VIRGINIA
STATEWIDE RAIL PLAN

CHAPTER 4

PROPOSED FREIGHT RAIL IMPROVEMENTS AND INVESTMENTS

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4 Proposed Freight Rail Improvements and Investments

4.1 Introduction

This chapter describes potential improvements and investments to address the freight rail and rail safety needs of Virginia. The following chapter describes projects identified by Virginia railroads and other participants in the outreach activities conducted during the development of this Plan, as described in **Chapter 6**. Select projects are included in DRPT's Rail Service and Investment Program (RSIP), which is the subject of **Chapter 5**. Although the projects described in **Chapters 3, 4, and 5** differentiate between passenger and freight rail, as required by FRA, in Virginia passenger and freight rail services operate on shared routes. As a result, many of the projects and initiatives discussed in this chapter ultimately benefit both passenger and freight rail and could be considered both a passenger and a freight rail project.

4.2 Class I Railroad Improvements

Class I railroad companies in Virginia must use private financing to cover the cost of equipment acquisition, such as locomotives and railcars, and infrastructure improvements aimed at renewing, upgrading, or expanding the state rail network, such as rail, ties, bridges, and signal systems. Railroads rely on a regulatory framework that provides sufficient return on investment as a means to accommodate these capital expenditures. Some programs administered by DRPT – notably the Rail Enhancement Fund – are available to Class I railroads to help fund rail network improvement projects, target job creation projects, and follow the goals and objectives of the State Rail Plan.

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During the last five years, the Class I railroads in Virginia have invested heavily in their networks to solve persistent capacity constraint issues that impact efficiency, velocity, and volume of through traffic. These investments were made to eliminate/mitigate operational chokepoints, handle various upgrades associated with maintenance and safety (including implementing Positive Train Control [PTC], which reduces the likelihood of train speeding and collisions), improve economic efficiency, support environmental sustainability, and accommodate routine infrastructure renewal.

Virginia's Class I railroads will continue to upgrade bridges and other infrastructure on several branch lines in the Commonwealth in order to accommodate railcars with a maximum allowable gross weight of 286,000 pounds (which has become the industry standard weight limit on Class I railroads). Detailed characteristics of the Class I rail network in Virginia, including allowable weights, are identified in **Appendix A**. Class I railroad needs were discussed with each of the carriers during the stakeholder outreach process conducted for the Virginia State Rail Plan.

4.2.1 Class I Railroads Past and Planned Improvements

4.2.1.1 CSX Transportation

Capital outlay by CSX on its total network during 2015 was $2.6 billion and included maintenance and upgrading of existing track and bridges, adding new track capacity, and improvements to network and facility efficiency.[1] Approximately $42.6 million of this investment was made in Virginia.[2] CSX's recent projects completed during 2011-2015 address mainline capacity constraints and operating efficiency issues within/affecting its Virginia network and include:

- **National Gateway** – Multi-state, public-private infrastructure project to improve the flow of freight between the Mid-Atlantic and the Midwest by clearing key freight corridors for double-stack rail service.[3] This project will help to create a more efficient rail route that links Mid-Atlantic ports with Midwestern consumption markets.[4]
- **Virginia Avenue Tunnel** – Replacement of one single-track, low-clearance tunnel with two new tunnels with clearance for double-stack rail service in southeast Washington, D.C. is critical in the movement of freight between key ports, manufacturing, and consumer markets while reducing rail and highway congestion in Washington, D.C. and the surrounding area. One tunnel is completed and in service, and one tunnel is still under construction.

CSX reported that it planned to invest approximately $2.4 billion on its total network in 2016.[5] Projects will generally include maintenance of the core network and infrastructure, PTC implementation, and locomotives and equipment. Specific future capital investment projects for its network in Virginia were not identified by CSX during development of the Virginia State Rail Plan with the exception of the continuation of the National Gateway Project.

