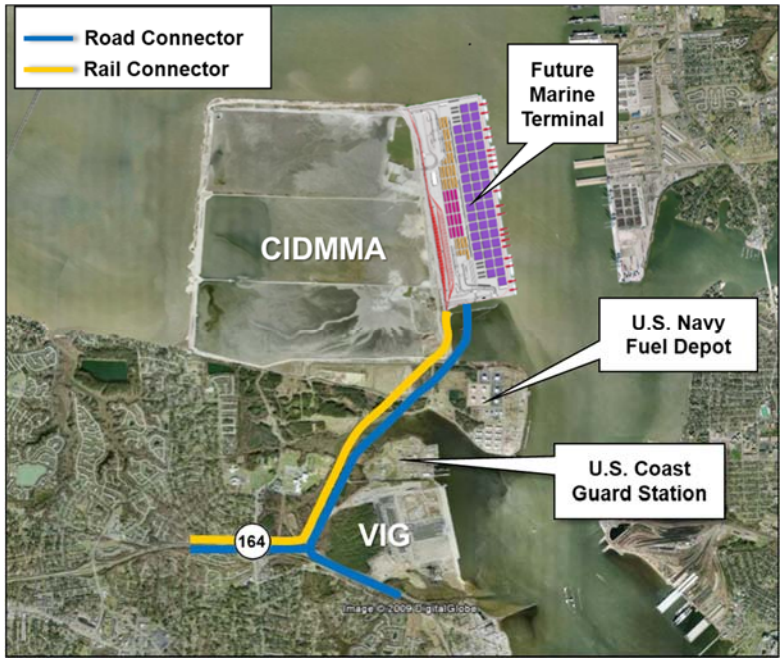

Figure 29 – Craney Island Road and Rail Connector Concept

Construction of the marine terminal is dependent on the phased completion of the CIEE. The initial phase of the terminal is currently anticipated to open sometime between 2030 and 2040, with subsequent phases of the terminal being constructed as required to support market demand.

5.7.2. Competitive Enhancements

Construction of the future marine terminal will increase rail traffic on the CWRY rail corridor and in the communities it passes through.

5.7.2.1. CIMT Concept 1 – Commonwealth Railway Improvements

Infrastructure improvements will be necessary to support the planned rail volume generated by a fully built out VIG terminal and the future marine terminal on Craney Island. The primary rail infrastructure concerns include:

- Double tracking the full length of the corridor to provide two-way rail traffic.
- Improving the rail junction at VIG to support concurrent arrival and departure operations at VIG while maintaining rail access to the future marine terminal.
- Providing sufficient capacity to interchange trains between CWRY, CSX, and NS (including marshalling yard capacity and connections to the Class I railroads' tracks). Preliminary sizing estimates suggests that with both terminals operating at full capacity, approximately 15 marshalling yard tracks (6,000 – 8,000 L.F. each) will be needed, though actual needs will need to be assessed against the rail operations that exist at that future time (Virginia Port Authority *Craney Island Interchange Access Modification Study*, September 2009).
- Acquisition of property necessary to construct the Craney Island Road and Rail Connector has not occurred. In addition to private parcels, right-of-way through the Craney Island U.S. Naval Supply Center and the City of Portsmouth Landfill will be necessary to support the conceptual alignment. This project may also be share an alignment with a proposed highway spur that connects with planned bridge/tunnel harbor crossings (The Third Crossing / Patriot's Crossing projects). This would also entail construction of a new highway interchange on State Route 164.

5.7.2.2. CIMT Concept 2 – Crossing Safety/Separation Improvements

As detailed in the NIT section, additional resources and technical assistance for communities (particularly Suffolk in the case of CIMT) seeking to mitigate rail-related impacts would serve to help sustain community support for not only development of the terminal, but also its full utilization. The *Suffolk Rail Concepts Screening Report*, by Moffatt & Nichol dated March 13, 2015 identifies improvements that may help mitigate long term traffic mobility impacts resulting from increased rail traffic through Suffolk.

5.7.3. Recommendations to Improve Rail Competitiveness at the Future Marine Terminal

Coordinated long range planning and land acquisition by DRPT, the Port, CWRY, NS, and CSX is recommended to ensure the improvements identified in Concept 1 above can be realized including identification and acquisition of the expanded marshalling yard location(s). Implementing these recommendations will require the identification and resolution of numerous commercial issues.

Establishing a program to support communities seeking to mitigate rail impacts is likewise recommended, particularly given the magnitude of rail capacity generated by the full build out of the terminal and the concentration of that rail traffic that may travel through the City of Suffolk. The *Suffolk Rail Concepts Screening Report* identifies improvements that could be used as part as part of a comprehensive plan to address these impacts.

6. RAIL CORRIDORS IMPORTANT TO THE PORT OF VIRGINIA

6.1. CSX National Gateway

The CSX National Gateway is a public-private partnership launched in May 2008. The goal of the National Gateway is to create a highly-efficient network of double-stack rail and intermodal terminals from the Mid-Atlantic to the Midwest that connects seaports with consumers and manufacturing centers. The effort, spanning six states and Washington DC, involves 61 clearance projects (49 complete) and six intermodal terminal projects (five complete), including four new facilities and two expanded terminals.

Figure 30 – National Gateway

The National Gateway improves the capacity (via double-stack clearances) of the connection between The Port of Virginia and CSX's state-of-the-art hub-and spoke intermodal terminal in Northwest Ohio and has supported increased frequency, improved levels of service, and reduced transit times to the Ohio Valley.

Virginia worked closely with CSX and the federal government to secure funding and invested $16 million in Rail Enhancement and other funds in the projects.

The $850 million project received federal stimulus funding and contributions from four states, including Virginia, with CSX funding 76% of the total project cost and public entities funding approximately $190 million.

6.1.1. Infrastructure

The CSX north-south main line through Virginia (Washington DC-Richmond-Rocky Mount NC) is part of the National Gateway. At Weldon NC, an eastward extension connects the National Gateway to Port of Virginia facilities in Hampton Roads.

Kilby Yard, located west of downtown Suffolk, provides approximately 28,000 L.F. of sidings to stage intermodal and other unit trains. Existing zoning and land-use approvals are in place for additional intermodal facilities to support industrial development in this vicinity, however they have not been constructed yet.

The project's target 2015 completion, which will provide double-stack access to The Port of Virginia, has been delayed due to an ongoing three-year environmental review of the Virginia Avenue Tunnel, a 108-year old single-stacked, single-tracked rail tunnel in Southeast Washington DC.

The Federal Highway Administration approved a preferred construction alternative for the project in November 2014 which will enable CSX to complete the tunnel design and initiate the construction permitting process. Construction is anticipated to begin within the next several months and last 30-to-42 months. The remainder of the corridor has clearances for double-stacked containers and is predominantly double-tracked.

6.1.2. Capacity

Currently, 53 passenger and commuter trains and an average of 21 freight trains operate over the CSX Richmond, Fredericksburg, and Potomac (RF&P) Subdivision and across the Potomac River each weekday. Windows for freight traffic are limited to over-night and to a lesser extent mid-day, as passenger and commuter trains limit freight capacity on the line between 0600 and 1900. These freight windows ultimately shape the CSX schedule to VIG, and when factored in with the NS rail service at the terminal, it further shapes the potential CSX capacity at VIG. Establishment of CSX double-stack service will improve utilization of the existing rail schedule to convey CSX cargo, but capacity will still ultimately be constrained by the RF&P corridor traffic unless prioritization rules or schedules relating to freight vs. passenger rail are adjusted. The current Richmond-D.C. High Speed Rail Study is reviewing the potential for a third track in order to expand freight and passenger capacity and improve level of service.

Traffic to and from the Port to the Kilby Yard in Suffolk is used for staging trains bound for the Port. CSX did not cite any specific capacity concerns at current volumes, but did indicate improvements would be necessary to support additional trains.

Additional capacity is required on CSX's Portsmouth Subdivision to facilitate port growth, especially potential future agriculture business. Beyond the state-supported Kilby Yard in Suffolk and the expanded grain operations in Richmond, CSX has indicated there is no additional capacity to stage freight destined for the Port.

6.2. Norfolk and Portsmouth Belt Line Railroad

NPBL was established in 1898 by eight railroads as a neutral railroad to provide efficient movement of rail cargo between Hampton Roads industries and those railroads. Since then, the shareholder railroads have undergone numerous consolidations, resulting in Hampton Roads now being served by two Class I railroads, CSX and Norfolk Southern, who are likewise the shareholders of NPBL with 43% and 57% ownership stakes, respectively.

NPBL's charter establishes that it must move all railcars for a fixed rate regardless of the originating railroad or destination.

NPBL's location within the urban industrial areas of Portsmouth and Chesapeake, and access to PMT and NIT, bring it in frequent contact as the local railroad with prospective industries evaluating sites for new facilities.

