DISTRICT OF COLUMBIA

STATE RAIL PLAN

STATE RAIL PLAN: FINAL REPORT

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CHAPTER 1: The Role of Rail in District Transportation

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Chapter 1 The Role of Rail in District Transportation

1.1 INTRODUCTION

The intent of the District of Columbia State Rail Plan (SRP) is to provide an actionable and pragmatic roadmap for future rail investment and policies in the District. The plan has been prepared by the District Department of Transportation (DDOT) to meet the requirements of the federal Passenger Rail Investment and Improvement Act (PRIIA), passed in 2008, as well as the subsequent State Rail Plan Guidance issued by the Federal Railroad Administration (FRA) in 2013. While the primary purpose of PRIIA was to provide for improved passenger rail service in the United States, the Act requires each state to have an approved rail plan as a condition of receiving future rail funding for either passenger or freight improvements. Per FRA guidance and PRIIA requirements, the SRP includes:

- A description of the role of rail in District transportation (Chapter 1),
- A discussion of how stakeholder input was incorporated into the plan (Chapter 2),
- A description of the District's existing rail system (Chapter 3),
- An analysis of trends and forecasts that will create opportunities or needs in the future (Chapters 4 and 5),
- A discussion of passenger, freight needs and opportunities, and proposed improvements to meet these needs (Chapters 4 and 5), and
- The overall SRP vision and goals and a proposed rail service and investment program to address identified opportunities and needs (Chapter 6)

This SRP represents the first rail plan completed in over 30 years by the District of Columbia and focuses on intercity passenger rail, freight rail, and commuter rail.[1] Within the District, freight rail is provided by CSX Corporation, with Norfolk Southern holding rights for service. Intercity passenger rail is provided by Amtrak, and commuter rail service is provided by Maryland Area Regional Commuter (MARC) and the Virginia Railway Express (VRE). The remainder of this chapter describes the framework for the SRP within a federal and local context and introduces freight, commuter, and intercity rail providers in the District.

Although not large geographically, the District's rail network plays a major role in both the metropolitan and national rail networks. Washington Union Station is the terminus of the Amtrak-owned Northeast Corridor (NEC) and is the second busiest intercity passenger station in the nation. It is also the northern terminus of the planned Southeast High Speed Rail Corridor that will eventually connect Georgia, South Carolina, North Carolina, and Virginia to the nation's capital and the NEC. The District is the end point of the rapidly growing MARC and VRE services. It is also the junction linking CSX's Northeast, Southeast, and Midwest freight operations. As such, it is a key location in the CSX National Gateway initiative to improve rail traffic flows between the Eastern Seaboard and Midwest. By virtue of its proximity to the Capitol, the District's rail system also faces unique safety and security issues not found elsewhere.

[1] A State Rail Plan document was prepared by DDOT in the early 1980s, pursuant to FRA's Rail Planning Manual, Volume 1, Guide to Decision-Makers published in December 1976. Original copies of this prior plan are not available.

1.2 FEDERAL AUTHORITY FOR STATES

PRIIA Section 22102 stipulates eligibility requirements for a long-established FRA rail freight grant assistance program pertaining to State planning and administration. With FRA approval of this SRP document, DDOT is in compliance with Title 49 United States Code Section 22102 as follows:

> "A State is eligible to receive financial assistance under this chapter only when the State complies with regulations the Secretary of Transportation prescribes under this chapter and the Secretary decides that:
>
> (1) the State has an adequate plan for rail transportation in the State and a suitable process for updating, revising, and modifying the plan;
>
> (2) the State plan is administered or coordinated by a designated State authority and provides for a fair distribution of resources;
>
> (3) the State authority –
>
> a. is authorized to develop, promote, supervise, and support safe, adequate, and efficient rail transportation;
>
> b. employs or will employ sufficient qualified and trained personnel;
>
> c. maintains or will maintain adequate programs of investigation, research, promotion, and development with opportunity for public participation; and
>
> d. is designated and directed to take all practicable steps (by itself or with other State authorities) to improve rail transportation safety and reduce energy use and pollution related to transportation.
>
> (4) the State has ensured that it maintains or will maintain adequate procedures for financial control, accounting, and performance evaluation for the proper use of assistance provided by the United States Government"

This plan serves to meet this requirement by establishing a District of Columbia State Rail Plan.

1.3 INSTITUTIONAL GOVERNANCE STRUCTURE OF THE DISTRICT'S RAIL PROGRAMS

Under the "District of Columbia Home Rule Act of 1973," enacted by U.S. Congress and ratified by District voters, the District of Columbia Government was afforded limited self-governance. District home rule allows the District Government to conduct planning activities and seek federal funding opportunities that are managed by state governments in other locations. DDOT was established by the District Council in 2002 as "an agency within the executive branch of the government of the District of Columbia to improve the District's economic competitiveness and quality of life by planning, coordinating, and operating the transportation system…"[2] and is regarded by the USDOT as a state DOT. On May 4, 2016, the Transportation Reorganization Amendment Act of 2016 (TRA) was approved to restructure the DDOT's organization. This Act intends to improve the multi-modal transportation planning process in the District, and also assigns DDOT the responsibility for freight and passenger rail within the District. In this act, DDOT was designated the local rail planning agency for the District. The act states that DDOT is "…responsible for…Freight and passenger rail, to the extent such authority has been delegated or required by federal law."

[2] Title 50, Chapter 9A of the Code of the District of Columbia.

Rail planning falls under DDOT's Planning and Sustainability Administration (PSA), which is housed within the Project Delivery arm at DDOT. PSA is responsible for establishing broad strategic goals to guide multimodal program development, developing the policies necessary to implement such goals, and ensuring compliance through plan review and permitting.

DDOT is responsible for identifying and developing transportation-related projects for the District of Columbia Capital Improvement Program (CIP) and the annual Capital Budget. DDOT uses the CIP as the basis for projects to include in the Metropolitan Washington Council of Government's (MWCOG) Transportation Improvement Plan (TIP) and Financially Constrained Long-Range Plan (CLRP). Compiled by MWCOG, these two documents provide an overview of the region's planned and desired transportation projects over a 20-year period.

The District's plans also document the cost, implementation phasing, sources and types of funds for each project included in the program. The projects identified in Chapter 6 as part of the Rail Service and Investment Program accordingly could then be considered for inclusion in the Districts CIP, and also in MWCOG's TIP and CLRP.

1.4 MULTIMODAL TRANSPORTATION SYSTEM GOALS

The SRP is part of the District of Columbia's overall multimodal transportation planning efforts. In that context, the SRP is an outgrowth of the District's Multimodal Long-Range Transportation Plan (LRTP), moveDC, which presents strategic transportation planning goals and objectives developed through collaboration among DDOT and the District's many stakeholders. moveDC is an implementation-focused plan for the District's transportation future. Its goals and objectives provide a guideline for future transportation investment in the District, including for rail. The goals and objectives encompass seven key areas as presented in Table 1-1.

The goals specified by moveDC have many implications for the future of the District's rail network, and specifically, development of a SRP was identified within the 2-year moveDC Action Plan, The moveDC plan's goals can relate to the modification or improvement of the existing rail network or historical right-of-way in some form. This SRP has been prepared to be consistent with moveDC.

1.5 RAIL TRANSPORTATION'S ROLE WITHIN THE DISTRICT'S TRANSPORTATION SYSTEM

Rail transportation within the District plays a key role in moving people and goods, and significantly contributes to economic growth in the District by providing jobs and mobility for residents and commuters. Although there is not a significant amount of track in the District, the rail lines and facilities that are present are heavily utilized and critical assets to the region's transportation network. The roles played by freight, commuter, and intercity rail in the District vary. The SRP identifies various projects for these various types of rail in the District. These projects are further discussed in Chapters 4-6 and Appendix H.

Table 1-1: moveDC Transportation Goals and Rail-Related Objectives

moveDC Goal Area	Goal	Rail-Related Objectives
Sustainability and Health	Achieve 75% of all commute trips in the District by non-auto modes.	• Increase non-auto mode split • Encourage active transportation for health benefits • Reduce air and water quality impacts of transportation • Prepare the transportation system for changing environmental and climatological conditions
Citywide Accessibility and Mobility	Maximize system reliability and capacity for moving people and goods.	• Increase the person-carrying capacity of the transportation system • Improve system reliability • Reduce financial barriers to the lowest-income transportation system users • Accommodate the movement and management of freight and goods • Integrate the District's transportation system with the region's transportation network
Neighborhood Accessibility and Connectivity	Support neighborhood vitality and economic development.	• Increase the coverage of all modal networks throughout the District • Increase the number of transportation choices for travel between city neighborhoods • Increase transportation availability to population centers and jobs, schools, amenities, and services • Increase transportation availability to economically challenged or targeted redevelopment areas
Safety and Security	Achieve zero fatalities and serious injuries on the District transportation network.	• Improve safety for all users • Improve redundancy of transportation networks to handle emergencies • Maintain ability to evacuate the District in case of emergency • Preserve security of key functions without impacting the transportation system
Public Space	Reinforce Washington DC's historic landscapes and quality of neighborhood public space.	• Protect and enhance important corridors and urban landscapes
Preservation	Maximize reliability for all District transportation infrastructure by investing in maintenance and asset management.	• N/A
Funding and Financing	Invest in transportation to achieve outcomes within the plan horizon.	• N/A

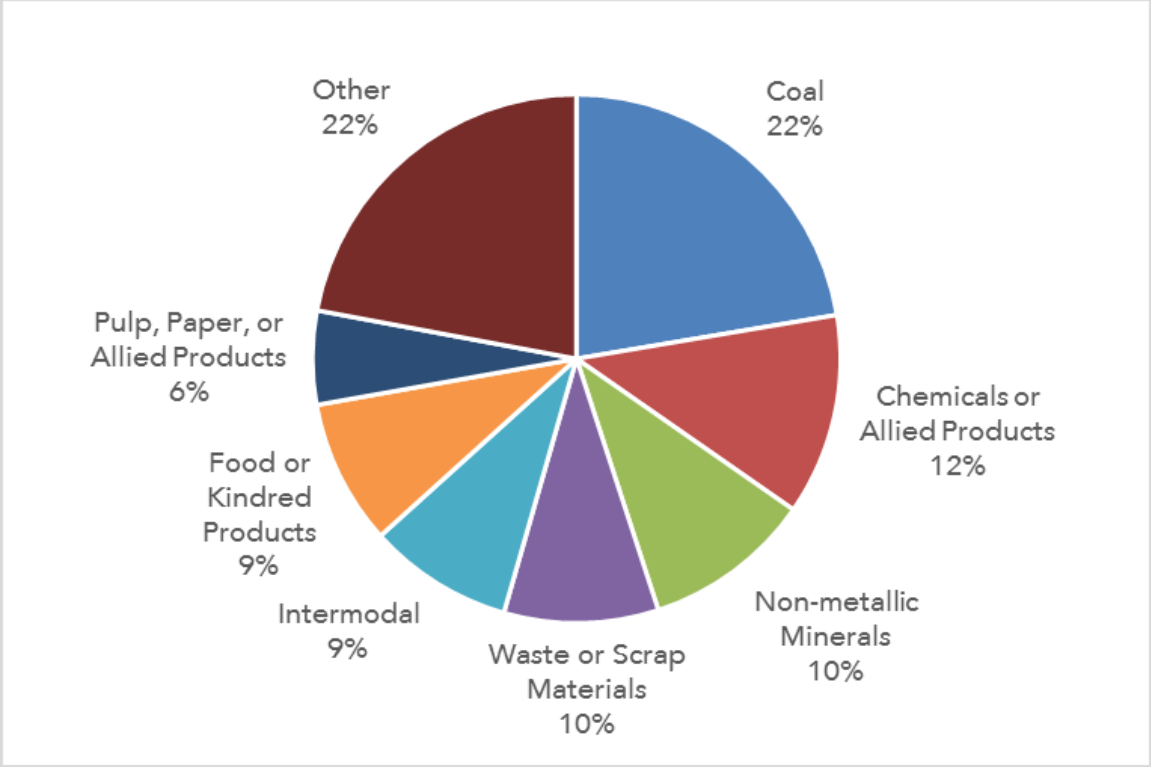
Source: moveDC

1.5.1 Role of Freight Rail

CSX is the sole freight rail service provider in the District operating over an active network of 21.0 miles.[3] Norfolk Southern has the rights to operate over 13.0 miles of the CSX network, but has no service at present. In 2014, 36.2 million tons of freight moved through the District. On a typical day, multiple freight trains move through the District: typically 14 general merchandise trains, 11 intermodal container trains, four dedicated trains of automobiles, and two bulk/grain/coal trains. The volume of freight moving through the District is equivalent to 1.8 million truckloads.[4] Data from the Association of American Railroads (AAR) and the District Freight Plan suggests that far more freight passes through the District by rail than by truck. The AAR estimated that in 2011 about 32.5 million tons of rail freight moved through the District. This compares to 10.4 million tons of truck freight traffic traveling through the District in 2011.[5,6]

The vast majority of rail freight in the District is pass-through or overhead traffic, both originating and terminating at locations outside of the District. Rail freight passing through the District is a cross-section of agriculture and industrial products as shown in Figure 1-1. Rail freight shipments that either originate or terminate in the District are limited to three relatively minor customers.

Figure 1-1: Commodities Shipped through the District of Columbia



Source: STB Waybill Sample

[3] CSX owns 26.2 route miles; however, 5.2 miles are currently inactive.
[4] https://www.aar.org/data-center/railroads-states#state/DC
[5] Note that a significant amount of freight truck traffic bypasses the District. This is discussed further in Chapter 3.
[6] http://www.godcgo.com/Portals/0/Freight_PDF/District-of-Columbia-Freight-Plan-Final-Report-10-15-2014.pdf

1.5.2 Role of Commuter Rail

While regional passenger rail has served the District since the mid-19th century, commuter service under the MARC name has existed since 1984 and VRE since 1999. Roughly 40-50,000 weekday trips to or from the District are by commuter rail.[7] Commuter rail is wide-reaching, with five lines serving commuters accessing the District from stations in Maryland, West Virginia, and Virginia. The majority of the service is peak-oriented, with trains in the a.m. peak headed to the District and headed out of the District during the p.m. peak, along with limited midday service. Of the two commuter rail services, only MARC provides moderate reverse commute service from Washington, DC (to Baltimore, MD).[8]

1.5.3 Role of Intercity Rail

Established in 1971, Amtrak provides intercity passenger rail service within the United States. In the District of Columbia, three different types of intercity rail service exist: high-speed *Acela Express* (initiated in 2000); regional or state-supported service, such as the *Northeast Regional* service operating between Boston and Washington, and state-supported trains operating primarily to points south in Virginia and the Carolinas; and traditional long-distance intercity service. Washington Union Station is the second busiest Amtrak station in the US in part because it is the southern terminus of the Northeast Corridor (NEC), but also because it serves state-supported routes into Virginia as well as the long-distance trains operating south and west of the District to cities as far as Miami, New Orleans, and Chicago. Only New York Penn Station has a larger number of Amtrak riders.

The rail modal share between DC and several NEC locations is significant. The busiest rail city pair is Greater DC/Baltimore to New York City (NYC) representing 27 percent (or 2.4 million) of the more than nine million annual person-trips by all modes between those two cities. Next, Washington to Philadelphia rail trips account for 19 percent of the annual trips or about one million of the total 5.3 million trips between the two locations. For both of these city pairs, rail travel is more popular than every other non-auto mode with bus travel representing a close second at 24 percent of all Greater Baltimore/DC-NYC trips and a distant 5 percent of all DC-Philadelphia trips. Air trips between Greater Baltimore/DC and New York City represent only 6 percent of all intercity trips between these endpoints.[9] However, while capacity constraints exist at many of the major NEC airports, future air travel growth is expected. Table 1-2 shows the existing annual person-trips for mode from travel from the District to New York City and Philadelphia.

Table 1-2: Annual Person-Trips by Mode

Trip	Rail	Bus	Air	Automobile	Total
Baltimore/DC to NYC	2,430,000 (27%)	2,160,000 (24%)	540,000 (6%)	3,870,000 (43%)	9,000,000
DC to Philadelphia	1,007,000 (19%)	265,000 (5%)	— (<1%)	4,028,000 (75%)	5,300,000

Source: Northeast Corridor Infrastructure and Operations Advisory Commission Northeast Corridor Intercity Travel Study, 2015

[7] U.S. Census, ACS 2014 5-year estimates
[8] VRE provides one southbound and two northbound limited stop reverse peak trains on the Manassas line.
[9] Northeast Corridor Infrastructure and Operations Advisory Commission: Northeast Corridor Intercity Travel Study, September 2015

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CHAPTER 2: Approach to Public and Agency Participation

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Chapter 2 Approach to Public and Agency Participation

Developing the State Rail Plan included comprehensive outreach to and input from the public and key agencies. Over a nine-month period, involvement included stakeholder roundtables, stakeholder briefings, the creation of a public-facing website, an online survey, public meetings, and workshops. Table 2-1 shows the stakeholder events which were held and who participated in them. Invitations to participate in the events were sent to a significant number of stakeholders and the table shows those who attended.

Table 2-1: Record of Stakeholder Events

Meeting Date	Meeting Type	Participant(s)
9/3/2015	Stakeholder Roundtable #1	Amtrak, CSX, MARC, VRE, Union Station Redevelopment Corp.
9/16/2015	Stakeholder Briefing	Legislative Counsel for US Rep Eleanor Holmes Norton
9/28/2016	Public Open House #1	General public
11/9/2015	Stakeholder Briefing	ANC 6D
1/19/2016	Workshop: L'Enfant Station Listening Session	VRE, WMATA, MARC, NCPC
2/1/2016	Stakeholder Briefing	Committee of 100
2/11/2016	Stakeholder Briefing	Parkside Civic Association
3/10/2016	Stakeholder Briefing	MWCOG TPB Freight Subcommittee
4/4/2016	Workshop: Draft Vision and Goals Review	WMATA, BLET/IBT, Amtrak, USRC, Committee of 100, FRA, MWRTBA, NCPC
4/27/2016	Stakeholder Briefing	ANC 5A
4/27/2016	Stakeholder Briefing	ANC 5B
5/18/2016	Stakeholder Roundtable #2	Amtrak, CSX, Norfolk Southern, VRE, MARC
6/6/2016	Stakeholder Briefing	BLET/IBT, USRC, NCPC
6/7/2016	Public Open House #2	General public

This public outreach allowed the public and stakeholders to participate in the plan development process, inform the plan team of priorities, and guide creation of an investment program. Overall, the public engagement informed the development of a vision for the District's rail network, as well as the goals and objectives necessary to fulfill this vision. The resulting vision and goals are outlined within Chapter 6. Recommendations made by various stakeholders were incorporated into the plan, and the investment program identified to meet the established goals is thus directly linked to the feedback received throughout the plan development from the public, other agencies, and key stakeholders.

The stakeholder events conducted and outreach approaches utilized as part of this plan are highlighted through the rest of this chapter.

2.1 STAKEHOLDER ROUNDTABLES

Key agencies participated in two stakeholder roundtables to discuss their rail needs as well as potential opportunities. The first roundtable was in September 2015 and the second was in May 2016.

2.1.1 Stakeholder Roundtable #1

The first Stakeholder Roundtable was held on September 3, 2015. In attendance were representatives of Amtrak, CSX, MTA, VRE, and Union Station Redevelopment Corporation (USRC), as well as representatives from DDOT. The meeting began with a presentation about the state rail plan, explaining why DDOT is completing one, what the primary elements are, what is required by PRIIA legislation, and what rail elements are covered by the plan. The presentation was followed by a roundtable discussion on the strengths and weaknesses of the District rail system and potential opportunities.

After sharing overviews of their agency perspectives on rail needs, the group discussed rail opportunities in the District. Opportunities discussed included leveraging new technology to improve service, exploring run-through options for MARC and VRE, building a new commuter rail infill station, pursuing fare consolidation and interoperability, and freight opportunities.

The meeting concluded with a discussion of next steps. Minutes for this meeting can found in Appendix A.

2.1.2 Stakeholder Roundtable #2

Stakeholder agencies reconvened for a second roundtable on May 18, 2016. Participants from Amtrak, CSX, NS, MARC, and VRE met with representatives from DDOT and the consultant team. The main purpose of the meeting was to review and gain input on the vision, goals, and objectives for the District's rail system as well the draft list of projects and initiatives. In total, there were four rail agencies represented along with DDOT.

After a brief update on the plan's development, DDOT presented the vision, goals, and objectives and the draft projects and initiatives list. Attendees were asked to provide input on whether anything was missing from the draft list of projects and initiatives and whether there were any recommended changes to the information and details. Discussion followed with an explanation of the categories used on the project list, as well as what was included in each of the projects.

Attendees were provided with an electronic version of these items to share amongst their organizations and this input was used to develop the primary content of Chapter 6.

2.2 STAKEHOLDER BRIEFINGS

Throughout the development of the State Rail Plan, District stakeholders were briefed on the purpose of the State Rail Plan and its progress. At these meetings, DDOT representatives presented an overview of the State Rail Plan, responded to questions, and gathered feedback from attendees. Stakeholders participating in these briefings included: Legislative Counsel for US Rep Eleanor Holmes Norton, Advisory Neighborhood Commission (ANC) 6D, Committee of 100, Parkside Civic Association, DC Office of Planning, MWCOG TPB Freight Subcommittee, BLET/IBT, WMATA, MWRTBA, ANC 5A, and ANC 5B.

Additionally, DDOT briefed neighboring states including Virginia and Maryland on development of this plan and sought feedback from them as the plan was formed.

2.3 WEBSITE

A website dedicated to the District State Rail Plan launched in September 2015 (www.dcrailplan.com). The website maintained information on the progress of the State Rail Plan, as well as recorded upcoming and past events. It also archived documents related to the State Rail Plan and the associated public meetings. Visitors to the website were also able to sign-up for email updates on the State Rail Plan as well as submit questions or comments to DDOT. Between September 2015 and June 2016, the website was visited nearly 1,800 times. Table 2-2 shows a breakdown of visits, page views, and audience size[1] of the website.

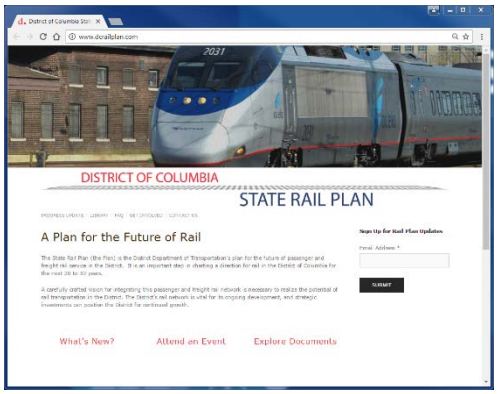


Table 2-2: Traffic Analysis of DC State Rail Plan Website

	Visits	Page Views	Audience Size
September 2015*	413	1,256	338
October 2015	95	226	72
November 2015	31	78	26
December 2015	79	227	52
January 2016	167	289	140
February 2016	308	485	288
March 2016	59	124	42
April 2016	92	238	51
May 2016	175	425	124
June 2016**	338	811	228
Total	1,757	4,159	1,361

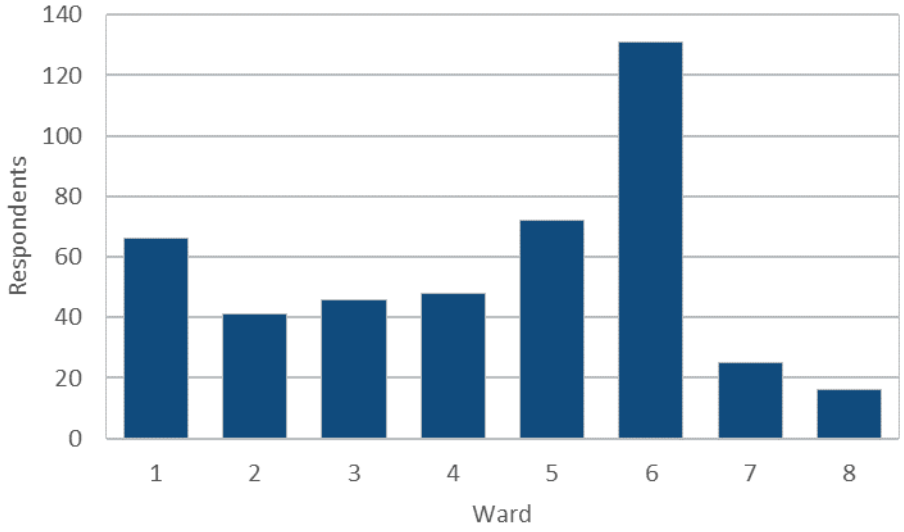
** Website launched on September 17, 2016*
*** June metrics are through June 20, 2016*

2.4 SURVEY

Key to public outreach on the SRP was a survey conducted from late January through early March 2016. Offered via SurveyMonkey, the State Rail Plan survey received a robust 1,067 responses, with half of respondents indicating they are regular users of commuter rail. Of the respondents, 445 indicated that they lived in the District and 622 skipped the residence question. Figure 2-1 shows the number of respondents from each ward as was self-reported.

[1] Audience size estimates the number of unique visitors to the website. In this case, the number of unique visitors by month.

Figure 2-1: Self-Reported Ward of Residence by Respondents



The survey highlighted what people who live, work, and play in the District thought of as the most important considerations for the future of passenger and freight rail. Respondents also provided input on why they do or do not ride rail. For freight rail, people provided opinions on potential freight issues as well as consideration of freight facilities in the District. Input was also sought on areas DDOT should prioritize for the rail network including expanding passenger rail connectivity, achieving a state of good repair for rail assets, improving rail connectivity with public transit, and enhancing safety and security.

DDOT used the SRP survey responses to shape the development of the draft vision and goals for District of Columbia's passenger and freight rail system described in Chapter 6 and to help prioritize plan elements.

The following is a brief summary of key survey responses, with full responses for each question provided in Appendix B.

Figure 2-2: Most Important Role for Rail Transportation in the District (on a scale of 1-6, where 6 is most important)

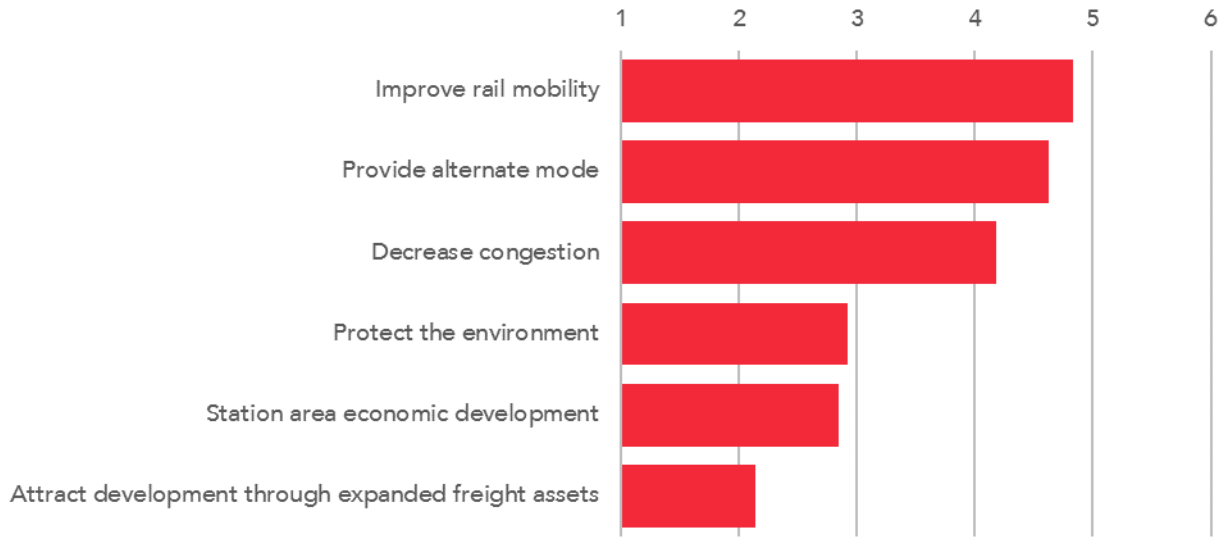


Figure 2-3: Most Important Challenges for Rail Transportation in the District (on a scale of 1-6, where 6 is most important)

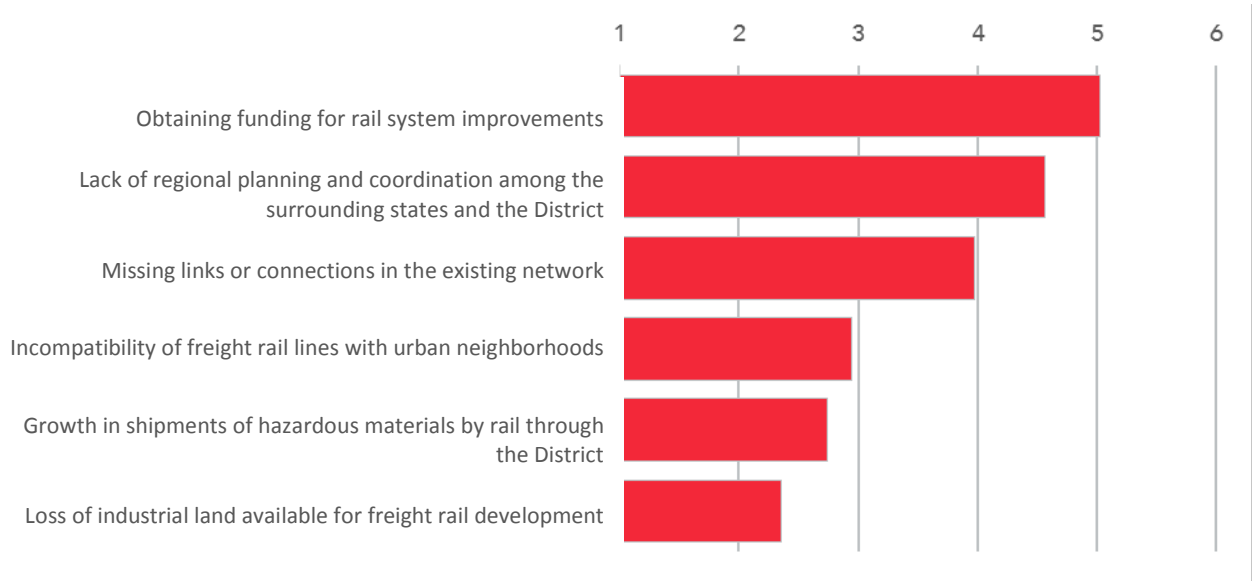
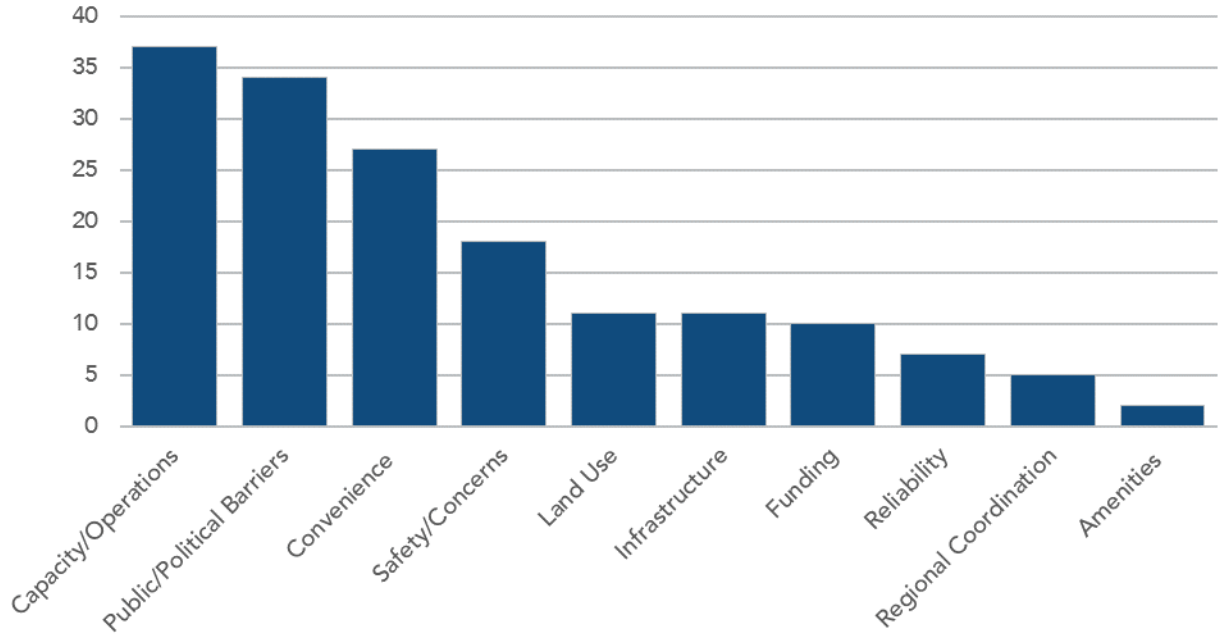
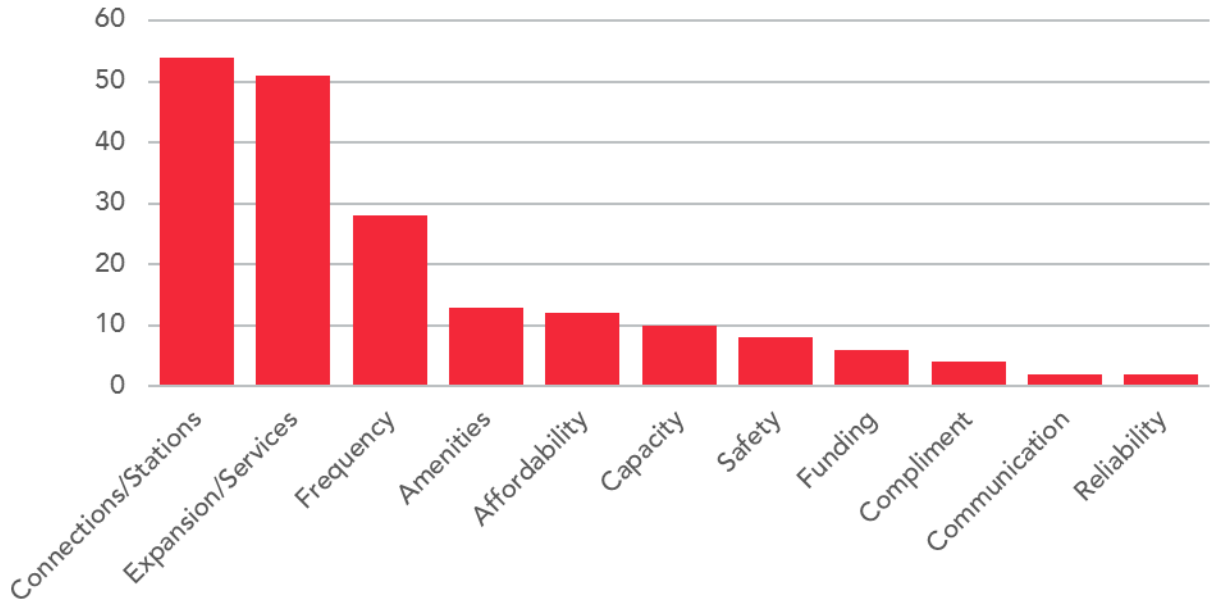


Figure 2-4: Additional Challenges for Rail Transportation in the District (number of mentions)



Respondents noted concern with commuter rail operations and capacity, and passenger rail priority when operating on host railroads. Many indicated public/political barriers as a potential challenge (e.g., public opposition, political will). Respondents also felt the lack of convenience (transfers, interoperability, existing infrastructure, and schedules) was another major passenger rail challenge.

Figure 2-5: Top Passenger Rail Issues and Opportunities (number of mentions)



Concerns about connectivity and new stations were most prevalent (25% of comments) among respondents regarding passenger rail issues and opportunities. Recommendations mentioned multiple times include an infill MARC Brunswick line station at Fort Totten connecting with WMATA, through-running of MARC/VRE services, and an additional MARC station in Ivy City. Also frequent were comments on expansion and services, many of which focused on increased span of service for later trains out of DC, weekend service, and reverse commute trips (VRE). Increased frequency was a major concern as well.

Figure 2-6: Potential Freight Issues (on a scale of 1-5, where 5 is most important)

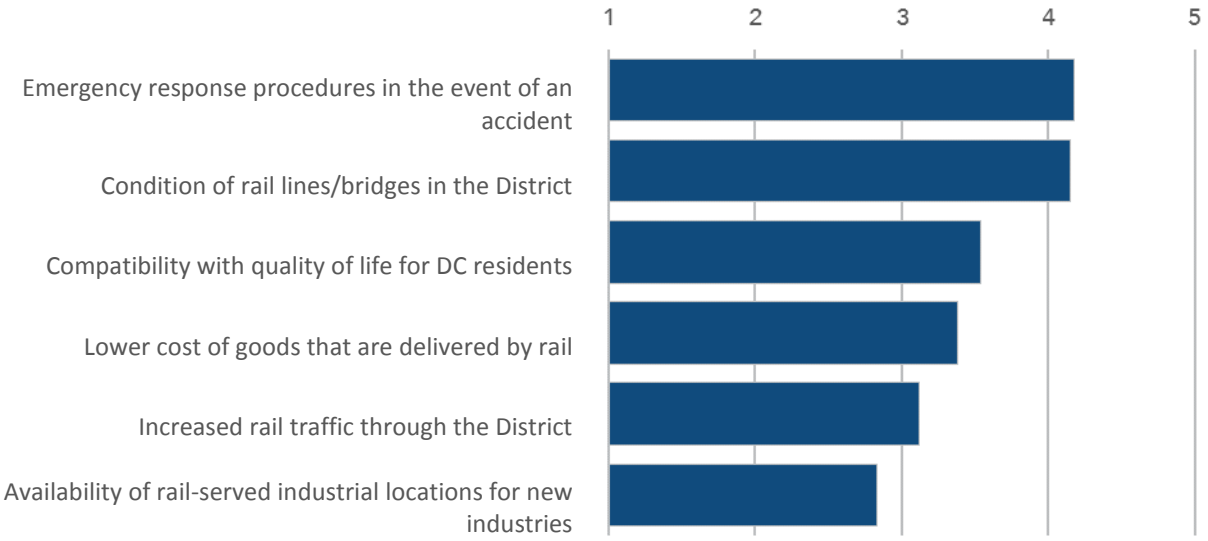
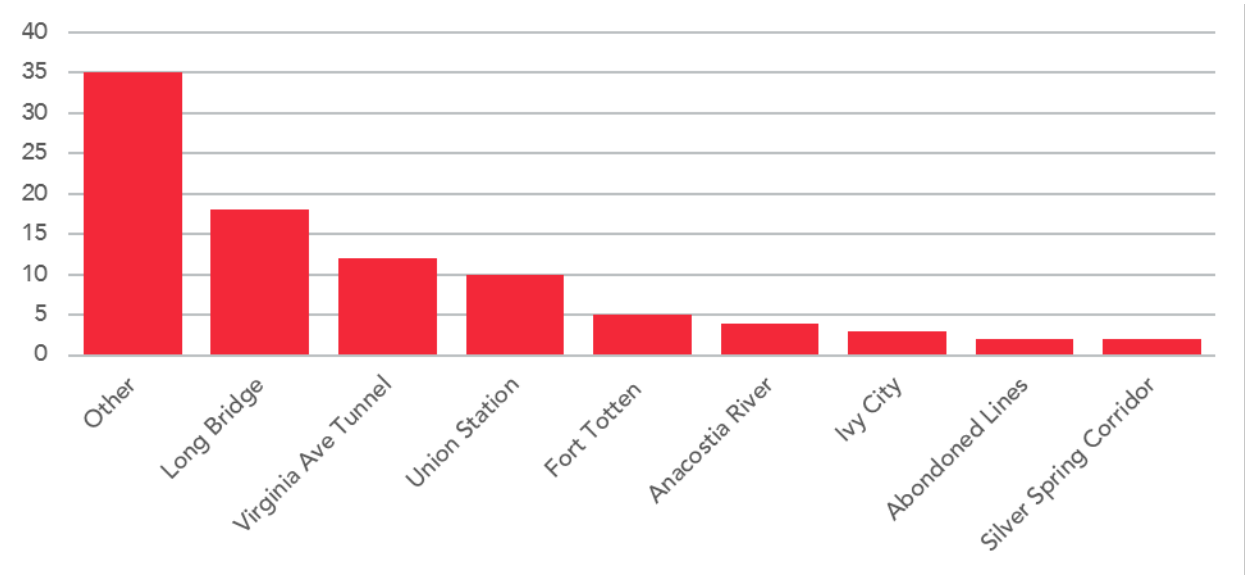


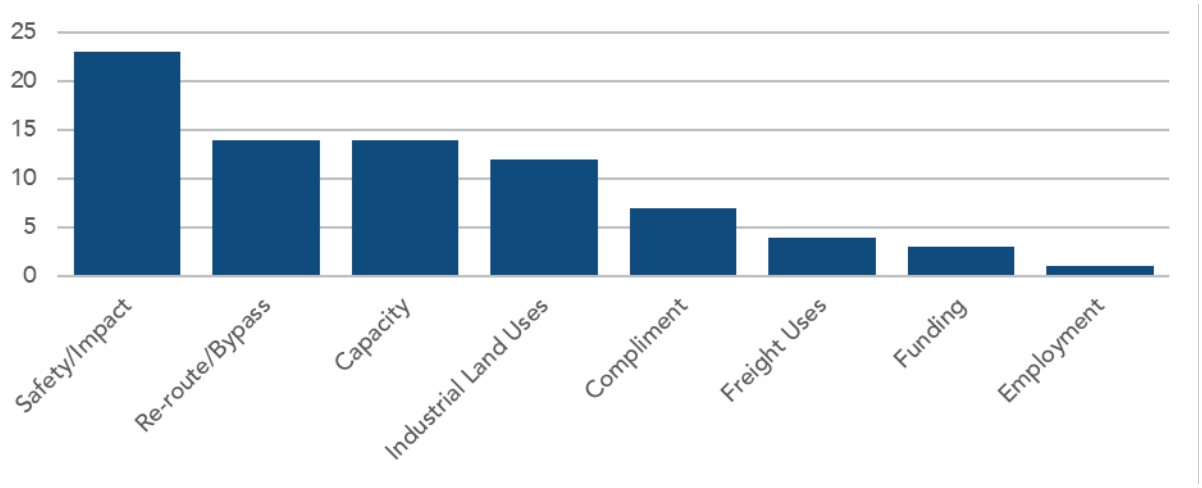
Figure 2-7: Specific Locations with Opportunities or Concerns (number of mentions)



Respondents mentioned the Long Bridge most frequently as an opportunity and concern with many recommendations involving the removal of most freight traffic from the bridge (calling for consideration of rerouting possibilities). The Virginia Avenue Tunnel was a frequently mentioned concern with a mix of support (highlighting its economic benefits/potential) and opposition (discouraging freight traffic through the District). Union Station was identified as both a concern and opportunity due to its frequent congestion (in the yard and passenger concourse) and the potential redevelopment (reconnecting of street grid to the north, renovation of concourse, etc.).

Concerns focused on the condition of the rail assets and a need for continued maintenance, along with noise and vibration from CSX trains. Other concerns noted include desire for local freight service and the potential for hauling trash from transfer stations to incinerators or landfills.

Figure 2-8: Additional Questions or Comments on Freight Rail Issues and Opportunities (number of mentions)



Respondents' freight-related concerns were mainly focused on community safety and the impact freight rail has on adjacent communities. Hazmat materials and accidents and vibrations were sources of numerous recommendations for rerouting and bypassing freight traffic around the District. Capacity, often relating to passenger service, was also a frequent reason for rerouting suggestions. Sentiments and attitudes towards industrial land uses around freight rail facilities was also a point of contention as some respondents realize the importance of industrial space while others believe such activity should take place outside the District.

Figure 2-9: Recommended Economic Development Coordination

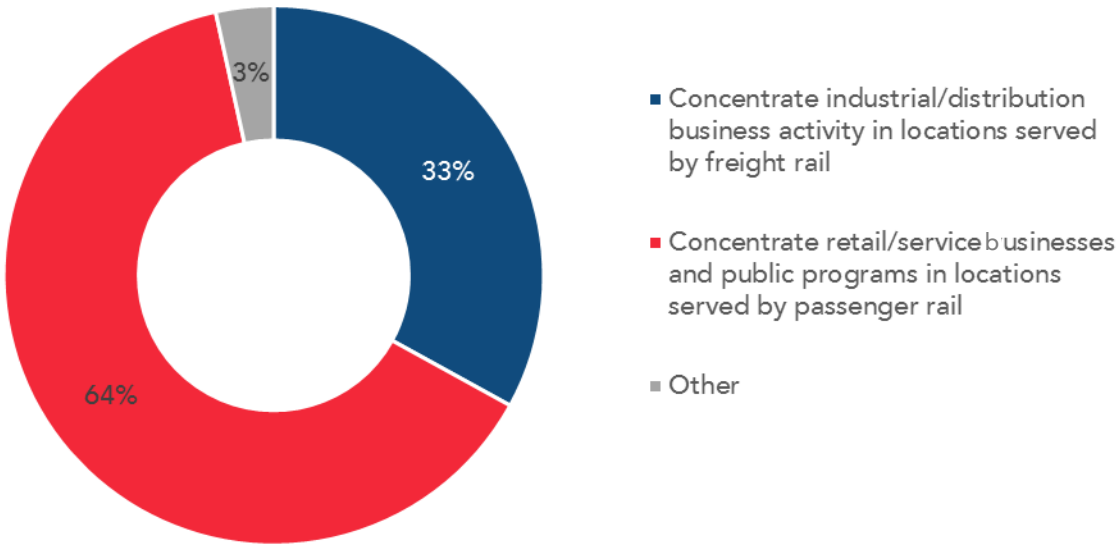
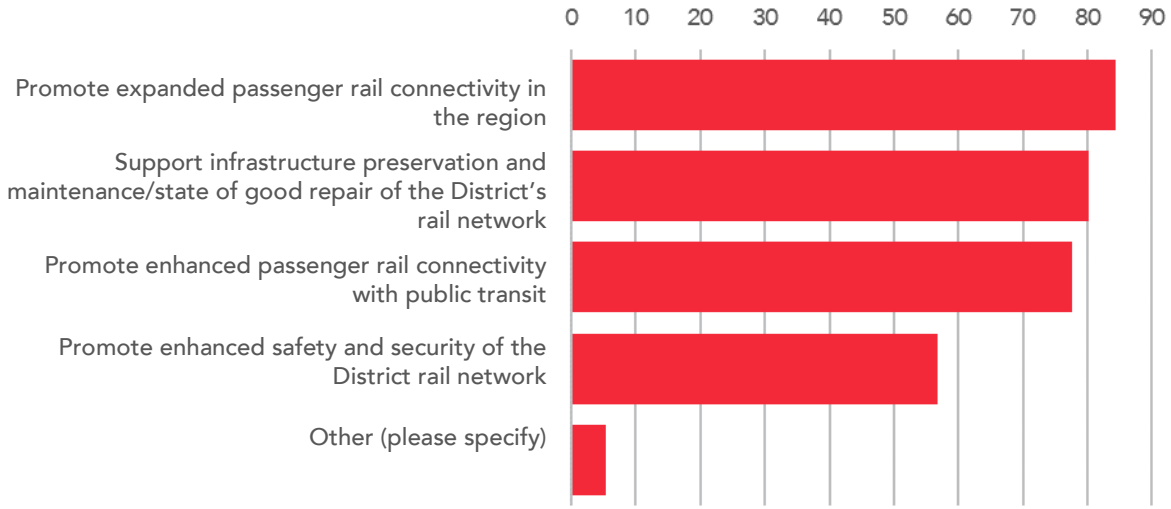


Figure 2-10: Recommended Prioritization Areas (percentage of respondents)



2.5 PUBLIC MEETINGS

DDOT hosted two public meetings over the course of the State Rail Plan development to inform the public of the planning work and to solicit input. Meetings were publicized via press releases, DDOT's website, a listserv message, newsletters, social media, the project website, and ANC Commissioners. Title VI information was collected from attendees to document participation.