1 https://www.csx.com/index.cfm/library/files/responsibility/2015-csr-downloads/2015-report/
2 https://www.csx.com/index.cfm/about-us/state-information/virginia/
3 https://www.csx.com/index.cfm/about-us/state-information/virginia/
4 https://www.csx.com/index.cfm/about-us/projects-and-partnerships/national-gateway/
5 http://www.rtands.com/index.php/freight/class-1/csx-targets-dol24-billion-capex-in-2016.html

4.2.1.2 Norfolk Southern Railway

Between 2015 and 2017, NS reported capital investments averaging $2.1 billion annually to maintain and improve rail infrastructure to enhance capacity, safety, and efficiency on its nationwide network, and to make improvements to its equipment.[6] These investments between 2015 and 2017 include[7]:

- Network Investments – $1.40 billion annual average
- PTC Implementation – $235 million annual average
- Rail Equipment – $489 million annual average

Specific projects and their respective capital costs were not identified, but these investments generally include:

- **Track and Bridge Infrastructure –** Includes replacement of rail and ties, improvements to bridges, the addition of double track in some locations, clearance projects for double-stack trains, and upgrades to some branch lines that have realized an increase in traffic volumes.
- **Safety –** Includes installation of additional wayside asset protection devices, such as hot wheel detectors, wheel impact load detectors, signaled sidings for broken rail detection, PTC, and implementation of new track geometry testing and joint bar inspection technology.
- **Growth and Productivity Initiatives –** Includes improvements to yards, intermodal terminals and transload and distribution facilities, and information technology.
- **Equipment –** Includes acquisition of new high-horsepower locomotives and rehabilitation and investment of freight rail cars.

Table 4-1 identifies several specific projects recently completed by NS in Virginia during 2011-2015. Recently, NS completed improvements to both its Heartland and Crescent Corridors, allowing for more efficient freight transportation into the interior of the U.S. and into the Northeast. These projects also addressed mainline capacity constraints and operating efficiency issues within its Virginia network.

[6] http://nscorp.com/content/nscorp/en/norfolk-southerns201524billioncapitalplan.html
[7] Ibid; http://www.rtands.com/index.php/freight/class-1/norfolk-southern-2016-capex-reflects-strategic-focus-toward-streamlined-railroad.html; http://www.progressiverailroading.com/rail_industry_trends/news/Most-Class-Is-cut-capital-spending-for-2017--50691

Table 4-1: Recent NS Capital Projects in Virginia 2011-2015[8]

Project	Type of Improvement	Location
Glade Springs	Siding Extension	Glade Springs
Manassas to Lynchburg	Increase Track Speeds; New Turnouts	Manassas to Lynchburg
Montgomery	Tunnel Clearances	Montgomery
Richmond	Increase Bridge Clearances	Richmond
Chesapeake	Rehabilitate Movable Span Bridge	Chesapeake
Elkton	Replace Superstructure	Elkton
Heartland Corridor	Tunnel clearances and track capacity increase	Norfolk to Roanoke (Virginia) and other locations in the network

During railroad outreach undertaken for development of the Virginia State Rail Plan, NS identified capital needs related to the Port of Virginia. Grade separation projects in particular were identified and would allow for more efficient freight rail moves while also minimizing potential motor vehicle delay at existing at-grade crossings. NS recognizes that these improvements are expensive and will require coordination among multiple public and private parties.

Current bottlenecks and specific future capital investment projects for its network in Virginia were not identified by NS during development of the Virginia State Rail Plan.

4.3 Shortline Railroads Past and Planned Improvements

Virginia's shortline railroads generally face a different set of challenges to implementing improvement projects than do the Class I railroads. This is largely a result of the lack of capital and technical resources, operating capacity and flexibility, and modern infrastructure when compared to the larger Class I railroads.

Shortline railroads typically rely upon private funding, public funding, or some combination of these sources to cover the capital cost of equipment acquisition and general infrastructure improvements. The potential for this funding and its applicability to shortline railroad improvement projects in Virginia are discussed in **Chapter 5**.

[8] http://nscorp.com/content/nscorp/en/norfolk-southerns201524billioncapitalplan.html

Typically, the largest constraints on shortline railroads in the U.S. involve accommodating railcars with a maximum allowable gross weight of 286,000 pounds (the industry standard weight limit on Class I railroads that interchange with the shortlines). Railcars with larger loading capacity provide greater operating efficiency by reducing labor, fuel, and maintenance costs while increasing capacity and synergy for rail operations and rail shippers. In order to accommodate heavier cars, shortline railroads must make upgrades to the track structure, substructure (the rail, switches, ties, and ballast), and bridges to handle the additional loads and stress caused by transporting the heavier cars. Segments of the Virginia rail network incapable of handling these heavier loads, as identified by the Commonwealth's freight railroads during coordination undertaken for the development of the Virginia State Rail Plan, appear in **Appendix A**.