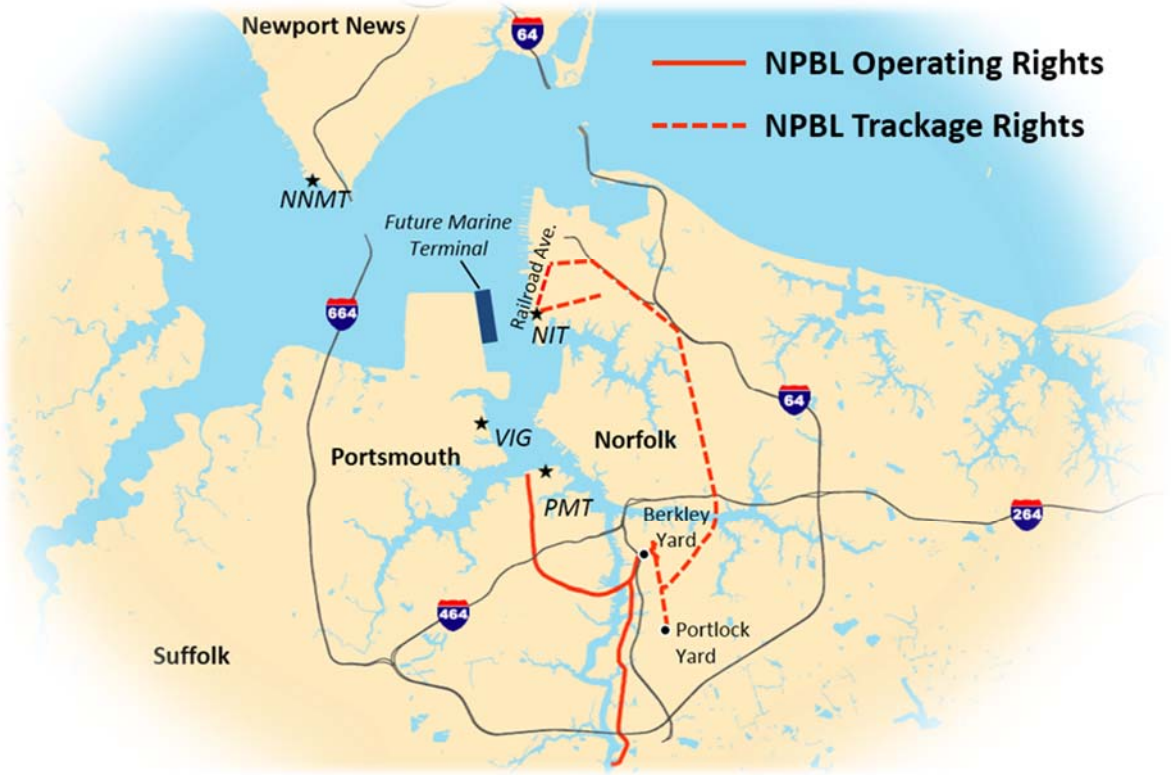

Figure 31 – NPBL Rail System

6.2.1. Infrastructure

NPBL's rail system is located in Portsmouth and Chesapeake, with operating rights to NS's Portlock Yard and NIT. At NIT, NPBL provides rail service to a cold storage facility and for project/dimensional cargo originating with or bound for CSX customers. A private industry, Lehigh Cement, retains a parcel within NIT and is served by NPBL as well. NPBL provides switching operations for various industries along their systems as well as along Sewell's Point Line.

NPBL's rail system has four primary rail yards, along with several other sidings. The South Street Yard in Portsmouth near Portsmouth Boulevard and Frederick Boulevard has recently been expanded (with further expansion opportunities available) to support increased rail demand from its customers using both CSX and NS.

A second yard at Freeman Avenue in Chesapeake is planned for expansion in conjunction with the construction of a grade-separated crossing, which will improve roadway traffic and emergency response to the industrial facilities that are land locked through this single point of access on Freeman Avenue. This project will improve train movement across NPBL's one major bridge, which crosses the Southern Branch of the Elizabeth River.

The PMT rail yard currently has four tracks, but historically had significantly more – NPBL retains the Right-of-Way to expand the yard if customer demand warrants. CSX presently leases this yard to support its own intermodal facility.

The Berkley Yard is NPBL's fourth and largest facility. It serves as the nexus between NPBL's Portsmouth and Chesapeake lines, and the CSX and NS rail systems.

Due to the urban environment and prevalence of at-grade crossings, existing storage tracks on the NPBL system are generally not long enough to accommodate entire unit trains on a single track and requires them to be broken into shorter segments.

NPBL's bridge over the Southern Branch of the Elizabeth River (the Belt Line Bridge) is a single track lift bridge and is the link for NPBL to move Class I trains to terminals they do not have direct access to (NS to PMT and CSX to NIT). By Coast Guard regulation, vessel traffic has right-of-way over rail traffic on the bridge, which much be lifted to accommodate most traffic. Due to the high volume of vessel traffic on the Southern Branch, the bridge is typically kept in the lifted position and lowered only to allow trains to cross.

As this bridge is one of only three rail bridges that cross the water, the single track structure limits capacity of any NPBL or CSX traffic crossing to the east side of the Elizabeth River.

NPBL traffic to NIT, after crossing the Jordon Lift Bridge, passes through NPBL's Berkley Yard and then ties into a double tracked segment of NS's Lambert's Point Line towards Portlock. A wye connection provides a direct connection between the Lambert's Point Line and the Sewell's Point Line, but has a constrained geometry that limits the length of rail cars that can use it. Trains unable to, or directed not to, use this connection must be pulled into to Portlock and the locomotive disconnected and moved around the cars to continue pulling to NIT via the Sewell's Point Line (See Section 5.2.3 for additional discussion), which adds delay to every train using this area of the rail network. These impediments affect both NPBL and CSX traffic on the NPBL system.

6.3. NS Crescent Corridor

The NS Crescent Corridor connects the American Northeast with the western portion of the American Southeast, and, in conjunction with Kansas City Southern, also Texas and Mexico. In addition to existing terminals, the Crescent Corridor connects with three new intermodal terminals at Birmingham, AL, Greencastle, PA, and Rossville, TN.

This initiative was a $25 billion, nine-state, and 2,500 mile network designed principally for intermodal traffic between New Orleans and Newark, New Jersey, that NS has promoted as a public-private partnership since the early 2000s.

In Virginia, the Crescent Corridor has two north-south main lines, one connecting Washington DC-Manassas-Charlottesville-Altavista-Danville and extending into North Carolina, and the other connecting Charles Town, WV -Berryville-Virginia Inland Port-Luray-Waynesboro-Roanoke and from Roanoke extending southward into North Carolina, and also southwestward into Tennessee.

Figure 32 – Crescent Corridor

Norfolk Southern did not express any specific concerns regarding rail capacity on the Crescent Corridor.

6.3.1. Capacity

NS did not identify any capacity concerns on the Crescent Corridor within Virginia. The corridor is primarily single-tracked through Virginia, but passing sidings and extended double-tracked segments support fluid movement of rail traffic in both directions.

6.4. NS Heartland Corridor

In 2010, NS opened its Heartland Corridor, which allows double-stack trains to move between Norfolk and Chicago. The project was a public-private partnership of NS, the federal government, and the states of Virginia, West Virginia and Ohio, and involved improving the vertical clearance of 28 tunnels and eliminating 24 other obstructions, such as bridges. Virginia worked closely with NS and the federal government to secure funding and invested $75.6 million in Rail Enhancement and other funds in the project.

In Virginia, the Heartland Corridor connects Norfolk (Ports of Virginia) and Roanoke and then extends into West Virginia. The corridor also supports the daily Norfolk-to-D.C. passenger service.

Figure 33 – Heartland Corridor

6.4.1. Infrastructure Capacity

NS did not identify any capacity concerns on the Heartland Corridor within Virginia. Significant segments of this corridor are double tracked to support fluid movement of rail traffic in both directions.

7. RAIL ACCESS COMMENTARY

Dual access represents one potential opportunity (of many) to improve overall port competitiveness. The typical context of competitive dual rail access is when a customer has the opportunity to select which railroad to transport cargo through.

Where industries are able to maintain active rail operations with both railroads, dual access is also a means to expand their potential inland customer base, where individual customers may be tethered to a single railroad.

Table 9 – Constraints to Competitive Dual Rail Service for Various Forms of Dual Rail Access

On-Dock Dual Rail Access Provided By	Physical and Operational Constraints to Competitive Dual Rail Service
Both railroads operating over the same infrastructure (i.e. trackage rights) to a terminal	• Increased complexity to coordinate operations may adversely impact effective capacity of the rail infrastructure and/or cost of operation; may require additional infrastructure to achieve a desired throughput. • Prioritization of traffic between the railroads may not be optimally aligned with the needs of the Port.
Direct access by one railroad and access by the second through an intermediary (short line) NIT: NS, CSX via NPBL PMT: CSX, NS via NPBL POR: CSX, NS via CSX NNMT: CSX, NS via CSX	• Introduces additional operations (costs) for the non-owning railroad to provide rail service due to the need to interchange with a second railroad. • Prioritization of traffic between the railroads may not be effectively aligned with the needs of the Port.
A common carrier (short line) transporting both railroad's trains to a terminal. VIG: Both NS and CSX via CWRY	• Introduces additional operations (costs) to rail service (relative to a single provider) due to the need to interchange with a second railroad. • The impact of this service to the overall competitiveness of the operation is dependent on the nature of underlying service charters or other agreements between the common carrier, port, and Class I railroads. • May require additional infrastructure on part of the short line and/or the terminal to segregate rolling stock.
Separate rail infrastructure for each railroad	• May require significant footprint within terminal to accommodate.

	• Rail corridor construction is an enormous undertaking, particularly in urbanized areas (significant community impacts).