2.5.1 Public Open House #1

In September 2015, DDOT hosted a public open house to begin the public involvement process for developing a State Rail Plan. During the open house the public learned more about existing rail infrastructure and the process to develop the plan. Attendees had the opportunity to speak with representatives from DDOT, and share comments on the current rail network and suggestions for what is needed or the future. 42 members of the public attended. In total over 60 comments were received via comment sheets, verbal communication, and map markups. Comments focused on track capacity and chokepoints, rail safety, regional coordination, land use, and connectivity and access. A full summary of Public Open House #1 can be found in Appendix C.

2.5.2 Public Open House #2

The second open house was held in June 2016, where DDOT presented a draft of the State Rail Plan findings and projects and programs. Attendees had the opportunity to speak with representatives from DDOT, and offer feedback on components of the draft plan. 41 members of the public attended the event and attendees could provide their comments at the event or up to 30 days afterwards. Several organizations also provided feedback after attending the open house, including the Committee of 100, the Brotherhood of Locomotive Engineers and Trainmen, the Advisory Neighborhood Commission (ANC) 7D, and the National Capital Planning Commission. A full summary of Public Open House #2 can be found in Appendix D. This includes full records of public responses as well as responses from the participating organizations.

2.6 WORKSHOPS

Two workshops were held to address specific issues with key stakeholders. One workshop was a listening session on VRE's plans for L'Enfant Station. The other was a review of the vision and goals included in the State Rail Plan.

2.6.1 L'Enfant Station Listening Session

In January 2016, DDOT hosted a listening session with VRE, WMATA, MARC, and NCPC on future rail plans and projects for L'Enfant Station. The purpose of the meeting was to establish an understanding of each stakeholder's station vision of the station for 2040, establish a shared understanding of current plans and ideas, identify areas of consensus, and determine the timing and potential need for an environmental study. Of particular interest was the desire for better vertical circulation and connection between surface rail and the WMATA station. The potential for MARC run-through service was also discussed along with other recommendations provided in the 2013 SW Ecodistrict Plan prepared by NCPC.

2.6.2 Visioning Workshop

Key rail stakeholders met in April 2016 to review and confirm the State Rail Plans vision and goals. In attendance were a total of nine representatives from WMATA, BLET/IBT, Amtrak, USRC, the Committee of 100, FRA, MWRTBA, and NCPC. Attendees discussed the need to meet federal rail requirements while simultaneously achieving the goals of moveDC. Attendees confirmed and provided input on the draft vision and goals. The resulting version is presented in Chapter 6. Minutes from this meeting can be found in Appendix E.

DISTRICT OF COLUMBIA

STATE RAIL PLAN

CHAPTER 3:
The District's Rail System

2017

d. delivers
district department of transportation

Chapter 3 The District's Rail System

Chapter 3 provides a comprehensive explanation of the District's passenger and freight rail system from the 19th century to present times, and then continues to describe the current rail system within the District. Profiles of the rail operators and services are provided, along with relevant initiatives taking place in the District, as well as Maryland and Virginia.

3.1 HISTORY OF THE DISTRICT'S RAIL SYSTEM

Over the past 180 years, the role of the District in the regional and U.S. rail network has evolved. The District's current role is a function of these historical developments.

3.1.1 19th Century

The first railroad line built in the District was the Baltimore and Ohio Railroad Company's (B&O) Washington Branch, which opened in 1835. The line joined Washington to the B&O's rail line at Relay, Maryland, just south of Baltimore, which was one of the earliest rail lines in the nation. At the time the Washington Branch was completed, the original B&O line ran between Baltimore and Sandy Hook, Maryland, on the Potomac River. The B&O line was one of the first to operate in the nation in common carrier service,[1] with the Washington Branch as the B&O's busiest corridor. The first station in Washington was at 2nd Street and Pennsylvania Avenue, NW, now an empty area on the edge of the U.S. Capitol grounds.

The B&O remained the only railroad to serve Washington until 1872. Service to points south was provided via a steamship connection to the Richmond, Fredericksburg, and Potomac Railroad (RF&P), which was first chartered in 1834, first at Fredericksburg, Virginia (1837-1842) and then at Aquia Creek, Virginia (1842–1861, 1866–1872). A railroad connection over the Potomac was established during the Civil War on the existing original Long Bridge located just southwest of the National Mall, but a continuous rail connection to Richmond was not completed until 1872. Several small railroads built sections that became a continuous corridor between the Long Bridge and the RF&P in Quantico, Virginia. These smaller railroads were later consolidated into the Washington Southern Railway and eventually absorbed into the RF&P.

In 1872 the B&O lost its monopoly serving Washington. The Pennsylvania Railroad (PRR) acquired the Baltimore & Pennsylvania Railroad (B&P) and was able to use a clause in the B&P charter to permit the construction of a line to Washington. The B&P entered Washington from the southeast via a new Anacostia River Bridge and a tunnel under Virginia Avenue in 1872. The PRR also established control over the Washington Southern Railway and therefore controlled the north-south link over the Long Bridge into Virginia.

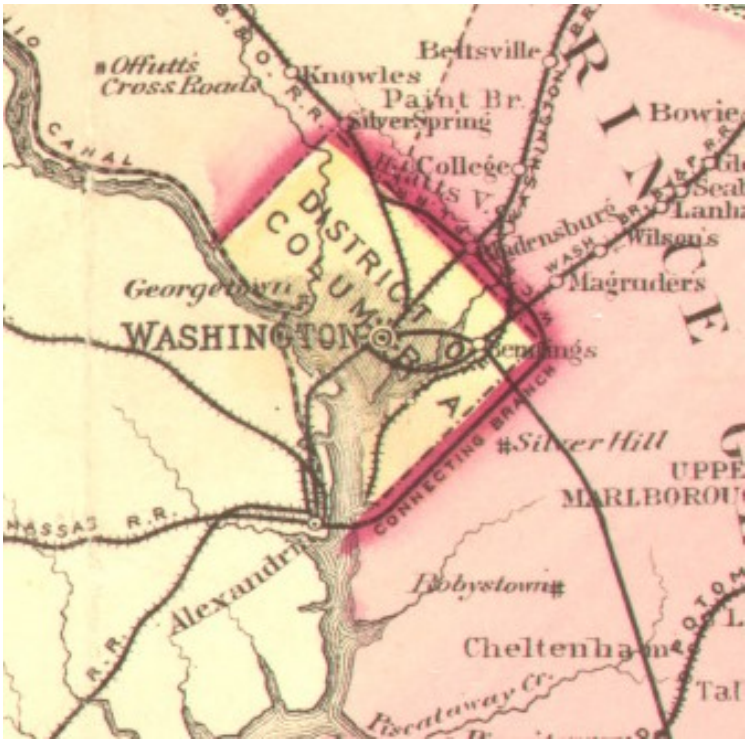
In response to losing access to the Long Bridge and thus Virginia, the B&O built the Alexandria Extension south of the Anacostia River, which ran from Hyattsville, Maryland to a point on the Potomac called Shepherds Landing, near what is now the Blue Plains sewage treatment plant, just north of the Woodrow Wilson Bridge. A car float operation carried freight cars across the river to Alexandria. This operation was discontinued in 1906 when the B&O obtained trackage rights to the Long Bridge and

[1] A railroad common carrier is a company that holds itself out to the public to provide rail transportation service and has the physical ability to do so.

the PRR to Alexandria.[2] The B&O built a half-mile connecting track between the Alexandria Extension and the PRR at Anacostia, at what is now the Benning Yard. This track eventually became the freight mainline through the District.

Other rail lines were constructed in the late 19th Century. The B&O railroad completed the Metropolitan Branch from Washington to Point of Rocks, Maryland in 1873. Work on the Georgetown Branch between Silver Spring and Georgetown was initiated in 1892 (now the Capital Crescent bike trail which opened in 1995). The line to Chesapeake Beach, Maryland from Seat Pleasant, Maryland was completed in 1899 as the Chesapeake Beach Railway. Figure 3-1 presents the District's rail network as it existed in 1877.

Figure 3-1: The District Rail Network in 1877



Source: John Hopkins University libraries online

By 1900, the rail lines comprising the current system were largely in place. One final significant change was to be realized in the forthcoming McMillan Plan.

3.1.2 McMillan Commission

The McMillan Commission, named after its chairman U.S. Senator James McMillan of Michigan, held its first meeting in February 1900. The purpose was to recommend a comprehensive park system and

[2] The rail line to Shepherd's Landing briefly again provided a second connection across the Potomac during the Second World War. Fears of sabotage of the Long Bridge prompted the federal government to build another railroad bridge across the Potomac at Shepherd's Landing, referred to as the "Emergency Bridge." The rail line was improved to handle wartime traffic that flowed over the new connection. After the war, the Emergency Bridge was dismantled, and traffic over this line declined.

design for the monumental core of Washington, DC. The McMillan Commission produced the McMillan Plan in 1902 (Figure 3-2). The committee included many of the prominent architects and landscape architects of the day, and embraced the ideals of the City Beautiful movement. This movement sought to inspire civic virtue through beautification of cities with open spaces and monumental grandeur. The design of the National Mall was a result of the McMillan Commission, based closely on the original designs for Washington of Pierre L'Enfant. Some existing railroad operations in the District were not considered to be consistent with the aesthetics espoused by the McMillan Commission, resulting in the following changes to the rail network:

- At the time, the PRR's tracks bisected what is now the National Mall along 6th Street. A train station was located where the National Gallery of Art now stands, and a train shed stretched halfway across the Mall. Because the station and railroad tracks were inconsistent with the McMillan Plan for a unified National Mall, the PRR's president was convinced to move the station. The McMillan Plan instead recommended consolidating District rail stations into a new station just northeast of the Capitol, which is now Union Station. The old B&O station on First Street was also closed. Union Station was completed in 1908 in a style envisioned by the McMillan Commission, given that Union Station's chief architect, Daniel Burnham, was one of the Commission members.
- With the new train station location established, rail connections south of Union Station now needed an efficient way to serve destinations south of Union Station. Between 1904 and 1906 the First Street Tunnel was built under Capitol Hill by the Philadelphia, Washington, and Baltimore Railroad. Upon exiting Union Station the tunnel runs due south under First Street NE and SE before curving to the southwest under a parking lot hear the Capitol South Metro station.
- Consistent with the beautification measures of the McMillan Commission was the removal of many of the District's freight yards near the Mall area and their consolidation at Potomac Yard in Alexandria when the yard opened in 1906. These changes necessitated a new Long Bridge to handle the increased freight and passenger traffic over the Potomac, which opened in 1904.

Figure 3-2: McMillan Plan

Source: McMillan Plan

3.1.3 Washington as a North-South Railroad Gateway

The District itself and ancillary Potomac Yard in Alexandria emerged as a major gateway between northern and southern railroads. Washington was the northern terminus of a number of southern railroads, including:

- Chesapeake and Ohio Railway (1869 – 1972)
- RF&P Railroad (1836 – 1970)
- Southern Railway (1894 – 1990)
- Atlantic Coast Line Railroad (1900 – 1967)
- Seaboard Coast Line (1967 – 1983)

The 113-mile long RF&P emerged as a bridge carrier, originating little of its own traffic, primarily serving to connect traffic for major Class I railroads between Richmond and Washington. In 1901, the RF&P was owned by a consortium of railroads, including the PRR, B&O, Atlantic Coast Line Railroad, Southern Railway, Seaboard Air Line Railway, and the Chesapeake and Ohio Railway. The RF&P also provided a connection to Potomac Yard and to Richmond for the northern railroads, including the PRR and the B&O.

Potomac Yard was also a southern terminus of various northern railroads, including:

- Baltimore and Ohio Railroad (1828 – 1987)
- Pennsylvania Railroad (1846 – 1968)
- Penn Central Transportation Company (1968 – 1976)
- Consolidated Railroad Corporation (1976 – 1999)

3.1.4 Railroad Decline and Crisis

The mileage of the U.S. railroad network peaked in 1916 at 254,000 track miles and has since declined by over half. The District rail network has shrunk as well. Major network losses include:

- The Chesapeake Beach Railway, which ceased operations in 1935, with 2.9 miles continuing operations as the East Washington Railway to switch coal to the Pepco Benning power plant. Following the power plant's conversion to natural gas, the East Washington Railway ceased all operations in 1978.
- The Georgetown Branch, which was abandoned in 1986, and converted to a trail in the early 1990s.
- The B&O Alexandria Extension south of Benning Yard to what is now the Blue Plains sewage treatment plant, which has been out of service since 2001, but still controlled by CSX.

In the 1920s and later, automobile ownership started to become widespread. Automobile travel, bus travel, and truck freight further increased after the Second World War with the building of the National Highway System. Competition from airlines also reduced rail's role in intercity passenger travel.

Intercity passenger train travel at Union Station declined by 84 percent between 1945 and 1965.[3] At the same time, railroads were heavily regulated and had limited ability to increase rates for passenger or freight transportation. They were not permitted to shed unprofitable lines or businesses. Passenger rail had ceased to be profitable in the post-war era, but railroads were not permitted by the Interstate Commerce Commission to end passenger rail service.

Matters came to a crisis point in the late 1960s and early 1970s. The northeastern railroads were particularly vulnerable to highway competition, since their freight networks were geared toward short hauls of industrial products that trucks could handle more cost-effectively. Northeastern carriers also had significant passenger operations, all of which were unprofitable. The Penn Central Transportation Company was created by the merger of the Pennsylvania Railroad, the New York Central Railroad, and the New York, New Haven & Hartford Railroad in 1968. It controlled a significant portion of the Northeastern rail network. In 1970, the company filed for bankruptcy.

The bankruptcy, combined with other railroad failures across the country, provided a catalyst for railroad regulatory reform. In order to relieve freight railroads of providing unprofitable intercity passenger rail service, Congress passed the Rail Passenger Service Act in 1970. This resulted in the creation of the National Railroad Passenger Corporation, otherwise known as Amtrak, to which were transferred the intercity passenger rail operations of the now freight-only railroads. Amtrak began operations in 1971. In 1976, Congress passed the Railroad Revitalization and Regulatory Reform Act, which transferred most of the former Penn Central lines to a new freight railroad company, the Consolidated Rail Company or Conrail. Much of the Northeast Corridor (NEC) was transferred to Amtrak, including the section within the District, though Conrail retained trackage rights over the NEC. Traveling through the District and Virginia, intercity rail service was provided by Amtrak and its predecessors for multiple runs between New York City and points south to locations such as Florida, Georgia, and Louisiana. Amtrak service to these destinations continues today.

The transfer of existing commuter rail service from private railroads to commuter rail authorities was more gradual than the transfer of intercity passenger rail to Amtrak. In 1974, the B&O Railroad (then part of the Chessie System[4]) approached the State of Maryland with the intention of discontinuing service on the Camden and Brunswick lines unless the Maryland Department of Transportation (MDOT) would subsidize the service, which MDOT did. In 1976, MDOT entered into a similar arrangement with Conrail to continue operations on the Penn Line (Northeast Corridor). In 1982, Congress relieved Conrail of the responsibility to operate local passenger rail service, and MDOT entered into an agreement with Amtrak to continue the service the next year. In 1984, Maryland took control of its commuter railroads and the MARC (Maryland Area Regional Commuter) service name was established. Service is provided into the District and Union Station via the Camden, Brunswick, and Penn lines.

In 1992, commuter rail serving the District from Virginia commenced. The Virginia Railway Express (VRE) was created by the Northern Virginia Transportation Commission (NVTC) and the Potomac and Rappahannock Transportation Commission (PRTC). Members of NVTC are the cities of Alexandria, Fairfax and Falls Church, and the counties of Arlington, Fairfax, and Loudoun. The PRTC members are Prince William and Stafford counties and the City of Manassas.

[3] Washington, D.C. Chapter of the National Railway Historical Society. http://www.dcnrhs.org/
[4] A holding company incorporated in 1973 that owned the Chesapeake & Ohio Railway (C&O), the Baltimore & Ohio Railroad (B&O), the Western Maryland Railway (WM), and several smaller carriers.

With the decline of the U.S. passenger rail network, and the financial struggles of first the PRR and then the Penn Central, Union Station fell into disrepair. In 1967, the chairman of the U.S. Civil Service Commission suggested that the station be repurposed as a visitor center for the 1976 Bicentennial celebrations. The reconstruction project was completed and opening ceremonies were held on the bicentennial Independence Day in 1976. During the mid-1970s a temporary structure was built to continue to function as a passenger rail station. The National Visitor Center was never very popular and could not attract enough people to sustain the cost of maintaining the facility. The visitor center closed in 1978, and Union Station fell into further disrepair. The building was closed in 1981.

Figure 3-3: Union Station in Disrepair

Source: Elevation DC

3.1.5 Rebirth of Union Station and Passenger Rail

In 1981, Congress passed legislation to convert the station into a retail/entertainment complex and a transportation center, including a new railroad terminal to the north of the original concourse. The Union Station Redevelopment Corporation oversaw the restoration of Union Station. The restoration was completed through a $160 million public-private partnership between USRC and private developers and the refurbished Union Station reopened in 1988 (Figure 3-5).

Figure 3-4: Union Station 1988 Reopening

Source: Jones Lang LaSalle

Usage of Union Station has grown dramatically since its reopening in 1988, after previously peaking during World War II, when it was estimated that as many as 200,000 people passed through the station each day.[5] In 1988, about 9,500 MARC riders per day passed through Union Station but immediately began growing. Rail ridership from Virginia further added to growth of passenger rail in the District with the initiation of VRE service in 1992. Since then, ridership between MARC and VRE has more than doubled, with 40-50,000 riders coming to the District per day in 2015 via commuter rail.

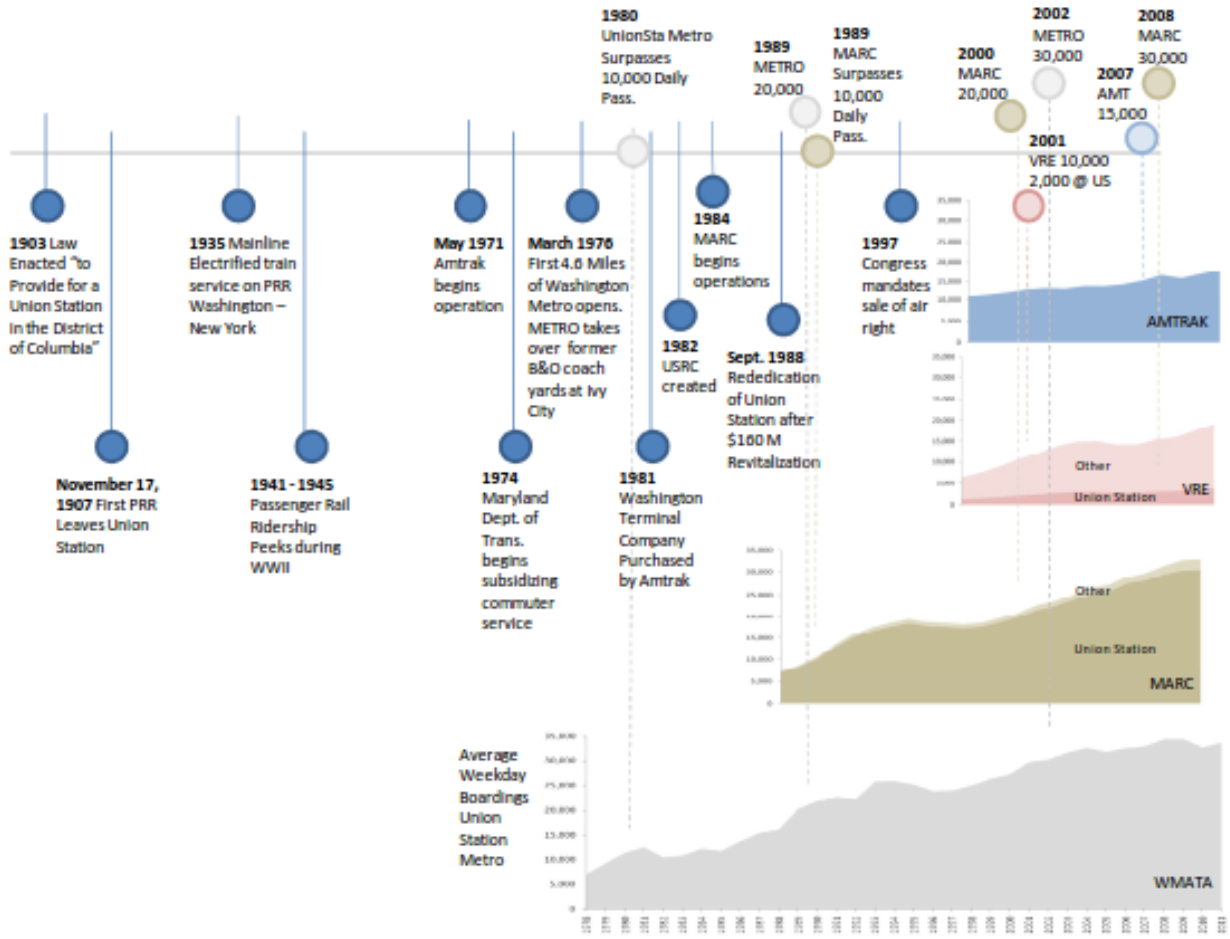
[5] https://www.nps.gov/nr/travel/wash/dc80.htm

The build-out of the Washington Metropolitan Area Transit Authority (WMATA) system has further increased the usage of commuter and intercity passenger rail in the District by providing connections throughout the District and suburban Maryland and Virginia. Construction of the Metrorail system began in 1969, and the original 103-mile network was completed in 2001. Union Station was on the first segment to open in 1976. It is the busiest station on the WMATA system, transferring commuter and intercity passenger rail users to Metro's Red Line and local transit. The District's spatial employment characteristics in relation to MARC's service into Union Station also drive Metrorail transfers at Union Station with an estimated 15,497 MARC users, or 50 percent, transferring to/from Metrorail each weekday to reach other employment centers.

Additionally, the growth at Union Station has helped propel redevelopment of the NOMA neighborhood to its north. Union Station in the 21st century continues to be further integrated into a still growing employment and residential neighborhood. Further new growth initiatives, as outlined in Chapter 4, are on the horizon.

Figure 3-5 provides a summary timeline of Union Station.

Figure 3-5: Washington Union Station Historical Timeline



Source: Union Station Master Plan, 2012

3.1.6 Freight Rail Developments

Following the Great Depression and World War II, many railroads were driven out of business due to competition from the new interstate highway system and airlines. For freight service, trucking businesses had become major competitors after the Great Depression with an increase in improvements to paved roads and after World War II they were able to further expand their operations as the highway network grew.

The freight rail industry in the United States continued to decline until the Staggers Rail Act of 1980. The Staggers Act deregulated the American rail industry to a significant extent and replaced the regulatory structure that existed since the 1887 Interstate Commerce Act. This legislation enabled freight railroads to adequately price and better compete for freight shipments resulting in significant revenue increases and infrastructure reinvestment.[6] As important, the act permitted railroads to more easily shed unprofitable lines. The Staggers Act opened the door to a flurry of mergers and acquisitions across the industry, which would have implications on the national and regional rail network. The Staggers Act resulted in railroad industry costs being cut in half over a 10-year period and the railroads were able to reverse their historic loss of traffic (measured in ton-miles) to the trucking industry, and railroad industry profits began to recover after decades of low profits and widespread railroad insolvencies.[7]

Due to mergers, the Washington region is no longer a gateway where northern and southern railroads interchange traffic (transfer railcars between rail carriers). CSX was created in 1986 through the combination of the Chessie System and Seaboard Coast Line Railroad (SCL), with antecedents going back to the B&O Railroad.

As a merged company, CSX connected the Northeast and Southeast spanning the entire eastern half of the United States. Later, when Norfolk Southern (NS)—itself a merger of the Southern Railway and Norfolk & Western Railway—and CSX split Conrail in 1999, NS too spanned both the Northeast and Southeast. The acquisition of Conrail's assets in 1999 included a portion of the former Pennsylvania Railroad connected to the north of RF&P's former Potomac Yard, going across the Long Bridge and into Washington, DC. As a result of these mergers, a need to interchange cars between the previously separate companies no longer existed, making Potomac Yard in Alexandria nearly obsolete. This yard was decommissioned in 1989. While the region no longer serves as an interchange location, the District remains an important freight rail junction, linking rail lines to the Midwest, Southeast, and Northeast.

Rail freight traffic reached an all-time high in the current decade, with the rail intercity market share now representing approximately 40 percent of ton-miles carried, more than any other transportation mode.[8] As the US population continues to grow, the overall tonnage of freight shipped by the US rail system is projected to increase another 22 percent by 2035.[9]

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[6] http://www.gao.gov/assets/120/117832.pdf
[7] Association of American Railroads, Washington, D.C. (April 2016). American's Freight Railroads Under Balanced Regulation: https://www.aar.org/BackgroundPapers/Impact%20of%20the%20Staggers%20Act.pdf
[8]http://www.engr.uky.edu/~jrose/CE533presentations/CE%20533%20PowerPoint%20Section%201/Rail%20Safety%20Fact%20Sheet.pdf
[9] http://www.forbes.com/sites/joannmuller/2014/01/22/americas-second-rail-boom/#4330a8e877b8

3.2 THE DISTRICT'S EXISTING RAIL SYSTEM: DESCRIPTION AND INVENTORY

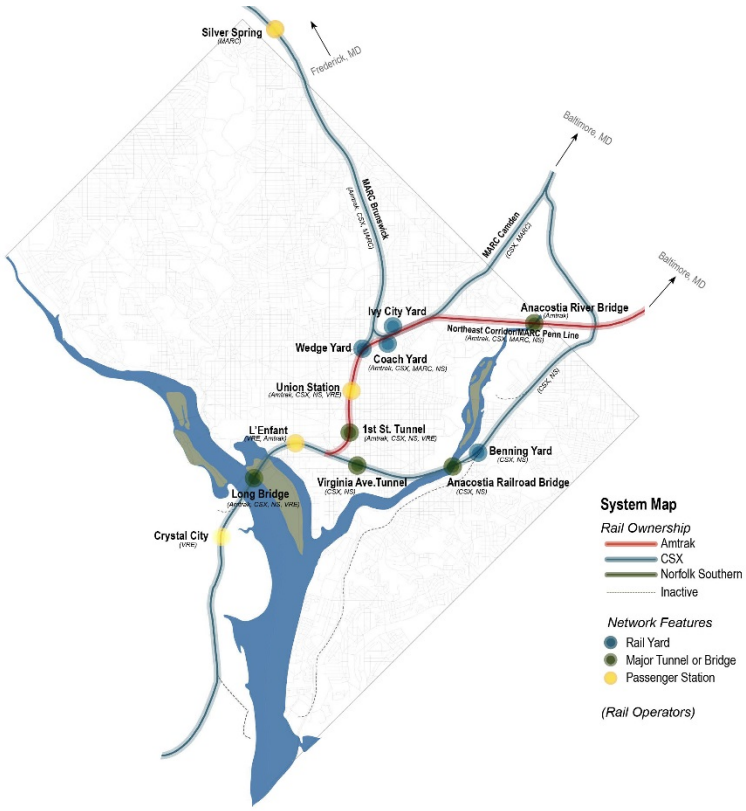
3.2.1 Existing Freight, Intercity Passenger, and Commuter Rail Service

Assets

The District's rail network in 2016 is made up of the multiple rail lines and structures that provide rail linkages, as well as important nodes, such as rail stations, yards, and other facilities where multimodal connections are facilitated or support services performed.

Within the District are 26.7 miles[10] of active and inactive rail lines. Of these, 21.0 miles are owned and controlled by CSX while 5.6 are owned and controlled by Amtrak, as shown in Figure 3-6.

Figure 3-6: District Rail Network



Source: WSP | Parsons Brinckerhoff

Amtrak and CSX each host other railroads that have been granted access their lines through trackage rights agreements. NS and VRE have rights over the CSX line south of the First Street Tunnel. NS also has rights over the CSX line that include operation through the Virginia Avenue Tunnel. MARC and Amtrak trains operate over the CSX Metropolitan Subdivision to Point of Rocks and MARC trains run over the CSX Capital Subdivision to Baltimore. CSX, MARC, and NS each have trackage rights over the Amtrak-owned NEC.

[10] Difference between total mileage and subsidiary ownership totals is due to rounding.

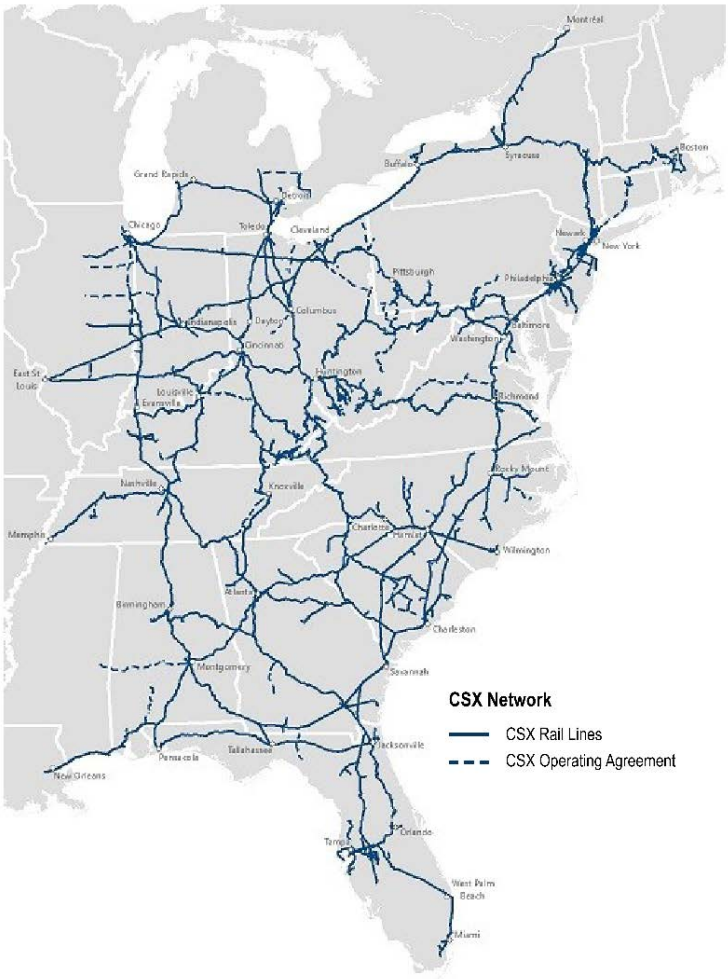
3.2.2 Profiles of Rail Operators in the District

Freight Rail

CSX

CSX owns 21 route miles in the District, which comprises 70 miles of main line tracks, second mainline tracks, yard tracks, and sidings. Nationwide, the CSX system comprises 21,000 route miles across 23 states, two Canadian provinces, and the District. CSX operates around 1,500 freight trains each day over its system. Figure 3-7 displays the CSX network.

Figure 3-7: Map of CSX Network



Source: http://www.csx.com/index.cfm/customers/maps/csx-system-map/?mobileFormat=true

CSX transported more than 416,000 carloads of freight over the District Rail network in 2014.[11] Most of the freight CSX handles passes through the District and does not originate or terminate in the District.

[11] http://www.csx.com/index.cfm/about-csx/company-overview/state-fact-sheets/washington-dc/

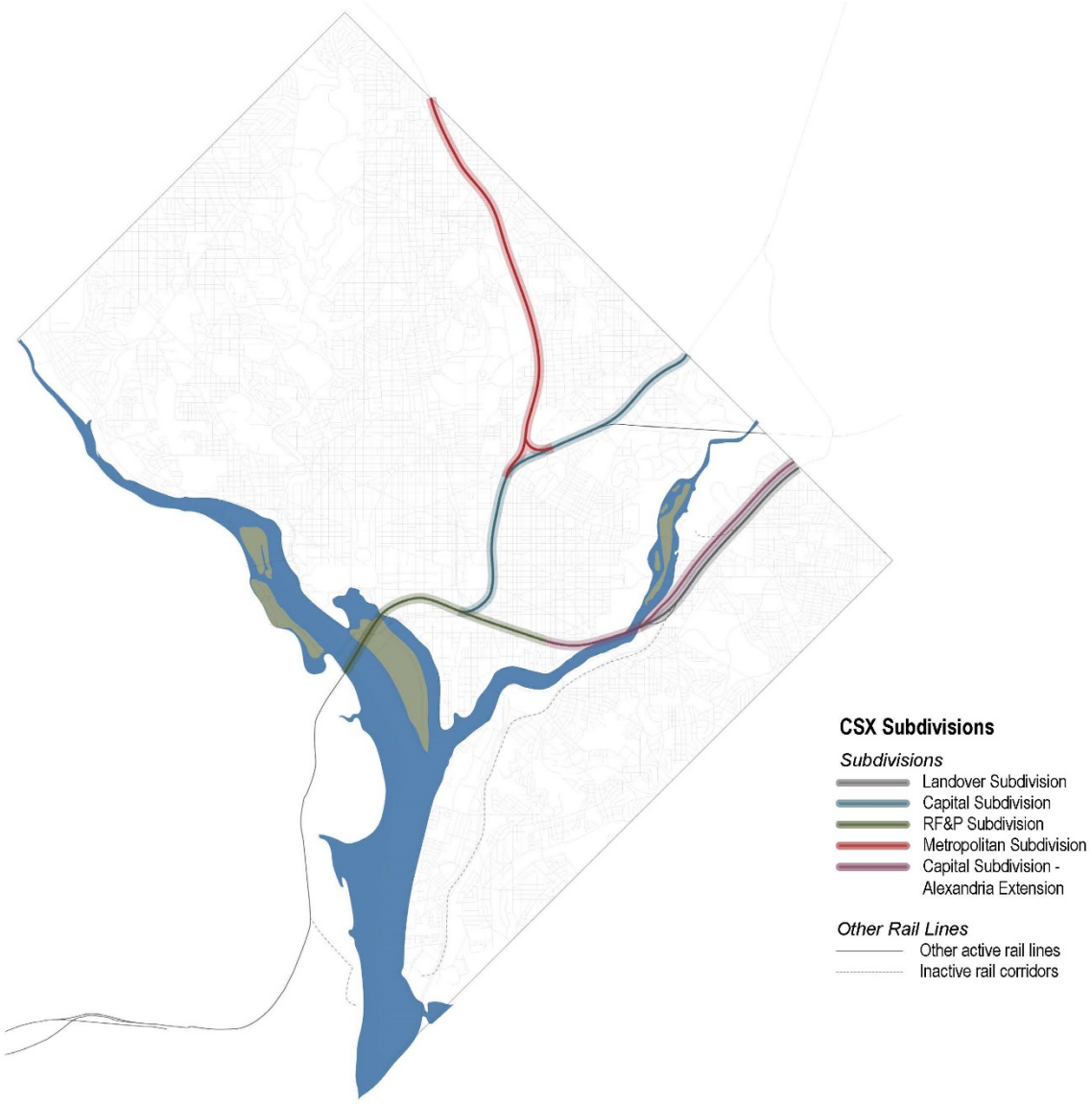
CSX operates four subdivisions in the District (Figure 3-8):

- The Capital Subdivision operates between Baltimore and Washington, through College Park, Maryland. This subdivision is used by general freight and intermodal trains, and by MARC Camden Line commuter trains. This rail line is the original Washington Branch of the B&O Railroad built in 1835. The Alexandria Extension is part of this subdivision and connects to the Landover Subdivision at Benning and the RF&P Subdivision at the Virginia Avenue Tunnel.
- The Landover Subdivision connects with the NEC at Landover, Maryland and merges with the RF&P Subdivision at the approach to the Anacostia Bridge.
- The Metropolitan Subdivision connects Washington, D.C. and Weverton, Maryland (just west of Frederick), passing through Takoma Park, Silver Spring, and Garrett Park. This subdivision is currently used by CSX freight trains, as well as MARC Brunswick Line commuter trains and Amtrak long-distance passenger trains. The line was constructed by the B&O Railroad in 1873.
- The RF&P Subdivision runs between Washington, D.C. and Richmond, Virginia. The northern end of the subdivision is at the Virginia Avenue Tunnel. The subdivision then crosses over the Long Bridge and into Virginia. It is currently used by CSX freight trains as well as VRE and Amtrak passenger trains. The line was previously owned by the RF&P Railroad.

The corridor connecting the Midwest and Mid-Atlantic will also grow in parallel importance. An initiative by CSX, the National Gateway, aims to expand intermodal traffic between Mid-Atlantic and Midwestern markets by increasing the vertical clearance of the rail lines, including in the District, to allow high efficiency double stack trains to operate, and by adding additional intermodal terminals to load and unload containers. Increasing corridor efficiency may reduce the growth in the number of trains and relieve some of the track-related congestion in the corridor. If CSX is able to improve the efficiency of the corridor, overall traffic flows through the District will increase.

Intermodal transportation, the movement of containers and truck trailers on railcars, has been one of the fastest growing segments of the rail industry. The CSX lines through the District are an important link in CSX's intermodal network connecting the Mid-Atlantic, the Northeast, and the Southeast (Figure 3-9).

Figure 3-8: CSX Subdivisions



Source: CSX, WSP | Parsons Brinckerhoff

Figure 3-9: The CSX Intermodal Network

Source: CSX

Norfolk Southern

The NS national network is of a similar scale to that of CSX. The company currently owns and operates 21,000 route miles in 22 states and in Canada (Figure 3-10). NS was formed when the Norfolk & Western Railway merged with the Southern Railway in 1982. Both the Norfolk & Western and Southern were themselves products of numerous prior mergers. The original NS network was again expanded in 1999 through acquisition of lines once owned by Conrail.

Figure 3-10: Map of NS Network with Crescent Corridor

Source: NS

In the District, NS has overhead trackage rights over lines owned by Amtrak, as well as the CSX RF&P and Landover Subdivisions. NS also has trackage rights over the portion of the Capital Subdivision that connects the Landover and RF&P Subdivisions. Today, only a small volume of NS freight passes through the District via a haulage agreement with CSX, where NS cars are hauled by CSX locomotives to customers within the District. NS does not use its trackage rights through the District.[12] Most NS freight between the Northeast and Southeast moves over two parallel NS mainlines outside the District, referred to as the "Crescent Corridor." The corridor located west of the District spans 13 states from New York to Louisiana.

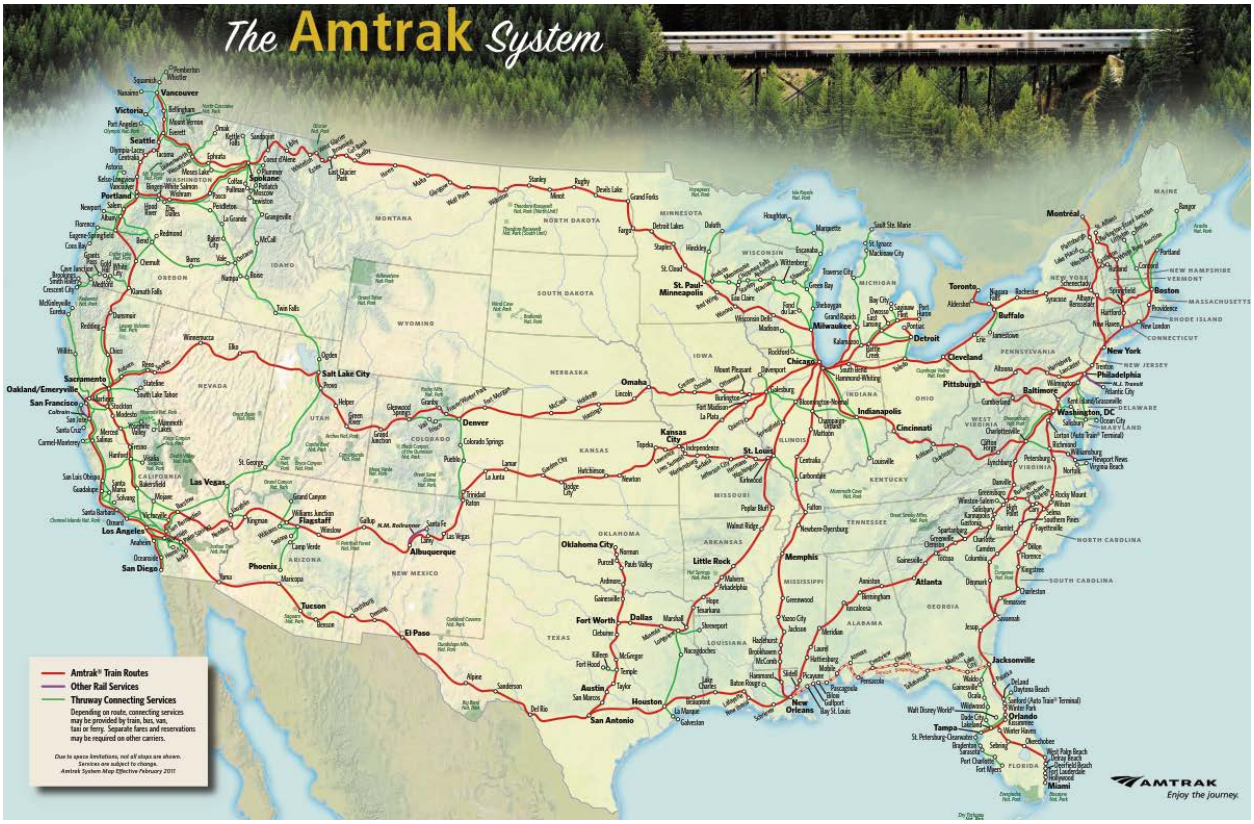
[12] By a haulage agreement, the host railroad transports another railroad's cars within its own trains. For trackage rights, the host railroad allows another railroad's trains to operate on its track.

Passenger Rail

Amtrak

Amtrak, headquartered in the District, initiated operations in 1971 following the passage of the Rail Passenger Service Act (RPSA) in 1970. Funded through a combination of federal support, state support, and ticket revenues, Amtrak currently operates 300 trains a day over 21,300 miles of track, of which it owns 730 miles (see Figure 3-11). Amtrak moved 31.6 million passengers between October 2012 and September 2013, with the majority of these trips occurring in the Mid-Atlantic and Northeast. About a sixth of Amtrak's ridership passed through Washington's Union Station.

Figure 3-11: Map of the Amtrak Network



Source: Amtrak

The District currently serves as the southern end of the Northeast Corridor (NEC) and thus many of the NEC trains terminate at Union Station. As the second busiest Amtrak station[13], Union Station served over five million Amtrak passengers in FY 2014 on ten routes.[14] Amtrak also owns the Ivy City maintenance facility near Union Station.

While established as a for-profit corporation, Amtrak has required federal grants and loans since its inception. Numerous states now also provide funding to Amtrak as part of state-supported intercity passenger rail service. Despite the federal and state support, and consistently growing ridership,

[13] Behind New York's Penn Station.
[14] http://www.amtrak.com/pdf/factsheets/DC14.pdf

Amtrak has continuously operated with a deficit. For example, in FY2012 Amtrak's operating revenues (including state subsidies) covered 88 percent of operating expenses. This percentage has consistently increased over the railroad's history, however.[15]

The NEC continues to experience record level ridership, with 11.6 million passengers in FY2014 and is the only Amtrak route that turns a profit.[16] In contrast, ridership on long-distance routes and state-supported services declined 4.5 percent and 0.6 percent, respectively, during FY2014.[17]

Throughout Amtrak's history, recommendations have been put forward for the company to reach operational self-sufficiency, including plans for restructuring the national rail passenger system. The passage of the Passenger Rail Investment and Improvement Act (PRIIA) of 2008 reauthorized Amtrak funding at increased levels, and also tasked Amtrak, USDOT, the Federal Railroad Administration, state, and other stakeholders to improve service, operations and facilities. The American Recovery and Reinvestment Act of 2009 also appropriated $1.3 billion to Amtrak for capital investment.

On December 4, 2015, President Obama signed a five-year, $305 billion transportation authorization – the Fixing America's Surface Transportation Act or FAST Act – the first long-term transportation funding bill in ten years. In an attempt to provide more transparency and much needed capital funding to the NEC, the legislation introduces several changes to Amtrak's financial and accounting methods that will have implications on the agency in future years.

As a quasi-government entity, Congress and the USDOT oversee Amtrak's stewardship of federal funds through grant agreements and appropriations provisions. Amtrak's Board communicates with the federal government through monthly and annual reports as well as business and strategic plans. Amtrak serves several roles: as primary owner and infrastructure manager for the NEC; as an equipment, maintenance facility, and station owner in places along the NEC and elsewhere in the U.S.; and as a service provider of state-supported and long-distance services throughout the U.S. Amtrak also provides contract commuter service for 13 rail agencies providing services and/or system access.

MARC

MARC provides commuter rail services connecting Harford County, Maryland; Baltimore City; Brunswick, Maryland; Frederick, Maryland, and Martinsburg, West Virginia, with Washington, DC over three routes, the Penn, Camden, and Brunswick lines. Trains only operate during the weekdays except on the Penn Line, which has limited service on weekends.[18] MARC ridership in FY2014 was over 9 million trips, with close to 36,000 trips each weekday on the three lines.[19]

This represented an average of 10.5 trains per day in each direction on the Camden Line, serving an average of 4,600 passengers per weekday; 15 trains per day each direction on the Brunswick Line, serving roughly 8,000 passengers every weekday; and just over 30 trains per day each direction on the Penn Line, serving about 25,000 riders per weekday. The Penn Line and the Camden Line operate rush hour trains going both directions on Amtrak's electrified Northeast Corridor via New Carrollton and

[15] http://www.amtrak.com/ccurl/851/32/AmtrakFY14-Budget-Request-Justification,0.pdf
[16] http://www.amtrak.com/ccurl/238/481/Amtrak-FY2014-Ridership-and-Revenue-ATK-14-096%20.pdf
[17] Ibid.
[18] Maryland Transit Administration, MARC Train / Accessed from http://mta.maryland.gov/marc-train
[19] https://mta.maryland.gov/sites/default/files/MTA_AR_2014_.pdf

CSX's Capital Subdivision via Jessup and College Park, respectively. The Brunswick Line operates on CSX's Cumberland and Metropolitan Subdivisions with limited service from Frederick on a branch off of CSX's Old Main Line. A map of these lines is provided in Figure 3-12.

