2022 MARYLAND STATE RAIL PLAN

Draft Report

Summer 2022

MARYLAND DEPARTMENT OF TRANSPORTATION

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Acronyms/Abbreviations

AAR ..... Association of American Railroads
ADA ..... Americans with Disabilities Act
B&O ..... Baltimore & Ohio
B&P ..... Baltimore and Potomac
BIL ..... Bipartisan Infrastructure Law
BUILD ..... Better Utilizing Investments in Leveraging Development
BWI ..... Baltimore/Washington International Thurgood Marshall Airport
C&O ..... Chesapeake & Ohio
CMAQ ..... Congestion Mitigation and Air Quality
CRISI ..... Consolidated Rail Infrastructure Safety & Improvements
CSX ..... CSX Transportation
DCA ..... Ronald Reagan National Airport
DE ..... Delaware
DelDOT ..... Delaware Department of Transportation
DNR ..... Maryland Department of Natural Resources
DOD ..... US Department of Defense
DOT ..... Department of Transportation
DRPT ..... Virginia Department of Rail and Public Transportation
EA ..... Environmental Assessment
EDA ..... US Economic Development Administration
EIA ..... US Energy Information Administration
EIS ..... Environmental Impact Statement
FAA ..... Federal Aviation Administration
FAST ..... Fixing America's Surface Transportation
FFY ..... Federal Fiscal Year
FONSI ..... Finding of No Significant Impact
FRA ..... Federal Railroad Administration
FTA ..... Federal Transit Administration
FY ..... Fiscal Year
GDP ..... Gross Domestic Product
HGR ..... Hagerstown Regional Airport
IAD ..... Dulles International Airport
ICTF ..... Intermodal Container Transfer Facility
IIJA ..... Infrastructure Investment and Jobs Act
INFRA ..... Infrastructure for Rebuilding America
LPG ..... Liquid Propane Gas
MDDE ..... The Maryland and Delaware Railroad Company
MDOT ..... Maryland Department of Transportation
MDTA ..... Maryland Transportation Authority
MPO ..... Metropolitan Planning Organization
MTA ..... Maryland Transit Administration
MTP ..... Maryland Transportation Plan
MUTCD ..... Manual of Uniform Traffic Control Devices
NEC ..... Northeast Corridor
NEPA ..... National Environmental Policy Act
NHFP ..... National Highway Freight Program
NS ..... Norfolk Southern
O&M ..... Operations and Maintenance
OOTS ..... Office of Traffic and Safety

OPCP ..... Office of Planning and Capital Programming
ORED ..... Office of Real Estate and Economic Development
OTP ..... On-Time Performance
PRIIA ..... Passenger Rail Investment and Improvement Act
RAISE ..... Rebuilding American Infrastructure with Sustainability and Equity
RFAP ..... Rail Freight Assistance Program
RR ..... Railroad
RRIF ..... Railroad Rehabilitation and Improvement Financing
SEPTA ..... Southeastern Pennsylvania Transit Authority
SHA ..... State Highway Administration
SRA ..... State Railroad Administration
SRP ..... State Rail Plan
STB ..... Surface Transportation Board
TDM ..... Transportation Demand Management
TIFIA ..... Transportation Infrastructure Finance and Innovation Act
TOD ..... Transit-Oriented Development
TSMO ..... Transportation System Management and Operations
TTF ..... Transportation Trust Fund
TTI ..... Travel Time Index
US ..... United States
USDOT ..... United States Department of Transportation
VHT ..... Vehicle Hours of Travel
VMT ..... Vehicle Miles Traveled
VOC ..... Volatile Organic Compounds
VRE ..... Virginia Railway Express
WILMAPCO ..... Wilmington Area Planning Council
WMATA ..... Washington Metropolitan Area Transit Authority
WMSR ..... Western Maryland Scenic Railroad
WSRR ..... Walkersville Southern Railroad

1 Role of Rail in Maryland's Statewide Transportation

PURPOSE AND INTRODUCTION

The 2022 *Maryland State Rail Plan* (Plan) is an update of a previous *Maryland Statewide Rail Plan* that was completed in 2015. The 2022 Plan provides an overview of the current and planned rail network and services within Maryland. It outlines public and private investment as well as policies and strategies that will help guide the state's support of railroad transportation in the future. The Plan draws from other planning efforts and outreach activities, such as the 2019 *MARC Cornerstone Plan* and the 2040 *Maryland Transportation Plan.* It also was prepared in coordination with the *Maryland Statewide Transit Plan* and the *Maryland State Freight Plan*. The Rail Plan covers freight, intercity passenger, and commuter rail services operating on the US national rail network governed by the Federal Railroad Administration (FRA). The Plan does not include heavy rail and light rail transit services operating independently of the national railroad network, usually on separate rights-of-way.[1]

This 20-year *Maryland State Rail Plan* was developed in coordination with the railroad industry and other key stakeholders who support rail policies and projects. The Plan, updated every five years, focuses on railroad operators in the state, including MARC, Amtrak and freight railroads, including CSX, Norfolk Southern, and short line/regional operators.

State rail plans are developed in accordance with the federal Passenger Rail Investment and Improvement Act of 2008 (PRIIA) and serve as a guide and resource for federal funds through grant applications. In addition to criteria outlined in PRIIA, state rail plans also adhere to more detailed State Rail Plan Guidance (Guidance) put forward by the FRA in 2013. Per the FRA Guidance, this Rail Plan consists of the following chapters:

- Chapter 1 – ***The Role of Rail in Statewide Transportation*** discusses the current and future role of rail in Maryland's multimodal transportation system. It also describes how

[1] https://www.apta.com/research-technical-resources/transit-statistics/public-transportation-fact-book/fact-book-glossary/

Maryland is organized to provide political, legal, and financial support to rail development.

- Chapter 2 – ***Maryland's Existing Rail System*** provides an overview and inventory of Maryland's existing rail system, rail services, and performance. It also describes trends that will affect the Maryland rail system.
- Chapter 3 – ***Passenger Rail Issues, Opportunities, and Proposed Improvements and Investments*** identifies issues and opportunities stakeholders have put forward regarding passenger rail services in Maryland, and investments and improvements that have been proposed.
- Chapter 4 – ***Freight Rail Issues, Opportunities, Proposed Improvements, and Investments*** discusses issues and opportunities associated with Maryland's freight rail system and identifies potential freight rail investments and improvements to address those issues and opportunities.
- Chapter 5 – ***Maryland's Rail Service and Investment Program*** describes the state of Maryland's long-term vision for rail service and goals, objectives, and strategies that can promote that vision. The chapter recommends and ranks projects that would support rail-related objectives. The chapter also compares project funding and financing requirements to estimated funding and financing that may be available.
- Chapter 6 – ***Coordination and Review*** summarizes stakeholder coordination in the development of this Rail Plan.

Figure 1-1. Structure of the Maryland State Rail Plan

MARYLAND'S MISSION AND GOALS FOR THE MULTIMODAL TRANSPORTATION SYSTEM

The Maryland Department of Transportation (MDOT) is responsible for statewide planning for all modes of transportation. The MDOT mission is to be "***a customer-driven leader that delivers safe, sustainable, intelligent, and exceptional transportation solutions in order to connect our customers to life's opportunities."*** The statewide transportation goals articulated in the *2040 Maryland Transportation Plan* developed in 2019 are multimodal in nature and apply to rail as well as other modes of transportation. The *2040 Maryland Transportation Plan* adopts the following goals:

- Ensure a **safe, secure & resilient** transportation system - *Enhance the safety and security of Maryland's multimodal transportation system and provide a transportation system that is resilient to natural or man-made hazards.*
- Facilitate **economic opportunity and reduce congestion** in Maryland through strategic system expansion - *Invest in and pursue opportunities to promote system improvements that support economic development, reduce congestion, and improve the movement of people and goods.*
- Maintain a **high standard and modernize** Maryland's multimodal transportation system - *Preserve, maintain, and modernize the state's existing transportation infrastructure and assets.*
- Improve the **quality and efficiency** of the transportation system to enhance the customer experience - *Increase the use of technologies and operational improvements to enhance transportation services and communication to satisfy our customers.*
- Ensure **environmental protection and sensitivity** - *Deliver sustainable transportation infrastructure improvements that protect and reduce impacts to Maryland's natural, historic, and cultural resources.*
- Promote **fiscal responsibility** - *Ensure responsible investment and management of taxpayer resources to add value and deliver quality transportation improvements through performance-based decision making and innovative funding mechanisms and partnerships.*
- Provide better transportation **choices and connections** - *Improve transportation connections to support alternative transportation options for the movement of people and goods.*

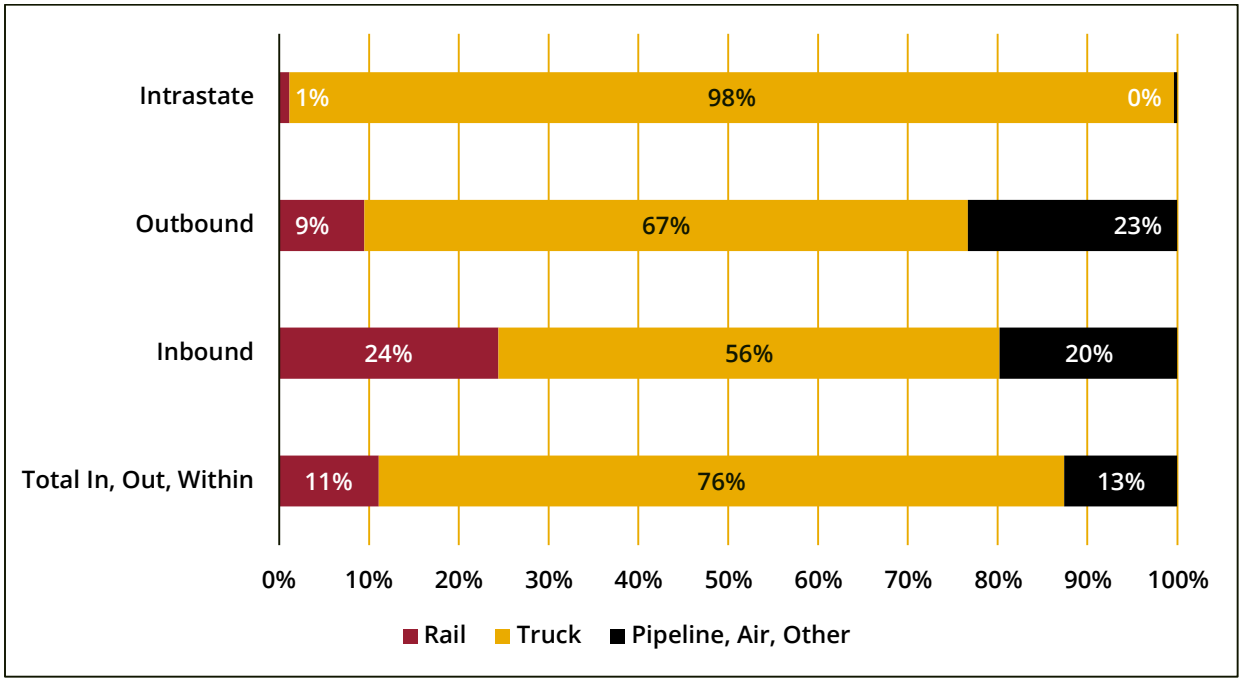
The goals of this Rail Plan largely echo those of the *2040 Maryland Transportation Plan*. Recommended objectives and strategies to address those goals are discussed in Chapter 5.

ROLE OF RAIL IN MARYLAND'S TRANSPORTATION SYSTEM

Maryland was home to the nation's first commercial railroad, the Baltimore & Ohio Railroad (B&O). The B&O was chartered in 1827 by Baltimore merchants to compete with other ports such as New York, Philadelphia, and Washington, DC, for trade to the west. The first 13 miles of the B&O were opened between Baltimore and Ellicott City in 1830. The B&O reached the Ohio River in 1852 and grew into an extensive system linking Chicago, St. Louis, and midwestern states to Baltimore and other commercial centers on the Atlantic Seaboard. Railroad transportation continues to play an important role in Maryland, with passenger, Class I, and short line operators providing service on a network of private and publicly owned rail infrastructure.

Freight railroads transport 11% of the tonnage that passes to, from, and within Maryland. The greatest amount of freight traffic in Maryland moves by truck, with motor carriers holding a modal share of 76% of tonnage to, from, and within Maryland. As shown in Figure 1-2, the modal share for intrastate freight tonnage is dominated by trucking but rail transport remains critical in many areas of the state. Rail's highest modal share is for inbound shipment from other states, where rail carries 24% of the tonnage.

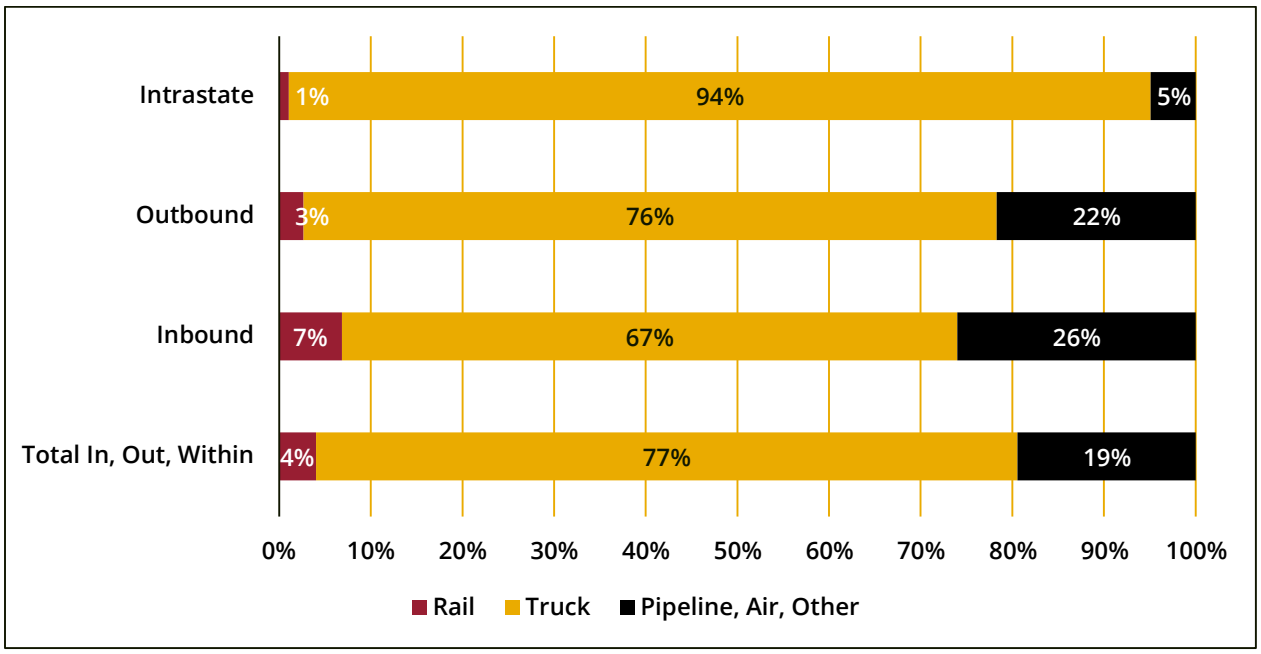
Figure 1-2. Modal Percentage of Tonnage by Mode to/from/within Maryland in 2019



Source: FHWA FAF-4

As shown in Figure 1-3, trucking holds the highest modal share of freight traffic when measured according to the total value of traffic moved to, from, or within Maryland. The modal share for rail is about 4% while the modal share for trucking is 77% when measured by value. The commodities best suited for transportation by rail tend to have a lower value per ton relative to those moved by truck. Lower value bulk commodities, such as coal, and larger or heavier loads, are generally better suited for the high-volume capacity and lower costs per ton associated with rail transportation, while trucking is well suited to transporting higher value goods and smaller loads that are not limited by a vehicle's loading capacity.

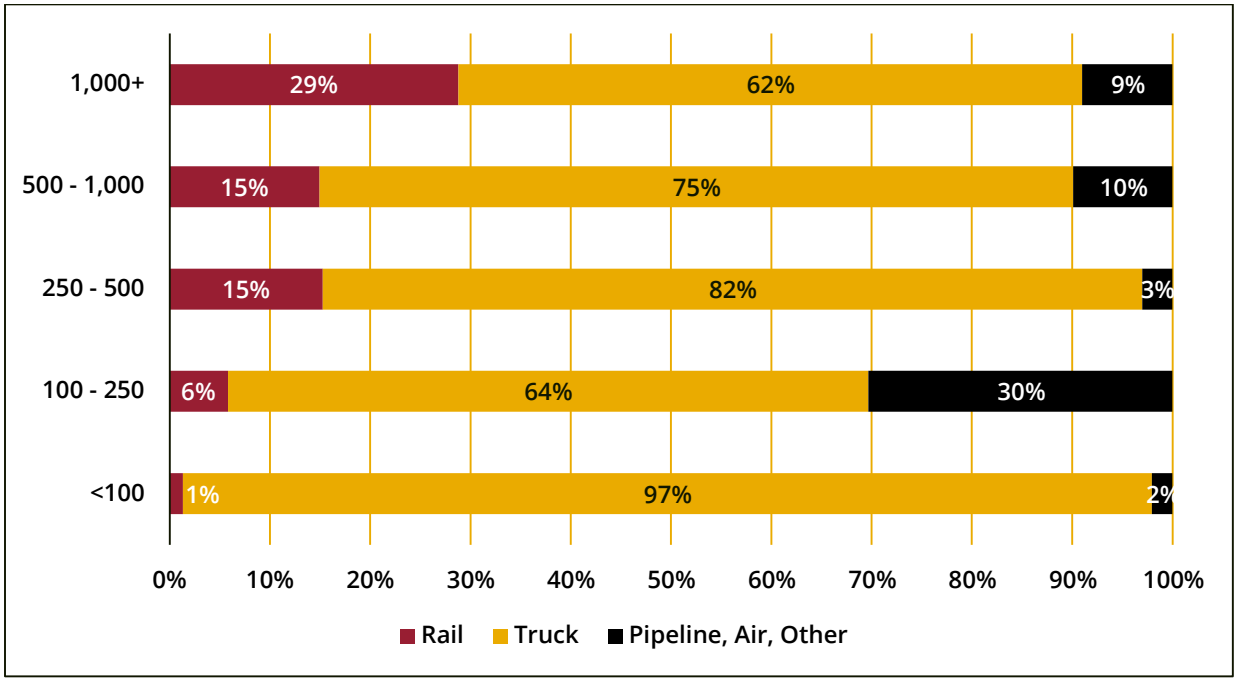
Figure 1-3. Modal Percentage of Total Value of Goods Moved to/from/within Maryland in 2019



Source: FHWA FAF-4

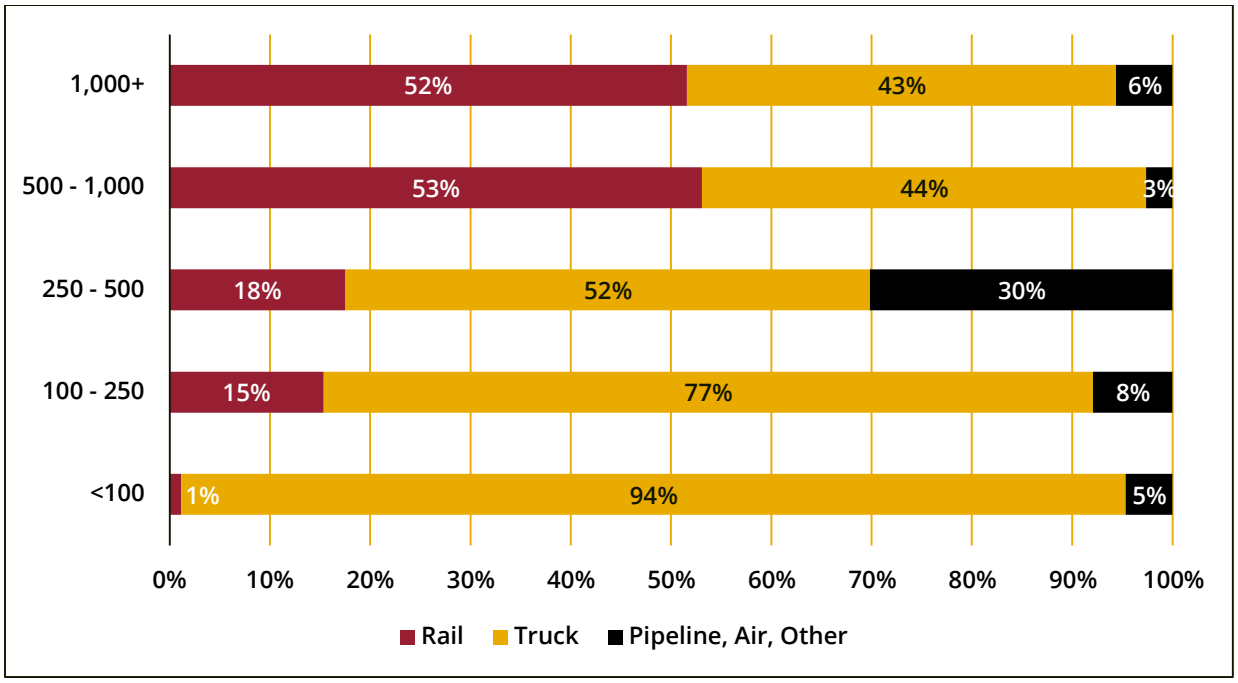
Longer distance shipments tend to move by rail, as shown in Figure 1-4 and Figure 1-5. For shipments originating in Maryland, rail only has a 1% share of tonnage shipped less than 100 miles, but a 29% share of tonnage shipped more than 1,000 miles. Similarly, for shipments that terminate in Maryland, rail has a 1% share of shipments less than 100 miles but a 52% share of shipments more than 1,000 miles and a 53% share of shipments moving 500 to 1,000 miles.

Figure 1-4. Modal Percentage of Total Tonnage Originating in Maryland by Miles Traveled in 2019



Source: FHWA FAF-4

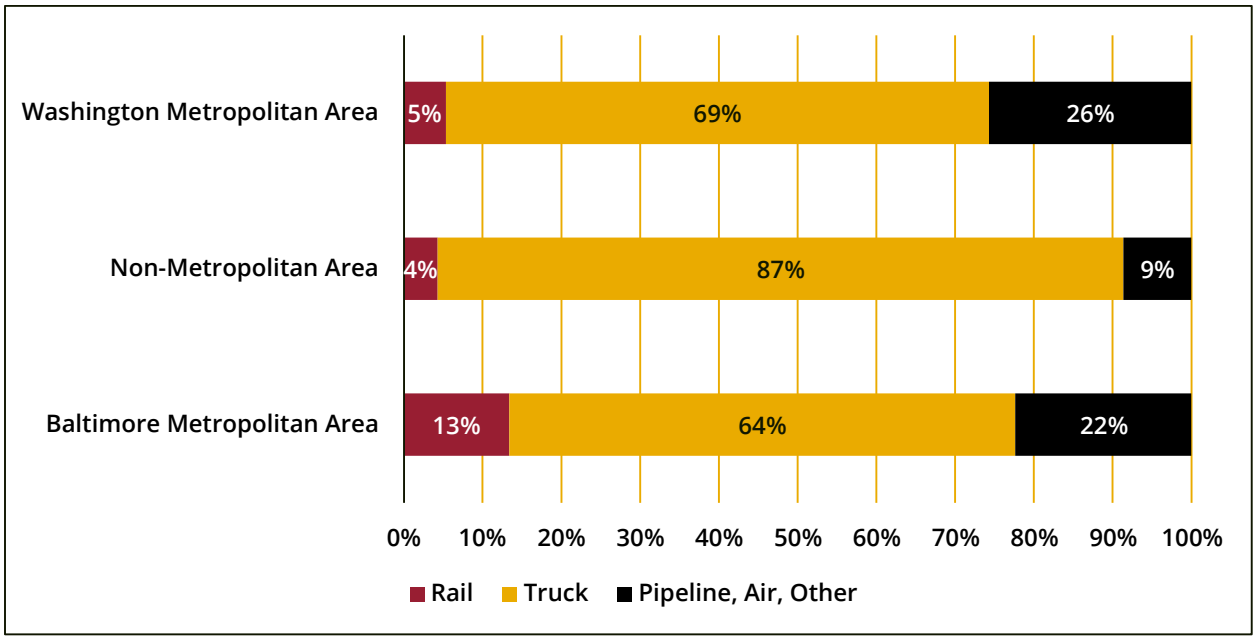
Figure 1-5. Modal Percentage of Total Tonnage Carried into Maryland by Miles Traveled in 2019



Source: FHWA FAF-4

The role of rail transportation varies across the regions of Maryland. As shown in Figure 1-6, the Baltimore Metropolitan area is particularly rail reliant, with 13% of freight tonnage shipped to, from, and within the Baltimore Metropolitan area in 2019 moved by rail. Rail plays a smaller role in freight transportation outside the Baltimore area, moving 5% of traffic to, from, and within the Washington Metropolitan area and 4% outside the two metropolitan areas.

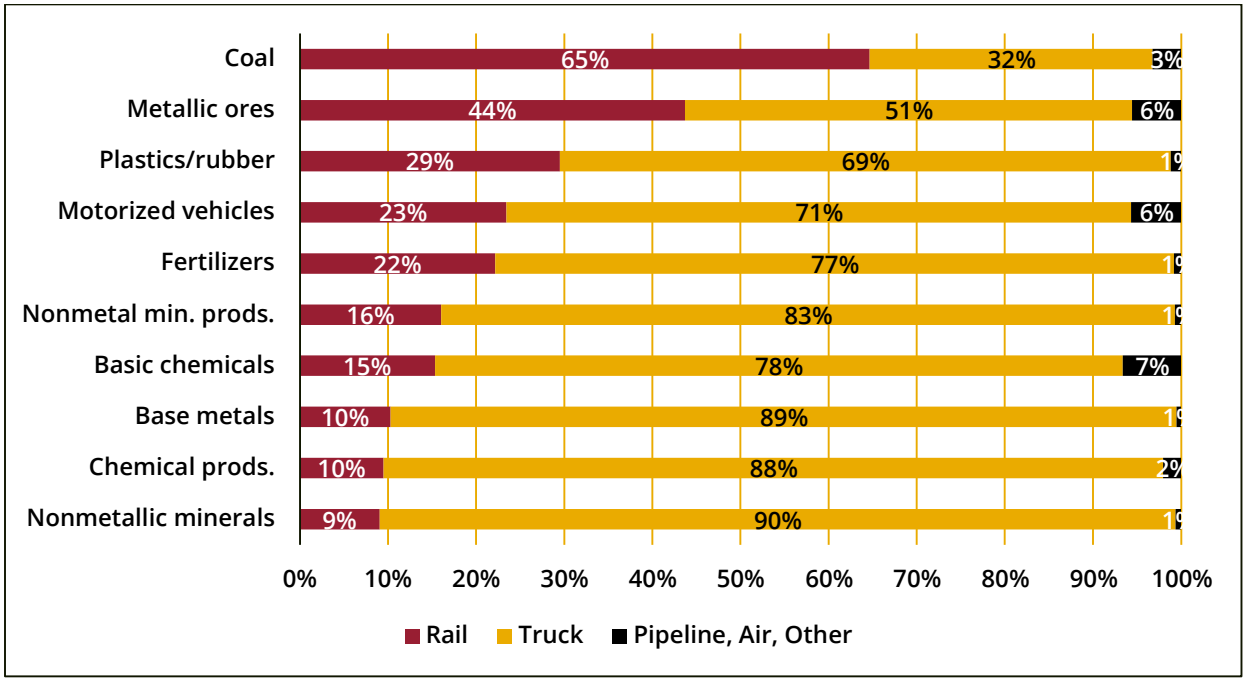
Figure 1-6. Modal Percentage of Total Tonnage Carried to/from/within Maryland Regions in 2019



Source: FHWA FAF-4

Figure 1-7 ranks the top ten commodity classifications for all freight traffic in Maryland by their percentage of modal share. As shown in Figure 1-7, rail tends to have a higher modal share for heavy bulk materials, such as coal, metallic ores, and plastics. An exception is motorized vehicles, which have a high value per ton. More than three-quarters of the automobiles moved by rail or multiple modes (truck and rail) to or from Maryland are imports or exports moving through the Port of Baltimore.

Figure 1-7. Modal Percentage of Total Tonnage Carried by Mode to/from/within Maryland by Commodity Classification in 2019



Source: FHWA FAF-4

Passenger Railroads

Commuter and intercity passenger rail services play an important role in Maryland's transportation network. For certain markets, passenger rail carries a sizeable share of travelers. For example, the *Northeast Corridor Intercity Travel Study*[2] of 2015 found that intercity passenger rail carries 27% of trips between the greater Baltimore/Washington metropolitan areas and New York City and 19% of trips between the greater Baltimore/Washington metropolitan area and the Philadelphia metropolitan area. In both cases, rail has a higher modal share than bus or air travel and is second only to highway travel.

The *2019 State of the Commute Survey Report*[3] found that the Virginia Railway Express and MARC commuter services carried 1.6% of commuters in the Washington metropolitan area in 2019. The US Bureau of the Census *2009 – 2013 American Community Survey* estimated that MARC carried 0.9% of Baltimore area commuters in 2013.[4] The Statewide Transit Plan

2 Northeast Corridor Infrastructure and Operations Advisory Commission, *Northeast Corridor Intercity Travel Study,* September 2015.

3 National Capital Region Transportation Planning Board, Metropolitan Washington Council of Governments, *2019 State of the Commute Survey Report,* June 2020.

4 Baltimore Metropolitan Council, The Transit Question: Baltimore Regional Transit Needs Assessment, October 2015.

indicates that in 2018, 8 percent of Maryland commuters used transit, of which MARC is a component. Ninety-eight percent of transit trips occur within the Baltimore and Washington metropolitan areas. These are important services, particularly since they divert passengers away from roadways during peak travel times when roadway capacity is most constrained. They enable employees to take jobs where the journey to work may otherwise be too lengthy and/or stressful to be feasible if commuter rail were not available.

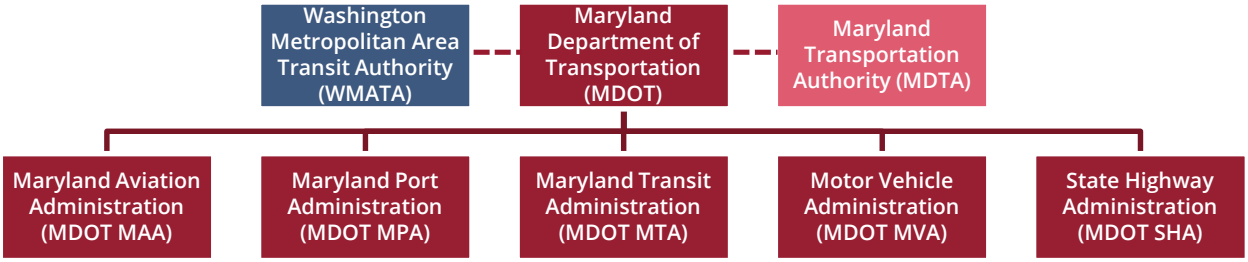
INSTITUTIONAL GOVERNANCE STRUCTURE OF RAIL PROGRAMS

A range of public sector organizations at both the statewide and local levels in Maryland provide support to passenger and freight rail. Because Maryland relies on many of the same services and infrastructure as nearby states and the District of Columbia, Maryland's rail activities and investments are in some cases coordinated through multi-jurisdictional agreements and organizations, as discussed below.

MARYLAND DEPARTMENT OF TRANSPORTATION

MDOT has five Transportation Business Units and one Authority. The Secretary of Transportation serves as Chair of the Maryland Transportation Authority (MDTA), and MDOT provides financial support to the Washington Metropolitan Area Transit Authority (WMATA), as shown in Figure 1-8.

Figure 1-8. Structure of Maryland Department of Transportation



Office of Planning and Capital Programming Rail and Intermodal Freight Section

This Plan was developed by MDOT's Office of Planning and Capital Programming (OPCP) Freight and Intermodal Freight (RIF) Team within The Secretary's Office. The RIF Team is responsible for administering freight rail lines owned by MDOT MTA, conducting freight

planning, and managing federal multimodal grants. The OPCP RIF Team establishes policies that will improve freight operating efficiencies, promote safe and reliable mobility, and advance initiatives to mitigate congestion and environmental impacts. OPCP is responsible for coordinating multimodal planning, including rail, managing the state consolidated transportation program, and ensuring regional coordination. It consists of Capital Programming, Regional Planning, and Transportation Planning, as well as interrelated programs, such as Air Quality, Bicycle and Pedestrian, and Community Enhancements. OPCP satisfies many legislative planning mandates from Maryland and the federal government.

Maryland Department of Transportation Maryland Transit Administration

The Maryland Department of Transportation Maryland Transit Administration (MDOT MTA), an MDOT Transportation Business Unit, operates one of the largest transit systems in the United States. It operates the Local Buses (CityLink and LocalLink) in the Baltimore area, Commuter Buses across the state, Light RailLink, Metro SubwayLink, MARC Train commuter service, and a comprehensive Paratransit (MobilityLink) system. MDOT MTA also manages and directs funding and statewide assistance to Locally Operated Transit Systems in each of Maryland's 23 counties, as well as Baltimore City, Annapolis, and Ocean City.

As mentioned previously, rail plans cover freight rail, commuter rail, and intercity passenger rail. As such, MDOT MTA's MARC Train service is relevant to this Plan. Also relevant are local transit connections to intercity and commuter passenger rail. Furthermore, MDOT MTA has primary responsibility for coordinating with Amtrak on passenger rail matters. MDOT MTA owns most of Maryland's state-owned rail lines, although RIF manages the operating agreements and the capital program that supports maintenance of these lines.

Maryland Department of Transportation State Highway Administration

The Maryland Department of Transportation State Highway Administration (MDOT SHA) is an MDOT Transportation Business Unit responsible for the construction, maintenance, and operations of the state's numbered, non-tolled roads. Among its activities, MDOT SHA administers Maryland's federally funded Rail-Highway (Section 130) Grade Crossing Program. This program improves the safety of highway-rail grade crossings in the state. MDOT SHA also coordinates with railroads when highway construction projects impact railroad properties.

Maryland Transportation Authority

MDTA is responsible for constructing, managing, operating and improving the Maryland toll facilities, as well as for financing new revenue producing transportation projects. These include eight toll facilities, two turnpikes, two tunnels, and four bridges. MDTA also owns the Canton Railroad Company.

Maryland Department of Transportation Maryland Port Administration

The Maryland Department of Transportation Maryland Port Administration (MDOT MPA) provides oversight, planning, and administration of the Port of Baltimore. Railroads will always be an important part of the Port of Baltimore, with a long railroad history dating back to when most of the piers were built and operated by the Pennsylvania Railroad, the Western Maryland Railway, and the Baltimore and Ohio Railroad. Two "Class I" railroads and one short line serve the port. Norfolk Southern and CSX Transportation provide service to most of the states east of the Mississippi River with connecting service to the western part of the United States, Mexico, and Canada. The Canton Railroad provides switching service to private facilities located in the port area. The connection with these railroads gives port customers an opportunity to use one of the most efficient, affordable, and environmentally responsible freight systems for the movement of international cargo.

MDOT Office of Real Estate and Economic Development

Similar to OPCP, the Office of Real Estate and Economic Development (ORED) is within The Secretary's Office. Several ORED activities could potentially impact rail. For example, ORED facilitates transit-oriented development projects, including those involving commuter rail. ORED can deliver and implement financing mechanisms for large infrastructure projects, which could include rail projects.

MDOT'S AUTHORITY

Statutory authority to conduct statewide transportation planning, including rail planning is assigned to MDOT. For the purposes of this Rail Plan, MDOT serves as the state agency responsible for preparing, maintaining, coordinating, administering, and approving the Rail Plan. MDOT complies with the requirements for FRA freight rail grant assistance per 49 US Code, Section 22102.

OTHER MARYLAND STATE AGENCIES

Beyond MDOT, several other Maryland state agencies support rail.

Maryland Department of Labor

The Maryland Department of Labor fulfills labor regulatory functions, as well as provides employment and training services. The Department of Labor participates in the FRA rail safety inspection program in which state inspectors supplement FRA safety inspections to enforce federal rail safety regulations. The program monitors the safety practices of each railroad company operating in Maryland by conducting inspections of railroad track, operating practices and motive power and equipment. State inspectors are certified by the FRA. The program also monitors and assists certain railroad operations that are not under federal jurisdiction. State inspectors work to promote understanding of railroad standards in private industry and with tourist and museum railroad operators who carry passengers, but are not covered under federal railroad regulations.

Maryland Department of Commerce

The Maryland Department of Commerce is the state's primary economic development agency, charged with stimulating private investment and creating jobs by attracting new businesses, encouraging the expansion and retention of existing companies, as well as providing workforce training and financial assistance to Maryland companies. Because access to rail infrastructure is a potential consideration for companies that wish to locate/expand in Maryland, the Department of Commerce's activities support rail.

Maryland Department of Planning

The Maryland Department of Planning works with state and local government agencies to ensure comprehensive and integrated planning for the best use of Maryland's land and other resources. The Maryland Department of Planning assists local jurisdictions with planning activities, so that local jurisdictions can create a vision for how they want their communities to develop in the future. Some of these planning activities are relevant to rail, such as integrating land use planning with passenger or freight rail development. The Maryland Department of Planning also oversees the State Clearinghouse process for the state to ensure that financial and non-financial assistance projects operating within Maryland are consistent with state and local policies and programs, through a state and local intergovernmental review process.

MULTI-JURISDICTION ORGANIZATIONS

Maryland participates in organizations that support rail and whose jurisdiction crosses state boundaries.

Northeast Corridor Commission

The Northeast Corridor (NEC) between Washington, DC, and Boston, MA, is the busiest passenger rail corridor in the United States, crossing Maryland between its borders with the District of Columbia and Delaware. The Northeast Corridor Commission (NEC Commission) was created through PRIIA of 2008. The NEC Commission was charged with developing a formula to allocate NEC capital and operating costs based on usage, making recommendations to Congress, and facilitating collaborative planning. Subsequently, the NEC Commission was tasked to focus on near-term strategies to stabilize the NEC and establish a foundation for future growth through unified regional action. The NEC Commission is made up of members of each NEC state, including Maryland, representatives from the District of Columbia, Amtrak, and the US Department of Transportation.

Washington Metropolitan Area Transit Authority

WMATA was created by an interstate compact between Maryland, Virginia, and the District of Columbia in 1967 to plan, develop, build, finance, and operate a balanced regional transportation system in the Washington, DC, Metropolitan area. Through the compact, MDOT provides funding to WMATA. While WMATA does not operate commuter rail as relevant to this Plan, it is nevertheless an important stakeholder with direct interaction with Maryland's rail systems. WMATA's Metrorail, Metrobus, and MetroAccess services connect to MARC and Amtrak systems and are relevant to commuter and passenger rail in Maryland.

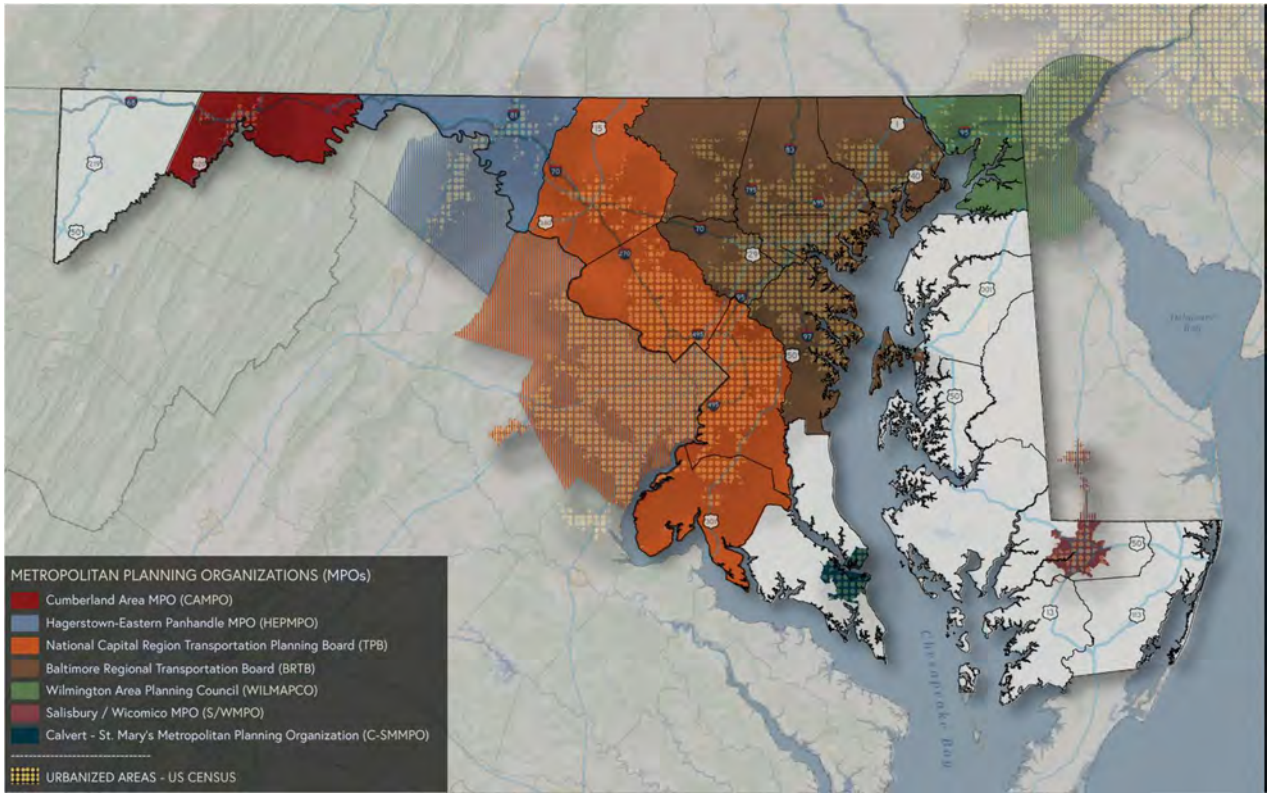
REGIONAL ORGANIZATIONS

Many local and regional organizations support rail in Maryland.

Metropolitan Planning Organizations

Federal transportation legislation requires that an urbanized area with a population of more than 50,000 people have a metropolitan planning organization (MPO) designated in order to carry out metropolitan transportation planning functions as a condition of federal aid. MPOs are led by representatives from local governments and governmental transportation authorities. Seven MPOs are located in Maryland. Many of these are shared between Maryland and neighboring states, as shown in Figure 1-9.

Figure 1-9. Maryland Metropolitan Planning Organizations



Freight rail, passenger rail, and highway-rail crossing issues and improvements can feature into MPO planning efforts.

Local Economic Development Agencies

Because rail influences business attraction and retention in Maryland, the activities of local economic development agencies have the potential to affect rail.

SUMMARY OF FREIGHT AND PASSENGER RAIL SERVICES, INITIATIVES AND PLANS

The Maryland State Rail Plan has been prepared within the context of several rail initiatives and plans, some of which are ongoing.

- MDOT continues to seek opportunities to improve rail access to the Port of Baltimore. The $466 million project to reconstruct the Howard Street Tunnel to allow double-stack intermodal containers into the Port of Baltimore is scheduled to be completed by 2024.
- Several high-priority infrastructure improvements for Amtrak's NEC are located in Maryland.
    - The Baltimore and Potomac (B&P) tunnel is a bottleneck on the NEC. MDOT, Amtrak, and the Baltimore City Department of Transportation released the B&P Tunnel Final Environmental Impact Statement on November 25, 2016, as a requirement of the National Environmental Policy Act (NEPA). The tunnel is estimated to cost $4.5 billion to replace.
    - The Susquehanna River Rail Bridge is nearing the end of its useful life and is a bottleneck for the NEC. Also, per NEPA requirements, MDOT, FRA, and Amtrak cooperated on an Environmental Assessment of the Susquehanna River Rail Bridge Project. A Finding of No Significant Impact for this project was released in June 2017.
    - Baltimore's Penn Station is the eighth busiest station on Amtrak's system. A $90 million plan to renovate the station continues to progress.
- MDOT MTA's priorities and intended investment areas for the MARC service can be found in the 50-year Statewide Transit Plan, as well as the *MARC Cornerstone Plan*, which includes investments in vehicles, stations, guideways, facilities, systems, and services. These include investments through 2045.
- MDOT SHA makes ongoing improvements to the safety of highway-rail grade crossings through its administration of the federal Railway-Highway Crossings (Section 130) Program.
- MDOT makes improvements to state-owned rail lines such as those operated by the Maryland and Delaware Railroad Company (MDDE) and by the Walkersville Southern Railroad.
- MDOT recently completed a feasibility study for monorail service in the I-270 corridor from the City of Frederick in Frederick County to the Shady Grove Metro Station in Montgomery County.

- The Northeast Maglev proposes to build a new high-speed corridor between Washington, DC, and Baltimore with an intermediate stop at Baltimore/Washington International Thurgood Marshall (BWI Marshall) Airport. A Draft Environmental Impact Statement has been prepared per NEPA.
- This Plan is prepared and coordinated within the context of other statewide planning initiatives underway in Maryland. Of relevance is the Maryland State Freight Plan update, which examines existing and projected conditions and identifies policy positions, strategies, and freight projects to improve freight movement efficiency and safety.

Initiatives and plans will be discussed in greater detail later in this Plan.

2 Maryland's Existing Rail System

DESCRIPTION AND INVENTORY OF MARYLAND'S RAIL SYSTEM

Maryland's Rail Lines

Maryland's rail network is comprised of about 886 miles of active lines owned and/or operated[5] by railroads classified by the US Surface Transportation Board (STB) as follows:

- **Class I railroads** are defined as companies generating more than $489,935,856 in annual operating revenues.[6] Maryland is served by two Class I railroads, CSX Transportation (CSX) and Norfolk Southern Railway (NS).
- **Class II railroads** are defined as companies generating annual operating revenue between $39,194,876 and $489,935,956.[7] No Class II railroad owns or leases trackage in Maryland, but the Wheeling & Lake Erie Railway operates about 25 miles within the state on trackage rights over CSX from the Pennsylvania border to Hagerstown.
- **Class III railroads** are also known as "short lines" and are defined as companies generating less than $39,194,876[8] in annual operating revenues. Seven Class III railroads operate in Maryland.

Other railroad owners in Maryland include:

- The National Passenger Railroad Corporation, or **Amtrak,** a federally supported corporation that operates nearly all intercity passenger rail service in the US. Most

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5 Here the operator is defined as the company/organization that controls the movement of trains on a given segment of track. This may be different from the owner of the rail line. The operator may not necessarily be the only user of the rail line.

6 $250 million in 1991 dollars, indexed by inflation to 2018.

7 Between $20 and $250 million in 1991 dollars, indexed by inflation to 2018 dollars.

8 $20 million in 1991 dollars, indexed by inflation to 2018.

intercity passenger service in Maryland operates on the Northeast Corridor (NEC), owned entirely by Amtrak within the state's boundaries.

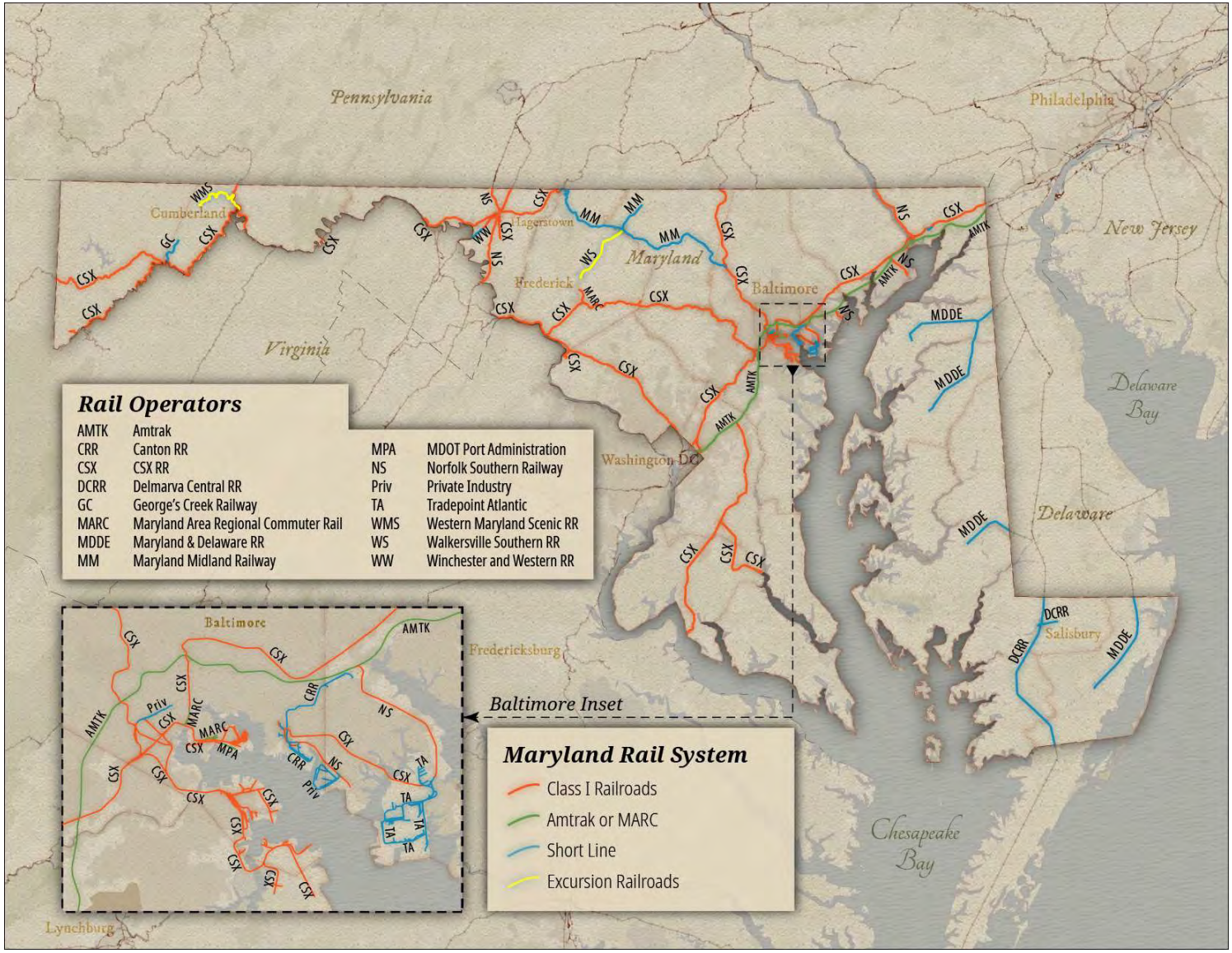
- The Maryland Department of Transportation **Maryland Transit Administration** (MDOT MTA) MARC Train service operates mostly on lines owned by Amtrak or CSX, but also owns three miles of track in Frederick County that hosts both MARC commuter service and CSX freight traffic.
- **Tourist/Excursion** railroads operate passenger service as entertainment and do not serve commuter or intercity customers.

Railroad companies do not necessarily own the lines on which they operate. Maryland's rail network is illustrated by Figure 2-1.

Western Maryland Scenic Railroad

By WMSRailroad - Own work, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=70267352

Figure 2-1. Map of the Maryland Rail Network



Source: MDOT

As illustrated by Table 2-1, most of the track mileage in Maryland is owned and operated by Class I railroads, accounting for 63% of the total. Class III railroads operate 247 miles or 28% of Maryland's rail network, but own 115 miles or 13%. The state of Maryland owns 109 miles of active lines representing about 10% of active mileage in the state, with Amtrak owning another 10%. About a quarter of rail mileage in Maryland is used by both freight and passenger rail. MARC and freight railroads have rights to operate on the Amtrak's NEC. MARC and Amtrak also operate on several rail lines owned and operated by CSX.

Table 2-1. Total Mileage of the Maryland Rail Network, All Operators

RAILROAD	MILES LEASED	MILES OWNED, OPERATED	MILES OWNED, NOT OPERATED	TOTAL MILES OPERATED EXCLUDING TRACKAGE RIGHT	TRACKAGE RIGHTS[9]
Class I Railroads	5	514	49	519	286
Class II Railroads	0	0	0	0	25
Class III Railroads	115	132	0	247	5
Amtrak	0	97	0	93	61
MARC	0	3	0	3	158
Tourist Railroads	7	17	0	24	0
Total Mileage	**127**	**763**	**49**	**886**	**535**

Survey of Railroads, MDOT, STB R-1 Annual Reports

CLASS I RAILROADS

Two Class I railroads, NS and CSX, serve customers in the eastern and midwestern United States, interchanging with western and Canadian railroads to connect Maryland with all of North America. CSX operates 460 miles within the state (Table 2-2), and NS operates 59 miles of its own trackage, as well as more than 200 miles of trackage rights on the NEC. NS also leases 42 miles of track on Maryland's Eastern Shore to the Delmarva Central Railroad. NS relies on the Amtrak Northeast Corridor to access Baltimore and the Delmarva Peninsula. The NS Crescent Corridor links northeastern and southeastern markets, crossing Maryland through Hagerstown.