Competitive dual rail access for containers is available at VIG and is planned for the future marine terminal on Craney Island. NIT, the Port's largest container terminal, presently provides scheduled on-dock container rail service only to NS trains due to the competitive advantage inherent in being located on a rail line which NS owns and which CSX must access through an intermediate carrier (NPBL). A significant limitation to concepts that seek to provide dual rail access through expansion of trackage rights is that granting such trackage rights is strictly between the railroads and is a matter of interstate commerce outside the jurisdiction of the state.

Measures to mitigate the operational and physical constraints to competitive dual rail access need to be evaluated in terms of the overall competitive position of the Port (i.e. the cost of mitigation vs. the benefit of doing so). Potential means for the Port to improve its competitive position through mitigation of existing rail access conditions is **an overall port-wide approach to competitive dual rail access** that includes:

- Strategic alignment of ship lines, where possible, to maximize availability of rail capacity for those ship lines with significant rail cargo (in consideration of multiple complex factors, of which rail is only one element).
- Ongoing coordination among the Port, railroads, and other stakeholders (e.g. U.S. Customs and Border Protection) to align resources and seek process optimizations that benefit all parties.
- Improved utilization of off-dock intermodal yards via drayage or barge service, if unable to meet demand with on-dock rail.
- For locations where tenant development is being sought (e.g. PMT) and may have tenants served by different railroads, development operating procedures and strategies to coordinate tenant operations and define expectations for level of service.
- Strategic investments in infrastructure where operational constraints cannot be overcome.

For the other principal facilities of The Port of Virginia:

- NNMT is served only by CSX with no competing railroads in close proximity.
- VIP is located on the NS main line with the nearest CSX line approximately six miles away. Seeking to provide a connection to CSX would, at a very minimum, require a significant capital investment likely to exceed its potential benefits.
- Rail access to the Port of Richmond is off of a CSX facility that NS has trackage rights into. Actual rail service to POR from the CSX facility is via a contract with the City (currently with CSX).
- The future marine terminal on Craney Island is planned to also have dual rail access via CWRY.

8. CONCLUSIONS

8.1. Master Rail Plan Findings

8.1.1. Intermodal Rail

The Port's capacity to transfer containers between the ship lines and railroads at a sufficient level of service to meet customer requirements is an interaction of several elements, each of which may be constrained by different factors. Major capacity elements include:

- Availability and productivity of Port resources (labor, container handling equipment)
- Availability of railroad resources (rail cars, locomotives, crews)
- Availability of U.S. Customs and Border Protection (CBP) resources to screen import cargo
- Alignment of Port, railroad, and CBP resource availabilities
- Port and railroad infrastructure and operational capacity to support the full range of cargo operations
- Impact of port operations on surrounding communities and affected industries

At The Port of Virginia, the coordination of many of these elements have private and/or competitive elements and are worked through in confidential settings with limited public transparency. Within this environment, the Master Rail Plan makes the following observations:

Table 10 – Summary of Observations

OBSERVATION	DISCUSSION
The Master Rail Plan acknowledges that resource allocations are made outside of the Master Rail Plan by the Port Authority and the General Assembly. Resource allocations by the railroads, both capital and operating, are private business decisions.	The Commonwealth and the U.S. Government have invested more than $300 million in public funds to support rail infrastructure supporting the Port, alongside equivalent federal investments in the Heartland, National Gateway and Crescent rail corridors benefitting the Port.
Trackage rights can introduce complexities to providing dual access to facilities that precludes readily apparent solutions from being viable.	Trackage rights are regulated at the federal level and there is very limited ability to compel a railroad to grant competitive access to another railroad. Existing trackage rights, particularly on the rail networks serving facilities in Hampton Roads, are fairly complicated. It is not uncommon for entities seeking improved rail access to suggest solutions that involve expansion of trackage rights, either due to being unaware of existing rights, or not fully appreciating the magnitude of the request.

OBSERVATION	DISCUSSION
U.S. Customs and Border Protection (CBP) personnel work closely with the Port to provide the support necessary to maintain the stream of commerce through the terminal, to the extent their own labor policies and resources can manage. Despite local CBP Field Office's best efforts, these resources are not always sufficient to provide the coverage the Port may require at NIT.	• CBP labor policies and resource availability limit its ability to adjust screening coverage to meet the changing and day-to-day needs of Port operations. • As rail demand increases, additional CBP resources may be necessary to support rail operations at the Port. • Infrastructure improvements at NIT and VIG are available to reduce the manpower resources required to meet CBP screening requirements. • The burden of funding these improvements has shifted to the Port. • The 2014 Consolidated Appropriations Act establishes a possible, but not a definite, mechanism for the state to provide supplementary funding to CBP. The competitive impact of doing so would need to be carefully evaluated.
Alignment of Port, railroad, and CBP resources is typically coordinated at the local level. However, many key decisions affecting local operations are made at the regional or national levels.	• As one example, the schedule for CSX trains at VIG is compressed by the national and regional schedules for passenger trains and to a lesser degree freight trains due to the mainline track capacity shortages between Richmond and Fredericksburg. • The Port and CBP have limited resources to support this schedule, resulting in reduced level of Port and CBP service for CSX cargo. • This places pressure on the Port and CBP to allocate additional resources. • Operational solutions may be feasible if coordinated among all stakeholders.
Investment in rail infrastructure is a common solution to Port rail capacity concerns, but may not be the only solution.	• The Port, the Commonwealth, and railroads routinely plan and invest in infrastructure improvements through their respective capital programs, special appropriations, and dedicated funding sources such as the Rail Enhancement Fund. • Conversely, dedicated resources to support coordination of interdependent freight and passenger rail operational services among the railroads, the Port and CBP have not been established.

OBSERVATION	DISCUSSION
	• An entity focused on supporting freight-related concerns within the state, such as OIPI or a new Office of Freight Planning, as have been successful in other states, may be useful for coordinating and advocating solutions between stakeholders.
The resources and obligations of the railroads and the Port are focused on supporting the movement of freight and often do not address resultant community or individual business impacts.	• Increasing rail traffic to and from the terminals results in increased traffic delays at rail crossings throughout Southside Hampton Roads. • Southside Hampton Roads rail traffic, including Port intermodal traffic, converges through downtown Suffolk. • Expansion of Commonwealth Railway's infrastructure to support VIG may require relocation of two large water pipelines owned by the City of Norfolk and the City of Portsmouth. • Resources and plans to mitigate community or individual business impacts of Port rail activities are inconsistent and/or deficient. • Clear guidelines to establish grade separation needs and funding would benefit the Port, the surrounding communities, and the railroads.

8.1.2. Other Rail Opportunities

There is potential to support other rail-served activities at several of the Port's facilities, including Portsmouth Marine Terminal (PMT) and Port of Richmond (POR). To this end, the Master Rail Plan includes the following observations:

- The Port has thus far remained open to a broad range of prospective industries, for example bulk agricultural exports or automobile imports.
- The unique needs of each industry and the potential for operational conflicts limits the opportunity to fully plan development of the Portsmouth or the Richmond terminals without a long-term commitment to one or more targeted industries or activities.
- The Port generally has the capacity and willingness to assist prospective industries with developing on-terminal solutions.
- Other economic development entities may be better positioned and have the necessary resources to assist prospective industries with developing off-terminal elements of a new operation.
- Realization of major industrial development opportunities can be improved through further coordination between on- and off-terminal improvements where proposed operations cannot be wholly accommodated on-terminal.

As with all aspects of transportation, infrastructure and operational needs are driven by public and private land use decisions. The Port has the clear authority to plan, fund and regulate on-terminal land uses. However, seaports are part of a global supply chain connecting disparate activities and bringing producers and consumers together in a competitive and increasingly efficient manner. All seaports are directly affected by the location and intensity of production, distribution and consumption activities outside the individual marine terminal.

Virginia was one of the early pioneers in stimulating rail-related economic development through the Virginia Inland Port in Front Royal. Equivalent opportunities exist today outside the gates of the Portsmouth Marine Terminal and the Port of Richmond. However, the ability, resources, and authorization for such initiatives are likely best found through collaboration among The Port of Virginia, the Virginia Economic Development Partnership, and supporting local and regional agencies, provided the Commonwealth develops clear benchmarks and goals to guide those efforts.

8.2. Recommendations

Traditional transportation plans yield a map with specific capital improvements. ***This Master Rail Plan follows a period of significant capital investment in rail and rail-related facilities, and the immediate priority of this Master Rail Plan is earning an appropriate level or rate of return on those prior rail investments, better collaboration among major stakeholders, and a process for ongoing operational improvements, out of which additional infrastructure improvements may be identified.*** However, this Master Rail Plan also contains a list of potential capital improvements (Recommendation 4) which should be considered in light of the more immediate operational, administrative, and strategic decision making recommendations (Recommendations 1-3).

Recommendation 1: State planning and investment in rail infrastructure serving the Port should maximize utilization of existing rail and rail-related infrastructure among all parties.