Figure 3-12: Map of MARC Network

Source: mta.maryland.gov

The Penn Line trains run on 77 miles of the NEC over tracks owned by Amtrak. Amtrak is also contracted to operate the service. There are approximately 24,000 daily passenger trips on the Penn Line.[20] With 12 stations along this line, trains run every 30 minutes between Baltimore and Washington during peak weekday hours. MARC also operates beyond Baltimore with service every 60 minutes between Washington and Martin State Airport, Maryland and every 70 minutes during the weekday peak between Washington and Perryville, Maryland. Off-peak service is limited to hourly between Washington and Baltimore and one midday train in each direction to and from Perryville. Weekend service began in 2013, with nine trains currently running in each direction between Washington and Martin State Airport past Baltimore, Maryland on Saturdays, and six trains running in each direction on Sundays.

The Camden Line operates on 39 miles of CSX's Capital Subdivision between Washington and Camden Station in Baltimore. The MTA contracts with Bombardier Transportation Services USA Corporation to operate service on the Camden Line with CSX dispatching trains on behalf of the MTA. There are 11 stations along this line. Service is every 45 minutes in the weekday peak directions, with no off-peak or weekend service. There are approximately 4,400 daily passenger trips on this line.

The Brunswick Line runs between Washington and Martinsburg, WV, operating on 74 miles of CSX's Metropolitan and Cumberland Subdivisions. Similar to the Camden Line, MTA also contracts with

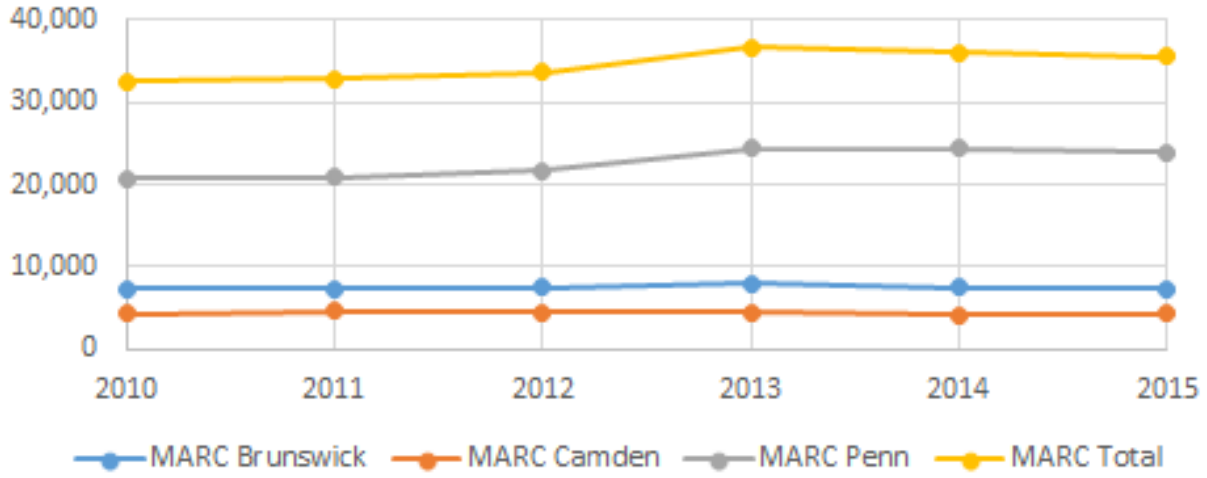
[20] https://mta.maryland.gov/sites/default/files/mgip_update_2013-09-13.pdf

Bombardier to operate this service with CSX dispatching trains. Eighteen stations are located on this line serving 7,600 daily passenger trips. Train frequency in weekday peak directions is every 40 minutes between Washington and Brunswick, Maryland; 50 minutes between Washington and Martinsburg, WV; and 75 minutes between Washington and Frederick, Maryland. One midday train is provided on Fridays only, and there is no weekend service.

There is a slight imbalance in MARC service, in that on a typical weekday, 49 revenue trains arrive at Union Station, but 46 revenue trains depart Union Station.

MARC currently operates with an annual overall on-time performance of 92 percent. Ridership has grown in the past decade with average daily ridership increasing by 30 percent between FY2003 and FY2010.[21] Growth has been slower between FY2007 and FY2014, with an average of 2.7 percent per year, with the Penn Line leading recent growth, with ridership increasing by 13 percent between FY2010 and FY2015.[22] The Brunswick and Camden lines grew at a negligible pace during this same period.[23] Weekend ridership on the Penn Line began in 2013 and averages between 5,000 and 5,500 passengers. Planning for additional riders is a salient concern as the system nears capacity in its current form, especially considering projected population growth and job growth (e.g., military) expected along the corridor. MARC anticipates that by 2025, more than 70 percent of their stations will be at capacity. See average weekday ridership by line in Figure 3-13.

Figure 3-13: MARC Average Weekday Ridership FY2010 through FY2015



Source: State of Maryland, "MTA Weekday Ridership by Month"

The Maryland Transit Administration (MTA) is a division of the Maryland Department of Transportation, and one of the largest multi-modal transit systems in the United States. MTA operates Local and Commuter Buses, Light Rail, Metro Subway, the MARC Train Service, and a comprehensive Paratransit

[21] MTA Maryland, "Analysis of MARC Ridership and Delays: January 2003 – July 2020," September 2010, retrieved from https://mta.maryland.gov/sites/default/files/MARC_Ridership_and_Delays_2003_to_2010_20100920_for_web.pdf
[22] MTA Maryland, "Growth and Investment Plan Update 2013 to 2050," retrieved from https://mta.maryland.gov/sites/default/files/mgip_update_2013-09-13.pdf
[23] MARC Ridership Report by Station 2001-2015

(Mobility) system. MDOT oversees several other transportation entities in the state including the Maryland Transportation Authority, the Maryland Port Administration, the State Highway Administration, the Maryland Motor Vehicle Administration, and the Maryland Aviation Administration. Daily operations and capital projects are financed through the sale of tickets and allocations from MDOT. The MARC system's fare box recovery rate averages at around 51 percent.[24]

Serving as MARC's only station in the District, many MARC riders transfer to/from Metrorail at Union Station to reach other areas in the District. Of the 15,497 estimated MARC riders that transfer to/from Metrorail each weekday, approximately 316 of these trips are made to/from WMATA's L'Enfant Plaza Station – a station that is adjacent to VRE's L'Enfant Station.

With demand expected to continue to rise, MARC is advancing its Growth and Investment Plan, most recently updated in 2013, to address objectives to maintain a state of good repair, increase ridership, improve service and enhance the customer experience. [25] Challenges to future growth include capacity constraints for overnight and midday train storage, insufficient track capacity, crowded trains, and lack of additional automobile parking at stations.[26]

MARC uses two kinds of locomotives: predominantly electric on the Penn Line and diesel on the Camden and Brunswick Lines. The 1970s-era GP40WH-2 diesel units were replaced in 2011 with newer MPI MP36PH-3C diesel locomotives. The electric locomotives, which reach speeds of 125 miles per hour (the limit on the Northeast Corridor), are maintained at Ivy City by Amtrak. However, Amtrak announced that it will no longer maintain the electric fleet starting in the summer of 2016. MARC has subsequently procured eight new Siemens Charger diesel locomotives to replace its electric locomotives.

Looking at the larger MARC system, MTA continues to invest in the system with planned improvements totaling almost $700 million over thirty years. Projects range from line improvements, additional facilities, overhauls and replacement of rolling stock, and parking expansions and upgrades at the BWI Airport and the West Baltimore Stations.

MARC has proposed a series of near- and long-term projects for each line to maintain a state of good repair, increase ridership, improve service, and enhance the customer experience. The lion's share of the investment is dedicated to the Penn Line over the long term. The state of good repair projects tend to include construction and improvements to stations, particularly expanding parking, with longer-term investments centering around track additions, and tunnel and crossing rehabilitations. Service and ridership improvements focus on increasing weekend trains on the Penn Line between Baltimore and the District, expanding peak, off-peak and reverse peak trains, maintaining reliability at the 94 to 95 percent level, lengthening trains to meet demand, and making connections to other commuter systems (both bus and rail). Proposed improvements to enhance customer experience include unifying the aesthetics and brand of the system, installing CCTV, adopting an "e-ticketing" system, and adding more bike racks, lockers, and EV chargers.

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[24] FY2011 – 2014 average: https://data.maryland.gov/Transportation/Farebox-Recovery-Ratio/6hpa-vs46/data
[25] https://mta.maryland.gov/sites/default/files/mgip_update_2013-09-13.pdf
[26] MARC, Growth and Investment Plan Update2013-2050, 2013/ Accessed from, http://mta.maryland.gov/sites/default/files/mgip_update_2013-09-13.pdf

Virginia Railway Express

Initiated in 1992, VRE revived commuter rail service in Northern Virginia for the first time since the early 1950s following years of proposals and deliberations dating back to 1964.[27] Perceived as an alternative to Northern Virginia's congested highways and a step towards a more balanced transportation system, VRE now operates weekday service via 32 daily trains over 90 route-miles and 18 stations in ten Northern Virginia jurisdictions. The Fredericksburg Line service runs primarily on a line owned by CSX to Spotsylvania, just south of Fredericksburg. The Manassas Line service operates primarily over NS west of Alexandria. This line reaches the Broad Run station, just west of Manassas, but VRE and the Virginia Department of Rail and Public Transportation (DRPT) are studying a service extension to Haymarket, Virginia. The route map is depicted in Figure 3-14.

Figure 3-14: Map of VRE Network

Source: vre.org

Organizationally, VRE is a joint venture of two commissions, the Northern Virginia Transportation Commission (NVTC) and the Potomac and Rappahannock Transportation (PRTC). Collectively, these represent the counties and cities that VRE serves. Each jurisdiction is represented on the VRE Operations Board, in addition to a representative from the Virginia DRPT. VRE is funded through

[27] http://www.vre.org/vre/assets/File/VRE-Chronology.pdf

passenger revenues, and subsidies from the Commonwealth of Virginia, the Federal Transit Administration, and local member jurisdictions – Alexandria, Arlington, Fairfax County, Fredericksburg, Manassas, Manassas Park, Prince William County, Spotsylvania County, and Stafford County.[28] NVTC is designated as the grantee of Virginia subsidies, while PRTC is designated as the grantee of federal subsidies. Responsibility for funding by member jurisdictions is allocated based primarily on residence of riders, and secondarily on the population of each jurisdiction. Daily operations and capital projects are funded through a combination of federal state, and local grants and through the sale of tickets.

Amtrak originally operated VRE trains; however, in the winter of 2009, VRE awarded a five-year operating and maintenance contract to Keolis, a subsidiary of France's national railway. The contract with Keolis has since been extended for five more years until 2020.

All VRE trains originate or terminate at Union Station, and stop at L'Enfant Station. In addition, VRE maintains a cross-honor agreement with Amtrak, in which VRE multi ticket holders can use their VRE tickets to ride Virginia state-supported Amtrak trains. These include Amtrak Northeast Regional trains between the District and Norfolk, Virginia; Newport News, Virginia; Richmond, Virginia; or Lynchburg, Virginia. Virginia-supported Amtrak trains stop at some VRE stations and not others. Some stop at L'Enfant Station, while others stop only at Union Station within the District.

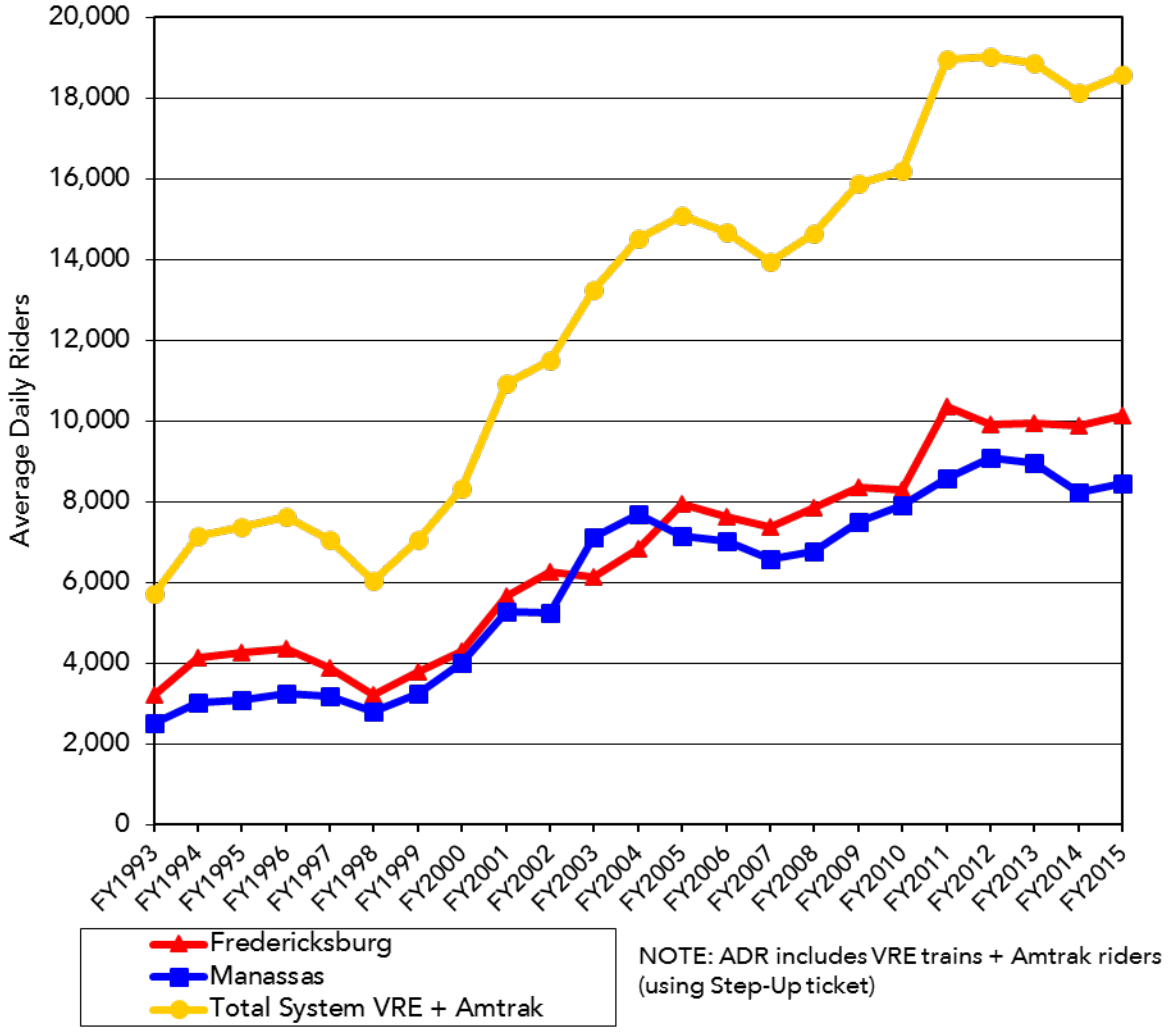
In 2014, the VRE system reported a total ridership of 4,513,500 passengers. This reflects an average of seven trains per day in each direction on the Fredericksburg Line with roughly 9,800 weekday trips, and nine trains per day in each direction on the Manassas Line carrying about 9,250 weekday trips. On-time performance in 2013 was 96 percent, almost ten percentage points higher than in 2010. Similar to MARC, VRE recovers over 50 percent of its costs from passenger fares.

In 2014-2015, the VRE system carried roughly 18,600 passengers on an average weekday and reported an average annual on-time performance of 83 percent. Predictions of substantial growth in population and jobs both around and on the corridor have raised concerns about capacity, which is projected in VRE's 2040 Service Plan to support only 25,000 average daily trips. Similar to MARC, VRE anticipates expanding service and increasing ridership. This in turn will require additional station facilities, more seats on trains, and more space for train storage.

VRE has been highly successful in providing an alternative to driving. Currently, VRE ridership is estimated to contribute to freeway travel delay reduction between 8 to 20 percent along both corridors (I-66 and I-95), saving roughly 2 to 4 million hours of travel per year. As previously mentioned, ridership has experienced explosive growth in the longer-term, more than tripling between the late 1990s and the early 2010s. There were slight decreases in 2005-2007 due to poorer on-time performance stemming from equipment breakdowns, train traffic congestion, heat, and other weather-related delays. Ridership was also affected by simultaneous fare increases and service cutbacks. Since then, ridership has increased from a low of 14,000 average daily trips to approximately 19,000 passengers in FY2015 (Figure 3-15).

[28] http://www.vre.org/vre/assets/File/Financial/FY16%20Budget%20Document%20Final%201-16-15.pdf

Figure 3-15: VRE Ridership, 1993-2015



Source: VRE Historical Ridership, 2016

Capacity improvements such as adding a third track, improving signals, building a new bridge over Quantico Creek, rail infrastructure improvements on CSX rail segments, and securing more round-trip train slots on freight tracks has allowed for an expansion and improvement in performance in both the District and Virginia. Two other recent investments have been CSX's work on its infrastructure to mitigate heat-related slow-orders that reduce speed limits from 70 mph to 40 mph; and the extension of the Fredericksburg Line to Spotsylvania County, where Spotsylvania Station opened in late 2015. The new station includes a station building, a 700-foot platform that serves up to eight cars, and 1,500 parking spaces.

VRE has replaced nearly all of its rolling stock fleet in the last decade. Between FY2005-2009, VRE purchased 71 new Gallery rail cars and ordered eight more in FY2012. A few years later (FY2008-2011), VRE entered into contracts to purchase 20 new diesel locomotives (MPI MP36PH-3C). The first was delivered in 2010 and all are now in service. These purchases have allowed VRE to retire and sell old equipment.

In VRE's 2040 System Plan (January 2014), short-term (2015-2020) and long-term (2021-2040) service and capital improvement projects are proposed. In the short-term, service improvements include an additional round trip peak period, peak direction train. Short-term capital improvements include the addition of a trainset, 21 additional coaches and cab cars in service, and station improvements (outside of the District, ranging from two new stations to the expansion of station parking by 5,500 spaces). These improvements are expected to boost ridership by more than 30 percent and further improve the cost recovery ratio of the system.

In the long-term, VRE plans on increasing the frequency of trains so that each line has 15-minute peak headways as well as several other improvements such as raising off-peak service to hourly headways and lengthening trains to meet demand. Capital improvements are even more ambitious, with an additional 11 trainsets, 10 more locomotives, and 48 new coaches and cab cars; investment in improved storage and maintenance facilities; three new stations and station expansion and improvements, including the addition of roughly 5,000 additional parking spaces; as well as the Gainesville-Haymarket Extension and the Long Bridge Corridor Program. The Gainesville-Haymarket Extension, on the Manassas Line, is expected to boost ridership by between 10 and 20 percent and improve cost recovery. The Long Bridge Study, in which VRE is participating, is an effort to expand severely constrained capacity on the Long Bridge, which only has two tracks for freight and passenger crossing from Washington DC to Virginia, creating a major traffic chokepoint.

The highest profile projects include an extension on the Manassas Line to Gainesville-Haymarket and the addition of the Potomac Shores Station on the Fredericksburg Line between Quantico and Rippon. Forthcoming capital projects include engineering and design services for a midday storage facility near New York Avenue NE and 16th Street NE in the District, and to provide platform extensions and other upgrades at five VRE stations in Virginia (the "Penta-Platform" Corridor Improvement Project). Altogether, the System Plan estimates a total investment of $2.7 billion in the upcoming 25 years.

Washington Terminal Company

The Washington Terminal Company (WTC) was chartered in 1901 to construct and operate Union Station. WTC's operations were purchased by Amtrak in 1981, but it remains a separate legal entity. It is a common carrier railroad according to definition by the Surface Transportation Board (STB). Today, Amtrak carries out the responsibilities of the WTC, providing switching services for passenger trains using or passing through Union Station. The WTC's status has been significant to rail service in the District in that the WTC's common carrier status was invoked by the VRE when Amtrak at one point suggested that it would withhold transportation services from VRE. Common carrier status requires railroads to provide rail service upon reasonable request.

Union Station Redevelopment Corporation

Union Station Redevelopment Corporation (USRC) was established in 1983 as a non-profit organization to enter into a public/private partnership to manage Union Station. Owned by the U.S. Department of Transportation, USRC is ultimately responsible for the historic preservation of the station, along with the management of its restoration and future development. USRC is charged with three main objectives:

- Preserve and restore Union Station's historic and architectural significance,
- Preserve the station's long-term function as a multi-use transportation center, and

- Enhance the retail and amenities within the station.

USRC has a 99-year ground lease for Union Station and the Parking Garage from the USDOT, and is governed by a Board of Directors consisting of members of USDOT, Amtrak, the Mayor of the District of Columbia, the FRA, and Federal City Council. USRC derives revenues from base rent and participation rent from Union Station tenants, for which a 99-year sublease exists with the privately-held Union Station Investco, LLC (USI). USI contracts for property management within the station with Jones Lang LaSalle Americas, Inc., who is responsible for securing retail tenants, as well as managing the Amtrak leases for the offices, ticket counter and waiting area. Revenues are also derived from licenses and net profit from the Union Station Parking Group, LLC, another private entity under USRC that leases and operates the parking garage at the station.

Recently completed projects in and around the station include:

- Main Hall restoration (2016)
- Ceiling restoration in the main hall and retail concourse (2016)
- H Street pedestrian entrance (2016)
- Historic preservation plan (2015)
- Garage escalators and pavilion enhancements (2015)
- First Street improvements (2015) (completed by DDOT)
- Station signage improvements (2014)
- Garage restoration and improvements (2014)
- Columbus Plaza Improvement Project (2013) (completed by DDOT)
- Improvements to the ticket counter, customer service office and the Design of a new Public Address (PA) system (2013)

A major ongoing project is the Washington Union Station Expansion Project Environmental Impact Statement (EIS), currently underway with environmental review and a master planning process. The EIS will complete with a Record of Decision from the FRA and a conceptual design for the station expansion project.

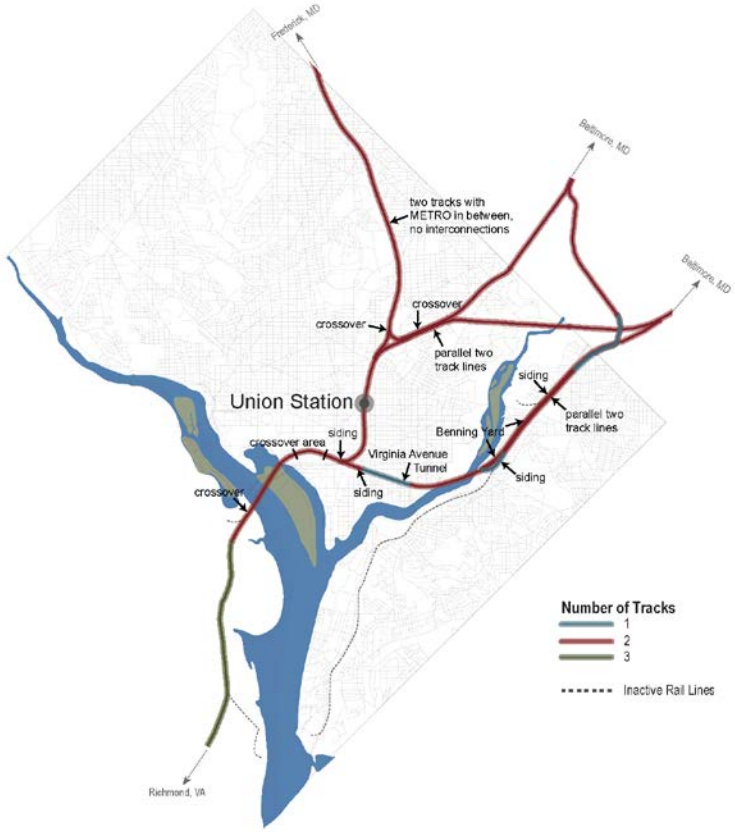
The Washington Union Terminal Infrastructure Plan (TI Plan), being conducted by Amtrak with VRE, MARC, and FRA, is a prerequisite for the expansion project. These parties must determine the future configuration of tracks and platforms in the station based on future service plans so that design work for the infrastructure planned as part of the Station Expansion Project can continue. The parties have been working together for over a year and Amtrak anticipates completing the study in 2017.

3.2.3 Rail Infrastructure in the District

Features of Rail Lines in the District

Active rail lines within the District are all high-capacity mainlines that carry between 223 and 233 trains each weekday.[29] The lines are dispatched by Centralized Traffic Control (CTC) technology. CTC is a system where a dispatcher at a remote location controls the local signals and switches and the routing of trains. Analogous to roadway traffic lights, signals alert train crews to whether trains can occupy a given section of track. Many of the active rail lines within the District consist of two parallel tracks (double track). This is in contrast to most rail lines in the U.S., which are single track. Trains traveling in opposite directions are required to wait in sidings to let each other pass. Although a double track network in many places, the District rail system also includes sidings to provide additional capacity by providing additional passing capacity. Other features of the District's rail network enhance capacity as well. Crossovers are pairs of switches that connect two parallel tracks, allowing a train to cross from one track to another. These increase capacity as trains occupying the same track can pass one another by switching to another track. Despite this relative abundance of infrastructure, many of the rail lines in the District are operating at capacity and the supply of passenger and freight service is constrained by the ability of the existing lines and related structures such as bridges and storage track to handle additional trains. Figure 3-16 displays the major physical features of the District rail network.

Figure 3-16: District Rail Network



Source: WSP | Parsons Brinckerhoff

[29] WSP | Parsons Brinckerhoff analysis. Refer to Table 3-1 for further details.

Major Rail Structures in the District

Figure 3-17 displays major rail structures in the District.

Figure 3-17: Major Railroad Structures in the District

Source: WSP | Parsons Brinckerhoff

Long Bridge

The Long Bridge is a two-track crossing connecting Virginia to the District across the Potomac River. The Long Bridge is a steel truss bridge that spans just over 2,500 feet. The first Long Bridge opened in 1809, and was first used for rail during the Civil War. Through the years, Long Bridge has served multiple modes, and was reconstructed several times for different purposes, including the addition of a parallel structure in 1863 for locomotive use.[30] In 1870, the federal government ceded control of the Long Bridge to the PRR, with the railroad officially becoming owner in 1918. As railroads consolidated, the bridge continued to change ownership, most recently in 1999 when CSX acquired the bridge following the breakup of Conrail.

[30] http://ddot.dc.gov/sites/default/files/dc/sites/ddot/publication/attachments/LongBridge_ExectuveSummary_Chapters1thru3_0.pdf

The current structure was first opened in 1904 and was then rebuilt in 1942 with bridge piers added to accommodate heavy WWII equipment. Between 1934 and 1935, electrification was added to the bridge via a catenary system of overhead wires, which remained in use until the early 1960s. The bridge is currently a two-track railroad bridge with a width of 36 feet 6 inches that narrows to 28 feet 8 inches at the swing truss. The vertical clearance under the bridge is limited to 21 feet at the swing trusses (Figure 3-18). Portions of the unused catenary remain in place today.

As an important link in the national rail network, the bridge was modified in 2014 as part of the National Gateway initiative to adjust the existing diagonal and lateral bracing members with systems to provide both the required bracing and the needed railcar clearance for double-stack trains.[31, 32]

Figure 3-18: Long Bridge

Source: Long Bridge Study

The bridge and approach track operate as a bi-directional line between two points, (1) two miles south of Virginia Interlocking, and (2) past L'Enfant Station where passenger trains continue to Union Station via the First Street Tunnel and freight trains continue toward the Virginia Avenue Tunnel. From both directions, three-track systems connect to the Long Bridge's two-track crossing, creating an operational bottleneck for crossing the Potomac River. Due to the bridge's current condition, the bridge and track approaches have speed restrictions in place, further limiting operational capacity.

Current and projected expanded cross-Potomac River passenger and freight services led DDOT to initiate a comprehensive study for the rehabilitation or replacement of the Long Bridge. The Long Bridge Phase I Study, a comprehensive study that identified short-term needs and longer-term capacity improvements was completed in 2015. It also identified and evaluated concepts to meet short and

[31] http://www.virginiaavenuetunnel.com/sites/default/files/TrainsMagazine.pdf
[32] http://www.nationalgateway.org/potomac-river-swing-bridge

long-term multimodal needs; and identified, collected, and evaluated data in support of the recommended improvements.[33] The Phase I study included a visual evaluation of the structural condition of the bridge, resulting in a "fair" assessment for the superstructure and "satisfactory" to "good" rating for the substructure.[34]

A Long Bridge Phase II Study was initiated in September 2015 by DDOT with the goal to further advance the planning process completed in Phase I to the National Environmental Policy Act (NEPA) process for accommodation of future demand for improved passenger and freight services. The Phase II Study is anticipated to be completed in 2017 with a draft Purpose and Need Statement, further refinement of conceptual alternatives, and preliminary evaluation criteria. This phase will also include the initial identification of environmental and sensitive resources within the project corridor.

An upcoming NEPA phase study beginning in 2017 by FRA, jointly with DDOT, will develop a Draft Environmental Impact Statement (DEIS) and Final Environmental Impact Statement (FEIS), Draft and Final Section 4(f) Evaluation, along with the issuance of a Record of Decision (ROD) to address reliability and long-term railroad capacity issues on the Long Bridge corridor. The EIS will identify a Preferred Alternative and address issues presented at the public hearing and during the public comment period.

Currently, the Long Bridge is used by CSX, Amtrak, and VRE. In 2016, an average of approximately 78 daily trains used the Long Bridge, with freight trains making up approximately 25 percent of the traffic and passenger trains the other 75 percent. Approximately 192 trains are expected to use Long Bridge in 2040 based on unrestricted service plans to meet each existing user's projected demand, a MARC expansion to Virginia, and Norfolk Southern usage of its trackage rights. This increase would have significant impacts on current on-time performances and create a bottleneck at the bridge.

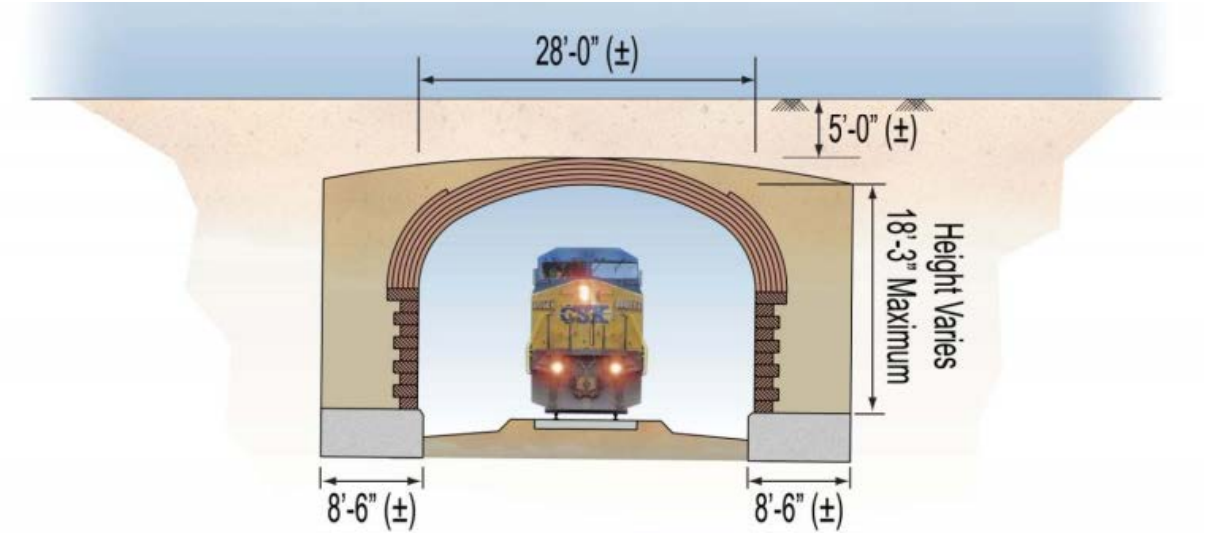
Virginia Avenue Tunnel

The Virginia Avenue Tunnel was constructed in 1872 by the B&P Railroad. It served both passenger and freight trains until the opening of Union Station. Since then, the tunnel only serves freight trains. The tunnel is a little less than 3,800 feet in length and runs underneath Virginia Avenue from 15th Street to 2nd Street, in the Southeast quadrant of the District. The tunnel currently has a single track in contrast to segments on each side of the tunnel, which are double-tracked.

The existing tunnel is 28 feet wide, prohibiting a second track, which would require a horizontal dimension of at least 33 feet. The tunnel has a clearance just above 18 feet, making it impossible to run the more productive double-stack intermodal trains that are increasingly being used throughout the country (Figure 3-19). Double stack railcars are as high as 20 feet 2 inches above the rails, but railcars require additional vertical clearance as a buffer due to train jostling and variation of specific rail segments due to ballast conditions, etc. The Association of American Railroads (AAR) has established a standard of 22 feet 6 inches for unrestricted rail operations.

[33] http://ddot.dc.gov/page/long-bridge-study
[34] http://ddot.dc.gov/sites/default/files/dc/sites/ddot/publication/attachments/LongBridge_ExectuveSummary_Chapters1thru3_0.pdf

Figure 3-19: Dimensions of the Existing Virginia Avenue Tunnel



Source: Virginia Avenue Tunnel Final Environmental Impact Statement

In 1985, a 350-foot section of the tunnel near 5th Street SE collapsed, and the tunnel and streets were closed for several months during emergency repairs while a 600-foot section of the tunnel was reinforced and reconstructed. In the 1990s concerns continued to mount regarding the need for extensive structural rehabilitation, as well as the tunnel being a major bottleneck in passenger train operations south of Washington. In 1999 CSX requested proposals for the reconstruction of the tunnel.

As of 2017, CSX was in the process of expanding the tunnel to include two tracks and to increase the clearance to allow double stack intermodal trains that can accommodate high capacity containers (Figure 3-20). Construction began in 2015 and is expected to be completed in 2018 at an estimated cost of around $170 million. Virginia has committed $24 million toward the project, while the remainder is funded by CSX. The project involves replacing the existing Virginia Avenue Tunnel with two new permanent tunnels constructed sequentially. Each tunnel provides a minimum vertical clearance of 21 feet to allow double-stack intermodal container freight train operations. Reconstructing the tunnel to allow double-stack intermodal freight rails also requires the re-grading of existing tracks west of the tunnel being rebuilt, which results in vertical clearance under the New Jersey Avenue SE overpass that will also allow the passage of double-stack freight trains.[35]

[35] http://www.virginiaavenuetunnel.com/sites/default/files/FEIS-Executive-Summary.pdf

Figure 3-20: Cross Section View of Post-Construction Preferred Alternative between 3rd and 9th Streets SE

Source: Virginia Avenue Tunnel Final Environmental Impact Statement & Section 4(f) Evaluation

First Street Tunnel

The First Street Tunnel was constructed between 1904 and 1906 as the southern approach to Union Station. The tunnel is owned by Amtrak and consists of two tubes, each with one track. The tunnel is 4,108 feet long and passes under Capitol Hill. The tunnel is 17 feet high, which allows users to operate bi level passenger cars (Figure 3-21). Certain freight equipment, such as auto racks and double stack intermodal could not fit through the First Street Tunnel. The tunnel is not electrified, so all trains operating south of Union Station cannot use electric locomotives.

Figure 3-21: South Portal of First Street Tunnel

Source: David Wilson [CC BY 2.0 (http://creativecommons.org/licenses/by/2.0)], via Wikimedia Commons

Anacostia Railroad Bridge

The Anacostia Railroad Bridge is located in the Southeast quadrant of the District. It is the structure used by CSX to cross the Anacostia River. A rail bridge has existed at this location dating back to 1872. The current bridge was rebuilt 100 years later, in 1972, with its current steel frame. The bridge consists of two independent spans measuring a total of 990 feet. An inspection of the bridge in November 2006 found that the structure had badly corroded, prompting the closure of the bridge for 30 days. CSX was collecting bids to build a replacement structure when the northern span of the bridge collapsed under the load of a passing coal train, spilling several cars into the Anacostia River. The remaining span was reopened 24 hours after the accident.[36] Reconstructed in 2012, the old bridge supports from three prior bridges were removed and new steel columns constructed in a manner so as to prevent items flowing down river becoming lodged and forming a dam. When closed, the bridge has a lift span of 5 feet over the river; when open there is a clearance of 29 feet (Figure 3-22).

Figure 3-22: Anacostia Railroad Bridge

Source: https://www.flickr.com/photos/28053622@N05/13084193083

Amtrak Railroad Anacostia Bridge

The Amtrak Railroad Anacostia Bridge is a double-track bridge that carries the NEC railroad over the Anacostia River at the east end of the District. The bridge includes three concrete piers, masonry abutments on both shores, and a steel superstructure (Figure 3-23). The bridge was built between 1904 and 1906 for a new, more direct route for the B&P Railroad (as a part of the PRR) operating between Washington and Baltimore. The bridge was nearly destroyed by a hurricane in 1933 after floodwaters damaged the piers and caused a passenger train to derail on the bridge, destroying most of the deck. The PRR rebuilt the bridge between 1934 and 1935. In 1944 the bridge caught fire and needed major repairs after a watchman dumped hot coals from a watchhouse, igniting oil left from passing trains. The bridge

[36] http://www.washingtonpost.com/wp-dyn/content/article/2007/11/14/AR2007111401403.html

became a part of Amtrak's infrastructure when Amtrak was established in 1971. Much of the structure received repair and major maintenance, including the concrete piers, masonry, and steel in 1999 as part of an Amtrak program of major infrastructure works along the NEC.

Figure 3-23: Amtrak Railroad Anacostia Bridge

Source: Wikipedia

Unused Rail Network in the District

Two inactive rail lines are located in the District. The most significant is the Shepherd Branch. This originally provided access to the Shepherds Landing ferry in the nineteenth century. It is 6.7 mile single-track line connecting to the CSX mainline near the Anacostia Bridge and running parallel to Interstate 295, terminating at the Blue Plains sewage treatment plant. At one point, this line provided fuel to Bolling Air Force Base, coal to St. Elizabeths Hospital, and liquid chlorine to the Blue Plains sewage treatment plant. As of 2001, all traffic on the line stopped. According to CSX, at least a portion of the line has not been formally abandoned, so the right-of-way is still intact.

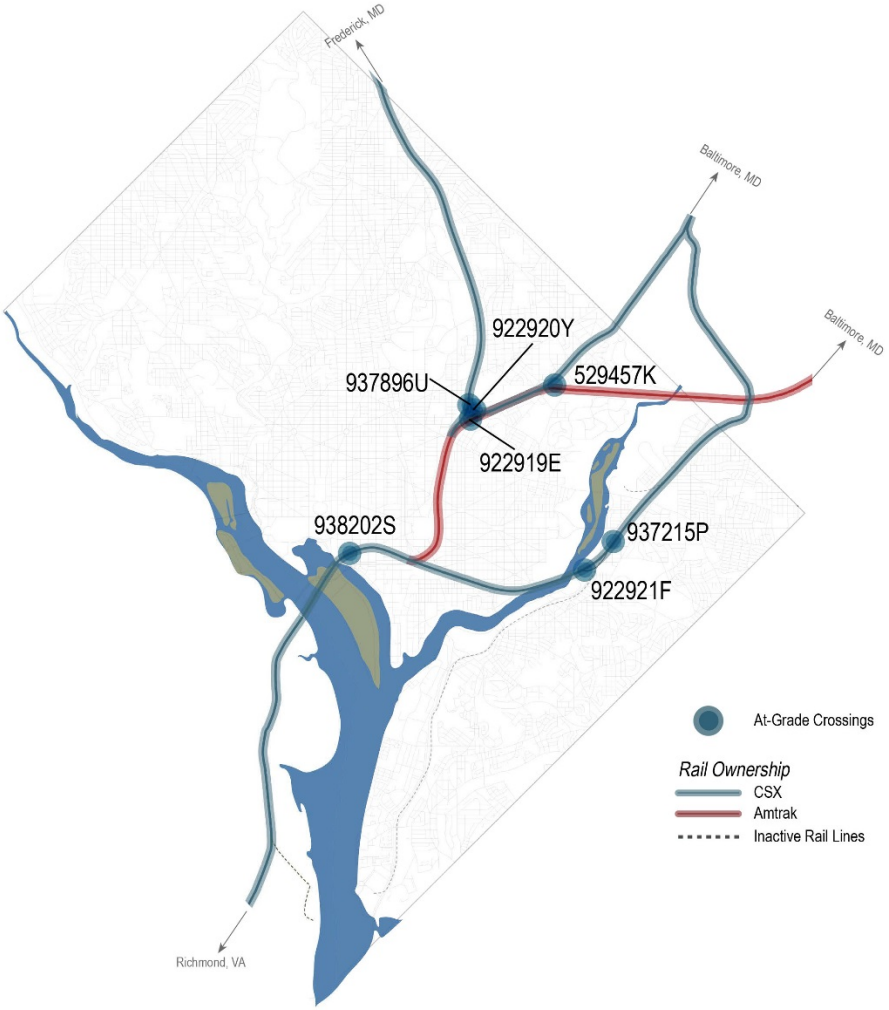
The second is the single track line of the former East Washington Railway which ceased operations in 1978. The line runs between the CSX Landover Subdivision at Benning Road and the PEPCO Service Center just north of Benning Road. It is about one-third of a mile in length.

Highway/Rail at Grade Crossings

According to the FRA crossing inventory database, there are seven active highway/rail at-grade crossings located within the District on the Northeast Corridor and two of CSX's subdivisions through the District (Figure 3-24). All of these at-grade crossings serve private roads that access railroad

property and facilities. There are an additional 108 grade crossings considered closed, i.e., on inactive or abandoned rail lines in the District.[37]

Figure 3-24: Railroad Grade Crossings in the District



Source: FRA Safety Database

- Amtrak's Northeast Corridor:
  - 529457K is located on a siding that is severed from the NEC, and serves a private drive that accesses a parking lot at the end of Adams Place NE.
  - 922919E is adjacent to Wedge Yard on the Camden line providing access for maintenance crews to a service road between the NEC and Camden lines.
  - 922920Y is located at the eastern end of Wedge Yard allowing maintenance vehicles to access two sides of the facility.

[37]http://safetydata.fra.dot.gov/OfficeofSafety/PublicSite/Crossing/XingLocResults.aspx?state=11&countycity=001,&railroad=&reportinglevel=ALL&radionm=County&street=&xingtype=%&xingstatus=1&xingpos=1

  - 937896U is located on the lead tracks between Washington Terminal Yard and the Metropolitan Subdivision, and provides employees access to WMATA's maintenance facility and rail yard from T St NE.

- CSX Capital Subdivision:
  - 937215P is located in CSX's Benning Yard connecting a service road that lies on either side of yard tracks.
  - 922921F is at the western end of Benning Yard, and provides CSX employees access to yard offices and the service road across the yard.
- CSX RF&P Subdivision:
  - 938202S is located near the intersection of Maryland Ave and 12th St SW on CSX's RF&P Subdivision connecting a service road that lies on either side of the line.

3.2.4 Usage of the District Rail Network

Train Operations on the District Rail Network

Between 223 and 233 trains pass through, depart, or arrive in the District on a typical weekday. Of these, 213 are passenger trains and between 10 and 20 are freight trains. MARC is the largest generator of traffic, with 95 trains originating or terminating at Union Station each day. Amtrak is the second largest generator of traffic with 86 trains, followed by VRE with 32 trains (30 revenue trains and two for repositioning). All passenger trains stop at Union Station.

The busiest corridor connected to the District is the Amtrak NEC, which carries 139 trains per day, of which 84 are Amtrak trains and 55 are MARC trains. Freight traffic on the NEC is minor, less than one train every other day. The second busiest corridor is the CSX RF&P Subdivision between the First Street Tunnel and the Long Bridge, which carries between 64 and 78 trains per day, including up to 34 VRE trains, 26 Amtrak trains, and between 10 and 20 freight trains. Table 3-1 displays the number of trains per day per rail line, as well as the number of trains by direction per operator.

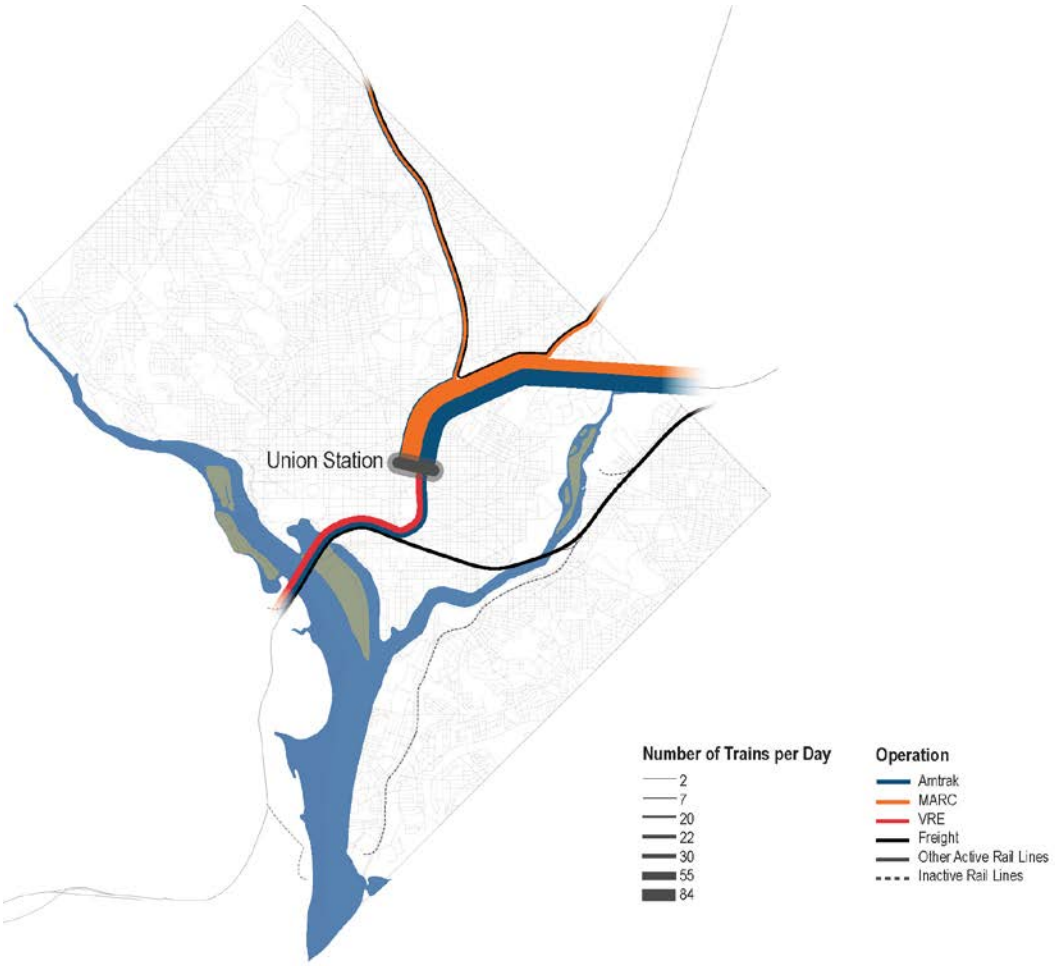
Table 3-1: Number of Trains per Day on District Rail Lines

	Northeast Corridor (MARC Penn Line)	CSX RF&P Sub (Long Bridge)	CSX Metropolitan Sub (MARC Brunswick Line)	CSX Capital Sub (MARC Camden Line)	Virginia Avenue Tunnel	Total
Amtrak Northbound	42	11-14	1			43
Amtrak Southbound	42	11-14	1			43
MARC Northbound	28		10	11		49
MARC Southbound	27		9	10		46
VRE Northbound		15-16				15-16
VRE Southbound		17-18				17-18
Total Passenger	139	54-60	21	21	0	213
Freight	<1	10–20	5–10	5–10	10–20	10–20
TOTAL	139	64–78	26–31	26–31	10–20	223–233

Source: WSP | Parsons Brinckerhoff Analysis

Figure 3-25 graphically presents the number of trains per day on District rail lines.