[9] Trackage rights comprise legal agreements such that the owner of particular railroad tracks permits another railroad operator to also use the tracks.

Table 2-2. Class I Railroad Mileage in Maryland

RAILROAD	MILES LEASED	MILES OWNED, OPERATED	MILES OWNED, NOT OPERATED	TOTAL MILES OPERATED EX TRACKAGE RIGHT	TRACKAGE RIGHTS
CSX Transportation	5	455	7	460	86
Norfolk Southern Railway	0	59	42	59	200
Total Class I Railroads	**5**	**514**	**49**	**519**	**286**

Source: STB R-1 Annual Reports

Additional details on NS and CSX rail lines in Maryland can be found in Appendix A.

CLASS III RAILROADS

Seven Class III or "short line" railroads operate in Maryland. These railroads provide last-mile access to the rail network by interchanging traffic with Class I railroads for access to more distant markets. The Canton Railroad and Tradepoint Rail, LLC are considered terminal or switching railroads operating within a yard or terminal area. Other Class III railroads provide a similar function, but not necessarily within a terminal or yard area (Table 2-3). Additional detail regarding Maryland's Class III railroads is provided in Appendix B.

Table 2-3. Class III Railroad Mileage in Maryland

RAILROAD	MILES LEASED	MILES OWNED, OPERATED	TOTAL MILES OPERATED EX TRACKAGE RIGHT	TRACKAGE RIGHTS
Canton Railroad	-	16	16	-
Georges Creek Railway*	-	14	14	-
Delmarva Central Railroad Company	42	-	42	-
Maryland and Delaware Railroad	73	23	96	-
Maryland Midland Railway	-	65	65	-
Tradepoint Rail LLC	-	12	12	-
Winchester & Western Railway	-	2	2	5
Total Class III Railroads	**115**	**132**	**247**	**5**

Source: Survey of Class III Railroads.

*As of 2021 Georges Creek Railway is no longer in operation.

AMTRAK NORTHEAST CORRIDOR

Measured in the number of trains per day, the Amtrak NEC is the busiest rail line in Maryland, and one of the busiest in the nation. According to the Northeast Corridor Commission, MARC and Amtrak operate 130 trains between Baltimore Penn Station and Washington Union station on an average weekday.[10] NS and CSX also operate freight traffic along the line. The NEC is largely comprised of three tracks between Baltimore and Washington, DC, with two tracks approaching Washington and Baltimore. North of Baltimore, the number of tracks varies, with sections of two, three, and four tracks, with two tracks on bridges. According to the Northeast Corridor Commission, the segment between Baltimore and Delaware has operated at 75% of capacity since 2013.

TOURIST/EXCURSION RAILROADS

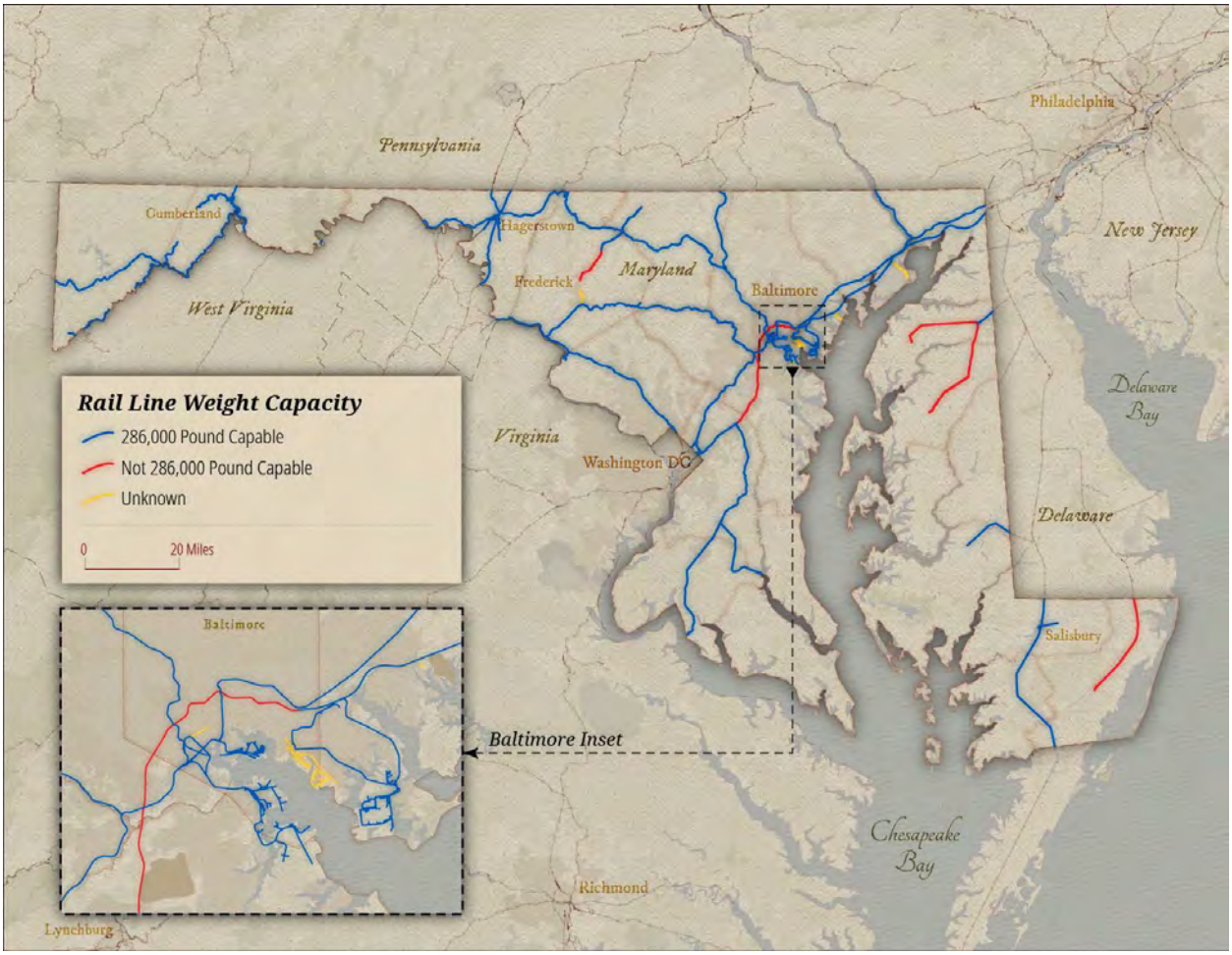
Tourist and excursion railroads play a role in preserving portions of the rail network and support local economies by attracting tourists to the areas where they operate. The Walkersville Southern Railroad operates over seven miles owned by the state of Maryland near Frederick. The Western Maryland Scenic Railway operates over 17 miles between Cumberland and Frostburg, along with two miles in West Virginia, owned by Allegany County.

LIMITATIONS OF MARYLAND'S RAIL NETWORK

Railroad cars were lighter and smaller when the US railroads were built originally. The current industry standard weight for railroad cars, including the weight of the car and payload, is 286,000 gross pounds. The standard was increased in the 1990s, from 263,000 pounds. Trackage rated for loads less than 286,000 pounds places railroads and online shippers at a disadvantage, since 263,000-pound cars are more costly to handle. Rates do not often vary according to weight, so that the rate to ship a 286,000-pound car carrying 10% more payload would be the same as a 286,000-pound car. Ninety-seven miles of track are not rated for 286,000-pound railcars, including 61 miles operated by the Maryland and Delaware Railroad Company, 29 miles of the Amtrak Northeast Corridor between Bowie and Bayview, and seven miles operated by the Walkersville Southern Railroad, as depicted in Figure 2-2.

[10] Northeast Corridor Infrastructure and Operations Advisory Commission, *Critical Infrastructure Needs on the Northeast Corridor*, January 2013.

Figure 2-2. Maryland Rail Corridors Rated for Less Than 286,000 Pound Loading



Source: MDOT

Clearance constraints on rail lines impose limits upon operations. Intermodal railcars enable shipping containers to be stacked to accommodate more containers per train. Double-stack trains require between 18 feet 8 inches and 20 feet 8 inches of vertical clearance from top of rail depending upon the type of container.

Figure 2-3. Double-Stack Intermodal Train

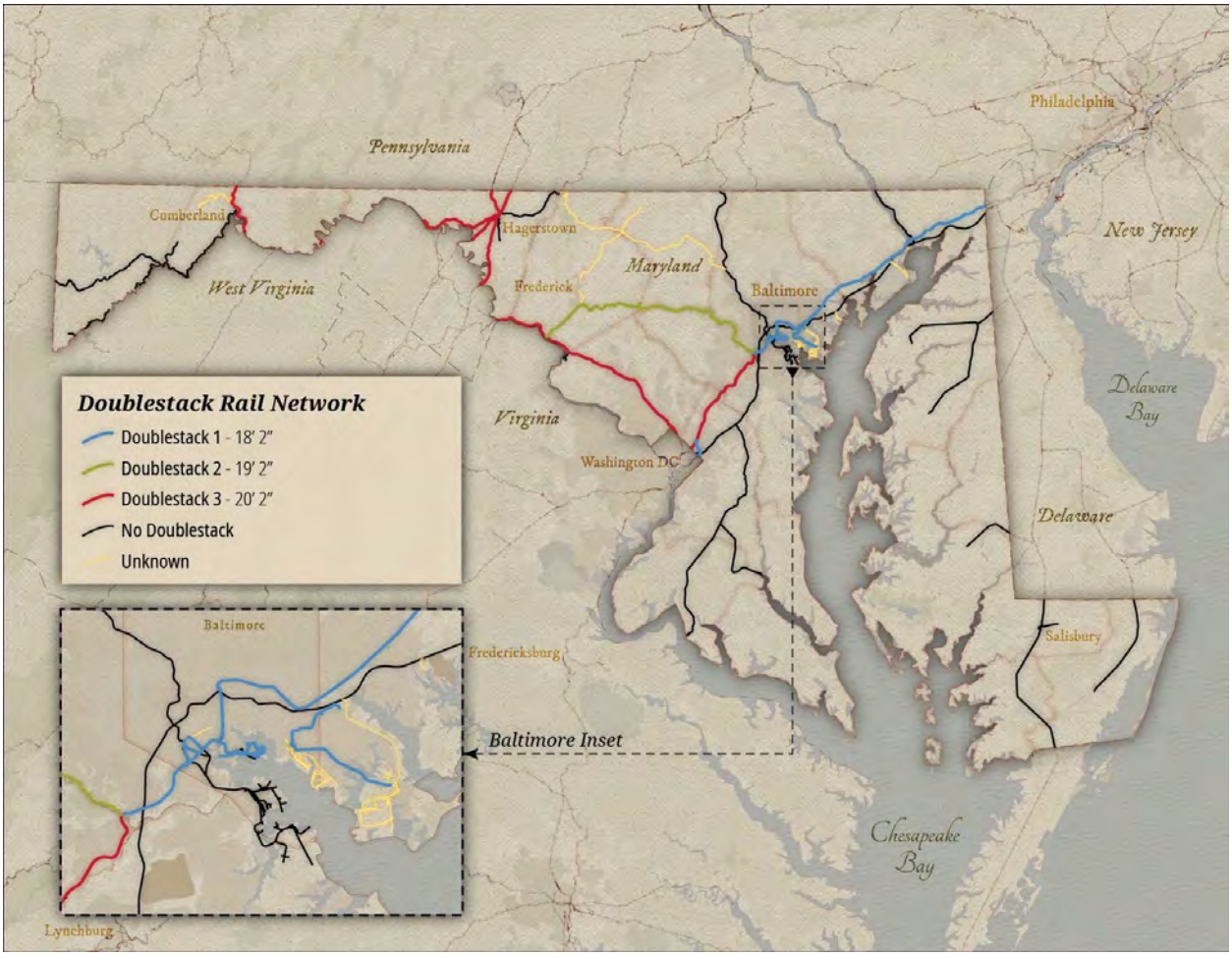
Source: MDOT Photos

Clearance of the CSX Howard Street Tunnel within Baltimore City precludes double-stack access to the Port. A $466 million construction project will clear the tunnel to accommodate double-stack container trains, with completion anticipated in 2024. Overhead catenary on the Amtrak NEC presents a clearance restriction that prevents NS operating double-stack trains to or from the Port of Baltimore.

Clearance constraints have limited intermodal operations in Maryland on a key rail line providing access to the Port of Baltimore.

The CSX National Gateway Initiative started in 2010 and has improved clearances on corridors in Maryland. National Gateway projects within Maryland include raising a pedestrian bridge in Germantown, raising highway bridges in Gaithersburg and Jessup, and lowering track within tunnels at Point of Rocks and Catoctin. The National Gateway Initiative was concluded in 2018 with the completion of the Virginia Avenue Tunnel project in Washington, DC. Figure 2-4 below illustrates double-stack clearance restrictions on rail lines in Maryland.

Figure 2-4. Double-stack Clearance Restrictions of Maryland Corridors



Source: MDOT, CSX, NS, shortline railroad surveys

STATE OWNERSHIP OF RAIL LINES

The state of Maryland owns active, inactive, and railbanked rail lines, most of which were purchased in the early 1980s following the creation of Conrail in 1976. Like many states, Maryland acquired rail lines identified for shutdown to continue rail service or preserve rights-of-way for potential future use. Contiguous corridors are very difficult to reassemble once lost. The following active rail lines are owned by the state of Maryland:

- MDOT MTA owns 73 miles of active track on Maryland's Eastern Shore operated by The Maryland and Delaware Railroad Company.
- Canton Railroad is a private company wholly owned by the Maryland Transportation Authority, with 16 miles of track serving industrial areas in southeastern Baltimore City and Baltimore County.

- MDOT MTA owns about seven miles of active track operated in excursion service by the Walkersville Southern Railroad.
- MDOT MTA owns about five miles of track in Frederick County dispatched by CSX and utilized by MARC commuter trains.
- MDOT MTA owns about three miles of track in Baltimore City operated by MARC.
- MDOT MTA owns about 15 miles of track in Dorchester County operated by the Maryland and Delaware Railroad Company but subject to embargo.[11]

The remaining rail lines owned by the state are inactive and fall into one of the categories noted below.

- **Abandoned:** Formal abandonment of a rail line requires that the owner seek approval by the US Surface Transportation Board (STB). Once abandoned, property in the right-of-way may be sold, and sections of the right-of-way acquired through easement may revert to adjacent property owners.
- **Inactive:** Railroad rights-of-way not formally abandoned or railbanked on which operations have ceased are considered inactive. The regulatory status of inactive rights-of-way may be uncertain, requiring legal determination to identify feasible options for the use and management of inactive rights-of-way.
- **Railbanked:** Under the National Trails System Act of 1983, interested parties may intervene in an abandonment proceeding and negotiate voluntary agreements to permit interim use as a recreational trail along rights-of-way slated for abandonment. A Trail Sponsor is required to assume full financial responsibility and liability for the right-of-way. The trail sponsor would be responsible for any potential funding and liability for the development and operations of an interim trail. With STB approval, a right-of-way may be considered railbanked, which permits removal of track and permits interim use of the right-of-way while maintaining STB jurisdiction over the right-of-way to permit future restoration of rail operations.

  Currently, three segments of right-of-way owned by MDOT MTA on the Eastern Shore are railbanked. The Chestertown Track is railbanked between milepost 18.82 and milepost 20.29 within the Town of Chestertown, along with about one-half mile of connecting track known as the Strawboard Branch. The Town of Chestertown has begun developing recreational trails along these sections of right-of-way. The Oxford Track, between Clayton, DE, and Easton, MD, is railbanked and subject to a lease

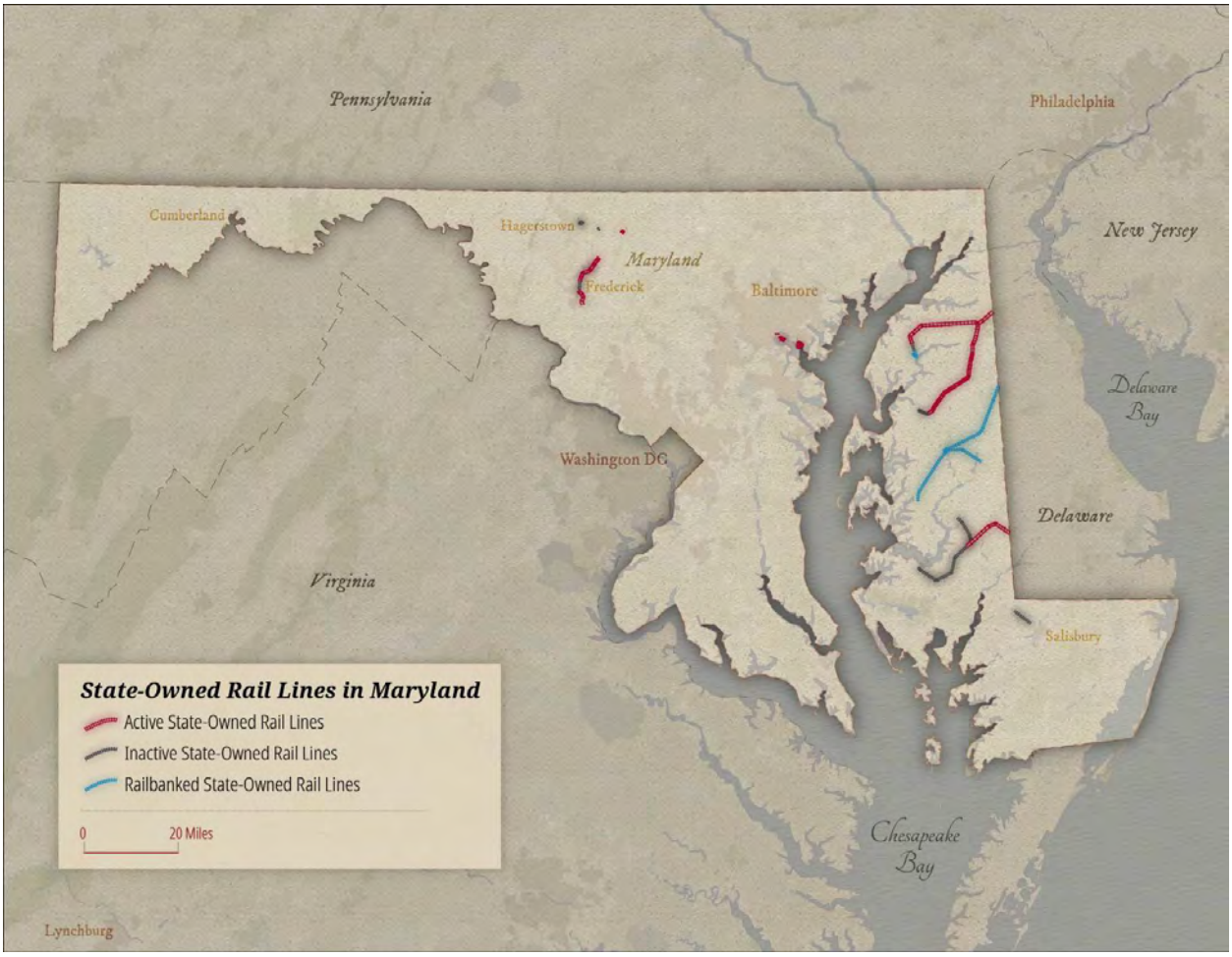
[11] An "embargo" is a halt to all rail traffic since the track is not safely passable at any speed.www

agreement between MDOT MTA and the Maryland Department of Natural Resources (DNR) that also includes about eight miles of right-of-way between Denton, MD, and a connection with the Oxford Track at Queen Anne, MD. Recreational trails have been developed along segments of the Oxford Track by DNR and the towns of Easton and Ridgely. An agreement between MDOT MTA and the City of Frederick provides for developing a recreational trail along active and inactive sections of the Frederick Track right-of-way between Downtown Frederick and Tuscarora Creek.

MDOT MTA also has begun discussions with the City of Cambridge to facilitate railbanking a section of inactive right-of-way along the Cambridge Track between Bucktown Road and Cedar Street in Cambridge. Consistent with the National Trail System Act and STB regulations, MDOT will continue to monitor activity on MDOT-owned rights-of-way and respond to any agencies or jurisdictions interested in pursuing railbanking for the purposes of protecting rail for future transportation purposes and interim trail use. Frederick County has indicated interest in entering into a Trail Use Agreement that would provide for developing a recreational trail within the active portion of the Frederick Track right-of-way operated by the Walkersville Southern Railroad. The proposed trail would be within the MDOT right-of-way, but adjacent to the active excursion railroad. Design of such a rail with trail facility requires extensive coordination between the property owners, operating railroad, and trail sponsor to balance the operations, maintenance, and safety requirements of a railroad with the specific needs of trail users.

Rail lines owned by MDOT MTA are illustrated in Figure 2-5.

Figure 2-5. State-Owned Rail Lines in Maryland

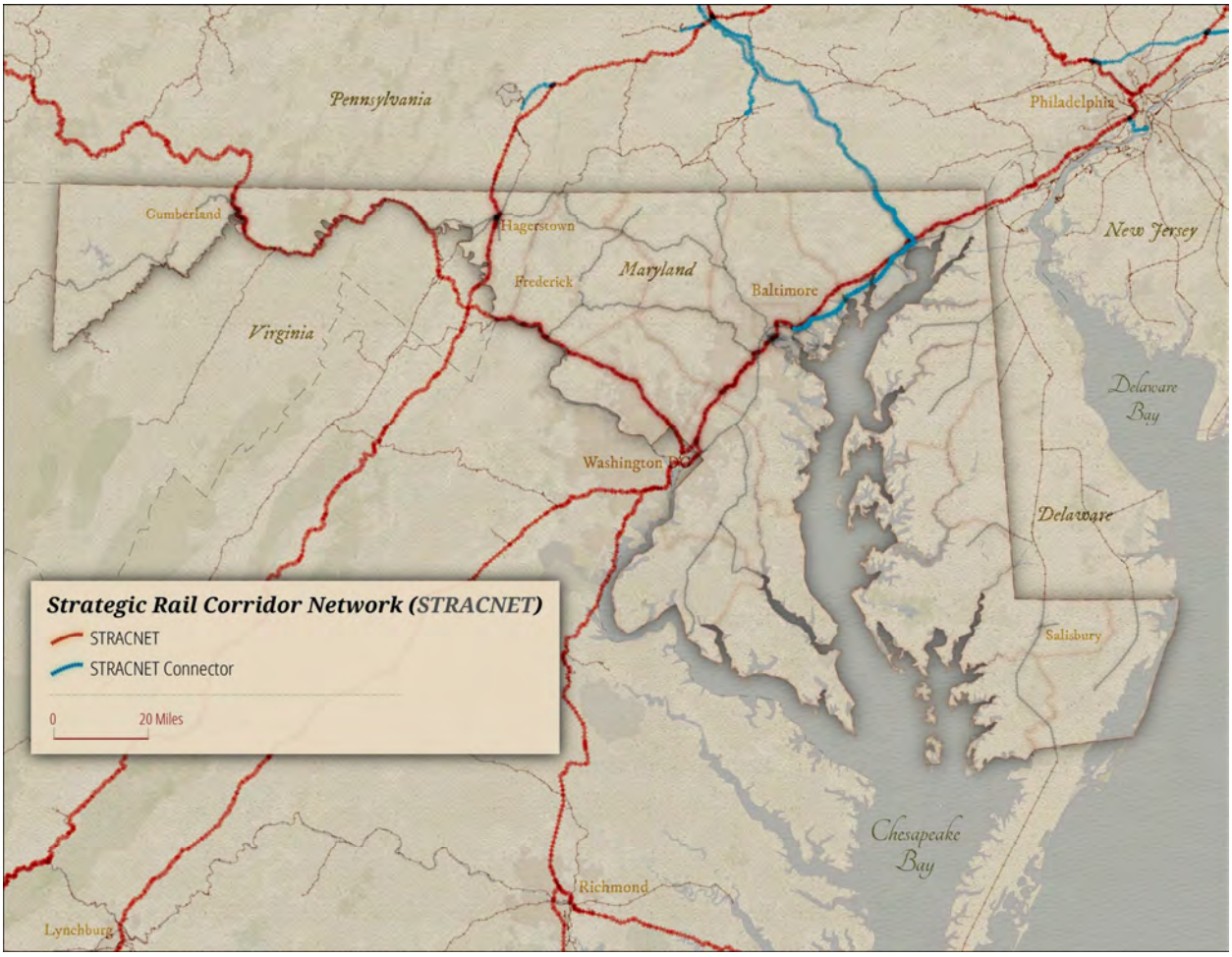


Source: MDOT

STRATEGIC RAIL CORRIDOR NETWORK

The US Department of Defense (DOD) has identified a series of rail lines critical for supporting defense deployment and peacetime military needs. DOD relies upon rail transportation to transport heavy and tracked vehicles and other heavy equipment to seaports of embarkation. The Strategic Rail Corridor Network (STRACNET) was established to identify DOD's minimum rail transportation requirements and ensure coordination with appropriate transportation authorities. The STRACNET routes within Maryland are illustrated in Figure 2-6.

Figure 2-6. STRACNET Routes in Maryland



Source: MDOT, US DOD

Major Multimodal Freight Facilities

Multimodal freight facilities enable the transfer of freight between rail and other modes of transportation. Several such facilities are located within Maryland, particularly in the Baltimore area. Appendix C lists multimodal freight facilities in Maryland, grouped as follows:

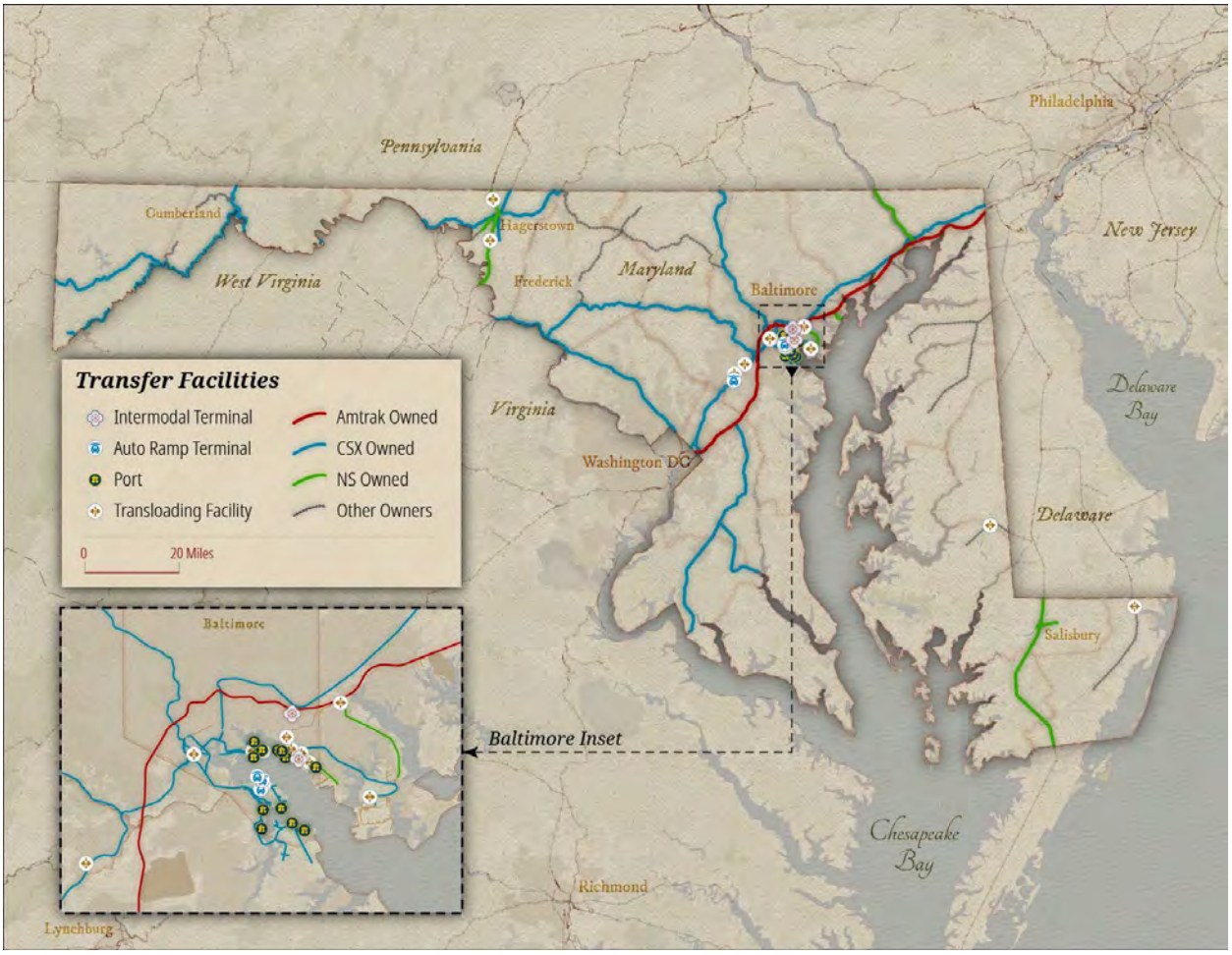
- **Intermodal terminals** facilitate the transfer of intermodal containers between truck and rail. Maryland's two intermodal terminals are located in Baltimore, including: 1) the Intermodal Container Transfer Facility (ICTF) at Seagirt Marine Terminal, which is operated by Ports America and served by CSX; and 2) the NS terminal at Bayview Yard. CSX provides international and domestic container services at Baltimore, while NS provides domestic service. Smaller, heavier containers (20, 40 and 45 feet long) used in international service move primarily between vessels and railcars on-dock for shipment

by rail between the Port and inland locations. Larger containers (53 feet long) in domestic service are trucked to and from Baltimore for movement by rail to other points in North America.

- **Auto ramps** provide for loading and unloading finished vehicles on or off railroad cars. Many of Maryland's auto ramps are associated with international movements of vehicles through the Port of Baltimore with autos moving between vessels and railroad transportation. Maryland's auto ramps also play a role in domestic auto distribution where trainloads of automobiles shipped from North American assembly plants are unloaded in Maryland and distributed by truck throughout the Mid-Atlantic and the Northeast.
- **Port facilities** facilitate the transfer of freight between marine vessels and rail. Auto ramps and intermodal facilities have been categorized separately from port facilities for the purposes of this Rail Plan, although they also perform this function for automobiles and containers. Many of Maryland's port facilities provide for the transfer of bulk commodities such as coal, petroleum products, gypsum, and chemicals between rail and marine vessels. The Port of Baltimore's two coal facilities are the highest tonnage rail facilities in the state. Other facilities provide for transfer break-bulk commodities such as steel, lumber, or paper.
- **Transload facilities** provide for the transfer of non-containerized freight between highway vehicles and railroad cars for multiple shippers whose facilities may not be directly served by rail. Transload facilities provide flexibility to accommodate bulk commodities or break-bulk traffic. Most transload facilities in Maryland are located in the Baltimore area, but others may be found throughout the state.

Figure 2-7 illustrates the location of Multimodal Facilities in Maryland.

Figure 2-7. Multimodal Facilities in Maryland

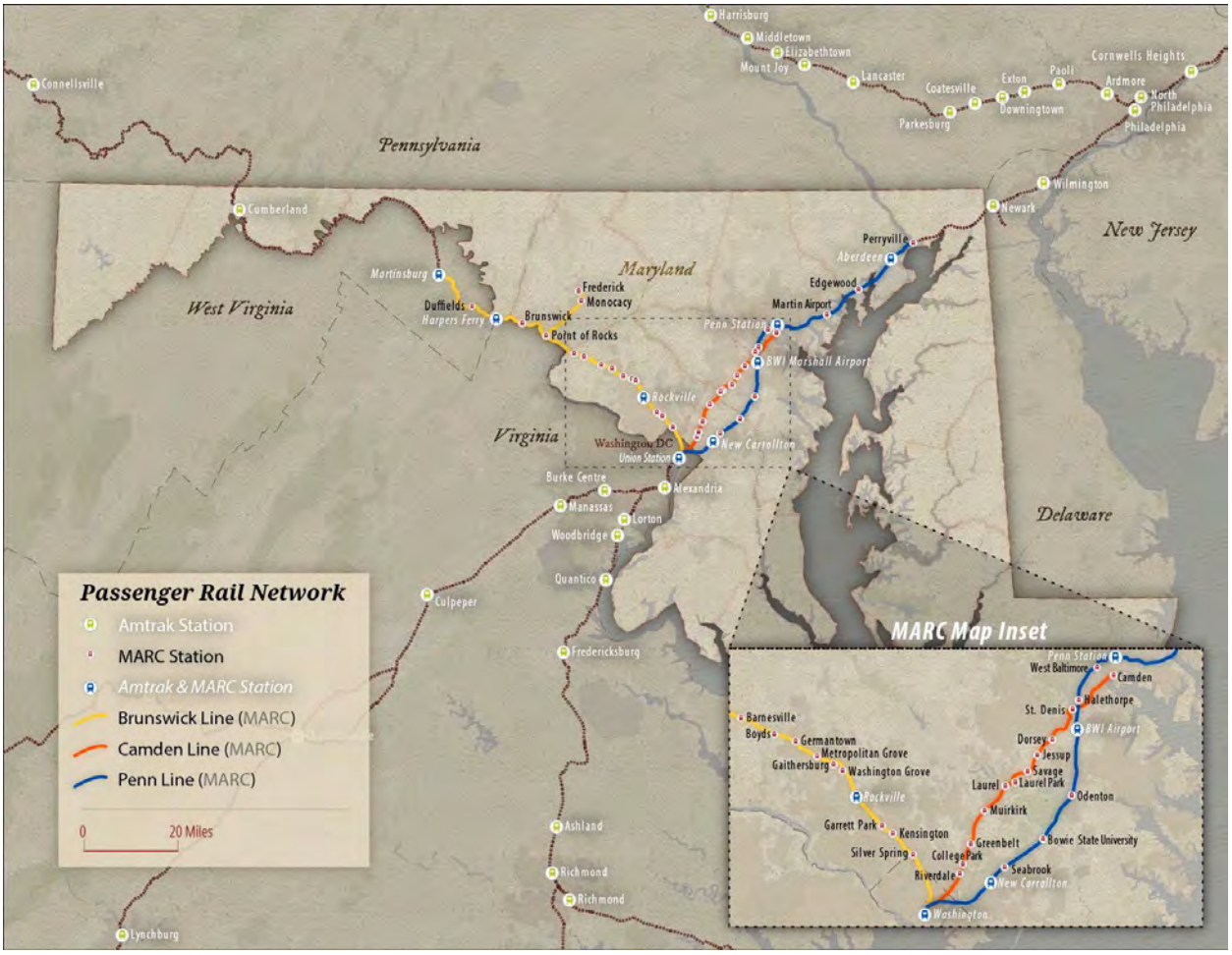


Source: Railroad survey and websites

Passenger Rail Service in Maryland

Amtrak provides intercity passenger rail service in Maryland while commuter rail is provided by MDOT MTA MARC Train service. Figure 2-8 depicts Amtrak and MARC stations and routes in Maryland.

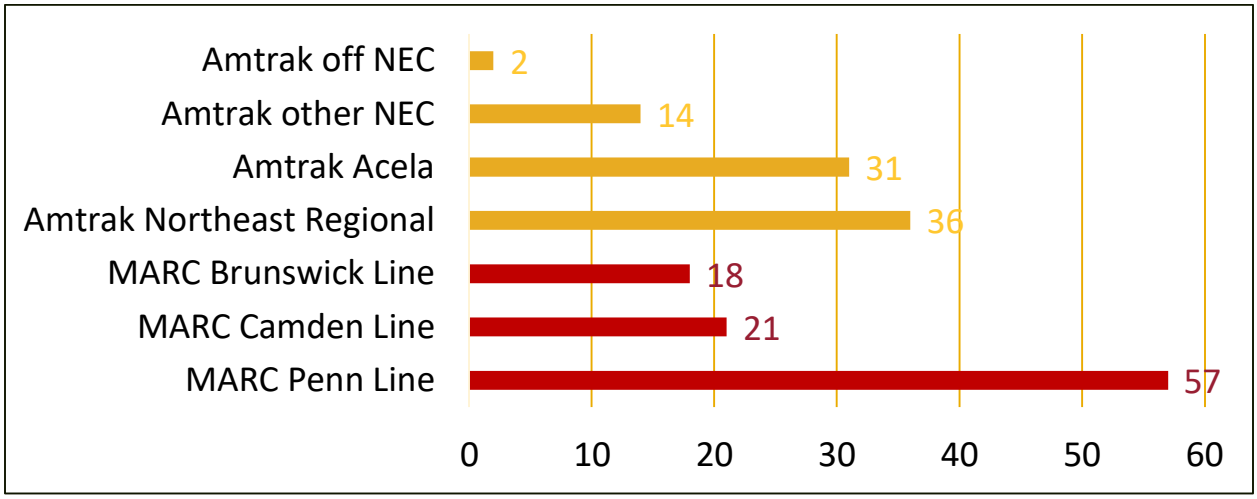
Figure 2-8. Passenger Rail Corridors and Stations in Maryland



Source: MDOT

More than 170 passenger trains operated in Maryland on a typical weekday in 2019. The most frequent of these services was provided by MARC on the Penn Line with 57 trains per day, followed by the Amtrak Northeast Regional and the Amtrak Acela service. These services operate on the Amtrak Northeast Corridor (Figure 2-9). Other less frequent services operate off of the Northeast Corridor.

Figure 2-9. Weekday Passenger Trains in Maryland, 2019



Source: MARC Cornerstone Plan, Amtrak Northeast Corridor 2019 schedule

AMTRAK SERVICES IN MARYLAND

Amtrak operates multiple services in Maryland:

- **Acela and Northeast Regional Service.** These services operate on Amtrak's Northeast Corridor, generally between Washington, DC, and New York or Boston, providing the highest frequencies with the greatest ridership. Acela and Northeast Regional trains operating strictly along the Northeast Corridor are considered self-supporting in that operating costs cover operating revenues, and operating subsidies are not required.
- **State-supported corridor routes.** Some Northeast Regional trains operate beyond Washington, DC, to points in Virginia, with operating costs for services off the Northeast Corridor subsidized by the Commonwealth of Virginia. In addition to Northeast Regional Services extending into Virginia, Maryland also is served by two state-supported services, the daily *Carolinian* supported by North Carolina between New York and Charlotte, NC, serving approximately 245,000 passengers annually, and the daily *Vermonter,* supported by the states of Connecticut, Massachusetts, and Vermont, between Washington, DC, and St. Albans, VT, serving about 100,000 passengers annually.
- **Long-distance.** Long-distance trains are defined by PRIIA as serving routes of 750 miles or greater, and operating costs are subsidized by the federal government. Maryland is served by seven Amtrak long-distance trains, including the *Crescent*, *Palmetto*, *Silver Meteor*, *Silver Star*, and *Cardinal*, operating on the Northeast Corridor. In addition, the *Capitol Limited* operates in Maryland and West Virginia on CSX's Metropolitan and Cumberland Subdivisions on its route between Washington, DC, and Chicago. Long-

distance train routes are more than 750 miles. All long-distance services in Maryland operate daily except for the *Cardinal*, which operates three days per week. The *Capitol Limited* is the sole Amtrak service that does not operate on the NEC through Maryland. It operates on CSX's Metropolitan and Cumberland Subdivisions between Silver Spring, MD, and Cumberland, MD, partially operating through West Virginia.

While Maryland does not directly support any Amtrak services, the state provides annual funding for the Northeast Corridor through the MARC Penn Line Access Agreement as provided by the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) and governed by the Northeast Corridor Commission. This funding arrangement is similar to others between Amtrak and states served by the Northeast Corridor Commission, including Delaware, Pennsylvania, New Jersey, New York, Connecticut, Rhode Island, and Massachusetts.

A summary of all Amtrak routes serving Maryland is depicted in Table 2-4.

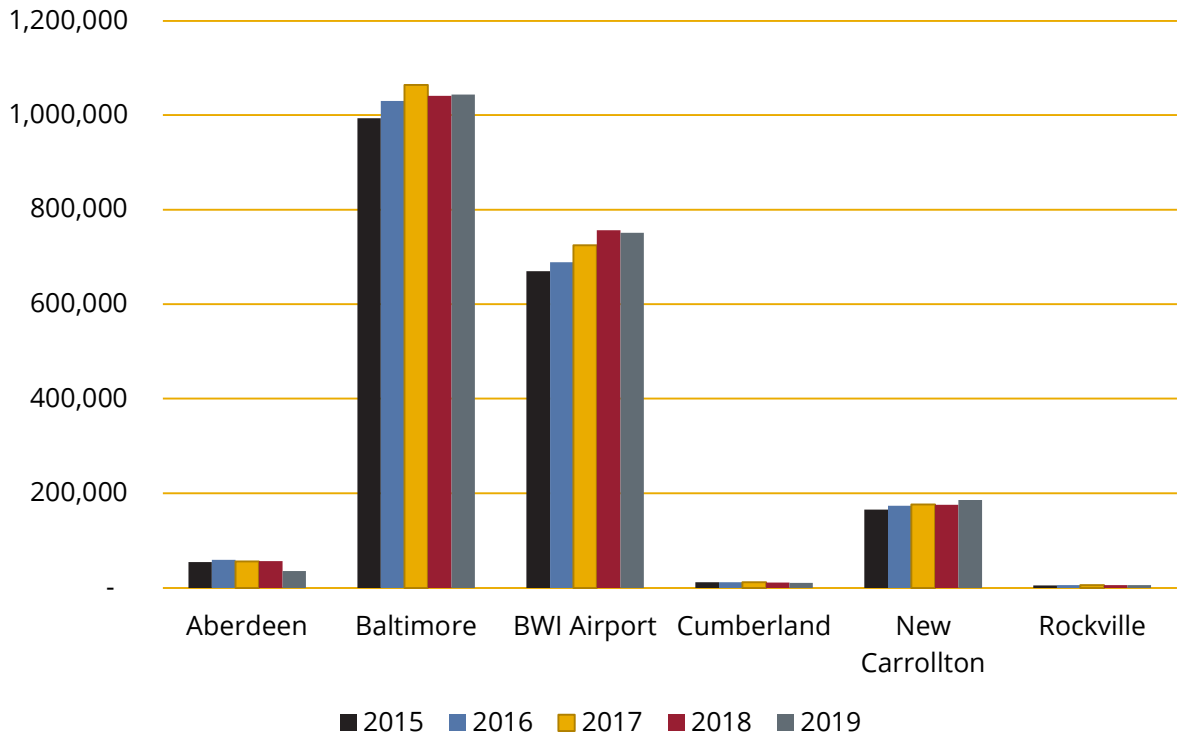
Table 2-4. Amtrak Routes Serving Maryland

ROUTE NAME	ORIGIN	DESTINATION	2019 WEEKDAY FREQUENCY	2019 RIDERSHIP	CATEGORY
Acela Express	Washington, DC	Boston, MA	16 Roundtrips	3,577,455	NEC
Capitol Limited	Chicago, IL	Washington, DC	Daily	209,578	Long Distance
Cardinal	Chicago, IL	New York, NY	Three Days per Week	108,935	Long Distance
Carolinian	Charlotte, NC	New York, NY	Daily	244,779	State-Supported
Crescent	New Orleans, LA	New York, NY	Daily	295,180	Long Distance
Northeast Regional	Virginia/ Washington, DC	Boston, MA	19 Roundtrips	8,940,745	NEC/State-Supported (Virginia services)
Palmetto	Savannah, GA	New York, NY	Daily	345,342	Long Distance
Silver Meteor	Miami, FL	New York, NY	Daily	353,466	Long Distance
Silver Star	Miami, FL	New York, NY	Daily	389,995	Long Distance
Vermonter	Washington, DC	St. Albans, VT	Daily	99,280	State-Supported

Source: Amtrak

Amtrak serves six stations in Maryland, four of which lie on the Northeast Corridor and two on CSX's Metropolitan and Cumberland Subdivisions along the *Capitol Limited* route. Pre-COVID, Amtrak ridership in Maryland was steadily growing from 1.9 million Maryland station boardings and alightings in federal fiscal year (October to September) (FFY) 2015 to 2.03 million in FFY 2019. Stations at New Carrollton and Baltimore/Washington International Thurgood Marshall (BWI Marshall) Airport experienced the largest proportional growth during this period, at 12.6% and 12.2% respectively. Aberdeen saw the largest proportional decline in passenger boardings and alightings between FFY 2015 and FFY 2019, which may be partially attributed to Amtrak Northeast Regional service changes during this period that resulted in fewer trains calling at Aberdeen. Boarding and alighting trends at Maryland Amtrak stations for FFY 2015-2019 are depicted in Figure 2-10.

Figure 2-10. FY 2015 – 2019 Amtrak Passenger Boarding and Detraining in Maryland by Station



Source: Amtrak

In addition to the Amtrak rail stations within Maryland, Union Station in Washington, DC, is a primary a rail hub serving many Maryland residents, particularly those residing in the suburbs of Washington, DC. Eight of the top 10 origin-destination pairs for boarding and

alighting at Maryland Amtrak stations include Baltimore Penn Station and BWI Marshall Airport. The top 10 origin-destination pairs in FFY 2019[12] include:

1. Baltimore – New York, NY
2. BWI Marshall Airport – New York, NY
3. Baltimore – Washington, DC
4. Baltimore – Philadelphia, PA
5. BWI Marshall Airport – Washington, DC
6. BWI Marshall Airport – Philadelphia, PA
7. New Carrollton – New York, NY
8. Baltimore – Newark, NJ
9. New Carrollton – Philadelphia, PA
10. BWI Marshall Airport – Newark, NJ

The Northeast Corridor spine services, such as the Acela Express and Northeast Regional services, provided the highest on-time performance (OTP) in FFY 2019, at 83.5% and 88.7%, respectively. These metrics apply to trains operating only between Washington, DC, New York, and Boston, and exclude Northeast Regional service operating south of Washington, DC. OTP for the state-supported *Vermonter* was also relatively high at 83.5%. Only these three Amtrak services in Maryland achieve Amtrak's OTP target of 80%.

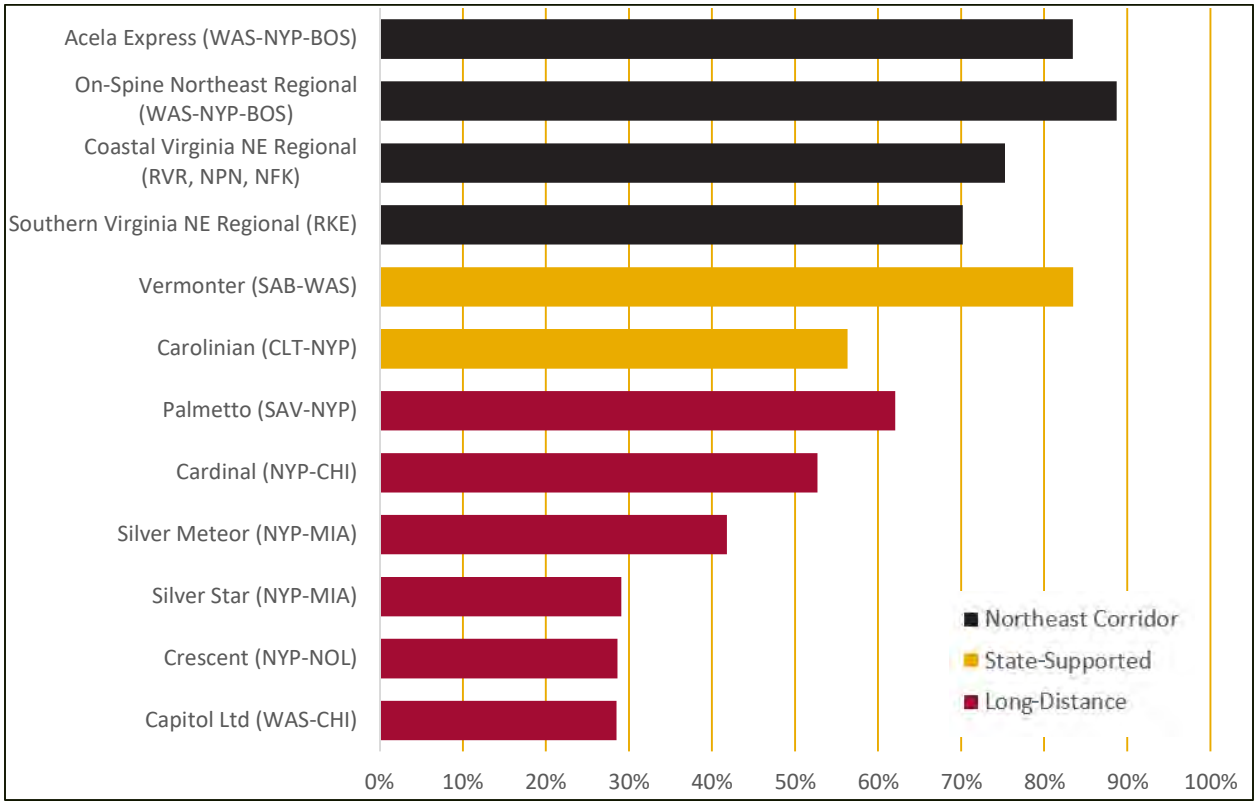
Amtrak operating beyond the NEC to and from points south of Washington, DC, provide lower OTP due to conflicts with traffic on host railroads, including CSX and NS. OTP rates for Northeast Regional trains serving Norfolk, Newport News, Richmond, and Roanoke markets are 75.3% and 70.2%, respectively. OTP rates for Long Distance trains operating beyond range between 62.1% and 28.6%. Long Distance services represent the lowest OTP performance, particularly those routes operating the longest distances, such as the *Silver Star* and *Crescent*.

The lowest OTP in Maryland for Amtrak service was provided by the *Capitol Limited* at 28.5%.

On-time performance for Amtrak services in Maryland are depicted in Figure 2-11.

[12] Rail Passengers Association

Figure 2-11. FY 2019 Amtrak On-Time Performance for Routes Serving Maryland



Source: Amtrak

MARC SERVICES

Commuter rail service in Maryland operates under the MARC brand, created in 1984 by the Maryland State Railroad Administration (SRA) and now a service of the MDOT Maryland Transit Administration (MDOT MTA). The MARC system today is comprised of three lines terminating at Washington, DC, Union Station: the Penn Line, Camden Line, and Brunswick Line.

The Penn Line operates on Amtrak's Northeast Corridor between Washington Union Station and Baltimore Penn Station, with limited service beyond north of Baltimore to Martin State Airport and Perryville. The Penn Line is a legacy Penn Central commuter service on the Northeast Corridor assumed by Conrail in 1976.[13] The Maryland Department of Transportation (MDOT) began subsidizing the Conrail service in 1977, continuing to 1983 when Amtrak was contracted to operate Penn Line service under the AMDOT brand

[13] Baer, Christopher. 2015. A General Chronology of the Pennsylvania Railroad Company Its Predecessors and Successors and Its Historical Context, 1976. http://www.prrths.com/newprr_files/Hagley/PRR1976.pdf

(Amtrak Maryland Department of Transportation).[14,15] Penn Line service came under the MARC brand in 1984 to be administered by MDOT.[15] Today, MDOT MTA contracts with Amtrak to operate Penn Line service.

The Camden Line operates on the CSX Capital and Baltimore Terminal Subdivisions between Washington Union Station and Baltimore Camden Station. The Camden Line is a legacy Baltimore & Ohio Railroad (B&O) commuter service for which MDOT began providing partial subsidy in 1974. A new operating agreement with B&O in 1975 provided for full state subsidy of the service.[16,17] Camden Line service came under the MARC brand in 1984 and is operated today under contract with Bombardier Transportation.

The Brunswick Line operates on the CSX Metropolitan and Cumberland Subdivisions between Washington Union Station and Martinsburg, WV with a branch to Frederick, MD. The Brunswick Line also is a legacy B&O commuter service partially subsidized by MDOT in 1974 and fully subsidized under the new operating agreement of 1975.[16,17] Brunswick Line service came under the MARC brand in 1984. MDOT MTA had contracted with CSX until 2011. The operating contract is rebid every few years. Currently Bombardier Transportation operates Brunswick Line service, although this contract ends in 2023.

MARC system ridership remained steady from 2010 - 2019. The most significant change in ridership during this period is attributed to new weekend service on the Penn Line beginning in 2015. Average daily boardings for Weekend Penn Line service has grown to levels similar to that of weekday Camden Line service. Average daily MARC boardings have declined slightly since 2016. Average daily boardings for MARC services are depicted in Figure 2-12.