- Designate an existing entity (e.g. OIPI) or create a new entity (e.g. Office of Freight Planning) to facilitate continuous and comprehensive coordination efforts among the Port, railroads, passenger rail, U.S. Customs and Border Protection, and other stakeholders to optimize rail service to the Port through improved alignment of schedules and resources. Similar efforts have been successful at other U.S. ports and in the Virginia I-95 rail corridor.
- The Port should provide regular input to, and collaborate with, this entity to evaluate and establish achievable and sustainable goals for rail intermodal service across the entirety of the Port.
- Focus of these efforts should include identification of critical infrastructure needs that are not readily apparent to any one stakeholder, conducting more accurate benefit/cost assessments, development of analytical tools and supporting data collection to support better decision making, and exploring cost-and risk-sharing opportunities.
- Designated entity should also regularly review public funding programs for rail, port, and highway infrastructure and operations to ensure that operational enhancements, such as use of mechanisms to provide supplemental funding to U.S. Customs and Border Protection operations, receive due consideration in such programs.

- A wide variety of performance expectations, performance incentives, and performance standards have been established as justification for public investment in rail infrastructure. The Commonwealth and the Port should ensure, in a transparent and collaborative fashion, that those expectations, incentives and standards all contribute to the overall goals of The Port and the Commonwealth.

Recommendation 2: Develop policies and/or programs to support local infrastructure planning and investment where rail activity occurs.

- Designate a lead individual or entity to explore programs to assist communities with coordination, planning, and funding of improvements to mitigate rail impacts, including quiet zones, crossing safety improvements, and grade-separated crossings, with short-term emphasis on the Commonwealth Railway corridor and Class I corridors in the vicinity of the CWRY interchange. Similar programs adopted by other states include California's Section 190 Grade Separation Program and North Carolina's Sealed Corridor Project.
- Designate a lead individual or entity (e.g. the entity designated in Recommendation 1) to explore program options for ensuring that existing, rail-served industries are not disadvantaged by other rail projects and programs.
- Establish a process for the Commonwealth to develop guidelines and metrics for use in prioritizing and justifying community and industrial mitigation efforts.

Recommendation 3: Where opportunities to foster Port-served private industrial activities are present, maximize the value of Port assets by improving coordination of on- and off-terminal development.

- Given the value and scarcity of Port property and the access it provides to deep draft vessels, the Port should evaluate, on a case-by-case basis, the extent to which it accommodates prospective private rail-served industrial operations within its terminal boundaries. If the Port determines an attractive operation cannot be wholly accommodated within a terminal, a lead individual or entity such as VEDP or DRPT should be designated to coordinate roles, responsibilities, and resources among stakeholders to evaluate and develop off-terminal rail facilities that could support realization of the opportunity.
- The designated lead individual should use this Master Rail Plan to assist with the identification, coordination, and development of off-terminal needs.
- Off-terminal development plans should seek to support other terminal rail activities where feasible and practical to maximize potential use as rail needs evolve over time.
- Off-terminal rail development plans should preserve the opportunity for competitive dual rail access to the terminal(s) it supports.

Recommendation 4: The Master Rail Plan identifies off-terminal impacts and constraints as intermodal rail traffic increases at NIT, VIG, PMT, and a future marine terminal. The following efforts will support near-term competitive improvements or community relief for intermodal rail activities, provided that the host railroad accepts the improvements and any associated conditions, and that planned terminal expansions occur as currently planned.

4A - Norfolk International Terminal (NIT)

- Double-tracking the rail line between Portlock and NIT would lower operational costs for NS, NPBL, and other railroads that all use the line.
- A direct connection between Lambert's Point line used by NPBL and the rail line to NIT once existed; reconstructing it would improve access for NPBL to serve its customers on the Sewell's Point Line.
- Establish storage for a complete unit train (i.e. no breaking) on NPBL system in order to stage longer trains.

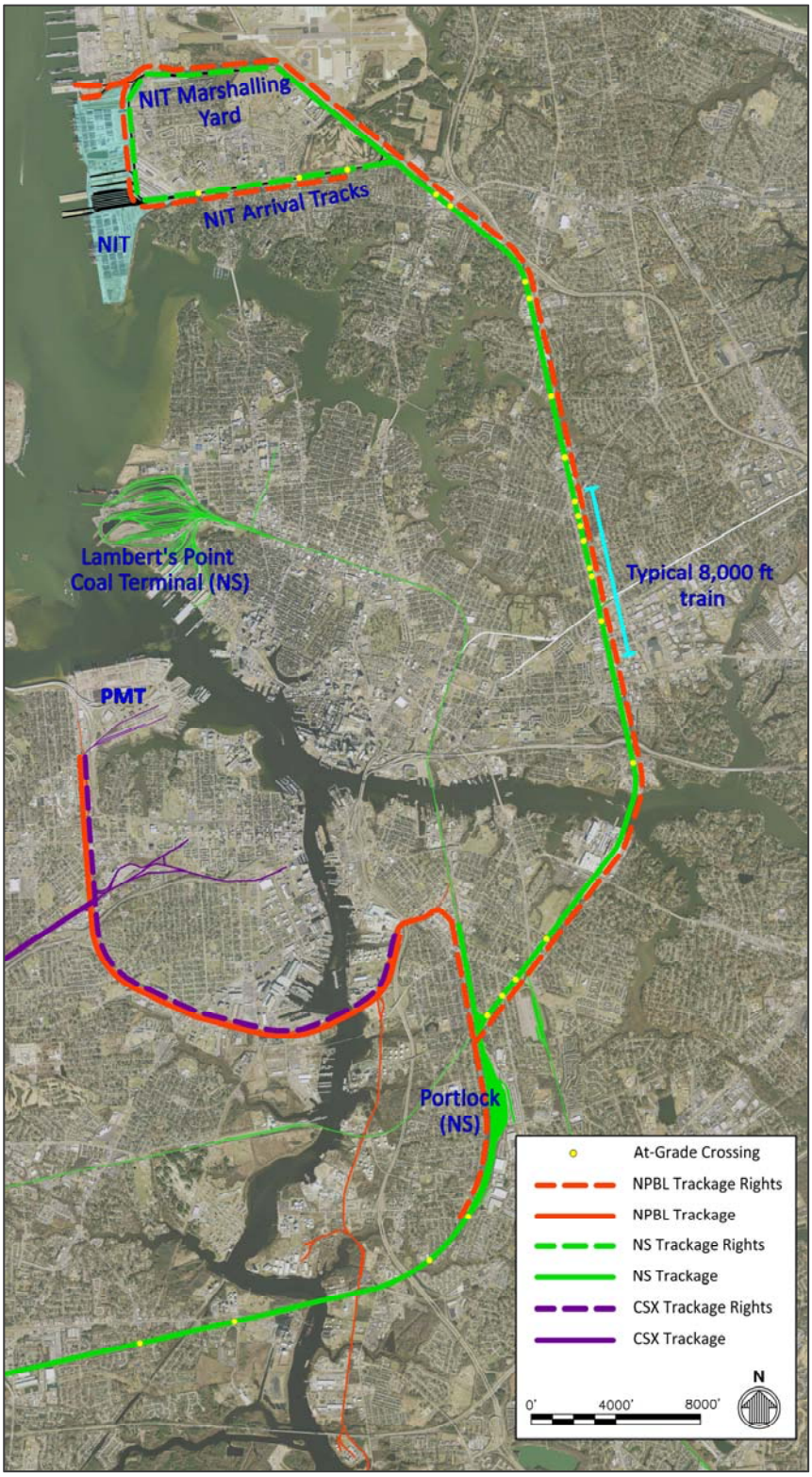

Figure 34 – NIT Overall Rail System

4B - Virginia International Gateway (VIG)

- Commonwealth Railway (CWRY) corridor should be double-tracked along its full length to support increased rail traffic at VIG.
- CWRY's Suffolk Marshalling Yard should have two additional tracks constructed (already partially funded by an REF grant).
- The interchange between CWRY and the Class I railroads in Suffolk should be evaluated for improvements.
- Related community impacts resulting from increased rail traffic should be identified and mitigated through the program described in Recommendation 2.[1]