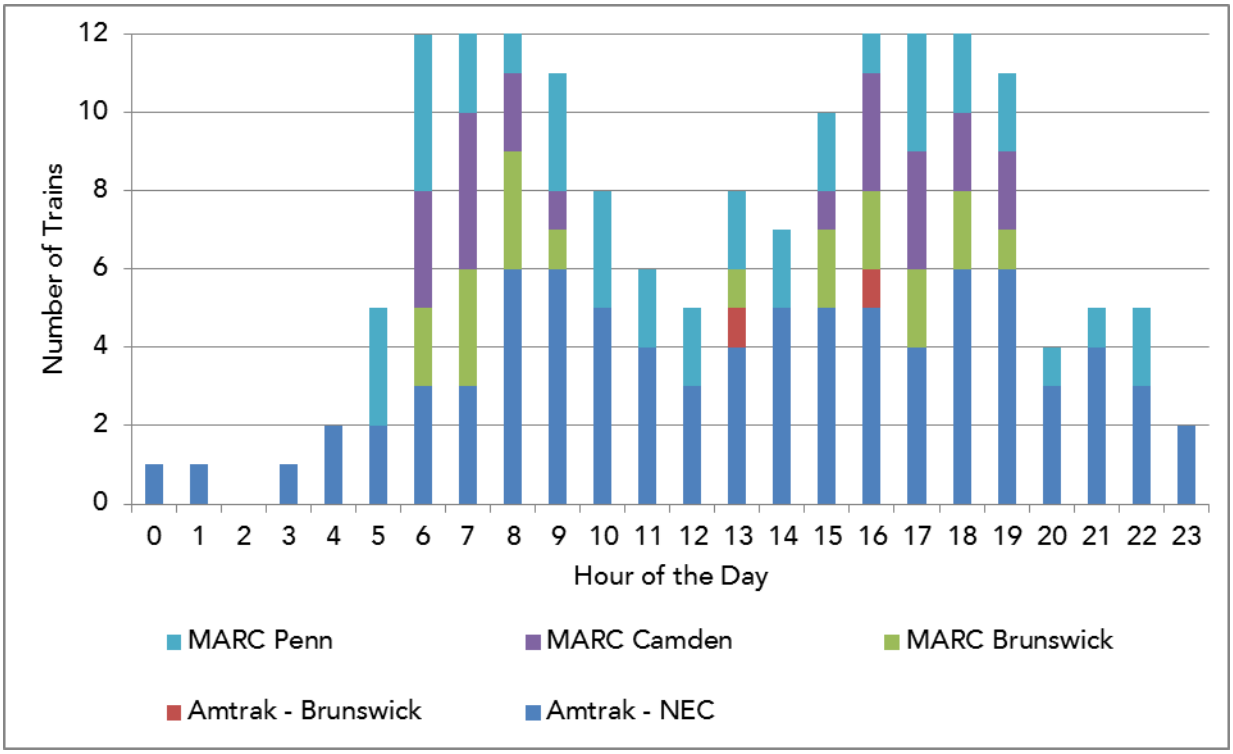
Figure 3-25: Trains per Day by District Rail Line



Source: WSP | Parsons Brinckerhoff Analysis

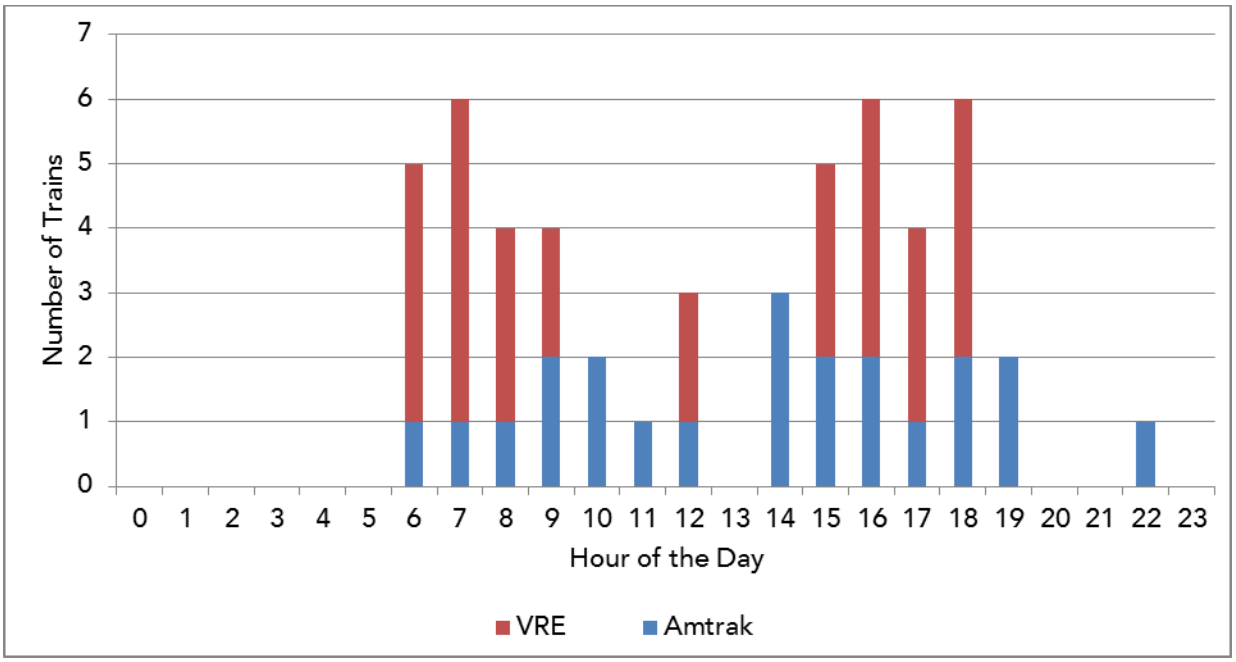
Amtrak trains arrive steadily throughout the day but both MARC and VRE train arrivals and departures are concentrated during peak time periods. MARC Brunswick Line and Camden Line trains arrive only in the morning hours and depart only in the afternoon and evening hours. MARC Penn Line trains arrive and depart throughout the day with a higher concentration of trains in the morning and evening commuting hours. VRE Fredericksburg Line trains arrive only in the morning hours and depart only in the afternoon and early evening hours. Most VRE Manassas Line trains arrive in the morning hours with two trains arriving in the early afternoon and most VRE Manassas Line trains departing in the afternoon and early evening hours, with one train departing at noon. Figure 3-26 and Figure 3-27 display weekday train departures from Union Station by hour. As shown, during morning and afternoon peaks 12 passenger trains per hour depart or arrive at Union Station for points north, while six trains depart per hour depart or arrive for points south.

Figure 3-26: Weekday Union Station Passenger Trains— Arrivals/Departures to/from Points North



Source: WSP | Parsons Brinckerhoff Analysis

Figure 3-27: Weekday Union Station Passenger Trains—Arrivals/Departures to/from Points South



Source: WSP | Parsons Brinckerhoff Analysis

3.2.5 Intercity Passenger Rail Services in the District

Intercity passenger rail operations that serve the District fall into three categories:

- NEC Service. These include the *Northeast Regional* and *Acela* services, as well as the NEC component of some state-supported services. The *Northeast Regional* serves the NEC between Washington and Boston with different trains making stops at Amtrak stations along the corridor throughout the day and some trains continuing through Washington to serve Richmond, Lynchburg, Newport News, and Norfolk, Virginia. The *Acela Express* serves the NEC between Washington and Boston using faster trains to stop only at major markets along the route.
- Corridor Service or State-Supported Service. Amtrak receives funding from 18 states under 19 operating agreements for financial support of 29 short distance routes (less than 750 miles). Six state-supported routes serve Washington. Four are extensions of the *Northeast Regional* that serve Richmond, Lynchburg, Norfolk, and Newport News, with the service south of Union Station funded by the Commonwealth of Virginia. The *Vermonter* is funded by a collaboration between Connecticut, Massachusetts, and Vermont. It travels the NEC between Washington and New Haven, Connecticut before traveling northward to St. Albans, Vermont. The sponsoring states pay for the portion of the route between New Haven, Connecticut and St. Albans, Vermont, but not the portion on the NEC. The other state-supported route is the *Carolinian*, which travels between Washington and Charlotte and is funded by North Carolina.
- Long Distance Service. Amtrak operates 15 long distance trains on a national network of routes that vary in length from 764 to 2,438 miles. Six long distance routes serve Washington - the Capitol Limited, Cardinal, Crescent, Palmetto, Silver Meteor, and Silver Star. This network of long distance routes provide the District direct connections to destinations as far away as Chicago, New Orleans, Savannah, Miami, and many intermediate points.

In 2008, PRIIA changed the way state-supported Amtrak train routes are funded. Section 209 of the PRIIA legislation required Amtrak and the states to develop a standardized funding formula for state-supported routes not on the NEC, requiring states to pay 100 percent of the costs of the state-supported routes, including applicable capital costs. This change increased the cost for states to fund Amtrak routes. Any new Amtrak routes proposed by states need to be funded through formulas developed in PRIIA Section 209.

Table 3-2 summarizes Amtrak routes that serve the District. As can be seen, by far the highest ridership is associated with the NEC services, including the *Northeast Regional* and *Acela Express* trains.

Table 3-2: Amtrak Routes Serving the District

Route Name	Origin	Destination	Weekday Frequency	Ridership FY 2014	Category	State Sponsor	FY 2014 Ridership at Union Station
Northeast Regional*	Washington, D.C.	New York City / Springfield / Boston	16 trains daily	8,274,070	Northeast Regional		2,870,514
Acela Express	Washington, D.C.	New York City / Boston	16 trains daily	3,545,306	Acela Express		1,415,780
Capitol Limited	Washington, D.C.	Chicago	Once daily	235,926	Long Distance		131,121
Northeast Regional extension	Lynchburg	Boston	Once daily	189,723	State-Supported	Virginia	57,005
Carolinian	Charlotte	New York City	Once daily	302,601	State-Supported	North Carolina	54,788
Crescent	New Orleans	New York City	Once daily	294,306	Long Distance		46,683
Northeast Regional	Newport News	Boston	Twice daily	344,335	State-Supported	Virginia	46,313
Northeast Regional	Norfolk	Boston	Once daily	152,135	State-Supported	Virginia	41,109
Palmetto	Savannah	New York City	Once daily	203,168	Long Distance		40,593
Silver Meteor	Miami	New York City	Once daily	348,581	Long Distance		39,941
Silver Star	Miami	New York City	Once daily	405,695	Long Distance		38,991
Cardinal	Washington, D.C.	Chicago	3 trains weekly	109,154	Long Distance		18,752
Vermonter	Washington, D.C.	St. Albans, Vermont	Once daily	89,640	State-Supported	Vermont, Massachusetts, Connecticut	8,370

Source: National Association of Rail Passengers and Amtrak
**Includes Virginia State-Supported trains to and from Richmond*

Rail-Trails in the District

Rails-to-trails is the common name used to describe abandoned rail lines that have been converted to paved or gravel paths for broader transportation use. Such an endeavor not only allows the reuse of abandoned right-of-way, but can also preserve right-of-way on inactive lines that may become active again in the future. The District is also home to rails-with-trails, which are rail rights-of-way that host adjacent trails with appropriate barriers for safety precautions.

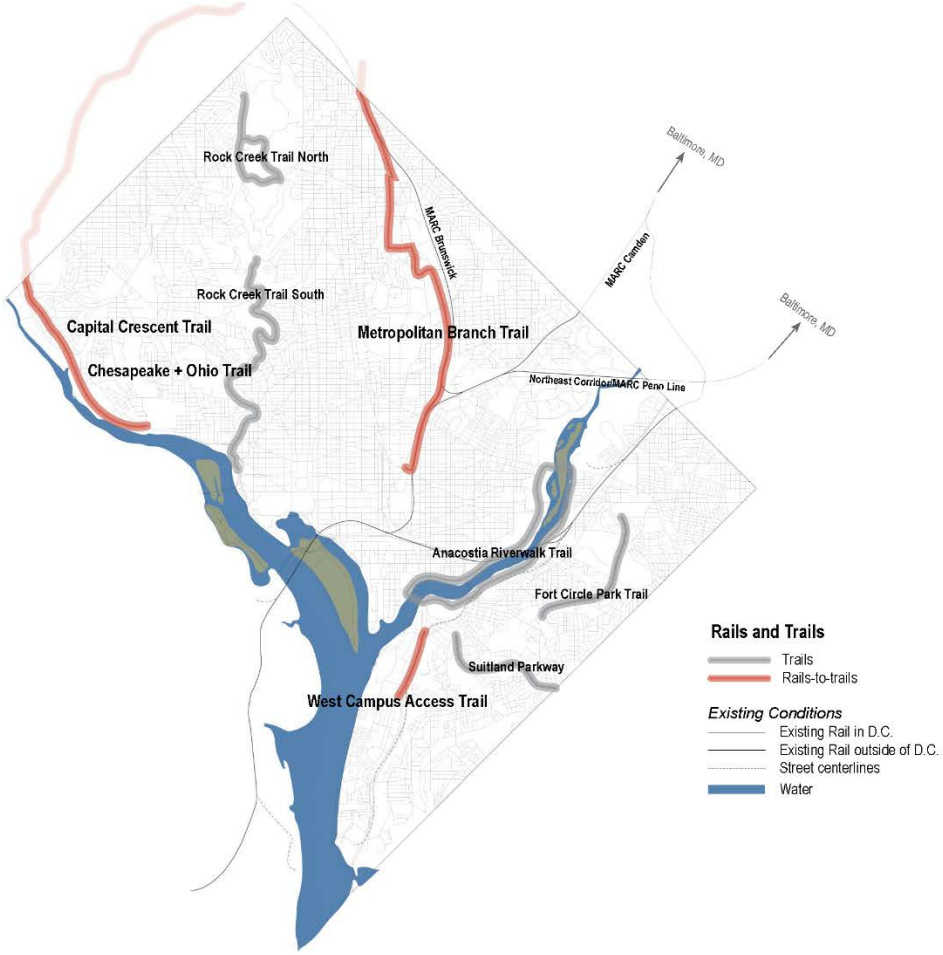
Currently there are three rail-trails totaling close to 12 miles in the District of Columbia:

- Metropolitan Branch Trail, 8 miles (7.0 miles in the District). This trail follows the route of the B&O's Metropolitan Branch rail line, as a rail-with-trail that shares a corridor with Metro's Rail Line, MARC commuter service, CSX freight trains, and Amtrak. At present, the trail is a mix of on-road and off-road facilities.
- Capital Crescent Trail, 11 miles (4.3 miles in the District). The Capital Crescent Trail follows the route of the abandoned Georgetown Branch rail line of the B&O Railroad. Beginning in Silver Spring, Maryland, the trail curves westward and south through Maryland into the District, ending in Georgetown. For the seven miles between Georgetown and Bethesda, Maryland, the trail is paved and much of it includes an adjacent gravel path for joggers. In Georgetown, the trail has the Potomac River on one side and the Chesapeake & Ohio Canal National Historical Park towpath on the other.

  Future plans include creating a hard surface along the proposed Purple Line light rail between Bethesda and downtown Silver Spring, where the Capital Crescent will connect to the Metropolitan Branch Trail.
- West Campus Access Trail, 0.4 miles (0.4 miles in the District). The West Campus Access Trail is the newest rail-trail in the District, and travels through the former campus of the St. Elizabeths Hospital, which is planned to become the new home for the Department of Homeland Security (DHS). Built on a former spur line of the B&O's Shepherd Branch, the trail provides access to the United States Coast Guard Headquarters, as well as the campus' bus bays.

  While the trail currently serves to bring bicycle and pedestrian commuters from Barry Farm and Anacostia (as well as a potential future streetcar on Firth Sterling Avenue SE) onto the DHS campus, in the future the trail will be extended along West Campus Access Road farther south to a planned terminus south of Malcolm X Avenue SE. To the north, the planned construction of the connecting South Capitol Street Trail will eventually allow trail users to head south to Joint Base Anacostia – Bolling and north towards the Washington Navy Yard and Downtown via the Anacostia Riverwalk Trail.

Figure 3-28: Rail-Trails in the District



Source: WSP | Parsons Brinckerhoff

As connections and extensions for these existing trails are advanced, and new rails-to-trails or rail-with-trail areas are considered, DDOT may want to consider developing a policy for potential right-of-way that may become inactive or be abandoned. This policy should also identify placement of trails proposed in a railway corridor and include strategies to prevent trespassing. The USDOT Rails-with-Trails: Lessons Learned guidebook (August 2002) is a resource that can be referenced for lessons learned on the safety, design, and liability issues associated with the use of shared use paths and other trails within or adjacent to active railroad and transit rights-of-way. DDOT can also collaborate with the national Rails-to-trails Conservancy to promote providing alternative uses for abandoned rail rights-of-way. Railbanking, or protecting inactive rail lines from development for future transportation use, is one potential way for the District to preserve inactive rail lines prior to repurposing them. A nearby example, the Capital Crescent trail, is railbanked in Maryland, but not yet in DC. Interim uses, such as a rail-trail, allow for the alignment to be kept intact and ownership maintained. Numerous potential rail-to-trail/rail-with-trail projects are underway or documented in plans for the District, including:

- Northern extension of Metropolitan Branch Trail from Brookland to Takoma: This trail extension will be built in two sections: 1) Brookland to Fort Totten, and 2) Fort Totten to Takoma. Both sections have portions adjacent to the Metropolitan Subdivision.

- New York Avenue Tunnel and spur at Penn St NE/4th St NE: Included as trail route in draft concept plan for New York Avenue Trail.
- New York Avenue Bridge and spur at Montana Avenue NE: Identified in draft concept plan for New York Avenue Trail as potential connection to Anacostia Riverwalk Trail.
- Shepherd Industrial Spur, six miles long from Greenway to Blue Plains SE: Proposed as trail in moveDC.
- New York Avenue/Amtrak line from Montana Avenue to the Anacostia River, and along the south side of the line to Hyattsville from Montana to Queens Chapel Road: PSA to study this in the New York Avenue Trail plan.
- Spur just east of Bladensburg Road going north from V Street towards Adams St NE and another towards South Dakota Ave NE: Adjacent to the corridor being examined for the New York Ave trail plan.
- Along west side of Metropolitan Branch from Franklin to Lawrence: Replace where the trail currently goes on-street along 8th.
- The Metropolitan Branch/CSX tracks from roughly Riggs to Oglethorpe: The tunnel under New Hampshire Ave. is likely prohibitive for trail development; currently an on-street route is the selected alignment in this area. The Environmental Assessment (EA) developed jointly by FHWA and DDOT may be reopened to review alternative alignments in this area; a route that takes the trail under New Hampshire is frequently suggested by residents.
- Long Bridge: As part of the ongoing NEPA process for the proposed Long Bridge Project, DDOT and FRA may consider trail access as part of the Project.

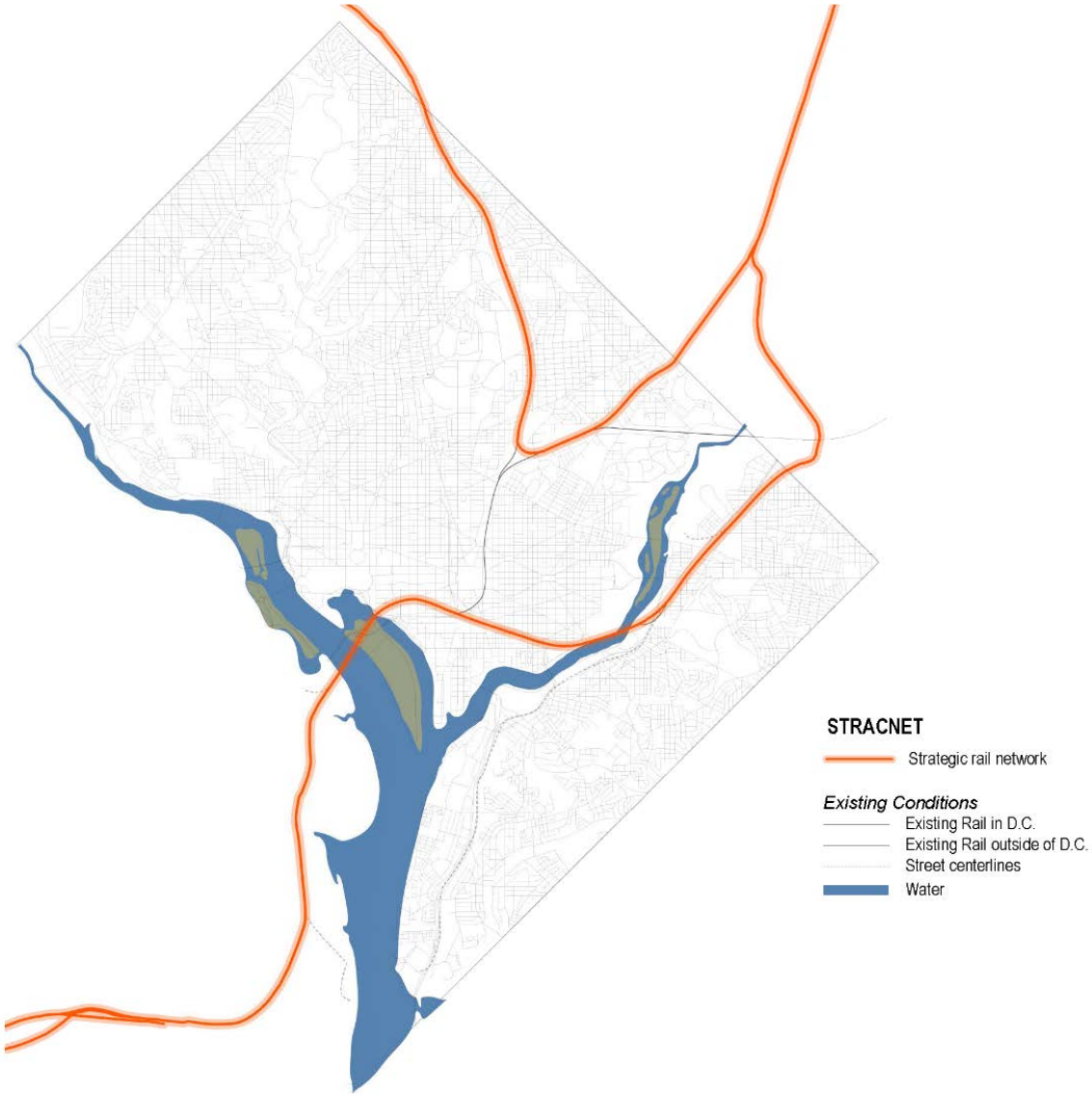
Several additional lightly-used rail corridors not currently included in a trail plan have also been documented:

- Both sides of Capital Subdivision rail line from Franklin and 27th NE to Eastern Avenue: Sufficient room within right-of-way on the north side, but need to determine appropriate connection.
- Small portions of the Chesapeake Beach Railway from Lee and 44th NE (Chesapeake Beach Junction) to Eastern and Dix NE.
- Small portions of the Washington, Baltimore and Annapolis Electric Railway (WB&A) from Nannie Helen Burroughs and 50th Street NE to Eastern and Dix.
- Unused/lightly used right-of-way on south side of rail line and bridge on the RF&P Subdivision at the Capital Subdivision Split between 2nd and E SW and New Jersey Ave SE with spurs/underpasses to Splash Car Wash and to H and New Jersey Avenue.
- Unused/lightly used right-of-way on north side of RF&P Subdivision from the west side of the L'Enfant Station to parking lot at southeast corner of 14th and D SW.
- Spur from the Landover Subdivision just east of the Minnesota Avenue Metro station to the old PEPCO plant site using a bridge over the Anacostia Freeway (could connect to Metro Pedestrian underpass).

3.2.6 Strategic Rail Corridor Network (STRACNET)

The Strategic Rail Corridor Network (STRACNET), as defined by the U.S. Department of Defense (DoD) and the FRA, provides access to essential military bases and support installations and is used for the deployment of military equipment during emergencies or natural disasters. A number of the rail lines within the District are on the STRACNET. One practical implication of being on the STRACNET is that lines must be able to accommodate railcars of the DoD clearance profile, which includes a 12-foot overall width and 16.92-foot overall height above rails. Figure 3-29 shows the STRACNET network.

Figure 3-29: District Rail Lines on the STRACNET



Source: National Transportation Atlas Database

3.2.7 Multimodal Connections

Union Station and Support Facilities

Union Station is the primary train station in the District and Amtrak's second busiest station. The building is a major tourist destination, with a variety of shops, restaurants, and services and also serves as Amtrak's headquarters. Beyond its rail services, Union Station is a station on Metro's Red Line, with the highest ridership of any station on Metro's system.[38] Intercity and tour buses are accommodated in the station's parking garage and Metrobus and the DC Circulator also serve the station. Pedestrian circulation is a major concern as ridership continues to grow for all operators and as passengers seek to make connections between these modes. As such, the following station elements are facing needs:

- Concourse and gate areas: Currently, during peak hours, some areas of the concourse and gate areas are typically near or over capacity. Passengers moving from trains to a connecting mode of transportation experience significant bottlenecks at gates and high-use corridors.
- Vertical circulation: The north Metrorail entrance does not have enough capacity in terms of escalators, fare vending area, fare gates, and circulation to handle pedestrian volumes.
- Platforms: Both high and low platforms are located at Union Station to accommodate the various types of trainsets that use the Station. Platforms currently do not meet Americans with Disabilities Act (ADA) width and gap requirements and do not effectively accommodate circulation when trains unload at the Station.

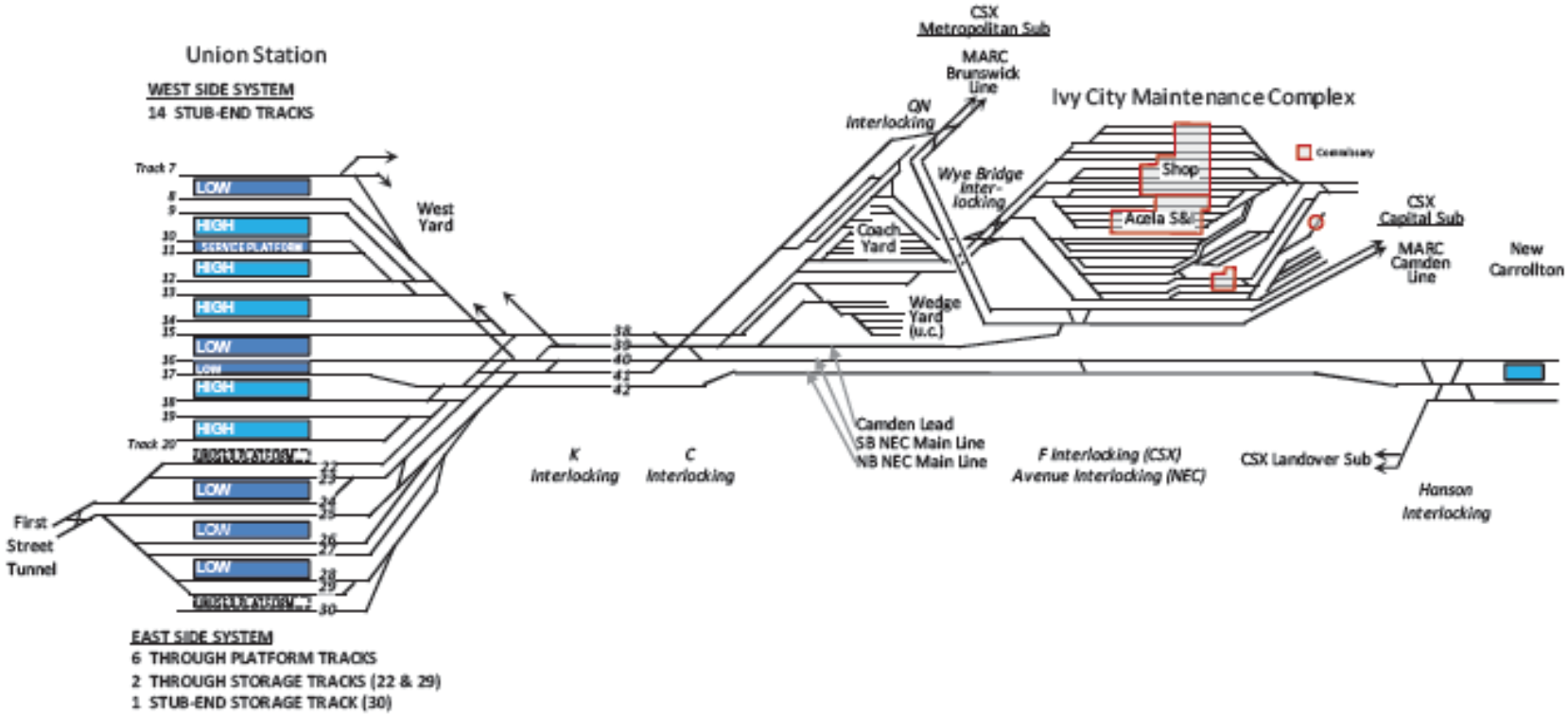
Beyond the station building, a number of facilities support passenger rail service. Washington Terminal encompasses the tracks and support facilities at Union Station and includes yards, spur tracks, and outbuildings in which a variety of functions are performed. Figure 3-30 displays the track layout of the area, showing Washington Terminal support yards such as the Ivy City Coach Yard, the new Wedge Yard, and the Ivy City yard and maintenance shop complex. Lack of available space is also a constraint for these facilities, as outlined here:

- Yards and support facilities: Storage of trains is a continuing area of concern, with MARC's and VRE's peak-oriented service requiring intense demand for midday layover facilities near the station. Currently, the midday trains are stored at Ivy City Coach Yard, West Yard, or on platform tracks, and all are essentially at capacity. The addition of any more trainsets will push these facilities to overcapacity. The location of train storage also creates operational problems, for example, with VRE train movements to midday storage locations periodically blocking access between the Union Station Terminal area and the NEC. Needed future expansion of commuter rail service cannot be accommodated with the current track configuration at Union Station.
- Support facilities: A variety of support functions occur at Union Station including passenger/station services, food and beverage, police, engineering, mechanical, and crew bases. The existing space required for support functions is inadequate for current functions to operate appropriately. The Union Station Master Plan identified a shortfall of close to 21,000 square feet lacking in these areas.

The functions performed for Amtrak, MARC, and VRE are shown in Table 3-3. Additional information on Union Station and its support facilities can be found within Appendix H.

[38] https://www.wmata.com/pdfs/planning/2015_historical_rail_ridership.pdf

Figure 3-30: Washington Terminal Track Layout and Related Facilities



Source: Union Station Master Plan, 2012

Table 3-3: Functions Performed at Union Station Washington Terminal Area

Function	Amtrak	MARC	VRE
Passenger boarding	Terminus for *Acela Express, Northeast Regional (excl. Virginia services), Vermonter, Capitol Limited,* intermediate stop for *Carolinian/Piedmont, Silver Service/Palmetto, Cardinal, Crescent, Northeast Regional (Virginia services)*	Southern terminus of all MARC trains, except for a single Penn Line train that repositions from Baltimore to Perryville for the morning rush hour.	Northern terminus of all VRE trains
Train storage	Private car storage at station platform tracks, train storage at Ivy City Maintenance Facility	Midday storage at station platform tracks, at West Yard	Midday storage at Ivy City Coach Yard Zone
Train cleaning and servicing	Layover cleaning and servicing for turning trains at Union Station platforms, Acela Express servicing at Ivy City Maintenance Facility, Car Wash at Ivy City Coach Yard Zone	Layover cleaning and servicing at Union Station platforms	
Coach maintenance	Coach maintenance at Ivy City Maintenance Facility, Acela Express wheel diagnostic facility Ivy City Coach Yard Zone	Coach maintenance at Ivy City Maintenance Facility, maintenance on Union Station platform tracks as needed	Coach maintenance as needed at Ivy City Maintenance Facility
Locomotive servicing and maintenance	Electric and diesel locomotive servicing and maintenance at Ivy City Maintenance Facility	Electric locomotive pantograph maintenance at Ivy City Maintenance facility, maintenance as needed at Union Station platform tracks	Locomotive maintenance as needed at Ivy City Maintenance Facility
Equipment inspection	Car inspections at Track 16 pit track at Union Station platform tracks, Acela Express inspections at Ivy City Maintenance Facility	Car inspections at Track 16 pit track at Union Station platform tracks, electric locomotive pantograph inspection at Amtrak Ivy City Maintenance Facility	
Commissary	Food service re-stocking at Union Station platform tracks from Satellite Commissary, primary commissary at Ivy City Maintenance Facility		
Police	Amtrak Police at Union Station		
Crew Base	Amtrak Train and Engine, On Board Services crews have a base within Union Station		
Engineering	Amtrak maintenance of way functions occupy buildings in the vicinity of Union Station.		

Source: Union Station Master Plan, 2012

L'Enfant Station

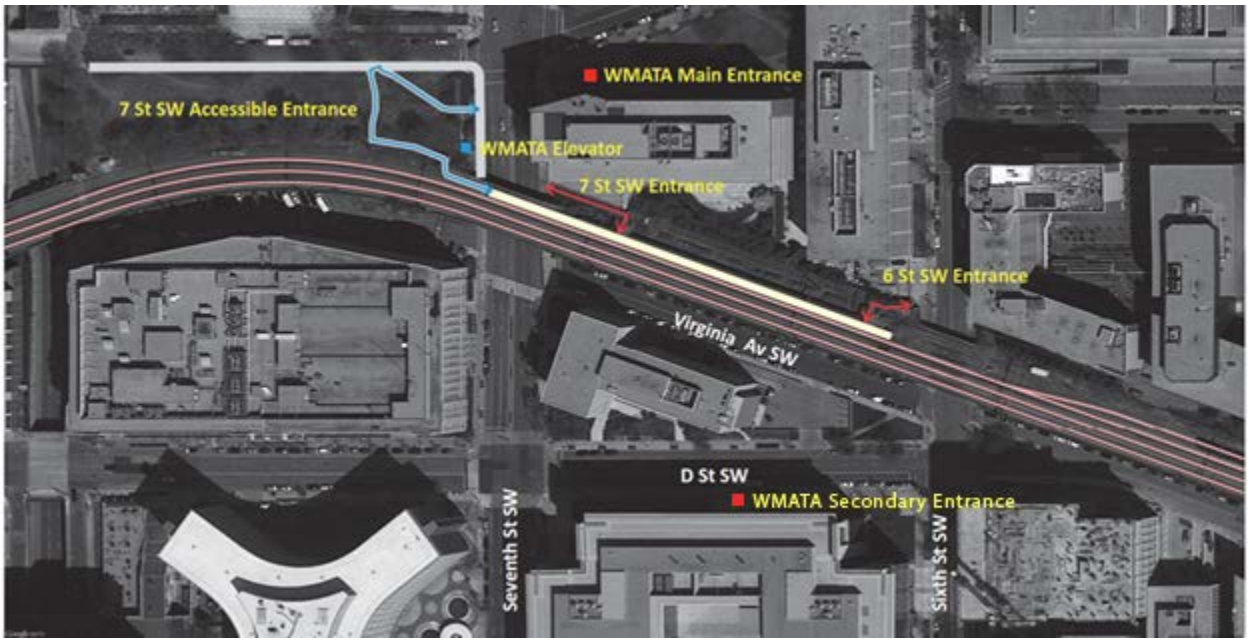
L'Enfant Station is located on Virginia Avenue between 6th and 7th Streets, SW. The 7th Street entrance is across the street from the L'Enfant Plaza Metro Station elevator and around the corner from the L'Enfant Plaza main entrance, while the 6th Street entrance is located next to the Federal Aviation Administration and across from Federal Center Plaza. Both of these entrances provide access to thousands of federal agency jobs. The L'Enfant Plaza Metrorail station provides access to the Blue, Orange, Silver, Green, and Yellow Metro Lines. L'Enfant Station is operated by VRE. Given the current limited reverse-peak service currently provided by VRE, there is no vehicular parking located at the station, however multiple privately operated parking garages located nearby. L'Enfant Station overwhelmingly serves as a destination station, with nearly all passengers walking, using bikeshare or taking Metro to their final destinations.

All VRE trains and some Amtrak Virginia state-supported trains stop at L'Enfant Station. It is used by 40 percent of VRE's ridership and is the highest volume station on the VRE network (compared to 22% at Union Station).

L'Enfant Station consists of a sheltered platform on the north side of the tracks, 555 feet long and 12-15 feet wide. The station can accommodate boarding/alighting of VRE trains of up to eight cars. The width of the platform is less than what is needed, which results in crowding during peak periods. The station platform serves a single track, which limits VRE's operations and ability to provide reverse-peak operations. The CSX rail line in front of the station consists of three tracks.

One side of the station is ADA accessible, although the access is circuitous as shown by the blue line in Figure 3-31. The rail line and L'Enfant Station platform are elevated above the adjoining Virginia Avenue.

Figure 3-31: Aerial Schematic of L'Enfant Station



Source: VRE

3.2.8 Intercity Passenger Service Performance Evaluation

Intercity Passenger Rail

Section 207 of PRIIA requires that Amtrak and FRA jointly develop route-specific performance measures to assess Amtrak operations, to provide Amtrak and government agencies with an indication of where improvements are required. Section 207 also includes targets for each of these performance measures.

The most recent FRA/Amtrak performance measures cover the period FY2013 Q4 to FY2014 Q3.

Financial Performance

Two metrics are used to track financial performance. One reflects the percent of fully allocated operating costs covered by passenger-related revenue. This statistic reflects the extent to which Amtrak routes pay for themselves. Amtrak reports recovery ratios both including and excluding state subsidies. Results shown in Table 3-4 exclude state subsidies in the recovery ratio. The performance standard is year-over-year improvement.

The other financial metric is passenger-miles per train-mile. This reflects the load factor of Amtrak trains, i.e. how many people are on a train at any given time. The standard is also year-over-year improvement. If load factors improve, routes are considered to have met the standard.

Table 3-4: PRIIA Section 207 Performance Reports Averaged for Last 4 Quarters (red indicates where standards were not met)

	Performance Measures	*PRIIA Standard*	Acela Express	Northeast Regional	Carolinian	Vermonter	Capitol Limited	Crescent	Palmetto	Silver Meteor	Silver Star
Financial	Percentage of operating costs recovered by passenger revenue—excludes state (last 8 quarters)	*Increase From Prior*	182%	132%	94%	51%	47%	42%	58%	51%	43%
	Passenger-miles per train-mile (last 8 quarters)	*Increase From Prior*	194	220	266	136	199	161	145	226	192
On-Time Performance	Change in effective speed from FY2008 baseline (mph)	*>=0*	-0.83	-0.13	0.93	3.53	1.68	-0.03	0.68	-0.58	0.65
	Endpoint on-time performance	*90% (Acela), 85% (NEC), 80% (0ther)*	76.0%	77.1%	64.7%	74.6%	47.1%	57.8%	68.0%	54.1%	56.0%
	All-stations on-time performance		80.9%	83.3%	63.6%	69.4%	41.8%	57.1%	65.8%	45.2%	50.0%

Table 3-4: PRIIA Section 207 Performance Reports Averaged for Last 4 Quarters (red indicates where standards were not met) (continued)

	Performance Measures	*PRIIA Standard*	Acela Express	Northeast Regional	Carolinian	Vermonter	Capitol Limited	Crescent	Palmetto	Silver Meteor	Silver Star
Train Delays	Host responsible delays—minutes per 10,000 train miles (by each host railroad)	900	988 (MNRR)	1060 (MNRR)	1632 (CSX) 439 (NS)	1449 (MNRR) 895 (NECR)	1233 (CSX)1823 (NS)	952 (NS)	1044 (CSX)	933 (CSX) 4696 (CFRC) 915 (FDOT)	1061 (CSX) 2770 (CFRC) 1197 (FDOT) 489 (NS)
	Amtrak responsible delays off NEC corridors—minutes per 10,000 train miles	325	108	360	461	341	263	277	200	385	464
	Amtrak responsible delays on NEC corridors—minutes per 10,000 train miles	*265 (Acela), 475 (other)*	337	535	485	555	--	691	549	971	707
Customer Service Indicators	Overall Service	82	78	80	84	78	82	78	81	76	78
	Amtrak Personnel	80	83	84	85	81	84	80	86	81	81
	Information given	80	77	73	77	72	72	65	74	65	67
	On-board comfort	80	82	81	81	78	78	76	80	73	75
	On-board cleanliness	80	64	58	60	54	67	57	59	55	54
	On-board food services	80	58	62	69	55	73	70	70	69	70

Source: PRIIA Section 207 Quarterly Reports from FY2013 Q4 to FY2014 Q3

As shown in Table 3-4, the results of the financial improvement metrics were mixed. Financial results of the NEC services and state-supported trains generally improved, while performance of the long distance trains deteriorated for the last four quarters over the prior four quarter period.

Service—On-Time Performance

Three measures of on-time performance are tracked:

- Change in effective speed from FY 2008 baseline: this provides an indication of how passenger train speeds have changed over the last six years, in miles per hour. Results were mixed with speeds improving on some routes and declining on others.
- Endpoint on-time performance: this metric indicates the percent of on-time arrivals at endpoints of each route, where "on-time" is defined as within 10 to 30 minutes from the schedule, depending on the length of the route. No routes met the standard, but NEC routes generally performed better than state-supported services.
- Station on-time performance: this metric indicates the percent of on-time arrivals at all stations, where "on-time" is defined as less than 10 minutes late for Acela Express and less than 15 minutes late for the other routes. No routes met this standard, but NEC routes generally performed better than state-supported services.

Service—Train Delays

Another way to measure how well the train service meets the expectations of customers is to measure delay. Train delay is reported by cause and responsibility, based on delay minutes per 10,000 train miles. This metric is calculated for the following three operational segments and causes:

- Host responsible delays by host railroad: this measures the amount of delay per train travel that occurred on each host railroad, caused by the host railroad. Nearly every host railroad caused delays above the standard.
- Amtrak responsible delays off NEC: this measures amount of delay per train travel that can be attributed to Amtrak, occurring outside the NEC. The standard for this metric was set at 325 minutes. The results are mixed, with the standard being met on some railroads and not met on others.
- Amtrak responsible delays on the NEC: this measures the amount of delay per train travel that can be attributed to Amtrak, occurring on the NEC. In most cases, Amtrak did not meet the standard.

Customer Service

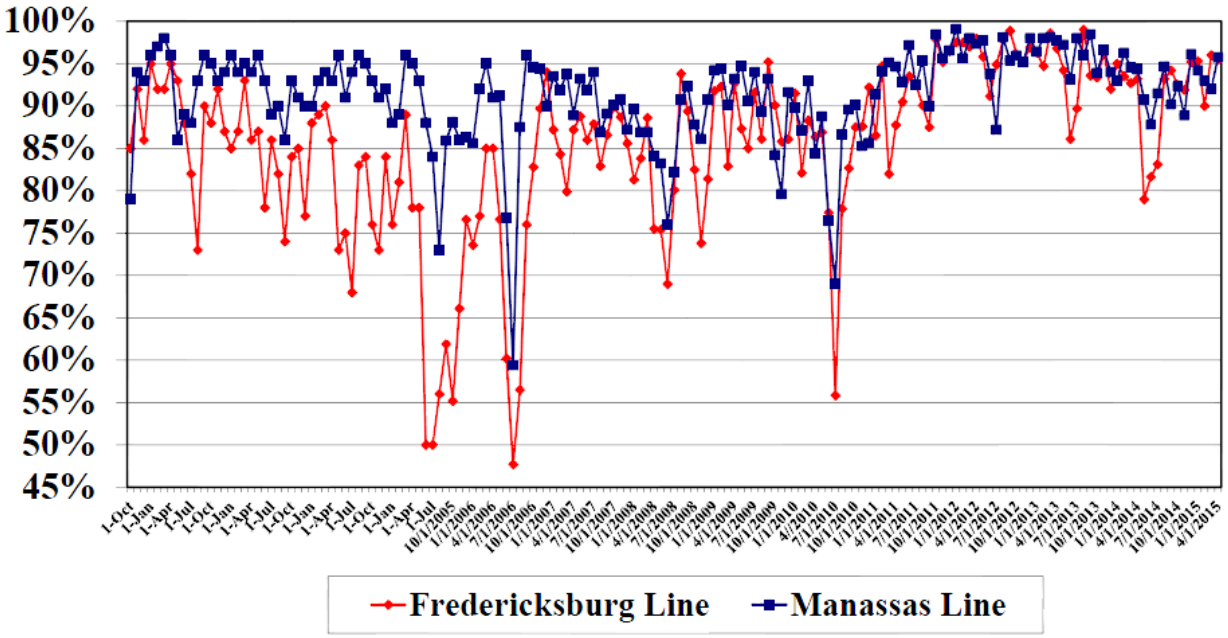
The final set of performance measures relate to customer satisfaction as measured in surveys. Customers are asked about whether they were "very satisfied" with five different service characteristics. The results regarding customer satisfaction with overall service and on-board comfort were mixed for the current period, with Amtrak meeting its objectives on some routes and not on others. Standards were met on all routes for customer satisfaction ratings of Amtrak personnel. Standards were not met on any routes for on-board cleanliness, on-board food services, or information given.