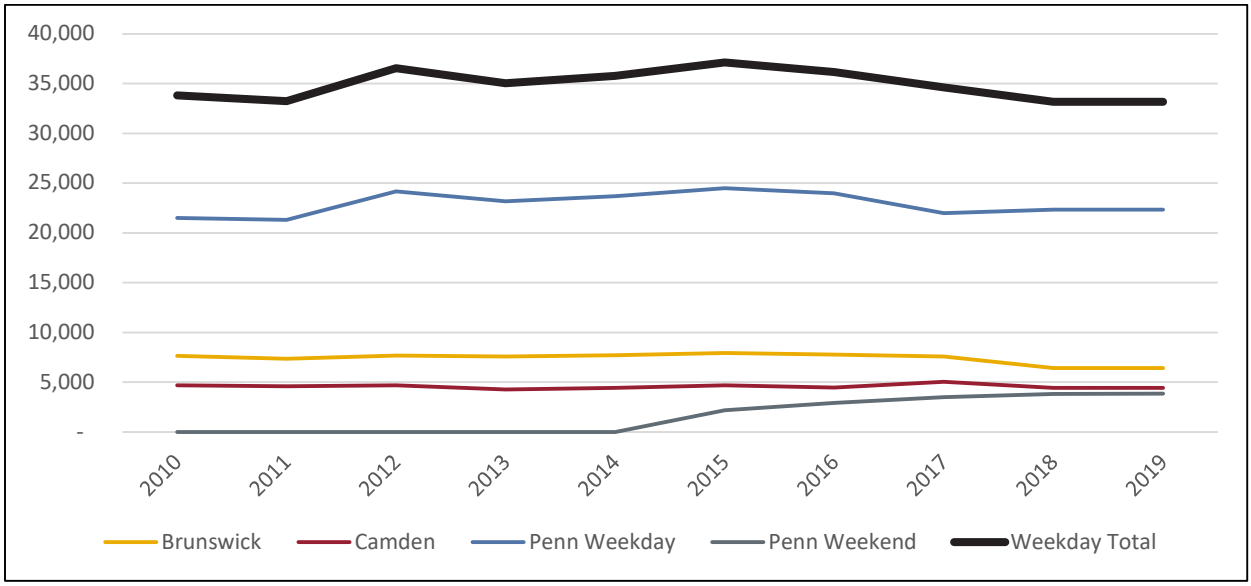
14 Baer, Christopher. 2015. A General Chronology of the Pennsylvania Railroad Company Its Predecessors and Successors and Its Historical Context, 1977. http://www.prrths.com/newprr_files/Hagley/PRR1977.pdf

15 Baer, Christopher. 2015. A General Chronology of the Pennsylvania Railroad Company Its Predecessors and Successors and Its Historical Context, 1980-1989. http://www.prrths.com/newprr_files/Hagley/PRR1980.pdf

16 Baer, Christopher. 2015. A General Chronology of the Pennsylvania Railroad Company Its Predecessors and Successors and Its Historical Context, 1974. http://www.prrths.com/newprr_files/Hagley/PRR1974.pdf

17 MTA. History of MARC Train. https://web.archive.org/web/20100117174532/http://mtamaryland.com/about/transitprofiles/MARC_History.cfm

Figure 2-12. 2010 - 2019 Average Daily Boardings by MARC Route



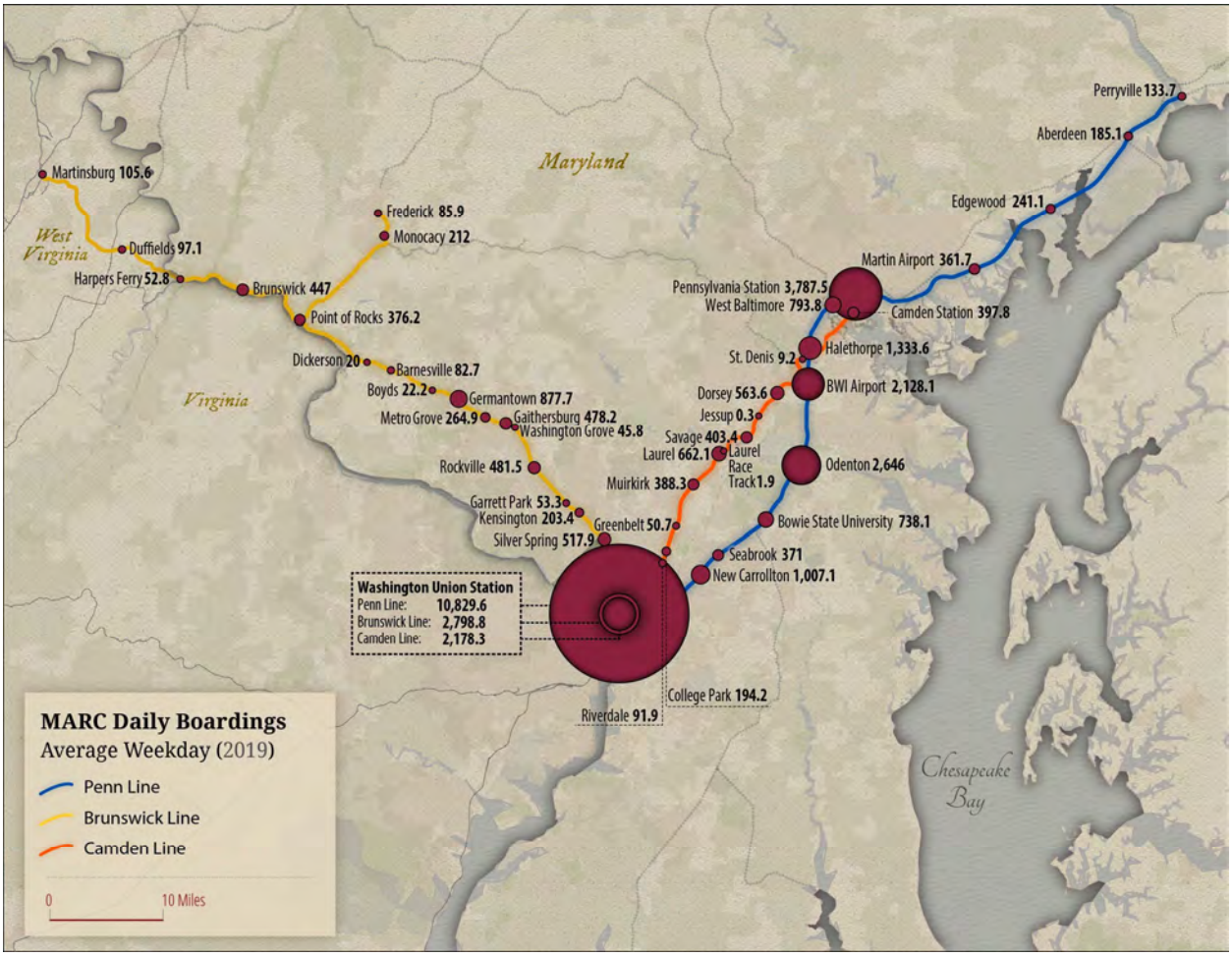
Source: MTA

Washington Union Station is the busiest in the MARC system with nearly 16,000 average weekday boardings in 2019. The busiest stations on the MARC system in Maryland are located on the MARC Penn Line, with Baltimore Penn Station at the top with almost 4,000 average daily boardings. Other top stations include Odenton (2,600), BWI Marshall Airport (2,200), Halethorpe (1,400), and New Carrollton (1,000).

Brunswick Line stations are busiest between Union Station and Point of Rocks where train frequencies are greatest. Frederick trains diverge at Point of Rocks while trains for Brunswick and Martinsburg continue on CSX's Metropolitan and Cumberland Subdivisions. The busiest Brunswick Line station is Germantown (882), followed by Silver Spring (501), Gaithersburg (490), Rockville (485), and Brunswick (450).

Camden Line stations see fewer daily boardings compared to other MARC Lines. The busiest Camden Line station is Laurel (655), followed by Dorsey (568), Savage (407), Camden (402), and Muirkirk (395).

Figure 2-13. MARC 2019 Average Daily Boardings by Station

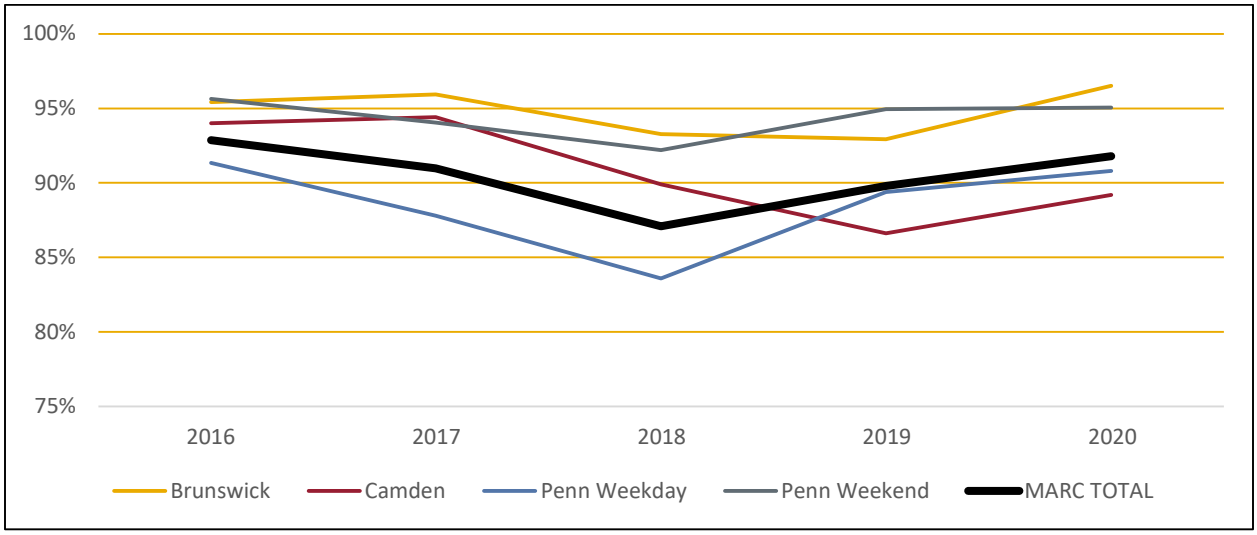


Source: MTA

The average OTP rate for all MARC lines was 92% in 2020. Nearly all lines were at or above 90%, with some fluctuations. The Brunswick Line performed best, with an average OTP of 96.5% in 2020. Between 2016 and 2020, the Brunswick Line's OTP rate averaged between 93% and 96%. OTP rates for Weekend Penn Line fluctuated between 92% and 95% and achieved an average OTP rate of 95% in 2020.

Weekday Penn Line service and the Camden Line experienced the greatest fluctuation in OTP between 2016 and 2020. Weekday Penn Line OTP dropped to a low of 84% in 2018 before recovering to 91% in 2020. Amtrak was doing significant track work in 2018, and at one point trains were operating at two thirds normal track capacity. Camden Line OTP dropped from a high of 94% in 2017 to a low of 87% in 2019. Since 2019, Camden Line OTP has improved to 89%. MARC OTP trends between 2016 and 2020 are depicted in Figure 2-14.

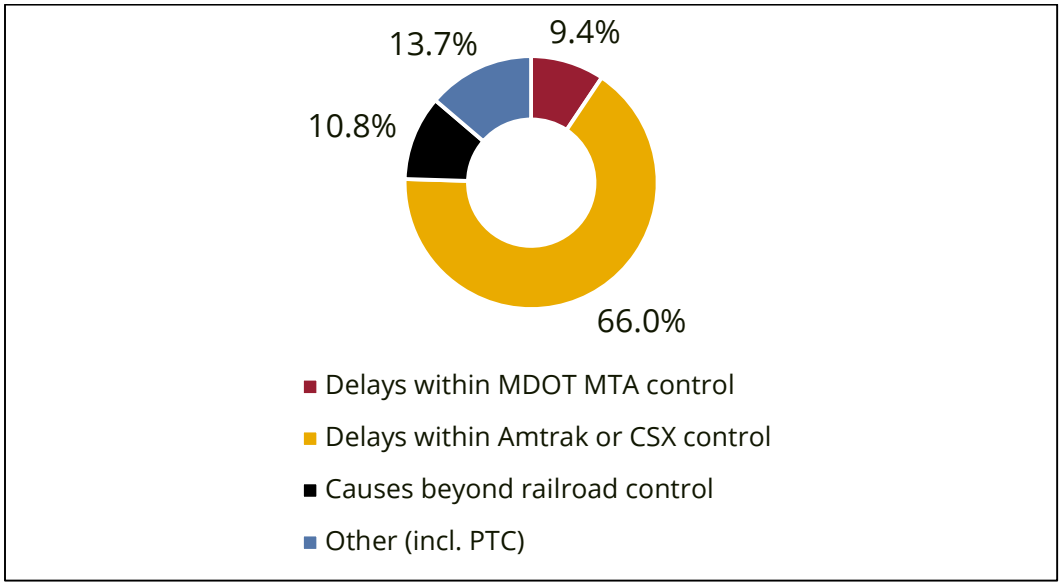
Figure 2-14. 2016 - 2020 On-Time Performance



Source: MTA

MARC experienced 3,893 delays in 2019, totaling almost 60,000 minutes. More than half of these delays (66% of all delay minutes) are reported as being beyond MDOT MTA's control, attributed to CSX (Brunswick and Camden lines) and Amtrak (Penn Line). Remaining delay minutes are attributed to other delays including positive train control or secondary delays (13.7%), causes beyond railroad control (10.8%), and MDOT MTA-related delays including equipment, personnel, or passenger delays (9.4%). 2019 causes of delay are depicted in Figure 2-15.

Figure 2-15. 2019 MARC Causes of Delay



Source: MTA

Causes of train delays vary by line, with the Brunswick Line experiencing the greatest proportion of delay minutes due to causes beyond railroad control at 30%, compared to 17% for the Camden Line and 5% for the Penn Line. The Penn Line reported the greatest proportion of delay minutes attributed to the host railroad or Amtrak at 75%. Comparatively, 30% of Brunswick Line delay minutes and 17% of Camden Line delay minutes are attributed to CSX. Most often, delays attributable to host railroads relate to dispatching policies and decisions.

MARYLAND PASSENGER STATIONS

Thirty-nine active passenger rail stations are located in Maryland along the NEC, MARC Camden Line, MARC Brunswick Line, and Amtrak's *Capitol Limited* route. Of these, five are shared Amtrak/MARC stations, one is an Amtrak-only station (Cumberland), and 33 are MARC-only stations. Station facilities range from large historic station buildings and concourses such as Baltimore's Penn Station to small asphalt platforms with shelters seen at small stations, such as Boyds. Twenty-two stations provide waiting rooms open during various hours, though most are open only during limited peak hours. Sixteen stations provide canopies or small enclosed shelters, and Laurel Racetrack provides neither platform shelters nor a waiting facility.

Figure 2-16. Boyds MARC Station

Source: Montgomery County Department of Transportation

Stations settings vary from dense urban centers to suburban park-and-ride locations, and centers of suburban or rural towns. Many busy suburban stations feature large parking decks and surface lots to accommodate park-and-ride commuters. Implementation of improvements to parking, bicycle and pedestrian accessibility, and transit bus access, such as those planned by Montgomery County at the Boyds MARC station can increase ridership on passenger rail. Detailed information pertaining to passenger rail stations in Maryland are depicted in Appendix D.

Figure 2-17. Baltimore Penn Station

Source: MDOT Photo Archives

Public Funding and Financing

Funding sources for rail projects and operations in the United States vary according to ownership, operation, and public benefit. Private railroad companies typically fund their own capital expenditures and operating expenses from freight revenues. Public entities can fund capital projects not considered a high priority for goods movement to private railroad companies in the interest of public safety or transit benefits. Passenger services are typically subsidized by the public sector to ensure the public benefit provided by passenger rail operations. Intercity passenger operations on the Amtrak Northeast

Corridor in Maryland are considered self-supporting, but capital needs exceed ticket revenue and are largely supported by the public sector. One quarter of Maryland's rail mileage supports both freight and passenger services, with maintenance and capital costs shared by operators.

STATE FUNDING FOR RAIL

Transportation Trust Fund

In Maryland, transportation projects, including rail needs, are funded primarily from an integrated account called the Transportation Trust Fund (TTF), with the following revenue sources:

- Motor Fuel Tax
- Operating Revenues
- Rental Car Sales
- Federal Aid
- Titling Tax
- Motor Vehicle Taxes and Fees
- Corporate Income Tax
- Bond Sales

Funds from the TTF are not earmarked for specific agencies or programs, which affords Maryland flexibility in meeting varying service and infrastructure needs to support its transportation system. All MDOT activities, including debt service, maintenance, operations, administration, and capital projects, are supported by the TTF, except those of the MDTA that are funded primarily by toll and concessions revenues. Unexpended TTF funding remaining at the close of the fiscal year is carried over into the following fiscal year and does not revert to the state's General Fund.

The state of Maryland does not provide a specific or dedicated funding source for rail projects or operations, which are funded through the TTF. This includes funding for MARC projects and service, and support for the maintenance and improvements to short line freight lines owned by MDOT MTA.

FEDERAL FUNDING FOR RAIL

Federal funding for intercity and freight passenger rail projects is provided primarily through competitive discretionary grant programs. MDOT has leveraged discretionary grants to fund more significant improvements exceeding the capacity of the state

transportation budget. Federal discretionary grant programs typically require a 20-50% non-federal match.

Railroad Crossing Safety Program

The Maryland Department of Transportation State Highway Administration (MDOT SHA) Office of Traffic and Safety (OOTS) leads Maryland's traffic safety programs and assures that state highways operate safely and efficiently. OOTS administers Maryland's federal aid Railway-Highway Crossing (Section 130) Program, which is authorized by United States Code Title 23, Section 130, and the only federal funding program specifically carved out for freight and intercity rail. The goal of this fund, commonly referred to as "Section 130," is to reduce the crash risk at public highway-rail grade crossings. The federal funding share for this program has been 90%, but the 2021 Infrastructure Investment and Jobs Act (IIIJA) increases federal funding to 100%.

Discretionary Rail Programs

The most recent transportation authorization bill, the 2021 Infrastructure Investment and Jobs Act (IIIJA), includes $66 billion in new funding for rail between federal fiscal year 2022 and 2026. This is a significant increase from previous federal funding levels.

Consolidated Rail Infrastructure and Safety Improvements Program

The Consolidated Rail Infrastructure Safety and Improvements (CRISI) program, authorized under the IIIJA, is intended to fund projects that improve the safety, efficiency, and/or reliability of intercity passenger and freight rail systems and is authorized at $5 billion or $1 billion per year. In 2020, Maryland was awarded up to $2.5 million in CRISI funds to rehabilitate approximately 1,960 feet of track near Worton on the Chestertown Line on the Eastern Shore. In 2019, up to $18.8 million was awarded to the Delmarva Central Railroad for critical ongoing railroad rehabilitation activities in Delaware, Maryland, and Virginia, including refurbishing a movable bridge and improving grade crossings on the Lower Eastern Shore.

Federal-State Partnership for Intercity Passenger Rail Grants

Authorized at $36 billion or $7.2 billion per year, this is an expansion of a previous program that had focused on rehabilitating and replacing aging infrastructure on the Northeast Corridor. The program has been expanded to include performance improvements or new services, planning, and environmental studies. At least 45% of funds are dedicated to Northeast Corridor projects, with at least 45% dedicated to projects off the Northeast Corridor. Up to 5% of the program funding is dedicated to the Corridor Identification and Development Program for the development of new intercity passenger rail corridors.

Restoration and Enhancement Grants

This program authorizes $50 million per year toward operating subsidies for intercity passenger rail routes. The program's priority is to restore service to routes where Amtrak service has been discontinued, but could also support services "that would enhance connectivity and geographic coverage of the existing national network of intercity rail passenger service." This suggests that routes where intercity passenger service has not existed since Amtrak began operations in 1971 could be eligible as well. The federal government would pay up to 90% of subsidies in the first year and up to 30% in the sixth year for up to six years of service.

Railroad Grade Crossing Elimination Grant Program

This program authorizes a total of $500 million at $100 million per year to improve safety at highway-rail grade crossings. The program focuses eliminating at-grade crossings through closure, grade separation, or track relocation. Program funds also may fund crossing improvements such as installation of protective devices.

Multimodal Discretionary Grant Programs

Several federal grant programs are not specific to a single mode of transportation, but been used for rail have in the past. Additionally, the IIJA created the new multimodal National Infrastructure Project Assistance Program, known as the "Mega Projects" program.

Rebuilding American Infrastructure with Sustainability and Equity

The US Department of Transportation's (USDOT) Rebuilding American Infrastructure with Sustainability and Equity (RAISE) grant supersedes the Better Utilizing Investments in Leveraging Development (BUILD) grant program and is another source of discretionary federal funding for rail projects. RAISE is a highly competitive grant program providing funding for road, rail, transit, bike/pedestrian, and port projects that support economic competitiveness, state of good repair, quality of life, sustainability, and safety. In 2009, $98 million was awarded for the CSX National Gateway Initiative to improve the clearance of the CSX corridor passing through Maryland, West Virginia, Pennsylvania, and Ohio. MDOT Maryland Port Administration received a $10 million grant in 2013 to complete the Port of Baltimore Enhancements Project, which included construction of a new rail auto ramp. Under the IIJA, the RAISE program will be funded at $7.5 billion for five years or $1.5 billion per year.

Infrastructure for Rebuilding America Grant Program

Infrastructure for Rebuilding America (INFRA) is a grant program established by the FAST Act to provide funding for Nationally Significant Freight and Highway Projects. INFRA is a

competitive grant program like RAISE, focused specifically on highway, rail, and intermodal freight projects of regional or national significance. Funding for INFRA was authorized under the IIJA FFY 2022–2026 for $8 billion. Up to 30% of these funds may support non-highway projects. Eighty-five percent of INFRA grants are reserved for "large projects" with a cost of at least $100 million. A minimum 40% match is required, some of which may be met with other federal funds (up to a maximum of 80% federal funds). The Howard Street Tunnel Project received a $125 million INFRA grant in 2019. As with BUILD, INFRA is oversubscribed. In 2020, 172 projects applied for funding with only 20 awarded funds totaling $906 million.

National Infrastructure Project Assistance Program ("Mega Projects")

Authorized at $5 billion, this program would provide grant funds for single or multiple years to carry out high-cost complex projects, or "mega projects," including freight or passenger rail projects and projects to eliminate highway-rail grade crossings with grade separation or closure. Projects eligible for funding under this program must either be more than $500 million or between $100 and $500 million (50% of funding reserved for projects in this category).

Other Federal Programs

Amtrak Capital Funding

The IIJA dramatically increases Amtrak capital funding from previous levels, providing $1.2 billion per year toward the NEC and $3.2 billion per year toward the national network.

National Highway Freight Program

Up to 30% of a state's apportionment of National Highway Freight Program (NHFP) funds may be spent on rail, port, and intermodal projects under IIJA. This program is otherwise focused on highway projects and is funded at $1.4 billion annually for FFY 2022 - FFY 2026. Maryland was apportioned $2.26 million in FFY 2020 funds from the NHFP eligible for intermodal and rail freight projects.

Economic Development Administration Grants

The US Economic Development Administration (EDA) grant and loan assistance programs support local organizations with economic development, focusing on economically distressed communities.[18] Two of these EDA grant programs provide funding for rail-related technical assistance, planning, and infrastructure.

[18] For additional detail, see the EDA website: https://www.eda.gov/programs/eda-programs/

Federal Highway Administration Congestion Mitigation and Air Quality

The Congestion Mitigation and Air Quality (CMAQ) program provides a flexible funding source to state and local governments for transportation projects and programs to meet the requirements of the Clean Air Act. Funding is available to reduce congestion and improve air quality for areas that do not meet the National Ambient Air Quality Standards for ozone, carbon monoxide, or particulate matter (nonattainment areas), and for former nonattainment areas that are now in compliance (so-called "maintenance" areas). The federal matching share for these funds is 80%. Currently, 12 Maryland counties[19] are nonattainment or maintenance areas eligible to receive CMAQ funding for projects that reduce vehicular emissions, including rail projects. Programming of selected CMAQ projects relies on criteria set forth in the Maryland Consolidated Transportation Program (CTP). Funding of programmed projects by MDOT focuses primarily on transit projects, such as MARC services.

The IIJA apportioned $2.6 billion per year for the CMAQ program from FFY 2022 through FFY 2026. Examples of CMAQ-funded freight rail projects include intermodal facilities, diesel engine retrofits, idle-reduction projects in rail yards, and track rehabilitation. MDOT MTA utilized $290,000 in CMAQ toward the $7.2 million cost of new higher-capacity MARC coaches.

Financing Mechanisms for Rail Investments in Maryland

Financing mechanisms provide funding for a project or service prior to the project generating revenue to support the investments. Unlike grant programs and direct funding mechanisms, financing mechanisms generally create a future financial obligation to the entity providing the financing.

Federal Credit Programs

The USDOT offers a variety of debt and credit assistance tools that may support passenger and freight rail projects. The two primary tools available to support rail projects include:

- **Railroad Rehabilitation & Improvement Financing:** The FRA's Railroad Rehabilitation and Improvement Financing (RRIF) program provides direct loans and loan guarantees to finance development of railroad infrastructure. The program is capitalized up to $35 billion, with $7 billion reserved for projects benefiting Class II and Class III railroads. The RRIF program is currently undersubscribed, with only $5.4 billion in outstanding loans. Of these, $3.1 billion represents loans to Amtrak another $1.5 billion loans to transit and local government agencies, with most of the remainder representing loans

[19] Table of counties and pollutants: https://www3.epa.gov/airquality/greenbook/anayo_md.html

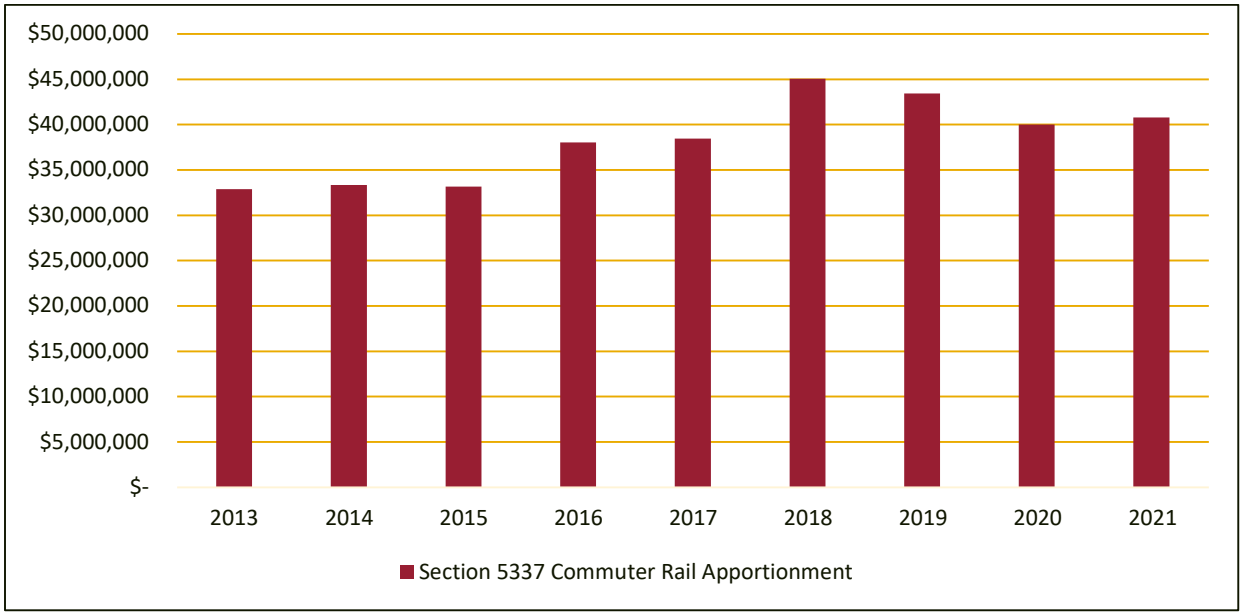
to Class II and III railroads. Potential borrowers have identified the long approval period (averaging nine months just to approve the application as complete) and costs of application as reasons for the program's underutilization. RRIF was re-authorized under the FAST Act in December 2015, which expanded the scope of eligible projects, shortened review times, and provided more transparency in the process.

- **Railroad Rehabilitation & Improvement Financing Program (RRIF) Express:** The RRIF Express program is designed particularly for Class II and Class III railroads as the only eligible applicants (including joint ventures that include one Class II and Class III railroad entity as eligible applicant). RRIF Express aims to reduce the time and costs associated with securing loans to modernize aging freight rail infrastructure. Offering low-cost financing (2.25%) and expedited processing times, the program allows borrowers with a well-documented financial history and readily identified revenue streams to finance projects. Eligible projects include track improvement, bridge rehabilitation, acquisition of rolling stock, planning and design, and refinancing non-federal debt.
- **Transportation Infrastructure Finance and Innovation Act:** The Transportation Infrastructure Finance and Innovation Act (TIFIA) program provides credit assistance in the form of direct loans, loan guarantees, and standby lines of credit (rather than grants) to projects of national or regional significance. Under the TIFIA requirements, state governments, state infrastructure banks, special authorities, local governments, and even private parties can request minimum assistance of $50 million for all projects ($10 million for rural projects). TIFIA assistance is limited to 33% of total project costs and requires a dedicated repayment source pledged to secure the debt financing.

Federal Transit Administration Funding for MARC

MARC has its own set-aside from Federal Transit Administration (FTA) in Section 5537 formula apportionments (under High-Intensity Fixed Guideway). (See Figure 2-18.) MARC also receives money under Section 5307 Urbanized Area formula apportionments where 33.39% of total Section 5307 funds are dedicated to Rail Tier and divided among MARC, Light Rail, and Metro. The IIJA increases Federal Transit Administration funding by 42% on average from FFY 2021 funding levels.

Figure 2-18. MARC Section 5337 Commuter Rail Apportionment



Source: MARC

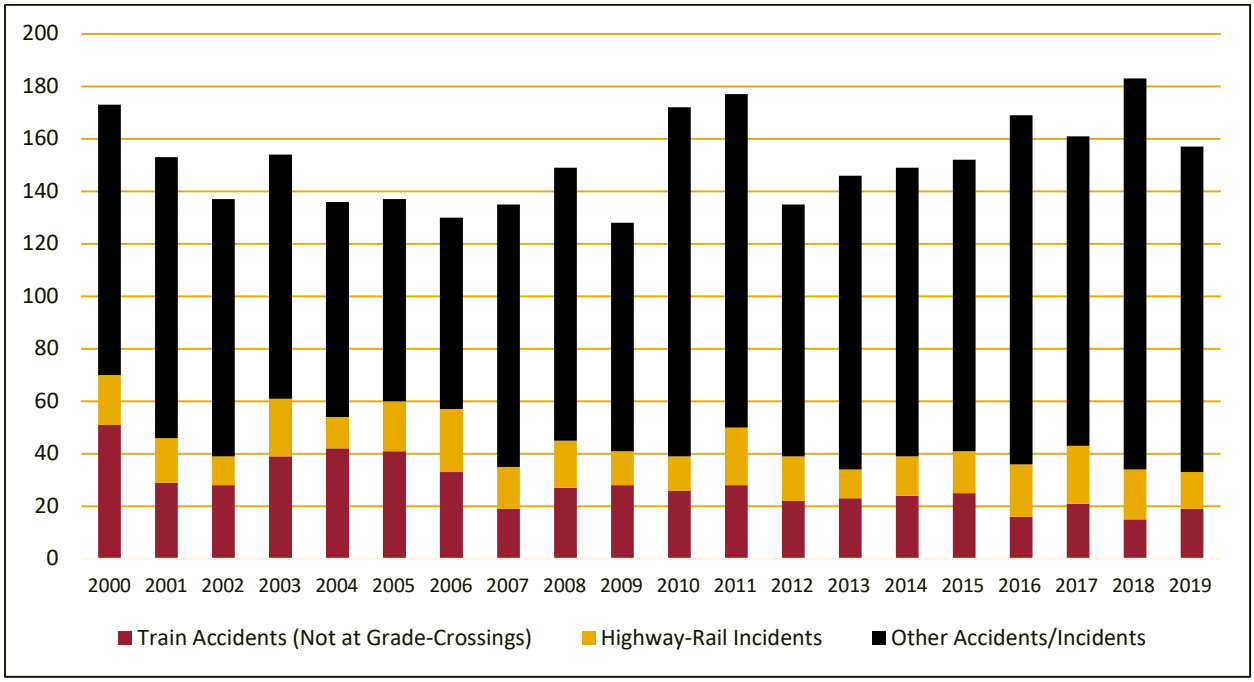
Safety Improvements

SAFETY TRENDS

Overall frequency of accidents and incidents[20] trends associated with Maryland's rail network during the past 20 years have not been consistent (Figure 2-19). Much of the inconsistency comes from accidents and incidents in the FRA's "Other" category, which decreased and then increased. Train accidents have declined, and the number of highway-rail incidents has declined slightly.

20 "Accident/Incident" is the term used by FRA to describe all reportable events. "These include collisions, derailments, and other events involving the operation of on-track equipment and causing reportable damage above an established threshold; impacts between railroad on-track equipment and highway users at crossings; and all other incidents or exposures that cause a fatality or injury to any person, or an occupational illness to a railroad employee." https://railroads.dot.gov/forms-guides-publications/guides/accidentincident-definitions

Figure 2-19. Rail-Related Accidents and Incidents in Maryland (20-Year Trend)



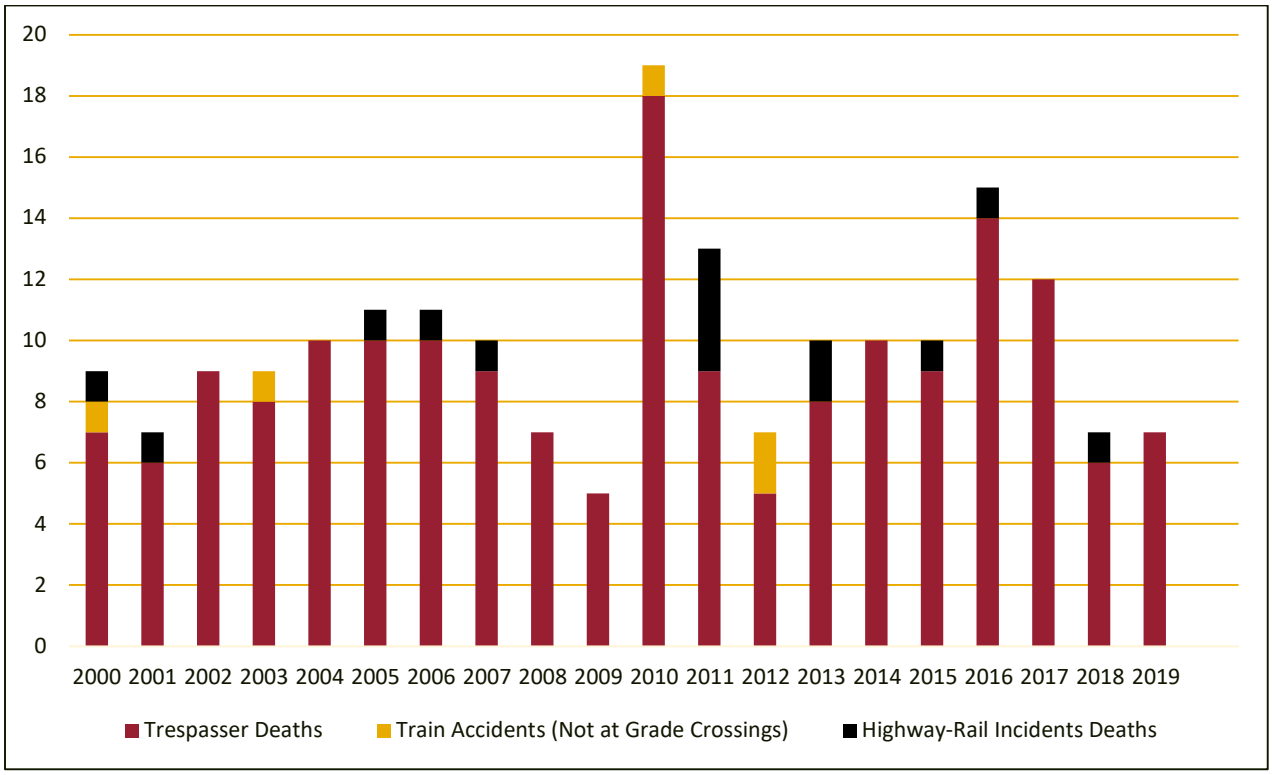
Source: FRA Safety Database

FRA's accident/incident categories are defined as follows:

- Train accidents are collisions and derailments of trains or other equipment that cause damage to railroad equipment, track, or structures. Accidents declined from an average of 34 per year between 2000 and 2009 to an average of 22 per year between 2010 and 2019.
- Highway-rail accidents are collisions between trains motor vehicles, bicycles, or pedestrians at highway-rail grade crossings. The frequency of these accidents declined slightly from 17.1 per year between 2000 and 2009 to 16.9 per year between 2010 and 2019. While the decrease may appear relatively minor, it is important to note that traffic levels increased on Maryland's roadway and rail network during that time, thus increasing potential for accidents/incidents. While the rate of accidents/incidents is relatively flat, safety improvements may be more significant when traffic growth also is considered.
- Other accidents/incidents do not fit into the first two categories. Railroad employees are required to report any work-related injuries or sickness, which are categorized as "other accidents/incidents." Incidents in which trespassers, railroad employees, or contractors are struck by trains also fall into the "other" category. Other accidents/incidents increased from an average of 92 occurrences per year between 2000 and 2009 to 121 per year between 2010 and 2019.

Most fatalities associated with Maryland's rail network are related to trespassing on railroad rights-of-way. As illustrated by Figure 2-20, fewer fatalities were associated with grade crossings or train incidents than trespassing.

Figure 2-20. Rail-Related Fatalities in Maryland (20-Year Trend)

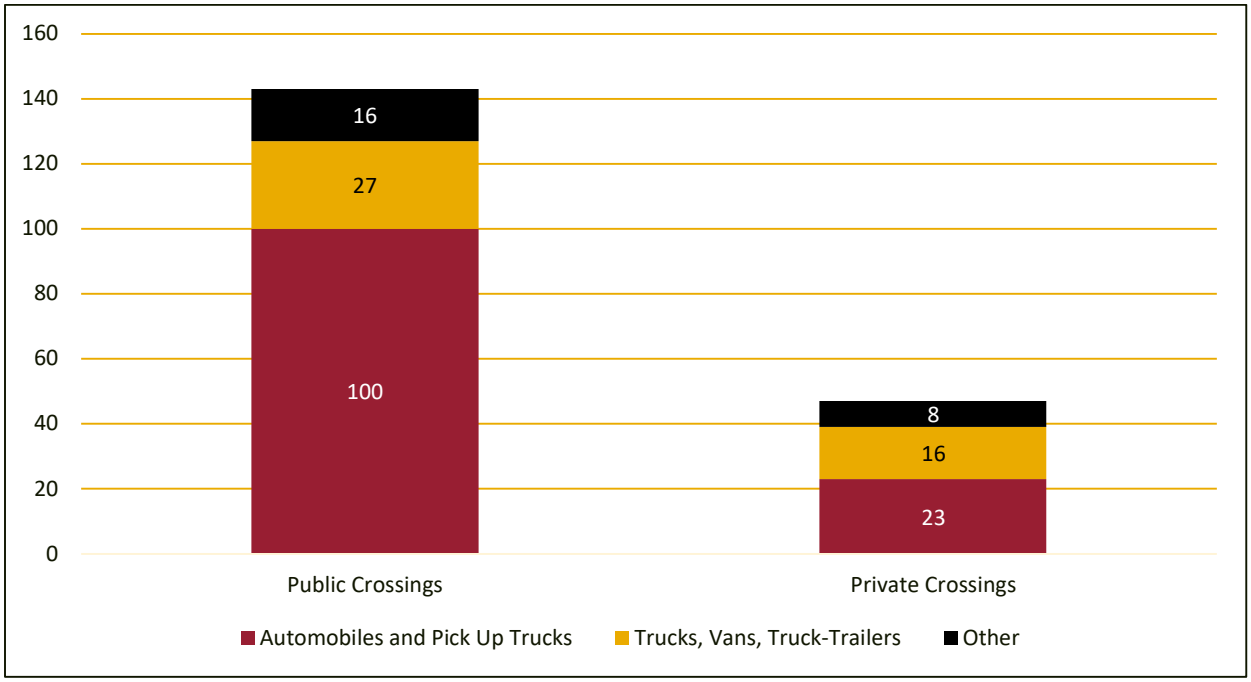


Source: FRA Safety Database

Between 2008 and 2019, 190 highway-rail accidents resulted in 9 deaths and 76 injuries. Of these 190 highway-rail accidents, 47 occurred where rail lines cross privately owned roads (private crossings) and the remaining 143 incidents occurred at public roadway crossings. More than half of the accidents at public crossings involved automobiles and pick-up trucks. Trucks, vans, and tractor trailers represent 14% of accidents at public crossings, but are involved in nearly half of accidents at private crossings. See Figure 2-21.

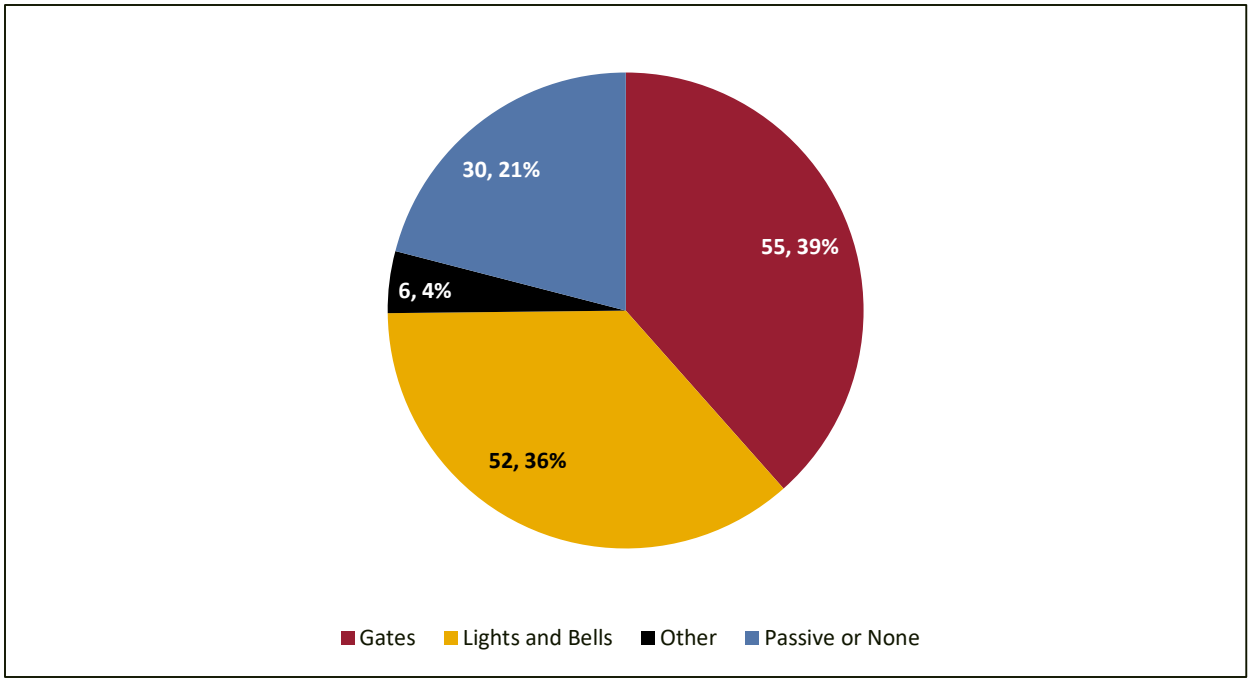
Thirty-nine percent of accidents at public crossings occurred at locations with active signal systems that included gate arms, 36% at crossings with active signal systems employing lights and bells, 21% at crossings with passive signals or no protection, and 4% at crossings with other types of protection. See Figure 2-22.

Figure 2-21. Public and Private Crossing Incidents by Vehicle Type, 2008-2019



Source: FRA Safety Database

Figure 2-22. Accidents at Public Crossings by Protection Type at Crossing, 2008-2019



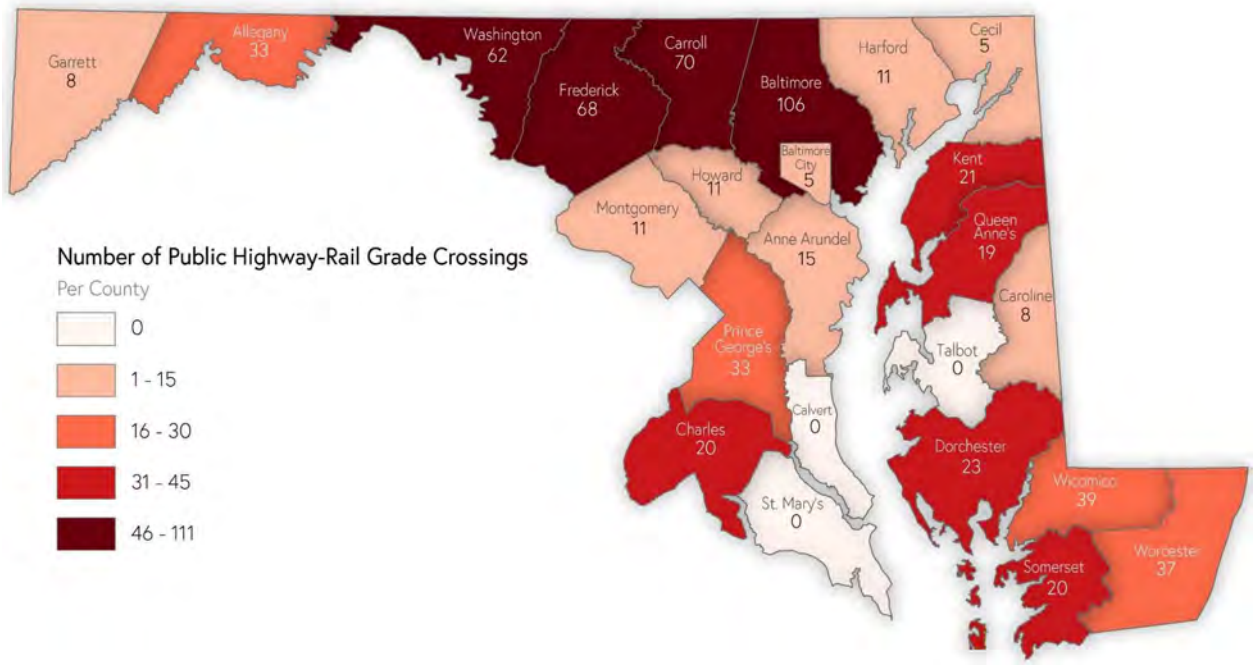
Source: FRA Safety Database

MARYLAND'S HIGHWAY-RAIL GRADE CROSSINGS

In 2019, there were 625 public highway-rail grade crossings in Maryland, of which 26% included active signal systems with gates and flashing lights (including one with four quadrant gates in Prince George's County), 35% included active signal systems with flashing lights, and 39% included passive signals or no protection.

Almost 50% of the state's public crossings are in five jurisdictions: Carroll, Frederick, Washington, and Baltimore counties; and Baltimore City. Figure 2-23 illustrates the number of crossings by county.

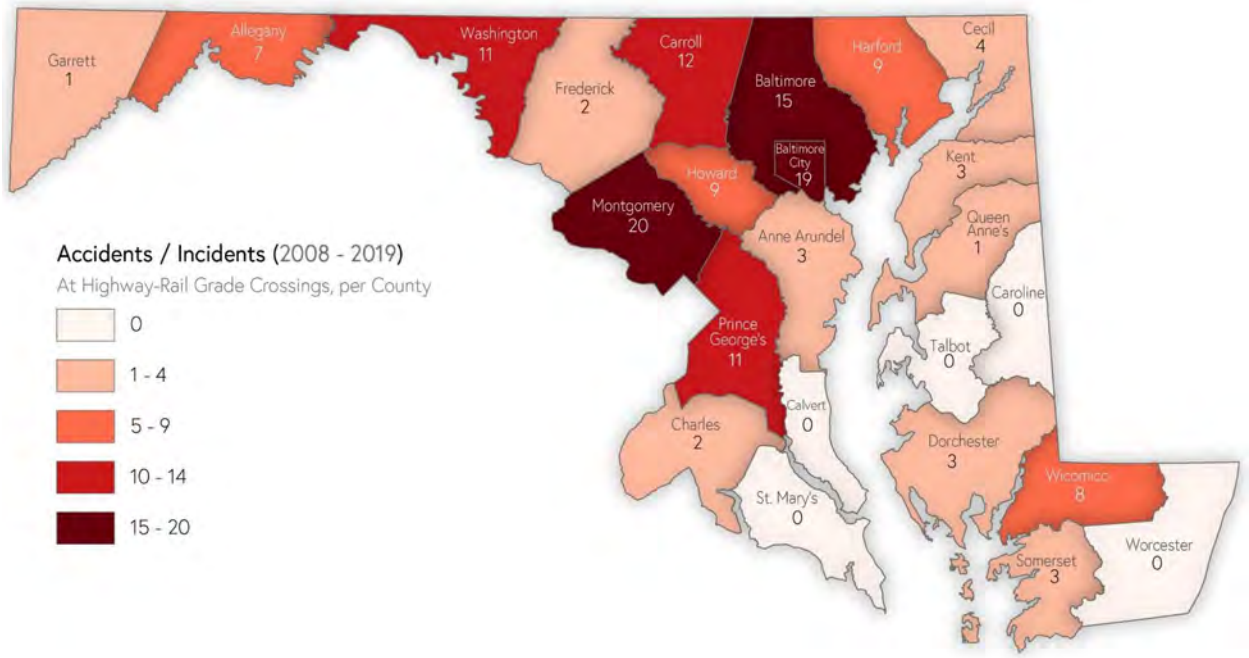
Figure 2-23. Public Highway-Rail Grade Crossings in Maryland



Source: FRA Safety Database

As illustrated by Figure 2-24, most public highway-rail grade crossing crashes have occurred in densely populated Baltimore, Montgomery, and Prince George's counties and Baltimore City. Montgomery County is over-represented in crashes per the number of crossings, with 20 crashes occurring at the county's 11 public crossings between 2008 and 2019. The majority of highway-rail crashes in Baltimore County occurred at crossings with passive signals or no protection. The majority of crashes in Montgomery County and Baltimore City occurred at crossings with gates and flashing lights. Crashes in Prince George's County are evenly distributed among crossings with active and passive controls.

Figure 2-24. Highway-Rail Grade Crossing Crashes/Incidents by County



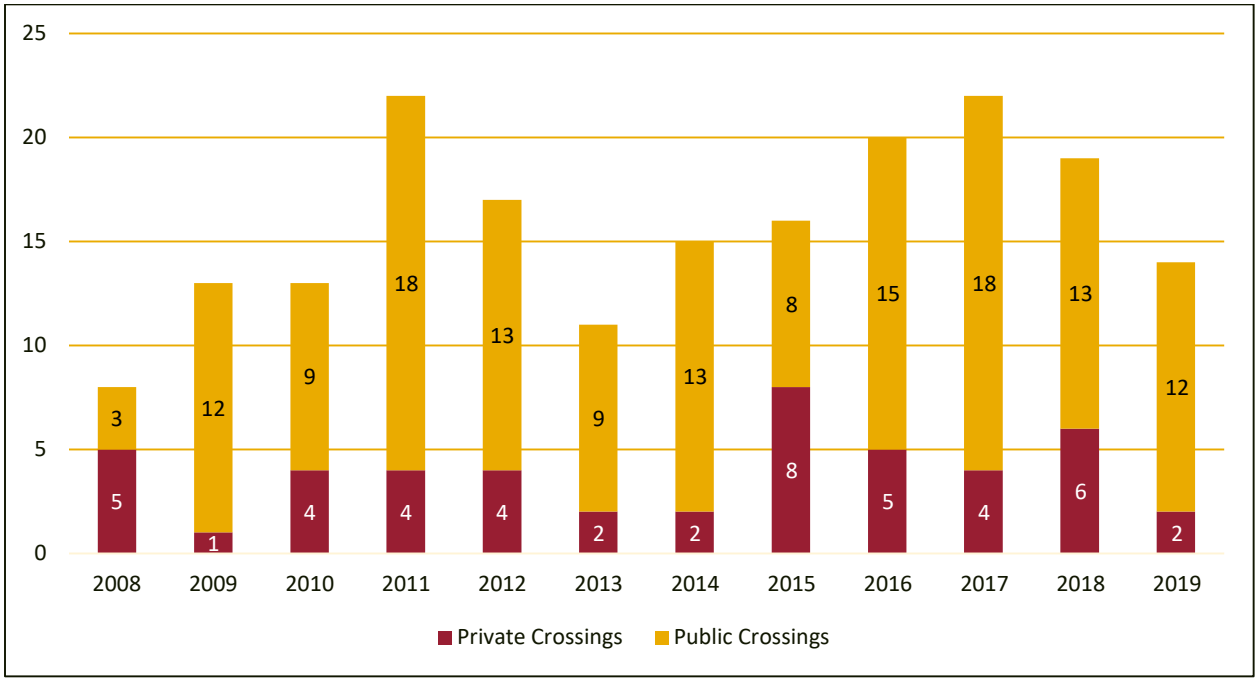
Source: FRA Safety Database

Figure 2-25 illustrates the distribution of highway-rail grade crossing crashes between public and private crossings. Figure 2-26 illustrates crash trends between 2008 and 2019 in the counties with the highest rate of incidents. No consistent trends appear for Montgomery, Baltimore, and Prince George's counties, but crashes in Baltimore City increased between 2015 and 2019.