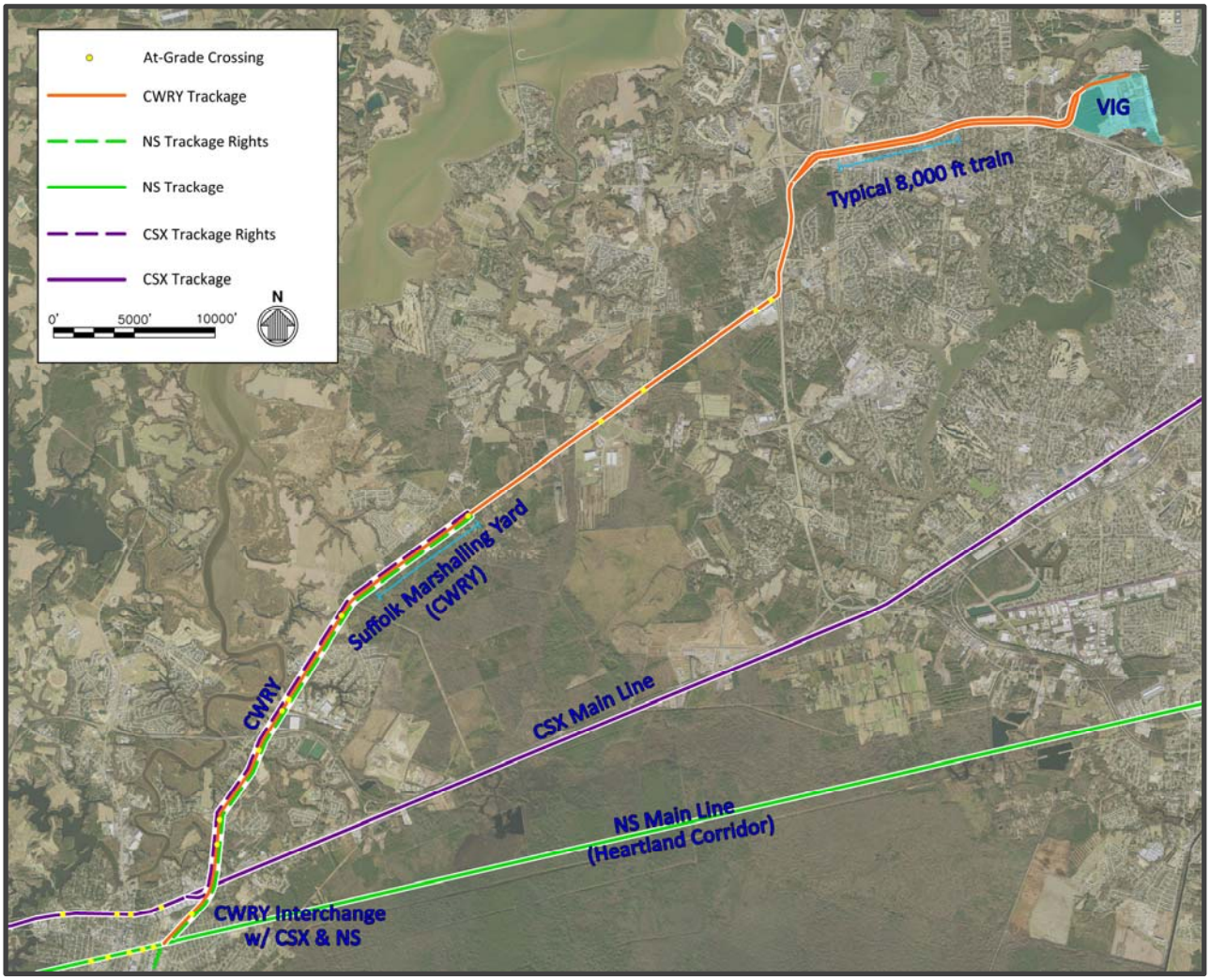

Figure 35 – VIG Overall Rail System

[1]Improvements to mitigate long term traffic mobility impacts resulting from increased rail traffic, including traffic generated by VIG and CIMT have been identified in the *Suffolk Rail Concepts Screening Report*, by Moffatt & Nichol dated March 13, 2015.

4C - Portsmouth Marine Terminal (PMT)

- If competitive rail operations are established at PMT, improvements to circumvent the physical constraints of the Pinner's Point interchange could mitigate some potential rail conflicts. This would likely require off-terminal property to construct.
- There are likely on-terminal solutions to mitigate rail conflicts on the east lead, once Midtown Tunnel construction is complete, but those will depend on any on-terminal activities or users.

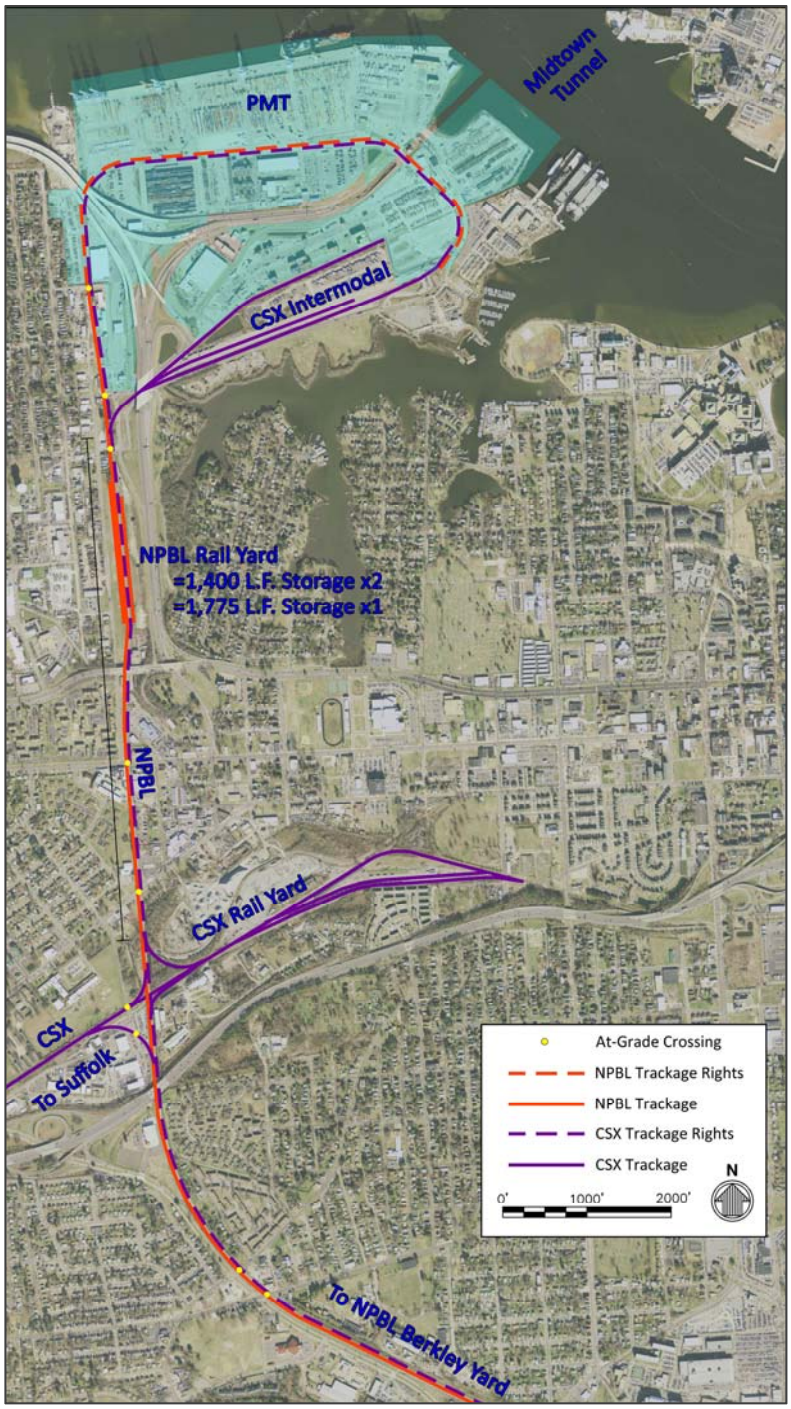

Figure 36 – PMT Overall Rail System

4D - Newport News Marine Terminal (NNMT)

- Engage with CSX to address vertical clearance restrictions on the Peninsula Subdivision that currently limit the height of rail cars (in particular, multi-level automobile carriers) may allow The Port to more effectively compete for automobile cargo and other breakbulk cargo through NNMT.

4E - Future Craney Island Marine Terminal (CIMT)

- Property for the rail corridor needs to be acquired.
- A significantly larger CWRY marshalling yard will be necessary to support CIMT at full build out. A process to identify potential sites for this yard should be initiated.
- Improvements will be needed near VIG to allow CIMT traffic to pass while trains arrive at or depart from VIG.
- Related community impacts must be identified and resolved[1].

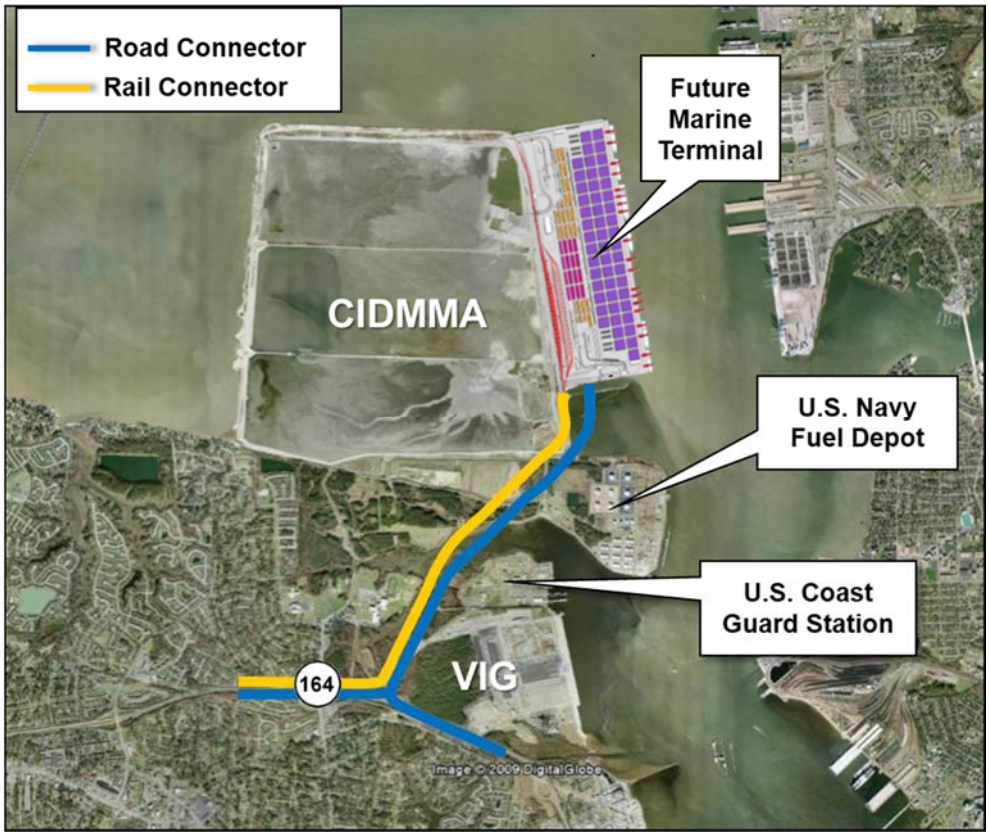

Figure 37 – Craney Island Road and Rail Connector Concept

While the above efforts are intended to improve the competitive position of The Port of Virginia, the improvements recommended herein would be above and beyond the considerable progress made at The Port in 2014 to maintain the longstanding success of The Port of Virginia.