Commuter Rail

VRE

VRE on-time performance has been generally high from FY2011-FY2012 (Virginia Fiscal Year ends June 30), with the system averaging around 90 percent on-time trains (Figure 3-32). FY2013-FY2015 have shown improvements to this already high on-time performance, with a FY2015 average of 96 percent on-time performance. On-time performance has improved since CSX invested in solutions for "sun kinks," helping to reduce the number of train delays caused by expanding rails in extreme heat.

Figure 3-32: VRE On-Time Performance Between 2001 and 2015

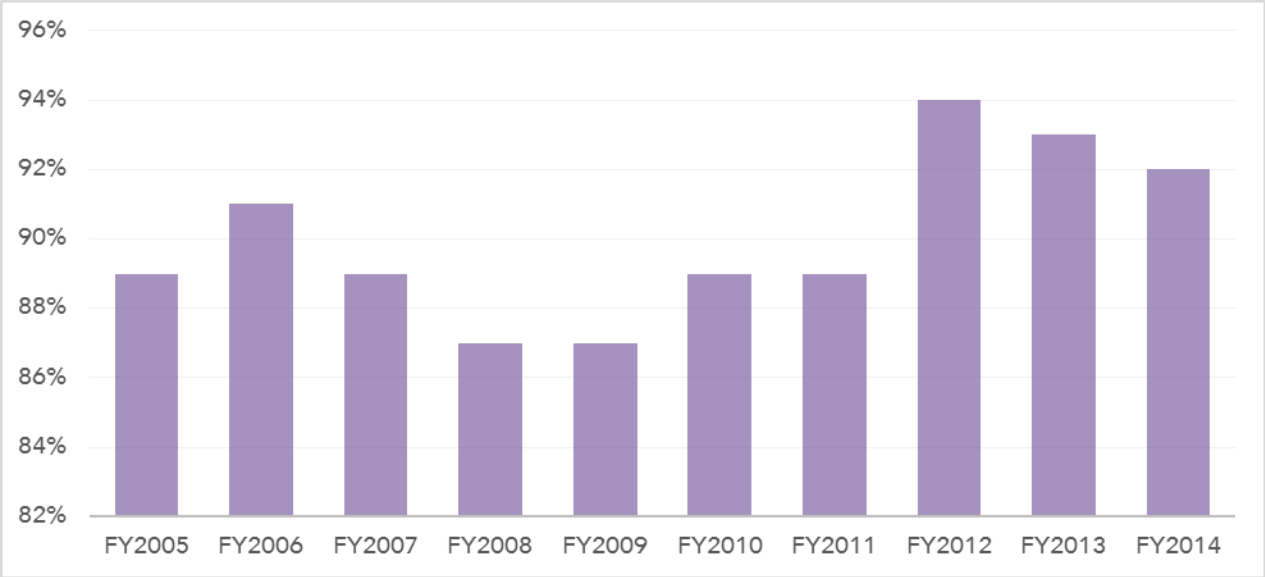


Source: Performance measures data from VRE June 2015.

MARC

MARC on-time system performance in FY2014 was 92 percent, which represents an improvement from FY2008 and FY2009, when system performance was 87 percent (Figure 3-33). Delays between FY2003 and FY2010 were most common and slightly increasing on the Penn Line. Half of the system's delays between FY2003 and FY2010 were due to interference to other trains or dispatching decisions, with mechanical, weather, track and catenary, and signaling issues also contributing factors. Delays on the Penn Line in the spring and summer of 2010 were common due to track work.

Figure 3-33: On-Time Performance, MARC, FY2005-FY2014



Source: MDOT

3.2.9 Safety and Security Programs

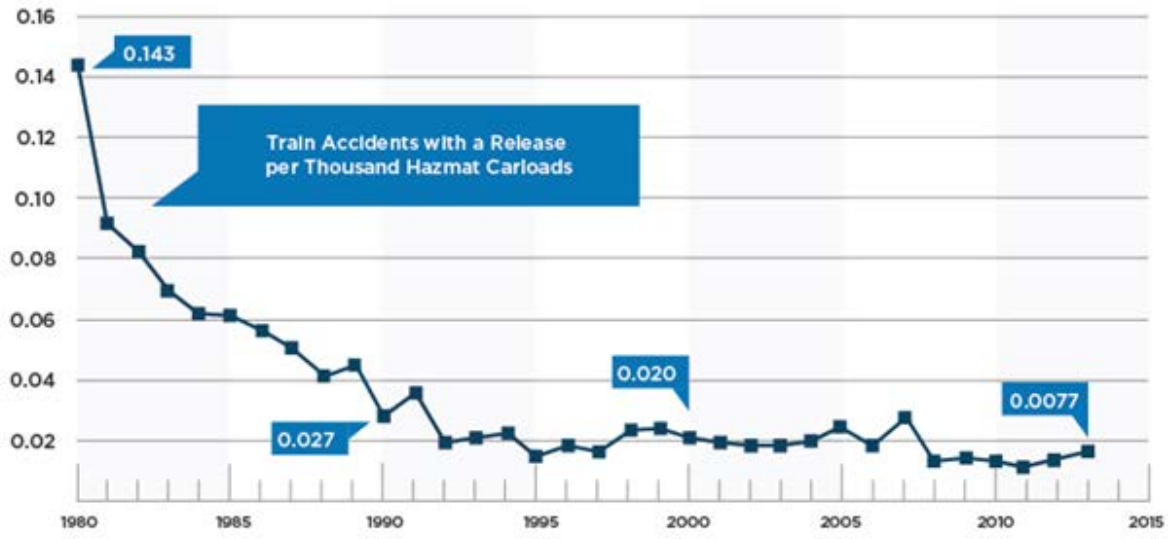
District residents have expressed concern over the safety of freight rail lines passing through the District, particularly with potential risks posed by hazardous materials (hazmat). Residents and District officials are aware of the possibility of a derailment or terrorist act that causes an explosion, fire, or release of toxic substances from rail cars passing through the District. Railroads, as common carriers, are required to provide transportation service at reasonable request, including the transport of dangerous materials. The CSX mainline passes within several blocks of the U.S. Capitol and through densely populated neighborhoods. More than 100,000 federal employees work within a half-mile of the line and more than 54,000 people live in this area of the District.[39] The District has been identified as a "High Threat Urban Area" by the Transportation Security Administration (TSA).

It is important to note that certain categories of highly hazardous materials do not move through the District via rail, including toxic by inhalation/poison by inhalation products, certain explosives, and spent nuclear fuel. Empty rail cars that previously contained high-hazard materials are permitted to travel through the District on rail.

While concerns about rail safety should not be discounted, the transportation of hazmat by rail is significantly safer than other modes with 99.997 percent of shipments reaching its destination without a release caused by an accident. Train accidents with a release per thousand hazmat carloads have declined 94 percent between 1980 and 2013.[40]

[39] National Capital Planning Commission, *Freight Railroad Realignment Feasibility Study,* 2007.
[40] https://www.aar.org/Charts/Safety/High%20Resolution/Safety%20-%20Hazmat.pdf

Figure 3-34: Rate of Train Accidents with a Release per Thousand Hazmat Carloads



America's freight railroads transport some of the most essential hazardous materials with special attention to safety. Today, 99.997 percent of all hazmat shipments by rail reach their destination without a release caused by a train accident. Investment in infrastructure, special operating procedures, advanced technology and community safety measures — just some of the many initiatives railroads undertake to ensure safe movement of hazmat — have helped lower the industry's hazmat accident rate by 94 percent since 1980 and 62 percent since 2000, to a new low.

Source: Association of American Railroads. U.S. Federal Railroad Administration

Current Emergency Response/Emergency Preparedness

In addressing District safety concerns, it is useful to understand the current organization of emergency response/emergency preparedness in the District. Several agencies within the District government are responsible for emergency response and preparedness, including the Homeland Security and Emergency Management Agency (HSEMA) and the Fire and Emergency Medical Services Department (FEMS). In addition, the Emergency and Safety Alliance focuses on emergency response as it pertains to schools. Further, the District Department of Energy and Environment (DOEE) and the District of Columbia Public Service Commission, as well as DDOT, may be involved with providing emergency response planning oversight.

HSEMA focuses on planning and training for emergency situations, as well as plays a coordination/public information role in case of an emergency. The agency is responsible for:

- Developing emergency preparedness plans in coordination with District agencies, service providers, and private businesses;
- Delivering training to local first responders, city employees, and other stakeholders;
- Maintaining awareness of potential threats and hazards;
- Serving as a central communications point in case of an emergency;
- Keeping the public informed; and
- Leading planning efforts to ensure safety during special events.

FEMS, along with the Metropolitan Police Department, is the District's first responder. It is the District's fire department, as well as the District's emergency medical service. FEMS includes units that are trained for and have equipment to respond to emergencies involving hazardous materials.

Of note, following the May 2016 CSX derailment, HSEMA, DOEE, and DC FEMS Community Liaison have arranged for community meetings on emergency preparedness in case of train derailment and hazardous chemical spill incidents. Amtrak and VRE have also briefed DC FEMS on safety best practices at rail incidents, following a minor bridge fire in May 2016 that disrupted service.

Figure 3-35: District HazMat 1

Source: "DCFEMS Hazmat 1 - 2010-02-06" by Andrew Bossi

The District of Columbia Homeland Security Commission (HSC) was established by the Homeland Security, Risk Reduction, and Preparedness Amendment Act of 2006 to make recommendations for improvements in security and preparedness in the District of Columbia. While this organization has a broad mandate addressing a wide range of security matters, the Commission finds it more practical to focus on specific issues. For example, in 2013 the Commission provided recommendations regarding cybersecurity.

The railroad industry has also instituted a number of measures to help first responders in case of an emergency. As the principal freight operator in the District, CSX is the rail carrier with primary interaction with FEMS. District emergency responders have participated in freight rail-related training provided by CSX, which ranges from information available in the CSX Community Awareness and Emergency Planning Guide, computer-based hazmat training programs, and hands-on sessions involving specific rail equipment and hazardous materials training. Recent training provided includes:

- CSX provided four days of specialized hands-on training to 128 FEMS and all Special Operations Chiefs and local Battalion Chiefs on CSX's Safety Train at Benning Yard (July 2015).
- CSX trained 220 FEMS personnel in a classroom setting (April 2015).

- CSX hosted three days of training exercises for District and regional police forces on passenger rail car incidents at Benning Yard (2014).
- A total of 220 FEMS responders (hazmat, special operations, and heavy rescue companies) were taught Emergency Response to Railroad incidents along with hands on training (June 2010).
- Since 2007, CSX has paid expenses for 13 District emergency responders to attend a week-long training session at the state-of-the-art Association of American Railroads Security and Emergency Response Training Center facility in Pueblo, Colorado for additional hands-on field and classroom training.

Figure 3-36: CSX First Responder Training

Source: CSX

Recently, the railroad industry developed the AskRail™ app, which can provide first responders with timely data about the type of hazardous materials a railcar is carrying, so that an informed decision about responding to a rail emergency can be made. This application can be loaded onto a smart phone. The user enters the car number stenciled on the side of each railcar into the app and the application displays the commodity being carried in the railcar at that time. CSX has developed a similar application, called CSX Rail Respond. Both apps are available for first responders in the District.

Title 49 of the Code of Federal Regulations, section 172.800 (49 CFR 172.800), requires railroads to share their safety and security plans with authorized officials at the U.S. Department of Homeland Security and Federal Railroad Administration. The regulations restrict who is able to see these plans, and expressly prohibits disclosure of this material. CSX does not publicly disclose information about the materials it transports, but the company provides a list of the top 25 hazardous materials (by rail car count) shipped through Virginia, Maryland, and the District to the respective state emergency organizations. This allows emergency responders to prepare for these specific commodities in case of an emergency.

CSX also recently launched a website that provides a list of hazardous materials transported in the District sorted by U.S. DOT hazardous material classification. According to CSX, in the District, hazardous materials make up approximately seven percent of the carloads moved by CSX each year.[41]

[41] https://www.csx.com/index.cfm/about-us/safety/hazardous-materials1/washington-d-c/

Table 3-5 summarizes the percentage of hazardous materials carloads by U.S. DOT hazard class that moved through the District between January 1 and December 31, 2015.

Table 3-5: Hazardous Materials Carload Percentage by U. S. DOT Hazard Class, 2015

Hazardous Materials Classification	Percentage
Class 1: Explosives	<1%
Class 2: Gases	2%
Class 3: Flammable Liquids	22%
Class 4: Other Flammable Substances	<1%
Class 5: Oxidizing Substances & Organic Peroxides	3%
Class 6: Toxic (Poisonous) & Infectious Substances	3%
Class 7: Radioactive Material	<1%
Class 8: Corrosives	20%
Class 9: Miscellaneous Hazardous Materials	49%
Total	100%

Although members of the District government do not have real-time information about the location and cargo of trains operating on CSX's rail lines passing through the region and the District, the TSA and the U.S. Department of Transportation Crisis Management Center, both located in the District, have access to this information via CSX's SecureNOW System. This on-line computer tool provides trained homeland security and public agency officials in the District to independently track the location of CSX trains and the contents of the rail cars in a nearly real-time environment. CSX also recently launched Rail Respond, a mobile web application with access to detailed information about trains in a particular jurisdiction.[42]

In 2005, U.S. Department of Homeland Security and CSX initiated a trial program, the National Capital Region Rail Pilot Project, to create a secure corridor through the District from the 14th Street Bridge to CSX's Anacostia Bridge. The project created a "virtual fence" of video surveillance on the rail line, including intruder detection software with the ability to identify unauthorized personnel. According to CSX, the company has maintained the security apparatus and has added enhancements since conducting the pilot project.

CSX has also participated in several urban rail safety programs in the District. The first is the Play It Safe Campaign, a public outreach campaign stressing the importance of staying safe around trains and tracks. These efforts involved partnership with WMATA to educate the public on rail safety and the hazards around rail tracks to pedestrians, and were also displayed at several sporting event venues in the region. The other safety education and awareness organization is Operation Lifesaver (OLI). Their programs are co-sponsored by federal, state and local government agencies, highway safety organizations and US railroads. OLI speaks to school groups, driver education classes, community audiences, professional drivers, law enforcement officers, and emergency responders.

[42] https://www.csx.com/index.cfm/about-us/safety/hazardous-materials1/washington-d-c/

Rail Safety Performance in the District

The FRA requires railroads to report a variety of accidents/incidents as they relate to the safety of rail operations (Table 3-6). According to the FRA's safety database, 1,828 accidents/incidents occurred on the District's rail network over the past fifteen years with the vast majority consisting of minor passenger related injuries mostly involving boarding or disembarking from trains at Union Station. Of these, 11 resulted in fatalities; 1,666 involved injuries, resulting in 1,698 involved injuries; and 151 were property damage only. Of the fatalities, nine were trespassers struck by trains. The other two were Amtrak passengers who later died from injuries sustained from a fall while disembarking from a train or walking on the platform.

Table 3-6: Rail-Related Accidents and Incidents in the District, 2000 – 2014

	2000	'01	'02	'03	'04	'05	'06	'07	'08	'09	'10	'11	'12	'13	'14	Total
Fatalities	.	1	1	1	3	2	.	.	1	1	1					11
Injuries	90	87	75	137	203	107	153	108	105	81	91	113	111	135	102	1,698
Property Damage Only	17	20	8	14	7	13	14	8	18	7	2	6	5	4	8	151
Total Accidents/ Incidents	107	108	84	152	213	122	167	116	106	88	90	118	111	136	110	1,828

Source: FRA Safety Database

Of the injuries, most either were Amtrak employees reporting work-related injuries, illnesses, or were injuries to passengers on trains (Figure 3-37 and Figure 3-38).

Figure 3-37: Percentage of Injuries by Reporting Railroad (2000 – 2014)

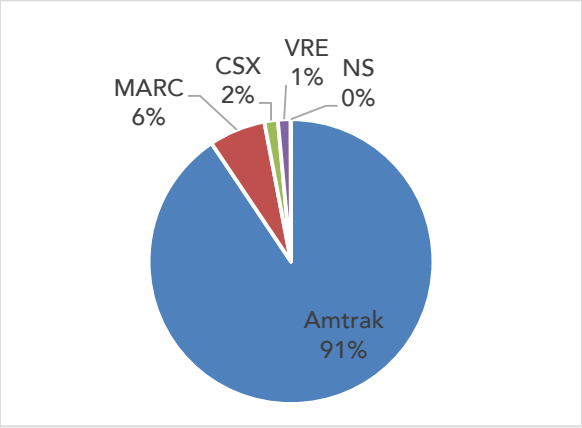
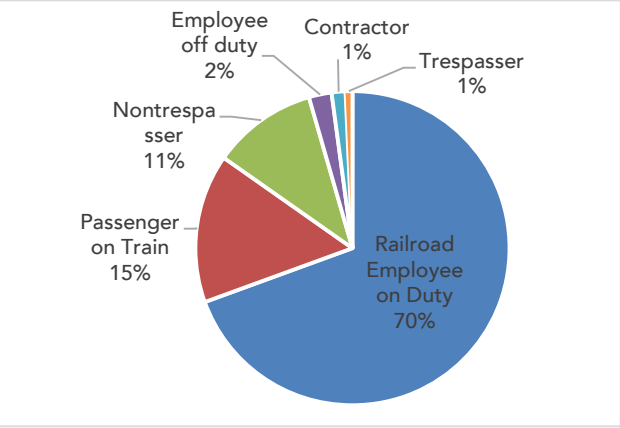


Figure 3-38: Percentage of Injuries by Person Type (2000 – 2014)



Source: FRA Safety Database

The majority of injuries (84 percent) were either bruises, cuts/abrasions, noise induced hearing loss, or sprains/ strains. Most (66 percent) were caused by falls, exposure to noise, or overexertion (Figure 3-39 and Figure 3-40).

Figure 3-39: Percentage of Injuries by Type (2000 – 2014)

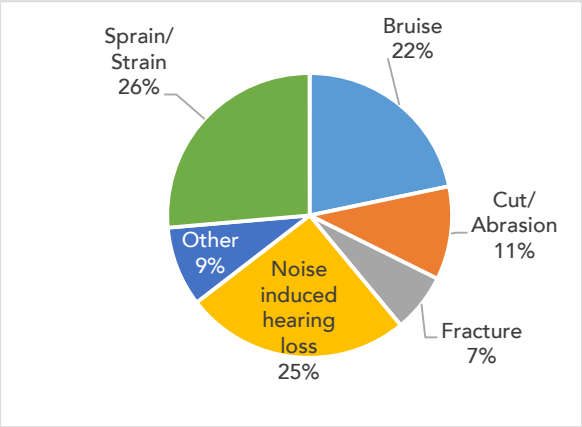
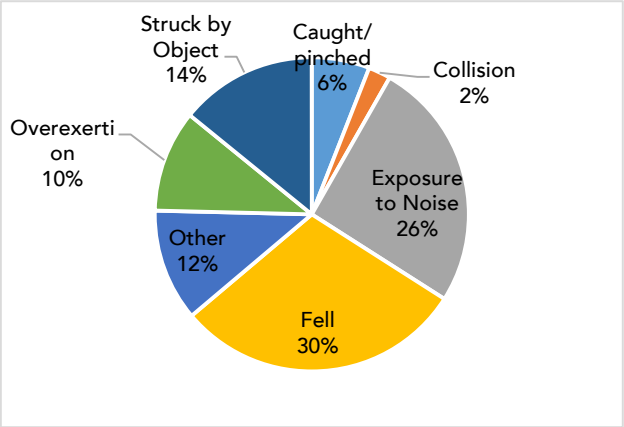


Figure 3-40: Percentage of Injuries by Injury Event (2000 – 2014)



Source: FRA Safety Database

Of the 1,828 rail-related accidents/incidents shown in Table 3-6, 97.5 percent were associated with passenger trains, while 2.5 percent were associated with freight trains. The FRA categorizes accidents/incidents into three primary categories:

- Train accidents: A safety-related event involving on-track rail equipment (both standing and moving) causing monetary damage to the rail equipment and track above a prescribed amount.
- Highway/rail at grade crossing incidents: Any impact between rail and highway users at a designated crossing site.
- Other incidents: Any death, injury, occupational illness that is not a result of a train accident or highway/rail incident.

Although the District contains no public highway/rail at-grade crossings on active rail lines, there were nevertheless five incidents reported over the fifteen years between 2000 and 2014. Each involved a collision between rail equipment and a truck or tractor at the private crossings within Amtrak's Washington Terminal area yard. One hundred fifty-four, or about eight percent of the reported accidents/incidents over the past fifteen years were train accidents, while the remainder fit into the FRA's "Other" category.

Of the 154 train accidents between 2000 and 2014, 83 percent were reported by Amtrak. Thirty-five percent of the train accidents involved locomotives not attached to trains, or "light" locomotives. Twenty-three percent of train accidents occurred in rail yards, where cars and locomotives are broken down or assembled into trains, while another 19 percent were associated with intercity passenger trains.

Figure 3-41: Percentage of Train Accidents by Reporting Railroad (2000 – 2014)

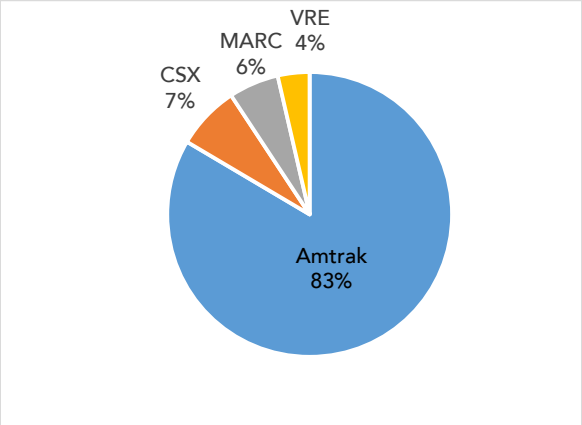
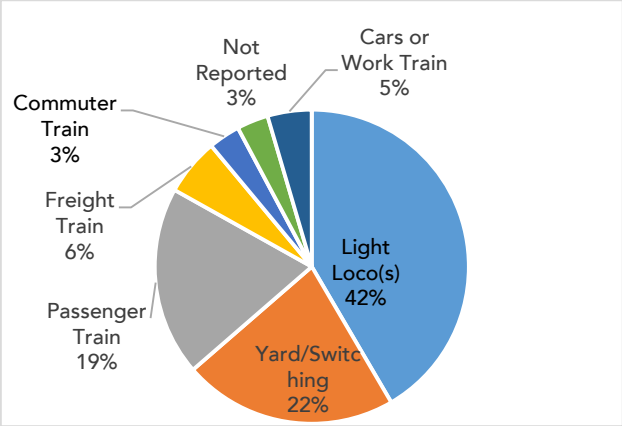


Figure 3-42: Percentage of Train Accidents by Equipment Involved (2000 – 2014)



Source: FRA Safety Database

Train accidents (as opposed to highway/rail at grade crossing accidents or other accidents) in the District between 2000 and 2014 involved no fatalities and 19 injuries. Twelve of the injuries resulted from a single incident where a locomotive was coupled to passenger cars with excessive force, thus jostling the passengers inside. Another four occurred when equipment being assembled into a MARC train and an Amtrak train struck each other. Two injuries occurred when a yard engine struck a backhoe. Of the 154 train accidents, 20 resulted in property damage above $50,000, and three resulted in damage above $500,000. In all but five cases, speeds were below 20 miles per hour.

Over the past 15 years, the release of hazardous materials due to a rail-related accident in the District has only happened once. In 2001, several cars of a CSX train derailed while cars were being coupled to the train. The train consist included three hazmat cars, but these were not among the cars that derailed. Similarly, 13 cars derailed on a CSX train in 2009 as the train slowly passed through the Virginia Avenue Tunnel. The train included 18 hazmat cars, but none of the hazmat cars derailed. Early the morning of May 1, 2016, 14 cars of a CSX train derailed on the Metropolitan Subdivision near the Rhode Island Avenue WMATA station, Of the 175 rail cars, 94 were carrying mixed freight and 81 were empty. The derailment spilled half of the liquid contents of one 15,500-gallon tanker containing sodium hydroxide onto the tracks and the ground below it. Several additional rail cars leaked less hazardous chemicals. Within several hours the leak was contained, and by that evening Metro service was restored.[43] Service on MARC's Brunswick line was suspended until the following day, and the Metropolitan Branch Trail was also temporarily closed in the area of the incident.

[43] https://www.washingtonpost.com/local/trafficandcommuting/csx-train-cars-derail-in-ne-washington-hazardous-substance-leaking/2016/05/01/568ae3fc-0f97-11e6-8967-7ac733c56f12_story.html

Rail Safety Regulation in the District

Safety Inspections of Railroad Bridges

DDOT's inventory includes 39 railroad bridges over DDOT highways and 19 bridges over railroads (Table 3-7). Other rail bridges exist in the District but do not cross a DDOT facility, and the railroad owners are thus responsible for safety inspections.

DDOT performs safety inspections of railroad-owned bridges crossing over all public highways in the District. The 19 highway bridges over railroads are inspected biennially as part of DDOT's Bridge Inspection Program using National Bridge Inspection Standards (NBIS) (Table 3-8).

The intent of these examinations is to perform a cursory inspection of the underside of the structures and supports, and the traffic safety features to determine if there are deficiencies at the structures that could affect the safe passage of vehicles or pedestrians below. These deficiencies could include deck underside concrete spalls or incipient concrete spalls, severe section loss in members, loose connection fasteners, extreme lean of bearings, traffic impact damage and lack of proper signs and/or hazard markers or the damage of such items. Detailed vertical underclearance is also obtained during each inspection. The safety inspections are performed at 24-month intervals. A report is prepared similar to the NBIS Inspection Report; however, it does not include all the forms of an NBIS.

Federal and State Roles in Rail Safety

Rail transport of hazmat is regulated by various government agencies, including the FRA, the Pipeline and Hazardous Materials Safety Administration (PHMSA), and the TSA.

The Federal Railroad Safety Act of 1970 (Pub. L. No. 91-458) gave the FRA primary responsibility for inspecting railroad infrastructure, equipment, and practices to ensure that the railroad network is operating in a safe manner. The law gave the FRA authority over "every area of railroad safety." Safety activities by the FRA include the following:

- Track condition inspections;
- Hazardous material inspections. Because most rail-related hazardous material releases result from defective equipment or loading/unloading operations, these inspections often focus on ensuring the integrity of equipment, or monitor the training and performance of personnel who prepare shipments or offload hazardous products;
- Operating inspections, which are concerned with rail employee welfare and safe train operations, such as ensuring that rail equipment is properly secured when not in use;
- Inspection of train control and highway-rail crossing signals; and
- Motive power and other rolling stock inspections.

Table 3-7: Railroad Bridges for DDOT Biennial Safety Inspection

Bridge Number	Description
504	Railroad over East Capitol Street (Built By DC)
506	Railroad over Kenilworth Avenue, N.E.
510	Railroad over Ohio Drive, S.W. and Potomac River
512	Railroad over Ohio Drive, S.W.
514-A	Railroad over Maine Avenue, S.W.
518	Railroad over 9th Street, S.W.
519	Railroad over 7th Street, S.W.
520	Railroad over 6th Street, S.W.
521-A	Railroad over 4th Street, S.W.
522-A	Railroad over 3rd Street, S.W.
523	Railroad over 2nd Street, S.W.
525	Railroad over South Capitol Street at Va. Ave.
527	Railroad over 1st Street and Delaware Avenue, S.W.
528	Railroad over South Capitol Street at Canal St.
530	Amtrak over K Street, N.E.
531	Amtrak over L Street, N.E.
532	Amtrak over M Street, N.E.
533	Amtrak over Florida Avenue, N.E.
535	Railroad over New York Avenue, N.E.
536	Railroad over Rhode Island Avenue, N.E.
537	Railroad over Montana Avenue, N.E.
538	Railroad over Galloway Street, N.E.
539	Railroad over Riggs Road, N.E.
541	Railroad over Aspen Street, N.W.
542	Railroad over Cedar Street, N.E.
546(A&B)	Railroad over Bladensburg Road, N.E.
548	Railroad over Montana Avenue, N.E.
553	Railroad over Burroughs Avenue, N.E.
554	Railroad over Burroughs Avenue, N.E.
555	Railroad over Canal Road, N.W.
558	Railroad over Van Buren Street, N.W.
561	Railroad over Piney Branch Road, N.W.
562	Railroad over Kansas Avenue, S.W.
595-A	Railroad over Eastern Avenue, N.E.
595-B	Railroad over Eastern Avenue, N.E.
1102R(Ramp A)	Railroad and Ramp C over Ramp A, Southwest Freeway
1102R(Ramp B)	Railroad over Ramp B, Southwest Freeway
1102R(Ramp D)	Railroad over Ramp D, Southwest Freeway
1135	14th Street, NB under PB&W Railroad

Table 3-8: Highway Bridges for DDOT Biennial Safety Inspection

Bridge Number	Description
---	Metropolitan Branch Trail/Rhode Island Avenue over Railroad
503(EB)	EB Benning Road over Kenilworth Avenue
503(WB)	WB Benning Road over Kenilworth Avenue
505	Anacostia Freeway over Railroad
515	12th Street, S.W. over Railroad
516	11th Street, S.W. over Railroad
517	10th Street Mall S.W. (L'Enfant Plaza) over Railroad
529	H Street, N.E. over Railroad
534	New York Avenue, N.E. over Railroad
543	Queens Chapel Road, N.E. over Railroad
544	South Dakota Avenue, N.E. over Railroad
550	9th Street, N.E. over Railroad
556	New Hampshire Avenue, N.W. over Railroad
563	New York Avenue, N.E. over Railroad
568	Monroe Street, N.E. over Railroad
571	Taylor Street, N.E. over Railroad
572	New Jersey Avenue, N.E. over Railroad
576	Eastern Avenue, N.E. over Railroad
596	Michigan Avenue, N.E. over Railroad
597	Franklin Street, N.E. over Railroad

The Federal Railroad Safety Act declared that laws related to railroad safety shall be "nationally uniform to the extent practicable" and set out a framework for determining when state requirements related to railroad safety are preempted as included in 49 U.S. Code 20106:

> "A state may adopt or continue in force a law, regulation, or order related to railroad safety until the Secretary of Transportation (with respect to railroad safety matters), or the Secretary of Homeland Security (with respect to railroad security matters), prescribes a regulation or issues an order covering the subject matter of the State requirement. A State may adopt or continue in force an additional or more stringent law, regulation, or order related to railroad safety when the law, regulation, or order
>
> 1) Is necessary to eliminate or reduce an essentially local hazard;
> 2) Is not incompatible with a law, regulation, or order of the United States Government; and
> 3) Does not unreasonably burden interstate commerce."

In return for the loss of authority, the Federal Railroad Safety Act provided a mechanism by which states could participate in the investigation and enforcement of federal safety laws. States can enter into an agreement with the FRA to be delegated certain specific authorities with respect to safety investigation and surveillance activities as part of a state rail safety office. All participating state employees must be certified by the FRA to perform the investigative and surveillance activities to which they have been assigned. The state inspector must have authority to the extent provided by state statute or charter. State inspectors only have the authority to conduct inspections in their state. In most ways, an FRA-certified state inspector has the same role and authority as a certified federal inspector. State inspectors do not have authority beyond FRA inspectors. For example, while both have the authority to require railroads to remove locomotives or railcars from service due to safety defects or reduce train speeds over defective track, neither has the authority to stop a train.

States can recommend that FRA seek injunctive relief and impose civil penalties for violations of federal regulations, and if the FRA has not taken action within specified periods, states can apply civil penalties and injunctive relief themselves. States are also not preempted from requiring railroads to provide immediate notification of accidents.

Prior to 2016, the District did not have a Rail Safety Office. However, in 2016 DC Council worked with DDOT, DOEE, FEMS, HSEMA and other city agencies to create a Rail Safety Office housed in DOEE. This office will operate within the federal preemption limits as described above. Office activities will be coordinated with the FRA, and this office will allow the District greater control over its rail network.

Recent Federal Rules Regarding Rail Transportation of Hazardous Materials

The TSA published new rules aimed at protecting the nation's freight and passenger rail systems on November 26, 2008. These include a requirement by railroads shipping toxic inhalation hazards (TIH), certain explosive materials, and certain radioactive materials (collectively referred to as "security-sensitive material"). These shipments are required to follow a prescribed chain of custody procedures. Rail carriers, rail transit systems, and certain rail facilities are required to designate rail security coordinators to act as liaisons with the TSA. Railroads are also required to report security concerns to the TSA. Upon request by TSA, railroads must be able to report the location of a single car with

security-sensitive materials within five minutes, and the location of multiple security-sensitive material cars in multiple locations within 30 minutes.

In 2008, PHMSA, working in consultation with the FRA, passed rules that require railroads that carry security-sensitive materials to perform comprehensive safety and security risk analysis to determine and select routes that pose the least overall risk. These analyses must consider 27 specific risk factors, including population density and proximity to iconic potential terrorist targets. Railroads are to consider practical alternative routes and to seek information from state and local officials. Railroads are to take measures to reduce the time that hazardous materials are stored near population centers. The rule states it preempts any state law that seeks to prohibit usage of a rail line for transporting hazardous materials that is not owned by a state or political subdivision of a state.

Tank car standards have received new scrutiny due to the dramatic recent increase in crude oil shipped by rail as well as several major recent accidents involving crude oil shipment by rail, the worst of which killed 47 people on July 6, 2013 in Lac-Megantic, Quebec. In 2011, the AAR recommended a more stringent tank car standard for hauling ethanol or crude oil. In May 2015, PHMSA and the FRA established a new rule to improve the safety of hazardous material transportation by rail. The rule applies to "high-hazard flammable trains" (HHFT), which are defined as those with a continuous block of 20 or more tank cars with flammable liquid or 35 or more tank cars with flammable liquid dispersed throughout the train. The rule:

- Establishes standards for new tank cars and retrofitting requirements for older tank cars carrying crude oil and ethanol, along with a schedule for retrofitting the older tank cars;
- Requires that a HHFTs be equipped with electronically controlled pneumatic (ECP) braking systems by 2023, and that certain HHFTs be so equipped by 2021;
- Restricts operating speeds on HHFTs to 50 miles per hour and 40 miles per hour if any tank cars are on the train that do not meet the enhanced standards;
- Requires routing analysis considering 27 safety and security factors for HHFTs;
- Improves the sampling, testing, and classification of unrefined petroleum-based products like crude oil; and
- Requires railroads to adequately communicate HHFT routing decisions.

Although HHFT do not pass through the District, the new tank car restrictions could impact the District.

District Regulations Regarding Hazardous Materials

The District of Columbia City Council (D.C. Council) passed an ordinance called the *Terrorism Prevention in Hazardous Materials Transportation Emergency Act of 2005* which attempted to ban all shipments by rail or truck of certain hazardous materials within 2.2 miles of the United States Capitol. This was passed several weeks after a deadly train collision in Graniteville, South Carolina resulted in a toxic cloud of chlorine which caused the death of nine people, sent 500 to the hospital, and forced the evacuation of 4,500. Among the substances that were illegal to transport through the Capitol Exclusion Zone were certain explosives, flammable gases, poisonous gases, and poisonous materials. Under the ordinance, the District could have issued permits for materials otherwise banned upon a

showing that there is "no practical alternative route." CSX challenged the law and asserted that this area of the law was preempted by the Federal Railroad Safety Act, 49 U.S.C. §§ 20101-20153.3 and requested an emergency injunction. The District Court agreed with the District and denied CSX's Motion for an Emergency injunction. CSX appealed to the United States Court of Appeals, District of Columbia Circuit. The Court held that a preliminary injunction was warranted, in light of CSX's very high likelihood of success on the merits, reversed the decision of the District Court and remanded the case back to the District Court with direction to enter a preliminary injunction prohibiting enforcement of the D.C. Act.

The case was dismissed after CSX and the District of Columbia filed a motion in federal court saying they planned to end their litigation. The reason that was cited was that the U.S. Department of Transportation ruled the District was not allowed to enact such a ban. As shown in Table 3-9, the materials covered by the District hazmat ban were similar but not identical to those covered by the TSA rule. The District hazmat ban remains in the District Code, but cannot be enforced. CSX transports most, if not all, of the substances in Table 3-9 away from the District in accordance with TSA rules that include toxic by inhalation/poison by inhalation products, certain explosives, and spent nuclear fuel.

Table 3-9: Comparison of Materials Covered by District Hazmat Ban and the TSA Rail Transportation Rule

Ultra-Hazardous Materials from D.C. Law 16-80, 16-2	Security-Sensitive Materials from TSA Rail Transportation Security Rule
Explosives of Class 1, Division 1.1 (mass explosion hazard) or Class 1, Division 1.2 (projection hazard)	Explosives of Class 1, Division 1.1 (mass explosion hazard) or Class 1, Division 1.2 (projection hazard), Division 1.3 (with predominately fire hazard)
Flammable gasses of Class 2, Division 2.1	
Poisonous gasses of Class 2, Division 2.3 and belonging to Hazard Zones A or B	Poisonous gasses of Class 2, Division 2.3 gasses, including anhydrous ammonia
Poisonous materials, other than gasses, Class 6, Division 6.1, belonging to Hazard Zones A or B	Liquids, Class 6, Division 6.1, belonging to Hazard Zones A or B
	Highway route-controlled quantity of Class 7 (radioactive) material

Source: WSP | Parsons Brinckerhoff Analysis

Subsequently, the D.C. Council passed the *Homeland Security, Risk Reduction, and Preparedness Amendment Act of 2006*, which established strict liability for the transportation of hazardous materials, so that the District could recover the costs of containment, cleanup and restoration, removal, costs of monitoring the threat of release, natural resource damage. The act also created a Hazardous Materials Reimbursement Fund to cover costs of a release or threatened release of hazardous materials.

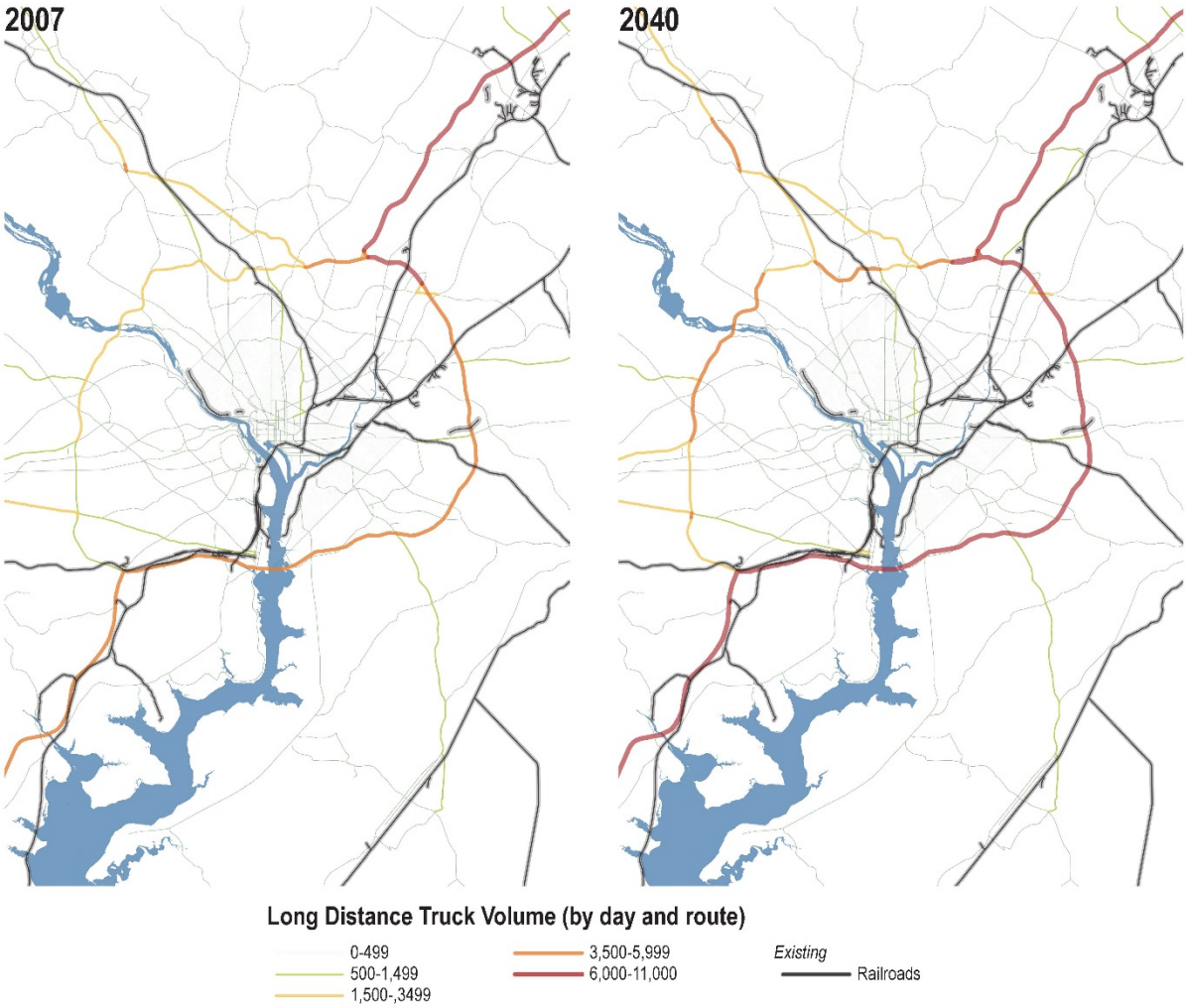
3.2.10 Economic and Environmental Impacts

Freight

As discussed previously, more freight passes through the District by rail than by truck. According to the District of Columbia Freight Plan, on average 31 trains pass through the District each day, with 11 providing containerized intermodal service. A number of stakeholders consulted for this Plan have emphasized the negative impacts of freight rail on the District. Freight trains create noise and vibration. Train tracks divide communities, consume land that could otherwise be used, and the transit

of hazardous materials by rail through the District create some level of risk. Small volumes of freight originate or terminate in the District, so some feel the District currently enjoys little benefit from local freight service. If the cargo did not move by rail but used an alternative mode instead, most cargo would instead move by truck. But given current and forecast truck patterns as shown in Figure 3-43, substituting truck for rail may not significantly increase truck traffic in the District. Most long-distance truck traffic is routed around the District. Long-distance truck traffic passing through the Metropolitan Washington region is primarily routed on I-95/I-495.

Figure 3-43: Long-Distance Truck Volumes on the Washington Metropolitan Highway Network, 2007 and 2040 Forecast



Source: FHWA Freight Analysis Framework – 3, WSP | Parsons Brinckerhoff

This leaves the impression that freight rail's impact on the District is negative. This would be true if District residents were impacted only by transportation issues within the District. But by relieving truck traffic on I-95, I-495, the I-66, and I-270, freight rail brings a number of benefits to the Metropolitan Washington region that also accrue to District residents and businesses. Some impacts, such as emissions, by their nature are regional. Greenhouse gases, nitrous oxides (NOx), and other pollutants

impact District residents, whether generated in the District or not. Other impacts benefit District residents when they travel outside of the District. Positive impacts of freight rail include:

- Freight rail reduces emissions of greenhouse gases and other harmful pollutants because rail is more fuel efficient and lower emitting than trucking;
- Rail reduces highway congestion;
- Rail reduces pavement damage caused by trucks; and
- Improves roadway safety.

Air Quality

Freight trains are more fuel efficient than trucks. As can be seen in Table 3-10, trucks emits 83 percent more NOx, 273 percent more PM, and 412 percent more VOC per ton-mile shipped. A single train can carry hundreds of containers or carloads, which reduces significantly the environmental impacts associated with moving each carload or unit. Shifting freight from rail to truck would directly lead to an increase in emissions from additional trucks traveling on I-495.

Table 3-10: Average Nationwide Truck and Rail Emission Rates for 2015

Type of Emission	Rail	Truck
NOX grams/ton-revenue mile	0.3178	0.5828
PM grams/ ton-revenue mile	0.0084	0.0232
VOC grams/ ton-revenue mile	0.0148	0.0611

Source: WSP|PB Analysis; EPA 2009[44]; EPA MOVES
Note: Rail emissions adjusted for increased circuity relative to truck. Truck emissions adjusted for empty travel.

Greenhouse Gas Emissions

Moving cargo by truck on average leads to 370 percent more emissions of greenhouse gasses per ton-mile shipped (Table 3-12). Unlike with emissions of the criteria pollutants, greenhouse gas emissions have the same negative impact regardless of where they are emitted.

Table 3-11: Average Nationwide Emissions of CO2e of Truck and Rail in 2015

Type of Emission	Rail	Truck
CO2e grams/ ton-revenue mile	25.033	92.197

Source: WSP|PB calculations using data from EPA MOVES and AAR

Congestion

For the past several decades the Washington Metropolitan region has been consistently ranked as one of the most congested regions in the United States by some metrics. One study found that Metropolitan Washington has the highest congestion costs and delay per-vehicle out of the largest 101

[44] EPA (2009). Emission Factors for Locomotives, Office of Transportation and Air Quality, EPA-420-F-09-025 April 2009. http://www.epa.gov/nonroad/locomotv/420f09025.pdf

urban areas of the country.[45] This study looked at GPS data, and found that Washington Metropolitan drivers experienced the highest levels of delay anywhere the country.[46] Over the next 25 years the number of miles driven in Metropolitan Washington is expected to increase by 14 percent, which is estimated to increase hours of delay caused by congestion by 43 percent.[47] While recognizing it is as a marker of economic vitality, mitigating congestion is a key priority for the District, as it leads to substantial costs for drivers and the broader society in increased fuel consumption, worsening air quality, and increased greenhouse gas emissions.

Some of Metropolitan Washington's congestion issues result from demand outstripping capacity. The rail freight network plays a critical role by taking many trucks off the roads. Conservatively assuming that each of the 31 trains that cross through the District carry cargo equivalent to 120 trucks each, shifting this cargo to trucks could generate an additional 3,700 truck trips on I-495 each day. This would represent an increase of truck traffic on I-495 by 50 to 100 percent. Each truck in turn takes up the space of two to four personal vehicles.

Safety

Moving trucks off the roads also improves safety. Rail has a significantly lower rate of accidents than trucking, as can be seen in Table 3-12. A truck's risk of causing fatal accidents is 3.2 times higher, 4.9 times higher for injury accidents, and 6.2 times higher for property damage only accidents.

Table 3-12: Truck Crash and Rail Accident Rates per 10 Billion Ton-Miles, 2014

Type	Rail	Truck
Fatal Accidents per Ton-mile	3.59	11.3
Injury Accidents per Ton-mile	45.4	221
Damage Only Accidents per Ton-mile	12.4	771

Source: WSP|PB Analysis, using ton-miles from the National Freight Strategic Plan, USDOT; FRA (2015): One Year Accident/Incident Overview – Combined 2015. Office of Safety Analysis, Federal Railroad Administration, U.S. Department of Transportation; and FMCSA (2014): Large Truck and Bus Crash Facts 2013. FMCSA-RRA-14-004. Analysis Division, Federal Motor Carrier Safety Administration, U.S. Department of Transportation. June 2014.