Highway-Rail Grade Crossing in Maryland

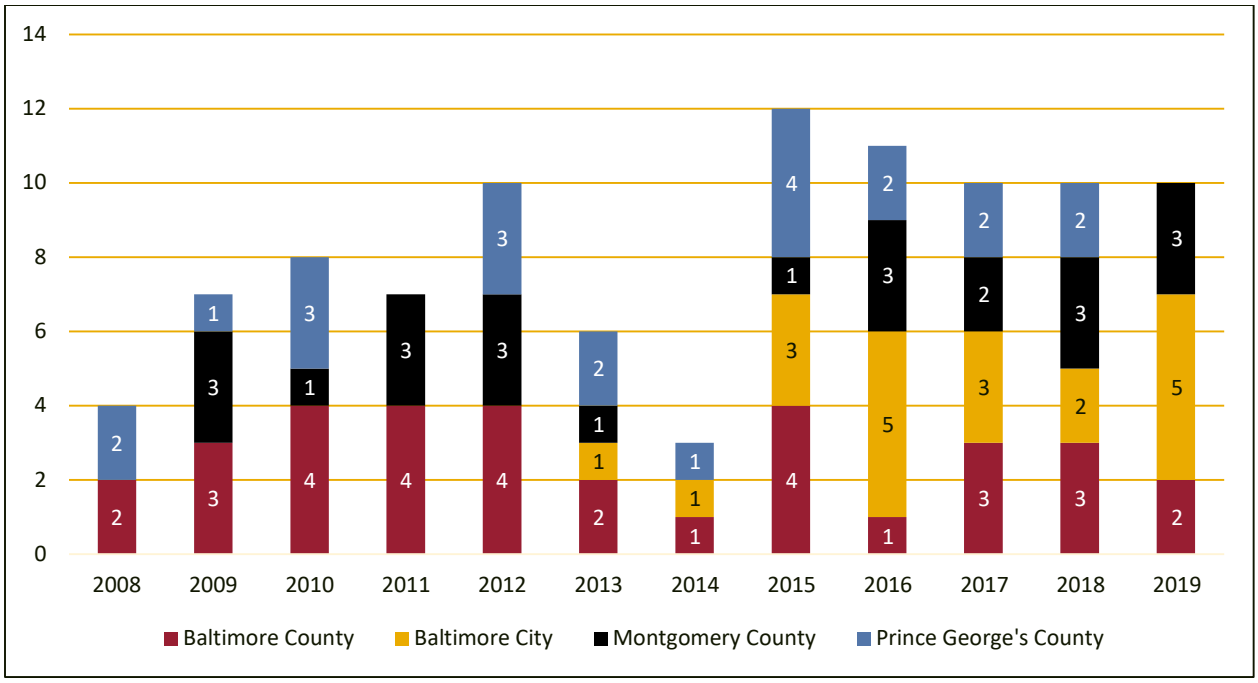
Famartin, CC BY-SA 4.0 https://creativecommons.org/licenses/by-sa/4.0, via Wikimedia Commons

Figure 2-25. Highway-Rail Grade Crossing Crashes/Incidents at Public and Private Crossings, 2008-2019



Source: FRA Safety Database

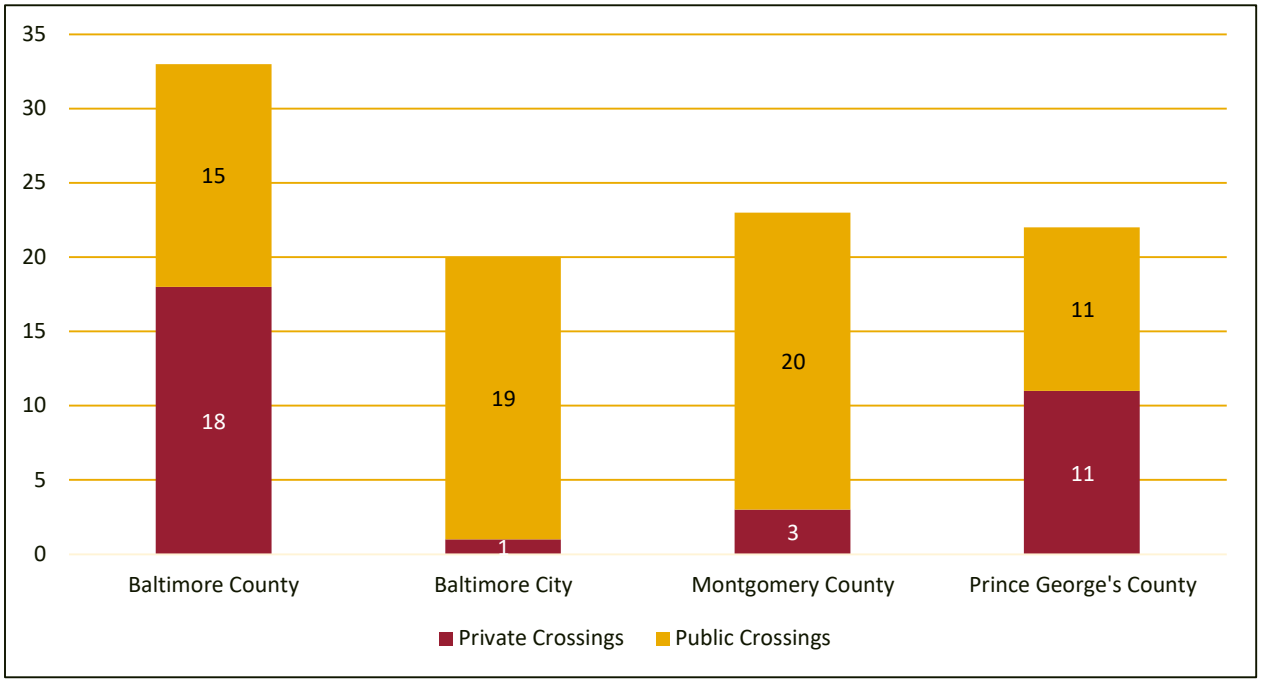
Figure 2-26. Highway-Rail Grade Crossing Crashes/Incidents (Public and Private Crossings) in Top Four Counties, 2008 - 2019



Source: FRA Safety Database

In Baltimore County, 55% of highway-rail grade crossing crashes and 50% in Prince George's County occurred at private crossings. Five percent of Baltimore City's crashes and 13% of Montgomery County's occurred at private crossings. See Figure 2-27.

Figure 2-27. Crashes/Incidents at Public and Private Highway-Rail Grade Crossings, 2008-2019



Source: FRA Safety Database

EFFORTS TO IMPROVE SAFETY

Maryland's efforts to improve railroad safety focus on improvements at highway-rail grade crossings. Maryland's funding from the Federal Rail-Highway Crossing (Section 130) Program is approximately $3 million per year.

MDOT SHA Office of Traffic and Safety (OOTS) administers Maryland's Highway-Rail Grade Crossing (Section 130) Program; coordinates with railroads when highway construction projects impact railroad properties; and provides traffic engineering, traffic operations, and traffic safety support to MDOT SHA and other MDOT Transportation Business Units. MDOT SHA's Section 130 program is the main funding source for safety improvements at highway-rail grade crossings, but improvements to crossing approaches, advanced warning signs, pavement markings, and sidewalk/bicycle accommodations may be completed as part of resurfacing or streetscape projects funded through MDOT SHA's capital program. MDOT MTA also funds grade crossing rehabilitation and safety projects for the freight lines it owns.

About 70% of the crossing improvement projects funded by MDOT SHA focus on signal improvements such as upgrading circuitry, installing new flashing signals, adding gates, etc. The remaining 30% of projects are evenly distributed between passive upgrades, surface improvements, and other improvements. When MDOT SHA upgrades a crossing, it looks at the crossing holistically and includes necessary safety improvements including upgrades to sidewalks/shared use paths to ensure safe passage for all users. MDOT SHA has not undertaken any grade separation projects.

MDOT SHA encourages private citizens, elected officials, county and municipal staff, railroad companies, and MDOT SHA field staff to recommend crossing improvements. Locations eligible for improvements under the Section 130 Program are reviewed by OOTS. Based on a site visit, recommended improvements are discussed and recorded. Crossings are ranked according to FRA's accident prediction formula with priority placed upon higher risk crossings. MDOT SHA is evaluating revisions to the formula-based process as part of the Highway-Rail Grade Crossing State Action Plan.

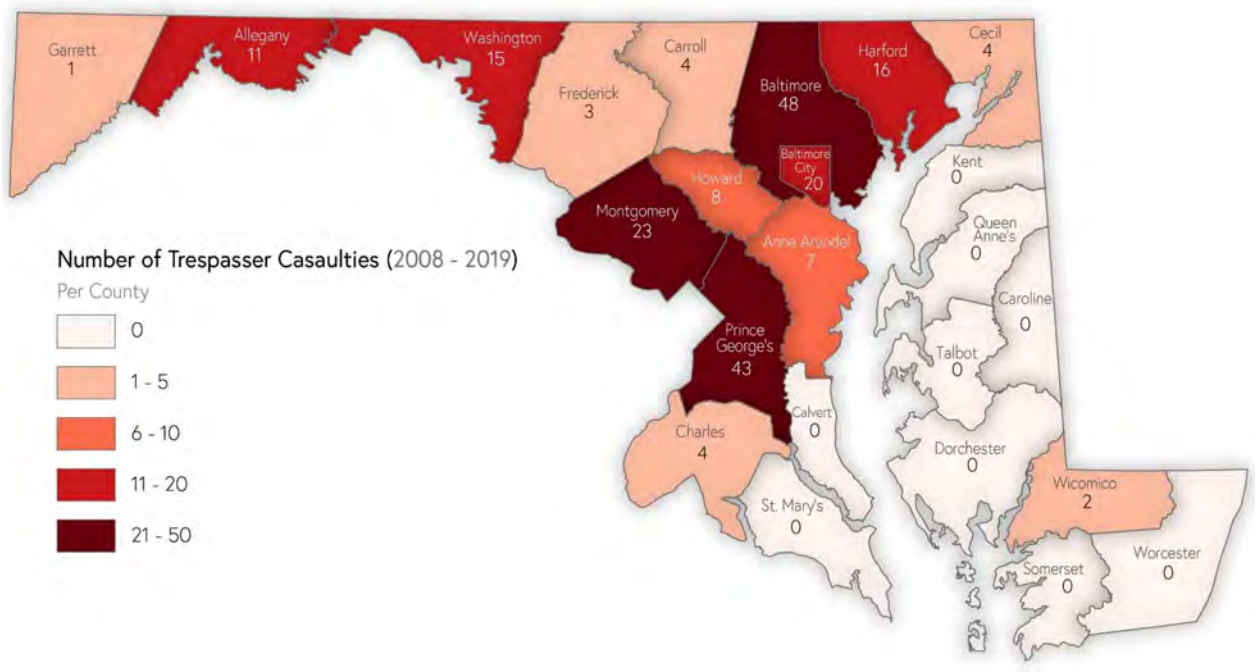
MDOT SHA is considering corridor-based approaches to crossing improvements with railroads and local jurisdictions. Examples include state or countywide signing projects to address compliance with the Maryland Manual on Uniform Traffic Control Devices for Streets and Highways or upgrading signal systems at multiple crossings within a corridor. Additional methodologies are investigated and recommended in the Highway-Rail Grade Crossing State Action Plan.

To assure that state and federal regulations are met, Maryland participates in FRA's inspection programs through the Maryland Department of Labor, Maryland Division of Labor and Industry, Safety Inspection. The program involves inspections of railroad track, operating practices, rolling stock, and equipment. State inspectors are certified by FRA.

TRESPASSER SAFETY

As illustrated in Figure 2-20, trespassing is the cause of most rail-related fatalities in Maryland. Figure 2-28 illustrates that the highest concentration of trespasser casualties (injuries or fatalities) occurred in Baltimore and Prince George's Counties, followed by Montgomery County and Baltimore City. Nearly 65%of trespasser incidents in Maryland occurred within these four jurisdictions.

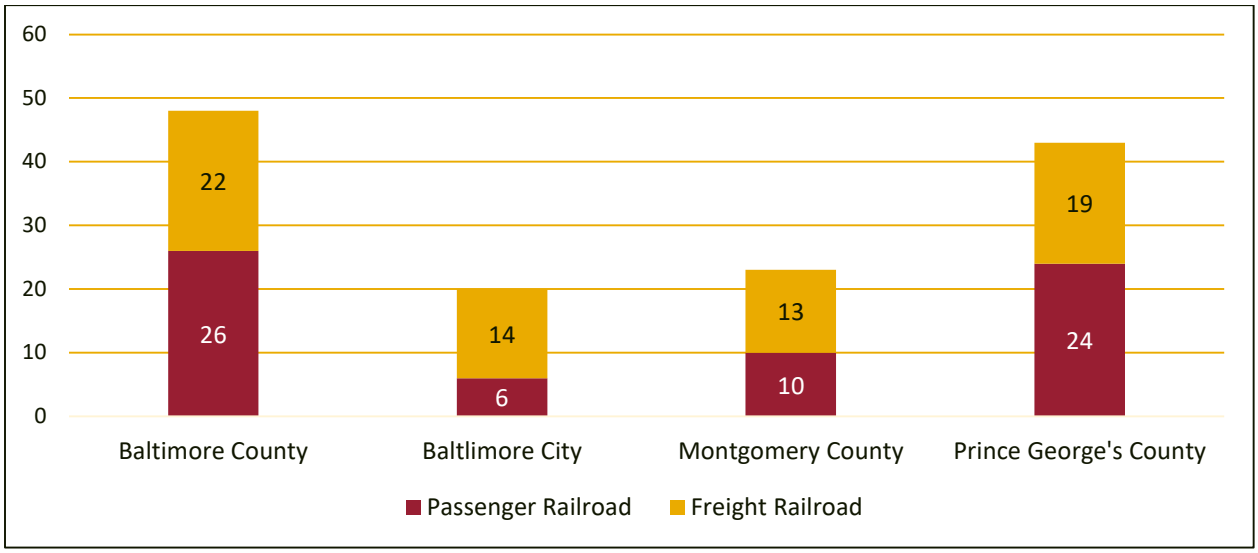
Figure 2-28. Trespasser Casualties by County, 2008-2019



Source: FRA Safety Database

Approximately 62% of trespasser incidents statewide are associated with freight trains and 38% with passenger trains. However, as illustrated by Figure 2-29, most incidents are associated with passenger rail in all jurisdictions except Baltimore City and Montgomery County.

Figure 2-29. Trespasser Incidents involving Passenger and Freight Trains, Jurisdictions with Highest Number of Incidents, 2008-2019



Source: FRA Safety Database

Trespassers tend to enter railroad property as a means of pedestrian access, but more detailed information regarding specific incidents is needed. MDOT's jurisdictional authority over highway-rail grade crossing safety does not extend to addressing trespassing upon railroad property. The state can provide increased education about risks associated with trespassing and can take steps to limit access to rights-of-way from public crossings. Consideration of land uses along railroad rights-of-way during local land use planning could address trespassing concerns, and state and local transportation agencies could improve pedestrian access to key destinations so as not to inadvertently encourage trespassing on railroad property.

In 2018, FRA presented a National Strategy to Prevent Trespassing on Railroad Property to Congress[21]. A key finding was a need for mitigation measures beyond efforts to educate the public on trespassing concerns. The national strategy adopted by the USDOT focuses on four areas: data collection and analysis, community site visits, funding, and partnerships with stakeholders. Reduction of railroad trespassing incidents in Maryland will require better understanding of specific issues and activities that lead to trespassing. Participating in the Operation Lifesaver Rail Safety Education program is a strategy that Maryland can pursue to educate the public about rail crossing safety and the dangers of trespassing on rail lines.

Rail's Economic and Environmental Impacts

CONGESTION IMPACTS

Before the COVID-19 pandemic, transit trips made up 24% of all commutes in the Washington, DC, Metropolitan area, of which three-quarters are taken on Metrorail and commuter rail services. [22] More than nine in 10 regional commuters using MARC services complete trips between the metropolitan centers of Baltimore City and Washington, DC, as an alternative to the major highways connecting the two regions.[23] From 2016 to 2019, the percentage of commuters using public transit in the Washington, DC, Metropolitan area grew approximately by one-fifth, illustrating the growing importance of public transit, including passenger rail services, for the mobility of the region's workforce.[24]

With many of Maryland's roadway facilities operating at capacity most hours of the day and travel demand expected to grow by 25% in 2040, future performance of the roadway

21 https://railroads.dot.gov/sites/fra.dot.gov/files/fra_net/18320/ROA%206310005_Congress_TrespasserPreventionStrategy_2018.pdf
22 Maryland Department of Transportation, *2040 Maryland Transportation Plan*, February 2018
23 Baltimore Metropolitan Council, *The Transit Question: Baltimore Regional Transit Needs Assessment*, October 2015
24 Commuter Connections, *2019 State of the Commute Survey Report*, June 2020

system is a concern[25] and other modes such as commuter rail are recognized as an alternative.[26] While the COVID-19 pandemic reduced commuting trips temporarily, commuter rail remains important to mobility and alleviating congestion after the pandemic.

FREIGHT RAIL ECONOMIC IMPACTS

According to the Association of American Railroads (AAR) profile for Maryland, freight rail operators employed 932 people in Maryland in 2019, with an average wages/benefits per employee of $131,070.[27] In addition, 8,200 railroad retirement beneficiaries live in Maryland with total railroad retirement benefits paid valued at $210 million.

With direct employment of 932 in 2019, the rail freight sector supports an estimated 1,622 indirect (rail industry spending on other industries) and induced (rail industry employee spending) jobs for a total supported employment of 2,553. The total labor income related to the direct, indirect, and induced effects related to the freight rail sector is estimated to be $228 million in 2019.[28] The labor income from jobs directly related to the freight rail sector is estimated to be $122 million, while the indirect and induced labor income related to business and household spending is estimated to be $106 million. The value-added related to the direct, indirect, and induced effects related to the freight rail sector is estimated to be $372 million in 2019. The value-added directly related to the freight rail sector is estimated to be $206 million, while the indirect and induced value-added related to business and household spending is estimated to be $167 million. The total labor income related to the direct, indirect, and induced effects related to the freight rail sector is estimated to $372 million in 2019. Table 2-5 summarized results of the economic impact analysis.

Table 2-5. Economic Impact Analysis of Maryland Freight Rail Sector, 2019

	DIRECT	INDIRECT	INDUCED	TOTAL
Employment (jobs)	932	755	867	2,553
Labor Income ($ millions)	$122	$55	$51	$228
Value-Added ($ millions)	$206	$74	$93	$372

Source: WSP Analysis

25 Maryland Department of Transportation, *2040 Maryland Transportation Plan*, February 2018
26 Commuter Connections, 2019 State of the Commute Survey Report, June 2020
27 Association of American Railroads, *Rail Freight State Rankings,* 2019
28 Shin & Farkas, Measuring the Economic Contribution of the Freight Industry to the Maryland Economy, 2015

FREIGHT RAIL ENVIRONMENTAL IMPACTS

To estimate the benefits of shifting freight to rail in Maryland, the net emissions, safety incidents, maintenance and congestion costs, and fuel costs generated by trucks transporting the equivalent tonnage by rail is calculated below. Due to the characteristics of the freight transportation economy, it is unlikely that some commodities moving certain distances would ever be transported by truck due to excessive cost. In instances where the modal share of rail for a certain commodity is greater than 80% of combined truck and rail tonnage, the traffic is not considered truck-competitive. The following commodities meet this criterion:

- Coal more than 100 miles
- Grain more than 500 miles
- Metallic ore all distances shipped
- Petroleum products more than 1,000 miles

The remaining rail traffic moving to, from, or within Maryland is considered truck-competitive, so that trucking would provide a reasonable alternative in the event of deteriorated rail service. The FAF-4 database estimates the total number of ton-miles (each ton-mile is one ton moving one mile) associated with truck-competitive rail traffic moving to, from, and within Maryland to be 107.2 billion. A reduction in truck traffic benefits Maryland with associated with fuel savings, reduced greenhouse gases and air pollutants, reduced highway safety risks, and reduced highway congestion and pavement damage. The benefits of diverting freight to rail are quantified by assessing the reduction in truck vehicle miles traveled (VMT) and associated savings. The VMT impact of rail can be quantified by dividing avoided ton-miles by the average tonnage carried by one truck, or its payload. Dividing Maryland's 107.2 billon ton-miles by an assumed payload per truck of 20.7 tons[29] equals 5.2 billion truck VMT avoided per year. Rail traffic tends to travel more miles to move between two points compared to trucks, which typically use the most direct available highway routes. To account for the fact that rail routes are usually more circuitous than the highway routes, VMT savings are adjusted downwards to 4.2 billion.[30]

Table 2-6 summarizes the annual nationwide fuel consumption, emissions, safety, congestion, and avoided pavement damage benefits of Maryland shippers using rail instead of trucks.

[29] US Federal Highway Administration, *Quick Response Freight Manual II*, September 2007, Table 4.20.
[30] WSP analysis of FAF-3

Table 2-6. Benefits to the US of Maryland Shippers and Receivers Using Rail

BENEFIT CATEGORY	HIGHWAY PARAMETER	RAIL PARAMETER	NET BENEFIT OF USING RAIL
Reduced Fuel Consumption [1/]	147 ton-miles per/gallon	479 ton-miles/gallon	63.9 million gallons
Reduced Emissions [2/]			
CO2	22 pounds/gallon	22 pounds/gallon	637,730 metric tons
NOx	8.098 grams/VMT	114.0 grams/gallon	1,480 metric tons
PM10	0.309 grams/VMT	2.90 grams/gallon	110 metric tons
VOC	0.877 grams/VMT	4.84 grams/gallon	450 metric tons
Reduced Frequency of Accidents [3/]			
Fatalities	2.17/billion ton-miles	0.47/billion ton-miles	24 fatalities
Injuries	52.6/billion ton-miles	4.80/billion ton-miles	705 injuries
Property Damage Only (PDO)	190.6/billion ton-miles	1.57/billion ton-miles	2,848 PDO accidents
Reduced Highway Damage and Congestion [4/]			
Pavement Damage	$0.16/VMT	N/A	$118.8 million ($2020)
Congestion	$0.05/VMT	N/A	$39.6 million ($2020)

Source: [1/] For trucking: US Energy Information Administration (EIA) 2020 Annual Energy Outlook; for rail: Association of American Railroads; 2018 fuel consumption values both rail and truck.

[2/] CO_2 emission rate from the EIA. For rail: emissions rates from US EPA; for trucking: emissions rates from WSP analysis of EPA MOVES model; 2018 emission rates both rail and truck.

[3/] For rail: accident rates from 2018 FRA data; for truck: accident rates from Federal Motor Carrier Safety Administration Large Truck and Bus Crash Facts 2018.

[4/] Highway damage and congestion from Federal Highway Administration Addendum to the 1997 Federal Highway Cost Allocation Study, indexed for inflation. Assumes 90% rural miles 10% urban, 60% 80-kip trucks, 40% 60-kip trucks.

The reductions in emissions include avoiding the release of carbon dioxide (CO2), which contributes to global warming, and several other pollutants known to harm human health and property. Particulate matter (PM10) can harm lungs and cause atmospheric haze. Nitrous oxides (NOx) contribute to respiratory ailments and acid rain. Volatile organic compounds (VOCs) also are harmful to human health.

PASSENGER RAIL IMPACTS

According to Amtrak, the company employed 2,209 Maryland residents with total wages of employees living in Maryland at $211,585,851.[31] According to US Bureau of Transportation Statistics, intercity passenger services use 47 percent less energy to carry a person one mile compared to automobile transportation.[32] Given the value illustrates the energy usage for all Amtrak services nationally, the energy footprint in the electrified NEC can be expected to be significantly smaller, resulting in more efficient energy consumption and fewer greenhouse gas emissions.

In 2019, MARC employed 476 employees in maintenance, operations, administration, and capital labor roles for a total income expense of $30.7 million; the annual employee income averaged $64,510. Including the employee wages calculated above, MARC manages a total annual operating budget of $77.9 million for the procurement of services and goods under state agency procurement regulations.

The Northeast Corridor Commission has assessed the economic impacts of the NEC between Washington, DC, and Boston, MA. The NEC facilitates the mobility of passengers generating $50 billion per year in economic productivity.[33] As a critical transportation corridor for the region, the investment in passenger rail operations in the NEC generates $8.2 billion in savings from avoided congestion per year by 2040 for the region's highway and aviation systems.

COMMUNITY IMPACTS

Commuter and intercity passenger rail services can support transit-oriented development (TOD), which is defined as dense, mixed-use, planned development within one-half mile of existing or planned transit stations that is designed to maximize the use of transit, walking, and bicycling. With the support of state and local government, transit-oriented development provides an opportunity to leverage smart growth strategies to encourage economic development, reduce sprawl and maximize return on existing transit investments. A number of transit-oriented development projects are in process, planned, or identified as potential locations in Maryland.[34] Planning initiatives for transit-oriented development at the local and state level provide a framework for integrating the regional

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31 Amtrak Fact Sheet, Fiscal Year 2019, state of Maryland.

32 US Department of Transportation, Bureau of Transportation Statistics, National Transportation Statistics, Table 4-20: Energy Intensity of Passenger Modes, 2019.

33 NEC Commission, NEC American Economy Report, http://nec-commission.com/app/uploads/2018/04/NEC-American-Economy-Final.pdf.

34 https://www.mdot.maryland.gov/tso/pages/Index.aspx?PageId=37

passenger rail services with multi-use development projects through the use of zoning tools, economic development resources, and community planning policies. An example of a potential parcel for transit-oriented development is shown in Figure 2-30 below.

Figure 2-30. Parcel for Potential Transit-Oriented Development near Dorsey MARC Station

TRENDS AND FORECASTS

Demographic and Economic Growth Factors

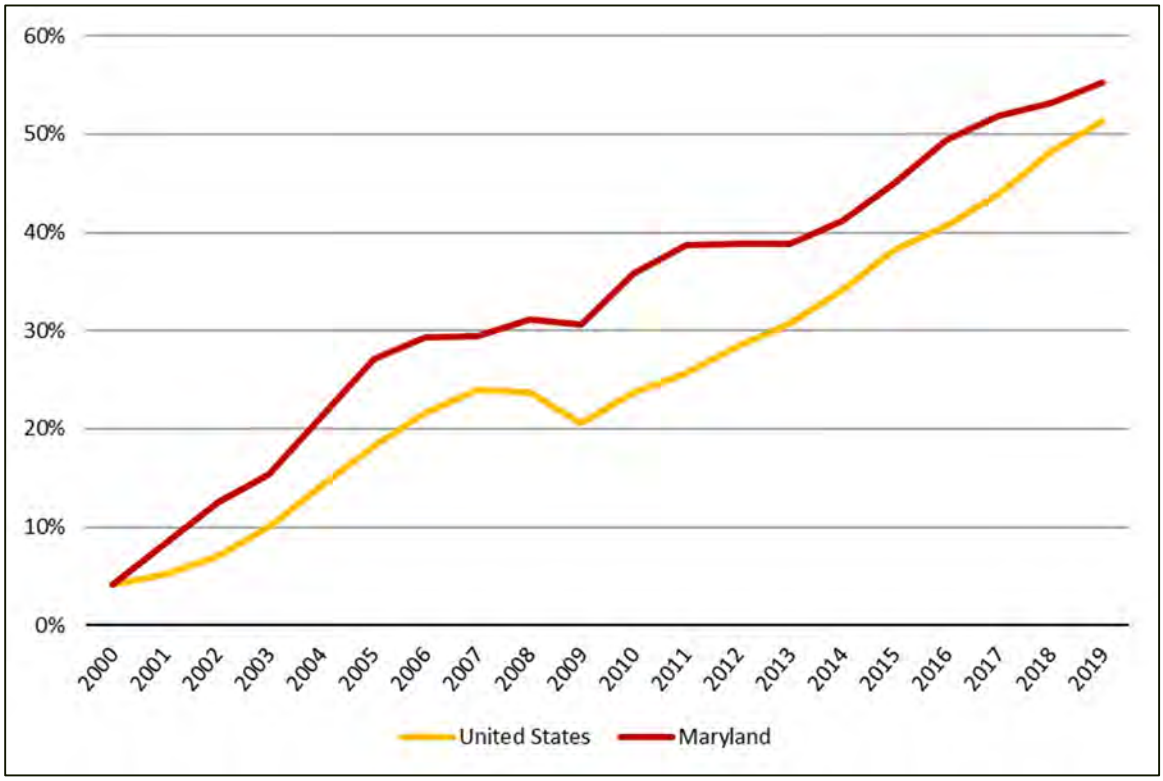
Changes in demand for freight and passenger rail transportation in Maryland will be influenced by economic and demographic factors, including changes in gross state product, personal income, population, and employment, as well as industry composition. This section explores economic and demographic trends to provide a context for passenger and freight rail transportation demand in the state of Maryland.

GROSS DOMESTIC PRODUCT

Gross domestic product (GDP) provides a measure of overall economic activity within the state. Maryland's GDP increased from $251 billion (2012$) in 2000 to $374 billion (2012$) in 2019, an increase of 49% compared to a 45% growth in national GDP during the same time

period.[35] The state outperformed the national average during the economic downturn of 2008 – 2011. GDP growth in Maryland outperformed that of the United States each year from 2008 to 2011. Figure 2-31 illustrates cumulative real GDP growth for Maryland and the United States between 2000 and 2019, demonstrating the long-term growth performance of the state's economy over the national average.

Figure 2-31. Maryland and United States Cumulative Real GDP Growth (2000 – 2019)

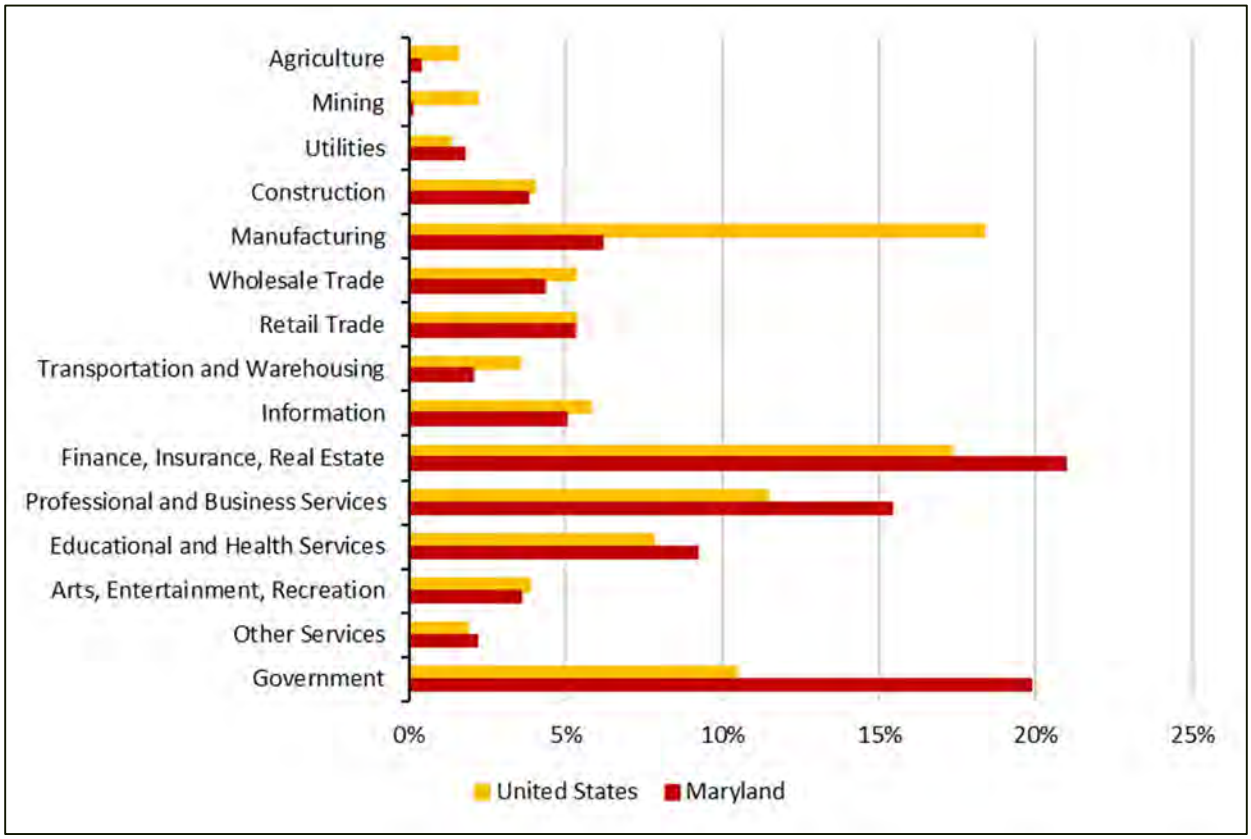


Maryland's largest industry sector in terms of economic output is finance, insurance, and real estate, which contributed to 21.0% of state GDP in 2019, followed by government services, which contributed 19.8% of GDP in 2019.[36] While all of Maryland's economy depends on the movement of freight, certain sectors are particularly dependent, including manufacturing, retail and wholesale trades, transportation and warehousing, construction, utilities, mining, and agriculture. Collectively, these industries contribute to 23.8% of the state's economic output. Of the industries particularly reliant upon freight transport, manufacturing is the largest in terms of GDP, followed by retail and then wholesale trade

[35] US Bureau of Economic Analysis
[36] US Bureau of Economic Analysis, Real GDP by State (Chained 2012$)

(Figure 2-32). The mobility enabled by passenger and commuter rail services impacts the economy generally.

Figure 2-32. Maryland and United States Sectors by Share of Real GDP (2000 – 2019)

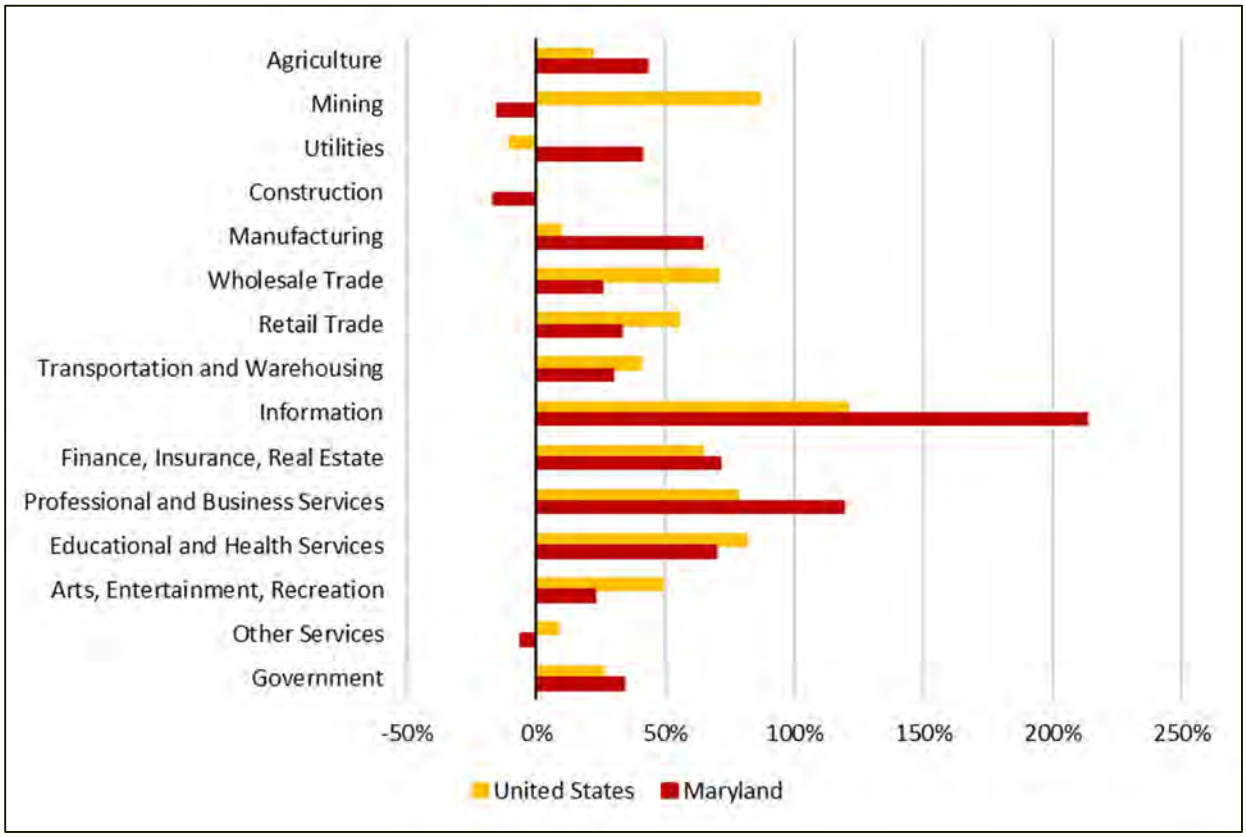


Source: US Bureau of Economic Analysis, Real GDP by State (Chained 2012$)

Similar to the rest of the nation, Maryland's fastest growing sectors include the information services and professional services sectors. The information sector includes data processing and hosting services and broadcasting and telecommunications, which has grown in Maryland with the boom in technology services companies. Several freight-dependent sectors declined between 2000 and 2019, including construction and mining, while the manufacturing sector outperformed the national average during the same period. The transportation and warehousing sector and wholesale and retail trade sectors continued to grow, but at a lower rate than the national average.

Figure 2-33 displays Real GDP growth by sector between 2000 and 2019 for Maryland and the United States.

Figure 2-33. Maryland and United States Real GDP Growth by Sector (2000 – 2019)

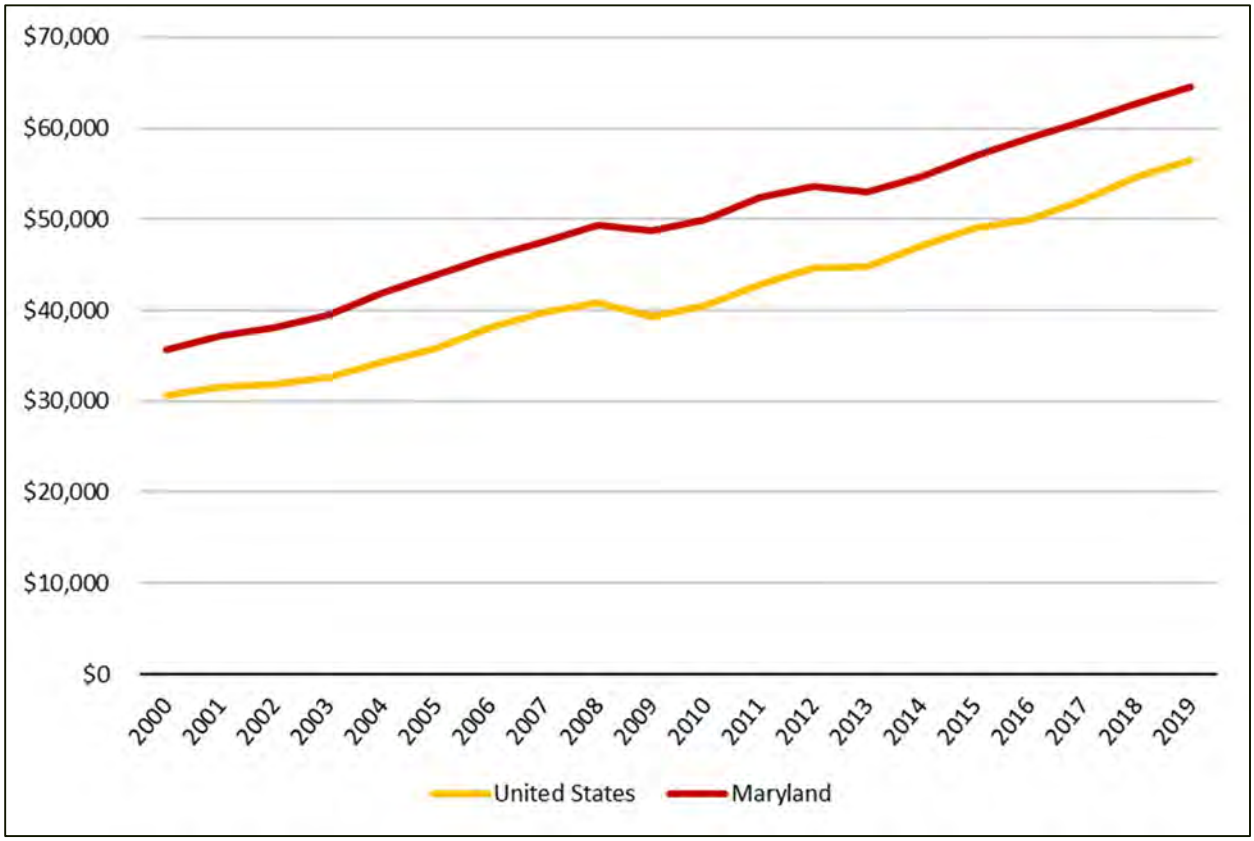


Source: US Bureau of Economic Analysis, Real GDP by State (Chained 2012$)

INCOME

In 2019, Maryland's per capita personal income was $64,640, 14% higher than the US average per capita personal income of $56,490.[37] Between 2010 and 2019, personal income in Maryland grew an average of 2.9% per year, slightly below the nationwide average of 3.8%. Figure 2-34 displays per capita personal income in Maryland and nationally between 2000 and 2019.

Figure 2-34. Maryland vs. United States Per Capita Personal Income

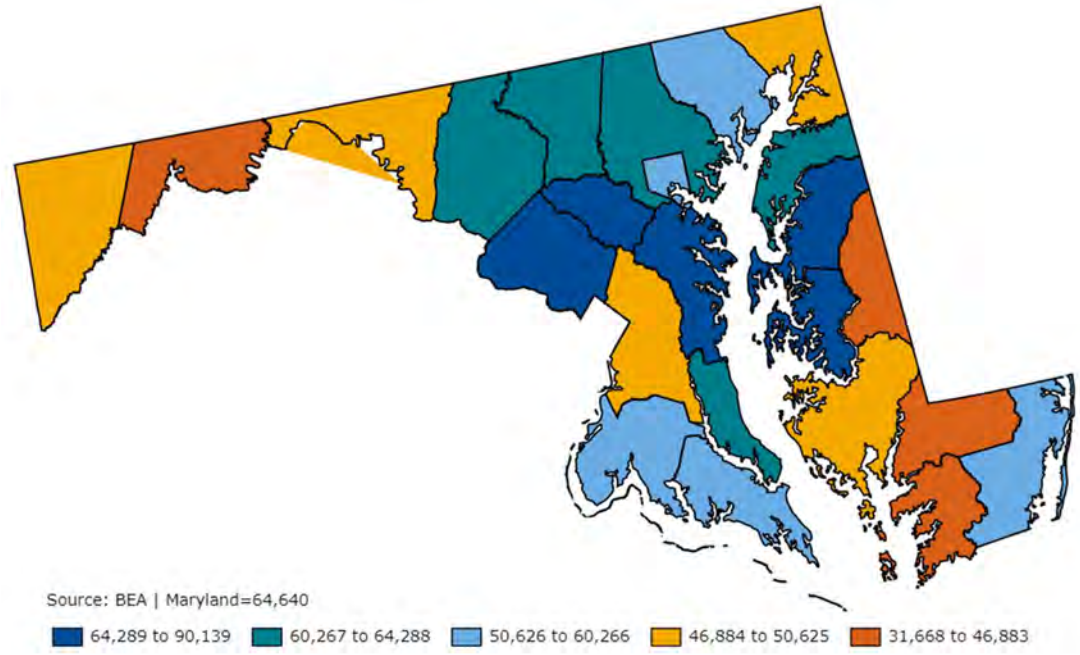


Source: US Bureau of Economic Analysis, Per Capita Personal Income in Maryland (SAINC1)

Montgomery County, outside Washington, DC, is the most populous county in Maryland and has the highest median household income in the state estimated at $90,139 (2019$).[38] Other counties with high median household incomes include Talbot County ($74,711), Anne Arundel County ($69,035), and Queen Anne's County ($66,733) (Figure 2-35).

[37] US Bureau of Economic Analysis, *State Per Capita Personal Income* (as of December 2020)
[38] US Department of Commerce, Bureau of Economic Analysis, Personal Income Summary: Per Capita Personal Income (CAINC1) (as of December 2020)

Figure 2-35. Maryland County per Capital Personal Income



Source: US Bureau of Economic Analysis, County Per Capita Personal Income (CAINC1)

POPULATION

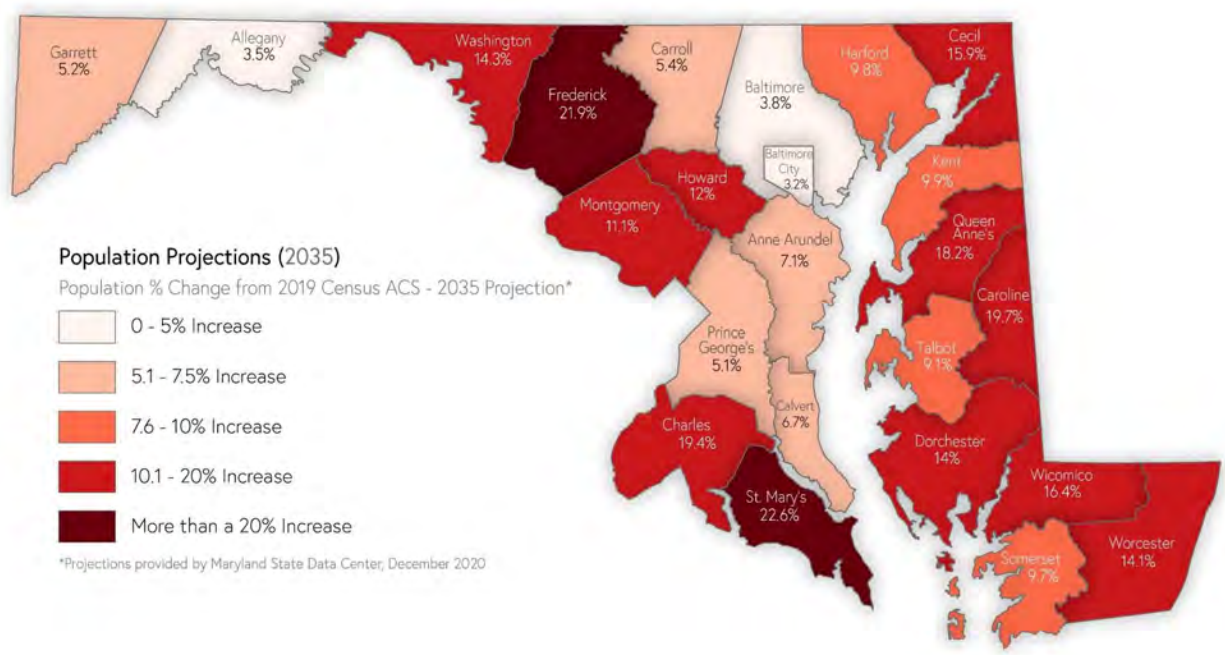
Maryland's population grew by 13.8% between 2000 and 2019, compared to the nationwide average of 16.3%.[39] According to US Census Bureau Population Estimates, Maryland's population averaged 6.0 million between 2015 and 2019 with an average annual growth rate of 0.3%. Despite slow growth, Maryland remains the nation's 19th most populous state and the 5th most populous state in the Mid-Atlantic region.

The Maryland Department of Planning estimates that population in all counties will continue to grow at a steady rate through 2045, with Maryland's population reaching 6.41 million by 2030 and 6.74 million by 2040.[40] St. Mary's County, the projected fastest growing county, is expected to grow 22.6% between 2019 and 2040. Frederick County and Charles County, outlying counties around Washington, DC, are forecast to grow by 21.9 and 19.4%, respectively, while Caroline County on the Eastern Shore is expected to grow by 19.7%. In general, the strongest projected growth in the state, based on percentage growth, is expected to occur in counties in Southern Maryland and the Upper Eastern Shore per

39 US Census Bureau, Mid-Year Population Estimates, 2000-2019 (as of December 2020)
40 Maryland Department of Planning, *Population Projections to 2045* (as of December 2020)

Figure 2-36. Many of the high-forecast growth areas are served by rail although some, such as St. Mary's County, are not.

Figure 2-36. Projected Population Growth of Counties, 2019 - 2040



Source: Maryland Department of Planning Population Projections (as of December 2020)

EMPLOYMENT

According to the US Bureau of Labor Statistics, total nonfarm employment in Maryland stands at 2.7 million as of November 2020, about 3% above its pre-recession peak in 2008 and about 10% higher than its recession low in 2010.[41] Figure 2-37 displays year-over-year employment growth for Maryland and the United States from 2000 to 2019. Employment in Maryland saw less decline than the overall United States during the recession in 2008, but has underperformed the national average since 2011.

41 US Bureau of Labor Statistics, Current Employment Statistics Survey (as of December 2020)

Figure 2-37. Annual Change in Total Nonfarm Employment, 2000 - 2019

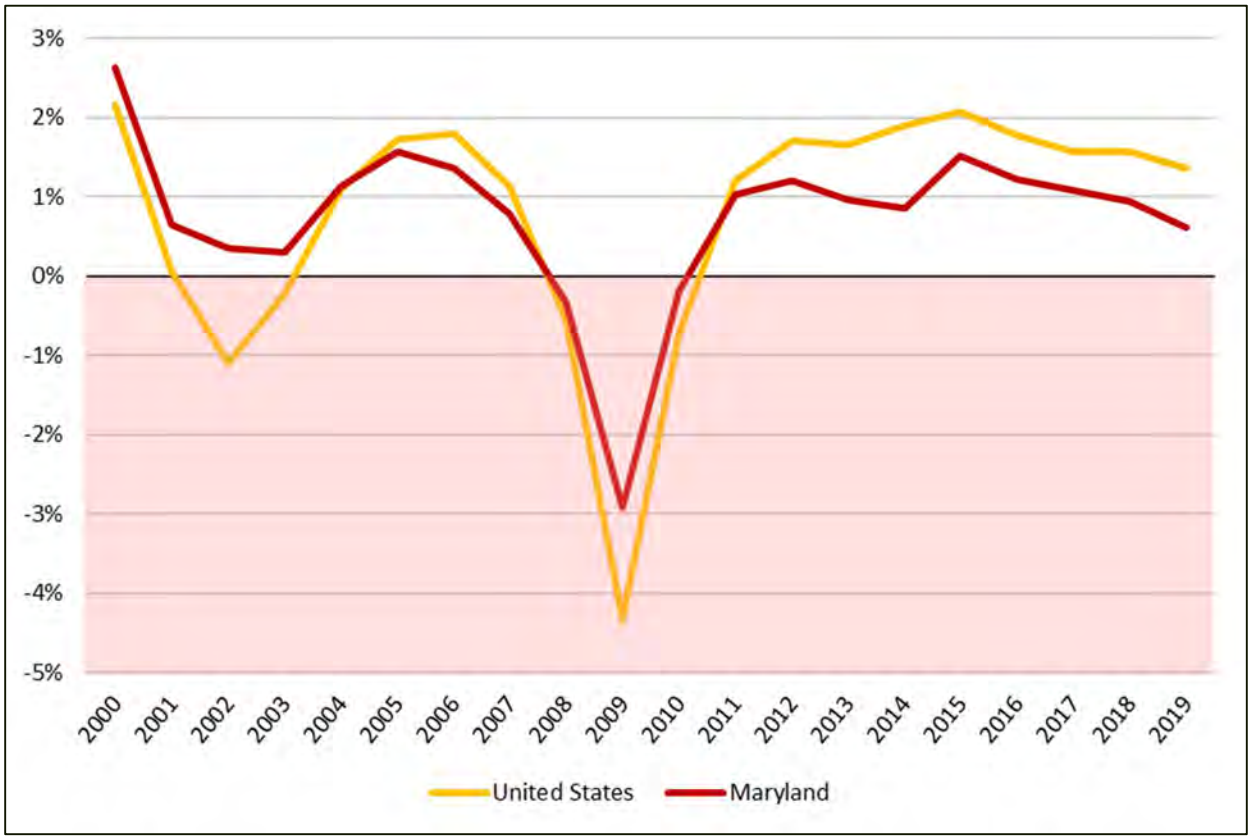


Table 2-7 shows the location quotient for each major industry sector, defined as the relative concentration of employment in Maryland compared to the concentration in the United States. For example, the share of total employment represented by financial activities in Maryland is 88% of its share compared to the national average.[42] As illustrated, the government services, construction, and professional and business services sectors are more concentrated in Maryland than the national average while some sectors such as mining, manufacturing and information services are underrepresented compared to the rest of the United States.