[1]Improvements to mitigate long term traffic mobility impacts resulting from increased rail traffic, including traffic generated by VIG and CIMT have been identified in the *Suffolk Rail Concepts Screening Report*, by Moffatt & Nichol dated March 13, 2015.

Appendix A

Summary of Findings Pertaining to SJR 69-specified Issues

1. Status & Characteristics of Current Rail Systems That Support the Principal Facilities of Port of Virginia On-Dock Rail Systems

Principal Facilities of The Port of Virginia On-Dock Rail Systems	
Norfolk International Terminals (NIT)	• Central on-dock rail system (Central Rail Yard). • Adjacent marshalling yard to assist with train inventory. • A soon-to-be-completed grade separated crossing on Hampton Boulevard at north end of terminal. • Rail throughput in 2013 was approximately 280,000 containers and is growing. • New rail processes anticipated to increase capacity and efficiency.
Portsmouth Marine Terminal (PMT)	• A single track connects PMT to CSX and NS (via NPBL). • Two vehicle ramps are located on the west side of the terminal.
Newport News Marine Terminal (NNMT)	• Multiple dead-end rail spurs primarily support a terminal tenant. • Project and break bulk cargo are supported by the rail spurs on an as-needed basis.
Virginia International Gateway (VIG)	• Two groups of three tracks approximately 2,375 LF in the intermodal yard. • Dual rail access for CSX and NS through CWRY. • Rail throughput in 2013 was approximately 150,000 containers and is growing. • Capacity limited by mix of cargo demand and rail service.
Virginia Inland Port (VIP)	• Rail service provided by NS. • Rail throughput in 2013 was approximately 35,000 containers.
Port of Richmond (POR)	• 3.5 mile long single rail connects POR to the CSX South rail yard w/ two sidings. • Supports seasonal rail to barge grain operations and other break bulk.

1. Status & Characteristics of Current Rail Systems That Support the Principal Facilities of Port of Virginia On-Dock Rail Systems

Rail Corridors Important to the Port of Virginia	
CSX National Gateway	• Project to create a double-stack corridor between the Mid-Atlantic and the Midwest. • Only the Virginia Avenue Tunnel in Washington, D.C. does not have enough clearance for double-stack freight trains. • The Virginia Avenue Tunnel modifications delayed by environmental studies. • Passenger/freight rail traffic congestion on Fredericksburg-D.C. corridor constrains freight movements.
Commonwealth Railway	• An approximately 19 mile rail corridor connects VIG to CWRY Interchange. • Provides CSX and NS access to VIG via CWRY. • Approximately 3.8 miles of rail outside of VIG is double tracked. • The Suffolk marshalling yard, 10 miles from VIG has two 8,000 LF sidings.
Norfolk Portsmouth Belt Line	• Connects rail-served industries in Portsmouth and Chesapeake to CSX and NS • Owns single track rail lead to PMT. • Maintains rail yards within Portsmouth and Chesapeake to move local rail between customers and Class I railroads.
NS Crescent Corridor	• 2,500 mile rail network that connects the American Northeast and the western portion of the American Southeast, Texas and Mexico. • Two north-south main lines converge in Virginia. • Virginia Inland Port is located on this corridor.
NS Heartland Corridor	• Major east-west rail corridor with double-stack clearance between Norfolk & Chicago. • Connects to the Crescent Corridor in Roanoke. • Originates at NS's Portlock Yard and used by intermodal traffic from NIT and VIG.

1. Status & Characteristics of Current Rail Systems That Support the Principal Facilities of Port of Virginia On-Dock Rail Systems	
NS Sewell's Point Line	• 8.5 mile long corridor between NS's Portlock Yard and NIT. • Primarily single track with sidings. • Includes a single track swing bridge over the Eastern Branch of the Elizabeth River. • Currently handles 10 - 15 trains per day by NS, NPBL, CA, and BCR.
CSX Peninsula Subdivision (Newport News – Richmond Line)	• Rail corridor between Newport News coal terminals and Richmond • Majority of crossings are grade separated. • The line has available capacity to handle NNMT activities. • Minor vertical clearance restrictions; CSX has identified the necessary infrastructure improvements to mitigate if warranted by rail demand.

2. Development of a Rail Master Plan with the Flexibility to Support Near- & Long-Term Business Opportunities at Port Facilities	
Norfolk International Terminals (NIT)	• NIT is primarily a container terminal. • There are locations on the terminal that have not been redeveloped for modern port operations that may support other business opportunities. • These opportunities must be carefully screened to avoid impacting container operations. • Largest hurdle likely to be the magnitude (cost) of redevelopment at these locations needed to support any new operation.
Portsmouth Marine Terminal (PMT)	• Available for new business opportunities • Establishing the initial rail-served tenant will affect the opportunities for establishing other rail-served tenants. • Port-established rail operating procedures and track management plan recommended for coordinating tenant rail operations.
Newport News Marine Terminal (NNMT)	• Terminal is near full utilization for its general cargo operations • Limited opportunity for introduction of any additional large operations on-terminal without displacing an existing operation, but may support smaller operations. • May be opportunities for near-terminal operations, but must be coordinated with City's vision for the area. • May be long-term opportunities generated by private rail corridor and marine terminal interests.
Virginia International Gateway (VIG)	• The VIG terminal's master plan is focused on container operations. • Effectively no opportunity for consideration of additional on-terminal operations without impacting container operations. • Near-terminal opportunities may be present.
Virginia Inland Port (VIP)	• Available sites on- and off- terminal for business opportunities that seek intermodal access to the Port's marine terminals.

2. DEVELOPMENT OF A RAIL MASTER PLAN WITH THE FLEXIBILITY TO SUPPORT NEAR- & LONG-TERM BUSINESS OPPORTUNITIES AT PORT FACILITIES	
Port of Richmond (POR)	• Available sites on-terminal for facility development; rail operations may require additional rail to support. • Opportunity for to integrate near-terminal industrial development with the terminal using underutilized industrial sites along Deepwater Terminal Boulevard.
Craney Island Marine Terminal	• Long-term opportunity to substantially increase Port of Virginia's container capacity • Terminal concept includes significant rail capacity (~1.4M containers/year) • Planned to have competitive dual rail access via CWRY.

3. Identification of Any Operational & Physical Constraints or Limitations on Providing Efficient & Competitive Dual Rail Access Service to the Port Facilities & Recommendations to Mitigate Them to the Extent Practicable

Terminal	Existing Competitive Rail Access	Operational and Physical Constraints to Efficient & Competitive Dual Rail Access Service	Mitigation Measures
Norfolk International Terminals (NIT)	NS CSX (via NPBL)	• Introduces additional operations for the non-owning railroad to provide rail service due to the need to interchange with a second railroad. • Prioritization of traffic between the railroads may not be effectively aligned with the needs of the Port.	• Strategic alignment of ship lines to maximize availability of rail capacity for those ship lines with significant rail cargo, in consideration of multiple other factors. • Improved utilization of off-dock intermodal yards via drayage or barge service, if unable to meet demand with on-dock rail.
Portsmouth Marine Terminal (PMT)	CSX NS (via NPBL)	• Introduces additional operations for the railroad with indirect access to provide rail service due to the need to interchange with a second railroad. • Prioritization of traffic between the railroads may not be effectively aligned with the needs of the Port.	• For locations where tenant development is being sought (e.g. PMT) and may have tenants served by different railroads, develop operating procedures and strategies to coordinate tenant operations and define expectations for level of service. • Support strategic investments in infrastructure where operational constraints cannot be overcome.