Freight Rail Employment

Freight rail operations do not generate large employment levels in the District. But its contributions to the regional economy should not be overlooked. CSX estimates that the company employs over 50 people in the District, with combined compensation of over $3.7 million dollars.[48] The District also benefits from the rail industry through white collar employment by government agencies, trade associations, consulting firms, etc. that are involved with national rail issues.

[45] Texas Transportation Institute Urban Mobility Report
[46] TTI Urban Mobility Scorecard
[47] Move DC: Vehicle Element, Multimodal Long-Range Transportation Plan.
[48] https://www.csx.com/index.cfm/about-us/state-information/washington-d-c/

Intercity Passenger Rail

Although the Northeast Corridor region accounts for 2 percent of the land area of the U.S., it has 17 percent of the population and produces 20 percent of the gross domestic product (GDP) of the country.[49] The District benefits from efficient access to other areas along the Northeast Corridor.

Amtrak recently surveyed riders at Union Station on how they would travel if Amtrak service were not available and found that 40 percent would fly instead, 36 percent would drive, 15 percent would take the bus, and 9 percent would not travel at all.[50] These responses indicate the loss of Amtrak service would result in the following negative impacts for the District:

- The 40 percent that would fly instead could potentially see their travel costs increase relative to Amtrak. Door-to-door travel times in some cases could increase, due to time otherwise spent accessing airports and negotiating airport security. These fliers would place an additional strain at airports in the region, many of which are facing capacity constraints. Passengers may be more likely to access airports by vehicle relative to Union Station, so vehicle trips may increase.
- The 36 percent that would drive instead would certainly face longer travel times than on Amtrak, and potentially higher costs as well, depending on the number of passengers per vehicle. These additional vehicle miles would generate pollution and add vehicles to an already congested corridor. Further, intercity passenger rail is more energy efficient than driving. According to data by the U.S. Energy Information Administration, intercity rail uses almost a third less fuel per passenger-mile compared to auto travel and about 12 percent less energy compared to flying.51
- The 15 percent that would take the bus instead would face considerable longer travel times than with Amtrak, although fares could be lower. However, because these people had originally made the decision to take Amtrak, it would be fair to assume that they would value the increase in travel time more than the reduction in fares.
- The 9 percent of people interviewed that would not travel at all without Amtrak represent the latent demand response to increases in transportation cost along the Northeast Corridor if Amtrak did not exist. These unrealized trips translate into less social or professional opportunities, which directly reduces economic activity.

Amtrak also benefits the District's economy via its headquarters location at Union Station. In fiscal year 2015 Amtrak employed 235 DC residents with wages totaling over $18.5 million dollars.[52] Amtrak also spent $24.2 million dollars on goods and service in DC during that same year. Amtrak estimated that including expenditures in the District it directly and indirectly supports the employment of over 1,000 people in the District with earnings of almost $32 million dollars.[53]

Commuter Rail

Because of congestion in the Washington metropolitan area, commuter rail provides numerous benefits and positive fiscal and economic impacts to both the District and the region as a whole.

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[49] https://nec.amtrak.com/sites/default/files/NEC%20Fact%20Sheet%20Winter%202014_2.pdf
[50] https://www.amtrak.com/ccurl/448/907/Washington-DC.pdf
[51] U.S. Energy Information Administration, *Transportation Energy Data Book, Edition 34 – 2015.*
[52] https://www.amtrak.com/ccurl/871/22/DC15.pdf
[53] https://www.amtrak.com/ccurl/448/907/Washington-DC.pdf

Without commuter rail, it is possible that employers in the District could not be able to find qualified employees to fill positions, as commuters would not be able to make it into the District as efficiently.

Commuter rail is also beneficial in removing automobiles from roadways, reducing vehicle miles traveled (VMT). The exceptionally high level of roadway congestion implies that there will be large economic returns from reducing the number of commuters that drive into the District. This would reduce congestion, vehicular fatalities, injuries, and property damage, reduced vehicle operations and maintenance costs, reduced pollution, and less pavement damage.

This section estimates the economic benefits and impacts of commuter rail service in the District by exploring two scenarios: (1) rail commuters would not venture into the District for jobs without the rail service and fewer jobs might remain in the District, and (2) rail commuters would divert to other modes without rail service. Exploring these counterfactuals helps illustrate the value of commuter rail services.

Scenario 1:

In this scenario the analysis assumes that commuter rail riders are only able to reach the District because of the commuter rail service, and without it these jobs might not be filled within the District. The approach used to estimate this impact estimated the average economic productivity associated with MARC and VRE riders using economic data published by the U.S. Bureau of Economic Analysis. This analysis estimates that the VRE and MARC carry commuters that add a combined $1.64 billion dollars to the District economy each year. Per commuter this amounts to $150,147 per year.

Table 3-13: Loss of Productivity without Commuter Rail to the District

Category	Productivity (2016 dollars)
Total Annual Productivity of Commuter Rail Riders	$1,640,992,821
Annual Productivity per Commuter	$150,147

In addition to these impacts, some positive effects benefit local business and property owners that generate significant fiscal revenue to the District. Based on property values surrounding Union Station and the L'Enfant Plaza station, commuter rail service contributes an incremental premium of over $430 million in office property values. This estimate is based on the combined value of office properties within a half-mile radius surrounding Union and L'Enfant Stations from the District assessor's data. In a study conducted by WMATA titled "Making the Case for Transit: WMATA Regional Benefits of Transit", analysis shows that office properties around stations had an added 8.9 percent increase in property values. The value of office properties was multiplied by 8.9 percent and the percent of commuter rail riders at Union and L'Enfant Stations (34.4 percent).

Table 3-14: Commuter Rail Property Value Premium and Fiscal Revenue, 2016 dollars

Office Property Value Premium	$435,669,609
Annual District Property Tax Revenue (1.75 percent)	$7,624,218

Based on the District's commercial property tax rate of 1.75 percent, the incremental property value resulting from the commuter rail ridership at these stations provides the District with an additional $7.6 million per year based on the most recent property assessments.

Scenario 2:

In this scenario the analysis assumes that the riders of the commuter rail service would take alternative transportation modes to get to the city if the commuter rail service were not available. A passenger survey conducted by VRE suggests that without the commuter rail service, passengers would do the following:

- 50 percent would drive alone;
- 20 percent would carpool; and
- 30 percent would take an alternate mode of transit.

Assuming alternate modal usage for MARC passengers would be similar to that of VRE, average distances for VRE and MARC riders, VMT savings from those who would otherwise drive alone are 96.4 million miles. Of these miles, 14 percent, or 13.2 million take place within the District. Table 3-15 highlights the quantifiable benefits of this reduction in VMT.

Table 3-15: Annual Benefits from Reduced VMT, Region and District, 2016 dollars

Benefit Category	Regional VMT	District VMT
Fuel Consumption	$6,083,916	$830,607
Emissions	$1,275,533	$174,142
Safety	$17,470,759	$2,385,197
Vehicle Operating and Maintenance	$29,195,428	$3,985,909
Congestion	$6,466,325	$882,816
Total	$60,491,961	$8,258,672

The monetary benefits shown above represent only those generated by the 50 percent of existing riders likely to shift modes to driving alone. This is conservative, since it does not account for:

- The increased VMT generated by those who would carpool;
- VMT reduction at the regional level for intermediate trips where riders disembark prior to Union Station or L'Enfant Plaza Station;
- Benefits derived from the increased reliability afforded by commuter rail. A recent study of VRE benefits showed that although vehicular travel times on average were slightly faster than commuter rail, the variability and resulting uncertainty of traffic congestion required increased planning time for auto commutes to account for potential delays;
- Value of congestion reduction may be understated given the extent of congestion in the region. The congestion cost assumption used represents the middle of the range based on FHWA's Cost Allocation Study, but using the higher end of the range would make the monetary benefit as much as three times what is shown in the above table; and

- Washington Metropolitan Area's traffic may become worse in the future.

Assumptions underlying the assessment of commuter rail impacts can be found in Appendix F.

3.3 REVIEW OF STATE RAIL PLANS FROM NEIGHBORING STATES

3.3.1 Relevant Initiatives from Maryland

Maryland's draft Statewide Rail Plan from 2015 highlights a number of projects that would improve the movement of people and freight on the Northeast Corridor (Table 3-16).

Table 3-16: Relevant Projects from the draft Maryland Statewide Rail Plan

Project Name	(Millions)
Replace Amtrak B&P Tunnel	$1,500
New freight tunnel in Baltimore (CSX)	$1,600
CSX National Gateway Initiative Clearances (Phase II)	$25
NS – Crescent Corridor	$405
Continued expansion to three main tracks between Baltimore and Washington	$160
Maglev – Baltimore to Washington DC	TBD
CSX Maryland second and third main track projects – West Baltimore to Washington, DC; add six miles triple track	$7
CSX Metropolitan Subdivision – add third main line to increase capacity	TBD
Washington Terminal Yard planned expansion	TBD
ADA/SGR Station Improvements (Aberdeen, Baltimore, New Carrollton, Washington)	$120
Add another Montgomery County MARC station or expand existing station on MARC Brunswick Line	$25
MTA investment in Washington Union Station Master Plan	TBD
WAS – Gunpow interlockings high-density signals	$15–$20
Increase capacity BWI Airport to New Carrollton	TBD
MARC Service Expansion to L'Enfant Plaza and Northern Virginia via MARC Penn Line	TBD

Source: draft Maryland Statewide Rail Plan, April 2015

3.3.2 Relevant Initiatives from Virginia

The Virginia Statewide Rail Plan of 2013 considered a number of projects that impact the District, including the National Gateway project, improvements to VRE, and state-supported Amtrak services between the District and Virginia. Near-term projects are included in the Six-Year Improvement Program (SYIP). All other projects are categorized as unfunded needs proposed for funding in future years and include longer-term projects such as the Richmond-DC High Speed Rail and Long Bridge Projects.

Table 3-17: Relevant Six-Year Improvement Projects

Project Description	FY2013-18 Total Programmed
I-95/I-64 Transportation Corridor Construction of additional track capacity for VRE service in Spotsylvania County and the SEHSR Tier II EIS from the Richmond area to the Potomac River	$82,269,000
National Gateway Upgrading multiple bridges, Kilby support yard, and the Virginia Avenue Tunnel to accommodate the clearance envelope of double stack trains	$53,076,686
Intercity Passenger Rail Operating and Capital Program $218,039,802 is the total intercity passenger rail operating and capital cost. There is currently a $162,258,676 funding shortfall.	$218,039,802

Source: 2013 Virginia Statewide Rail Plan

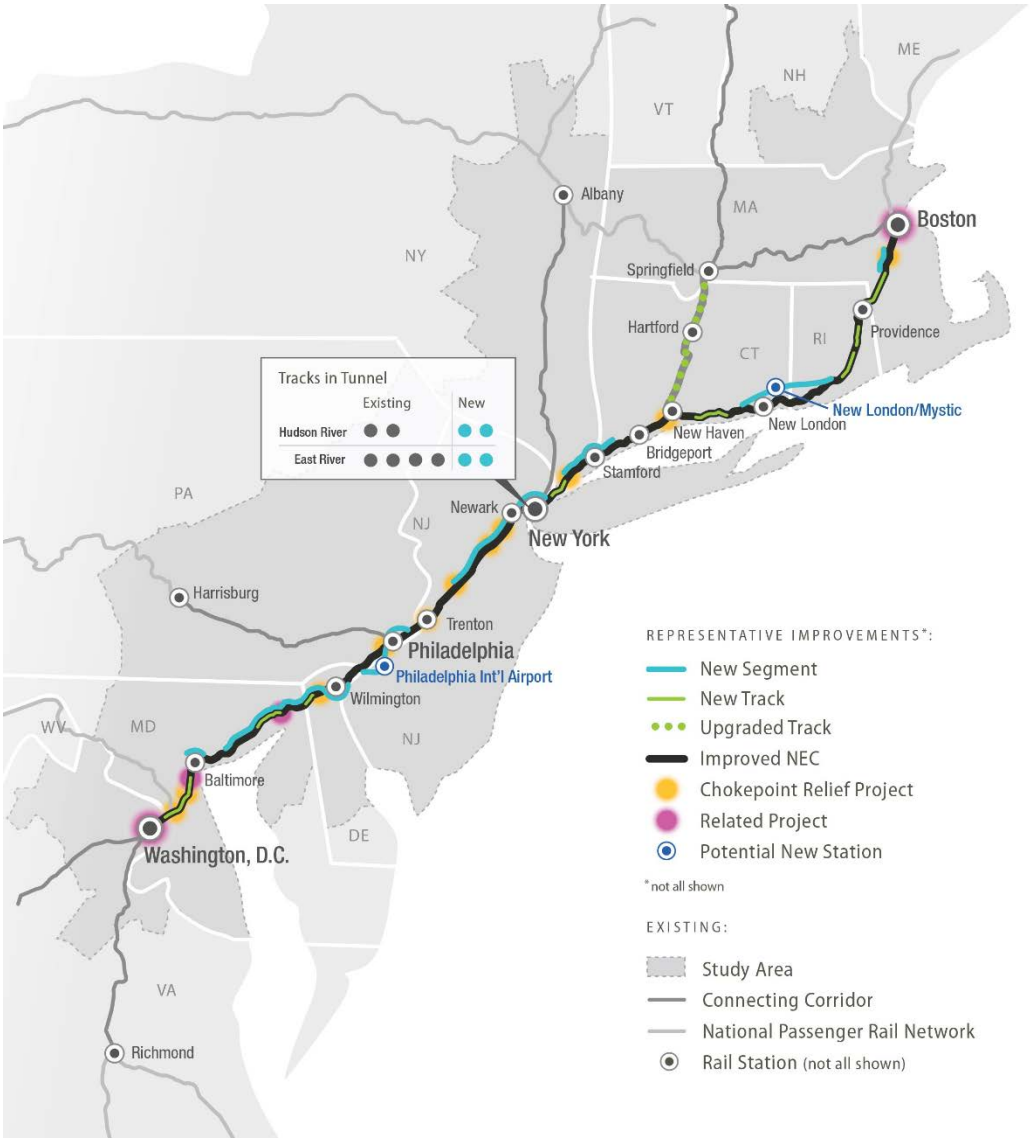
3.3.3 Relevant Northeast Corridor Initiatives

The most relevant initiative currently underway in the Northeast Corridor is the NEC FUTURE project. This project is a comprehensive planning effort to define, evaluate, and prioritize future investments in the Northeast Corridor. The FRA launched NEC FUTURE in 2012 to consider the role of passenger service in the context of current and future transportation demands. Through NEC FUTURE, the FRA will determine a long-term vision and investment program for the Northeast Corridor, and provide a Tier 1 Environmental Impact Statement (EIS) and Service Development Plan (SDP) in support of that vision.

The Draft Tier 1 Final Environmental Impact Statement (FEIS) was released in December 2016 and assesses the broad impacts of an investment program to improve passenger rail service within the NEC FUTURE study area. It evaluates three Action Alternatives for the NEC in comparison with a No Action Alternative, and considers impacts to transportation, the economy, the build environment, and natural resources. A Preferred Alternative has been identified that dramatically increases the amount of intercity rail service, with reductions in trip time, to accommodate the growth in population and employment projected for the Northeast. For Union Station (along with Penn Station New York and Boston South Station), the Preferred Alternative's relief of capacity constraints would create opportunities for ridership growth. The daily two-way trips for Union Station were estimated to increase by 114 percent by 2040 with the the Preferred Alternative (38,564,500) versus the No Action Alternative (17,999,000).

Compared to the No Action Alternative, project ridership on intercity service doubles by 2040 in the entire Study Area. Increases in regional ridership of up to 20 percent are also anticipated by the NEC FUTURE travel demand model. In selected metropolitan area pairs, intercity ridership would increase by more than 200 percent by 2040. For Union Station, a 229 percent increase is anticipated in 2040 for the Preferred Alternative compared with the No Action Alternative: 84 trains vs. 276 bi-directional intercity trains per day. Similarly, for regional passenger trains per day serving Union Station in 2040, 127 trains are anticipated in the No Action Alternative vs. 436 trains in the Preferred Alternative, a 243 percent increase. Figure 3-44 presents the map of the Preferred Alternative in 2040.

Figure 3-44: NEC FUTURE Preferred Alternative, 2040



Source: NEC FUTURE Final Environmental Impact Statement, 2016

3.3.4 Relevant Southeast Corridor Initiatives

There are several efforts underway in the Southeastern US that have impacts on rail operations in the District. The first is the Atlantic Gateway project. In 2016, the Commonwealth of Virginia was selected for a $165 million federal FASTLANE grant to advance the Atlantic Gateway project. Combined resources for the project including the federal grant, private investment, and other public funding total $1.4 billion. Project partners include the Virginia Department of Transportation (VDOT), the Virginia Department of Rail and Public Transportation (DRPT), the Australian private entity Transurban, and CSX. The effort intents to resolve bottlenecks, alleviate congestion and reduce safety concerns by accelerating a variety of projects for the long-term, multimodal network. Rail project components include:

- Long Bridge;

- Acquiring the S-Line, a 60-mile abandoned rail corridor between the Richmond Area and North Carolina. The line, currently owned by CSX, could be used to extend high speed rail into the Southeast US;
- Constructing a third main line track from Franconia to Occoquan; and
- Improving operations along the rail corridor south of Fredericksburg

A related initiative is the DC to Richmond Southeast High Speed Rail (DC2RVA). DRPT is leading the development of a Tier II EIS, and a Tier II Record of Decision is anticipated in 2017. The DC2RVA project is part of the larger Southeast High Speed Rail (SEHSR) project to advance the implementation of high speed passenger service within the SEHSR corridor from Washington, DC to Charlotte, NC. Improvements are focused on minimizing impacts by using existing rail infrastructure, corridors, and railroad right-of-way, resulting in four new higher-speed intercity round trips to the corridor. A range of alternatives are being considered, including:

- Construction of additional main line tracks and crossovers,
- Straighten curves in existing tracks,
- Improve station areas,
- Improve sidings and signals, and
- Improve grade crossings[54]

Figure 3-45 illustrates the northern part of the SEHSR corridor, from Washington DC to south of Richmond.

[54] http://dc2rvarail.com/about/project-history/

Figure 3-45: DC2RVA Project Map

Source: DC2RVA Project Website.

DISTRICT OF COLUMBIA

STATE RAIL PLAN

CHAPTER 4: Passenger Rail Issues, Needs and Potential Improvements/Investments

2017

d. delivers

district department of transportation

Chapter 4 Passenger Rail Issues, Needs, and Potential Improvements/Investments

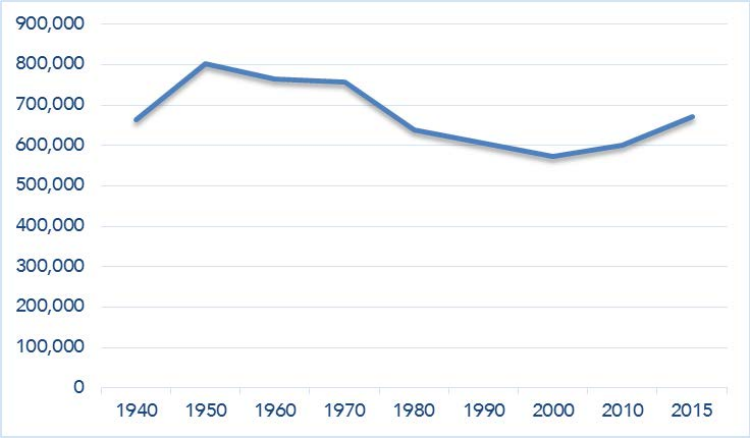
Chapter 4 discusses demographic and transportation trends that will likely impact the need for passenger rail transportation to and from the District in the future. The chapter then describes initiatives that have been put forward to address the District's passenger rail needs.

4.1 PASSENGER RAIL SYSTEM TRENDS AND FORECASTS

4.1.1 Demographic and Economic Growth Factors

Washington, D.C.'s demographic landscape has changed radically in the last one hundred years. Like many U.S. cities, it experienced rapid growth before World War II, more than doubling in population between 1890 and 1940. Then, the intersection of a variety of factors saw the city's growth reverse as population left for the suburbs in adjacent states. However, since the early 2000s the District has begun to grow again. Since the 2000 Census, the District has experienced a net gain of 100,000 residents. Growth has not only stayed consistent but has accelerated, making the District one of the fastest growing cities in the nation (Figure 4-1).

Figure 4-1: Population of the District



Source: U.S. Census Bureau

Population growth in the District of Columbia is expected to continue, increasing the demand for commuter and intercity rail services. According to the Metropolitan Washington Council of Government (MWCOG), the District's residential population in 2045 is expected to be 987,000, a 32 percent increase over the 2015 population. Double digit increases are expected for employment growth in the District as well, estimated to increase by 23 percent over 2015 levels to more than one million jobs by 2045. Similarly, the Washington region as a whole will increase population and jobs by 28 percent and 36 percent, respectively.[1] Moreover, many people commute into the District via car. Currently, there are about 550,000 people who commute into the District from Maryland, Virginia, and West Virginia, or beyond. Of these workers, about 200,000 traveled by public transportation and about

[1] MWCOG Round 9.0 Cooperative Forecasts of Future Growth, March 16, 2016

340,000 traveled by car or carpool.[2] With expanded job growth, increased commuter rail service could provide more opportunities for people to travel by transit.

4.1.2 Passenger Demand and Growth

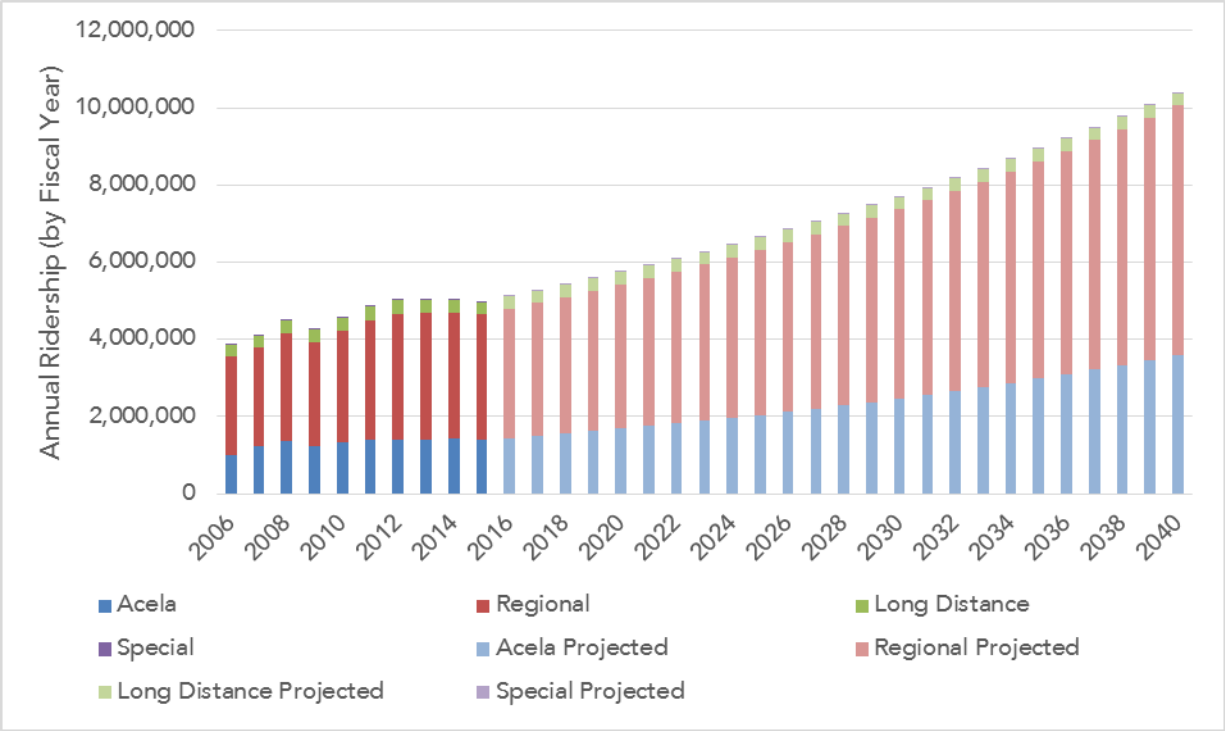
Roughly 4.9 million riders passed through Washington Union Station in 2015. Between 2001 and 2013, Union Station ridership grew by an average of 3.8 percent annually. Most riders arrive or depart Union Station by commuter rail systems such as MARC and VRE, while the remaining third come from Amtrak. Rail ridership on all three has grown, although MARC's share of passengers that board or alight at Union Station has grown faster than ridership at Union Station or the MARC system as a whole. Between 2008 and 2015, MARC system ridership grew by roughly 1.6 percent per year, but MARC ridership at Union Station grew faster at around four percent annually. Most of this growth was on the Penn Line. The VRE system grew on average 4.35 percent per year between 2006 and 2011. Like MARC, more and more VRE passengers have been boarding and alighting at Union Station, a number which is growing by an average (2001-2012) of around five percent every year. This growth is split between the Fredericksburg and Manassas lines. While VRE's average growth both system-wide and at Washington Union Station is considerable, it is only about seven percent of the total ridership at the station.

Ridership at Union Station has shown continuously high growth rates (averaging just below an annual ten percent increase) between 2010-2012. Amtrak ridership growth at Union Station from 2001-2015 averaged around 2.6 percent per year between 2001 and 2015 (Figure 4-2). Total Amtrak ridership at Washington Union Station grew by nearly 29 percent between federal fiscal year (ends September 30) 2006 and 2015. Acela ridership increased the most over this time period, growing by 41 percent from 990,000 in FY2006 to 1,400,000 in FY2015. Amtrak's Northeast Regional ridership increased by 28 percent from 2,600,000 to 3,300,000. Long Distance ridership increased slightly at one percent from 306,000 to 309,000 annual on and offs. Over this same time period, special service (private charter) ridership decreased by 51 percent from 10,000 to 5,000.

Nearly three-quarters of the District's workforce commutes from outside the District while one-third of the District's residents reverse commute to jobs outside the District.[3] MARC provides limited reverse commute service from Washington, DC to Baltimore, MD.[4] However, both agencies have included expansion of reverse commuter trains in their long-term plans in response to long-standing passenger demand and in the interest of enhancing mobility in the region. The share of reverse commuting on Metrorail is small (below 10 percent) but has grown by approximately 40 percent between 2002 and 2012, suggesting a pattern of increasing demand for reverse commute services.

[2] U.S. Census Bureau, 2009-2013 5-Year American Community Survey Commuting Flows, Table 2. County to County Commuting Flows by Travel Mode.
[3] U.S. Census Bureau
[4] VRE provides one southbound and two northbound limited stop reverse peak trains on the Manassas line.

Figure 4-2: Amtrak Historic and Projected Annual Ridership at Union Station[5]



Source: Amtrak (2016)

Intercity rail in the Northeast Corridor is estimated to grow by 115 percent by 2040, outpacing aviation's expected 102 percent growth. Dramatic growth is also projected for commuter rail throughout the Northeast Corridor with an 87 percent demand increase compared to automobile's 22 percent.[6] Growth in traffic between Virginia and the District is predicted within the Long Bridge Phase II Study, with the number of passenger trains over the Long Bridge expected to increase by 140 percent between 2016 and 2040.[7] This projected increase in demand will create the need for passenger rail expansion initiatives described in this plan.

Figure 4-3 presents a composite look at the various commuter and Metro services bringing together projections developed as of 2016 by both the rail agencies (Amtrak, MARC[8], VRE[9]) and an extrapolation of Metro ridership based on recent growth to 2040. Figure 4-4 shows average daily ridership for Amtrak, VRE, and MARC at Washington Union Station, which would match the annual trends.[10] MARC daily ridership is extrapolated based on recent growth.

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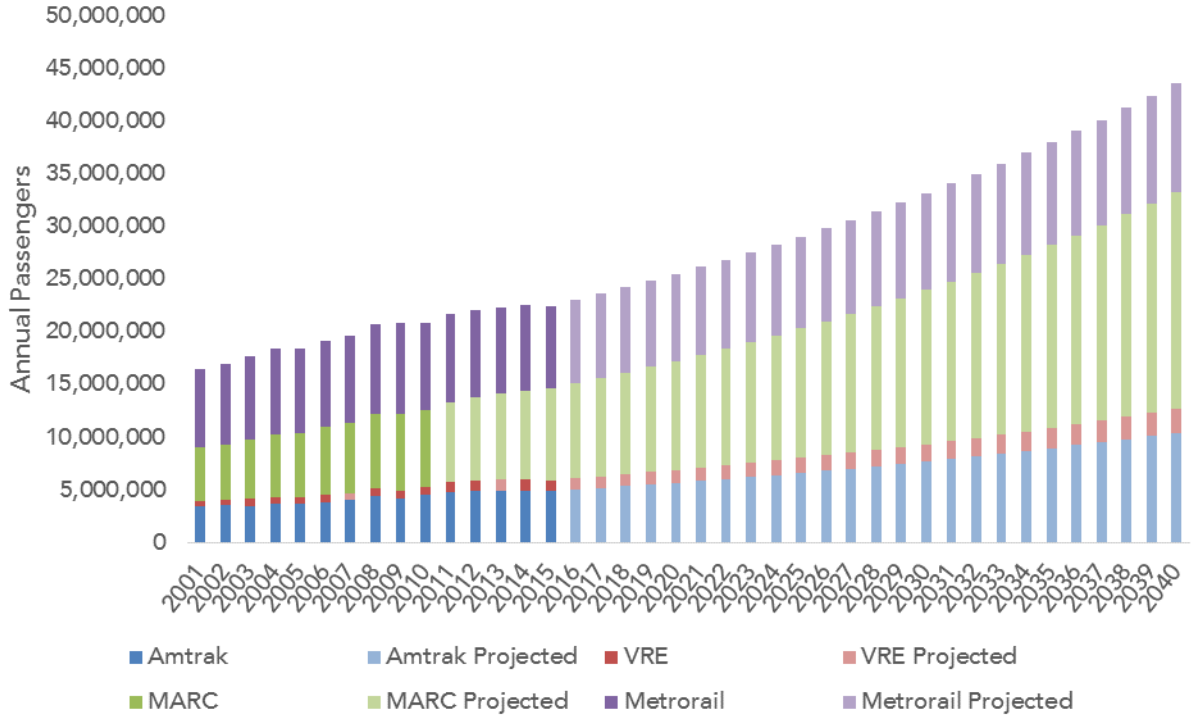
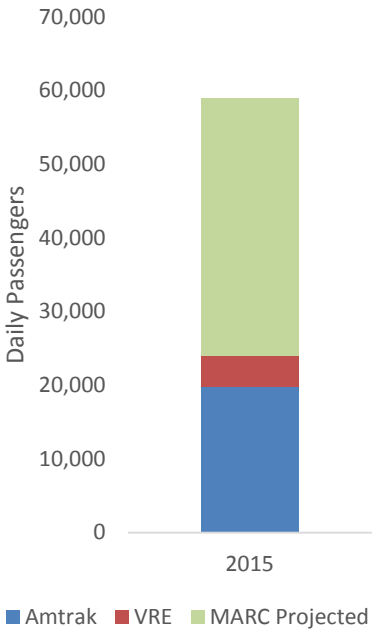
[5] Ridership projections are based on information provided by rail agencies in 2016 and may differ from future modeling efforts conducted as part of NEC FUTURE, the Washington Union Station EIS, and the Long Bridge EIS.
[6] Northeast Corridor Infrastructure and Operations Advisory Commission State of the Northeast Corridor Regional Transportation System Summary Report, February 2014
[7] The Long Bridge Phase II Study projects an increase from 60 passenger trains in 2016 to 144 in 2040 on Long Bridge.
[8] *MARC Growth and Investment Plan Update 2013 to 2050*
[9] *VRE System Plan*
[10] A daily factor of 250 was used for all rail services to convert annual ridership to daily. Future projections may utilize varying factors, which could lead to differences in daily or annual totals.

Figure 4-3: Amtrak, VRE, MARC and Metro Historic and Projected Annual Ridership at Union Station [11]



Source: Amtrak, VRE, MARC, WMATA (2016)

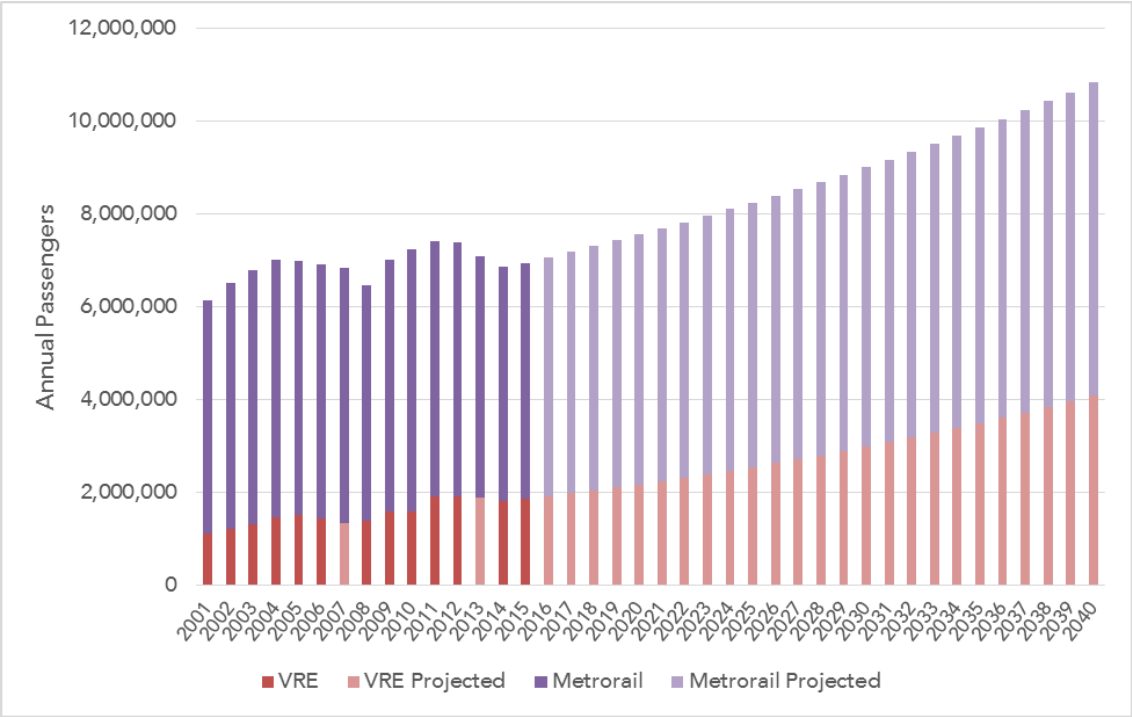
Figure 4-4: 2015 Average Daily Ridership at Washington Union Station for Amtrak, VRE, and MARC



[11] Ridership projections are based on information provided by rail agencies in 2016 and may differ from future modeling efforts conducted as part of NEC FUTURE, the Washington Union Station EIS, and the Long Bridge EIS.

Similar to Union Station, L'Enfant Station is also expected to see significant passenger growth. VRE numbers for historic and projected growth also include Virginia Amtrak services at the Station (Figure 4-5). In order to accommodate projected growth in demand, a number of initiatives are anticipated to provide additional train services.

Figure 4-5: VRE and Metrorail Ridership Recorded and Projected at L'Enfant Station [12]

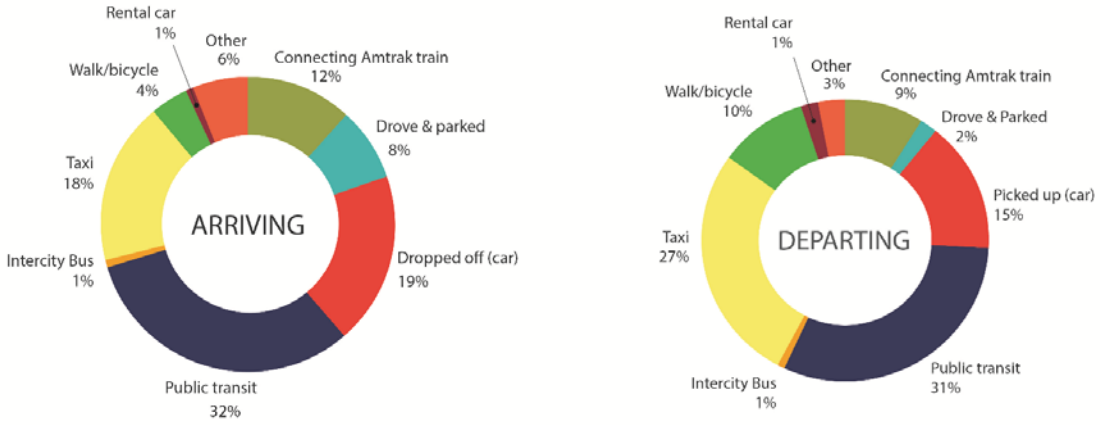


Source: VRE, WMATA (2016)

As shown in Figure 4-6, most passengers accessing Washington Union Station arrive or depart by automobile (their car, another driver picking up or dropping off, or a taxi/limo), while a third use public transit, and four percent walk or ride bikes.

[12] Ridership projections are based on information provided by rail agencies in 2016 and may differ from future modeling efforts conducted as part of NEC FUTURE, the Washington Union Station EIS, and the Long Bridge EIS.

Figure 4-6: Mode of Passengers Arriving and Departing Union Station (2012)



Source: Union Station Master Plan, 2012

As passenger rail ridership continues to grow in the District, the capacity of the existing rail system will be challenged in future years to meet this demand. Realizing this important need, rail agencies and related stakeholders are already investing in numerous projects to provide needed rail capacity both on the tracks and within the Districts' two rail stations. Ensuring accessibility to and from the rail stations in the District will be increasingly important as ridership grows, particularly so as to not hinder the full potential rail. Agencies are similarly advancing projects to improve operational flexibility, particularly with regard to midday and overnight train storage as service levels increase.

The remainder of this chapter describes passenger rail initiatives underway in the District, both near-term investments, as well as longer-term projects that are in various stages of planning, environmental, and design. Details on many of these initiatives are provided in Appendix H.

4.2 ISSUES AND OPPORTUNITIES WITH THE DISTRICT PASSENGER RAIL NETWORK

In order to accommodate increased passenger volumes and services, capacity at the District's rail stations, yards, rail lines and bridges will need to be expanded.

4.2.1 Yards

The first area concerns train storage capacity and the flow of passenger trains into the District. After commuter trains bring commuters into the District in the morning, it is in many cases most cost-effective to store the trainsets in the District so that they are ready to carry commuters out of the District in the afternoon. Amtrak stores its trains at Ivy City and at Union Station platform tracks overnight and at various points of the day. MARC stores as many as 94 units (locomotives and coaches) in 15 trainsets per day, and VRE stores as many as 82 units in 12 trainsets. During the midday, VRE trains are stored at the Ivy City Coach Yard, while MARC trains are stored at either the West Yard, Wedge Yard, or at platform tracks. In most cases, storage tracks are effectively at capacity. Furthermore, stored trains and trains accessing storage areas cause operation problems.

In May 2016, VRE released an RFP to design a new train storage yard along New York Avenue adjacent to the NEC. This would add midday storage capability for VRE. MARC is exploring additional options for train storage as well.

4.2.2 Stations

Passenger rail stations within the District are another area that is currently at capacity during peak hours.

Union Station

Concourses and gates in Union Station as well as platform widths and curvature cannot accommodate capacity for passenger loading, circulation and on-board services, baggage, and commissary. Additionally, the north Metrorail entrance at Union Station is overcrowded, and the fare vending areas and gate areas do not have enough room to handle all riders, and movement between transit modes within the station is not intuitive. Also within the station, support services are constrained in space and the layout of certain functions, such as commissary, are awkward.

Outside of the station, multimodal access to the station is another issue, with circuitous circulation at Columbus Circle and the need to accommodate additional streetcar access. Taxi facilities are also inefficient and lack adequate queuing areas. Buses (intercity and local) and bicycle facilities lack adequate capacity to meet future demand. The station could also be better integrated with surrounding neighborhoods, connecting areas north and south of the Station.

The Union Station Master Plan was prepared in 2012 by Amtrak and created a long-term vision for improving the primary functions of the station, focusing on the core needs and customer experience by increasing capacity, improving the quality of passenger and visitor experiences, and adding vitality in the surrounding area. Amtrak subsequently rebranded the effort as the 2nd Century Projects at Washington Union Station. Amtrak, the FRA, and the Union Station Redevelopment Corporation have continued to advance the efforts through the Washington Union Station Expansion Project, which will culminate in an Environmental Impact Statement (EIS). A series of phased improvements are envisioned beginning with track and platform reconstruction and passenger concourse improvements that will increase the Station's passenger handling capacity. Eventually a new train shed would be built with a new below-ground passenger concourse. The intent of these efforts is to expand and modernize the station through the following:

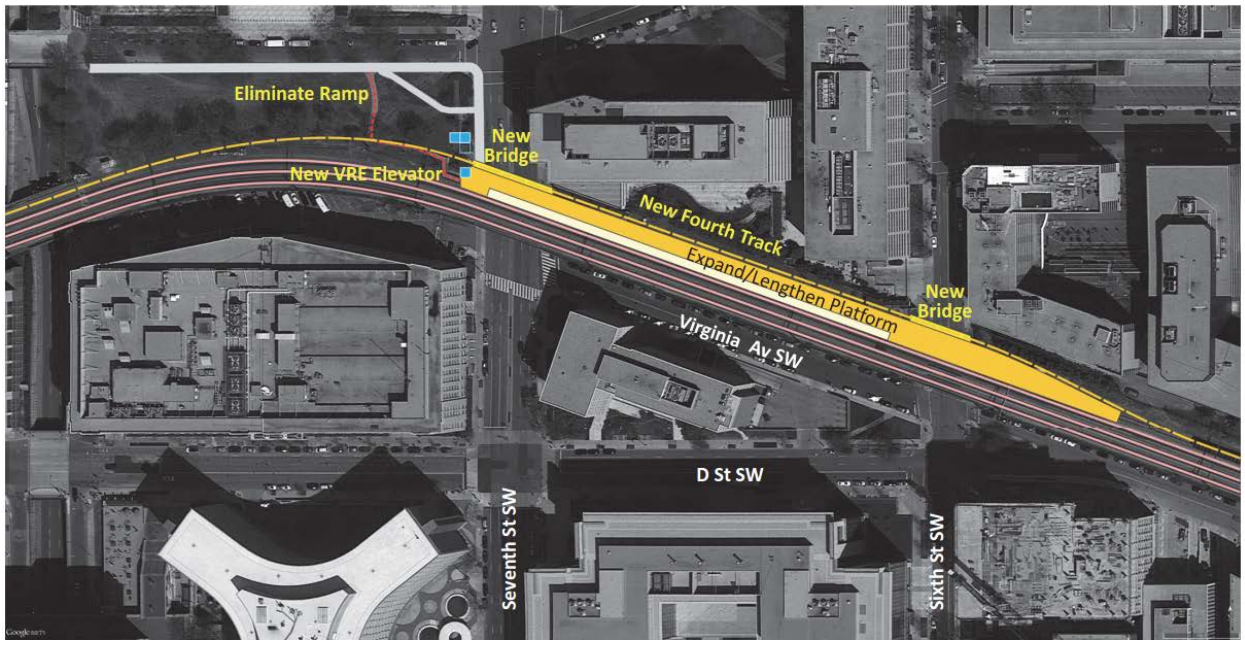
- Increase Station capacity to accommodate growth in passenger traffic and railroad operations, and achieving compliance with ADA, security, and life-safety standards;
- Maintain financial viability to preserve and maintain the historic Washington Union Station building and its features;
- Provide improved connectivity among transportation modes; and
- Provide better integration between Washington Union Station and its surrounding neighbors and planned land uses.

One of the prerequisite efforts for the redevelopment of Union Station is the reconstruction of the H Street Bridge. Currently under design by DDOT, it is anticipated that this bridge will also carry the western extension of the streetcar. A second project also in design is Amtrak's Subbasement Structural Replacement at Union Station to replace the supports that hold the floor of the run-through tunnel at Union Station.

L'Enfant Station

L'Enfant Station, served by VRE and Amtrak, is also experiencing capacity constraints that are limiting the ability to expand service. Providing additional capacity will, among other improvements, require the replacement of Long Bridge, originally constructed in 1904. As of 2017, DDOT has completed the Long Bridge Phase I and Phase II Studies, which will culminate in an EIS phase as required by the National Environmental Policy Act (NEPA). Figure 4-7 displays current recommended improvement concepts at L'Enfant Station. VRE is currently pursuing a L'Enfant Station and Track Improvements environmental study to identify the preferred project components at this station.

Figure 4-7: Summary of VRE Concept for L'Enfant Station



Source: VRE, 2016

At L'Enfant Station, VRE plans to add an additional track, so the L'Enfant platform can serve two tracks, as well as lengthen and widen the existing platform. Improvements in the Long Bridge corridor enable the future possibility that MARC trains provide service at L'Enfant Station and the potential eventual use of midday storage facilities in Virginia.

Multiple planning studies envision a more ambitious approach to resolving space and capacity issues at L'Enfant Station. These envision decking over the CSX rail line as it passes between Long Bridge and the Virginia Avenue Tunnel. The tracks would then emerge at Virginia Avenue to an elevated L'Enfant train station. This infrastructure would allow additional investment in the station area. These additional potential improvements would follow the near-term plans being pursued by VRE.

Detailed information on the specific passenger rail projects identified here is provided in Appendix H.

4.3 OTHER LONGER-TERM PASSENGER RAIL NEEDS

4.3.1 NEC FUTURE

As outlined in Chapter 3, NEC FUTURE is a comprehensive planning effort currently underway to define, evaluate, and prioritize future investments in the NEC from Washington, D.C. to Boston. Launched in February 2012 by FRA, the project is considering the role of rail passenger service in the context of current and future transportation demands with an outcome of determining a long-term vision and investment program for the corridor. A final Tier 1 EIS and Service Development Plan (SDP) is anticipated in summer 2017 to support this vision. The Draft EIS was released in December 2016. This plan points to several passenger rail needs within the District.

NEC FUTURE outlined four alternatives for the future of rail on the Northeast Corridor (NEC) through the horizon year 2040. This included a No Action Alternative, which maintains current levels of service, but does not increase capacity or meet a state of good repair. Alternative 1 invests in infrastructure improvements, which increases service to meet demands associated with increasing employment and population along the NEC. Alternative 2 improves service beyond Alternative 1 by maximizing capacity through more new track, new segments, and chokepoint relief projects. Alternative 3 offers the most dramatic change with major service improvements as well as a two-track second spine to enable high-performance rail service. In December 2016, FRA identified Alternative 2 in the Draft EIS as the preferred alternative.