[42] US Bureau of Labor Statistics, Quarterly Census of Employment and Wages (as of December 2020)

Table 2-7. Maryland vs. United States Sector Location Quotient (Second Quarter, November 2020)

SECTOR	LOCATION QUOTIENT
Government Services	1.30
Construction	1.23
Professional and Business Services	1.22
Other Services	1.10
Education and Health Services	1.04
Trade, Transportation, and Utilities	0.91
Financial Activities	0.88
Information	0.68
Manufacturing	0.50
Natural Resources and Mining	0.23

Source: US Bureau of Labor Statistics, *Quarterly Census of Employment and Wages (as of December 2020)*

The Maryland Department of Planning's long-term employment projections estimate that Maryland will add approximately 405,800 jobs between 2020 and 2040, an increase of 11%.[43]

MANUFACTURING SUBSECTORS

Rail supports manufacturing by transporting inbound raw materials and outbound finished products. Manufacturing is Maryland's largest freight-intensive sector by GDP. As illustrated in Table 2-8, chemical manufacturing is the largest manufacturing subsector by output (by dollar value) in Maryland, but computer and electronics, and food and beverage manufacturing are the largest subsectors by employment. Nationwide, chemical manufacturing and certain food and beverage manufacturing are significant users of rail. The computer manufacturing subsector is a less-frequent user of freight rail. Plastics and rubber, fabricated metal products, and nonmetallic mineral product manufacturers frequently rely on rail.

[43] Maryland Department of Planning, Total Jobs by Industry 2015 to 2040 (as of December 2020)

Table 2-8. Selected Manufacturing Subsectors in Maryland by Gross Economic Output and Total Employment in 2019

INDUSTRY SECTOR	GROSS ECONOMIC OUTPUT ($ MILLIONS)	TOTAL SECTOR EMPLOYMENT
Chemical Manufacturing	$7,863	13,700
Computer and Electronics Manufacturing	$5,206	20,800
Food and Beverage Product Manufacturing	$3,019	21,800
Machinery Manufacturing	$1,381	7,100
Plastics and Rubber Products Manufacturing	$1,046	6,300
Fabricated Metal Product Manufacturing	$917	8,400
Nonmetallic Mineral Product Manufacturing	$664	4,000

Source: US Bureau of Labor Statistics, *Quarterly Employment and Wages (as of December 2020)*; US Bureau of Economic Analysis, SAGDP9N GDP by state in current dollars *(as of December 2020)*

Freight Demand and Growth

This section presents the historical trends and existing conditions of freight rail activity in Maryland. It relies on the 2019 Maryland US Surface Transportation Board (STB) Carload Waybill Sample, which is a sample of waybills for all US rail traffic submitted by those carriers terminating 4,500 or more carloads annually. Because the STB Carload Waybill Sample includes confidential information from private railroads, the results of the analysis are presented in a summarized format. The analysis also relies on freight rail flows presented in the Association of American Railroads (AAR) Maryland profiles, which also are based on the STB Carload Waybill Sample.

EXISTING CONDITIONS FOR FREIGHT RAIL FLOWS

As shown in Table 2-9, the highest tonnages of freight volumes by direction are shipped through Maryland between other states (55% of tons and 69% of carloads). Maryland also receives a high volume of freight (38% of tons and 24% of carloads) from other states. Lower volumes are shipped outbound to other states or within the state.

Table 2-9. Rail Tonnage by Direction, 2019

DIRECTION	TONS (MILLIONS)	PERCENTAGE OF TONS	CARLOADS	PERCENT OF CARLOADS
Inbound	32.1	38%	389,000	24%
Outbound	4.3	5%	89,000	5%
Intrastate	1.1	1%	18,000	1%
Through	46.7	55%	1,120,000	69 %
Grand Total	84.5	**100%**	**1,615,000**	**100%**

Source: 2019 Waybill Sample
Note: Tonnages are rounded to nearest million, carloads are rounded to the nearest thousand

Commodities Originating and Terminating

Table 2-10 summarizes the top commodities that originate from (outbound and intrastate) or terminate to (inbound and intrastate) Maryland. These commodities are further described below.

Table 2-10. Top Commodities Originating or Terminating in Maryland, 2019

ORIGINATING			TERMINATING		
COMMODITY	TONS (MILLIONS)	CARLOADS/ UNITS	COMMODITY	TONS (MILLIONS)	CARLOADS
Waste and Scrap	1.2	13,300	Coal	23.1	197,500
Glass and Stone	1.0	9,600	Nonmetallic Minerals	2.7	25,600
Coal	0.8	7,200	Chemicals	1.3	13,800
Intermodal	0.5	32,900	Others	4.8	141,800
Metallic Ores	0.3	3,100			

Source: AAR Maryland Profile
Note: Tonnages are rounded to nearest million

- **Coal** is the highest-volume commodity category handled by Maryland's rail system, mostly bituminous coal shipped into the state. Most coal traffic terminating in Maryland originates in Pennsylvania or West Virginia. Most coal is shipped to the Port of Baltimore for export, although some is delivered to coal-fired power plants. Coal traffic originating in Maryland is shipped from mines in the western part of the state.

- **Nonmetallic minerals** is the second highest-volume commodity category and includes sand, gravel, clay, and crushed stone. Most nonmetallic minerals are shipped to Maryland and are primarily crushed and broken stone.

- **Chemicals** are the third highest-volume commodity category handled by Maryland's rail system, and most are shipped inbound. Most are industrial chemicals although a small amount are plastics and synthetic resins.
- **Waste and scrap** primarily moves outbound from Maryland. Most belongs to the miscellaneous subcategory, suggesting that it is either municipal solid waste or construction and demolition waste.
- **Stone, clay, and glass** primarily moves outbound from Maryland. The classification includes a broad range of materials, such as glass and glassware, hydraulic cement, pottery, concrete, gypsum, plaster, and cut stone and stone products. Hydraulic cement is shipped from Maryland to points outside the state.
- **Transportation equipment** primarily moves inbound to Maryland. Almost all tonnage is finished motor vehicles.
- **Food and kindred products** are primarily shipped inbound. The top three subcategories of food and kindred products that are shipped into to Maryland are: grain mill products, including flour rice, and meal; miscellaneous; and beverages and extracts.
- **Miscellaneous mixed shipments** are a commodity classification that applies to intermodal containers and trailers. Not all intermodal shipments are designated as miscellaneous mixed shipments, but most are. More intermodal traffic terminates in Maryland than originates.
- **Lumber and wood products** move into Maryland and are primarily sawmill or planing mill products like surfaced lumber, railroad ties, and woodchips.
- **Petroleum and coal products** move inbound to Maryland and are primarily products of petroleum refining such as gasoline, kerosene, and asphalt.

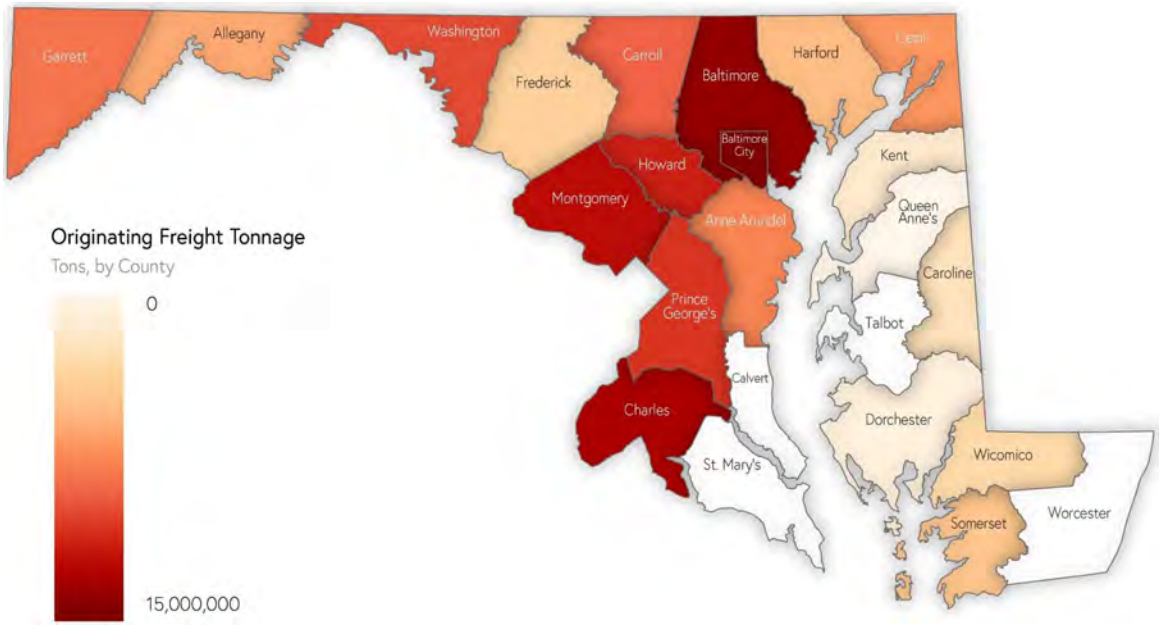
Geography of Maryland Freight Rail Traffic

Top Originating/Terminating Counties

Most of Maryland's rail traffic terminates or originates in the Baltimore region. Traffic originates and terminates at Port of Baltimore terminals, as well as other freight users and producers in the region.

Exports of coal are the largest source of traffic to or from the Baltimore region, but bauxite, intermodal containers, and pulp and pulp mill products also are major components of traffic, as are industrial chemicals, crushed and broken stone, and petroleum-refining products. Figure 2-38 illustrates freight traffic, in tons, for Maryland's counties.

Figure 2-38. Maryland Rail Freight Traffic by County, 2019 Tons



Source: 2019 Waybill Sample

Table 2-11 below describes rail traffic in each county in Maryland served by rail.

Table 2-11. Primary Commodities Carried by Tonnage by County, 2019

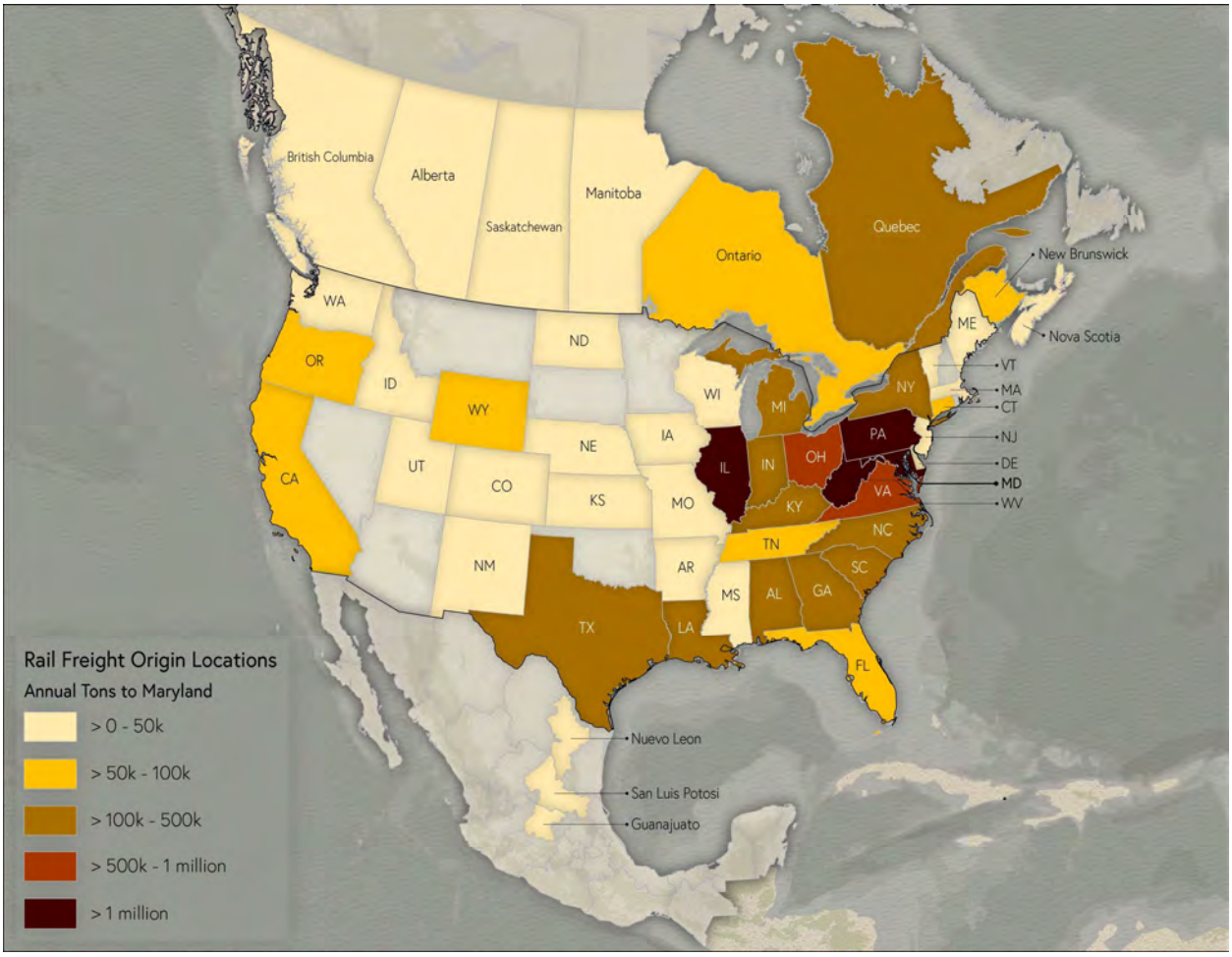
COUNTY	PREDOMINANT DIRECTION	OUTBOUND	INBOUND
Baltimore City	Inbound	About a quarter bauxite and aluminum ores and fifth intermodal	Mostly coal
Baltimore County	Inbound	Mostly waste and scrap	Mostly coal
Charles	Inbound	Empty railroad equipment	More than half coal and under half crushed and broken stone
Howard	Inbound	All waste and scrap	Almost all motor vehicles and equipment
Prince George's	Inbound	None	Mostly crushed and broken stone
Carroll	Outbound	All hydraulic cement	A third industrial chemicals, a fifth sawmill and planning products
Washington	Inbound	Under half waste and scrap, a fifth hydraulic cement	Just under half sawmill and planning products
Anne Arundel	Inbound	None	Mostly crushed and broken stone
Cecil	Inbound	None	More than a third household appliances, just under a third grain mill products
Allegany	Outbound	Just more than half paper (excluding building paper), just under half waste and scrap	Just more than half abrasives and asbestos, a fifth industrial chemicals

Source: 2019 Waybill Sample

Top Originating/Terminating Trading Partners

Pennsylvania and West Virginia are Maryland's largest trading partners, traffic from which primarily consists of inbound coal shipments. Illinois, Virginia, and Ohio are the third-, fourth-, and fifth-largest trading partners. Illinois serves as a gateway to the rail network in the western US. Maryland also is one of its own largest trading partners. Figure 2-39 illustrates the tonnage received by Maryland by origin state.

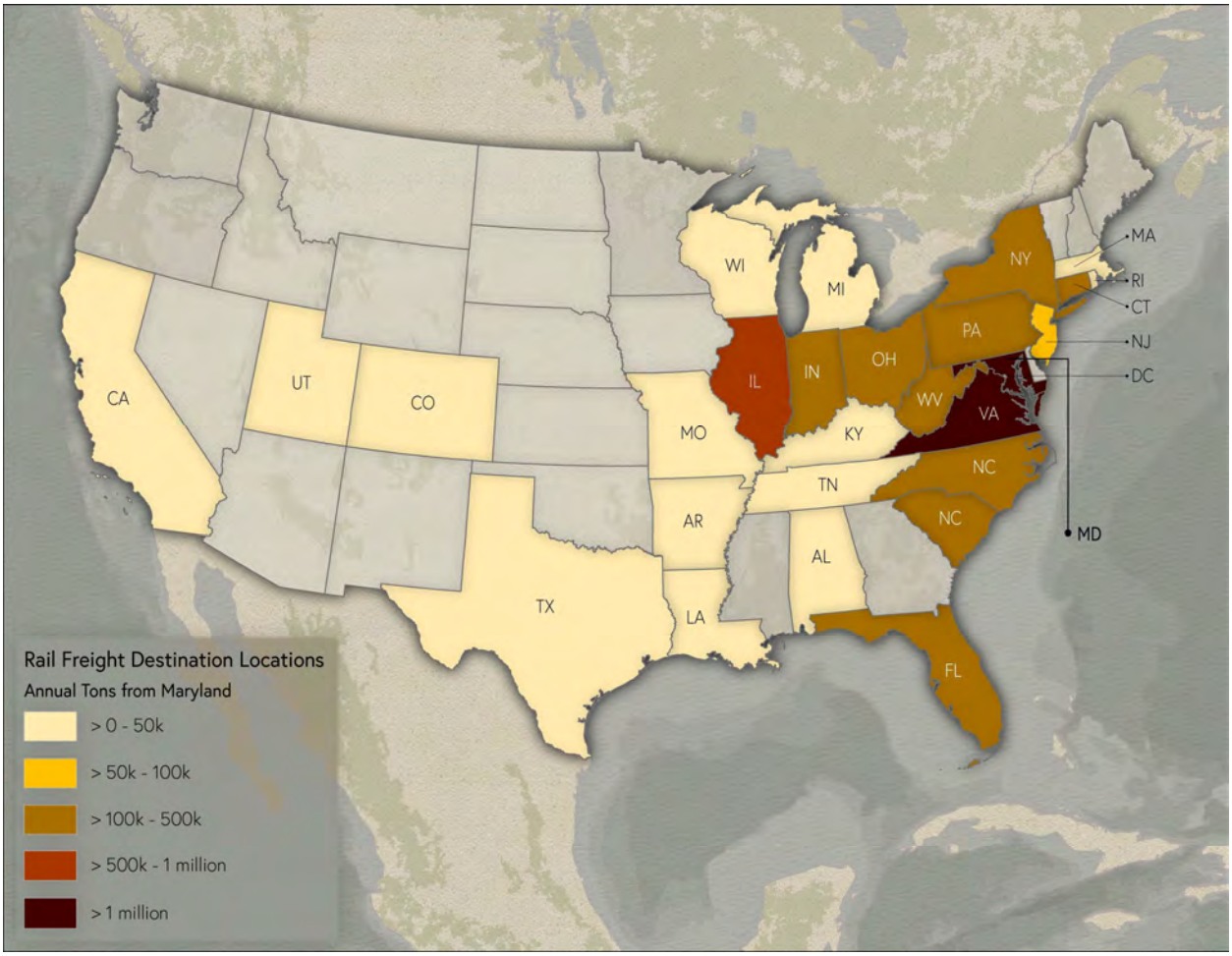
Figure 2-39. Freight Rail Traffic Terminating in Maryland by State/Province of Origin, 2019 Tons



Source: 2019 Waybill Sample

As shown in Figure 2-40, Virginia and Maryland are the largest recipients of shipments from Maryland, followed by Illinois.

Figure 2-40. Freight Rail Traffic Originating in Maryland and Destination by State, 2019 Tons



Source: 2019 Waybill Sample

Table 2-12 displays the highest volume commodities traded with each trading partner.

Table 2-12. Highest Volume Commodities Traded by Trading Partner by Tons, 2019

STATE	OUTBOUND	INBOUND
Pennsylvania	Hydraulic cement	Coal
West Virginia	Coal	Coal
Illinois	Intermodal, converted paper and paperboard products	Industrial chemicals, intermodal, motor vehicles and equipment
Virginia	Waste and scrap, hydraulic cement	Crushed and broken stone, coal
Ohio	Waste and scrap, hydraulic cement	Products of petroleum refining, coal, motor vehicles and equipment
Indiana	Intermodal	Coal
New York	Bauxite	Industrial chemicals
North Carolina	Hydraulic cement	Products of petroleum refining, plastics and plastic synthetic resins
Michigan	Motor vehicles and equipment, waste and scrap	Motor vehicles and equipment
Kentucky	Waste and scrap	Household appliances, intermodal, motor vehicles and equipment

Source: 2019 Waybill Sample

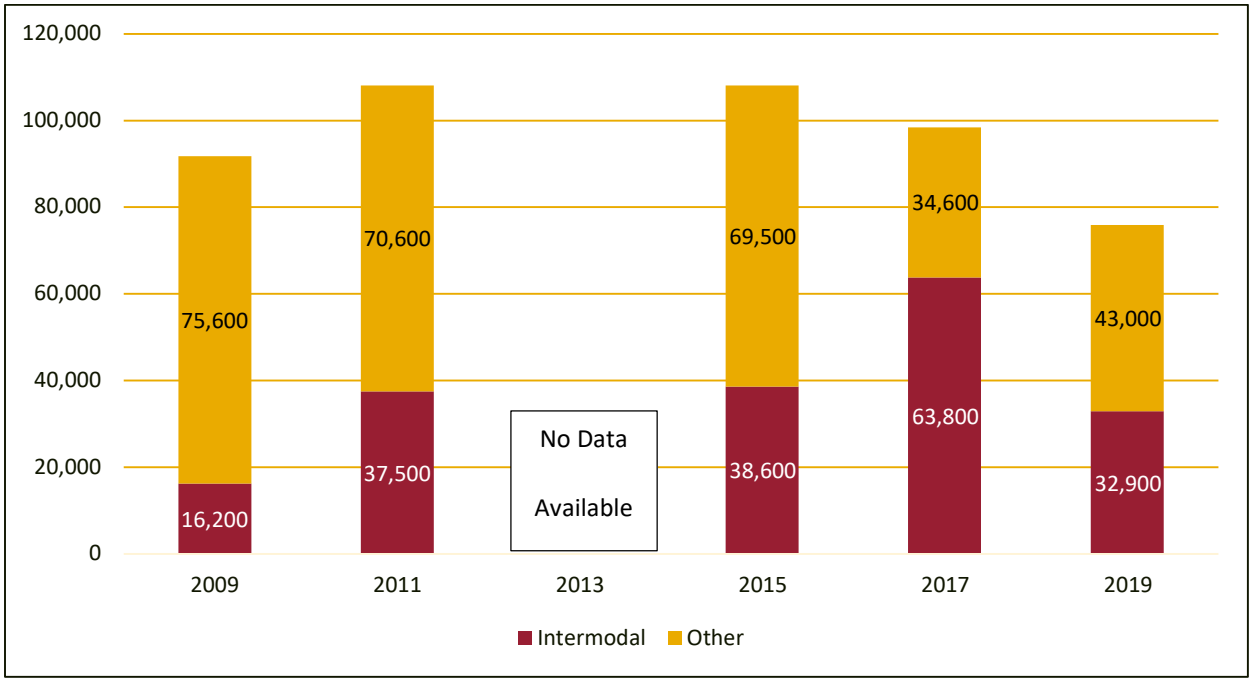
Maryland Commodity Trends

As illustrated in Figure 2-41, carloads originating in Maryland increased after the recession in 2009, but have since declined. Originating traffic increased from 91,800 carloads in 2009 to 108,100 carloads in 2011 and 2015. Since 2015, carloads originating have decreased to 75,900.

Yard in Baltimore

Caseyjonz, Public domain, via Wikimedia Commons

Figure 2-41. Rail Carloads Originating in Maryland, 2009 – 2019[44], Every other Year

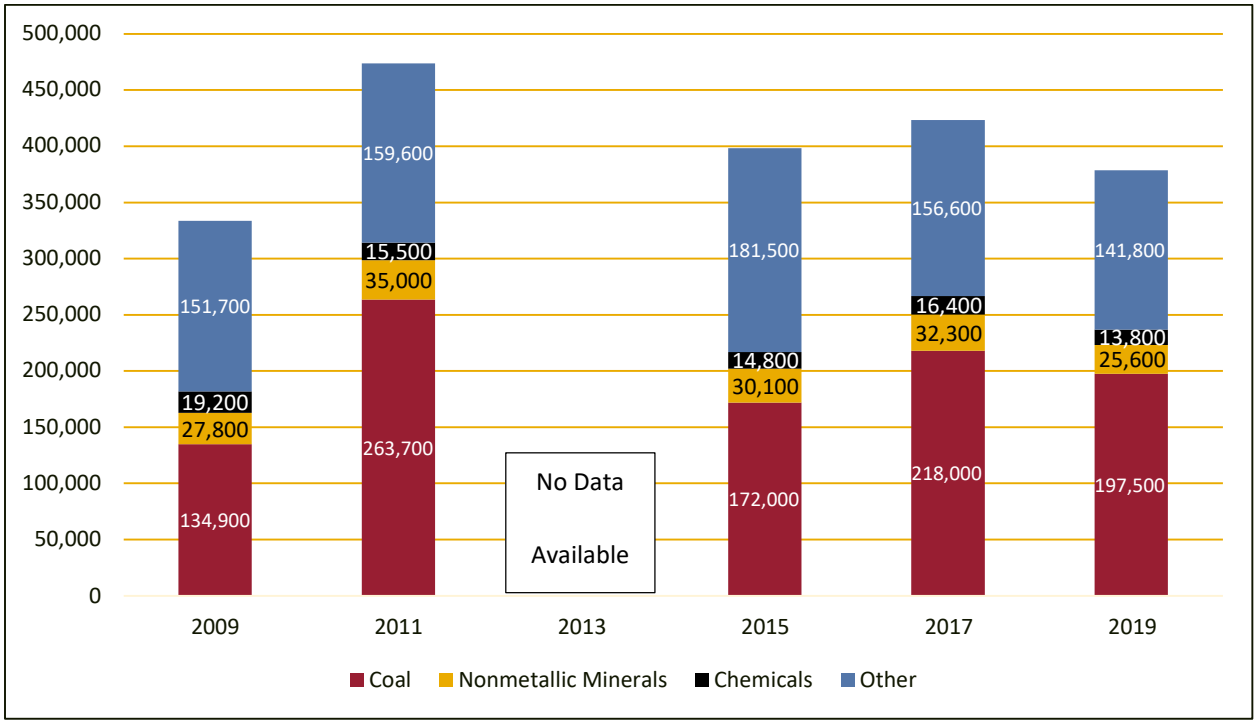


Source: AAR Maryland State Profiles

Carloads terminating in Maryland also increased after 2009, but then declined to 2019. Carloads increased from 333,600 in 2009 to 473,800 in 2011. However, freight levels then declined. Carloads terminated of nonmetallic minerals and chemicals are less in 2019 than in 2009, as illustrated in Figure 2-42.

[44] AAR did not produce state profiles in 2013.

Figure 2-42. Rail Carloads Terminating in Maryland, 2009 – 2019, Every other Year



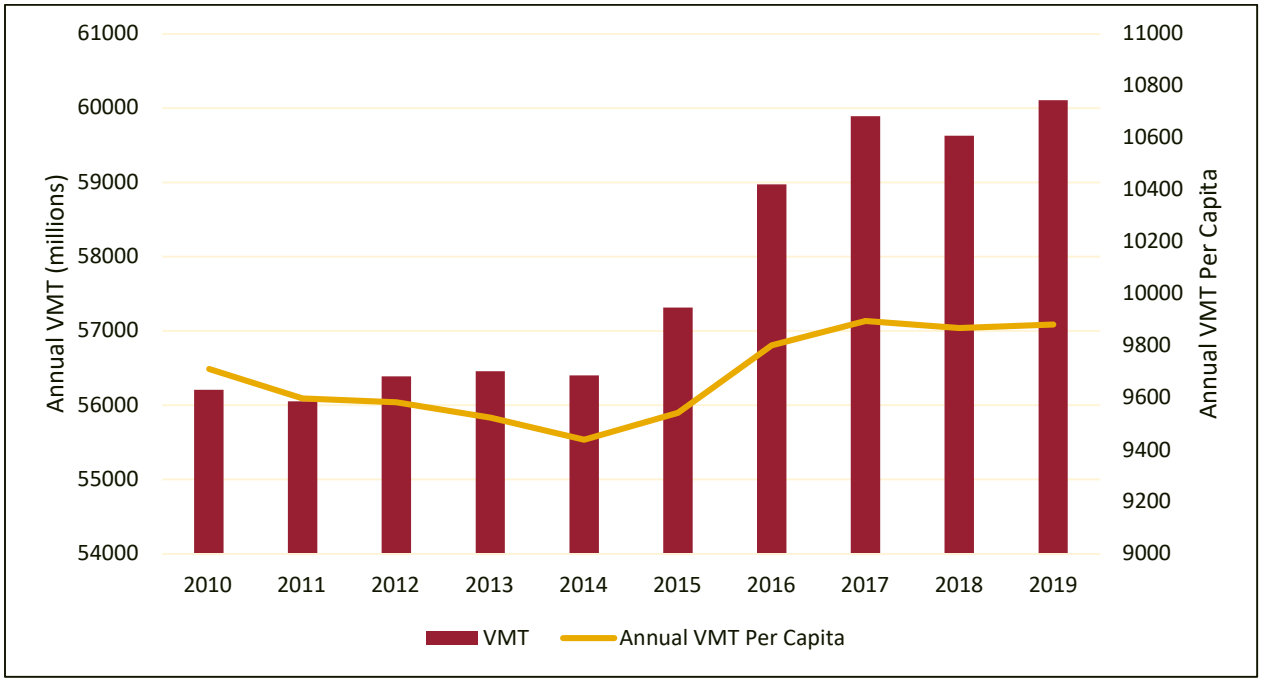
Source: AAR Maryland State Profiles

Passenger Travel Demand and Growth

Coal Train

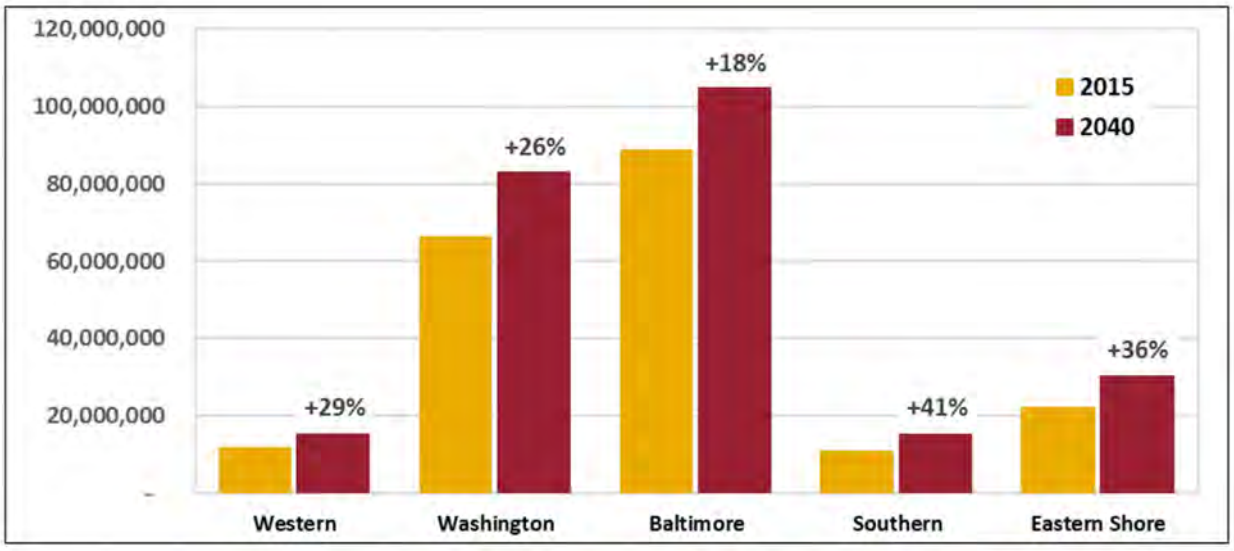
Passenger rail service provides an alternative to private vehicles and can alleviate congestion caused by growth in passenger vehicle travel. As illustrated in Figure 2-43, passenger vehicle miles traveled (VMT) and the VMT per capita increased between 2010 and 2019, although VMT per capita leveled off between 2017 and 2019. Figure 2-44 illustrates travel demand forecasting performed by MDOT SHA that indicates VMT will continue to grow in the future.

Figure 2-43. Annual Vehicle Miles Traveled (VMT) and Annual VMT Per Capita



Source: Maryland Department of Transportation, 2020 Annual Attainment Report on Transportation System Performance

Figure 2-44. Change in Vehicle Miles of Travel by Maryland Region, 2015 and 2040

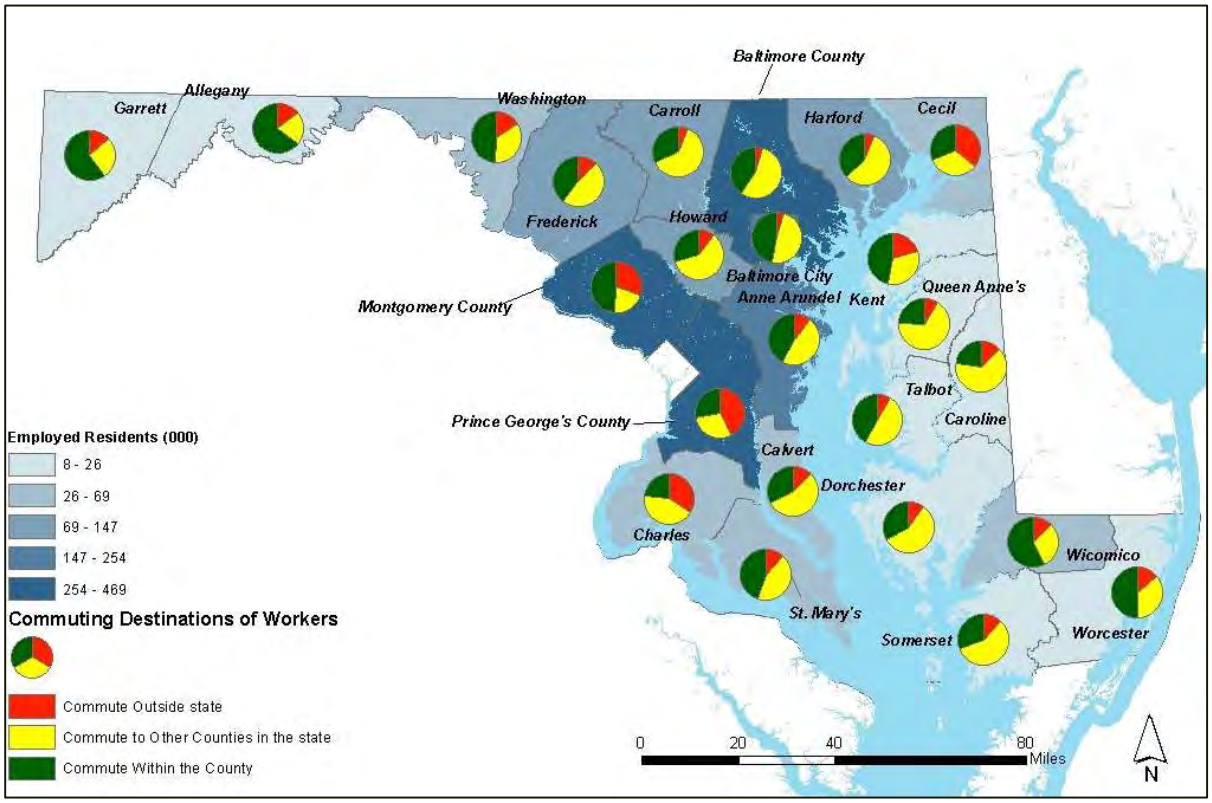


Source: Maryland Department of Transportation State Highway Administration, MSTM V1.1

Figure 2-45 illustrates that commuters of most Maryland counties have work destinations within the state, often within the same county. Cecil County is an exception, with commuters traveling to Wilmington, Delaware, or Southeastern Pennsylvania. Other exceptions are Montgomery, Prince George's, and Charles counties, with commuter

destinations in Washington, DC, or Northern Virginia.

Figure 2-45. Share of Commuting Destinations by County



Source: US Census Longitudinal Employment and Household Dynamics (LEHD) 2014

Fuel Cost Trends

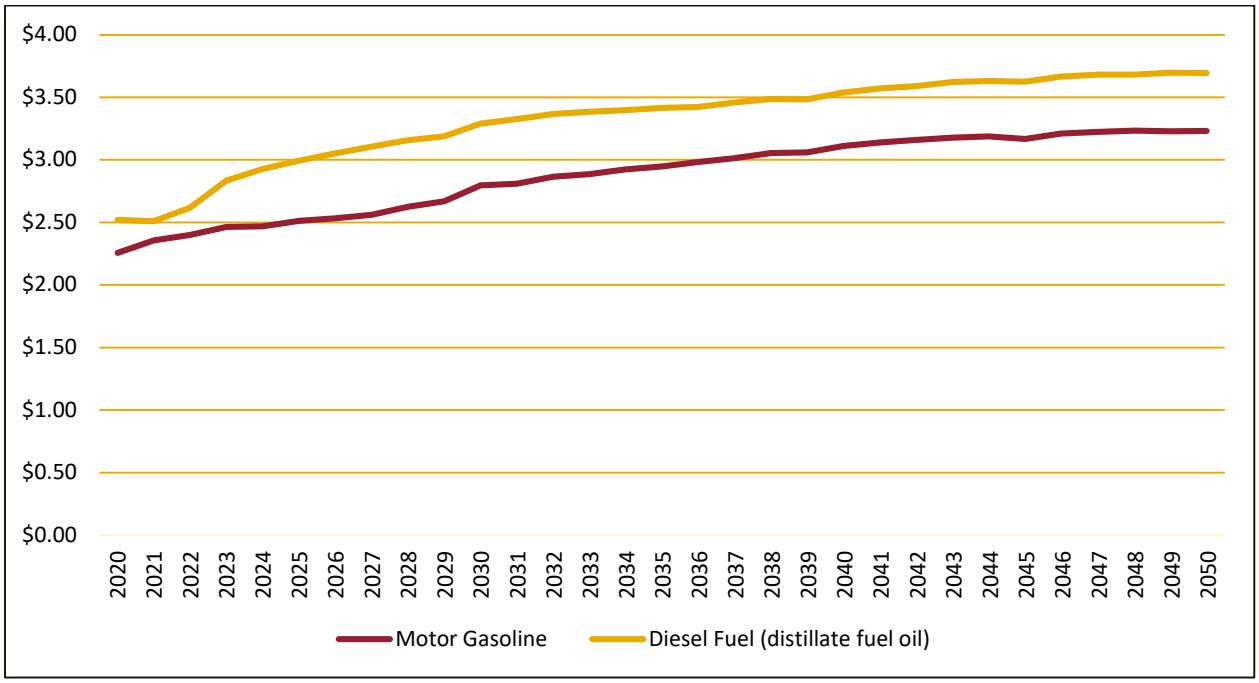
Research has found that a positive correlation exists between gasoline costs and commuter rail ridership. For example, the Mineta Transportation Institute found that a 10% long-term increase in gasoline prices causes commuter rail ridership to grow by 1.16%.[45] Amtrak ridership is similarly sensitive to fuel prices.[46] Theoretically, demand for freight rail service could be impacted by fuel prices, since freight rail is less fuel-intensive than highway transportation. An increase in fuel prices grows the relative cost of highway transportation compared to rail transportation.

[45] Hiroyuki Iseki, Ph.D., Rubaba Ali for the Mineta Transportation Institute, *Net Effects of Gasoline Price Changes on Transit Ridership in US Urban Areas*, December 2014.

[46] Boomberg, "Late Trains Aren't Amtrak's Biggest Problem: A new analysis point to an even bigger impediment to ridership," February 2, 2016.

The US Energy Information Administration predicts that during the next 30 years gasoline and diesel prices will slowly increase in real terms. Theoretically, this increase in fuel prices could increase demand for rail transportation. However, the relationship may diminish throughout time as transportation networks shift away from petroleum as a fuel source.

Figure 2-46. Long-Term Transportation Sector Fuel Prices, ($2020 per Gallon)



Source: US Energy Information Administration Energy Outlook

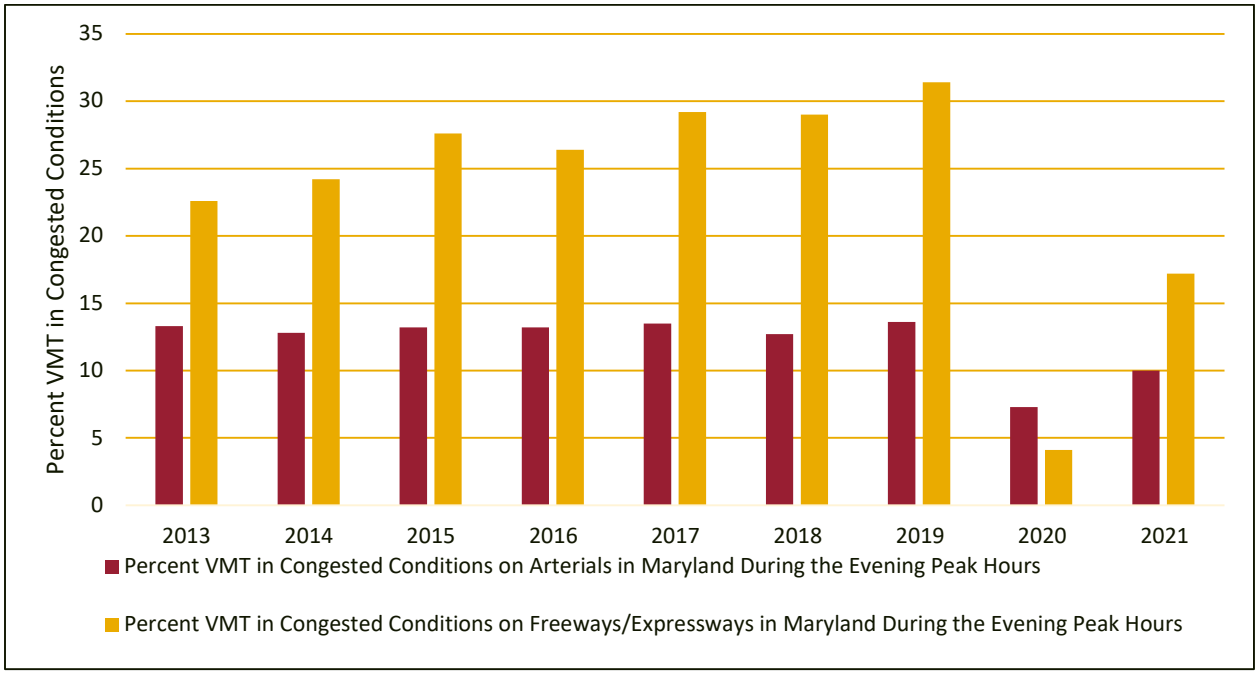
Rail Congestion Trends

On-time performance of MARC trains can serve to indicate rail congestion in Maryland. As earlier illustrated in Figure 2-14, Penn Line OTP peaked at 87% in 2013, dipped to 76% in 2017, and has improved steadily since then. On-time performance on the Camden and Brunswick lines dipped between 2017 and 2019 but improved in 2020. Camden Line OTP decreased from 94% in 2017 to 87% in 2019, but improved to 89% in 2020. The Brunswick Line OTP decreased from 96% in 2017 to 93% in 2019, but improved to 97% in 2020.

Highway and Airport Congestion Trends

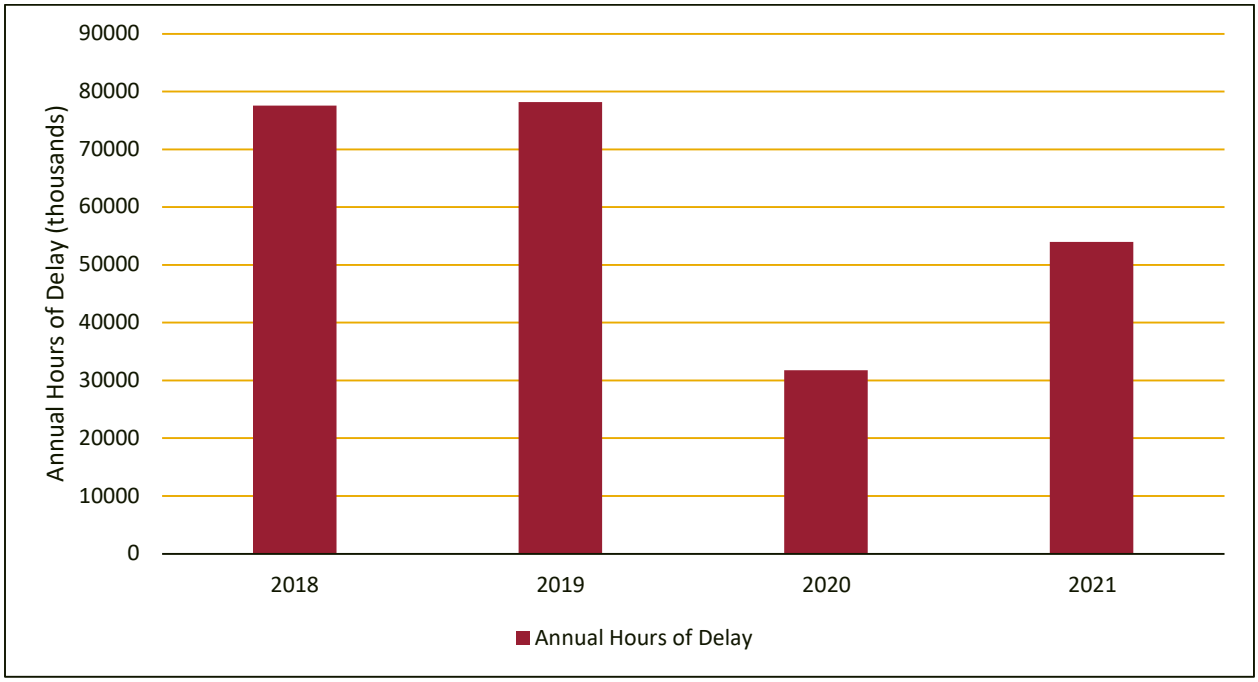
As illustrated in Figure 2-47 and Figure 2-48, congestion was prevalent on Maryland's roadways and was not improving before the COVID-19 pandemic. It is likely that congestion will return after the pandemic.

Figure 2-47. Percentage of VMT in Congested Conditions in Evening Peak



Source: Maryland Department of Transportation, 2022 Annual Attainment Report on Transportation System Performance

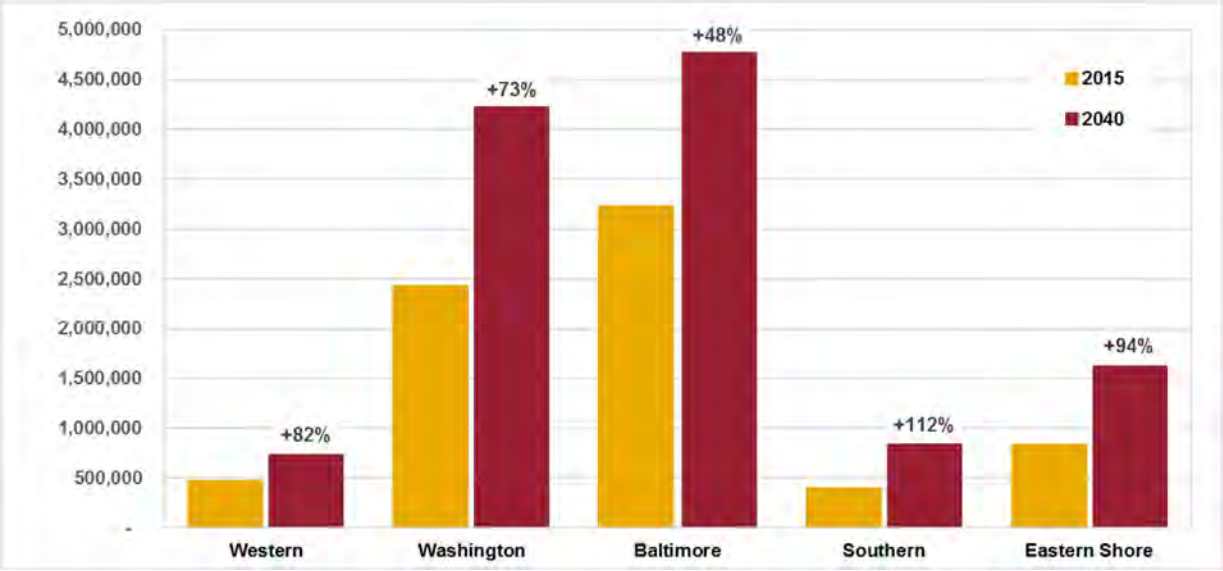
Figure 2-48. Annual Hours of Delay



Source: Maryland Department of Transportation, 2022 Annual Attainment Report on Transportation System Performance

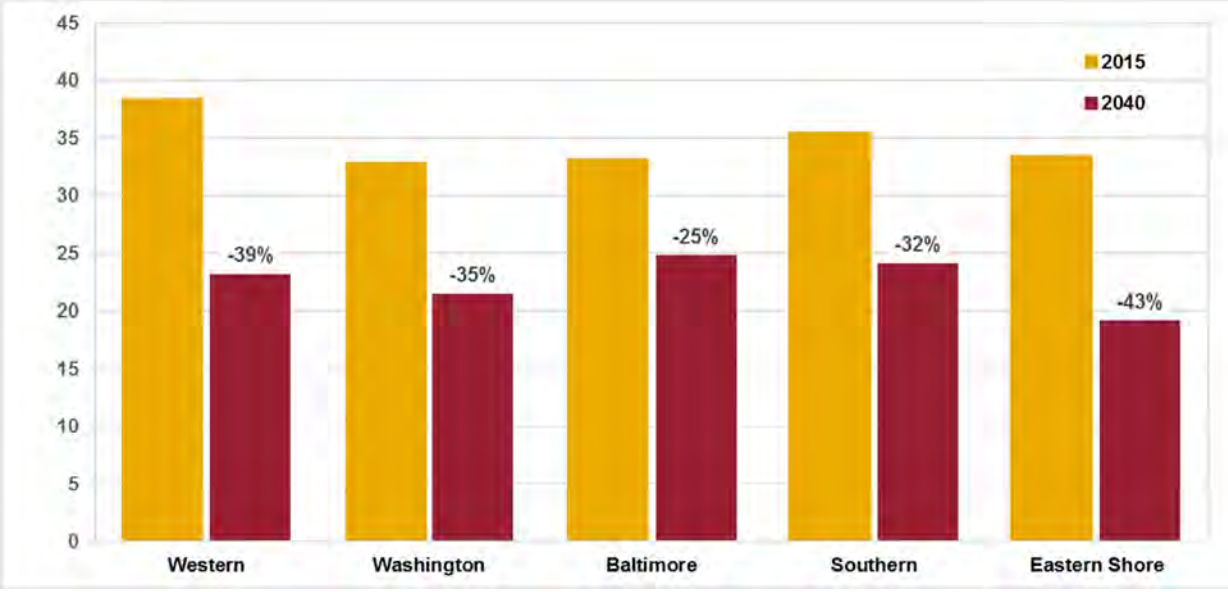
Congestion is expected to increase as Maryland's population and employment increases between now and 2040. National studies consistently cite the Baltimore/Washington region's transportation system as one of the most congested in the country. Many of the state's major roadways operate at capacity for multiple hours of the day. Figure 2-49 and Figure 2-50 illustrate the forecast change in vehicle hours of travel (VHT) and change in average congested speeds between 2015 and 2040.