3. Identification of Any Operational & Physical Constraints or Limitations on Providing Efficient & Competitive Dual Rail Access Service to the Port Facilities & Recommendations to Mitigate Them to the Extent Practicable			
Newport News Marine Terminal (NNMT)	CSX NS (via CSX)	• Introduces additional operations for the non-owning railroad to provide rail service due to the need to interchange with a second railroad. • Prioritization of traffic between the railroads may not be effectively aligned with the needs of the Port.	• Current and anticipated rail demand for NNMT does not warrant active investigation of mitigation measures.
Virginia International Gateway (VIG)	CSX (via CWRY) NS (via CWRY)	• Introduces additional operations to rail service (relative to a single provider) due to the need to interchange with a second railroad. • May require additional infrastructure on part of the short line and/or the terminal to manage both railroads' rolling stock.	• Strategic alignment of ship lines to maximize availability of rail capacity for those ship lines with significant rail cargo, in consideration of multiple other factors. • Consider solutions to improve utilization of off-dock intermodal yards via drayage or barge service, if unable to meet demand with on-dock rail. • Ongoing coordination between the Port, railroads, and other stakeholders (e.g. U.S. Customs and Border Protection) to align resources and seek process optimizations that benefit all parties.
Virginia Inland Port (VIP)	NS	• Terminal has access to NS mainline only.	N/A

3. Identification of Any Operational & Physical Constraints or Limitations on Providing Efficient & Competitive Dual Rail Access Service to the Port Facilities & Recommendations to Mitigate Them to the Extent Practicable			
Port of Richmond (POR)	CSX (City Contract) NS (via CSX)	• Introduces additional operations for the railroad with indirect access to provide rail service due to the need to interchange with a second railroad. • Prioritization of traffic between the railroads may not be aligned with the needs of the Port.	• Ongoing coordination between the Port, railroads, and other stakeholders to align resources and seek process optimizations that benefit all parties. • Support strategic investments in infrastructure where operational constraints cannot be overcome.

4. Identification of Any Improvements to Rail Access to the Port Facilities & Related Intermodal Facilities to Support Desired Train Volumes	
Norfolk International Terminals (NIT)	• Marshalling yard tracks may need to be modified to mitigate impacts to NPBL service during assembly of intermodal trains for departure. • Constructing a grade-separated crossing on Hampton Boulevard at Terminal Boulevard will improve operational flexibility for managing arriving intermodal trains. • Elimination of the two at-grade crossings into the adjacent residential neighborhood on the NIT arrival tracks along Terminal Boulevard would support arrival of longer trains and more efficient arrival operations. • Other Sewell's Point Line improvements as needed to mitigate rail traffic congestion (determined by NS).

Portsmouth Marine Terminal (PMT)	• On-dock rail will need to be constructed to suit operational needs of tenant and Port.
	• Terminal has heavy lift to rail capabilities that may need to be retained.
	• Concepts supporting unit train operations and/or smaller scale industrial operations have been developed. Implementing the unit train concept may requires property from adjacent CSX intermodal yard. Also may displace some Port operations (empty container yard).
	• Existing constraints limit east and west rail leads to single track, which could hamper fluid rail operations between tenants.
	  o East lead restricted by current tunnel construction activities; constructing additional tracks may be feasible but needs to be evaluated.
	  o West lead constrained by Pinner's Point highway interchange support piers. Establishing second track into terminal will require additional property.

4. Identification of Any Improvements to Rail Access to the Port Facilities & Related Intermodal Facilities to Support Desired Train Volumes	
Newport News Marine Terminal (NNMT)	• Adjacent CSX rail corridor has minor vertical clearance restrictions that may need to be corrected if justified by a new cargo opportunity (CSX has identified these improvements) • Rehabilitation and improvements to terminal tracks likely necessary to support expansion of rail activity at terminal. • Opportunity to explore more-integrated connection between terminal and near-terminal rail yard if a sufficient cargo operation is identified.
Virginia International Gateway (VIG)	• Terminal has areas to construct expanded intermodal capacity • Constructing additional tracks at Suffolk Marshalling Yard needed to support interchange operations with NS and CSX. • Construction of additional crossovers on CWRY line may provide additional operational flexibility. • Extending the double track segment of the corridor to support fluid movement of rail traffic to/from VIG.
Virginia Inland Port (VIP)	• Additional on-dock tracks may be necessary to support increased volume • May need to evaluate additional on or offsite trackage to deconflict arrival and departure operations with other NS mainline traffic.
Port of Richmond (POR)	• Construct additional rail infrastructure (working and storage tracks) to expand rail capacity (effectively at capacity during peak grain season). • Expansion of off-terminal rail infrastructure to support fluid train movements to the terminal, if justified by cargo volume.

5. IDENTIFICATION OF POTENTIAL INCREASES TO THE PORT FACILITIES' INTERMODAL RAIL THROUGHPUT CAPACITY AS DEMAND INCREASES	
Norfolk International Terminals (NIT)	• Rail operations are undergoing optimization efforts to increase capacity using the existing rail infrastructure. • Terminal configuration supports construction of additional working tracks to provide greater rail capacity at the terminal.
Portsmouth Marine Terminal (PMT)	• Current operations focused on over-the-road truck intermodal transportation. • Opportunity to provide intermodal rail service via adjacent CSX intermodal rail yard.
Newport News Marine Terminal (NNMT)	• The Port currently uses NNMT as a general cargo terminal; implementation of significant intermodal operations would necessitate significant infrastructure improvements.
Virginia International Gateway (VIG)	• Terminal configuration supports expansion of intermodal capacity. • Greater capacity of existing facilities may be achievable if/as demand conditions and rail service trend towards more optimal conditions, including CSX double-stack service and more balanced import/export demand.
Virginia Inland Port (VIP)	• VIP's intermodal capacity may be increased through the construction of additional working tracks. • Near-term capacity controlled by frequency of NS service.
Port of Richmond (POR)	• Over-the-road truck intermodal operations use POR as an inland access point to NIT and VIG via barge service. • Intermodal rail operations at POR are not envisioned.

6. SJR69 Specific Issues of Concern	Summary of Master Rail Plan Findings
Strategic recommendations to guide future rail planning and funding decisions to support desired train volumes.	
Recommendation 1: State planning and investment in rail infrastructure serving The Port should maximize utilization of existing rail and rail-related infrastructure among all parties.	• Designate an existing entity (e.g. OIPI) or create a new entity (e.g. Office of Freight Planning) to facilitate continuous and comprehensive coordination efforts among the Port, railroads, passenger rail, U.S. Customs and Border Protection, and other stakeholders to optimize rail service to the Port through improved alignment of schedules and resources. Similar efforts have been successful at other U.S. ports and in the Virginia I-95 rail corridor. • The Port should provide regular input to, and collaborate with, this entity to evaluate and establish achievable and sustainable goals for rail intermodal service across the entirety of the Port. • Focus of these efforts should include identification of critical infrastructure needs that are not readily apparent to any one stakeholder, conducting more accurate benefit/cost assessments, development of analytical tools and supporting data collection to support better decision making, and exploring cost-and risk-sharing opportunities. • Designated entity should also regularly review public funding programs for rail, port, and highway infrastructure and operations to ensure that operational enhancements, such as use of mechanisms to provide supplemental funding to U.S. Customs and Border Protection operations, receive due consideration in such programs. • A wide variety of performance expectations, performance incentives, and performance standards have been established as justification for public investment in rail infrastructure. The Commonwealth and the Port should ensure, in a transparent and collaborative fashion, that those expectations, incentives and standards all contribute to the overall goals of The Port and the Commonwealth.

6. SJR69 Specific Issues of Concern	Summary of Master Rail Plan Findings
Recommendation 2: Develop policies and/or programs to support local infrastructure planning and investment where rail activity occurs.	• Designate a lead individual or entity to explore programs to assist communities with coordination, planning, and funding of improvements to mitigate rail impacts, including quiet zones, crossing safety improvements, and grade-separated crossings, with short-term emphasis on the Commonwealth Railway corridor and Class I corridors in the vicinity of the CWRY interchange. Similar programs adopted by other states include California's Section 190 Grade Separation Program and North Carolina's Sealed Corridor Project. • Designate a lead individual or entity (e.g. the designated entity in Recommendation 1) to explore program options for ensuring that existing, rail-served industries are not disadvantaged by other rail projects and programs. • Establish a process for the Commonwealth to develop guidelines and metrics for use in prioritizing and justifying community and industrial mitigation efforts.
Recommendation 3: Where opportunities to foster Port-served private industrial activities are present, maximize the value of Port assets by improving coordination of on- and off-terminal development.	• Given the value and scarcity of Port property and the access it provides to deep draft vessels, the Port should evaluate, on a case-by-case basis, the extent to which it accommodates prospective private rail-served industrial operations within its terminal boundaries. If the Port determines an attractive operation cannot be wholly accommodated within a terminal, a lead individual or entity such as VEDP or DRPT should be designated to coordinate roles, responsibilities, and resources among stakeholders to evaluate and develop off-terminal rail facilities that could support realization of the opportunity. • The designated lead individual should use this Master Rail Plan to assist with the identification, coordination, and development of off-terminal needs. • Off-terminal development plans should seek to support other terminal rail activities where feasible and practical to maximize potential use as rail needs evolve over time.