Table 4-1: NEC FUTURE Alternative Scenarios for Washington DC

	No Action Alternative	Alternative 1	Alternative 2	Alternative 3
Daily Trains at Washington Union Station (2040)				
Intercity	84	144	222	304
Regional	127	248	468	492
Daily Two-Way Trips at Washington Union Station (2040)*				
	48,000	75,000	86,000	104,000

Source: NEC FUTURE Tier 1 Draft Environmental Impact Statement[13]

** NEC FUTURE Tier 1 Draft Environment Impact Statement, Chapter 5. Transportation, p.5-39.*

With the proposed preferred alternative, there will be a significant increase in daily trains at Washington Union Station compared to the No Action Alternative (or current service levels). This will correspond to a significant increase in ridership at the station as well. Daily two-way trips could increase from 48,000 in the No Action Alternative to 86,000 in the preferred alternative. Significant infrastructure investment will be required in the preferred alternative scenario, including within the District. Various projects along the NEC and at Union Station will be necessary to allow this anticipated growth.

4.3.2 Northeast Maglev

Another effort to improve mobility along the NEC is The Northeast Maglev, or TNEM, which proposes a new service connecting Baltimore and Washington in 15 minutes utilizing magnetic levitation

[13] http://www.necfuture.com/alternatives/alternatives_comparison.aspx

technology. TNEM is private sector firm advocating the construction of a larger superconducting magnetic levitation line from Washington, D.C. to New York City, working closely with maglev operator Central Japan Railway Company. The Washington to Baltimore segment was awarded $27.8 million in FRA funds in 2015 to initiate planning and engineering analysis for this initial segment, which is being led by the State of Maryland. Currently, the project is in the Preliminary Engineering/NEPA phase of project development. No capital funding for the construction has been confirmed. This effort is anticipated, however, to receive further financial support from the Japanese government along with the TNEM subsidiary Baltimore-Washington Rapid Rail LLC.[14] At this time, study is ongoing and no immediate needs are apparent.

4.3.3 Washington, DC-Richmond High Speed Rail

As outlined in Chapter 3, The Washington, D.C. to Richmond Southeast High Speed Rail project (DC2RVA) is a segment of the Southeast Corridor High Speed Rail Project linking it to the Northeast Corridor. This segment is part of a larger federally-recognized high speed rail corridor stretching from the District to Atlanta. The objective of the project is to increase freight and passenger rail capacity and speed and utilizes an incremental development approach. Currently, some rail segments between Richmond and D.C. are nearing shared capacity of freight, commuter, and passenger trains. Without improvements, congestion is likely to increase and the quality of service decrease. Improvements from this project will enable rail travel to meet growing demands for passenger and freight travel in the region. New service is anticipated to begin by 2026. Currently, the Virginia DRPT is considering adding nine daily round-trip passenger trains.[15] Investment at the Long Bridge will be necessary to meet the needs identified as part of the DC2RVA project.

4.4 POTENTIAL INFILL PASSENGER RAIL STATIONS

As part of the efforts to describe passenger rail issues, needs, and potential improvements and investments, DDOT performed an analysis of potential new commuter rail stations in the context of the current rail network. The goal of the analysis was to ascertain which potential stations could provide the greatest potential for new services. Additional stations could provide added mobility for District residents and also relieve pressure on Metro's Red Line at Union Station by allowing passengers with destinations prior to or beyond Union Station to transfer to Metro earlier and not have to go through the station or pass directly to their destination.

The effort began with a comprehensive list of station sites developed through DDOT, rail stakeholder, and the public input (Figure 4-8). A series of detailed evaluation criteria were developed based on commuter rail station planning best practices and refined with DDOT input (Figure 4-8). The criteria encompassed areas such as creating new transportation options in underserved areas, enhancing access to jobs, fostering multi-modal connectivity, and general site feasibility constraints. Points were then applied to each criterion and a weighted score resulted for each location. Higher numeric scores indicate locations with more potential for future station consideration.

The ten station sites evaluated included:

- Benning Yard

[14] http://northeastmaglev.com
[15] http://dc2rvarail.com/resources/faqs/

- East Potomac Park
- Fort Totten Metro Station
- Michigan Avenue near Brookland-CUA Metro Station
- Minnesota Avenue Metro Station
- New York Avenue near Ivy City (approximately across from Farragut Street)
- Rhode Island Avenue Metro Station
- South Dakota Avenue (within residential area)
- South Dakota Avenue at New York Avenue (near Fort Lincoln development)
- Union Market Spur

Figure 4-8: Locations Examined for Potential New Commuter Rail Stations

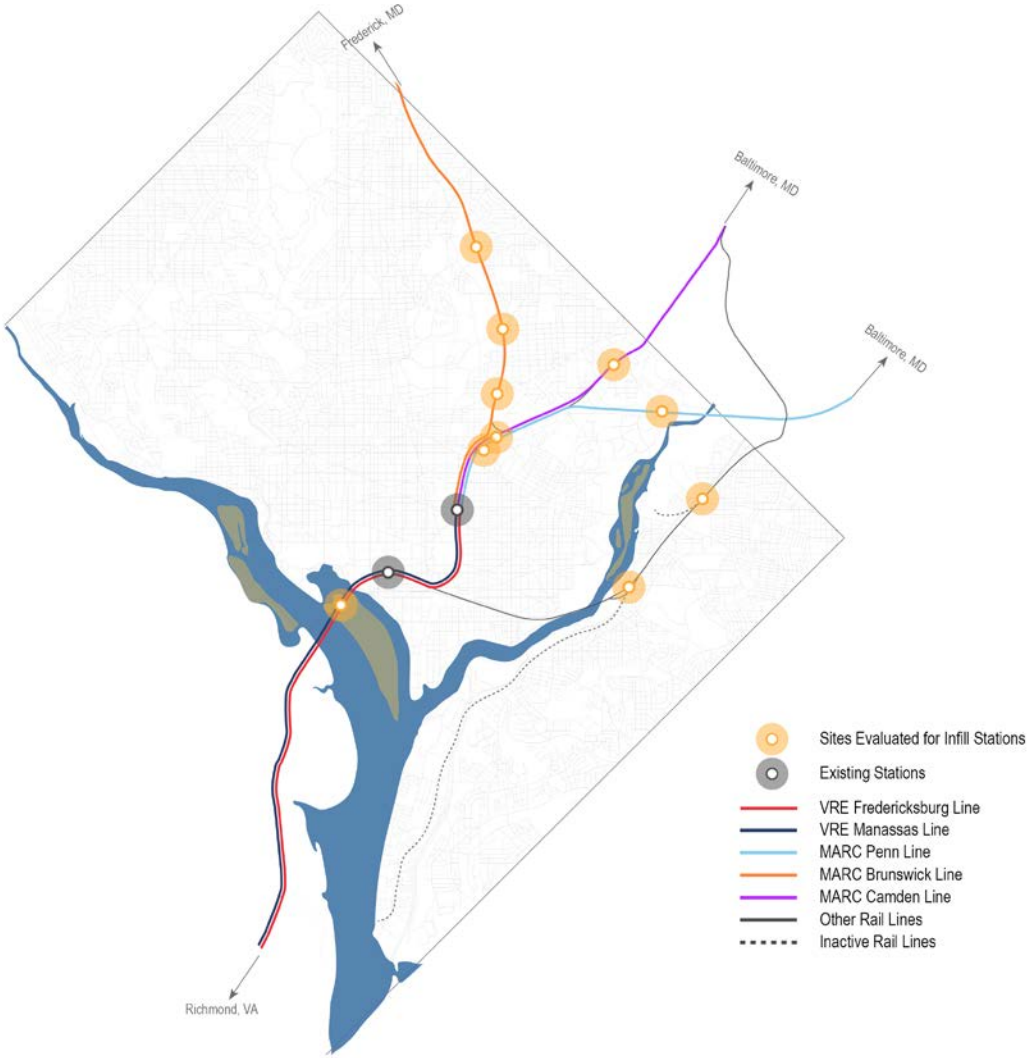


Figure 4-9: Commuter Rail Station Location Selection Criteria

1. Population and Employment (maximum of 10 points)

The location contains substantial population and employment to support commuter rail.

Metrics: Within 1 mile of proposed locations:

- Population within one mile
- Number of employees within one mile

Selection: Prioritize areas that have relatively high population density, high employment density

2. Economic Growth Potential (maximum of 10 points)

The location enhances access to jobs.

Metrics: Within 1 mile of proposed locations:

- MWCOG projections
  - Residential development potential
  - Employment development potential
- TOD zoning – existing and potential
  - Not favorable
  - Potential for change in existing zoning
  - Already appropriate zoning
- Potential number of TOD acres

Selection: Prioritize areas that could see high job/development growth.

3. New transit in underserved areas (maximum of 25 points)

The location enhances mobility in neighborhoods and communities which currently lack transit options.

Metrics: Within ½ mile for rail and ¼ mile for bus of proposed locations measure:

- Transit trips within walkable distance per hour using the Park Right DC model

Selection: Prioritize areas that do not have significant transit options.

4. Foster multimodal connectivity (maximum of 25 points)

The location connects rail riders to other modes of transit such as subway, bus, and/or bike share.

Metrics: Within ½ mile measure:

- Bus routes
- Subway lines
- Bike share stations

Selection: Prioritize areas that have high connectivity.

5. Site parameters (maximum of 30 points)

The infrastructure at the location could accommodate a new station without significant land acquisition or design barriers.

Metrics: Measure and identify:

- Station provides relief to Union Station (Metro access)
- Facilitates through-running/yard operation for rail agencies
- Rail station parameters
  - Adequate platform and clear length (minimum of 850')
  - Minimal track curvature/tangent track
  - Environmental conditions could easily accommodate a station
    - Presence of wetlands/floodplain, steep grades
    - Site would require additional design and construction cost
- Ownership of site is possible
- Note other site-specific impacts

Selection: Prioritize locations which have fewer obstacles to overcome.

The project team toured the initial list of locations and noted locations currently not served by commuter rail and/or in a location with constraints that would likely preclude the addition of a commuter rail station. These sites are indicated below by an asterisk (*) and while still evaluated in terms of their current and future demographics and transit options, these locations were considered infeasible at this time and would not likely be considered for future investigation by DDOT. The locations were then evaluated based on the station planning criteria, resulting into two tiers of potential new station locations:

- First tier (out of 100 points):
  1. Union Market, 65.5*
  2. Rhode Island Avenue Metro, 65.3
  3. Fort Totten Metro, 63.6
  4. New York Avenue near Ivy City (approximately across from Farragut Street), 61.8
  5. East Potomac Park, 57.0*
- Second tier (out of 100 points):
  6. Michigan Avenue near Brookland-CUA Metro, 56.8
  7. Minnesota Avenue, 49.3*
  8. Benning Yard, 47.0*
  9. South Dakota Avenue (residential area), 45.0
  10. South Dakota at New York (near Fort Lincoln development), 43.0

This evaluation indicates that the Rhode Island Avenue Metro, Fort Totten Metro and New York Avenue sites may be worthy of future examination. This tool is one means for DDOT to advance planning and feasibility studies for possible future station locations in support of a future broadened passenger rail network serving the District and the surrounding region. Future efforts to advance exploration of a potential new station may or may not be pursued. Detailed scoring for each of the sites is available in Appendix G.

DISTRICT OF COLUMBIA

STATE RAIL PLAN

CHAPTER 5: Freight Rail Needs and Potential Improvements/ Investments

2017

d. delivers

district department of transportation

Chapter 5 Freight Rail Issues, Needs, and Potential Improvements/ Investments

Chapter 5 discusses freight trends that will impact freight rail needs and opportunities for the District in the future as well as initiatives that have been put forward to address District freight needs and opportunities.

5.1 FREIGHT RAIL SYSTEM TRENDS AND FORECASTS

Freight needs, issues, and opportunities in the District are driven by current and future demand for freight and the nature of freight flows.

5.1.1 Overall Trends

The vast majority of rail freight that moves in the District is passing through, with origins and destinations outside the District. According to the 2014 U.S. Surface Transportation Board (STB) Waybill Sample,[1] of the 46 million tons of rail freight handled in the District in 2014, only about 151,000 tons originated and 124,000 tons terminated in the District, accounting for 0.43 and 0.34 percent of all rail freight traffic, respectively.

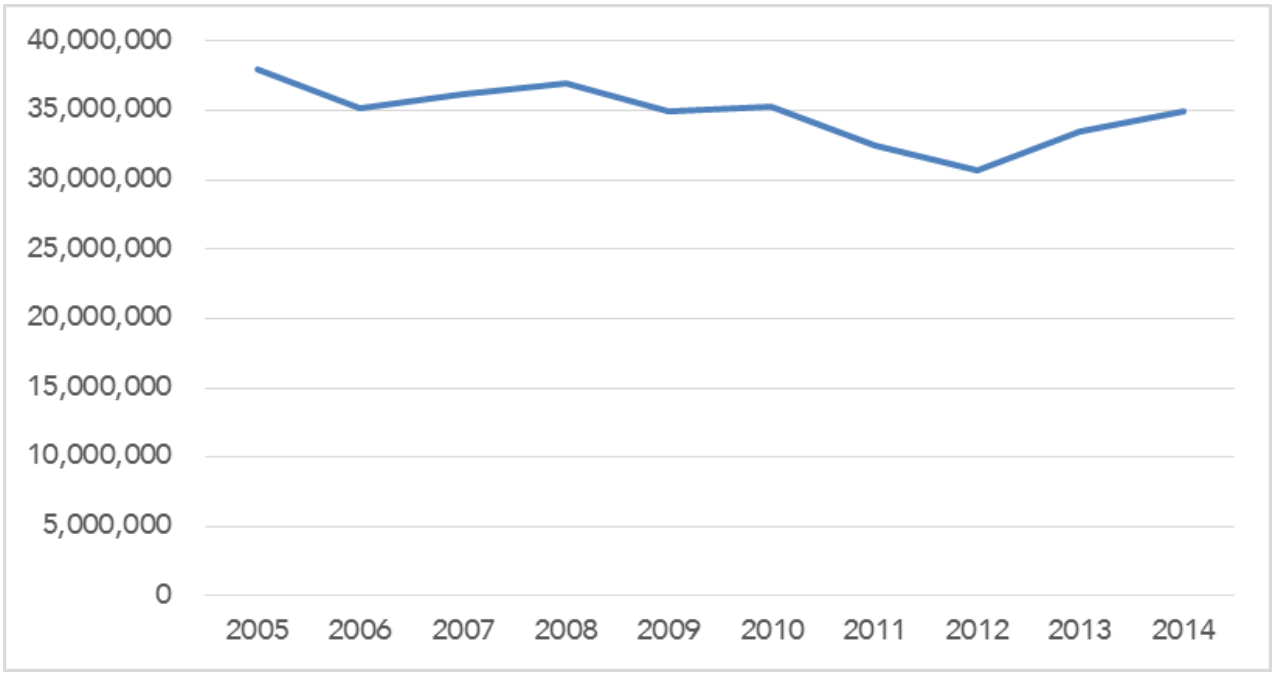
Commodities that originate in the District primarily consist of waste and scrap metals, although other miscellaneous shipments originate as well. Commodities that terminate in the District primarily consist of waste and scrap metal, although coal also terminates in the District.

Total freight traffic increased by 14 percent between 2012 and 2014. Longer term, freight levels handled over the District rail network have shrunk 8 percent from 38.0 million tons in 2005 to 34.9 million tons in 2014 as shown in Figure 5-1. Nationwide, originated rail traffic declined by three percent over the same time period so the reduction of tonnage in the District was slightly more than national trends. Although rail flow data for the District since 2014 is not available, nationwide, shipments of some commodities have declined significantly over the past two years. CSX Coal carloads handled declined from 1.3 million in 2014 to 1.1 million in 2015, with additional declines expected in 2016. Intermodal volumes increased between 2014 and 2015, but have been declining in the first part of 2016.[2]

For the small volumes of freight that originate or terminate in the district, these generally trended downward between 2005 and 2013, but then spiked in 2014 as shown in Figure 5-2. The increase was primarily associated with increases in shipments of scrap metal to and from the District. If District shipments of Waste and Scrap follow trends with of other areas on the CSX network they have since declined. CSX shipments of Waste and Scrap shrank by four percent between 2014 and 2015, with further reductions expected in coming years.

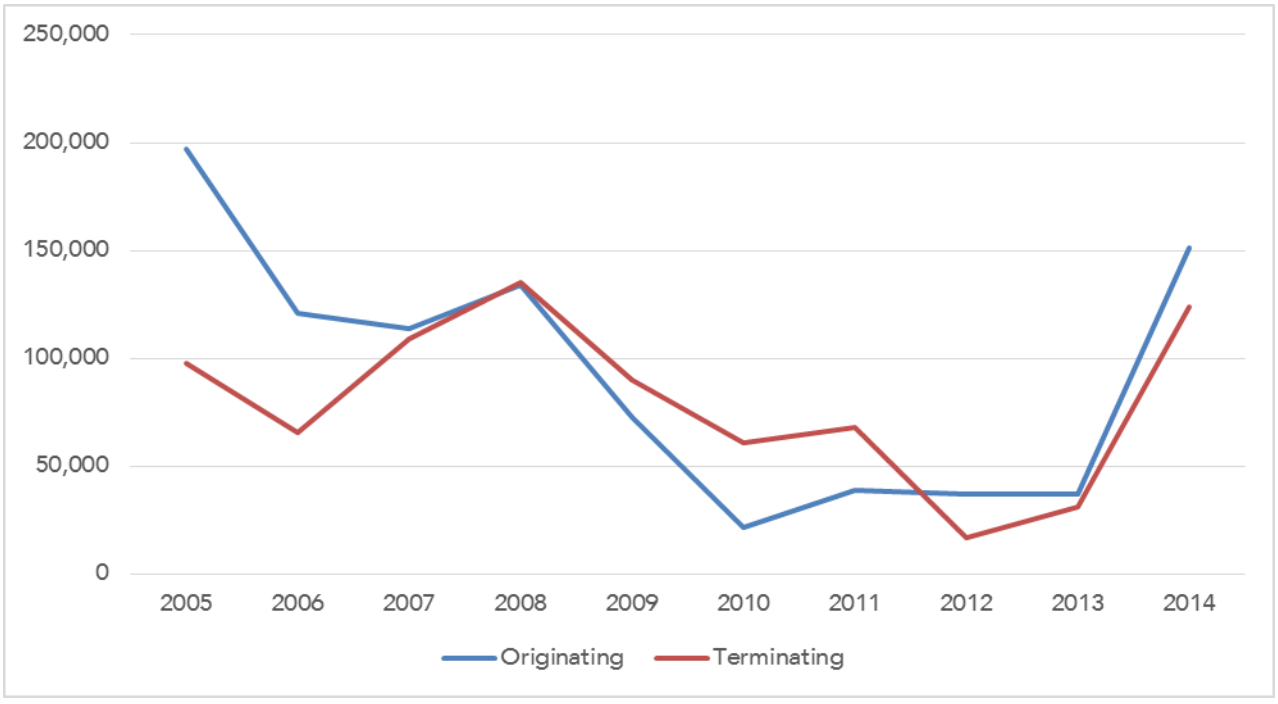
[1] Stratified sample of carload waybills for all U.S. rail traffic submitted by those rail carriers terminating 4,500 or more revenue carloads per year.
[2] CSX Annual Report, Yahoo Finance.

Figure 5-1: Trends in Total District Freight Rail Volumes by Tonnage



Source: AAR and STB Waybill Sample

Figure 5-2: Trends in District Originating and Terminating Freight Rail Volumes by Tonnage



Source: AAR and STB Waybill Sample

5.1.2 Freight Flow by Commodity

Table 5-1 displays commodities shipped by rail to/from and through the District by carload. Automotive and Intermodal traffic together account for over half of the rail traffic handled in the District, although intermodal containers and trailers are counted by the unit, not the railcar on which they sit, which produces higher unit counts than would be the case if carloads were counted by the underlying railcars. Chemicals are five percent of the traffic, but according to the CSX website, about seven percent of carloads handled in the District are hazardous materials.

Table 5-1: District Freight Rail Commodities by Carload, 2014

Commodity	Carloads	Percentage of Total
Forest Products	41,000	6%
Agricultural Products	27,000	4%
Chemicals	31,000	5%
Coal, Coke, and Iron Ore	69,000	11%
Phosphates	26,000	4%
Metals	21,000	3%
Intermodal	189,000	30%
Auto	136,000	21%
Food and Consumer Products	14,000	2%
Minerals	35,000	6%
Waste and Equipment	46,000	7%
Total	635,000	100%

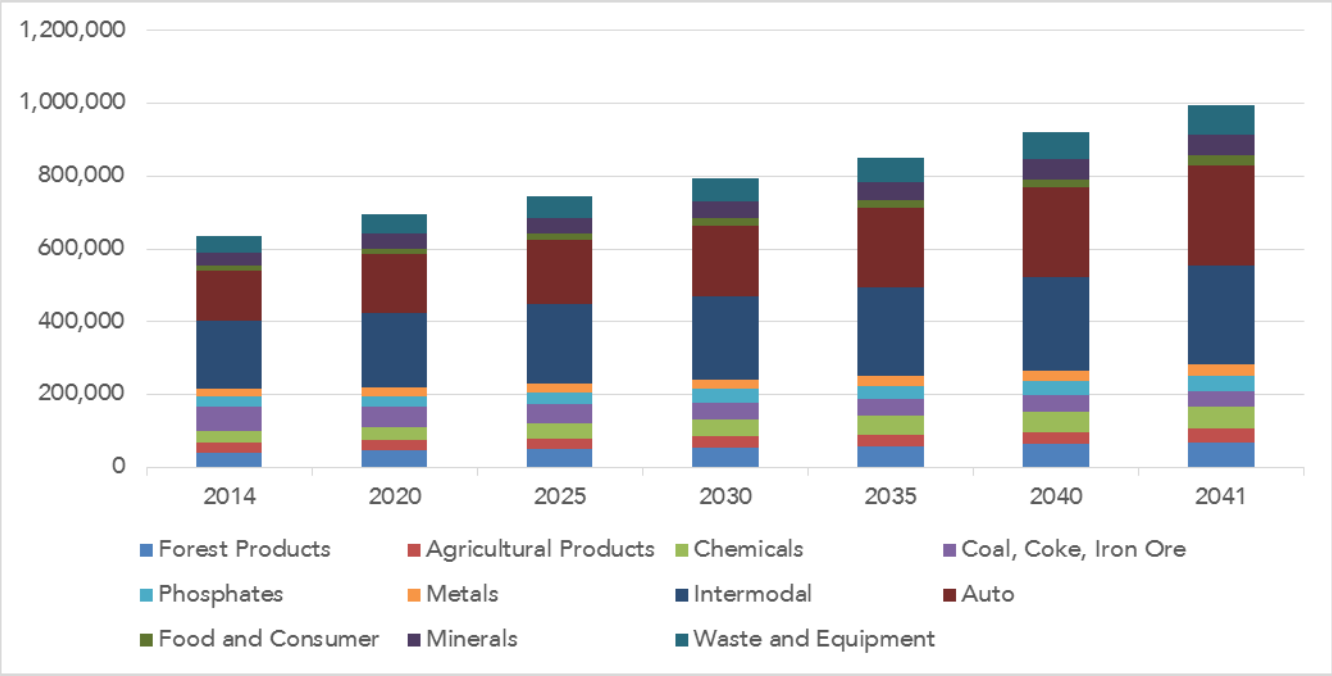
Source: 2014 STB Waybill Sample, 2015 data from CSX

5.1.3 Forecasted Rail Freight Traffic

Although freight rail traffic in the District declined between 2005 and 2014, over a long-term planning horizon freight traffic is expected to grow with the U.S. economy. Applying projected growth rates from the FHWA Freight Analysis Framework – 4, rail freight tonnage through the District would be expected to grow by around 57 percent between 2014 and 2040.[3] This is lower than the Long Bridge Phase II Study projects, which predicted that between 2016 and 2040, the number of freight trains over the Long Bridge would increase by 167 percent.[4] Much of the growth is expected to be associated with intermodal and automotive traffic. Figure 5-3 displays the forecast freight flowing through the District.

[3] FAF-4 does not produce forecasts for intermodal rail. Therefore, a forecast by IHS Global Insight for the American Trucking Associations was used to forecast intermodal 2014 – 2025, while a growth rate of 2.6 percent per year was assumed for 2025 – 2040 per forecast GDP growth.
[4] The Long Bridge Phase II Study projects an increase from 18 freight trains in 2016 to 48 in 2040 on Long Bridge.

Figure 5-3: Forecasted Rail Freight Passing through the District 2014–2040



Source: WSP | Parsons Brinckerhoff using Freight Analysis Framework – 4 Forecasts, STB Waybill Sample Base Year

Several factors could alter these forecasts.

- Recent reduction in rail shipments of coal are caused by environmental regulations, as well as recent declines in natural gas prices which have made natural gas electric generation more cost-effective relative to coal fired electric generation. Environmental regulations could further lower demand for coal. Regulations aim to lower the emissions of coal fired power plants. These include the National Ambient Air Quality Standards (NAAQS) for ozone and particulate matter; the Cross-State Air Pollution Rule (CSAPR) to address interstate transport of air pollution; Mercury and Air Toxics Standards (MATS); and regional haze regulations. In June 2014 under the authority of the Clean Air Act (CAA), the EPA proposed guidelines to cut CO2 emissions from existing fossil fuel power plants under the Clean Power Plan (CPP). The EPA estimates that coal production for electric power would decrease by 25 to 27 percent by 2020 compared to a base case where the CPP does not take effect.[5] In February 2016, the U.S. Supreme Court issued a "stay" of the CPP, so that the EPA cannot take any actions to implement or enforce the CPP pending resolution of state and industry challenges to the rule. If these regulations do not take effect, coal transportation through the District may be much higher than forecast.
- The National Gateway and other CSX intermodal initiatives could increase the volume of intermodal shipments passing through the District. This initiative will make it possible to ship containers on trains in double stack configuration, which is more efficient and cost-effective than the current arrangement, where containers cannot be stacked on each other due to clearance restrictions. This more efficient service could prompt shippers to increase usage of intermodal on

[5] U.S. EPA, *Regulatory Impact Analysis for the Proposed Carbon Pollution Guidelines for Existing Power Plants and Emission Standards for Modified and Reconstructed Power Plants*, June 2014.

the I-95 and I-70 corridors. While the total volume of containers would increase, the National Gateway initiative may reduce the number of intermodal trains through the District in the short-term since, since more containers can fit onto a single train.

CSX is investigating locations to build a new intermodal terminal in North Carolina. This terminal would serve as a hub, analogous to an airline hub. The other CSX hub terminal is in North Baltimore, OH, so analogous to service between airline hubs, CSX would provide frequent service between the Ohio and the North Carolina facilities though the District. The hub concept would make it possible for CSX to serve markets that otherwise would not generate sufficient volume to justify service.

CSX and the Port of Baltimore are also seeking funding to enable double stack intermodal trains to pass through the Howard Street Tunnel, a tunnel in Baltimore that currently prohibits double stack intermodal trains from accessing the Port of Baltimore. If this is completed in conjunction with the Virginia Avenue Tunnel project, additional traffic to and from the Port of Baltimore could pass through the District.

- Additional regulations regarding the movement of hazardous materials could impact the volume of chemicals expected to come through the District.

5.2 ISSUES AND OPPORTUNITIES WITH THE DISTRICT FREIGHT RAIL NETWORK

The trends described above, as well as the existing conditions described in Chapter 3 raise several rail freight issues that will impact the District into the future. These in turn are addressed by proposed initiatives described later in this chapter.

1. The District represents a freight bottleneck. Per Table 5-1 and Figure 5-3, intermodal is a rapidly growing segment of rail traffic, but the height of the Virginia Avenue Tunnel limits the efficiency of intermodal freight through the District, since double stack intermodal trains cannot pass through. Freight rail intermodal service competes closely with trucking. Clearing obstructions in the District represents a regional opportunity to divert trucks off the highway and freight onto rail.
2. As shown in Table 5-1 and Figure 5-3, chemicals represent a significant portion of rail freight that has and will continue to pass through the District. Since many of these shipments are hazardous, they create concern among District residents regarding the safety and security implications of these shipments passing through the Nation's Capital.
3. Nearly all of the rail freight in the District is passing through between origins and destinations outside of the city. While District residents may benefit from rail freight through the regional Mid-Atlantic economy, the direct economic benefit from freight rail operations within the District is fairly minimal. There is therefore a question as to whether a freight facility or multiple freight facilities could be built, so that more freight could be shipped to and from the District and shippers could benefit.

5.3 FREIGHT RAIL INITIATIVES

5.3.1 National Gateway Initiative/Virginia Avenue Tunnel

The CSX National Gateway initiative is intended to increase the use of rail intermodal service by building additional intermodal terminal capacity and clearing obstructions to allow double stack trains

to operate between the Midwest and Mid Atlantic ports. The National Gateway initiative entails 61 double stack clearance projects and the construction of six intermodal terminals.

The Virginia Avenue Tunnel project is a major component of the National Gateway initiative. As discussed in Chapter 3, CSX is in the process of expanding the tunnel to include two tracks and to increase the clearance to allow double stack intermodal trains that can accommodate high capacity containers. Construction began 2015 and is expected to be completed in 2018 at an estimated cost of around $170 million. The Commonwealth of Virginia has committed $24 million toward the project, while the remainder is funded by CSX.

CSX has completed or is in the process of completing other projects in the District related to the National Gateway double stack clearance initiative, including a modification of Long Bridge and track lowering at several locations. More detailed information about the National Gateway Initiative and the Virginia Avenue Tunnel Project can be found in Appendix H.

5.3.2 Washington, DC Freight Bypass

If freight trains bypassed the District, the expansion of the Virginia Avenue Tunnel may have been unnecessary. Bypass alternatives were studied in the Freight Railroad Realignment Feasibility Study in 2007, a joint effort between DDOT and the National Capital Planning Commission, funded by a grant from the Department of Homeland Security's Urban Areas Security Initiative Program. The impetus behind the study was concern over the potential threat of a terrorist attack on hazardous material shipments on the CSX line as it passes through the District. The study points out that the line passes close to the Washington Monumental Core, including several blocks for the U.S. Capitol, and through a heavily populated area within a half mile of the tracks. The study also sought alternatives to eliminate impediments to public access to the Anacostia River created by the current alignment, to improve railroad infrastructure, and to accommodate the expansion of passenger and freight capacity. Seven possible alternatives for routing freight away from the Washington Monumental Core were identified. Three were evaluated, including,

- DC Tunnel: a new tunnel could be built under the Potomac River from Potomac Yard in Alexandria through the District to the Maryland border east of the Anacostia River. This would be located south of the existing CSX alignment and could meet the existing Shepherd Branch.
- Indian Head: a new alignment could be constructed that would separate from the existing CSX line south of Quantico, Virginia. The new line would cross the Potomac River and join an existing CSX line between Waldorf and La Plata, Maryland.
- Dahlgren: a new alignment could depart the existing CSX line south of Fredericksburg, Virginia and would cross the Potomac near Dahlgren, Virginia, joining an existing CSX line across the river near the Morgantown Generating Station.

The study estimated that constructing these bypass alternatives would cost between $4.7 billion and $5.3 billion and no funder has been identified. It is difficult to assess whether risk reduction benefits would be adequate to justify the project or how the project would shift risks without more information on risk mitigation. DDOT is therefore not currently considering pursuit of any of these alternatives. Additional detail about the study can be found in Appendix H.

5.4 RAILROAD FREIGHT FACILITIES

During the course of preparing the SRP, some stakeholders have expressed interest in the construction of an intermodal terminal or a transload facility within the District. The development of freight infrastructure in conjunction with co-located production businesses is termed Cargo-Oriented Development (COD). Today large volumes of rail freight pass through the District of Columbia without stopping, providing little economic benefit to the District. One of several interrelated reasons for this situation is that the District lacks a commercial transload center or intermodal terminal where cargoes could be transferred between rail and truck. Research beyond the scope of this SRP would be required to study specific market opportunities for a transload or intermodal terminal that would anchor industrial businesses and COD in the District. Similarly, detailed land use and traffic studies will be needed to determine the feasibility of any particular site for a freight transfer facility. However, this plan takes the first step in exploring a COD strategy for District by identifying potentially viable sites for a transload or intermodal terminal. The SRP analyzed potential locations for COD facilities, facility requirements, and feasibility. Ten sites were evaluated as part of this analysis, as shown in Figure 5-4. The details and results of this railroad freight facility analysis can be found in Appendix I.

Figure 5-4: Locations Examined for Potential New Railroad Freight Facilities

DISTRICT OF COLUMBIA

STATE RAIL PLAN

CHAPTER 6: Rail Service Investment Program

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district department of transportation

Chapter 6 Rail Service Investment Program

This chapter presents the vision, goals, and objectives of the SRP and the plan's resulting rail service and investment program (RSIP). The District of Columbia RSIP is intended to forward DDOT's vision to provide a world-class transportation system serving people who live, work, and visit the city. It supports and promotes the goals put forward in this SRP. The FRA describes the RSIP as the "action plan" component of a state rail plan, in that it proposes improvements to achieve the plan's vision, along with an estimate of investment needs and benefits resulting from those investments. In addition to the RSIP, this chapter also presents policy and programmatic initiatives that are not specific infrastructure projects, but rather general areas of direction or sets of activities. The chapter reports and provides a qualitative evaluation of additional infrastructure projects for potential future study. Finally, this chapter suggests performance measures by which to monitor the progress toward the vision, goals, and objectives.

6.1 VISION, GOALS, AND OBJECTIVES

As part of the SRP development process, and as informed by public involvement, DDOT has developed a vision for the District's long-term rail system and goals to meet this vision. The SRP vision has been developed to articulate an image of the role of rail and how the District's rail system can meet the needs of District residents and the region in the future. Goals break down the vision into manageable pieces, while the objectives point to actions and policies to meet the goals.

6.1.1 Vision

The vision reflects the District's desires for rail transportation for the next 20 years and beyond and describes the intended role for rail in the District's overall transportation system. It is developed based on input from stakeholders as well as the direction set by *moveDC*, DDOT's comprehensive long-range transportation plan (LRTP). The goals will help the District achieve the vision and assist in prioritizing the projects and initiatives that will be identified in the SRP's Rail Service Investment Program. DDOT's vision for the District's rail system is:

> *The District of Columbia will preserve and enhance our rail transportation system to move people and goods to, through, and from the Nation's Capital in a manner that encourages economic opportunities while fostering safe, secure, sustainable, and reliable transportation choices.*

The vision will be realized through an integrated process of planning and implementing improvements in the rail system as it intertwines with the economy, environment, and communities of the District, continually engaging business and resident stakeholders, and the owners and operators of rail service.

6.1.2 Goals

As shown in Table 6-1, the goals for the SRP are expressed across five overarching goal areas encompassing the broad ideas expressed in the vision statement. The bullets under each high-level goal provide details on the particular goal and convey how the goal area could be realized in the District. The objectives in Table 6-2 represent the steps DDOT can take with the rail stakeholders in the District to advance a variety of rail projects and initiatives to achieve the goals.

Table 6-1: Goals of the District of Columbia State Rail Plan

1. Enhance Safety and Security
• Facilitate appropriate and effective rail oversight to safeguard general public and critical infrastructure. • Support maintenance and upkeep of rail infrastructure in the District to highest standards to maintain a state of good repair. • Provide rail safety planning, emergency response and education at the community level. • Maintain appropriate rail perimeter control to minimize community impacts.
2. Increase Operational Flexibility
• Work with regional rail stakeholders to identify and address chokepoints in the rail network to minimize operational delays and improve efficiency. • Support the arrangement of track, terminal, and yard layouts to increase flexibility and reduce constraints on rail throughput.
3. Provide Added Rail Capacity
• Facilitate rail capacity enhancement projects to augment the ability to move people and goods to and through the District. • Support improvements in station rail and person capacity along with horizontal and vertical circulation to allow seamless connectivity to other modes of transportation. • Encourage investment in terminal yard capacity to meet service needs.
4. Grow Economic Opportunity
• Identify industrial, intermodal, or freight rail service opportunities to capitalize on rail service in the District for economic growth and equitable development outcomes. • Use passenger rail service and station enhancements as anchors for mixed-use and commercial development.
5. Improve Quality of Life
• Promote rail as a means to move passengers and freight in a way that sustainably improves and protects environmental quality and natural resources in the District. • Utilize rail infrastructure to improve multimodal accessibility to community destinations. • Support rail projects that are of high visual quality and celebrate the historic role of rail in the District.

6.1.3 Objectives

Within each goal area are an additional series of objectives. These have been categorized as pertaining to:

1. Infrastructure or capital projects, i.e., constructing, maintaining, or improving physical structures or facilities that are needed to operate the rail system; or
2. Programmatic/policy initiatives, which establish principles and courses of action that will guide DDOT actions toward the rail system.

Table 6-2 lists the objectives within each goal, grouped by infrastructure project items and policy or programming items.

Table 6-2: Objectives of the District of Columbia State Rail Plan

Infrastructure
Enhance Safety and Security • Provide funding for improvements at the local, regional, and mega-regional levels. • Promote rail-related recommendations in District plans such as *moveDC* along with the capital plans of rail stakeholders. • Identify additional routes for freight traveling through the District, involving regional stakeholders in the discussion. • Partner with rail carriers to discourage trespassing and contact with freight cars. Increase Operational Flexibility • Develop strategies that promote projects to expand choices or improve efficiency such as run-through MARC or VRE service and additional commuter rail stations/yards in the District. • Facilitate rail operators' efforts to identify locations for overnight and midday train storage that permit easier access, considering maintenance and electrification needs for each operator. Provide Added Rail Capacity • Implement the recommendations of the National Gateway project and Long Bridge Study to address short- and long-term structural needs as well as long-term capacity improvements. • Identify funding and financing to invest in rail transportation to achieve appreciable outcomes within the plan horizon. • Advance implementation of high- and low-level platform improvements to facilitate train movements and ADA access at stations and platforms. Grow Economic Opportunity • Facilitate rail connections to more employment centers in the District, improving access to regional jobs. • Identify additional opportunities for building over rail infrastructure to increase developable space and/or improve the public realm. Improve Quality of Life • Implement projects to overcome system gaps and barriers to access, with a focus on populations and neighborhoods currently disconnected from the rail system. • Identify new markets that desire passenger or freight rail access to the District, including locations formerly served by rail.
Policy & Programming
Enhance Safety and Security • Foster the effective communication among providers, first responders and residents regarding emergency preparedness and enable faster response to incidents in areas adjacent to rail. • Work collaboratively with the various responsible organizations to ensure rail safety and security. • Consistent with Federal and local policy, support initiatives to improve the resiliency of the District's rail network. • Ensure adequate District emergency response plans are in place to respond to any rail incident. • Assist in the full implementation of positive train control to meet Federal requirements by 2020. • Participate in safety training exercises in the District. • Support federal and local agencies in enforcing the safe transport of hazardous materials and ensuring that safety protocols are consistently met and only appropriate materials carried.

Increase Operational Flexibility

- Implement improvements in coordination among freight, intercity passenger and commuter rail systems with each other and other modes of transportation to facilitate additional rail service.
- Preserve the land needed to install new technology along the rail right-of-way.

Provide Added Rail Capacity

- Participate in the development of the investment plan to provide required yard capacity at Union Station.
- Identify partnerships, including opportunities for public-private partnerships, to increase investment in the District's rail network.
- Advance implementation of improvements to vertical circulation efficiency to maximize transfer capacity at intermediate rail stations and terminals.
- Encourage increased passenger rail service to and from the District.
- Complete the Long Bridge NEPA process to facilitate completion of an upgraded Long Bridge rail corridor.

Grow Economic Opportunity

- Identify different types of train services that will benefit co-located business and/or reduce costs for District businesses.
- Identify opportunities for state-of-the-art freight facilities operating on a small footprint.
- Support development of areas near rail where there is opportunity for jobs and industry to be "good neighbors."
- Coordinate regional workforce development programs with the labor needs of railroads and related transportation and logistics businesses.
- Enable increased reverse commuting for District residents through service and station improvements.

Improve Quality of Life

- Develop metrics for use as part of the project development and evaluation process that address visual elements and historic context of rail and related infrastructure.
- Facilitate the ongoing relationships between railroads and communities in support of neighborhood vitality.
- Promote awareness of passenger stations and public transit connectivity through outreach programs aimed at potential users.
- Identify projects and locations where sharing and/or swapping rail property with WMATA would be beneficial.
- Develop program to communicate with businesses and residents to promote rail as a way to improve air quality and collectively enhance the interconnections between land use, transportation, and quality-of-life.
- Participate in the equipment procurement decisions for equipment that will reduce negative environmental impacts and be compatible with other emerging technologies.
- Continue to participate in NEPA documentation activities for rail infrastructure projects.
- Implement a promotion program to advance new technologies that improve passenger service, including customer information services prior to boarding, and innovative methods for seamless fare payment and service interoperability.
- Minimize environmental impacts of rail and develop a policy on evaluation of environmental benefits of rail projects.

6.2 RAIL SERVICE AND INVESTMENT PROGRAM

The District has a unique relationship with many of the rail-related investments that occur within its borders. In many cases, the District will help plan or play a coordinating role and represent an important stakeholder, but funding and project management will primarily fall to other governmental or private entities. The two commuter rail systems that operate into the District are sponsored and funded by the neighboring states. Several state-supported intercity Amtrak routes originate and

terminate in the District, but are supported by the Commonwealth of Virginia. Amtrak owns the rail infrastructure (tracks, platforms, and supporting facilities) at Union Station and is the majority owner of the Northeast Corridor. FRA is the owner of Union Station, while USRC acts as the landlord for Union Station and is its public steward. Akridge is a private development company that purchased and owns a portion of the air rights over the tracks and platforms at Union Station. And CSX is responsible for freight railroad elements within the District. In short, projects are included in this RSIP regardless of whether the District would be likely to be the primary project sponsor.

The SRP includes a full exploration of all rail-related projects within the District. Some projects were identified through planning/environmental studies sponsored by stakeholders in the District, including DDOT, FRA, USRC, Amtrak, VRE, MARC, CSX, and the Virginia DRPT. Many of these projects are included in the near-term needs and future needs as described below and represent stakeholder priorities. For the most part, projects that have advanced in the planning process are not evaluated in the SRP. These projects generally have already been subjected to more rigorous evaluation than would be appropriate in this SRP.

Other projects were put forward during the completion of the state rail plan and represent ideas from stakeholders or the general public. These projects are generally included in the later tiers presented in this SRP, i.e. needs to be determined and potential future needs. Because these projects in many cases have never been evaluated, a matching of project impacts against the goals of the SRP is included in Table 6-8. It should be noted that the inclusion of projects within particular tiers does not necessarily speak to funding availability. Nor does DDOT have additional funding sources identified beyond those listed in this plan.

The tiers to which projects are assigned are as follows:

- Near-term needs. These projects are already underway or have significantly advanced in the planning process. They generally respond to needs present in current conditions. With the need for the projects established, they should be addressed within the next five years. These projects are included in the RSIP.
- Future needs. These projects respond to anticipated future needs. They also have advanced in the planning process but are not yet fully developed or are not anticipated in the near-term. Generally, construction of these projects is planned beyond a five year timeframe but is likely within 15 years. Completion of these projects is likely, and these projects should continue to be pursued. They are sponsored by stakeholders within the District, including DDOT, Amtrak, CSX, VRE, FRA, Virginia DRPT, USRC, and MARC. These projects are included in the RSIP.
- Need to be determined. These represent ideas whose concepts have been put forward in studies or during the course of preparing the SRP. Not enough information is currently available to evaluate whether these projects would be worth completing, but a preliminary qualitative matching of project impacts against the goals of the SRP suggests that the project would be worthwhile and would make sense in the timeframe covered by this plan. Future study is necessary and is recommended. The timing of any potential studies associated with these projects are categorized as mid-term (6 – 15 years) and implementation would be anticipated within 25 years. The 25 year timeframe was chosen as it coincides with the planning horizon used within moveDC. These projects are not included in the RSIP.

- Potential future need. These represent ideas that have been put forward during previous studies or during the course of preparing the SRP. Not enough information is currently available to evaluate whether these projects would be worth completing, and it is unclear whether the need for these projects exists. While relatively indeterminate, it is possible these projects could make sense within the 25 year timeframe covered by this plan. Further study of these ideas would be necessary, and the desire to complete this study could develop in the future. The timing of any potential studies associated with these projects are categorized as long-term (16 – 24 years) and implementation would follow. These projects are not included in the RSIP.
- Not expected during plan timeframe. These projects have been evaluated and, at this time, they are not expected to be considered for further study before 2040, the timeframe covered by this plan. These projects are not included in the RSIP.
- Not recommended. These projects have been evaluated and, at this time based on the information available, they are not recommended for further pursuit. These projects are not included in the RSIP.

As highlighted above, the current SRP RSIP will consist of projects within the first two tiers. Each near-term or future need is or should be studied/planned within the next five years. These projects will typically involve stakeholders within the District, including DDOT, Amtrak, CSX, VRE, FRA, Virginia DRPT, USRC, and MARC. As such, the RSIP represents infrastructure projects that have established sponsorship, have been studied, and are likely to be completed. Per the 2013 FRA State Rail Plan Guidance, the RSIP focuses specifically on likely infrastructure projects rather than on identifying areas for future study or policy and programmatic initiatives.

Additional projects identified but placed in the latter tiers are discussed beginning on Page 6-23 of this chapter. All projects included within the RSIP, plus other infrastructure projects that have been put forward, plus policy and programming initiatives, are included with additional detail in Appendix J.

6.2.1 RSIP Passenger Element

The passenger rail element consists of passenger rail-related projects that are Near-term Needs or Future Needs. These respond to the needs identified in Chapter 4 and are generally improvements to Union Station, upgrades/increased capacity on the Long Bridge/L'Enfant Station Corridor, or new midday storage capacity for commuter rail services. It should be noted, however, that improvements to freight also provide benefit to passenger services (and vice versa) as many facilities within the District are shared. Per FRA State Rail Plan Guidance, passenger and freight RSIP elements are presented separately, and thus some projects are double listed. Projects appear in both the passenger and freight RSIP tables if it is anticipated they will benefit both passenger and freight rail, with the effects difficult to differentiate. Additional information regarding the status of these projects can be found in Appendix H.