Figure 2-49. Change in Vehicle Hours of Travel (VHT)



Source: Maryland Department of Transportation State Highway Administration, MSTM V1.1

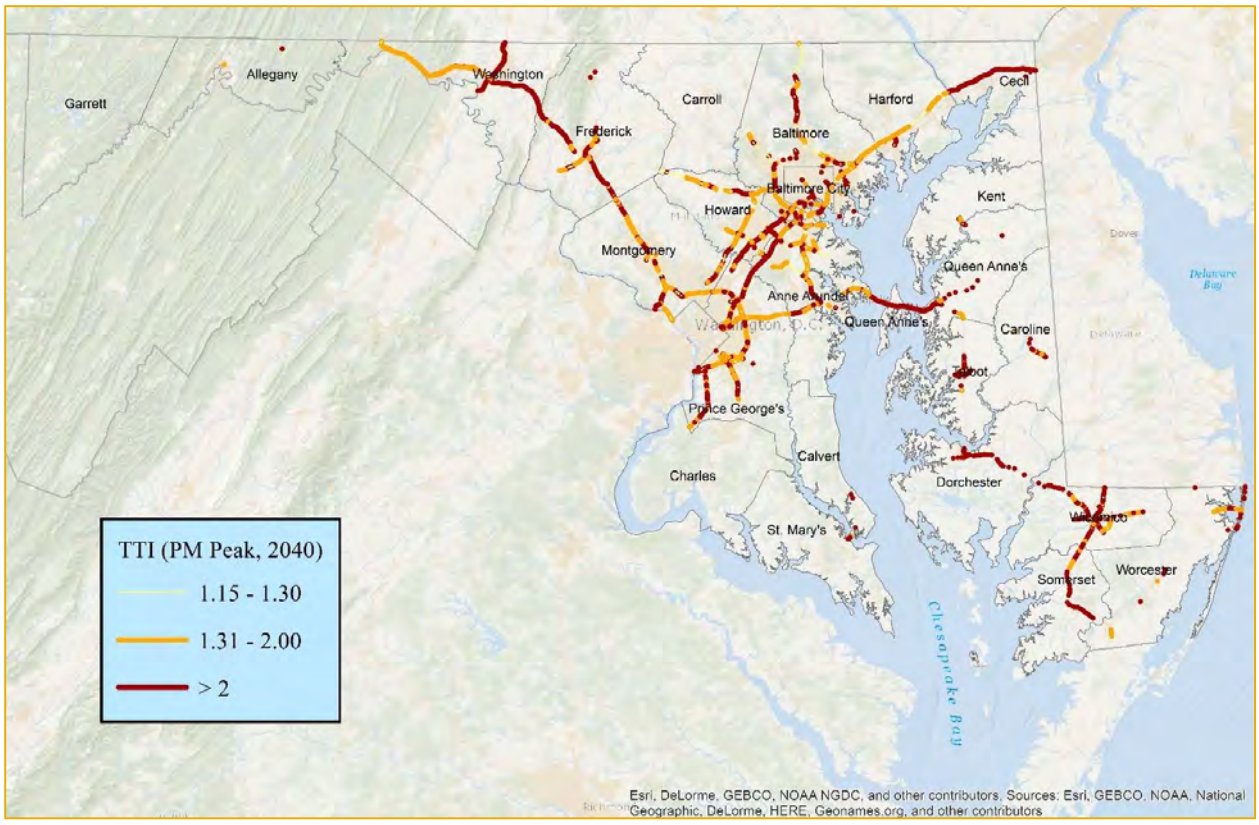
Figure 2-50. Change in Average Congested Speeds



Source: Maryland Department of Transportation State Highway Administration, MSTM V1.1

Travel Time Index (TTI) measures the congestion conditions on individual roadway links. The TTI compares free flow time, the travel time when there is no congestion, to congested travel time. A TTI of 2.0 or above indicates that a trip that requiring 10 minutes in light traffic would require 20 minutes in heavy traffic.[47] Figure 2-51 illustrates the TTI for projected 2040 conditions in Maryland. Many of Maryland's roadways will be congested by 2040, particularly in Frederick County, Cecil County, Montgomery County, and Anne Arundel County. Figure 2-52 illustrates the roadway segments forecast to experience a TTI increase of 50% or more. Many of the trips in the congested corridors, especially those along I-95 and I-270, could be served by rail.

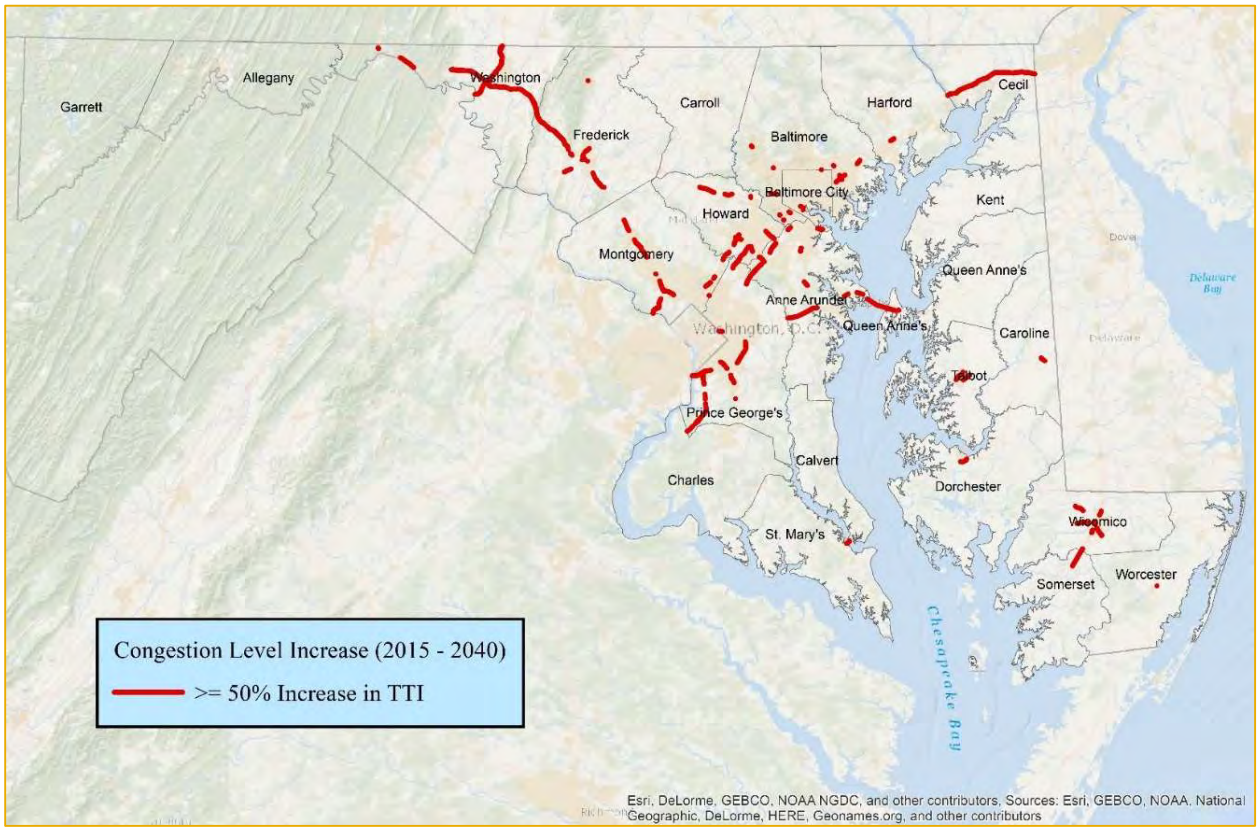
Figure 2-51. Congested Highway, Freeway, and Expressway Links, 2040



Source: Maryland Statewide Transportation Model 2015

47 https://ops.fhwa.dot.gov/congestion_report_04/appendix_C.htm

Figure 2-52. Roadway Links with Increased Congestion between 2015 and 2040

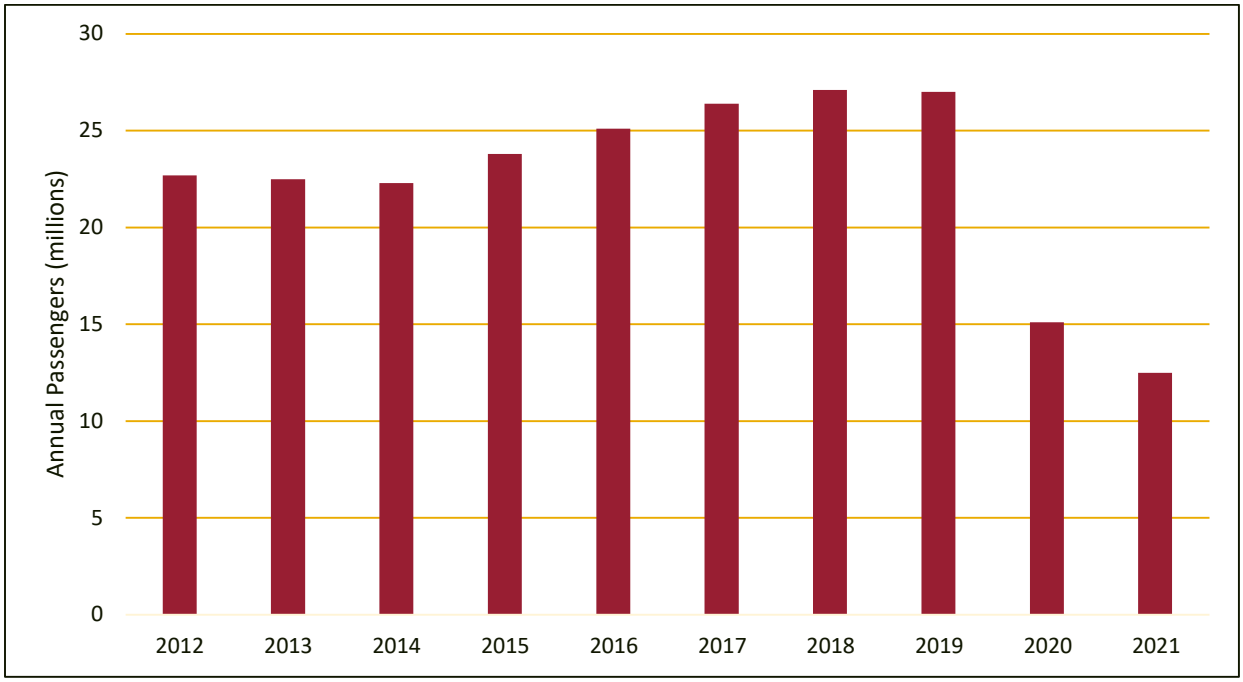


Source: Maryland Statewide Transportation Model 2015

Airport Congestion Trends

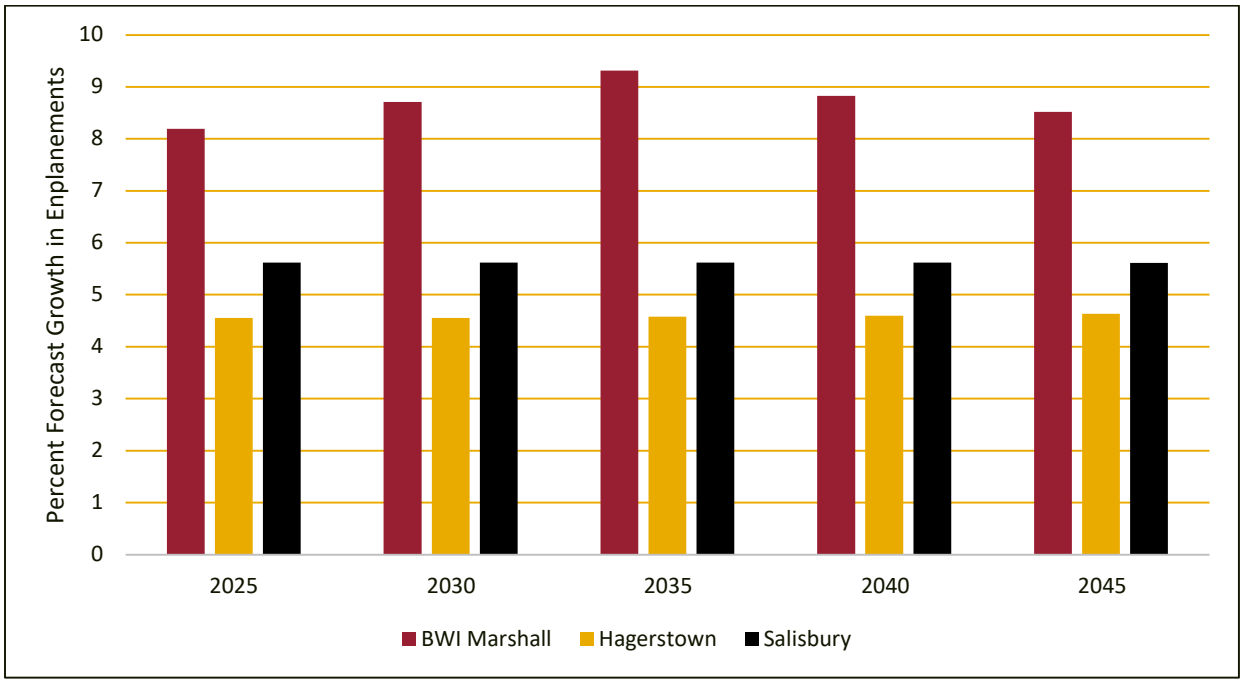
Understanding airport congestion trends can support the assessment of opportunities for passenger rail, either in feeding the aviation network or providing a substitute. Commercial airlines serve three Maryland airports: BWI Marshall Airport, Hagerstown Regional Airport (HGR), and Salisbury-Ocean City (SBY) Airport. BWI Marshall Airport is by far the largest, with more that 27 million annual passengers in 2019 and nonstop service to 90 markets. It is the 22nd largest airport in the US, based on enplaned passengers, surpassing Washington Dulles (IAD) Airport and Reagan National (DCA) Airport. In 2019, SBY handled 70,111 annual enplanements and HGR handled 29,015. Figure 2-53 illustrates passenger growth at BWI Marshall Airport since 2012, and Figure 2-54 illustrates the FAA's forecasted percentage of growth at the three airports through 2045.

Figure 2-53. BWI Marshall Airport Annual Passengers, 2012-2021



Source: Maryland Department of Transportation, 2022 Annual Attainment Report on Transportation System Performance

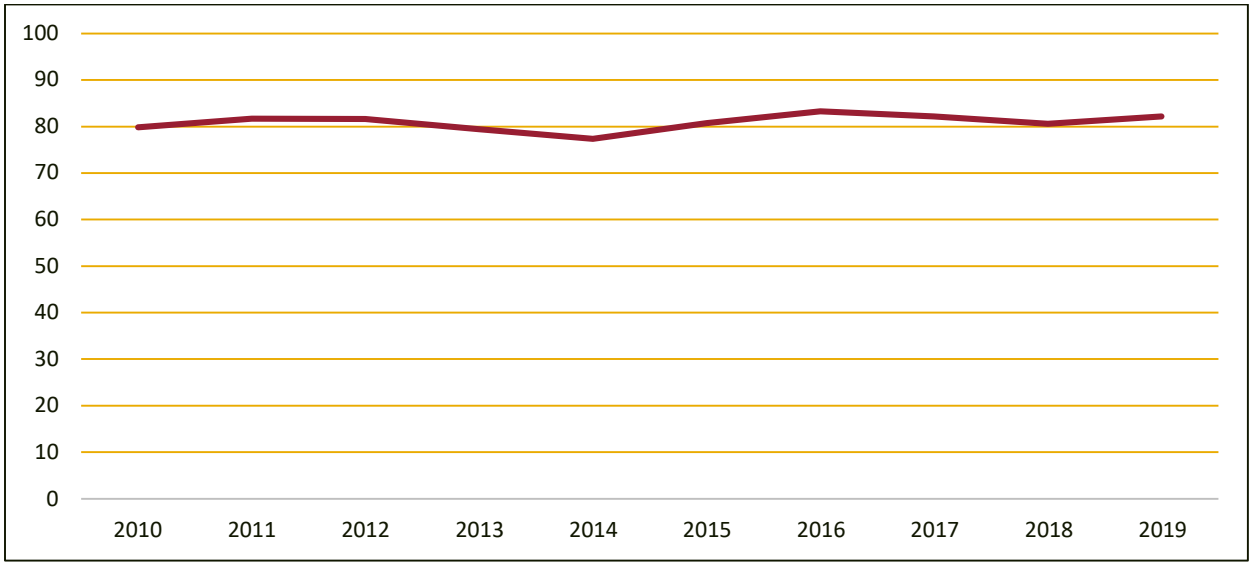
Figure 2-54. Percent Forecast Growth in Emplaned Passengers



Source: FAA

Airport on-time percentages can serve as a proxy for airport congestion, since congestion increases flight delays. Flights are on time if they arrive or depart gates within 15 minutes of scheduled times. On-time arrivals at BWI Marshall Airport hover around 81%. Figure 2-55 illustrates variances in on-time arrival percentages at BWI Marshall Airport over time. Data is not available for SBY Airport, and only 2019 and 2018 data are available for HGR Airport. In those years, 80.9% and 76.8% of flights were on time at HGR Airport in 2019 and 2018, respectively.

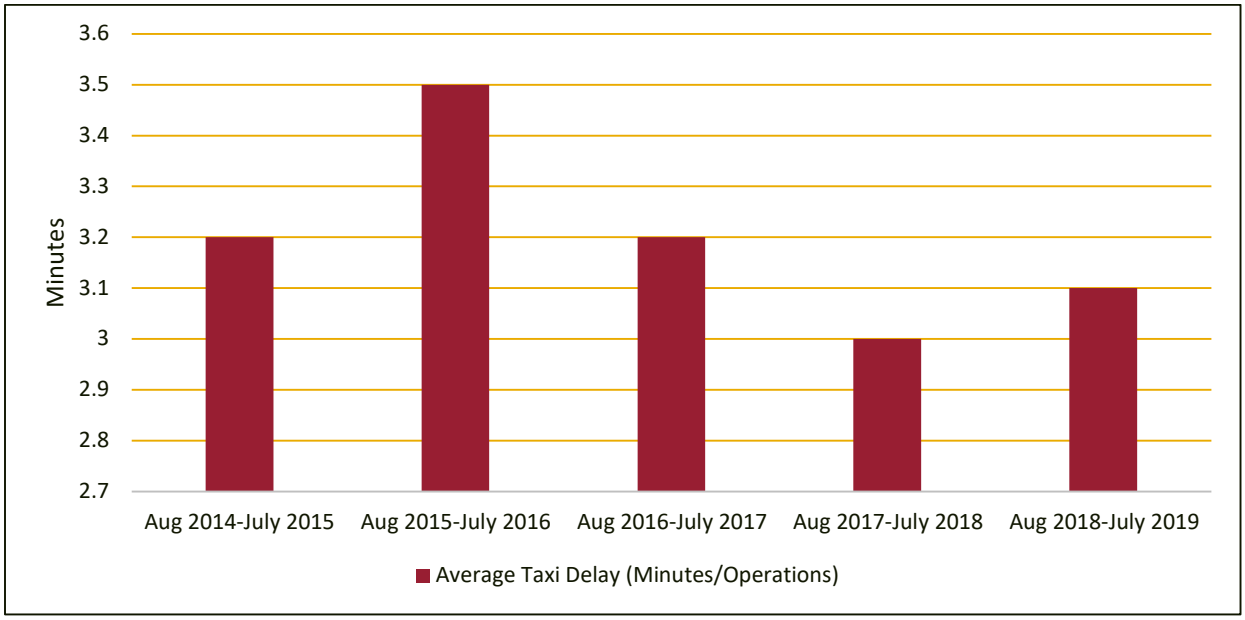
Figure 2-55. BWI Marshall Airport On-Time Arrival Percentages, 2010-2019



Source: FAA

Airport congestion may be measured by average taxi delay. Average taxi delay is calculated by dividing the sum of all taxi-in and taxi-out delay of one minute or more in one hour by all arrivals and departures within that hour. MDOT Maryland Aviation Administration (MDOT MAA) monitors this metric to anticipate the point when delays will reach six minutes, the threshold indicating the need for additional runway capacity. Figure 2-56 illustrates the average taxi delay under all-weather conditions at BWI Marshall Airport. The higher amount of delay between August 2015 and July 2016 can be attributed to an 83-day runway closure for construction activity and an issue with Southwest Airlines gate usage resulting in excessive arrival staging during the morning arrival push. This issue has since been resolved.

Figure 2-56. Average All-Weather Taxi Delay at BWI Marshall Airport



Source: Hourly Operations and Delay Per Operation Technical Memorandum, prepared for Baltimore/Washington International Thurgood Marshall Airport, prepared by Landrum & Brown, Incorporated, October 2019

Air and rail passenger services are competitive along the Northeast Corridor, and Amtrak carries more passengers between New York City and Washington, DC, and New York City and Boston than do airlines. The connection between passenger rail service and BWI Marshall Airport is strong. The BWI Marshall Airport Rail Station is less than one mile from the airport terminal, and the MDOT MAA operates a shuttle bus between the station and airport to provide link to MARC and Amtrak trains, as well as local and MDOT MTA Commuter/Express buses. In 2019, the BWI Marshall Airport Rail Station was the 12th busiest Amtrak station in the country with 751,228 passengers. The station underwent a $4.7 million renovation in 2018 and 2019, which expanded customer seating and ticketing facilities, constructed a new concessions area, and upgraded the restrooms.

Land Use Trends

Maryland was home to the first railroad in the United States, and railroads influenced the location and growth of cities and towns across the state. However, like many states, Maryland has seen an increase in suburban and rural development. Historic downtown cores, many built around train stations, remain but much of the state's new development occurs farther from these centers in suburban and large-lot development patterns. The Maryland Transportation Plan identified Changing Development Patterns, growth moving out from centralized cores, as an important transportation challenge facing the state.

To address this challenge, MDOT and the state of Maryland continue to encourage TOD at Maryland rail stations. In 2008, the General Assembly provided MDOT with increased abilities to advocate for TOD. MDOT MTA has published station area concepts for Bowie State University Station on the Penn Line and Monocacy Station the Brunswick Line, and the Transit Station Area Profile Tool includes data on all Maryland MARC stations. Land use planning and development approval are local decisions, but MDOT is working with its state and local partners to encourage collaborations that will maximize the benefits offered by investment in the rail network.

As development is considered at station areas and along railroad rights-of-way, it is important to account for land use impacts on rail transportation.

- Changes in land use can create conflicts, such as conversion of industrial or agricultural areas to residential use. Rail activities can be loud and disruptive to adjoining residential areas.
- Changes in land use potentially can affect traffic at highway-rail grade crossings, changing the safety concerns and associated infrastructure needs of those crossings.
- Changes in land use adjacent or near rail lines can increase trespassing opportunities. Most of Maryland's rail fatalities are associated with trespassers, who often seek the most direct walking path between destinations. Therefore, it is important for local jurisdictions to consider land uses near railroad tracks and to work to provide convenient pedestrian access to key destinations without inadvertently encouraging trespassing.
- Changes in railroad operating practices can disrupt communities and adjoining properties, and changes resulting in idling and stopped trains can result in blocked crossings.
- Changes in land use that reflect conversion to medium- or high-density residential or mixed-use development near passenger rail can provide increased passenger rail ridership.
- Changes in land use to freight-compatible and supportive land uses can provide for local economic development opportunities not otherwise realized through traditional residential or commercial land use. Conversion of truck trips to rail trips could also be a benefit of maintaining rail access to supportive land uses.

3 Proposed Passenger Rail Investments and Improvements

PASSENGER RAIL ISSUES AND OPPORTUNITIES IN MARYLAND

Intercity and commuter rail passenger services are important modes of transportation in Maryland. Both provide a public benefit with the potential to move more people rapidly along congested corridors in comfort. Potential opportunities were raised by stakeholders for consideration in planning for the future of passenger rail in Maryland.

- **Northeast Corridor Improvements** – Some of the infrastructure on the Northeast Corridor (NEC) has reached or is approaching the end of its useful life. This includes the existing signaling system, the tunnels in Baltimore City, and the bridges across the Chesapeake Bay tributaries. If not addressed, the condition of these assets will continue to deteriorate and increasingly become unable to serve their functions. Other infrastructure and equipment will require maintenance and replacement under a programmatic asset management process.
- **Corridor Capacity and Additional Passenger Services** – Stakeholders were interested in additional Amtrak and MARC service, particularly enhancing MARC frequencies on the Brunswick and Camden lines. Increased network capacity will be required to expand Amtrak and MARC service and increase operational flexibility along the corridors on which they operate. This would include additional trackage, but also improvements to signaling, stations, and construction or expansion of maintenance and layover facilities.
- **Rail Connections** – Virginia, Maryland, and Delaware each are served by separate commuter rail agencies. Currently, these passenger rail systems do not overlap. Virginia Railway Express (VRE) and MARC terminate at Union Station in Washington, DC, but do not extend into each other's territories. Some stakeholders proposed a connection between MARC and Southeastern Pennsylvania Transit Authority (SEPTA) at Newark, DE.

Others proposed extension of MARC service to L'Enfant Station and Northern Virginia to provide a one-seat trip for passengers traveling from Maryland to employment centers in Northern Virginia. Stakeholders also expressed interest in a more seamless travel experience for passengers using more than one rail service or mode, including coordinated schedules and integrated ticketing and fare payment systems and passenger information systems among the three commuter rail services: Amtrak, local transit, and first- and last-mile access providers.

- **Rail Station** – Rail stations can present both challenges and opportunities. Regular maintenance and upkeep of Maryland's intercity and commuter rail stations are required. Safety considerations, like grade-separated access to platforms, also must be addressed. Enhancements to intercity and commuter rail stations can provide development opportunities, particularly with increased connectivity with transit and other modes of travel. Maintenance and improvement of Maryland's intercity and commuter rail stations will also be required as appropriate. To increase safety at stations, MDOT MTA would like to minimize locations where passenger access to platforms requires crossing tracks at-grade.
- **New services** – Not all of Maryland is served by passenger rail, and some stakeholders expressed interest in establishing new services or extending existing services to areas of the state where no passenger rail service exists.

The *Maryland State Rail Plan* was prepared during the COVID-19 pandemic, which resulted in the dramatic reduction in transit ridership across the world and the adoption of virtual work and educational activities in remote locations. Commuter rail systems like MARC experienced the most dramatic decrease in ridership among US transit operations, since these operations historically catered to traditional 9-to-5 commuters traveling to central office locations, many of whom were federal government employees mandated to work from home. Upon assessing the impacts of the pandemic, some stakeholders predicted an increase in remote work enabling employees to live farther from office locations with less frequent in-person interaction, resulting in fewer, longer trips.

The following projects and initiatives address opportunities to improve passenger rail in Maryland. Most are in the planning, design, or construction/procurement phase.

AMTRAK/NORTHEAST CORRIDOR INITIATIVES

While Amtrak is the owner of the NEC in Maryland, major corridor initiatives and capital projects are programmed by the Northeast Corridor Commission (NEC Commission), a consortium of Amtrak and federal and state DOT entities, including MDOT. As a member of the NEC Commission, MDOT contributes funding towards various NEC projects pursuant to the Passenger Rail Investment and Improvement Act of 2008 (PRIIA) and the Northeast Corridor Commuter and Intercity Rail Cost Allocation Policy.

Several state-of-good repair projects have been identified to maintain service on the NEC, including major projects in Maryland like the replacement of the Baltimore & Potomac (B&P) Tunnel and the Susquehanna River Bridge. Additionally, several corridor capacity projects through Maryland are proposed to enable greater frequencies and higher speeds. These projects include improved signaling, interlocking improvements, construction of additional trackage to provide a four-track system, and expansion of stations at New Carrollton and Baltimore/Washington International Thurgood Marshall (BWI Marshall) Airport. Renovation and redevelopment of Baltimore Penn Station and the surrounding area is another major Amtrak initiative in Maryland.

B&P Tunnel Replacement – Frederick Douglass Tunnel

The B&P Tunnel, built in 1873, is one of the oldest infrastructure components on the NEC in active use today. The tunnel accommodates two mainline tracks between the West Baltimore MARC Station and Baltimore Penn Station and presents an operational chokepoint for both the Amtrak NEC and MARC Penn Line services. The existing tunnel consists of three tunnel segments more than 1.4 miles in length, with capacity and throughput affected by curvature, limiting the operating speed to 30 mph. Vertical and lateral clearances within the tunnel also restrict operations.

The B&P Tunnel is used by Norfolk Southern freight trains operating in local service, but cannot accommodate double-stack intermodal trains. The tunnel carries 138 kv transmission lines that supply traction power to the NEC in antiquated cables that require replacement. Antiquated ventilation systems provide only passive ventilation as trains travel through and push air out of the tunnel.

After a National Environmental Policy Act (NEPA) study with preliminary engineering, the Federal Railroad Administration (FRA) selected a preferred alternative that would build a new multiple track tunnel north of the existing facility. The new Frederick Douglass Tunnel would feature a wide arching alignment to accommodate higher operating speeds,

improved clearances, greater operational capacity, and modern ventilation systems. The design allows for a future adjacent tunnel with two additional tracks to enhance the capacity of the line for the long term. Figure 3-1 depicts the proposed B&P Tunnel replacement alignment.

Figure 3-1. B&P, Frederick Douglass Tunnels

Source: Amtrak

The tunnel would meet the existing alignment near the West Baltimore MARC station and continue to Baltimore Penn Station. The existing NEC would be realigned between Gwynns Falls Bridge and the West Baltimore MARC station to accommodate the appropriate grades and approaches to the new B&P Tunnel. The West Baltimore Station would be rebuilt on the modified alignment.

On June 18, 2021, Amtrak and MDOT released new plans to replace the 148-year-old Baltimore & Potomac (B&P) Tunnel on the Northeast Corridor in the next 10 years at a cost of $4 billion. The B&P Tunnel Replacement Program is a broad range of investments that

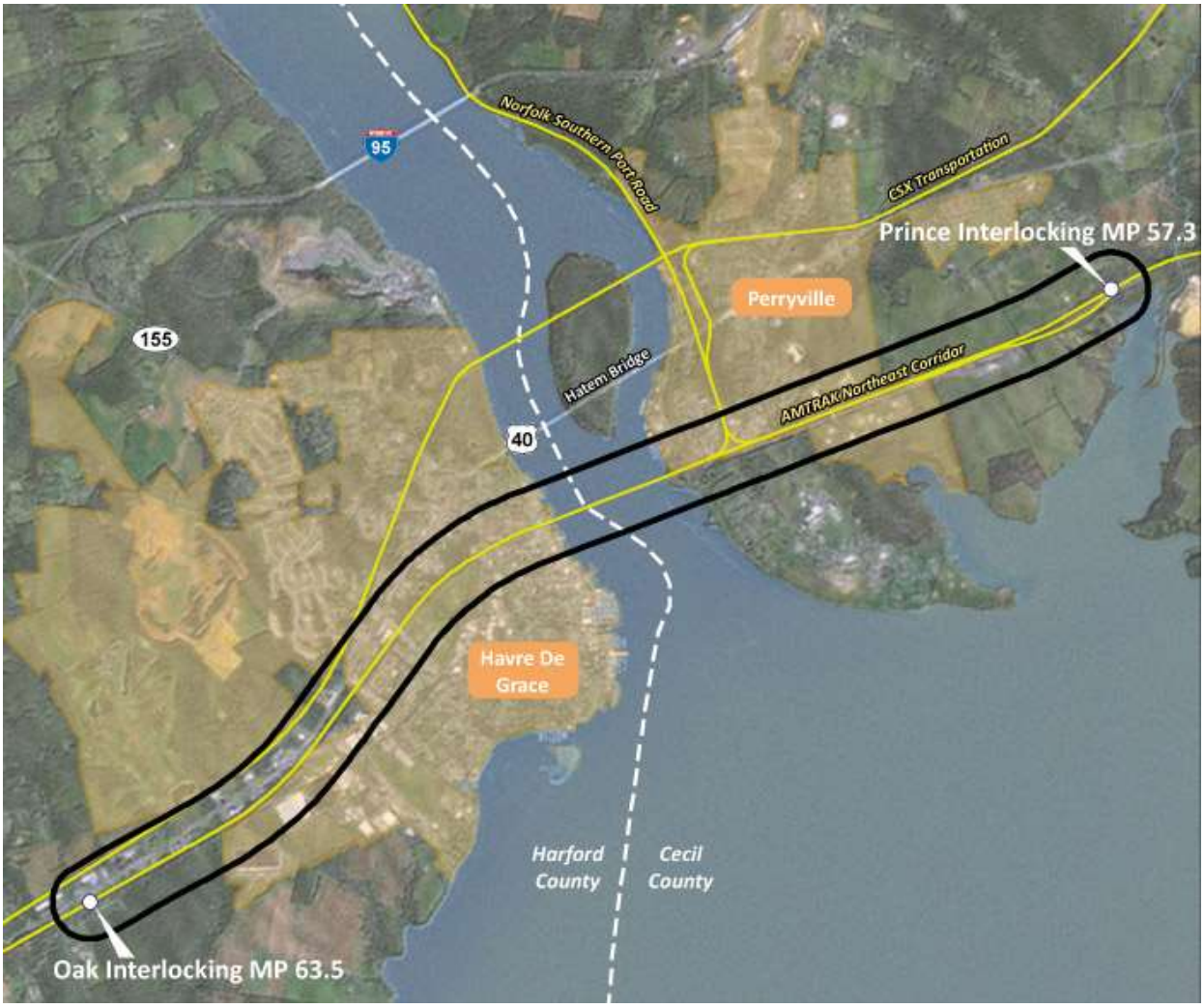
will transform a four-mile section of the Northeast Corridor in Baltimore. It includes the new Frederick Douglass Tunnel, a new ADA-accessible West Baltimore MARC Station, and the replacement of bridges, track, and rail systems. Amtrak currently is performing final design and initiating property acquisitions to prepare for construction. Pending sufficient funding for the approximately $4 billion investment, early construction activities on the tunnel's southern approach could begin during the next one to two years. Amtrak continues state of good repair work on the existing B&P Tunnel to maintain existing operations.

Susquehanna River Bridge

The existing Susquehanna River Bridge, owned by Amtrak, carries two tracks over a movable-lift span across the Susquehanna River between Havre de Grace and Perryville, MD. Maximum operating speed on the bridge is 90 mph for passenger trains.

An Environmental Assessment (EA) and Finding of No Significant Impact (FONSI) were completed in 2017 by the FRA in partnership with MDOT. The preferred alternative would build a new four-track fixed-span close to the existing structure, to provide higher operating capacity and operating speeds up to 160 mph. To improve capacity and reliability and minimize conflicts, the bridge would provide both horizontal and vertical separation for freight and passenger train operations. There has been desire to provide improved access for people walking and bicycling across the Susquehanna River either at this location or along the US 40 Thomas J. Hatem Memorial Bridge. The rail bridge project does not include a separate bicycle and pedestrian component, but would be designed to not to preclude the future addition of a multi-use path. Furthermore, the Maryland Transportation Authority provides opportunities for people bicycling to cross the nearby US 40 Hatem Bridge. Figure 3-12 depicts the Susquehanna River Bridge Study Area. The bridge replacement is estimated to cost $1.1 billion, with funding yet to be identified. Construction is expected to last five years.

Figure 3-2. Susquehanna River Bridge



Source: Susquehanna River Rail Bridge Project website

Baltimore Penn Station

As the eighth busiest Amtrak station in the country, Baltimore's Pennsylvania Station is an important multimodal transportation facility and hub for the City of Baltimore, as well as Maryland and the Mid-Atlantic Region. Amtrak is advancing the renovation and redevelopment of Baltimore Penn Station to create a mixed-use, transit-oriented development to better connect and serve Midtown Baltimore. The project renovates the existing historic station building, expands the station to include a new north concourse, and adds mixed-use and commercial development.

The renovation of Penn Station will bring the historic building to a state of good repair, including masonry repairs, window refurbishment, a new roof, vertical air circulation improvements, and new mechanical systems. This renovation will be the centerpiece of the

station redevelopment plan and features new retail establishments and restaurants on the concourse level and office space on the upper three floors.

Figure 3-3. Penn Station

Source: Penn Station Partners website

The new north concourse will be connected to the existing building and concourse, with access to all station platforms below. The plan features modern station facilities, including relocated ticketing and baggage areas and a new Metropolitan Lounge. An unused low-level platform will be converted to a usable high-level platform, and a new side platform will be constructed on an existing station bypass track, expanding the station's track capacity to accommodate increased Amtrak and MARC service in the future. Existing platforms will be upgraded/repaired as well.

As a final component of the project, a building will be constructed adjacent to the new north concourse for commercial and residential uses. The new development will be integrated with the station expansion and will increase station area activity.

Roadway improvements in the vicinity of the station are planned, including better curbside management and circulation, multimodal access, and parking access. Amtrak, the City of Baltimore and MDOT are working with a private partner to seek funding and advance project elements. MDOT recently submitted a federal grant application to improve the accessibility at Penn Station, including dedicated bus lanes and curb extensions, bus stop amenities like real-time signage, dedicated curbside frontages, bicycle and pedestrian connectivity and facilities as shown in Figure 3-4.

Figure 3-4. Baltimore Penn Station Connections Project Elements

Source: Building Baltimore Penn Station Connections grant application[48]

[48] https://www.mdot.maryland.gov/OPCP/BuildingPennStationConnections_ProjectNarrative.pdf

The estimated $50 million renovation of the existing Penn Station building began in 2022 with the $40 million station and platform expansion work. In total, public and private investment in the Penn Station project and surrounding area is estimated around $500 million.

Capacity/Fluidity Projects on the Northeast Corridor

Several projects that impact the speed and number of trains that can operate on the NEC are either in design/construction or are in advanced planning/environmental stages. These include projects related to signals, track configuration, and station platform capacity.

WASHINGTON – BALTIMORE SIGNAL CAPACITY

Amtrak is replacing the existing 1980s-era signal system between Washington and Baltimore with a new system to provide greater operational fluidity and increased capacity and maximum speeds on the Corridor.

GROVE INTERLOCKING

Grove Interlocking, located between the Odenton MARC Station and the BWI Marshall Airport Station, currently provides universal crossovers to allow access between all three tracks. The project would upgrade the Grove Interlocking with new high-speed universal crossovers to accommodate a future fourth mainline track.

NEW CARROLLTON STATION TRACK 1 PLATFORM

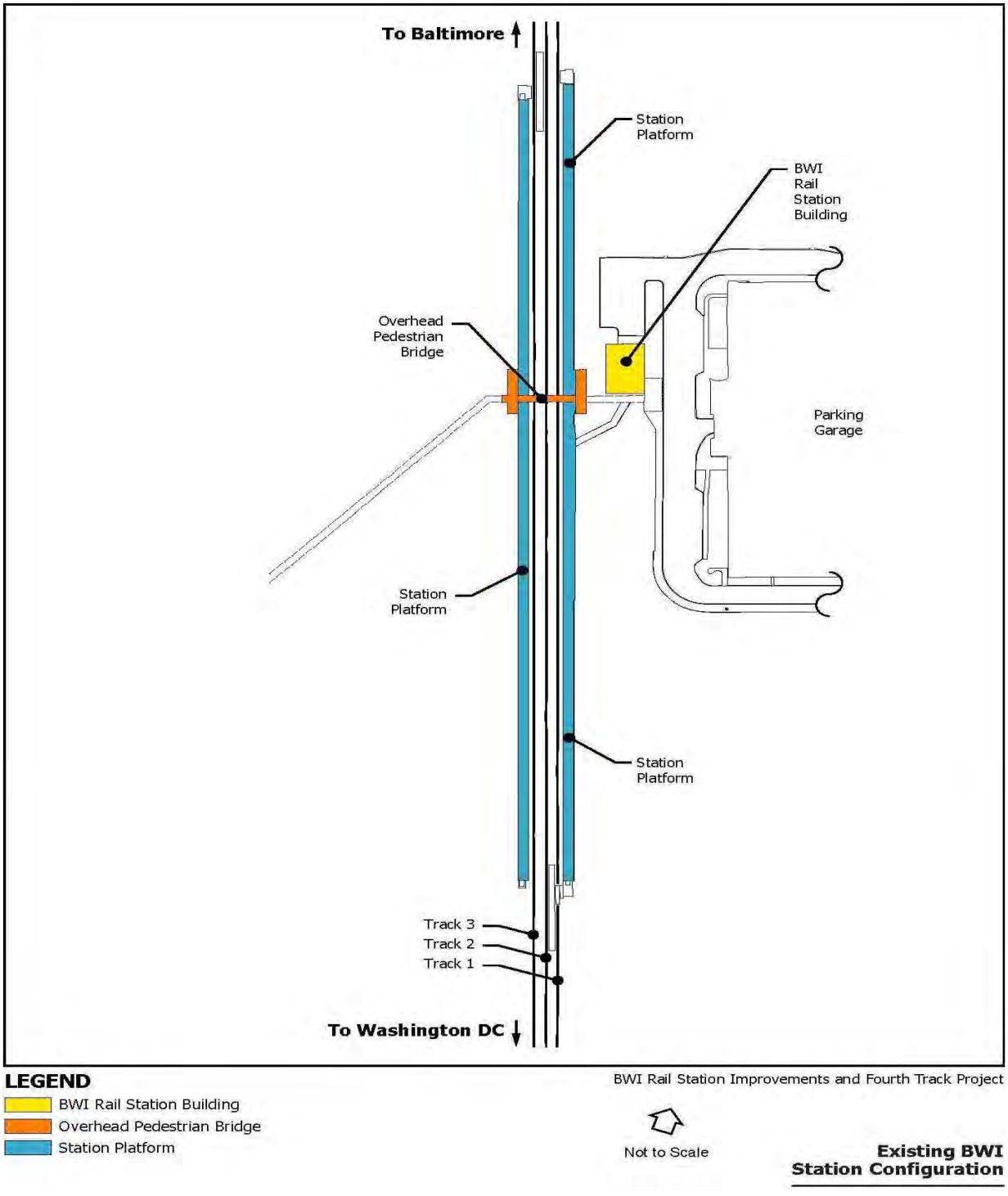
The New Carrollton Station Track 1 Platform project would construct a new high-level platform adjacent to the existing Track 1, providing a third boarding track at the station. This project would accommodate increased MARC and Amtrak frequencies and allow express trains to overtake trains stopped at New Carrollton Station more easily. The project also includes the reinstallation of a freight gauntlet track along Track 2 to preserve wide-load freight operations through New Carrollton Station. The estimated project cost is $36 million. The long-range plan allows for a future fourth track and additional side platform on the west side of the right-of-way.

BWI MARSHALL AIRPORT PLATFORM EXPANSION AND FOURTH TRACK

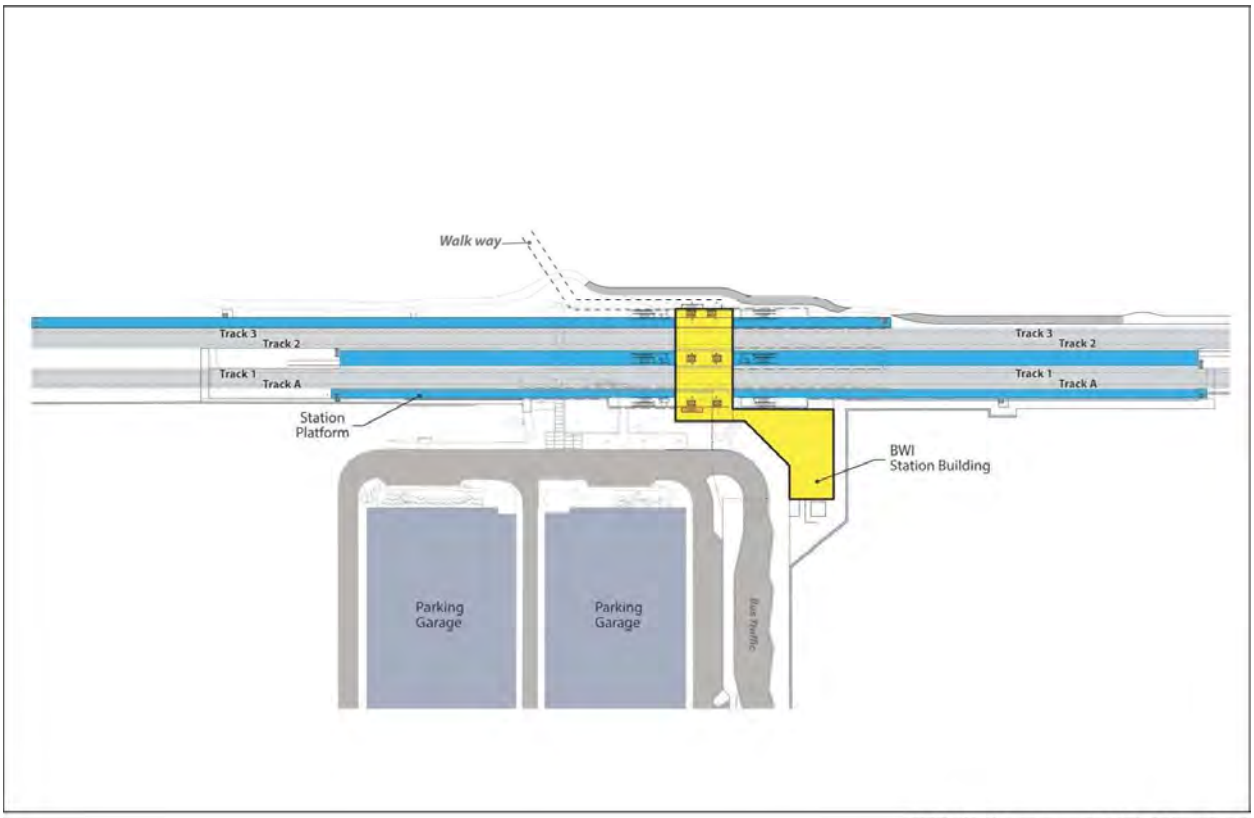
The BWI Marshall Airport Platform Expansion would enable platform boarding on all mainline tracks. Proposed design retains side platform access to Track 3, constructs a new center platform between Track 2 and Track 1, and enables access to a new Track 4. Figure 3-5

illustrates the proposed station configuration. Station improvements are estimated at $600 million, including nine miles of fourth track infrastructure through the station area.

Figure 3-5. BWI Marshall Station Configuration



Source: Maryland MTA, https://www.mta.maryland.gov/bwi-amtrak-rail-improvement, Figure 1.2-2



Source: Maryland MTA, https://www.mta.maryland.gov/bwi-amtrak-rail-improvement, Figure 2.2-6

Washington Union Station

MDOT MTA's MARC service has historically been the largest user of Union Station in Washington, DC, accounting for more than half of average weekday riders.[49] Although not located in Maryland, developments at Union Station have a significant impact on Amtrak and MARC services used by Marylanders. Amtrak is preparing to break ground on a project to double capacity in Union Station's passenger rail concourse. Later, Amtrak plans to widen platforms and eventually completely redevelop Union Station with additional concourses, a new train hall, and terminal rail improvements that would double the capacity for trains and passengers. MDOT MTA will need to adjust to changes at Union Station to ensure that MARC trains have adequate layover locations and other needed facilities. Changes at Union Station also should be coordinated with any proposed run-through services.

[49] District Department of Transportation, *District of Columbia State Rail Plan,* 2017.

NEC Capacity North of Baltimore

While passenger demand and traffic density on the NEC is greater between Washington, DC, and Baltimore, there are state of good repair and capacity needs on the NEC north of Baltimore to support increased intercity and commuter passenger service. The NEC north of Baltimore supports significant freight rail traffic, since Norfolk Southern's primary route to access the Port of Baltimore is along the NEC between Bayview in Baltimore City and the NS Port Road Subdivision at Perryville.

Replacing two existing two-track movable bridge spans at the Gunpowder and Bush river crossings will be required to achieve a state of good repair. Station improvements, including high-level platforms, will be required at Martin State Airport, Edgewood, Aberdeen, and Perryville. Adding additional trackage to maintain a four-track main line along the corridor will provide capacity for more frequent intercity and commuter rail service.

MARC COMMUTER RAIL INITIATIVES

Several key initiatives are in the planning phase or underway, including fleet enhancements and replacements, station improvements, service expansions, and capital infrastructure projects. Some of the MARC initiatives described below were identified by MDOT MTA in the *MARC Cornerstone Plan* published in 2018, as well as the Statewide Transit Plan. The *Cornerstone Plan* represents MDOT MTA's long-term vision for MARC commuter rail service. Initiatives that would impact MARC service presented in this Rail Plan reflect the input of MARC staff and other stakeholders.

Vehicles and Stations

The MARC train fleet comprises 223 revenue vehicles, including 177 railcars and 46 locomotives, each varying in type and age. MARC must regularly overhaul or replace vehicles to maintain reliable and dependable service. Several fleet projects are underway, including:

GP39H-2 LOCOMOTIVE MIDLIFE OVERHAUL

The GP39H-2 is the oldest locomotive in the MARC fleet, having entered service in 1987. MDOT MTA will overhaul the six locomotives at a cost of $17 million to extend their useful life and keep the locomotives operating reliably.

Figure 3-6. MARC GP39H-2

Source: By Ryan Stavely - Charger Testing-6, CC BY-SA 2.0, https://commons.wikimedia.org/w/index.php?curid=68496082

MP36PH-3C LOCOMOTIVE MIDLIFE OVERHAUL

The MP36PH-3C, procured in 2009, comprises much of the MARC locomotive fleet. MDOT MTA will complete a midlife overhaul of all 26 locomotives at a cost of $65 million to ensure continued reliability. The midlife overhaul will include replacing all major systems and components.

MARC III RAILCAR OVERHAUL

MARC III cars, procured in 1999, are one of two types of bi-level cars MARC operates. MDOT MTA began the overhaul of the MARC III cars in 2018 and continues the program to replace and overhaul interior systems, including communication systems, HVAC system, electrical systems, seats, and other passenger-facing elements on all 63 MARC III cars. The total program cost is $53 million.

MARC IV RAILCAR OVERHAUL

MARC IV cars, procured in 2014, are the second type of bi-level cars MARC operates. As the newest cars in the system, MDOT MTA has scheduled their midlife overhaul in 2028 which will include replacing major component parts, electrical systems, seats, and other passenger-facing elements. The midlife overhaul of the 54 MARC IV cars is estimated at $60 million.

RAILCAR FLEET REPLACEMENT

The single-level MARC II and bi-level MARC III cars will be reaching the end of their service lives, requiring replacement beginning in 2035. MDOT MTA will develop specifications to prepare for railcar procurement with the intent to standardize the fleet to improve maintenance and repair efficiency. Additional passenger amenities such as bike racks and electrical and USB outlets will be considered for the railcar specifications. The total estimated cost for replacing the MARC II and MARC III fleet is $920 million.

LOCOMOTIVE FLEET REPLACEMENT

MDOT MTA plans to replace various MARC locomotives as they reach the end of their useful life, which typically ranges from 20 to 30 years. MDOT MTA will seek to standardize the locomotive fleet to improve maintenance and repair efficiency and incorporate experience-based preferences and operator feedback into locomotive specifications. Potential future specifications include dual mode locomotives capable of operating under diesel and electric power, as well as potential all electric locomotives. The total estimated replacement cost for the GP39H-2 and MP36PH-3C locomotives is $580 million.

NON-REVENUE VEHICLES

In addition to revenue locomotives and railcars, MDOT MTA also operates and maintains non-revenue vehicles such as automobiles, trucks, and special-purpose vehicles to support MARC service operations. MDOT MTA will invest appropriate funding in non-revenue vehicles to perform operating and maintenance functions. The total estimated cost for non-revenue vehicle procurement and replacement is $5 million through 2045.

IMPROVE STATION ACCESS

MDOT MTA is continuing efforts to enhance multimodal access to MARC stations with sidewalk, crosswalk, parking, bicycle amenities, and other improvements. Where feasible, MDOT MTA will seek to expand parking at park-and-ride lots at or above capacity.

STATION RENOVATIONS

MDOT MTA will renovate stations as required by the lifecycle of each station. The total estimated cost of Penn Line Station renovations through 2045 is $90 million; Camden Line Station renovations through 2045 is $80 million; and Brunswick Line Station renovations through 2045 is $22 million.

WEST BALTIMORE STATION

The West Baltimore Station project will replace the existing station and provide passengers with full-length ADA-accessible high-level platforms. The B&P Tunnel project will realign the NEC mainline tracks through this area, requiring the new station to be programmed, designed, and built in tandem with the tunnel replacement project. The total estimated cost of the new West Baltimore Station is $58 million.

ELIMINATE AT-GRADE PEDESTRIAN CROSSINGS

The Brunswick and Camden lines include 19 stations with at-grade pedestrian crossings that passengers must cross to access platforms. Pursuant to CSX safety requirements for any improved station facilities, MDOT MTA will eliminate at-grade pedestrian crossings at stations undergoing significant improvements. The total estimated cost of the elimination of at-grade pedestrian crossings is $370 million through 2045.

TRANSIT-ORIENTED DEVELOPMENT INITIATIVES

In addition to the redevelopment of Baltimore Penn Station and the surrounding area, MDOT supports the planning and implementation of several other transit-oriented development (TOD) initiatives. MDOT is working with stakeholders to coordinate the planning and development of TODs near MARC stations systemwide potentially including the Odenton, Martin Airport, Aberdeen, Laurel, Dorsey, Monocacy, and Germantown stations. It is important that these projects allow for potential expansion of rail infrastructure, such as additional tracks. Figure 3-7 displays a concept rendering for development around New Carrollton Station, used by Metrorail, Metrobus, Amtrak, MARC, and Prince George's County TheBus.