6. SJR69 Specific Issues of Concern	Summary of Master Rail Plan Findings
	• Off-terminal rail development plans should preserve the opportunity for competitive dual rail access to the terminal(s) it supports. • Where opportunities to benefit from private development efforts appear to be present, designate a lead individual or entity to establish benchmarks for tracking progress and expected involvement from state agencies, including the Port.
Recommendation 4: The Master Rail Plan identifies off-terminal impacts and constraints as intermodal rail traffic increases at NIT, VIG, PMT, and a future marine terminal. The following efforts will support near-term competitive improvements or community relief for intermodal rail activities, provided that the host railroad accepts the improvements and any associated conditions, and that planned terminal expansions occur as currently planned.	**Norfolk International Terminal (NIT)** • Double-tracking the rail line between Portlock and NIT would lower operational costs for NS, NPBL, and other railroads that all use the line. • A direct connection between Lambert's Point line used by NPBL and the rail line to NIT once existed; reconstructing it would improve access for CSX trains via NPBL. • Establish storage for a complete unit train (i.e. no breaking) on NPBL system in order to stage longer trains. **Virginia International Gateway (VIG)** • Commonwealth Railway (CWRY) corridor should be double-tracked along its full length to support increased rail traffic at VIG. • CWRY's Suffolk Marshalling Yard should have two additional tracks constructed (already partially funded by an REF grant). • The interchange between CWRY and the Class I railroads in Suffolk should be evaluated for improvements. **Portsmouth Marine Terminal (PMT)** • If competitive rail operations are established at PMT, improvements to circumvent the physical constraints of the Pinner's Point interchange could mitigate some potential rail conflicts. This would likely require off-terminal property to construct. • There are likely on-terminal solutions to mitigate rail conflicts on the east lead, once Midtown Tunnel construction is complete, but those will depend on any on-terminal activities or users.

6. SJR69 Specific Issues of Concern	Summary of Master Rail Plan Findings
	Newport News Marine Terminal (NNMT) • Engage with CSX to address vertical clearance restrictions on the Peninsula Subdivision that currently limit the height of rail cars (in particular, multi-level automobile carriers) may allow The Port to more effectively compete for automobile cargo and other breakbulk cargo through NNMT. **Future Craney Island Marine Terminal (CIMT)** • Property for the rail corridor needs to be acquired. • A significantly larger CWRY marshalling yard will be necessary to support CIMT at full build out. Recommend identifying potential sites for this yard. • Improvements will be needed near VIG to allow CIMT traffic to pass while trains arrive at or depart from VIG. • Related commercial issues must be identified and resolved.

Appendix B

Summary of Private Industry Input

During the development of this Master Rail Plan, input from a variety of industry sectors was sought to understand what qualities of rail and port operations are most relevant to industry operations. Discussions further touched on where industries see opportunities to further improve the competitiveness and attractiveness of rail-served operations at The Port of Virginia.

Bulk Commodities

The overarching theme for bulk commodity industries was the strong desire for a responsive supply chain that provided consistent quality of service. Industries involved in importing or exporting bulk commodities, such as soybeans, corn, and other grain products, typically seek to minimize their costs by establishing highly efficient and closely coordinated supply chains to minimize the number of assets needed (e.g. rail cars, track, vessels, and silos). Rail and ship line services further encourage this behavior with rate structures that incentivize rapid turnaround of assets (e.g. 12 – 15 hour unloading windows for trains) and efficient crew use.

Attractive locations for rail-served facilities are those that can accommodate best-in-class operational practices such as the following:

- High-Speed / High-Volume facilities that provide economies of scale and minimize the time transport assets (rail and vessels) are held on site.
- Loop tracks that permit the loading or unloading of rail cars without breaking a unit train into multiple rail car strings and reducing the number of non-productive moves.
- Unrestricted operations, including priority access by rail providers and the opportunity to use onsite locomotives to quickly execute operations on time and with minimal disruption. Typically requires additional tracks to allow other trains to pass.
- Consistent service by the rail provider(s) to support the close coordination of supply chain elements - particularly the ability to meet schedule commitments for arrival, departure, and other railroad-supported activities. This level of service is often impacted by the presence of constrained rail infrastructure (e.g. single track segments) used by multiple rail providers.
- Deep draft port facilities that enable the industry to use modern, larger vessels.

Furthermore, bulk commodity industries generally seek to construct facilities specific to their operational needs. The opportunity to be in immediate proximity to complementary industries can also be desirable.

Due to the low margins associated with bulk commodities, competitive rail pricing generated by facilities having dual rail access is regarded as extremely attractive as well.

Outside the facility, the capacity of the associated local and interstate rail corridors is also a consideration. Bulk commodity unit trains are typically 75 to 95 cars (4,800 – 6,700 L.F.) or more and require equally long passing sidings, local yards, and storage tracks to efficiently travel. This infrastructure also impacts the responsiveness of goods movement to other uncertainties or events occurring within the supply chain, such as vessel schedule changes.

Financial assistance, in the form of subsidies, tax breaks, financing, or other benefits are naturally attractive, but are generally regarded as a secondary consideration to the inherent operational potential of the site when evaluating where to make a capital investment. The level of investment in the common infrastructure serving the broader industrial community by public entities and/or the railroads was regarded as more important.

Transload

Transload operations are those operations that receive containerized cargo and distribute its contents to multiple trailers; or those that receive non-containerized materials and load into containers.

Container to Trailer Transload

Container to trailer transload is typically used by retail customers. Large orders of single products from overseas suppliers via container. It is unlikely that a single store requires a full container of a single product, so the containers are delivered to a distribution center which splits the container cargo between trailers bound for multiple stores. Each trailer delivers multiple products from multiple containers.

Rail service typically provides a link between the port and inland distribution centers. As a critical segment in the supply chain, these operations are price-sensitive but also strongly consider the speed and reliability of the rail service from the port to the distribution centers.

Cargo to Container Transload

Container loading operations provide the opportunity for exporters to reach smaller markets where demand does not warrant (or infrastructure cannot support) bulk delivery. Examples of this include placement of grain from gondola rail cars into containers, containerizing logs and lumber products, and containerizing paper products. These operations typically seek to make use of the empty container inventory generated by imbalance between import and export volumes. Rail service may either provide the means to transport the raw good (e.g. grain cars) or the loaded containers thereafter.

These transload operations typically serve customers from multiple origins with loaded containers headed for multiple destinations, and thus benefit greatly from access to multiple railroads and multiple ship lines.

Other critical elements for site selection includes the following:

- Proximity to marine terminal to minimize (or eliminate, if on-terminal) drayage costs
- Terminal gate capacity (where containers are transported to the terminal via truck)
- Opportunity to load containers above highway weight limits
- Proximity to concentrations of empty containers
- Opportunity to use own labor to load the containers
- Synergies or services that further reduce costs

These services also typically operate with low margins, limiting their opportunity to make significant infrastructure investments.

Break Bulk

Break bulk cargo has been largely replaced by intermodal container operations, but does remain part of selected industry supply chains. In Virginia, this cargo includes paper goods and rubber.

On-dock warehouse facilities are typically sought in support of quickly moving the cargo between the ship and sheltered storage, where transfer to/from box cars or trucks occurs. Rail demand is typically lower and less sensitive to schedules, and thereby can function with less efficient infrastructure than the bulk operations discussed above, particularly. Trains associated with break bulk cargo can typically be accommodated on the shorter yards and sidings prevalent in the Hampton Roads area.

Break bulk operations do not typically use specialized infrastructure and can be viable at facilities that have not been modernized. This allows prospective operations to consider use of less-than-ideal locations, particularly if the leasing costs are low and/or there are subsidies or incentives offered to overcome high land development costs. At The Port of Virginia facilities in particular, the prevailing soil characteristics frequently necessitate use of higher cost foundation structures to support the high working loads sought by break bulk operations.

The primary considerations for evaluating a rail-served facility include the size of the warehouse, including interior bay dimensions, proximity to the wharf, and length of the rail loading dock. Truck traffic is also a large element and similar consideration is given to the truck facilities, such as number of loading docks and ease of access to arterials and highways (often evaluated on the potential number of daily trips a truck could make between the site and local customers).

Dual rail access is preferred again for the competitive price pressure, but also as an opportunity to broaden the customer base via an increased number of inland destinations/origins. Dimensional clearances of the rail corridors are also considered, as the industry has been transitioning to “high cube boxcars” whose heights may exceed the design clearance criteria used by railroads in the past.

Ro-Ro Cargo

Industries with Roll-on / Roll-off cargo, primarily relating to automobile import and exports, generally rely on the railroads and ports to provide the infrastructure necessary to transfer the vehicles between the railcars and vessels. The industries further coordinate with each other to generate economies of scale and convenience through improved utilization of the infrastructure and rail car assets (i.e. in addition to the ramp infrastructure supporting multiple companies, there is effort to balance import and export activity to improve utilization of the vessels and rail cars).

These industries are therefore primarily attracted by other Ro-Ro activity and the opportunities for lower costs from the improved asset utilization described above. Decisions regarding port selection are driven primarily by the chosen rail provider and their connections to ports. Rail service is typically contracted

for relatively short durations (a few years) and then rebid. This arrangement generally diminishes access to incentives offered by states and are only effective if offered to a railroad for use as a pricing advantage.

The infrastructure needed to support Ro-Ro operations generally consists of large storage yards for vehicle staging, and multiple straight working tracks to support loading from the end of the train with portable ramps. For heavy machinery, this typically consists of one or more vehicle ramps to drive cargo onto flatbed rail cars. For automobiles, straight track segments with work areas at either end for mobile loading ramps are needed to allow vehicles to be driven onto the rail cars.

Other Feedback

Other industries providing feedback to this rail plan expressed concern regarding rail congestion within the Richmond area and its impact to both the cost and quality of rail service to industrial activities east and north of the Richmond metropolitan area (e.g. Counties of King William and New Kent). Representatives of these industries believe that improvement of rail service to their facilities would assist them with expanding their operations into international markets via Port of Virginia facilities (or domestically via improved access to imported cargo).

Participating rail-served industries with no specific ties to Port of Virginia facilities indicated that they have encountered level of service issues relating to availability of railroad assets (locomotives).