Table 6-3: Passenger Rail Projects

Name	Description	Status	Role of DDOT	Construction Timing	Capital Cost of Rail Improvement	SRP Goal/Benefits
Near-term Needs						
PTC Implementation	Implement positive train control safety system in the District.	Construction	None	2017 - 2018	$5 million (wayside cost only)	Safety and Security. System is intended to prevent overspeed derailments, train to train collisions, protect track workers, prevent movement through misaligned switches
Security Fencing	Identify areas to build/repair fencing or implement other means to reduce pedestrian access to rail corridors	No Action to Date	Planning and Potential Funding	2017 - 2021	$0.2 million	Safety and Security. Reduces the risk of pedestrian injuries and fatalities.
Union Station - Rail Operational Improvements	Provide infrastructure to improve terminal operations.	Design	Coordination	2018 - 2020	$30 million - $60 million	Operational Flexibility. Creates operational flexibility for current and future operations; bring to state of good repair
VRE Train storage yard	Explore potential to provide new location for VRE to store its trains and minimize deadhead transit	Environmental	Planning, Coordination, Permitting	2017 - 2020	$40 million	Operational Flexibility. Free up space in the Union Station terminal area for other uses, increase capacity for VRE.
L'Enfant Storage Tracks	Build a stub track and establish new connections for a storage track to connect to main line between L'Enfant Station and Control Point Virginia	Construction	Coordination	2016	$10 million	Operational Flexibility. Prepares area for L'Enfant Station improvements
Union Station - Subbasement Structural Replacement	Replace the supports that hold the floor of the run through tunnel at Union Station; bring to state of good repair	Design	Funding, Coordination	2019 - 2020	$40 million	Capacity. Amtrak and VRE will continue to be able to access Union Station from Virginia. Estimated Benefit-Cost ratio of 15.7.

Name	Description	Status	Role of DDOT	Construction Timing	Capital Cost of Rail Improvement	SRP Goal/Benefits
Union Station - Passenger Concourse Modernization	Relocate support and amenity functions to "clear the floor."	Design	Coordination	2017 -2019	$50 million	Capacity. Operational Flexibility. Double passenger capacity, avoid current passenger circulation issues
Washington Terminal Yard Improvements	Expand maintenance and support facilities.	Design	Coordination	2017 - 2021	$90 - $100 million	Capacity. Increase near-term capacity and position for future growth and improvements.
Hopscotch Bridge	Rebuild H Street bridge to accommodate streetcar and growth of Union Station Expansion Project	Design	Funding, planning, design	2019 - 2021	$200 - $300 million	Capacity. Enable streetcar to access Union Station and connect to planned future additions to the system, remove bottleneck to Union Station terminal expansion.
Future Needs						
Near-term L'Enfant Station Improvements	Extend the L'Enfant Station platform and add a fourth track that could serve the other side of the L'Enfant station platform	Planning	Coordination	2019 - 2021	$80 million	Operational Flexibility. Increases operational flexibility, prepares area for expansion of L'Enfant Station.
WMATA Union Station Metrorail Improvements	Reconfigure entrance	Design	Coordination, funding as part of WMATA	2020 - 2022	$28 - $36 million	Capacity. Better accessibility and safety; improve vertical circulation between station and Union Station. By 2030, estimated to save 133,000 annual person hours of travel time.
Long Bridge Replacement	Explore options to increase capacity of Long Bridge corridor from Alexandria to CP Virginia	Environmental	Funding, Coordinating, Permitting, Funding	2021 - 2025	$500 - $900 million	Capacity. Will enable passenger and freight services to expand, operating more trains over Long Bridge.

Name	Description	Status	Role of DDOT	Construction Timing	Capital Cost of Rail Improvement	SRP Goal/Benefits
Union Station Expansion Project	Investigate and advance new multi-modal facility that includes a full reconstruction of tracks and platforms, new passenger concourses, and new bus parking facilities	Environmental	Cooperating agency, Permitting, Funding associated with changes to District assets	2021 - 2030	$6.5 - $10.5 billion	Capacity. Provide the capacity to accommodate future growth, a station that will be efficient for users and operators, be attractive, and integrate well with the neighborhood.
Burnham Place	Explore potential to build three million square foot mixed use air rights development adjacent to the Union Station terminal	Planning	Coordination, Permitting, Planning Input	2025 - 2030	$440 million - $1+ billion	Economic Opportunity. Transportation improvements will enable development over Union Station, increasing economic development, creating a more integrated, livable community.

6.2.2 RSIP Freight Element

The freight element of the SRP consists of projects intended to provide freight rail benefit that are Near-term Needs or Future Needs. Several of these are associated with the National Gateway initiative. These respond to the needs identified in Chapter 5. Additional projects may be added in subsequent updates to the SRP as they are studied further and a need for these projects is established. Additional information regarding these projects can be found in Appendix H.

Table 6-4: Freight Rail Projects

Name	Description	Status	Role of DDOT	Timing	Capital Cost of Rail Improvement	SRP Goal/Benefits
PTC Implementation	Implement positive train control safety system in the District.	Construction	None	Complete by 2018	$5 million (wayside cost only)	Safety and Security. System is intended to prevent overspeed derailments, train to train collisions, protect track workers, prevent movement through misaligned switches

Name	Description	Status	Role of DDOT	Timing	Capital Cost of Rail Improvement	SRP Goal/Benefits
Security Fencing	Identify areas to build/repair fencing or implement other means to reduce pedestrian access to rail corridors	No Action to Date	Planning and Potential Funding	2017 - 2021	$0.2 million	Safety and Security. Reduces the risk of pedestrian injuries and fatalities.
CSX National Gateway project - Virginia Avenue Tunnel	Virginia Avenue Tunnel reconstruction to provide double tracks with double-stack clearance	Construction	Coordination, permitting	Under construction - to be completed 2018	$170 million	Capacity. Enables more efficient double stack intermodal trains to operate on I-95 corridor, removes an operational bottleneck that enables better fluidity for both passenger and freight trains between Long Bridge and Anacostia.
CSX National Gateway project - track lowering	track lowering under NJ Ave, 10th Street, I-395 ramp, and 12th Street to provide double-stack clearance	Construction	Coordination, permitting	Under construction – to be completed by 2018	$11 million	Capacity. Enables more efficient double stack intermodal trains to operate on I-95 corridor.
Long Bridge Replacement	Explore options to increase capacity of Long Bridge leading towards L'Enfant Station and Virginia Interlocking	Environmental	Planning, Coordination, Permitting, Funding	2020 - 2025	$500 - $900 million	Capacity. Will enable passenger and freight services to expand, operating more trains over Long Bridge.

6.3 PROGRAM BENEFITS

6.3.1 Passenger Element

Projects included within the passenger element for this SRP will provide needed capacity, connectivity, and operational flexibility for growing passenger rail flows between the District and points north and south.

As discussed in Chapter 4 and 5, the number of trains that pass between the District and Virginia is expected to increase from a current volume of 78 per day to 192 in 2040. This will be driven by increases in demand for passenger rail and freight. As an example, VRE expects daily ridership to increase from around 18,500 per day now to between 35,000 and 45,000 by 2040. Projects such as the Long Bridge improvement will provide the infrastructure to make the necessary service expansion possible.

Enabling this growth will require not only additions to track infrastructure, but also expanding station facilities. If the growth in relative usage of stations by VRE/Amtrak Virginia services remains constant, daily ridership at L'Enfant Station will grow from around 7,500 per day now to 14,000 to 18,000 per day in 2040. VRE's planned expansion of L'Enfant Station is intended to enable service by larger, more frequent trains, as well as enable the station to safely accommodate more people. Daily ridership at Union Station is expected to increase from around 50,000 today to almost 135,000 in 2040, including growth in MARC, Amtrak, and VRE services. This growth drives the need to expand Union Station, as well as surrounding support facilities such as midday train storage for commuter rail agencies.

The benefits of the passenger rail service made possible by the elements within this SRP are significant. To the extent that the RSIP enables rail riders to divert from automobile usage, it generates benefits from reduced fatalities and injuries and reduced greenhouse gas emissions, reduced vehicle operating costs, and reduced fuel usage. This also has the potential to grow the District's economy by increasing overall transportation capacity. The ability for employees, tourists, and District residents to move into and out of the city strengthens the District's economy.

6.3.2 Freight Element

Freight projects included within this SRP mostly relate to the CSX National Gateway project, which seeks to remove bottlenecks within the District and throughout the east to allow CSX to operate double stack intermodal trains and increase the number of tracks within the Virginia Avenue Tunnel from one to two. Because CSX would be able to operate intermodal trains more efficiently and intermodal rail competes with trucking, the project could enable CSX to divert freight from truck to rail. Rail creates relatively few externalities compared to trucking, including safety, environmental, and usage of highway resources, so the project could yield significant public benefits. Benefits to District residents will relate to these regional benefits, as projects could reduce truck traffic on regional interstate highways such as I-495.

6.4 FUNDING & FINANCING

Projects put forth in this SRP would be funded via a variety of sources.

6.4.1 Public Funding of Rail

There are several ways in which rail projects are funded and financed in the District. Federal funding, local funding, project-specific funding, and funding from neighboring states are all utilized in order to advance infrastructure projects throughout the city. These funding sources encompass the environmental, planning, design and construction costs of capital infrastructure projects as well as policy and programming initiatives. Typically, funding from several sources is brought together in order to fund a project, including funding from neighboring jurisdictions in Maryland and Virginia, Amtrak, FRA, or the private sector, e.g., CSX.

The District's ability to fund projects in the past reflects its dual capacity as a city and a state. Because DDOT is considered a state DOT, it receives federal funding for highway construction and improvement projects based on formulas provided in law. With few exceptions, the funds that the federal government provides to states and the District for highways must be matched by funds from other sources – in the District's case, local revenues.[1] The funding requirement for most federal highway programs is 80 percent federal and 20 percent state/local funding.

The District has provided partial funding or offered partial funding for several rail-related projects including $3 million proposed contribution for the design Union Station Subbasement Structural Replacement, $700,000 for environmental planning for the Long Bridge Study (Phases I and II), and design for a rebuilt Hopscotch Bridge. There are numerous projects and policy/programming initiatives identified that will require DDOT support in order to move forward.

The local District of Columbia budget is proposed by the Mayor and then passed by the District of Columbia Council. Included within is the annual local DDOT budget, with funds programmed by DDOT for various transportation elements, including roadway maintenance. For major projects, the District's limited available funding will need to be combined with other sources, such as grants or finance programs from the federal government.

Commuter rail serving the District is funded by neighboring states. Notably, improvements in the District to Ivy City Yard and L'Enfant Station were funded by VRE and Virginia. The Rail Enhancement Fund, administered by the Virginia DRPT, is a funding resource for Virginia that is dedicated for funding capital improvements benefiting passenger and freight initiatives. With a stringent evaluation criteria requiring a quantified public benefit, this fund is typically used by Class I railroads, the Port of Virginia, and VRE for major capital investments.[2]

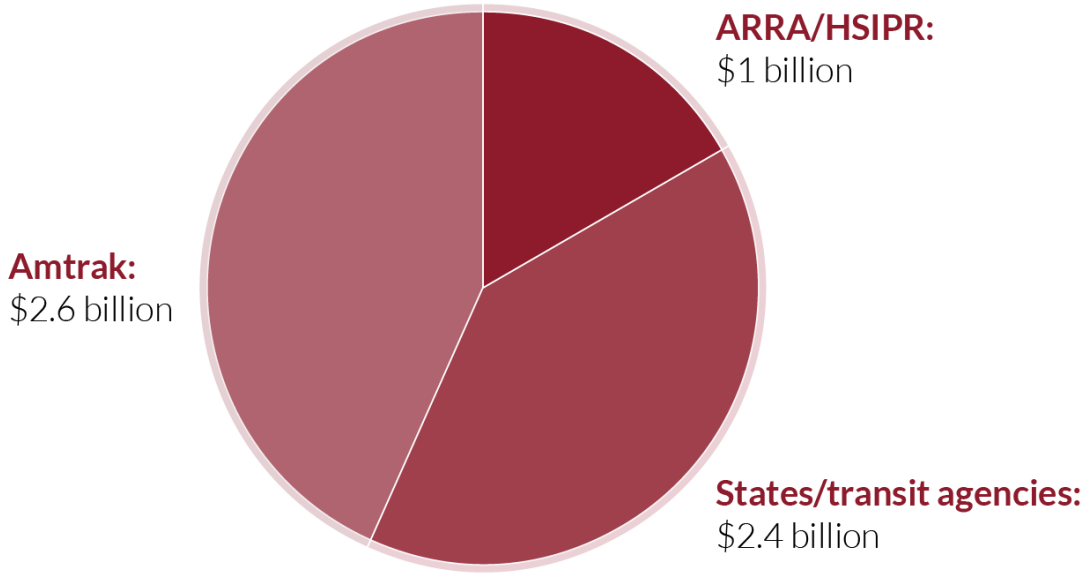
In Maryland, MARC is an agency of the Maryland Transit Administration, and thus rail projects are typically supported by funding from the State. As identified in the draft 2015 Maryland State Rail Plan, a series of near-term investments are programmed, but the need for funding in most cases exceeds the available resources. Several examples exist of special funding programs supporting rail, but these are not annual appropriations or dedicated sources of funds. One example is the Transportation Infrastructure Investment Act of 2013 that funded rail improvements including MARC weekend service and locomotive replacements. This legislation authorized an increase in the Transportation Trust Fund

[1] http://www.gao.gov/new.items/d04644r.pdf
[2] http://www.drpt.virginia.gov/grantees/rail-grants/

through various means, including a motor fuel tax increase. The State is also pursuing innovative financing strategies in order to enable the more rapid advancement of the projects identified in their State Rail Plan. Currently MARC is not permitted to invest in capital projects outside of Maryland. One potential area to investigate is whether it might be possible to establish a Joint Powers Authority or other vehicle to implement rail projects in the District.

Intercity passenger rail in the District is provided by Amtrak. Amtrak operates service on the Northeast Corridor and long distance routes but receives funding from Virginia DRPT via the State's Intercity Passenger Rail Operating and Capital Fund (IPROC) for Virginia state-supported services to Richmond, Norfolk, Lynchburg, and Newport News. In addition, Amtrak collects fees from commuter rail operators, such as MARC that access the Northeast Corridor. Figure 6-1 presents the capital investments over the last ten years from states, transit agencies, Amtrak and federal programs on the NEC.

Figure 6-1: Recent Investment in the NEC Mainline and Connecting Corridors, FY 2004 - 2013



Source: Northeast Corridor Commission

Amtrak services on the Northeast Corridor have traditionally been Amtrak's sole profitable routes. In 2015, the Northeast Corridor profit was approximately $447 million, while Amtrak's 15-long distance routes lost $480 million and 30 state-supported routes lost $66 million.[3]

FAST Act

On December 4, 2015, a five-year, $305 billion transportation authorization, the Fixing America's Surface Transportation Act or FAST Act – the first long-term bill in ten years – was passed. The FAST

[3] http://www.democratandchronicle.com/story/news/2015/12/12/amtrak-able-reinvest-northeast-corridor/77176560/

Act ends a long period of flat federal funding, providing for a growth rate of 3.2 percent each year between 2015 and 2020.

These higher funding levels will enable state departments of transportation and transit agencies to invest in critical new capacity and capital maintenance projects. The majority of funding, 92 percent, authorized by the FAST Act is "contract authority" and is therefore not subject to appropriations, providing predictability and stability to project sponsors. Freight and passenger rail are two of the key areas where provisional changes were made to create new opportunities for state and local governments to undertake improvements in the nation's transportation infrastructure.

Freight

The FAST Act authorizes $6.3 billion in National Highway Freight Program (NHFP) "Formula" funds, up to 10 percent or $0.63 billion of which may be used for rail or port projects. In addition, it authorizes $4.5 billion in Nationally Significant Freight and Highway Projects (NSFHP) competitive grant funds, of which $800 million was appropriated for FY 2016. These can be used for freight rail projects.

Another freight provision creates a National Multimodal Freight Network (MNFN), incorporating the NHFN plus Class I railways, waterways, major ports and airports and some intermodal and short line rail facilities. The NMFN is also to be included as an element of the newly-required state freight plans.

Passenger Rail – Amtrak Reforms

The FAST Act creates a minimum of two primary accounts for the NEC and the National Network. These changes require all of Amtrak's financial, business, and asset activities to be implemented beginning in 2017 for the business line plans and 2019 for the new asset plans. These provisions will provide for reinvestment of the Northeast Corridor net operating revenues into the Corridor's substantial capital investment needs, while providing more transparency for the costs for Amtrak to operate its national network.

The FAST Act also provides several opportunities for the District to partner with rail stakeholders to enhance the rail network:

- Creates a State-Supported Route Committee for a more collaborative relationship between states, Amtrak and USDOT for state-supported routes.
- Encourages station development opportunities for the private sector.
- Explores new revenue streams through right-of-way development.
- Promotes the use of local products on Amtrak right-of-way.
- Requires the Secretary to evaluate Amtrak's existing reporting requirements and provide a report to Congress on recommendations and requirements.
- Directs a report to be submitted to Congress on options to enhance economic development and accessibility of and around Amtrak stations and terminals, which can be supported with analysis of DOT and value capture opportunities.

The FAST Act also authorizes three new discretionary grant programs to support intercity passenger rail:

- Consolidated Rail Infrastructure and Safety Improvements grant program authorized at $1.105 billion over the life of the bill to support a broad array of rail projects and activities. Although authorized, funding must still be appropriated and was not appropriated for FY 2016.
- Federal-State Partnership for State of Good Repair grant program authorized at $997 million for the life of the bill to address critical rail assets with a backlog of deferred maintenance, such as Northeast Corridor infrastructure. Although authorized, no funds were appropriated for FY 2016.
- The Act also includes provisions for collaborative capital planning and asset management efforts among all Northeast Corridor users.

Innovative Finance

The FAST Act reauthorizes the Transportation Infrastructure Finance and Innovation Act (TIFIA) and attempts to broaden its usage, while streamlining the application process. TIFIA is a federal direct lending program offering loans, loan guarantees, and lines of credit to eligible projects. The program offers low interest rates and flexible repayment terms to facilitate financing of transportation projects.

The FAST Act also attempts to streamline and broaden the usage of the Railroad Rehabilitation & Improvement Financing Program (RRIF). The RRIF program is a federal loan program for eligible freight, commuter rail, and intercity passenger rail projects. The program offers low interest rates and flexible repayment terms to finance rail infrastructure projects. VRE received $72.5 million in 2006 from the RRIF program to finance the purchase of bi-level commuter rail cars, with Virginia providing an additional $20 million in state funds.[4]

Federal Commuter Rail Funding

VRE and MARC are eligible for FTA funds under programs used for transit capital projects, including Section 5307 (urbanized area) and Section 5309 (fixed guideway). For VRE, federal operating subsidies and capital grants make up 15 percent and 19, percent, respectively, of the monies used to fund the service.[5] FTA monies are also important to funding the MARC service as well.

TIGER Grant Program

The Transportation Investment Generating Economic Recovery (TIGER) program is a highly competitive U.S. Department of Transportation (USDOT) grant program supporting the capital costs of road, rail, transit, and port projects that have a significant impact on the nation, a region, or a metropolitan area. To date, TIGER grants have provided over $4.2 billion in funding to transportation and transit projects that are multi-modal, multi-jurisdictional, or otherwise challenging to fund through existing programs. Another $500 million was made available for 2015. However, the program's 625 funding requests were

[4] https://www.fra.dot.gov/Page/P0128
[5] 2013 Virginia Statewide Rail Plan

more than 20 times available funding. For projects in non-rural areas, TIGER provides a minimum grant of $10 million and a maximum grant of $200 million.[6]

DDOT was the recipient of a $2.8 million TIGER Planning Grant in 2014 for the Long Bridge NEPA Documentation. The latest TIGER round was in April 2016, and DDOT submitted for the Union Station Subbasement Structural Replacement project, but was unsuccessful.

Congestion Mitigation and Air Quality Improvement Program

Flexible federal funding for the Congestion Mitigation and Air Quality Improvement (CMAQ) Program is distributed to air quality maintenance or non-attainment areas (regions that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter) using a formula based on an area's population by county and the severity of its ozone and carbon monoxide problems with the non-attainment or maintenance area. Greater weight is given to areas that are both carbon monoxide and ozone non-attainment/maintenance areas. The Washington Metropolitan Area is a non-attainment area for 8-hour ozone. Funds are allocated to transportation projects and programs for the purpose of reducing congestion and improving air quality in the existing and former air quality non-attainment area. CMAQ funding can be used for the capital costs of transit projects and up to three years of the operating and maintenance costs of new transit service.[7]

Transportation Alternatives Program

The Transportation Alternatives Program is administered by the Federal Highway Administration (FHWA), MWCOG, and DDOT to provide funding for programs and projects defined as transportation alternatives, including on- and off-road pedestrian and bicycle facilities, infrastructure projects for improving non-driver access to public transportation and enhanced mobility, community improvement activities, and environmental mitigation; recreational trail projects; safe routes to school projects; and projects for planning, designing, or constructing boulevards and other roadways largely in the right-of-way of former divided highways.[8] 50% of the District's funds must go to projects selected through the MPO, while 50% are administered by DDOT. (DDOT has elected to fund Safe Routes to Schools programs through the state-administered portion.)

Public/Private Partnerships

Working with the private sector is one way to fund more with available public funds. These public/private arrangements are often referred to as public/private partnerships or P3. A P3 project is a contractual agreement between a public entity and private entity that:

- Transfers the responsibility of a facility's engineering, construction, operation and/or maintenance to the private sector for a defined period of time;
- Allows the private sector to be involved by contracting a service previously provided by the public sector; and

[6] https://www.transportation.gov/tiger
[7] https://www.fhwa.dot.gov/safetealu/factsheets/cmaq.htm
[8] http://ddot.dc.gov/page/transportation-alternatives-program

- Ensures the private firm receives payments either from existing revenue sources or through the collection of new tolls or user fees.

In the District, one past example of a rail-related P3 is the USRC's efforts for the rehabilitation of Union Station beginning in 1981. The restoration of the station involved the efforts of USDOT, the District, Amtrak, and private developers. The $160 million project took almost five years to complete, including the three-year renovation. Public sector partners for the project were the District of Columbia, U.S. Congress, and Amtrak. The USRC nonprofit entity set out to identify funds from private sector partners to complete the restoration process. These partners were selected through a national competition.

Contributions for the restoration included $70 million from Amtrak, in part for the construction of new ticketing and passenger facilities. The District contributed $40 million in interstate highway funds for the construction of a parking deck, with funds guaranteeing a bond whose debt service is paid through parking garage fees. Private sector partners Jones Lang LaSalle, Williams Jackson Ewing, and Benjamin Thompson Associates provided the remaining $50 million balance through equity financing, serviced by revenues from commercial, rental, and sales.[9]

In general, those agencies that provide a service are responsible for arranging the funding to invest in the infrastructure to support that service. For some of the major projects identified, some specific funding has been procured, which is outlined in the following sections.

6.4.2 L'Enfant Station, Long Bridge, and Midday Storage

Primary responsibility for securing funding for improvements around L'Enfant Station will be VRE and the Virginia DRPT. VRE and DRPT will also be responsible for securing funding for new midday storage facilities. In 2016 VRE commenced engineering and environmental study for midday train storage facilities near New York Avenue. The midday storage program is listed in VRE's capital program, which indicates that most of the funding will come from FTA Urbanized Area Formula Program (5307) funds, while most of the remainder will be from the Virginia Mass Transit funds. VRE has identified about $30 million in funding for the L'Enfant Station, but has not identified funding for the remaining $50 million in estimated cost.

Funding sources for the construction of the new Long Bridge have not yet been identified. VRE, DRPT, and DDOT will seek to secure funding for Long Bridge improvements, as well as adding a fourth track between Long Bridge and the Virginia interlocking where the CSX line and First Street Tunnel divide. In April 2016, Virginia DRPT submitted a $1.4 billion grant application to the U.S. DOT FASTLANE program for a variety of road and rail projects to add capacity on the I-95 corridor in Virginia. Part of this project is to continue the Long Bridge Study and perform engineering. Phase II of the Long Bridge study was funded as follows:

- $2,800,000 federal money from grant award under TIGER VI;
- $700,000 from DDOT;

[9] http://www.ncppp.org/resources/case-studies/transportation-infrastructure/union-station-washington-dc/

- $300,000 from DRPT;
- $300,000 from VRE.

6.4.3 Union Station Projects

It is likely that the financing of Union Station will explore a number of funding options. These could include a number of the same elements as the earlier Washington Union Station work as well as other more recent passenger station redevelopment projects, such as in Denver or St. Paul.

- The renovation of Washington Union Station could have a public/private partnership component, where private partners fund part of the project in exchange for the rights to real estate development income;
- The project could be funded in part through debt financing whereby loans are secured against future revenues associated with the facility; or
- Federal grants could be an important component of the funding mix.

DDOT's funding role will likely focus on District-owned assets, such as securing funding for the reconstruction of the Hopscotch Bridge. Amtrak's portion of the project will likely focus on Amtrak transportation functions, such as ticketing, passenger areas, and terminal infrastructure, although federal sources will be an important component for paying for these improvements.

6.4.4 Freight Projects

Freight projects in the District are generally funded by CSX. CSX is funding most of the work for the Virginia Avenue Tunnel and other components of the National Gateway initiative in the District, although $24 million for the Virginia Avenue Tunnel project funding comes from the Virginia DRPT.

6.4.5 Timing of Investments

This RSIP proposes over $7 billion in rail investments within the next 15 years. These overwhelmingly are associated with improvements to Union Station and related facilities (91 percent). Of these, most investments are associated with long-term investments in Union Station itself (80 percent). Investments and a current understanding of the timing of investments are displayed in Table 6-5. It is important to consider that cost estimates prepared so far for the Union Station Master Plan have been at a purely sketch level and were prepared using highly conservative assumptions. The actual expenditure amounts could vary even by an order of magnitude, so the total for this SRP is subject to a similarly high level of uncertainty.

Table 6-5: Investment Program by Year (thousands of 2016 dollars)

Year	L'Enfant Station	VRE Midday Storage	Long Bridge, 4th Track	Short-Term Union Station*	Long-Term Union Station**	Burnham Place	National Gateway	PTC and Fencing	Total
2017	200	22,000	4,400	34,000			50,000	1,350	111,950
2018	3,600	31,000	11,400	49,000			50,000	1,350	146,350
2019	18,700	33,000	35,000	144,000					230,700
2020	43,400	3,000	25,000	136,000					207,400
2021	14,400		150,000	141,000	400,000				705,400
2022			75,000	12,000	400,000				487,000
2023			150,000		400,000				550,000
2024			150,000		400,000				550,000
2025			150,000		400,000	240,000			790,000
2026					400,000	240,000			640,000
2027					400,000	240,000			640,000
2028					400,000	240,000			640,000
2029					400,000	240,000			640,000
2030					400,000	240,000			640,000
2031					400,000				400,000
Total	80,300	89,000	747,800	516,000	4,400,000	1,440,000	100,000	2,700	7,378,800

*Includes funding for Union Station Rail Operational Improvements, Subbasement Structural Replacement, Passenger Concourse Modernization, Washington Terminal Yard Improvements, WMATA Union Station Metrorail Improvements, and Hopscotch Bridge.

**Represents funding for the Union Station Expansion Project.

6.5 RAIL INITIATIVES

In addition to infrastructure projects, a number of potential policy and programming initiatives were also proposed during the course of preparing this SRP. These are potential policies directing the District's future courses of action, or programmatic initiatives that would consist of a series of actions. Some of these are organizational recommendations. Many of these also suggest potential future areas of study as well. Each of the items with timing designated "Near-term" is expected to be planned or studied in the next five year, while each labeled "Mid-term" would likely be studied or planned in six to 15 years, but will be reevaluated during the completion of the next update to this SRP. These initiatives can also be found listed in Appendix H.

Table 6-6: Summary Programmatic and Policy Initiatives Put forward during SRP Development

Initiative Name	Description	Goal	Lead Agency	Implementation Progress	Role of DDOT	Potential Roadblocks	Timing
Education program for rail safety	Work with Operation Lifesaver to publicize, give presentations regarding rail safety, develop and deploy overall rail education program	Safety and Security	CSX, DDOT	Existing	Support and potential funding	None	Near-term
Rail safety oversight office and protocol	Establish a rail safety inspection program where DC employees provide oversight and help to inspect and enforce federal rail safety laws	Safety and Security	DOEE	Proposed	Coordination	Cost	Near-term
Risks of passenger and freight rail network	Prepare study to quantify the risks of a range of potential rail-related incidents and the costs of incidents were they to occur, put forward cost-effective solutions to mitigate risks based on findings	Safety and Security	DOEE, HSEMA, FEMS, DDOT	Under discussion	Coordination	Cooperation in sharing information	Near-term
Pursue appropriate new technology to monitor safety	Explore technological solutions that provide added monitoring or measurement abilities utilizing new technology options available	Safety and Security	DDOT, DOEE	Proposed	Coordination	Cost, Oversight	Near-term

Initiative Name	Description	Goal	Lead Agency	Implementation Progress	Role of DDOT	Potential Roadblocks	Timing
Rail safety and rail emergency response plans	Develop rail resiliency, emergency preparedness plan, improve communication and training among first responders and residents	Safety and Security	DOEE, HSEMA, FEMS, DDOT	Under discussion	Support and Potential Funding	Agreement between parties	Near-term
Interoperability between MARC, VRE, Metro, and Amtrak fares	Enhance the ability to use-the same fare for MARC and VRE and consider opportunities for further coordination with Amtrak and WMATA in the future	Operational Flexibility	VRE, MARC	Existing	Coordination	Reconciling systems with very different operating procedures	Mid-term
Land swaps	Investigate the opportunity for land swaps between WMATA and rail operators for mutual benefit	Operational Flexibility	DDOT	Under discussion	Coordination	Existence of opportunities, cooperation	Mid-term
Southeast Regional Rail Study	Participate in development of the FRA-led Southeast Regional Rail Study	Capacity	FRA	Existing	Coordination	None	Near-term
Regional Rail Plan	Work with FRA and adjacent and neighboring states to complete a regional rail plan that compiles together state projects and initiatives and sets a vision for the Mid-Atlantic region rail network	Capacity	DDOT with neighboring states	Proposed	Support and Coordination	Cooperation between states	Near-term
Conduct SHRP2 Railroad-DOT Mitigation Strategies (R16) Workshop	Work with FHWA to hold a facilitated discussion workshop with rail agencies to work towards template master agreements between DDOT and rail agencies	Economic Opportunity	DDOT	Proposed	Coordination	None	Near-term
Reverse commuter options	Investigate options and discuss with VRE and/or MARC the possibility of programming additional reverse flow trains	Economic Opportunity	DDOT, VRE, MARC	Proposed	Support and Potential Funding	Agreement with VRE, MARC, funding	Mid-term

Initiative Name	Description	Goal	Lead Agency	Implementation Progress	Role of DDOT	Potential Roadblocks	Timing
Industrial rail facility investment	Work to establish an incentive program that provides financial incentives for rail-centric investment in the District	Economic Opportunity	DDOT	Proposed	Coordination	Existence of opportunities, cooperation	Mid-term
Enhance communication regarding rail	Sponsor forums for outreach between neighborhoods and railroads, quantify benefits of rail	Quality of Life	CSX, DDOT	Proposed	Support and Potential Funding	None	Near-term
Visual quality and rail's role in the District	Develop metrics for use as part of the project development and evaluation process that address visual elements and historic context of rail and related infrastructure	Quality of Life	DDOT	Proposed	Coordination	None	Near-term
Railroad noise and vibration policy	Develop a policy for railroad noise barriers and vibration mitigation similar to the District's policy for highways	Quality of Life	DDOT	Proposed	Coordination	None	Near-term
Railroad environmental analysis policy	Minimize environmental impacts of rail and develop a policy on evaluation of environmental benefits of rail projects	Quality of life	DDOT, DOEE	Proposed	Coordination	None	Near-term

6.6 EVALUATION OF ADDITIONAL RAIL PROJECTS

The concepts of some additional projects have been put forward either in studies or in discussions with stakeholders during the preparation of the SRP. But these projects had not yet been subjected to a systematic evaluation. Therefore, too little about these projects was known to establish a need and therefore include them in the RSIP. In order to identify which projects may warrant future study, a qualitative evaluation of potential projects has been prepared to assess the extent to which potential projects forward the goals of this SRP. Evaluation criteria are described in Table 6-7 below.

Table 6-7: Criteria Used to Evaluate Projects

Goal	Evaluation Criteria
Enhance Safety and Security	Project reduces the risk of accidents by isolating rail activities, improving dependability of infrastructure or operations.
Increase Operational Flexibility	Project enables the rail system to remain efficient under a variety of traffic levels and other circumstances.
Provide Added Rail Capacity	Project increases the potential volume of trains, people, and goods that can move over District rail lines, yards, and multimodal facilities.
Grow Economic Opportunity	Project capitalizes on rail service to promote economic growth and equitable development.
Improve Quality of Life	Supports environment and natural resources, improves access to communities, or is of high visual quality/supports historic preservation.

For each goal criterion, projects have been assigned one of three benefit levels:

- No change or negative: The project does not forward goal or could have a negative impact.
- Potential benefit: The project could support the goal, and there is little risk of a negative impact.
- High benefit: The project would support the goal.

In addition to the SRP goals, these projects have been evaluated by one additional consideration, which is practicality, the likelihood that potential roadblocks would bar the project's likely completion. These are assigned one of three measures of practicality:

- Practical: Potential roadblocks are not significant.
- May be practical: Significant potential roadblocks exist, but it is uncertain whether these could be overcome.
- Impractical: Based on information currently available, it seems doubtful that the project will overcome potential roadblocks.

In the subsequent sections discussing the relative merits and practicality of each of the proposed projects, impact categories with high benefits and those considered practical are indicated with an orange circle. Those with a potential benefit or those that may be practical are assigned a half orange

circle. Those that provide no change, negative benefits, or that are considered impractical for a particular goal receive a clear circle.

 High benefit/practical

 Potential benefit/may be practical

 No change or negative/impractical

Table 6-8 summarizes all infrastructure projects considered in the SRP process and provides a qualitative evaluation.

Table 6-8: Summary and Evaluations of Infrastructure Projects Put forward during SRP Development

Project Name	Description	Safety and Security	Operational Flexibility	Rail Capacity	Economic Opportunity	Quality of Life	Total Goals	Practicality	Tier	Discussion
Freight bypass around the District	Revisit the NCPC Freight Rail Study, establishing a new alignment for freight that would otherwise pass through the District	◐	◐	◐	◐	○	◐	○	Not expected during plan timeframe	Lack of incentive for Virginia or Maryland to support this, funding, uncertainty over purpose and need
MARC Run-through Service and Train Storage	Extend MARC trains to serve L'Enfant Station and continue on to Virginia along with added midday storage in Virginia	◐	●	●	◐	◐	●	◐	Need to be determined	Would improve commuter rail service and provide cost-effective solution to MARC midday storage issues. Institutional and physical barriers would need to be overcome.
New connection between CSX and Northeast Corridor	Provide a connection between the CSX Alexandria Extension and the NEC at Kenilworth, MD to allow east/south interchange between the two rail lines; this would enable midday storage for commuter rail agencies or other activities to occur at available properties on the Alexandria Branch	○	●	◐	◐	○	◐	○	Potential Future Need	CSX has indicated that the company believes that putting passenger operations on the Alexandria Extension would be counterproductive.
Benning Yard Storage/ Expansion	Expand Benning Yard to provide added storage for commuter rail or freight	○	◐	◐	◐	○	◐	◐	Need to be determined	Need has not been established, CSX, the owner of Benning Yard would need to agree.
Shepherd Branch, Reactivation	Study potential to reactivate Shepherd Branch as a functioning rail line	○	◐	○	◐	○	○	○	Not expected during plan timeframe	Shepherd Branch was deactivated after drop in traffic, security concerns made transiting Joint Base Anacostia-Bolling difficult. Situation remains.

Project Name	Description	Safety and Security	Operational Flexibility	Rail Capacity	Economic Opportunity	Quality of Life	Total Goals	Practicality	Tier	Discussion
New rail crossing of Potomac	Investigate options for constructing a new rail crossing of Potomac River, potentially near Blue Plains, or at other location								Not recommended	Would be highly disruptive and costly; Long Bridge is being planned to provide capacity needs for crossing the Potomac to 2040.
NEC Future Northeast Corridor track expansion within the District	Establish a third or fourth track mainline to the NEC in the District, and potentially improve the Amtrak Anacostia River crossing								Need to be determined	The feasibility of additional tracks has not been determined, but this would add capacity
Long-term L'Enfant Station improvements	Create a station concourse with direct connections to Metrorail; consider shifting L'Enfant Station (as partially outlined within SW Ecodistrict Plan) to create capacity (See Appx. H)								Need to be determined	3P opportunities may present themselves for funding of this project.
High Speed Rail Tunnel connecting Union Station to the SEHSR Corridor	Construct tunnel from Union Station south and east to Virginia to carry passenger trains from the District to Virginia and beyond, connecting to the overall SEHSR corridor								Potential Future Need	This may be a long-term solution, but it would cost $billions, and in the near-term, these issues are addressed by the Long Bridge Study
Increase capacity on CSX Metropolitan Subdivision within the District	Realigning Metro tracks near the WMATA Brentwood yard to make available more capacity on the CSX Metropolitan Subdivision								Potential Future Need	Uncertain whether this is an opportunity or not. Would require agreement by parties.
NE Maglev	Investigate potential to install NE Maglev, a new maglev rail line between the District and Baltimore, MD								Potential Future Need	Relatively unproven technology, uncertain where the ROW would go, would cost $billions, Maryland conducting current study

Project Name	Description	Safety and Security	Operational Flexibility	Rail Capacity	Economic Opportunity	Quality of Life	Total Goals	Practicality	Tier	Discussion
Anacostia Bridge Replacement	Explore options to replace the existing CSX Anacostia Bridge with a new bridge that provides additional capacity and higher clearance								Not expected during plan timeframe	No need has been identified for this project. CSX, the owner of the bridge, would need to decide this was in the company's best interests.
New Infill Commuter Rail Station	Provide infill commuter rail station(s) in District located based on market shed analysis results (See Appendix G)								Need to be determined	Not certain of impact on existing commuter services or demand for new stations.
Deck over CSX track between L'Enfant Station and 12th Street SW	Cover the CSX line to make way for other land uses (See Appendix H)								Need to be determined	Given that rail line is now above street level, uncertain if could be decked over and whether grades would allow concept from SW EcoDistrict. Other transportation concepts explored in the Maryland Ave. SW Study mean decking may not be necessary.
New Transload Facility	Establish a transload facility at screened locations in the District identified through feasibility analysis (See Appendix I)								Need to be determined	Would need to be driven by agreements between private companies, do not recommend "build it and they will come" approach. Could support low-income jobs.
New Intermodal Facility	Establish a container or trailer intermodal ramp at the PEPCO site with an aim to support production, construction jobs in the District (See Appendix I)								Need to be determined	Would increase truck VMTs in the District but reduce regional VMTs. Could support low-income jobs. Few locations where practical.

Project Name	Description	Safety and Security	Operational Flexibility	Rail Capacity	Economic Opportunity	Quality of Life	Total Goals	Practicality	Tier	Discussion
Air rights development over various rail lines	Add development over rail to gain developable space above at various locations in the District (except Union Station and the section along Maryland Avenue between Long Bridge and the Virginia Avenue Tunnel, which are called out separately)								Potential Future Need	Would require agreement by owners, should not encroach on current rail operations, potential ventilation concerns
Install aesthetic elements along rail lines	Establish standards and then propose locations for installation of new plantings to separate rail lines from surrounding neighborhoods in order to address perceived noise and improve appearance; this could extend to associated rail facilities.								Potential Future Need	Vegetation would do little to improve noise or vibration. Also, would need to not interfere with access to rail facilities.
Micro-yard to serve Washington, DC Chapter of the National Railway Historical Society	Consider establishing storage space for the rail excursion cars used by this chapter to free up space at Union Station								Need to be determined	On the one hand, this could support DC rail history, on the other hand, it could consume valuable space that could be used by other rail operations.
Access improvements for neighborhoods separated by rail facilities	Expand or build additional overpasses or underpasses for cars and pedestrians at locations separated by rail yards and rail lines								Need to be determined	Improvements could be particularly beneficial at Benning, but will need cooperation of all parties
Railbanking of inactive rail spurs	Repurpose inactive rail spurs such as into the former PEPCO site, or near NY Avenue, for added transportation utility (e.g., rail-trail) with railbanking benefit								Need to be determined	Would require agreement by current owners, but could provide transportation options and keep rail ROW intact.

Project Name	Description	Safety and Security	Operational Flexibility	Rail Capacity	Economic Opportunity	Quality of Life	Total Goals	Practicality	Tier	Discussion
Shepherd Branch, Abandonment	Study potential to convert Shepherd Branch from inactive to abandoned; Study what uses would be permitted in the corridor post-abandonment in light of the current uses from prior conveyances								Potential Future Need	Would require agreement by CSX and an abandonment proceeding. Uncertain value of making ROW available.
Shepherd Branch, Repurposing	Study potential to convert Shepherd Branch to other transportation uses, compatible with its other uses								Potential Future Need	Would probably not be feasible to make "interim use" as recreation trail on entirety of Branch, since line passes through Joint Base Anacostia – Bolling Air Force Base, but northern section could be studied.
Rail line electrification	Explore expansion of the areas within the District where rail lines are electrified to facilitate added electrified train service								Not expected during plan timeframe	Uncertain how electrification would work with freight operations, would be unlikely to have support of CSX, which owns the rail lines. Not likely by 2040.

6.7 PERFORMANCE MEASURES

In order to monitor progress toward achieving goals laid out in this SRP, performance measures could be established. Performance measure targets provide benchmarks for assessing the return on investments to the District's rail infrastructure and will help to monitor the progress of the District SRP. Performance measures should rely on information that is easy to collect but still adequately reflects progress toward the underlying goal. Another issue will be the frequency of measurement of performance measures. A logical frequency would be every four years, with the update of the SRP, and it is anticipated the next SRP will evaluate progress against these metrics.

Table 6-9: Proposed Performance Measures and Targets

Goal	Performance Measure	Performance Target
Safety	Trespasser incidents	2 or fewer every 5 years
Safety	Freight train accidents	No more than one every 2 years
Safety	Train accidents involving hazardous material cars or high profile train accidents	None
Operational Flexibility	Progress on projects, programmatic/policy initiatives aimed at operational flexibility	Accomplishment of one project, progress on one programmatic/policy initiative
Operational Flexibility	Average passenger train delay	Maintain existing on-time performance prior to major planned expansion
Capacity	Number of trains using rail network	Increase over base (213 District-wide passenger trains, 10 – 20 freight trains/day)
Capacity	Number of trainsets that can be stored	Increase over base to support operations
Economic Development	Number of passengers originating/terminating in District, number of freight carloads originating/terminating in the District	Increase over base (14M annual riders at Union Station, 1.9M at L'Enfant, 151,000 tons originating, 124,000 tons terminating)
Quality of Life	Projects to improve access to communities, to the rail system, or to moderate any harmful externalities, such as noise, vibration, aesthetics of rail system	Completion of at least two projects every five years

6.7.1 Safety and Security

Data presented in Chapter 3 suggests that the vast majority of rail-related accidents or incidents in the District relate to Amtrak employees reporting work-related illness or injury. The District has limited control over Amtrak internal safety policies. The District can however help to limit the number of

trespasser accidents. The chosen performance target will be to reduce the number of trespasser incidents to two or less per five-year period.

District residents are also concerned about avoiding potential safety and security accidents/incidents, particularly involving hazardous materials. One relevant performance measure here could be the number freight train accidents. As discussed in the safety section in Chapter 3, a "train accident" involves on-track equipment such as train cars or locomotives. Monitoring train accidents could indicate the extent to which CSX is able to maintain rigorous control over its operations in the District. Given that CSX had nine train accidents between 2005 and 2016, a performance target will be to reduce the occurrence of freight train accidents to no more than one every two years. Another additional target will be no high profile accidents and/or accidents involving hazardous materials cars, such as the 2007 unit coal train accident that shut down the CSX Anacostia River Bridge or the 2016 derailment and spill of sodium hydroxide.

6.7.2 Operational Flexibility

MARC, VRE, and Amtrak each maintain records of delay for routes serving the District. Unfortunately, these do not specifically identify delays within the District boundaries. One possibility could be to generally monitor on time performance of passenger routes serving the District. While it is difficult to identify delays in the District, it is recommended that on-time performance be the initial metric included. The target will be maintenance of current operations prior to the major planned expansion. Additionally, progress toward the projects and initiatives classified as improving operational flexibility as shown in Table 6-3 and Table 6-6 should be measured. The standard could be completion of at least one project within the next five years and progress on one programmatic/policy initiative oriented toward operational flexibility.

6.7.3 Rail Capacity

Several measures could assess the availability of rail capacity, including the total number of trains per day that serve the District, the peak period volume of trains, or the number of seats available on District rail network. The latter measure would not only capture the number, but also the size of passenger trains serving the District. Measuring the capacity of stations would require qualitative considerations, such as the existence or non-existence of queues at passenger gates, or the extent of auto/bus/taxi queues at Union Station. To simplify, it is recommended that the relevant initial metric be the number of freight and passenger trains that serve the District. This would reflect the extent to which the District rail network, including yard facilities, has sufficient capacity to allow these carriers to expand their services. The performance target would be expanded service over the 2016 level, which is 213 passenger trains per Table 3-1, plus 10 – 20 freight trains. Additionally, the number of train sets that can be stored within the District can be tracked to capture growth in yard availability, which supports increasing capacity.

6.7.4 Economic Development

Economic development would be measured by the number of rail-related jobs in the District. Economic development measures could also consider the employers that rely on rail, including commuter trips, employment by companies that use rail freight services, and intercity business trips. Another consideration could be the ridership and availability of reverse commuting, so that District residents can have better access to jobs in other jurisdictions. Theoretically, one could also measure economic development by value capture or rail-oriented development, but these would be difficult to measure.

To simplify, it is suggested that passenger rail ridership and freight originating/terminating in the District be used as proxies for economic development. Freight levels reflect the usage of rail by District businesses and therefore the impact on the economy. Passenger rail ridership also reflects a general level of interaction between rail and the District economy, relating to District businesses, tourism, or other passenger usage.

6.7.5 Quality of Life

Theoretically, quality of life measures could relate to the aesthetics of rail lines, but it is uncertain how this would be measured. Rather, it is recommended that measures focus on the extent to which projects have been completed relevant to this goal. These could include projects that reconnect communities otherwise isolated by rail lines, or projects that reduce the externalities associated with rail lines. The standard will be two projects completed every five years.

6.8 CONCLUDING THOUGHTS

While geographically small, the District is a vital part of the regional and national rail network. The importance of the District's rail network is illustrated by the more than $7 billion in planned investments that are included in the RSIP. These projects are sponsored by a range of stakeholders, including Amtrak, FRA, MARC, VRE, CSX, the Virginia DRPT, and DDOT. This SRP presents these various initiatives in a single plan. In many cases, the District will help plan or play a coordinating role and represent an important stakeholder, but funding and project management will primarily fall to other governmental or private entities. DDOT and the District of Columbia will support projects as they support the vision, goals, and objectives put forth in this SRP. DDOT may also support projects, programs, and initiatives outside of the RSIP that are put forward to the extent that they address a need and support the vision, goals, and objectives developed in this SRP.

With the investment envisioned, the District's rail network will help realize the vision laid forth in this plan to preserve and enhance our rail transportation system to effectively move people and goods.