Typically, the largest constraints on shortline railroads in the U.S. involve accommodating railcars with a maximum allowable gross weight of 286,000 lbs.

Due to their strategic locations, many of Virginia's shortline railroads have also shown interest in developing bulk transload and intermodal facilities along busy trucking corridors, such as Interstate 64, Interstate 81, and Interstate 95. These facilities would be served by shortline railroads with freight capacity and would also help to minimize truck traffic to/from many of Virginia's port locations.

Older infrastructure on shortline railroads creates chokepoints that have the potential to limit capacity and hamper the efficiency and flexibility of modern operations. Among other things, chokepoints, and their resultant operational impacts, can lead to protracted delays for motorists and emergency vehicles at blocked highway-rail grade crossings, and can negatively affect air quality due to increased emissions from idling vehicles and trains. Potential constraints from the older shortline infrastructure include:

- Yard capacity that is insufficient for building trains, switching, and staging cars.
- Sidings that are of inadequate number, length, or location to accommodate the demands of present-day train operations.
- Delays that stem from interchanging railcars with another carrier or in the use of trackage rights to access an isolated segment of their network.

4.4 Port-Rail Improvements

As noted in Chapter 1, growth in intermodal rail traffic is a driving factor in rail planning decisions. Intermodal growth is largely driven by the Port's connectivity to markets outside Virginia and the expansion of the Panama Canal, allowing larger container vessels to reach the U.S. east coast. The Port's ability to handle this additional intermodal traffic depends on continued investment in port-rail

infrastructure. In particular, continued investment is critical to ensure the ports' competitiveness relative to other regional ports to the north and south of Virginia.

The Port is poised to enhance multimodal transportation opportunities through investments targeted to rehabilitate existing rail connections between principal railroad lines and port properties; additional sidings, spurs, or yard tracks for switching, staging, and storing railcars at or near port facilities; and expanding on-dock rail capacity; thus enabling more inbound and outbound port traffic to be hauled by rail.

A brief summary of each of port's capabilities is in **Appendix N**. **Table 4-2** illustrates the anticipated rail-related project for each of the ports.

Table 4-2: Virginia Port Authority's Current Rail-Related Projects

Port	Projects
Norfolk International Terminals	Increase on-dock rail capacity by expanding the existing rail yard and improving train loading and unloading efficiencies.
Portsmouth Marine Terminal	Upgrade terminal infrastructure and maximize the use of undeveloped areas in order to increase container storage capacity.
Newport News Terminal	No current rail-related projects.
Virginia Inland Port	Increase on-dock rail capacity by expanding the existing rail yard and improving train loading and unloading efficiencies.
Richmond Marine Terminal	Upgrade existing lead track and improve connectivity with national freight network.
Craney Island Marine Terminal	Improve land area for site develop and construct new intermodal container terminal.

4.5 Highway-Rail Crossing and Safety Improvements

Virginia spends approximately $4 million per year on highway-rail crossing improvements to enhance safety. Funding comes from the Virginia Highway-Railroad Grade Crossing Safety Program (supported by the Federal Highway Safety Improvement Program; formerly Section 130 funds), the Virginia Highway-Railroad Grade Crossing Surface Repair Program, and the Virginia Primary Road-Highway-Railroad Grade Crossing Repair Program. Virginia strives to consolidate projects where possible (e.g., a combination of closures and warning device installation as one project). Refer to **Chapter 2.1.5** of **Chapter 2** for further details about these federal and state funding sources and **Chapter 2.1.6** in **Chapter 2** for a rail crossing inventory and safety data for Virginia.