Figure 3-7. New Carrollton Joint Development Rendering

Source: WMATA

Penn-Camden Connector

The proposed Penn-Camden Connector is a new non-revenue rail connection between the MARC Penn and Camden lines through southwest Baltimore. This project would improve maintenance and repair efficiency, allowing both Penn and Camden line fleets to be stored and maintained at consolidated locations. The connector would leverage the capital investment and construction of the new Riverside Heavy Maintenance Building and allow Penn Line trains to access the new facility. The Penn-Camden Connector would connect to the NEC at Milepost 100 opposite the Loudon Park Cemetery and join the Camden Line near Monroe Street, using existing rail ROW. The total estimated cost for the Penn-Camden Connector is $295 million through 2035.

MARC Connections to Adjoining Regional Rail Systems

During the development of this Plan, stakeholders highlighted that regional rail networks, including MARC, the SEPTA, and the Virginia Railway Express (VRE), are currently shaped by political boundaries and travel markets. Integrating these networks could increase travel options to better connect regional activity centers and provide a more seamless journey for rail customers. These journeys could be enhanced by extending existing service, overlapping services in Washington, DC, and northern Delaware, and creating convenient transfers between services. Integration of ticketing, fare payment systems, and information systems also can improve service to these markets.

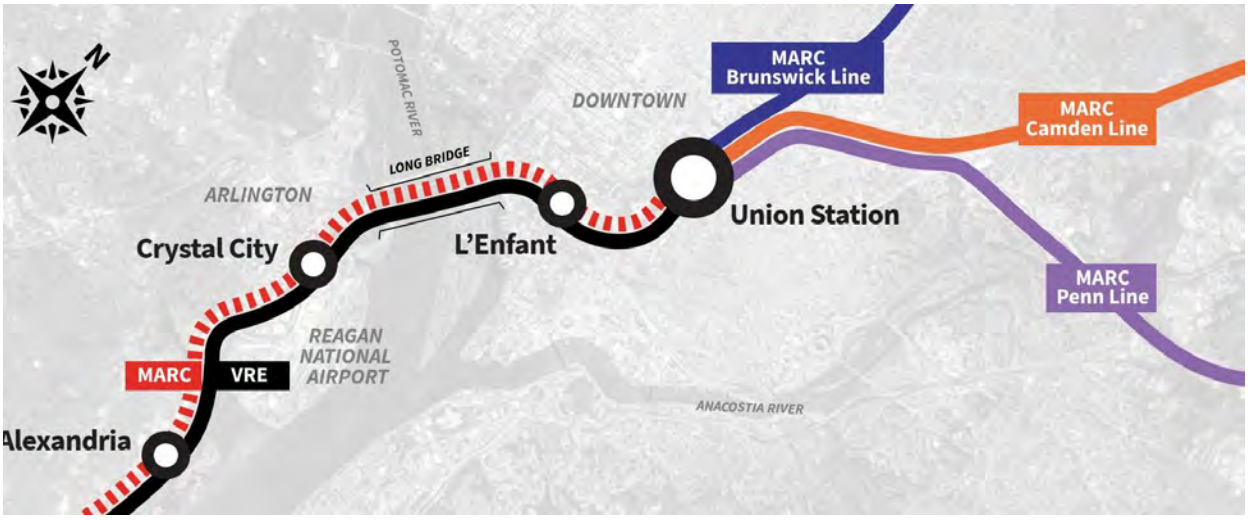
MARC RUN-THROUGH SERVICE SOUTH OF UNION STATION

Extending MARC service south of Union Station has long been a goal of multiple jurisdictions and stakeholders. Network capacity south of Union Station has hindered the ability to accommodate MARC trains. The Commonwealth of Virginia recently has

embarked upon an ambitious program of capacity improvements in Northern Virginia and the District of Columbia known as "Transforming Rail in Virginia."

MARC service extensions south of Union Station would provide riders better access to local transit connections on the WMATA Metrorail system and access to additional employment centers within walking distance of stations. In addition to having to transfer at Union Station from MARC to Virginia Railway Express to reach Virginia destinations, a MARC passenger arriving at Union Station desiring a connection to WMATA Metrorail's Blue, Orange, Green, Yellow, or Silver Lines to destinations around the region and in Virginia must travel via the Metrorail Red Line to access a transfer point. Extending MARC Rail to L'Enfant Plaza would eliminate the need for the Red Line transfer for these trips. This single-seat service between Maryland and Northern Virginia would be advantageous and has been proposed by stakeholders to better balance regional mobility and provide access to employment and activity centers.

Figure 3-8. Run-Through Service to Northern Virginia



Source: MARC Cornerstone Plan

The Greater Washington Partnership advocates for a more coordinated, integrated regional rail network for the region including Baltimore, Washington, and Richmond, through the *Capital Region Rail Vision.*[50] Some of the vision coincides with initiatives described in the MARC *Cornerstone Plan*, such as run-through service between VRE and MARC and expanded service on both systems. The *Capital Region Rail Vison* also advocates for additional integration in such areas as branding and fare policy.

50 Greater Washington Partnership, *Capital Region Rail Vison*, December 2020.

MDOT MTA is required by House Bill 1236 to conduct stakeholder engagement and good-faith negotiations for a MARC pilot service to Virginia, including two morning trains traveling from Union Station through the L'Enfant Plaza Station to the Crystal City Station and ending at Alexandria Station and two evening trains traveling from Alexandria Station through the Crystal City Station, on to the L'Enfant Plaza Station, and ending at Union Station.

CONNECTION TO SEPTA

Currently, there is no commuter rail connection between the MARC Perryville, MD and SEPTA Newark, DE stations, but there is a connecting bus service provided by Cecil County Transit. The only rail connection from Newark to the Baltimore/Washington area is provided by Amtrak, which stops at Aberdeen, MD, approximately eight miles south of the Perryville MARC station. The MARC Cornerstone Plan identifies a MARC connection to SEPTA, which serves points as far south as Newark, DE, as a long-term service strategy. As a requirement of House Bill 1236, MDOT MTA is discussing a pilot project study to establish commuter rail service between Perryville, MD, and Newark, DE. The goal of this project is to help improve commuter rail service connectivity and operation efficiency and improve access to transit and jobs in the region, particularly in Cecil County.

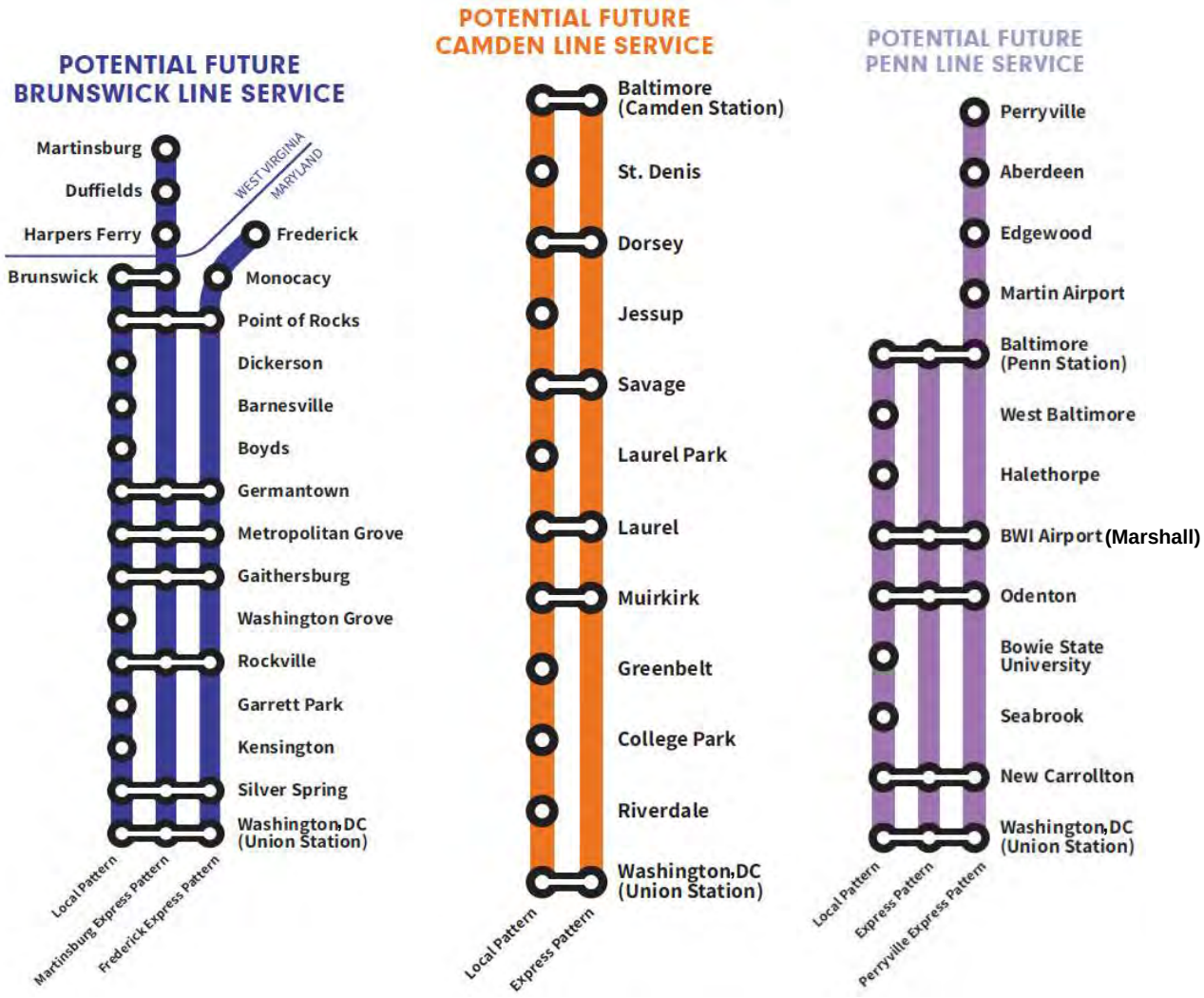
Stakeholders believe that a connection would be beneficial to opening new opportunities and have suggested connections at Newark or Wilmington, DE. Newark, DE, is a potential interchange point, as recent improvements to the Newark station could provide capacity to facilitate a connection. A 2017 study commissioned by the Wilmington Area Planning Council (WILMAPCO) estimated a potential 6% ridership increase on the MARC Penn Line by connecting MARC and SEPTA service at Newark, DE, with a new Elkton station. MDOT MTA plans to begin refreshing the 2014 study and concept for Elkton Station in 2023.

Service Expansion

During the Maryland State Rail Plan preparation, stakeholders advocated for greater MARC frequency, particularly on the Brunswick and Camden lines. The MARC *Cornerstone Plan* envisions future service patterns as shown in Figure 3-9. More frequent MARC service would require negotiations with host railroads and additional capacity to accommodate the added trains. These improvements and additions to service can be phased and incremental.

Required improvements include storage and maintenance facilities; additional mainline track capacity; positive train control improvements; specific bridge and tunnel replacements; and specific yard access improvements.

Figure 3-9. Potential Future MARC Service Patterns



Source: MARC Cornerstone Plan

MARC Service in Southern Maryland

Survey comments recommended that MARC service be established in Southern Maryland on the CSX Pope's Creek and Herbert Subdivisions. These lines, along with the Morgantown Industrial Track provide a route for coal to two power plants: the Morgantown power plant in Charles County and the Chalk Point power plant in Prince George's County. Both plants are scheduled for decommissioning by 2027, which will result in these lines being underutilized. Some have suggested that at least a portion of the line(s) could be

repurposed[51] for passenger rail. The potential for MARC service into Southern Maryland was studied in 2009. The study considered the usage of the Pope's Creek Subdivision, Herbert Subdivision, and the Morgantown Industrial Track (Figure 3-10).

Figure 3-10. Existing Rail Network in Southern Maryland

51 MDOT MTA, Southern Maryland Rail Commuter Feasibility Study, 2009.

Source: Southern Maryland Rail Commuter Feasibility Study

The study found that, while technically feasible, adding MARC service onto the Pope's Creek Branch would face challenges:

- Traveling from Southern Maryland to Washington, DC, along the Pope's Creek Branch and the NEC via a connection at Bowie would be circuitous and therefore difficult to compete with other modal alternatives on the basis of travel time.
- Substantial investment would be required to enable trains to travel at sufficient speeds to be competitive with bus options.
- The connection between the Pope's Creek Branch and the NEC at Bowie currently is not configured to provide adequate access to all NEC tracks. The interlocking would require a major overhaul.

The study estimated that the capital cost of establishing a service with competitive transit times would be $1.7 billion.

MARC Service to Western Maryland

MDOT MTA is undertaking the Brunswick Line Expansion Study to evaluate opportunities for expanded service on the Brunswick Line, including service to Western Maryland. The study will explore up to three potential routes and identify the associated infrastructure investments needed to accommodate the expanded service. The study will include an evaluation of existing transit operations and station access, markets for increased ridership, as well as operating and capital costs to support service expansion. Coordination with CSX will be required to facilitate any expansion of MARC service, trackage or station improvements along the Brunswick Line.

Other MARC Service Extensions

The MARC *Cornerstone Plan* envisions greater frequency on existing routes and connections to adjoining regional rail networks, but stakeholders have proposed additional services including new service west of Baltimore along the CSX Old Main Line Subdivision.

NEW RAIL SERVICE TO THE EASTERN SHORE

Several stakeholders recommended that the Rail Plan consider intercity passenger rail service on the Eastern Shore. Stakeholders recommended that service would be provided from the north, such as a connection to the NEC at Newark, DE, or eventually, a far more

ambitious project would bring passenger rail service over the Chesapeake Bay. A study commissioned in 2013 investigated the possibility of passenger rail service between Washington, DC, or New York and a terminus either in Berlin, MD, or West Ocean City, MD (Figure 3-11).[52] The study noted rapid growth of some coastal counties on the Delmarva Peninsula. Added development of beach towns increases the traffic burden with peak traffic volumes on summer weekends. The study evaluated 21 different service alternatives, including weekend only, weekday only, and daily service. The weekday only and daily services had higher farebox recovery ratios and were considered a better utilization of capital investments. Farebox recovery ratios were estimated to be between 75 and 85% (2013), with subsidies per rider between $10 and $23 in 2020 dollars. The estimated cost to implement the project was between $400 million and $770 million, and equipment would be $31 million per trainset.

[52] Parsons Brinckerhoff for the Delaware Department of Transportation and the Maryland Department of Transportation, *Delmarva Intercity Rail Feasibility Study,* December 10, 2013.

Figure 3-11. Passenger Rail Route onto the Delmarva Peninsula

Source: DelDOT

Chesapeake Bay Crossing Study

The Chesapeake Bay Crossing Study: Tier 1 NEPA (Bay Crossing Study) is a NEPA Tier 1 study completed in 2022 that approved a preferred corridor alternative to address congestion at the William Preston Lane, Jr. Memorial (Bay) Bridge.[53] This study considered alternatives whereby a new Bay Bridge would include a rail transit corridor, either Heavy Rail Transit or Light Rail Transit. These alternatives were eliminated in the screening process due to cost and low estimated ridership. The study did not consider a commuter rail alternative.

MONORAIL

Monorail is defined as a single beam or rail serving as a guideway for passenger vehicles. Eight monorail systems operate in the United States. While elevated in most cases, monorails also operate at or below grade. MDOT conducted a feasibility study in 2021 to assess the viability of a monorail system between Shady Grove Metrorail Station and Frederick, MD, as part of the Maryland Board of Public Works Traffic Relief Plan focusing on congestion relief in the I-270 corridor [54]

The study evaluated existing monorail services, alignment options, station locations, frequency of service, ridership, environmental and land use considerations, operations and maintenance, and capital and maintenance costs. The study updated and assumed the same alignment from a previous study completed for the High Road Foundation in 2019.[55] The study found that monorails can provide viable urban transit and unique solutions to difficult alignment requirements, and that such systems function best in areas of higher population density with concentrated urban development next to stations.

While the study found that monorail is physically feasible and constructible on the I-270 corridor, the system's estimated ridership and cost effectiveness could be constrained. Ridership on the proposed monorail would predominantly shift from existing transit systems such as MARC's Brunswick Line and commuter bus routes. The cost effectiveness of the system also would measure sub-optimally according to FTA's cost effectiveness

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53 Maryland Transportation Authority, *Chesapeake Bay Crossing Study, Tier 1 NEPA,* https://www.baycrossingstudy.com/.

54 Maryland Department of Transportation, *I-270 Monorail Feasibility Study*, February 2021, https://www.mdot.maryland.gov/tso/pages/Index.aspx?PageId=122.

55 Cambridge Systematics for the High Road Foundation, *Frederick-Shady Grove Ridership and Revenue Study,* March 15, 2019.

benchmarks, suggesting federal grants may be difficult to obtain (www.mdot.maryland.gov/monorail).

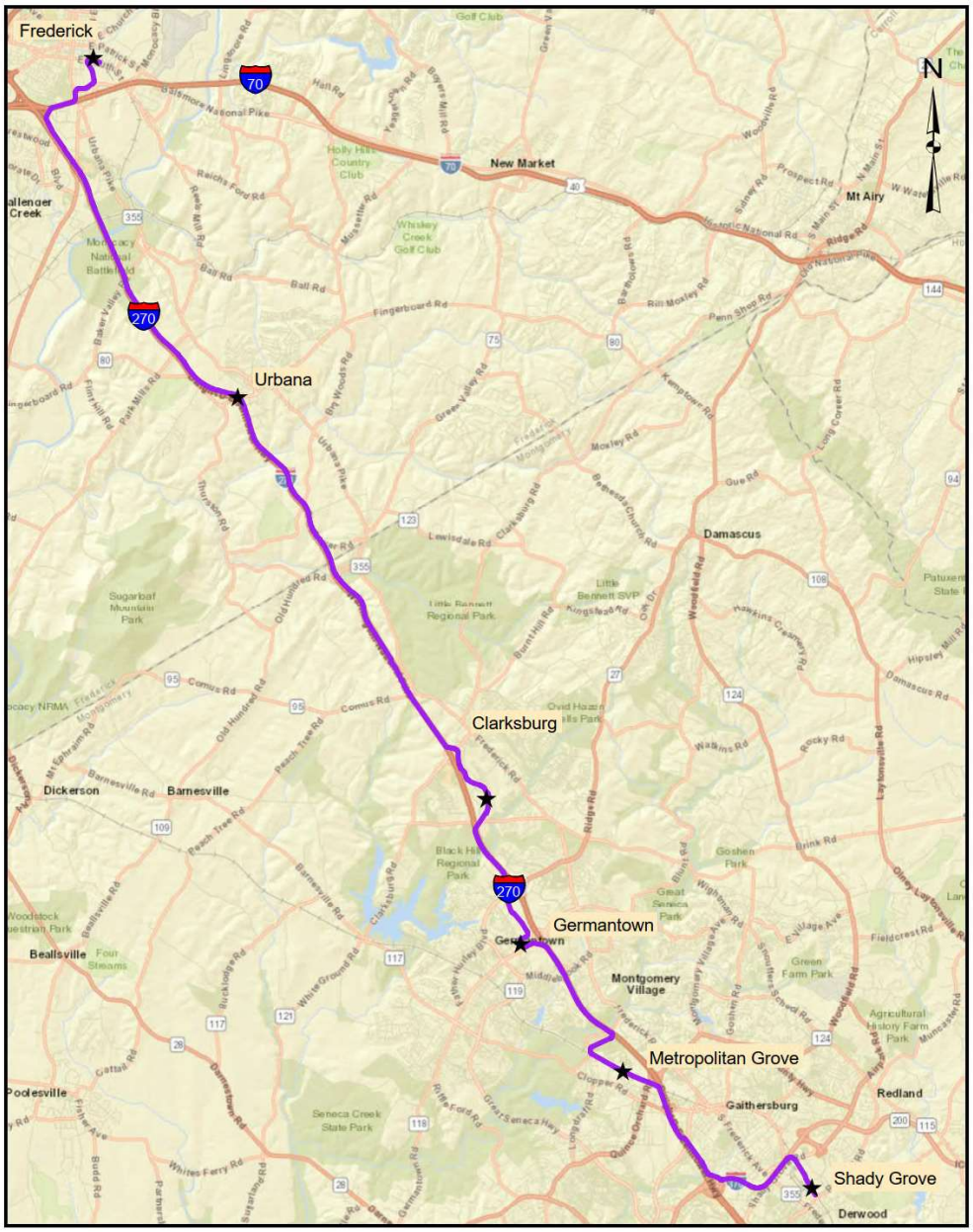
Figure 3-12 provides an example of a typical monorail configuration and an example of a monorail (Las Vegas Monorail). Figure 3-13 displays the monorail alignment studied in Maryland.

Figure 3-12. Example of Monorail Configuration/Las Vegas Monorail

Example of Monorail Configuration	Las Vegas Monorail
	

Source: I-270 Monorail Feasibility Study, By Priwo - photo taken by de:Benutzer:Priwo, Public Domain, https://commons.wikimedia.org/w/index.php?curid=59608453

Figure 3-13. Monorail Alignment



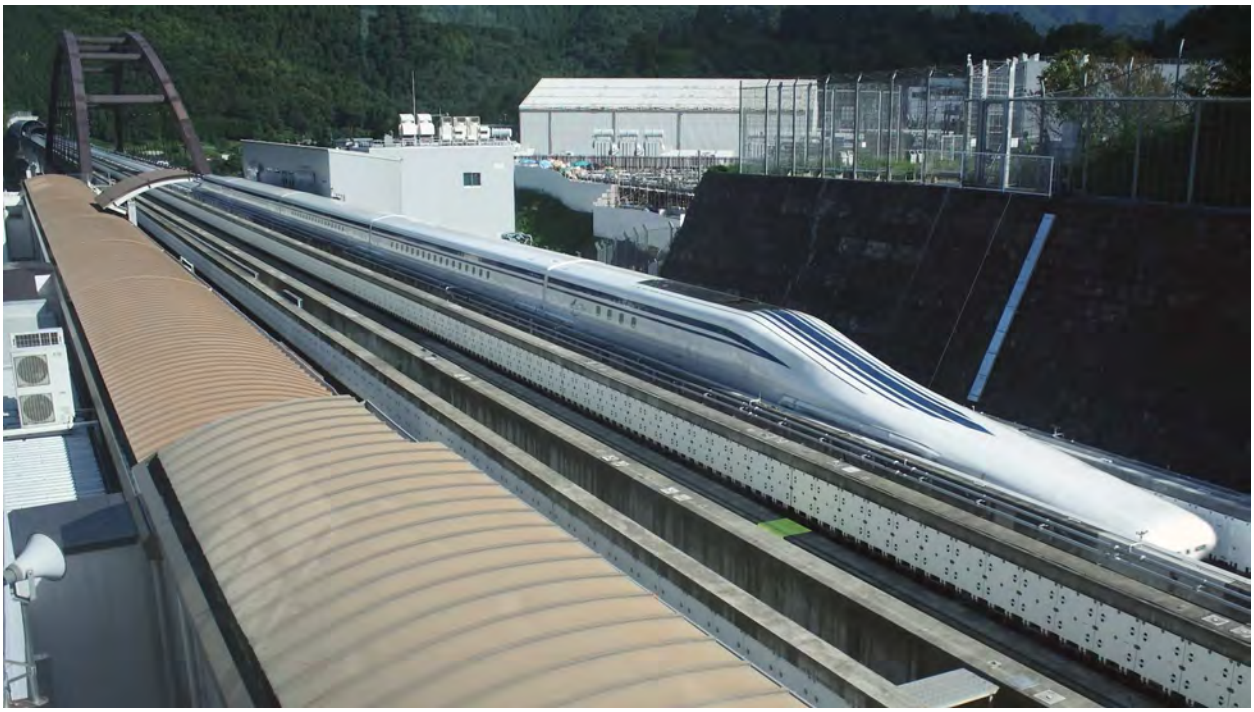
Source: I-270 Monorail Feasibility Study

MAGLEV

Magnetic Levitation technology (Maglev) has been studied for application on the Baltimore to Washington corridor since 2001 through the FRA Maglev Development Program. In 2016, the FRA awarded a grant to MDOT to prepare preliminary engineering and NEPA analyses exploring Japanese superconducting magnetic levitation (SCMAGLEV) technology in

partnership with a private developer. Instead of traditional train tracks, SCMAGLEV uses powerful magnets to levitate trains in a concrete guideway. With only air friction, SCMAGLEV trains can accelerate quickly and reach speeds of 374 miles per hour.

Figure 3-14. Maglev Train on Test Track in Japan



Source: Saruno Hirobano, CC BY-SA 3.0 <https://creativecommons.org/licenses/by-sa/3.0>, via Wikimedia Commons

A private company named Baltimore Washington Rapid Rail holds a railroad franchise from the state of Maryland and seeks to establish an ultra-high-speed connection between Washington, DC, Baltimore, and eventually New York, providing passenger service in excess of 300 mph. As of May 2021, a Draft Environmental Impact Statement (EIS) for the Baltimore to Washington SCMAGLEV initiative was underway. On August 25, 2021, the FRA paused the environmental review process to "review project elements and to determine the next steps."[56] The estimated cost of the first phase of the project between Washington, DC, and Baltimore is estimated to exceed $10 billion.

[56] Permitting Dashboard, Federal infrastructure Projects, https://www.permits.performance.gov/permitting-projects/baltimore-washington-superconducting-maglev-project.

4 Freight Rail Issues, Opportunities, Proposed Investments, and Improvements

Freight rail is critical to Maryland's economy and plays an important role in the *Maryland State Rail Plan*, along with the Maryland State Freight Plan. Freight rail opportunities and issues were assessed, along with data analysis, interviews, a public survey, and questionnaires with Maryland railroads. These will be discussed in more detail in this chapter, but they generally fall into the following categories:

- Port and intermodal issues, opportunities
- Short Line and economic development issues
- Excursion railroad and Western Maryland freight opportunities
- Projects on Class I railroads beyond port and intermodal
- Safety/grade crossing concerns

PORT AND INTERMODAL ISSUES AND OPPORTUNITIES

The Port of Baltimore is well situated with the deepest harbor in Maryland's Chesapeake Bay. It is closer to the Midwest than any other East Coast port and is centrally located in the Northeast Megaregion, the most densely populated area of the United States. The Port of Baltimore is within an overnight drive of one-third of the nation's population. With the expansion of the Panama Canal, larger cargo ships from Asia can travel the canal to access East Coast ports such as Baltimore. More cargo will access East Coast ports via the Suez Canal due to shifts in sourcing from northern China to Southeast Asia. The Port of Baltimore is one of four eastern US ports with a 50-foot shipping channel and a 50-foot container berth, and can accommodate some of the largest container ships in the world. In 2019, the Port was ranked first in the nation for handling automobiles, sugar, and gypsum,

and second in exporting coal. In 2018, the Port was ranked 13th in the nation for containers.[57]

Many of the Port of Baltimore's major commodities move by rail to and from inland markets. The Port of Baltimore enjoys a relatively direct connection to the Midwest through the CSX Capital, Metropolitan, Cumberland, and Keystone Subdivisions. It has on-dock rail access for intermodal containers through the Seagirt Intermodal Container Transfer Facility (ICTF). Containers are typically trucked between ports and their immediate vicinity, such as the Baltimore/Washington Metropolitan area. Rail enables ports to reach broader markets, especially for container traffic destined for the Midwest.

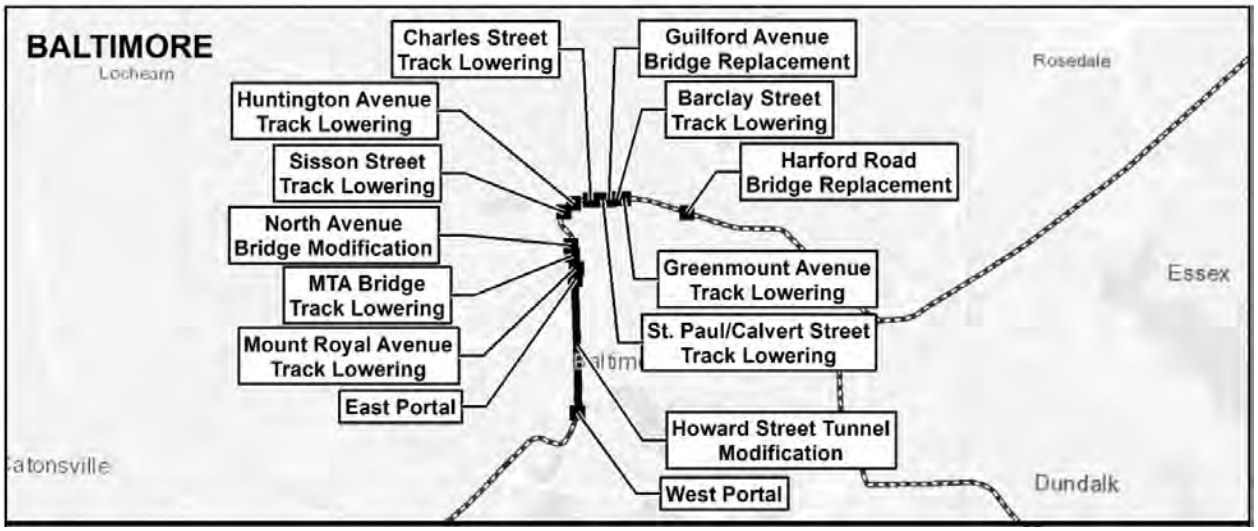
Howard Street Tunnel Project

The largest single obstacle to intermodal rail shipments at the Port of Baltimore is the clearance of the Howard Street Tunnel. This 1.7-mile, 126-year-old tunnel has a clearance that is 18 inches lower than the needed 21 feet for double-stack intermodal operations. Double-stack trains are far more efficient with twice as many containers loaded on trains, so the cost of operating is less per container. Double-stack has become the industry standard, and the Howard Street Tunnel Project will reconstruct the tunnel to accommodate double-stack trains. The project will clear 22 additional obstructions, including 11 in Maryland, where tracks will be lowered, so that trains can pass beneath. In other cases, the bridges that limit the clearance will be reconstructed to accommodate the increased height. The total project is estimated to cost $466 million, of which $202.5 million is funded by the state of Maryland, $125 million from a federal Infrastructure for Rebuilding America grant, $113 million from CSX, and $3 million in federal highway formula funding. The Commonwealth of Pennsylvania is contributing $22.5 million for improvements that impact access into Pennsylvania. Construction began in 2021 and is expected to be completed by 2024. The Maryland Department of Transportation Maryland Port Administration (MDOT MPA) estimates that 20 to 25% of the Port's traffic will move inland by rail once the Howard Street Tunnel is completed.

Howard Street Tunnel

[57] American Association of Port Authorities

Figure 4-1. Howard Street Tunnel Baltimore Projects



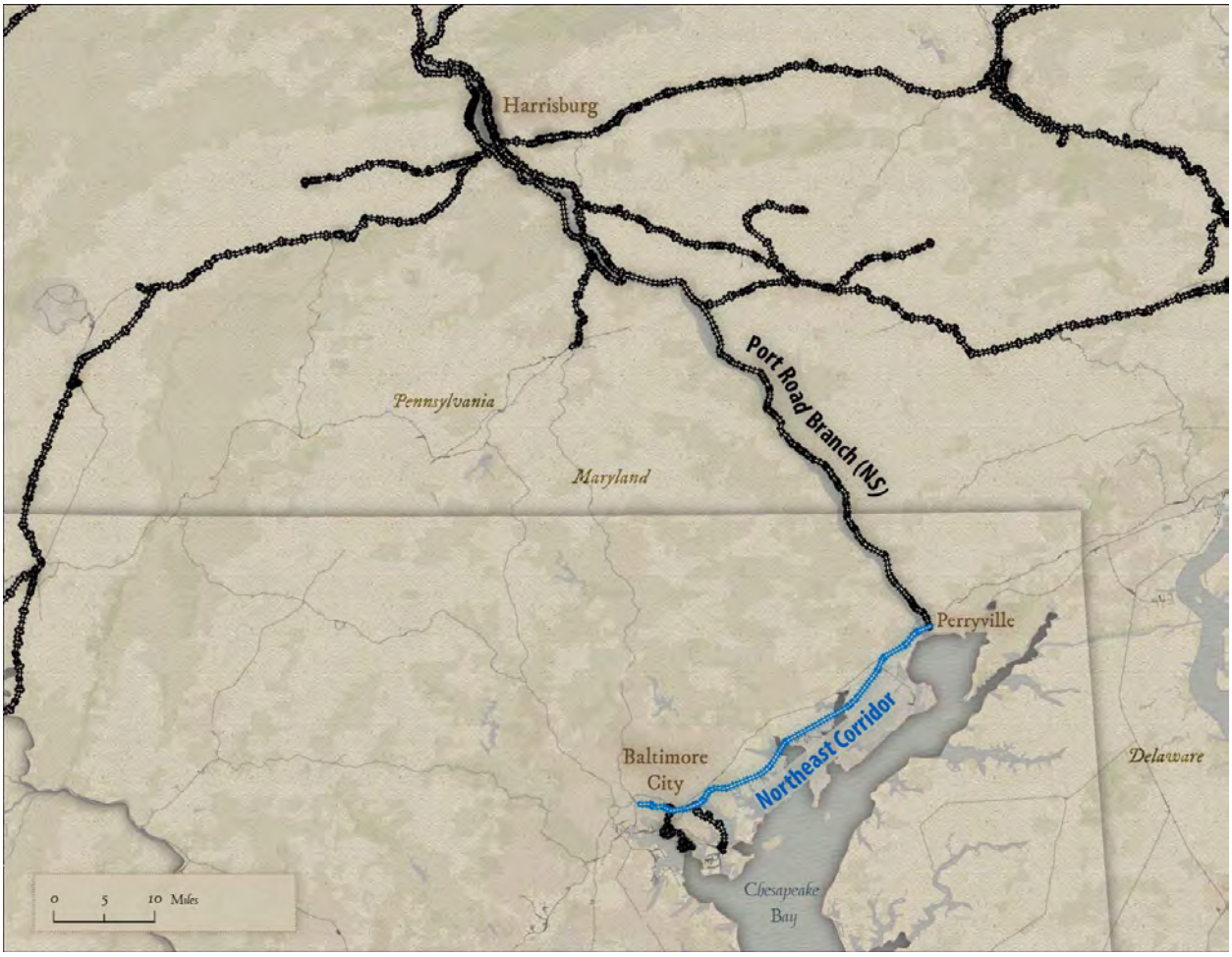
Source: Federal Railroad Administration/Maryland Port Administration Finding of No Significant Impact

Norfolk Southern Access to the Port of Baltimore

Bridge on Northeast Corridor North of Baltimore

The Port of Baltimore is served by both CSX and NS. NS accesses the Port of Baltimore via the Port Road Branch between Harrisburg, PA, and Perryville, MD. NS trains move between Perryville and Baltimore over the Amtrak Northeast Corridor (NEC). This reliance by NS on the NEC creates several issues. Clearance restrictions created by overhead catenary prevent operations of double-stack trains over the NEC. Operation of NS freight trains over the NEC is restricted to off peak hours to minimize conflicts with passenger trains. NS access to the NEC is governed by agreements with Amtrak that dictate the parameters of NS operations. Anticipated increases in passenger traffic and train speeds will increase pressure to separate passenger and freight operations.

Figure 4-2. NS System Access to the Port of Baltimore (NS Lines in Black)



Source: MDOT

In the long-term, the management of passenger and freight operations and enabling double-stack clearance in the Northeast Corridor would require infrastructure improvements between Perryville and Baltimore and additional improvements to clear obstructions on the NS Port Road Branch between Perryville and Harrisburg, PA. The planning and design of all projects along the Northeast corridor requires extensive coordination with Amtrak, MARC, the freight railroads, and associated jurisdictions and an understanding of the importance of the corridor for passenger movement.

Other Port Issues and Opportunities

Improvements are planned for the Ports America Chesapeake Seagirt ICTF including enhancements to the layout and cranes to boost efficiency and capacity. Eventually, CSX may move its domestic intermodal operations to another terminal in the Baltimore area to free additional capacity at Seagirt to handle international containers.

Several other opportunities and issues were shared by stakeholders, including a concern about encroachment by residential properties into the Port district. These competing land uses could limit future port-related development and cause conflict with residential uses. Additionally, MDOT MPA plans to implement a rail shuttle that will transport goods between the Seagirt Marine Terminal and the Tradepoint Atlantic terminal at Sparrows Point to minimize truck movements in the surrounding areas.

Other Intermodal Opportunities

Several stakeholders mentioned the possibility of establishing an inland port. An inland port is an intermodal transfer facility where cargo is transferred between truck and rail but located a distance inland from the seaport. Inland ports serve as extensions of seaports but can minimize the congestion of travel at the seaport. Inland ports can drive economic development as logistics firms locate near these facilities. As an example, Home Depot, Red Bull, Newell Rubbermaid, Family Dollar, Lenox, and Mercury Paper opened distribution centers located near the Virginia Inland Port in Front Royal, VA.

Several inland port locations were suggested during the preparation of this Rail Plan. One proposed service would be a shuttle train between the Port of Baltimore and a potential intermodal terminal in Perryville. This would enable the Port to free capacity by moving port activities to Perryville. It also would take advantage of the growing distribution infrastructure in Cecil County. Other potential locations include Western Maryland where existing intermodal routes and the interstate highway system are in close proximity, such as in Cumberland. Generally, intermodal services are provided over distances above 250 miles so that the relatively inexpensive line haul portion of rail moves can defray the relatively expensive terminal costs to compete with trucking. The feasibility of short haul intermodal will depend on the relationship between these fixed terminal costs of the rail moves and costs that vary by distance.

SHORT LINE AND ECONOMIC DEVELOPMENT ISSUES

During the preparation of the Maryland State Rail Plan, the state's Class III railroads and excursion train operators identified infrastructure needs, as well as economic development opportunities.

Figure 4-3. State-Owned Rail Line on Operated by Class II Railroad Maryland's Eastern Shore

Source: APK Photography

Rail Condition

Maryland is home to seven railroad companies whose annual revenue classifies them as Class III railroads or short lines. These railroads generally operate lines with low traffic volumes. Infrastructure is often in poor condition and in need of rehabilitation or upgrade to modern standards. For example, 61 miles of line operated by the Maryland and Delaware Railroad Company is rated for 263,000-pound railcars instead of the industry standard 286,000-pound railcars. This places shippers using these lines at a disadvantage since the rate to ship railcars is often the same despite the fact that shippers using 286,000-pound railcars can haul at least 10% more per railcar. It is often prohibitively expensive to shift freight from one railcar to another. A segment of track that cannot accommodate 286,000-pound railcars will limit the payloads along an entire journey.

The Federal Railroad Administration (FRA) restricts speeds based on track conditions and frequency of inspection. Track rated at FRA Class 1 safety standards is limited to 10 miles per hour operations. Railroads can gain an exception from the FRA standards, but trains can only operate at less than 10 miles per hour. Passenger operations are not allowed on these lines, and no more than five railcars in any train can carry hazardous materials. Within Maryland there are 32.3 miles of excepted track. MDOT contributes to capital maintenance on state-owned rail lines operated by the Maryland and Delaware Railroad Company, but several railroads suggested that the state establish a short line assistance program that could be used for rehabilitation projects both on state and on privately owned rail lines. Responding to a survey for this Rail Plan, short line and excursion railroads put forward six rehabilitation projects to bring rail lines or bridges to a state of good repair and modern standards. Of these, four had cost estimates, totaling $30.6 million in investment. These are listed in Appendix E.

Rail and Economic Development

A common theme noted by short line and regional railroads feedback for this Rail Plan was that the MDOT or state economic development agencies should do more to help attract and retain companies that ship by rail. Recommendations included:

- **Establish an industrial rail access grant program similar to those of neighboring states**. Establishing new rail access at a shipper location requires major infrastructure investments. Prospective rail shippers may be unwilling to make such investments even if rail transportation may be a less expensive option. Rail industrial access programs provide an incentive for shippers to use rail by helping to defray the initial infrastructure costs. These programs not only support economic development, but they also generate public benefits by diverting freight from truck to rail.

  Several neighboring states provide industrial access programs. Virginia's Rail Industrial Access Program is used to construct rail spurs and sidings for businesses for economic development. Grants up to $450,000, requiring at least a 30% match by the applicant, are available to businesses, industries or local jurisdictions. The Pennsylvania Rail Freight Assistance Program (RFAP) seeks to preserve essential rail service and stimulate economic development through the generation of new or expanded rail freight service. The maximum grant is $700,000, requiring at least a 30% match by the applicant.

- **Improve the marketing of rail**. Several railroad representatives suggested that the state market rail-served industrial sites. They noted that few rail-served industrial sites are listed on Maryland's database of commercial and industrial properties. While economic development initiatives in Maryland tend to be more regionally and locally

focused, stakeholders recommended a comprehensive statewide list of available commercial properties in Maryland. Existing resources, such as the Department of Commerce database, rely on input from local agencies. Economic development officials often focus on opportunities to attract large employers, which are not necessarily potential rail shippers, and rail access is only one consideration in marketing industrial locations.

- **Zoning plan for managing the development of industrial sites**. Several railroads and economic development officials expressed concern about the limited availability of rail-served industrial sites. As residential development spreads and development patterns change, it will be important to preserve and plan industrial areas. Stakeholders encourage zoning to ensure protection of industrial sites.

When considering freight rail and economic development in Maryland, it is important to note differing economic activities and land uses across the state. Certain regions will value rail access more heavily. The amount of commerce shipped by rail in certain regions is very small relative to the overall economic activity in that county. This variation across Maryland suggests that while state resources could be applied to support rail's role in economic development, the relevance of rail-related economic development may vary depending on the specific region.

Figure 4-4. The Maryland and Delaware Railroad Shipper Location

Source: MDOT Photo Archives

Freight rail can help to support economic equity and inclusion. The areas of Maryland that rely more heavily on rail are generally more rural regions. Rail investments can help to support the industries in these areas and provide jobs where they are most needed. Employers that use rail often provide jobs to employees that do not necessarily have college degrees, thus supporting economic inclusion.

In response to a questionnaire for this Rail Plan, short line railroads recommended five projects to support industrial access, worth $10 million, as well as three additional projects to establish or improve truck/rail transload facilities worth $2 million. These are listed in Appendix E.

EXCURSION RAILROAD AND WESTERN MARYLAND FREIGHT OPPORTUNITIES

Two excursion railroad companies are exploring new freight opportunities.

- The Western Maryland Scenic Railroad (WMSR) is an excursion railroad that carries passengers between Cumberland and Frostburg, MD. It operates on a rail line owned by Allegany County. WMSR has identified opportunities to haul liquid propane gas (LPG), charcoal, soybeans, and municipal solid waste. The company would like to build a transload facility and also has potential online customers with rail connections that could be established or rehabilitated. WMSR's interchange with CSX would be relatively easy, since the WMSR is located off the CSX yard lead in Cumberland. There currently is a shared use path that runs parallel to the WMSR.
- The Walkersville Southern Railroad (WSRR) is an excursion railroad that operates over 6.75 miles of track owned by the state of Maryland. The company would like to re-establish a connection with the Maryland Midland Railway over track that is currently inactive. This would provide the WSRR with access to the general rail network and enable the WSRR to engage in additional revenue activities such as storing railcars and hauling freight. There is a potential industrial development site along the line that could benefit from rail access. Frederick County and the City of Frederick are planning development of a shared-use path adjacent to the active WSRR. Design of such a rail with trail facility requires extensive coordination between the property owners, railroad and trail sponsor to balance the operations, maintenance, liability and safety requirements of a railroad with the specific needs of trail users.

With each of these new opportunities, the economic feasibility of the entire rail move will be a key consideration. Interchanges with other railroads will be required, and the interchange partners will need to be able to profitably provide competitive pricing. Revenues from the additional freight would need to support any new services required.

PROJECTS ON CLASS I RAILROADS BEYOND PORT AND INTERMODAL

NS has proposed to build a bypass around the Vardo Yard in Hagerstown to provide capacity for through trains to operate without conflicts with yard operations. This would alleviate a bottleneck at Hagerstown, improving fluidity in this part of the NS system.

- CSX did not propose new projects for this Rail Plan, but the 2015 Maryland Statewide Rail Plan included an extensive list of projects on CSX lines that CSX indicated could still be applicable.[58] Most of these projects would increase capacity on CSX lines, by adding additional tracks, improving rail yards, building new connections and bypasses, or upgrading track to increase operating speeds. Some of these projects would improve lines used by MARC trains and could benefit MARC service in terms of reliability and speed. These projects can be found in Appendix E.

SAFETY/GRADE CROSSING CONCERNS

As discussed in Chapter 2, the MDOT SHA administers the federal Railway-Highway Crossing (Section 130) program. In support of this program, MDOT SHA has completed a Highway-Rail Grade Crossing State Action Plan that describes Maryland's current practices and programs related to highway-rail grade crossing safety, conducts an analysis to find potential areas of improvement or areas of need, develops an action plan to improve safety at highway-rail grade crossings throughout the state. Specifically the action plan:

- Identifies high-risk crossings in Maryland;
- Discusses data sources used to classify crossings as high risk;
- Develops strategies to improve the safety of crossings;
- Provides an implementation timeline for strategies;
- Designates individuals responsible for implementation; and
- Improves processes and procedures within the program.

58 Maryland Department of Transportation, *Maryland Statewide Rail Plan*, April 2015.

As noted in Chapter 2, highway-rail grade crossings are not the only hazards associated with rail in Maryland. According to FRA safety records, 14 fatalities resulted from accidents at highway-rail grade crossings between 2000 and 2019. A total of 179 fatalities were reported during the same time period associated with trespassers on railroad rights-of-way. Trespasser strikes are relatively concentrated in Prince George's County, Baltimore County, Montgomery County, and Baltimore City. There may be opportunities to work with partners such as operating railroads to identify locations where train strikes of pedestrians have occurred and where near misses occur regularly. MDOT should work with partners to search for potential solutions such as fencing or other strategies to route pedestrians away from these high-hazard locations. Participation in education programs such as Operation Lifesaver also are effective in improving safety around railroads.

5 Maryland's Rail Service and Investment Program

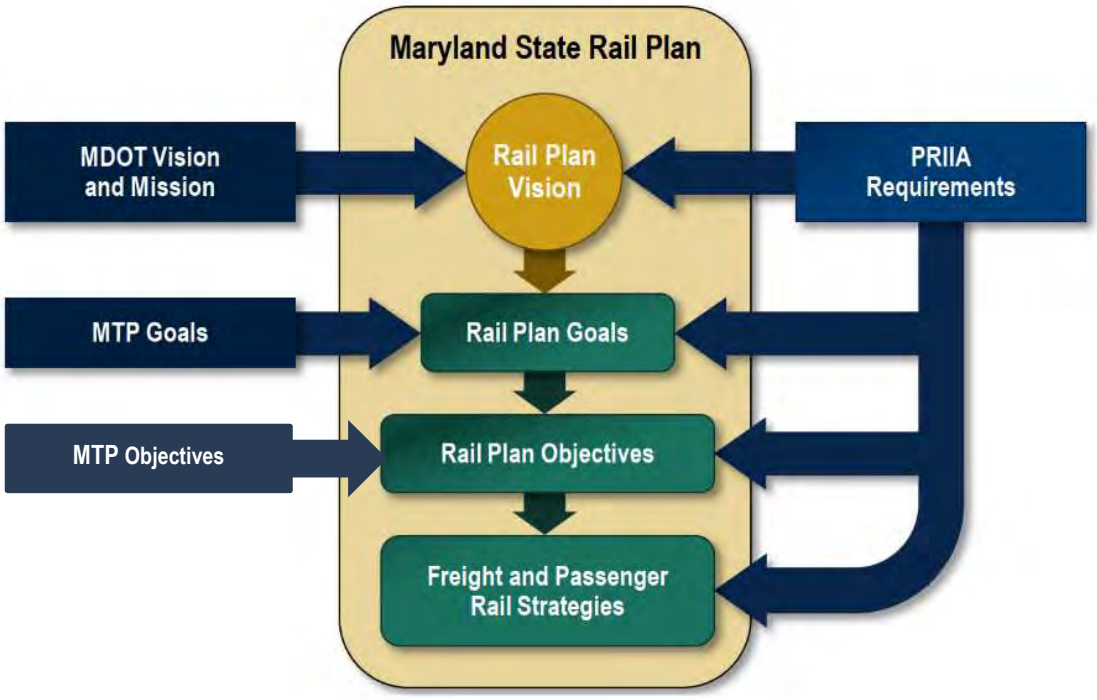
VISION, GOALS, OBJECTIVES, AND STRATEGIES

Maryland's freight and passenger rail network is an essential component of the state's multimodal transportation system connecting residents and businesses to employment, educational, and recreational opportunities. This is critical for goods movement and connecting services, customers, and suppliers throughout the state, nation, and world. Continued population and economic growth will increase demand on the transportation system. The vision, goals, objectives, and strategies detailed in this chapter provide a framework upon which the Rail Plan implementation and action plan have been developed.

The *2040 Maryland Transportation Plan (MTP)* lays out the Maryland Department of Transportation's (MDOT's) role in providing and maintaining a safe and efficient multimodal transportation system for people and goods during a 20-year timeframe. The MTP is developed in coordination with state, local, regional, and public stakeholders. The plan sets MDOT's long-range mission, goals, and objectives for transportation investments and defines performance measures for assessing achievement of the goals and objectives.

Figure 5-1 shows the framework used to establish the vision, goals, objectives, and strategies for the Maryland State Rail Plan. The goals are statements of purpose for the state's rail system. The objectives provide targeted outcomes and suggest actions to execute the goals, while strategies recommend activities to advance the goals and objectives. The rail vision, goals, objectives, and strategies are consistent with PRIIA requirements and Federal Railroad Administration (FRA) guidance and were vetted with the Rail Plan's Advisory Committee, as well as through a survey seeking public comment.

Figure 5-1. Vision, Goals, Objectives, Strategies Framework



MARYLAND RAIL SYSTEM VISION

The vision for Maryland's freight and passenger rail system is:

> "Freight and passenger rail is a well-maintained, sustainable and intermodal component of the transportation system that supports the equitable, safe, convenient, and efficient movement of people and goods within and through Maryland."

This vision directs MDOT to plan for a rail system that moves freight and passengers safely and efficiently.

Maryland Rail System Goals

In the MTP, MDOT identifies seven goals for addressing transportation challenges during the next 20 years (linked here). The Rail Plan echoes the MTP and focuses similarly on the following seven goals:

- **Safe, Secure, and Resilient** – Enhance the safety and security of Maryland's multimodal transportation system and provide a transportation system that is resilient to natural and man-made disasters.

- **Economic Opportunity** – Invest in and pursue opportunities to promote system improvements that support economic development, reduce congestion, and improve the movement of people and goods.
- **System Maintenance and Modernization** – Preserve, maintain, and modernize the state's existing transportation infrastructure and assets.
- **Quality and Efficiency** – Increase the use of technologies and operational improvements to enhance transportation service and communication systems to satisfy customers.
- **Environmental Protection and Sensitivity** – Deliver sustainable transportation infrastructure improvements that protect and reduce impacts to Maryland's natural, historic, and cultural resources.
- **Transportation Choice and Connections** – Improve transportation connections to support alternative options for the equitable movement of people and goods.
- **Fiscal Responsibility** – Ensure responsible investment and management of taxpayer resources to add value and deliver quality transportation improvements through performance-based decision making and innovative funding mechanisms and partnerships.

Maryland Rail System Goals, Objectives, and Strategies

These goals, objectives, and strategies were adapted from the 2015 Maryland State Rail Plan and 2040 MTP and modified in collaboration with public and private stakeholders. The objectives and strategies are grouped according to their relationship to the rail system goals in Table 5-1.