Over $140 million (2015 dollars) has been spent on upgrading more than 1,340 rail grade crossing locations throughout the Commonwealth since inception of the Federal Highway Safety Act of 1973.[9] During 2017, Virginia anticipates spending approximately $4.0 million, mostly to upgrade active warning devices. Projects funded during 2015-2016, along with the total capital investment for each year's projects, include:

- 2015/2016 ($3.95 million) – 20 total projects:
  - 10 projects upgrading crossings with only flashing light signals to flashing light/gate arm crossings
  - 10 projects upgrading continuous warning time circuitry in crossings protected by flashing light signals and gate arms

Appendix E contains a listing of major Section 130 projects in Virginia.

Beyond highway-rail crossing safety improvements, DRPT identified specific goals for rail safety and estimated the costs for achieving these goals. These are identified in **Chapter 5** of the Virginia State Rail Plan.

4.6 State-Sponsored Rail Investment Programs

The state-sponsored rail programs identified in this chapter are consistent with VTrans2040, which underscores the idea that potential changes in catalytic factors, such as major economic generators, freight movement, household characteristics, land development patterns, transportation technology, and the natural environment, will require a transportation system that is developed with these factors in mind.[10]

In Virginia, these state-sponsored rail investment programs are led by DRPT, with the CTB allocating state funds for the programs. Freight rail funding includes improvements for Virginia's Class I railroads (CSX and NS), nine shortline railroads, the Virginia Port Authority, and businesses expanding or locating on the railroad network. In addition to improving freight capacity, DRPT works to preserve existing freight capacity when accommodating new passenger rail services.[11]

[9] http://www.virginiadot.org/business/HSIP_Implementation_Manual_060315.docx
[10] Ibid.
[11] http://www.drpt.virginia.gov/rail/rail-overview/

Chapter 2 of the Virginia State Rail Plan details how Virginia Code authorizes each of the Commonwealth's sponsored rail investment programs. A list of projects funded through these programs can be found in **Chapter 5** of the Virginia State Rail Plan.

4.7 Concepts from Stakeholder Outreach

Participants in the Statewide Rail Plan Stakeholder Committee and members of the public suggested various project concepts. The stakeholder committee meeting was held on November 22, 2016 and used various activities that engaged key rail stakeholders in identifying bottlenecks, chokepoints, and economic development opportunities in the Commonwealth. The stakeholder committee also identified investments to best enhance the Virginia railroad network. Other outreach activities focused on interviews with representatives from the Commonwealth's Class I and III railroads, government agencies, and metropolitan planning organizations. Outreach conducted as part of the Virginia State Rail Plan is described in **Chapter 6**.

The project categories identified during the outreach are described in the Virginia Rail Service and Investment Plan featured in **Chapter 5** of the Virginia State Rail Plan.

4.7.1 Proposed Freight Projects

Stakeholders generally identified the potential for rail-related projects or initiatives to address:

- Bottlenecks associated with capacity on rail lines and in rail yards;
- Congestion on the Commonwealth's railroad network in urban areas;
- Development of enhanced intermodal and transload facilities;
- Enhanced railroad access and multimodal connectivity (i.e., truck/rail and river barge/rail);
- Opportunities for economic development and maintaining Virginia's competitiveness in the global marketplace;
- Availability of additional Commonwealth funding for railroad improvement projects;
- Improved network efficiency and safety;
- Maintenance and/or replacement of aging rail infrastructure;
- Improvement of the state of good repair of the Commonwealth's freight transportation network; and,
- Captivity of shippers to one railroad.

Specific projects identified through the survey and the stakeholder outreach process, and any opportunities for improved coordination or integration with current and potential future passenger rail services in the Commonwealth, are included in DRPT's Rail Service and Investment Program, which is the subject of **Chapter 5**.

4.7.2 Proposed Safety and Security Projects

Stakeholders generally identified the potential for rail-related projects or initiatives to address:

- Positive Train Control implementation;
- Grade crossing safety, improvements, and reduction by closure and/or grade separation;
- Protecting the integrity of Virginia's freight; and,
- Improved awareness of hazardous materials transportation by rail and improved training and response to hazardous materials incidents.

Specific projects identified through the survey and the stakeholder outreach process, and any opportunities for improved coordination or integration with current and potential future passenger rail services in the Commonwealth, are included in DRPT's Rail Service and Investment Program, presented in **Chapter 5**.