Table 5-1. Maryland Rail System Goals and Strategies

GOAL	OBJECTIVES	STRATEGIES
Safe, Secure, and Resilient	Reduce the number of lives lost and injuries sustained on Maryland's rail system	Educate pedestrians, bicyclists, and motorists on the hazards of being on or near railroad tracks.
		Inform all rail passengers aboard trains about emergency response procedures.
		Emphasize the safety of rail passenger travel to increase confidence in the rail system and increase ridership.
		Use technological innovation to support rail safety.
		Enhance the Highway-Rail Grade Crossing Safety Improvement Program and support grade crossing closures or grade separation.
		State participation in the Operation Lifesaver Rail Safety Education program.
		Work with state and local law enforcement agencies to improve emergency service response times and support efficient and coordinated responses to rail accidents.
	Provide for the secure movement of goods and people on rail network	Work with local jurisdictions to address safety and security along rail corridors through land use planning and development such as in local master plans and by providing best practices or guidelines.
		Work with neighboring states, federal and state partners to identify opportunities to enhance secure movement of goods.
	Provide a resilient rail system	Anticipate and plan for changing natural and/or man-made conditions and hazards, including future climate impacts.
Economic Opportunity	Pursue capital improvements to the rail system that will improve access to jobs and tourism	Work with economic development representatives to identify opportunities for rail to support economic development, including transit-oriented development.
		Support state efforts to improve the attractiveness of Maryland as a place to visit and do business.
		Support opportunities for railbanking to preserve MDOT owned rail corridors for future transportation usage while providing for the possibility of interim trail use consistent with the National Trails System Act.
	Improve movement of goods on rail network by investing in multimodal connections and improvements to reduce bottlenecks	Provide double-stack access to the Port of Baltimore.
		Support development and improvement of intermodal and transload facilities.
		Identify capacity constraints in the state's rail network.
	Strategically invest in expansion and operational improvements to reduce congestion along rail network	Implement MARC programs to expand capacity and reduce peak headways.
		Explore project funding opportunities.
		Partner with railroads to explore opportunities for increased movement of goods and passengers by rail.
System Maintenance and Modernization	Preserve and maintain state-owned rail lines	Rehabilitate and maintain state-owned rail assets in a state of good repair.
	Strategically modernize rail infrastructure through new and innovative technology, enhanced partnerships, design standards, and practices to facilitate the movement of people and goods	Protect and preserve railroad rights-of-way and assets.
		Support efforts to bring the Northeast Corridor (NEC) to a state of good repair.
		Support railroad state of good repair projects.
		Continue to improve rail infrastructure using the most current design guidelines and applicable technology enhancements, including real-time tracking of passenger trains.
		Explore federal, state, and local funding opportunities.
Quality and Efficiency	Increase the efficiency of rail services through partnerships, advanced technologies, and operation enhancements to improve service delivery methods	Develop new tools and use new technologies to increase efficiency and reliability of rail services.
		Apply technologies to improve communications and real-time information to users.
		Work with regional and national groups to advance innovative rail technology.
	Enhance customer satisfaction with rail services	Continue customer outreach and responsiveness to share information about rail services, events, and news.
	Minimize travel delays and improve predictability of travel times on rail network	Promote collaboration to minimize conflicts between passenger and freight operations on shared corridors.

GOAL	OBJECTIVES	STRATEGIES
Environmental Protection and Sensitivity	Implement initiatives to reduce fossil fuel consumption, mitigate greenhouse gases, and improve air quality	Work with stakeholders on emissions-reduction and energy-saving strategies, and promote a shift to more energy-efficient, low-emitting modes.
		Promote and/or incentivize fuel-efficient technologies for freight and passenger rail.
Choices and Connections	Increase and enhance rail multimodal connections to improve the movement of people and goods within and between activity centers	Pursue relevant state and federal discretionary grant programs.
		Improve intermodal connections, such as to the Port of Baltimore, transload and intermodal facilities.
		Improve MARC and Amtrak stations to provide better multimodal connectivity.
		Work with neighboring states to improve multimodal connections.
		Promote Transit-Oriented Development.
		Promote development of rail-served industrial and commercial facilities along rail corridors.
		Support MDOT's Transportation Demand Management (TDM) program (Commuter Choice Maryland).
	Inform and educate customers on transportation options and benefits	Educate local governments and elected officials on the benefits of rail transportation to Maryland.
Fiscal Responsibility	Accelerate rail project completion through improved and efficient use of alternative delivery methods and strategic partnerships	Coordinate with the Transportation System Management and Operations (TSMO) activities across MDOT and with regional and local agencies.
		Support public and private rail partners to continue addressing double-stack access to the Port of Baltimore.
		Assess opportunities for improved rail freight and passenger service through public-private partnerships.
	Provide rail services and solutions that maximize value	Identify opportunities to decrease long-term O&M costs of current and future rail investments.
		Promote rail efficiencies through a state rail management team.

PROGRAM COORDINATION

As discussed above, the vision, goals, and objectives of the Maryland State Rail Plan have been coordinated with those in the MTP and a series of other planning efforts, including:

- MARC Cornerstone Plan
- Maryland Strategic Goods Movement Plan and update to the State Freight Plan
- Maryland Statewide Transit Plan
- Northeast Corridor Commission efforts such as the Connect 2035
- MPO planning efforts, such as long-range transportation plans and specific rail-related studies
- Greater Washington Partnership's Capital Region Rail Vision

The Rail Plan also informs other plans, such as the MPO regional plans and the Maryland State Freight Plan, which is being updated at the same time as the Rail Plan.

RAIL AGENCIES

No new programs or state rail organizational, policy, or legislative changes are planned through the preparation of the Rail Plan. However, stakeholders recommended two changes, noted below.

Establish a Rail Industrial Access/Short Line Program

Some short line operators within the state suggested that Maryland should establish an industrial access funding program like those in Virginia and Pennsylvania. Such a program would assist new or existing rail customers with funding rail infrastructure projects, such as constructing or rehabilitating sidings on their property. Funding for eligible projects would be tied to job creation and/or generating railroad traffic. Applicants to programs in Virginia and Pennsylvania are required to contribute at least 30% of the project cost, although similar programs in other states require a greater match. For example, Michigan's Freight Economic Development Program requires a 50% match.

Some state rail programs offer either grants or loans. For example, the Iowa Railroad Revolving Loan and Grant Program will consider requests for both loans and grants, applying different matching requirements according to the type of funding.

A Maryland program could focus specifically on rail industrial access or also could fund upgrades to short line railroads. For example, the Indiana Industrial Rail Service Fund supports "the upgrade of Class II and Class III railroad physical plant to help maintain and increase business shipping levels…and also to assist with funding needed for track infrastructure improvements related to new business development on the line."

Consolidate State Rail Functions. As described in Chapter 1, rail functions in Maryland are dispersed through a range of state agencies. As an example, the following state agencies have a role in rail in Maryland:

- MDOT MTA administers funding for and operates the MARC commuter service, coordinates with Amtrak and other stakeholders like the Northeast Corridor Commission on intercity passenger rail concerns, and owns most of MDOT's rail lines,
- MDOT TSO OPCP Rail and Intermodal Freight Section (OPCP RIF) is responsible for statewide rail planning, managing state-owned rail lines, and manages federal multimodal grants.
- MDOT SHA is responsible for administering the federally funded Rail-Highway (Section 130) Grade Crossing Program.
- MDOT MPA oversees rail access and improvements for the Port of Baltimore.
- The Maryland Department of Labor provides railroad safety inspections.

Some stakeholders felt that rail activities could be better coordinated within the state government, and that rail could have a stronger modal representation if at least some of these activities were consolidated within a single Transportation Business Unit within MDOT.

PASSENGER AND FREIGHT ELEMENTS – FUNDING PLAN

As described in Chapter 2, state funding for rail in Maryland is provided through the Transportation Trust Fund, which is not necessarily earmarked for specific Transportation Business Units or programs. While this approach provides balance and flexibility, rail competes with other state transportation investment priorities. Specific rail programs in Maryland receive federal formula funds, such as FTA grant programs for MARC and Section 130 funds for the Rail-Highway Grade Crossing Program. However, federal funding opportunities beyond these specific focus areas tend to be competitive and discretionary

programs. Therefore, project funding during any given round of appropriations cannot be predicted ahead of time. With limited available dedicated monies, rail funding is uncertain. It is, therefore, not possible to attach funding-specific sources to projects in this Rail Service and Investment Program.

Some projects in this Rail Service and Investment Program can best be described as mega projects with price tags of a billion dollars or more. Funding any of these projects will require multiple years to seek rounds of funding opportunities and partnerships across various agencies and organizations. Examples of how large projects recently were funded both within Maryland and outside of the state are listed below:

- As described in Chapter 4, the $466 million Howard Street Tunnel Project was funded through $202.5 million from the state of Maryland, $125 million from a federal Infrastructure for Rebuilding America grant, $113 million from CSX, $3 million in federal highway formula funds, and $22.5 from the Commonwealth of Pennsylvania for double-stack improvements providing access to the Port of Philadelphia.
- As announced by Governor Hogan in June 2021, the Maryland Department of Transportation (MDOT) will continue working with Amtrak and FRA to identify funding to support engineering and construction for the Frederick Douglass Tunnel Project to replace the B&P Tunnel in Baltimore City. The B&P Tunnel Replacement Program is a broad range of investments that will transform a four-mile section of the Northeast Corridor in Baltimore. It includes the new Frederick Douglass Tunnel, a new ADA-accessible West Baltimore MARC Station, and the replacement of bridges, track, and rail systems. Amtrak currently is performing final design and initiating property acquisitions to prepare for construction. Pending sufficient funding for the approximately $4 billion investment, early construction activities on the tunnel's southern approach could begin during the next one to two years.
- In January 2021 the FTA announced a $766.5 million Capital Investment Grant to support the $1.8 billion project to replace the Portal North Bridge on the Northeast Corridor in Hudson County, NJ. A total of $57.1 million also will be provided through the FHWA CMAQ program. New Jersey will fund $811 million, and Amtrak's obligation will fund $261.5 Million.

These examples illustrate the variety and number of funding sources used to fund other large rail projects. Furthermore, the division of local, state, federal, and railroad funding would likely vary depending upon the benefits to the respective organizations and jurisdictions. The recent IIJA creates promising new funding programs to support significant

projects including the "mega project" program, dramatic increases in Amtrak capital funding, and programs such as the Federal-State Partnership for Intercity Passenger Rail.

PASSENGER PROGRAM

This section presents the Passenger Rail Investment Program, passenger rail infrastructure projects that will help implement Maryland's rail vision, goals, and objectives during the next 20 years. Although these projects have been identified as primarily benefiting passenger rail, some would benefit freight rail with improvements to shared corridors.

Passenger rail infrastructure projects have not been assigned a specific timing or prioritization through these 20 years. However, "project readiness" considerations are provided to indicate likely project timing. Several characteristics indicate that rail projects could be completed earlier in the 20-year period covered by the Maryland State Rail Plan:

- **Project Priority –** In some cases, project sponsors have provided indications of relative priority among projects. Here "project" sponsor refers to the railroad or agency whose services will be using the infrastructure that will be improved as a result of the project. All else equal, those of higher priority will be completed sooner.
- **Project Cost –** Federal grant programs, such as those listed in Chapter 2, frequently provide for minimum and maximum, federal and non-federal match requirements. A project with a cost consistent with these grant programs could potentially be funded under a single round of funding appropriations, but multiple grants may be required to fund larger projects.
- **Required Agreements –** Rail lines owned by one company or agency may host multiple operators. Any modifications to services and/or infrastructure requires agreement by the property owner. Negotiations between parties adds potential complexity and risk to any project's schedule or viability. A property owner's support and participation reduces the risk and increases the likelihood of project implementation.
- **Project Development Status –** Projects further along in the development or design process, including National Environmental Policy Act (NEPA) documentation, would reflect a project's priority to its sponsors and present less risk.

Projects have been grouped by the category they are intended to address. For each project, the following tables also show the MTP goal areas the project benefits.

Northeast Corridor State of Good Repair

Seven projects presented in this Rail Service and Investment Program represent a combined $7.8 billion that would replace aging infrastructure on Amtrak's Northeast Corridor (NEC). These projects also would expand capacity and improve the service level on the NEC, benefiting all operators, including Amtrak, MARC, CSX, and NS. Although categorized as passenger rail projects, some could benefit freight operators as well, particularly along the NEC between Baltimore and Perryville providing freight access to the Port of Baltimore. Among state of good repair projects in Maryland, Amtrak's highest priority is the replacement of the B&P Tunnel, followed closely by replacement of the Susquehanna River Bridge.

Table 5-2. Northeast Corridor State of Good Repair Projects

PROJECT	COST	PROJECT READINESS	GOAL AREA
Frederick Douglass Tunnel (Replacement B&P Tunnel)	$4.5 Billion	▪ Phased approach may be necessary ▪ NEC Commission recommends $466 million for final design ROW, beginning construction ▪ Top Amtrak Priority ▪ FRA Record of Decision ▪ Second largest NEC Project ▪ Maryland (MDOT) funding commitment of $147k PP	▪ System Maintenance and Modernization ▪ Quality and Efficiency ▪ Economic Opportunity
Susquehanna River Bridge Replacement	$1.1 Billion	▪ FRA Finding of No Significant Impact ▪ Funding may be less challenging than Frederick Douglass Tunnel ▪ High Amtrak priority after B&P Tunnel	▪ System Maintenance and Modernization ▪ Quality and Efficiency ▪ Economic Opportunity
Gunpowder River Bridge Replacement	$614 Million	▪ Conceptual engineering complete but environmental process not started	▪ System Maintenance and Modernization ▪ Quality and Efficiency ▪ Economic Opportunity

PROJECT	COST	PROJECT READINESS	GOAL AREA
Bush River Bridge Replacement	$447 Million	▪ Conceptual engineering complete but environmental process not started	▪ System Maintenance and Modernization ▪ Quality and Efficiency ▪ Economic Opportunity

Northeast Corridor Capacity Projects

Another focus for MARC and Amtrak is increasing capacity of the NEC, particularly between Washington and Baltimore. Increased capacity allows more trains to operate and accommodates new services such as MARC express trains between Baltimore and Washington, DC. Certain station improvement projects also would boost capacity by adding platforms to permit express trains to pass local trains stopped at stations.

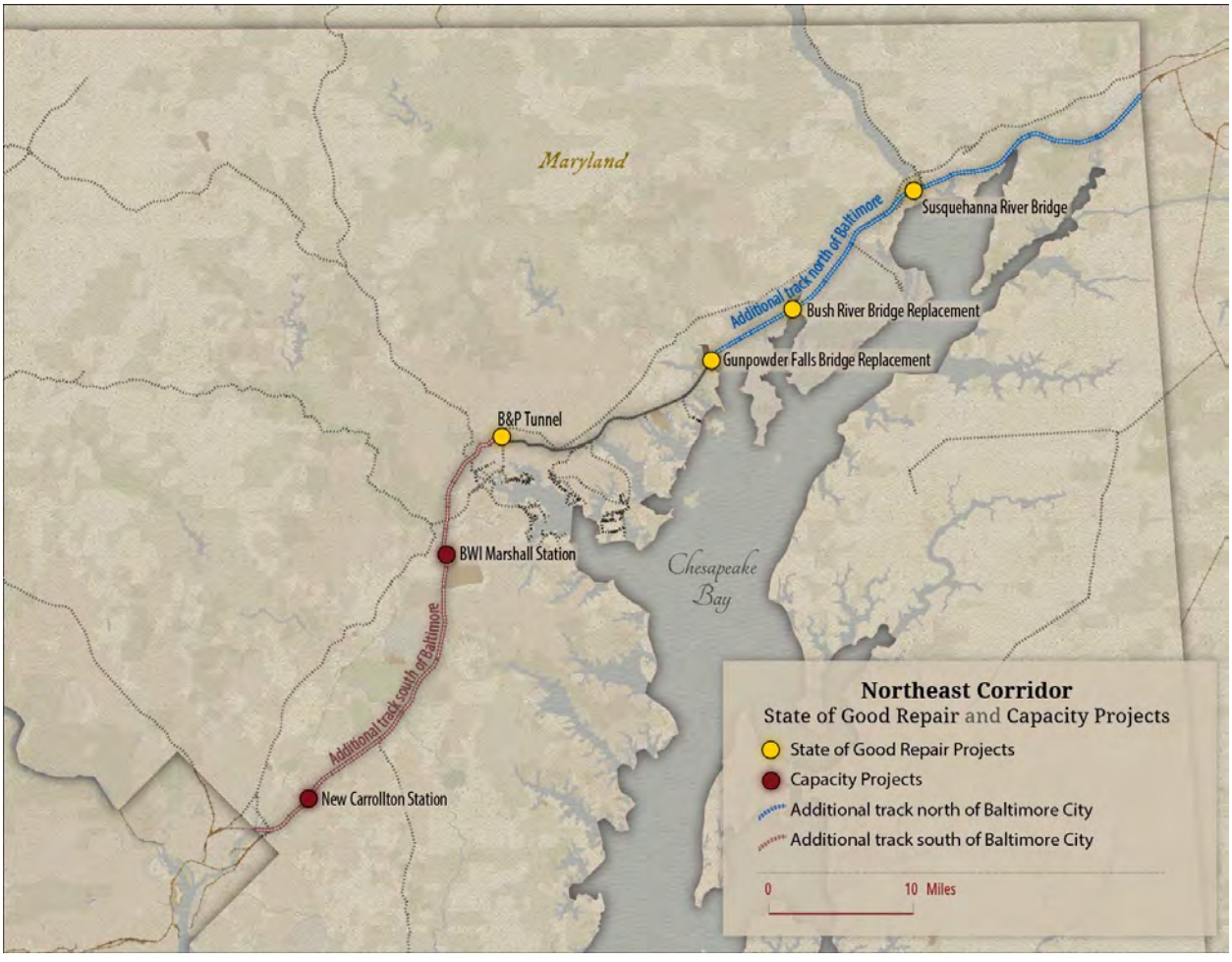
Table 5-3. Northeast Corridor Capacity Projects

PROJECT	COST	PROJECT READINESS	GOAL AREA
Amtrak Signal Project	TBD	▪ Amtrak high priority	▪ System Maintenance and Modernization ▪ Safe, Secure, and Resilient ▪ Quality and Efficiency
New Carrollton Station Track 1 Platform	$36 Million	▪ Amtrak/MARC priority ▪ Consistent with existing grant programs	▪ Quality and Efficiency ▪ Economic Opportunity
BWI Marshall Airport Platform Expansion and 4th Track	$600 Million	▪ Amtrak/MARC priority ▪ Larger than most federal grant sources	▪ Quality and Efficiency ▪ Economic Opportunity
Express MARC Service between DC and Baltimore	TBD	▪ High MARC priority ▪ Largely contingent on other projects	▪ Economic Opportunity ▪ Quality and Efficiency ▪ Choices and Connections
Additional 4th Track, between DC and Baltimore	TBD	▪ Additional planning needed	▪ Quality and Efficiency ▪ Economic Opportunity

PROJECT	COST	PROJECT READINESS	GOAL AREA
Capacity Projects North of Baltimore	TBD	▪ Additional planning needed	▪ Quality and Efficiency ▪ Economic Opportunity

The locations of projects on the NEC to promote state of good repair and increase capacity are displayed in Figure 5-2.

Figure 5-2. Northeast Corridor State of Good Repair and Capacity Projects



Connectivity Projects

Several proposals have been put forward to extend MARC commuter service into neighboring jurisdictions and integrate and coordinate MARC service with those of neighboring jurisdictions. MDOT MTA is conducting stakeholder engagement and good-faith negotiations for MARC pilot service to Virginia as well as pilot service into Delaware.

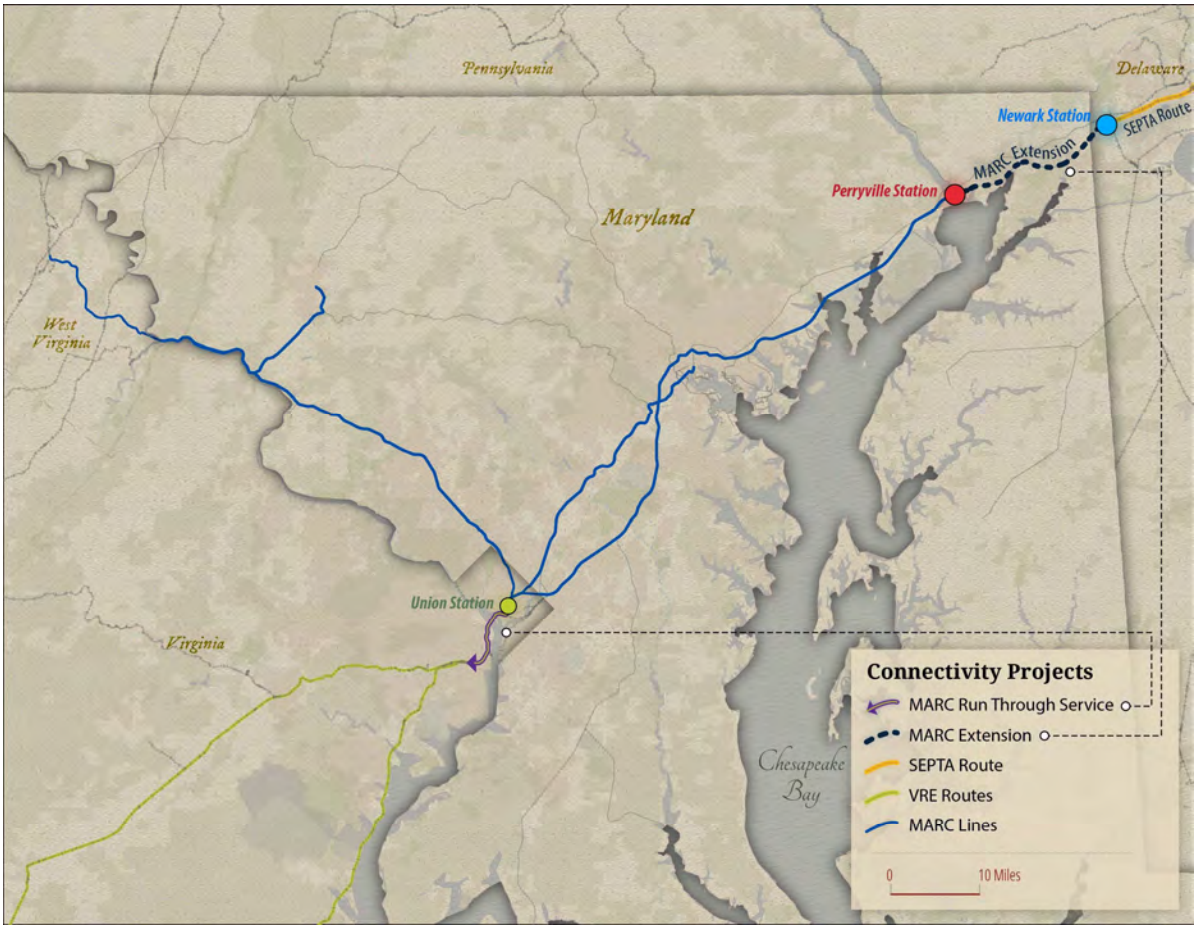
The proposed pilot service to Virginia includes two morning trains traveling from Union Station to Northern Virginia, and two evening trains traveling from North Virginia to Union Station. The proposed pilot service to Delaware includes extending MARC service to Newark, DE, connecting MARC with Southeastern Pennsylvania Transportation Authority (SEPTA) service to Philadelphia. MDOT MTA also is completing a study of MARC service expansion into Western Maryland. These proposed projects could provide Maryland residents with improved access to jobs, activity centers, and transportation options.

Table 5-4. Connectivity Projects

PROJECT	COST	PROJECT READINESS	GOAL AREA
MARC Run-Through Service to Northern Virginia	TBD	▪ Contingent on agreements ▪ Infrastructure improvements in DC and Virginia ▪ Maryland House Bill 1236 (2020)	▪ Choices and Connections ▪ Economic Opportunity ▪ Quality and Efficiency
SEPTA-MARC Connection in Delaware	TBD	▪ Contingent on agreements ▪ Necessary Newark, DE, Station improvements are complete ▪ Maryland House Bill 1236 (2020)	▪ Economic Opportunity ▪ Quality and Efficiency ▪ Choices and Connections
Fare Integration and Other Operational Integration	TBD	▪ Contingent agreements and organizational and operational changes	▪ System Maintenance and Modernization ▪ Quality and Efficiency ▪ Choices and Connections

Connectivity project locations are displayed in Figure 5-3.

Figure 5-3. Connectivity Projects



MARC Service Projects

Projects listed in Table 5-5 will enable MARC to continue service at a high standard while using public funds responsibly.

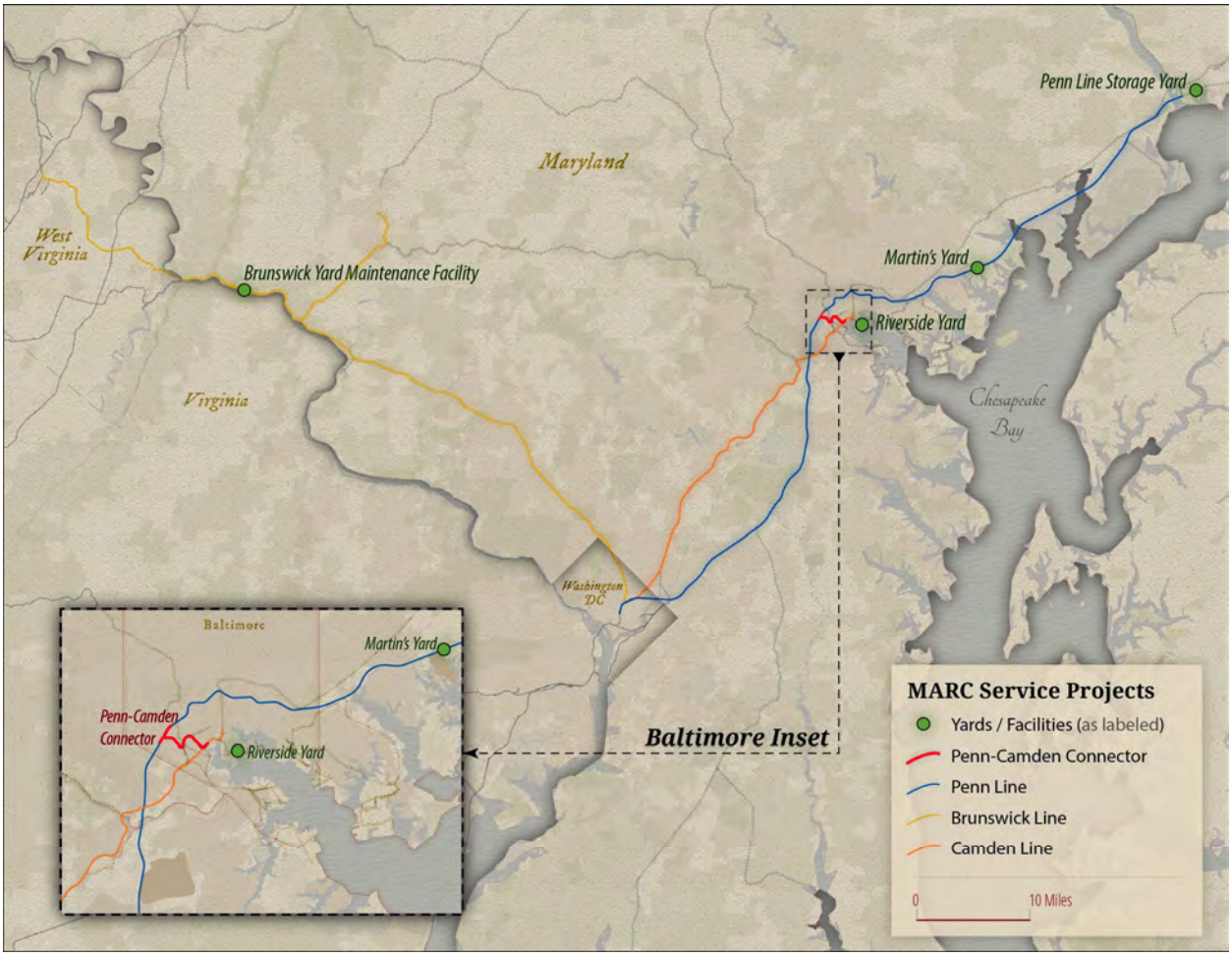
Table 5-5. MARC Service Projects

PROJECT	COST	PROJECT READINESS	GOAL AREA
Rolling Stock Overhauls	$142 Million	▪ Ongoing	▪ System Maintenance and Modernization ▪ Quality and Efficiency ▪ Fiscal Responsibility
Rolling Stock Replacements	$1.5 Billion	▪ Long-Term	▪ System Maintenance and Modernization ▪ Quality and Efficiency

PROJECT	COST	PROJECT READINESS	GOAL AREA
Penn-Camden Connector	$295 Million	▪ Highest priority for MARC ▪ Requires agreements but do not appear unsurmountable	▪ System Maintenance and Modernization ▪ Quality and Efficiency ▪ Fiscal Responsibility
Storage and Maintenance Facilities	$177 Million	▪ Riverside Heavy Maintenance and Martin's Yard Expansion identified as short-term ▪ Penn Line storage (Mt. Clare) medium-term ▪ Brunswick Yard storage long-term	▪ System Maintenance and Modernization ▪ Quality and Efficiency ▪ Fiscal Responsibility
Frederick Branch Improvements	$10 Million	▪ Ongoing	▪ System Maintenance and Modernization ▪ Quality and Efficiency
PRIIA Penn Line cost-sharing	$480 Million	▪ Ongoing	▪ System Maintenance and Modernization ▪ Quality and Efficiency
CSX Joint Benefits – Brunswick and Camden Lines	$108 Million	▪ Ongoing	▪ System Maintenance and Modernization ▪ Quality and Efficiency
Grade Crossing Safety Projects	TBD	TBD	▪ Safe, Secure, and Resilient

MARC service project locations are illustrated in Figure 5-4.

Figure 5-4. MARC Service Projects



Projects listed in Table 5-6 relate to commuter or intercity passenger rail stations. Some projects would renovate stations to maintain a state of good repair and modernize amenities. Others focus upon safety, minimizing conflicts between passengers and train. Other projects seek to improve the integration of stations with surrounding communities, either through improved access, parking, or a suite of improvements including transit-oriented development.

Table 5-6. Station Projects

PROJECT	COST	PROJECT READINESS	GOAL AREA
Baltimore Penn Station Renovation, Platform Expansion	$90 Million	▪ First stages underway	▪ System Maintenance and Modernization ▪ Quality and Efficiency ▪ Choices and Connections
Baltimore Penn Station Developments with private partner(s)	$500 Million	▪ Preliminary designs	▪ Economic Opportunity ▪ Choices and Connections
Station Access Improvements	$104 Million	▪ Ongoing	▪ Safe, Secure, and Resilient ▪ Quality and Efficiency ▪ Choices and Connections
Penn Line Station Renovations	$90 Million	▪ Ongoing	▪ System Maintenance and Modernization ▪ Quality and Efficiency ▪ Choices and Connections
Camden Line Station Renovations	$80 Million	▪ Ongoing	▪ System Maintenance and Modernization ▪ Quality and Efficiency ▪ Choices and Connections
West Baltimore Station	$58 Million	▪ Ongoing	▪ System Maintenance and Modernization ▪ Quality and Efficiency ▪ Choices and Connections
Eliminate At-Grade Pedestrian Crossings	$370 Million	▪ Ongoing	▪ Safe, Secure, and Resilient
Brunswick Line Station Renovations	$22 Million	▪ Ongoing	▪ System Maintenance and Modernization ▪ Quality and Efficiency ▪ Economic Opportunity
Aberdeen MARC Station TOD	$70 Million	▪ Additional planning needed	▪ Economic Opportunity ▪ Choices and Connections

PROJECT	COST	PROJECT READINESS	GOAL AREA
Bayview MARC and Intermodal Station	$73 Million	▪ Subject to negotiations with MARC and host railroads	▪ Economic Opportunity ▪ Choices and Connections
North East Transit Hub/Train Station	TBD	▪ Subject to negotiations with MARC and host railroads	▪ Economic Opportunity ▪ Choices and Connections
Perryville Train Station Parking and TOD	TBD	▪ Concept	▪ Economic Opportunity ▪ Choices and Connections
Other TOD	TBD	▪ Preliminary concept designs	▪ Economic Opportunity ▪ Choices and Connections

New/Expanded Services

Stakeholders have proposed additional MARC frequencies or new commuter services. Negotiation with host railroads will be required to implement proposed service enhancements. MDOT MTA has identified improvements required to provide additional service on each MARC line. New or expanded services could provide Marylanders with additional transportation options, divert passenger trips from highways, and provide passengers with greater mobility to access business or leisure activities in other locations.

Table 5-7. New and Expanded Service

PROJECT	COST	PROJECT READINESS	GOAL AREA
Expanded MARC Brunswick Service	$720 Million	▪ Subject to negotiation	▪ Economic Opportunity ▪ Quality and Efficiency ▪ Choices and Connections
Expanded MARC Brunswick Service-Frederick	$620 Million	▪ Subject to negotiation	▪ Economic Opportunity ▪ Quality and Efficiency ▪ Choices and Connections

PROJECT	COST	PROJECT READINESS	GOAL AREA
Expanded MARC Camden Line Services	$660 Million	▪ Subject to negotiation	▪ Economic Opportunity ▪ Quality and Efficiency ▪ Choices and Connections
Expanded MARC Penn Line Service North of Baltimore	TBD	▪ Subject to negotiation	▪ Economic Opportunity ▪ Quality and Efficiency ▪ Choices and Connections
Pope's Creek Line Passenger Rail	TBD	▪ Concept only	▪ Economic Opportunity ▪ Choices and Connections
Service to Eastern Shore	TBD	▪ Concept only	▪ Economic Opportunity ▪ Choices and Connections
MARC Expansion to Western Maryland	TBD	▪ Concept only	▪ Economic Opportunity ▪ Choices and Connections
I-270 Monorail	$3.7 Billion	▪ Feasibility study	▪ Economic Opportunity ▪ Choices and Connections
Maglev (Baltimore-Washington)	$13 Billion	▪ DEIS complete ▪ Subject to decisions/funding	▪ Economic Opportunity ▪ Choices and Connections

FREIGHT INVESTMENT PROGRAM

Freight rail projects are grouped into several categories depending upon their purpose:

- **Port/Intermodal Projects** are intended to improve containerized rail intermodal connections either to the Port of Baltimore or other locations in the state.
- **Freight Projects on Short Line/Excursion Railroads** represent improvements to Class III railroads or lines currently operated by excursion railroads.

- **Other Projects on Class I Railroads** are recommendations by Class I railroads for the current Rail Plan or are carried over from the 2015 Plan.

Port and Intermodal Projects

Port and intermodal projects vary in their readiness. Some are long-term and would require agreements between property owners and operators, while others would be more straight-forward. Proposed port/intermodal projects could provide Maryland shippers better options, increase efficiency, decrease congestion by removing more trucks from highways and better integrate the region with US and international markets.

Table 5-8. Port and Intermodal Projects

PROJECT	COST	PROJECT READINESS	GOAL AREA
Seagirt Terminal Operating Improvements	TBD	▪ Endorsed by sponsor	▪ System Maintenance and Modernization ▪ Economic Opportunity ▪ Quality and Efficiency ▪ Safe, Secure, and Resilient
Separation of NEC Freight and Passenger Operations (between Perryville and Baltimore) with Unrestricted Double-stack Access	TBD	▪ Concept only, subject to agreements	▪ Safe, Secure, and Resilient ▪ Quality and Efficiency ▪ Economic Opportunity
New CSX Domestic Intermodal Terminal	TBD	▪ Long-term, if needed	▪ System Maintenance and Modernization ▪ Economic Opportunity ▪ Quality and Efficiency ▪ Choices and Connections
Shuttle Train: Baltimore to Perryville, Inland Port	TBD	▪ Concept only, subject to agreements	▪ Economic Opportunity ▪ Quality and Efficiency ▪ Choices and Connections
Intermodal Terminal in Cecil County	TBD	▪ Concept only, subject to agreements	▪ Economic Opportunity ▪ Quality and Efficiency ▪ Choices and Connections

Freight Projects on Short Line/Excursions Railroads

A total of 17 projects were put forward for short line/excursion railroads in Maryland. These are described in more detail in Appendix E. Projects include rehabilitation of railroad track and bridges to a state of good repair and upgrade of track and structures to modern standards. With improved infrastructure, railroads can serve their customers more efficiently and effectively to maintain freight rail as viable transportation option. Other projects would establish or improve access points to the rail network to provide shippers with new or improved transportation options and support local economic development.

Table 5-9. Short Line and Excursion Railroad Projects

PROJECT	NUMBER OF PROJECTS	COST	PROJECT READINESS	GOAL AREA
Crossing Improvement	1	$0.3 Million	▪ Sponsored by property owners/operators	▪ Safe, Secure, and Resilient ▪ System Maintenance and Modernization
Industrial Access	3	$10.1 Million	▪ Sponsored by property owners/operators	▪ Economic Opportunity ▪ Quality and Efficiency ▪ Choices and Connections
Rail Capacity-Upgrade to accommodate 286,000 lb. railcars	3	$12.0 Million	▪ Sponsored by property owners/operators	▪ System Maintenance and Modernization ▪ Economic Opportunity ▪ Quality and Efficiency
Re-establish Connection(s)	1	$0.1 Million	▪ Sponsored by property owners/operators	▪ System Maintenance and Modernization ▪ Economic Opportunity ▪ Quality and Efficiency ▪ Choices and Connections

PROJECT	NUMBER OF PROJECTS	COST	PROJECT READINESS	GOAL AREA
Track Rehabilitation	6	$30.6 Million	▪ Sponsored by property owners/operators	▪ Economic Opportunity ▪ System Maintenance and Modernization ▪ Quality and Efficiency
Transload	3	$1.7 Million	▪ Sponsored by property owners/operators	▪ Economic Opportunity ▪ Choices and Connections
Grade crossing projects	TBD	TBD	▪ TBD	▪ Safe, Secure, and Resilient

Other Projects on Class I Railroads

Various stakeholders recommended projects at topical and advisory committee meetings, as well as through a public survey. NS recommended construction of bypass trackage the Vardo Yard in Hagerstown to better separate through traffic from yard activities. Other Class I projects on CSX are carried over from the 2015 Maryland State Rail Plan. Projects would increase the capacity and improve the operations on CSX lines, with potential benefit to MARC services and are described in more detail in Appendix E.

Table 5-10. Other Projects on Class I Railroads

PROJECT	COST	PROJECT READINESS	GOAL AREA
NS Hagerstown Bypass (Vardo Yard)	$13 Million	▪ Sponsored by property owner	▪ System Maintenance and Modernization ▪ Economic Opportunity ▪ Quality and Efficiency ▪ Choices and Connections

PROJECT	COST	PROJECT READINESS	GOAL AREA
CSX Capacity Projects ▪ Carried Forward from 2015 Maryland Rail Plan ▪ Includes improved connections, state of good repair ▪ Potential MARC benefits	$329 Million	▪ Sponsored by property owner	▪ System Maintenance and Modernization ▪ Economic Opportunity ▪ Choices and Connections
Grade Crossing Safety Projects	TBD	▪ TBD	▪ Safe, Secure, and Resilient

RAIL STUDIES AND REPORTS, NEXT STEPS

Maryland has recently completed its State Highway-Rail Grade Crossing Action Plan per federal requirements. Other potential next steps are below.

Work with our partners to advance rail enhancements

- Work with Amtrak, the Northeast Corridor Commission, and other relevant stakeholders to develop strategies for funding projects in Maryland on the Northeast Corridor, particularly high priority "mega projects" such as the Frederick Douglas Tunnel and the Susquehanna River Bridge Project.
- Initiate a study to review alternatives to separate freight and passenger rail services, implement double-stack intermodal service on the Northeast Corridor between the NS Bayview Yard in Baltimore and the NS rail line at Perryville.
- Continue working with partners to promote rail corridor preservation, including railbanking, and supporting interim trail use on MDOT-owned right-of-ways consistent with the National Trails System Act and Surface Transportation Board requirements
- Continue working with partners to advance existing projects, including the Howard Street Tunnel, etc.
- Investigate FRA and other federal IIJA funding programs for opportunities to advance freight and passenger rail improvements and grade crossing safety.

Enhance rail and grade crossing safety

- Continue to implement the Maryland State Highway-Rail Grade Crossing Action Plan (SAP)

- Initiate a commission a study to investigate best practices to prevent trespasser fatalities on railroad rights-of-way and recommend measures to reduce trespasser fatalities on Maryland's rail network.

Assess potential revisions to state rail programs and oversight

- Develop a multi-agency proposal for a program to support short line railroads in Maryland. This program could support investments that modernize and bring short line rail infrastructure to a state of good repair, and/or it could support projects that improve access to short line, such as through transload facilities or sidings/spurs. Consider potential alternatives to provide technical support to short line railroads pursuing federal grants such as through the CRISI program.
- Assess and revise oversight of state rail programs and rail governance. Discuss options to consolidate rail functions with employees performing rail functions in the Maryland state government and develop a recommended organizational structure for rail within the Maryland state government.

Advance rail integration

- Continue discussions and studies to investigate the anticipated ridership and logistics of extending MARC services into Northern Virginia, Northern Delaware, and Western Maryland.

Advance innovative rail technology

- The future of rail transportation will undergo significant changes in response to the growing demand for efficient rail transportation, enhanced safety features, opportunities to decarbonize trains, modernized communication, rail automation, and workforce development. An example of an innovative enhanced safety feature in practice at MDOT MTA is the positive train control in place designed to prevent train-to-train collisions, over-speed derailments, and movements of trains through switches in the wrong position.
- Continue to advance rail technology as MDOT understands the importance of being prepared for innovation in the rail industry and will continue to work with stakeholders on opportunities for innovation.

6 Maryland State Rail Plan Coordination and Review

PUBLIC AND AGENCY APPROACH AND COORDINATION

MDOT is committed to engaging rail stakeholders and the public in all rail planning activities. Based upon federal requirements, a State Rail Plan must include adequate and reasonable notice and opportunity for comment and input from a variety of stakeholders. At the start of updating the Maryland State Rail Plan, a Stakeholder and Public Involvement Plan was developed to outline the approach, activities, and schedule to engage stakeholders and the public throughout the development of the Plan. Stakeholder and public outreach and coordination was designed to focus on the role of freight and passenger rail in Maryland and meet the following goals:

- Understand the needs and potential opportunities for rail to improve the efficiency and sustainability of Maryland's transportation system
- Educate and inform stakeholders and the public on rail issues throughout the state
- Solicit input on rail policy, projects, and programs to better meet the state's transportation needs while also making Maryland a more attractive place to live, work, conduct business, and visit

Several approaches were used to engage stakeholders:

- Railroad interviews and data collection
- Project website
- Online survey
- Advisory committee
- Topical meetings
- Interviews
- Online survey to adjoining states

Railroad Interviews and Data Collection

Questionnaires were sent to freight and excursion railroads operating in Maryland to request information to allow better understanding of system characteristics, needs, and general views on rail-related issues and opportunities in Maryland. The response rate was 100%, with responses from seven short line operators, two excursion railroads, and two Class I carriers. Information requests on specific topic areas also were sent to and completed by Amtrak and MARC.

Project Website and Public Survey

In keeping with the MDOT's commitment to engage both rail stakeholders and the public, summary materials related to the State Rail Plan were made available on the MDOT website, http://www.mdot.maryland.gov/railplan. The website included a link to a survey and also provided an opportunity to comment on the draft vision, goals, and objectives for the Rail Plan. The survey also asked respondents to:

- indicate characteristics of rail services they value the most,
- prioritize strategies to improve rail services, and
- recommend rail network improvements.

The online survey was available from November 12, 2020, through January 29, 2021, with 216 responses received. A summary of the survey results and outreach effort is available on the Maryland State Rail Plan website. Based on the survey, respondents provided more comments regarding passenger rail service than for freight rail service. With respect to MARC service, 38% indicated new service in the Northeast Corridor (NEC) as a top priority, followed by 22% who indicated faster service on the NEC and 21% who indicated reliable service as top priorities. For intercity (Amtrak) service, 38% indicated more frequent or faster service as a top priority, followed by 30% who indicated run-through service and 14% who indicated reliable service as top priorities. Priorities for improving freight rail were more evenly split, with 28% of respondents suggesting the improvement of short line railroads, 27% indicating improvements to industrial and commercial sites served by rail, and 24% requesting enhanced access to the Port of Baltimore.

Rail Advisory Committee

MDOT formed a Rail Advisory Committee that included key stakeholders from the railroads, MDOT Transportation Business Units, other state agencies, Metropolitan Planning Organizations (MPOs), and other organizations. The Rail Advisory Committee met twice during development of the Plan. The first meeting introduced the Plan and requested preliminary input on proposed goals, issues, and strategies. The second meeting vetted initial findings regarding issues, opportunities, and potential projects.

Topical Meetings

Three meetings were held to focus on specific rail topics:

- Freight rail, focusing on Class I railroads and the Baltimore/Washington Metropolitan area;
- Freight rail, focusing on short line railroads and issues/concerns outside of the Baltimore/Washington Metropolitan area; and
- Passenger rail.

Meetings were attended by members of the Rail Advisory Committee plus other invited stakeholders with a specific interest in rail. The purpose of these meetings was to inform stakeholders about the Plan and obtain feedback on issues and opportunities and potential projects for each topical focus area. The meetings were intended to uncover

additional themes and issues for further discussion during the interviews or one-on-one meetings.

Interviews

Fourteen one-on-one interviews were conducted with various stakeholders as follow-up meetings to the topical meetings. The purpose of these one-on-one interviews was to further explore issues mentioned during earlier meetings, generated by the questionnaires, and introduced by the interviewee. These meetings were conducted one-on-one so that stakeholders could share their thoughts and concerns freely.

COORDINATION WITH NEIGHBORING STATES

MDOT sent questionnaires to neighboring states to inquire about rail issues and opportunities in their states; how they are impacted by Maryland's rail network and services; and how Maryland can work with their state to address these issues and opportunities. In addition, MDOT conducted a phone interview with the Virginia Department of Rail and Public Transportation (DRPT) to explore how planned DRPT investments could impact Maryland. Several areas of coordination across state boundaries were raised:

- The Pennsylvania Department of Transportation suggested that state transportation agencies should explore and adapt to changes in rail technology. Collectively, states on the East Coast should support rail access to East Coast ports. Maryland and Pennsylvania can support passenger rail across state boundaries by helping to improve the state of good repair, resiliency of passenger rail infrastructure in their states, and by supporting high-speed rail initiatives.
- The Delaware Department of Transportation (DelDOT) noted several areas for collaboration. DelDOT would like to collaborate to improve freight and commuter transportation on the Northeast Corridor with additional trackage and other improvements on the segment between Newark, DE, and Perryville, MD. This would help to support the new Edgemoor Container Port near Wilmington, ideally with double-stack intermodal service. DelDOT noted that Maryland and Delaware have been working for a long time at the possibility of extending MARC to Newark, DE. DelDOT also remarked on Delmarva Peninsula rail opportunities, including efforts to encourage preservation of industrial properties on the Delmarva Secondary and longer-term passenger rail opportunities.

- The Virginia DRPT mentioned that the agency is supportive of proposals for MARC run-through service in partnership with VRE. The Long Bridge expansion project across the Potomac River is Virginia's top priority project which will benefit Maryland by removing a major bottleneck between Maryland/DC and the Southeast. Maryland also will benefit from Amtrak's adoption of dual electric/diesel locomotives, which will reduce dwell times at Washington Union Station for trains continuing south.
- The District Department of Transportation highlighted the District of Columbia State Rail Plan (DC Rail Plan), which emphasizes the District of Columbia's role as a rail hub and junction point for both passenger and freight. Major focus areas of the DC Rail Plan include the Washington Union Station terminal area and the corridor between Union Station and Long Bridge. The Washington Union Station terminal area will be a key component of any plans to increase MARC service or generally increase Maryland passenger service on the Northeast Corridor. The area between Union Station and Long Bridge will be key to a MARC extension to L'Enfant Station or run-through service to Virginia.
- No response was received from the West Virginia State Rail Authority.

STAKEHOLDER INPUT

Stakeholders and members of the public were invited to provide feedback throughout development of the Rail Plan. Many of the issues, concerns, and potential strategies commented on by stakeholders and the public are discussed in Chapters 3 and 4, which focus on rail improvements and investments, and are summarized by subject area below.

Passenger Rail Issues

EXISTING AMTRAK ROUTES

- Improve the reliability of Amtrak services.
- Replace the Susquehanna River Bridge.
- Reassess ticket prices for intercity (Amtrak) service to make this a more financially feasible option for passengers.
- Replace the B&P Tunnel as a high priority.

EXISTING MARC ROUTES

- Provide limited express MARC service, particularly between Baltimore and Washington, DC.
- Improve and expand commuter service hours to better serve the reverse peak and weekend service. This is especially important for the Brunswick and Camden lines.
- Provide supplemental bus service to increase flexibility on Brunswick Line.
- Add train frequencies, particularly on the Brunswick Line.
- Improve multimodal (e.g., bicycle, pedestrian, light rail, commuter bus) connections, and park-and-ride options including secure bicycle parking at key rail stations and hubs. Some specific suggestions include:
    - A bike/pedestrian connection between downtown Bowie and Bowie State MARC station.
    - A light rail connection between BWI Marshall Airport/BWI Marshall Station.
    - Better timing of modal connections at Baltimore Penn Station, including additional circulator buses and improved bike/pedestrian access.
- Work with rail service providers to develop a fare integration system that allows easier transfers for rail passengers while also accommodating disadvantaged populations, such as the homeless. The Southeastern Pennsylvania Transit Authority (SEPTA) Key Card could be a model for integration between MARC and light rail. Fare integration between Amtrak and MARC on the Penn Line could help riders think of the service as a corridor, instead of two separate operators.
- Improve real-time train information, including but not limited to websites, phone applications, and station display dashboards**.** Improve existing customer information systems, which sometimes provide misleading information on train delays.
- Better integration between passenger rail service between commuter rail (MARC, VRE, SEPTA) and Intercity rail (Amtrak) with fare integration, schedule coordination, and stop locations. Add run-through service to Virginia.
- Improve statewide marketing and advertisement of rail services throughout the Maryland and neighboring states.
- Increase speed between Point of Rocks and Frederick.
- Provide a MARC station at Bayview.
- Provide a MARC station at Havre de Grace.

- Rethink traditional commuter service schedule in light of how work patterns have changed as a result of COVID-19. People will not necessarily go back to working in the office 9 to 5, five days a week. They may go into the office several days per week and may be willing to have a longer commute.

NEW OR EXPANDED PASSENGER RAIL SERVICES

- Expand intercity (Amtrak) service to Annapolis and the Eastern Shore. Provide Eastern Shore service with either a rail line over the new Bay Bridge or on existing rail infrastructure from Wilmington/ Newark, DE south to Maryland beach and resort areas.
- Establish passenger rail to Southern Maryland on the existing CSX freight line that runs between Bowie and the Morgantown power plant.
- Support existing, conventional technologies instead of maglev and hyperloop.
- Extend MARC to Hagerstown and into Pennsylvania.
- Provide MARC run-through service to L'Enfant Station and to Northern Virginia.
- Connect to SEPTA/Amtrak at Wilmington, DE, and build a new station in Elkton.
- Provide new MARC service from Baltimore to Westminster, new service to Harrisburg/ York, and new service west of Baltimore on the Old Main Line.
- Provide additional Amtrak service between Washington, DC, and Cumberland.

Freight Rail Issues

- Improve coordination between freight and passenger rail services on multi-use corridors.
- Encourage low emission technologies for freight trains.
- Establish a Maryland freight rail industrial access program. This would provide monetary assistance to companies interested in expanding the use of freight rail service, but currently lacking the capital to do so. Other states, such as Virginia and Pennsylvania, have these types of programs.
- Enhance freight rail marketing by promoting turnkey industrial sites. The state should maintain a database of all rail-served sites.
- Work to preserve buildable industrial sites along freight rail corridors in Maryland.
- Improve the protection of industrial development around the Port of Baltimore.

- Coordinate economic development with land use planning. Provide rail "best practices" for local jurisdictions for their local comprehensive plans and development review process.
- Provide additional options for double-stack access to the Port of Baltimore.
- Improve NEC freight timeslots. Separate freight and passenger rail operations on the NEC.
- Ensure industrial zones are available in flat areas of Western Maryland, so that locations zoned industrial are not solely unbuildable locations on steep hills.
- Pursue an intermodal terminal in Cecil County/ Perryville, which has become a major hub for distribution centers. Such a facility might enhance NS operations, which are currently limited by the need to access Baltimore over the Amtrak Northeast Corridor.

Safety and Land Use Issues

- Implement a grade crossing separation at Boston Street, which is currently a hazard.
- Work to designate crossings as quiet zones, especially in Baltimore City.
- Ensure residential property owners be warned about the noise levels of rail within a certain proximity of rail infrastructure prior to their purchase of property.
- Provide greater police enforcement around railroad crossings to ensure the safety of motorists and pedestrians.
- Improve the Weverton crossing where bicyclists and pedestrians cross the CSX track to access the C&O Canal.
- Consolidate crossings, so that underutilized crossings are closed, rail blockages and alternate and or grade separated crossings should be considered long-term where rail blockages or safety concerns remain .
- Encourage the use of native plants and trees in green space along tracks as a buffer to discourage trespassers and reduce noise.
- Railbanking and evaluation of opportunities for interim trail use on MDOT-owned rights-of-way consistent with the National Trail System act and Surface Transportation Board regulations

COORDINATION WITH OTHER TRANSPORTATION PLANNING EFFORTS

The Maryland State Rail Plan update includes coordination with other statewide transportation planning efforts. This has helped identify needs, issues, opportunities, and projects. Other planning efforts reviewed include:

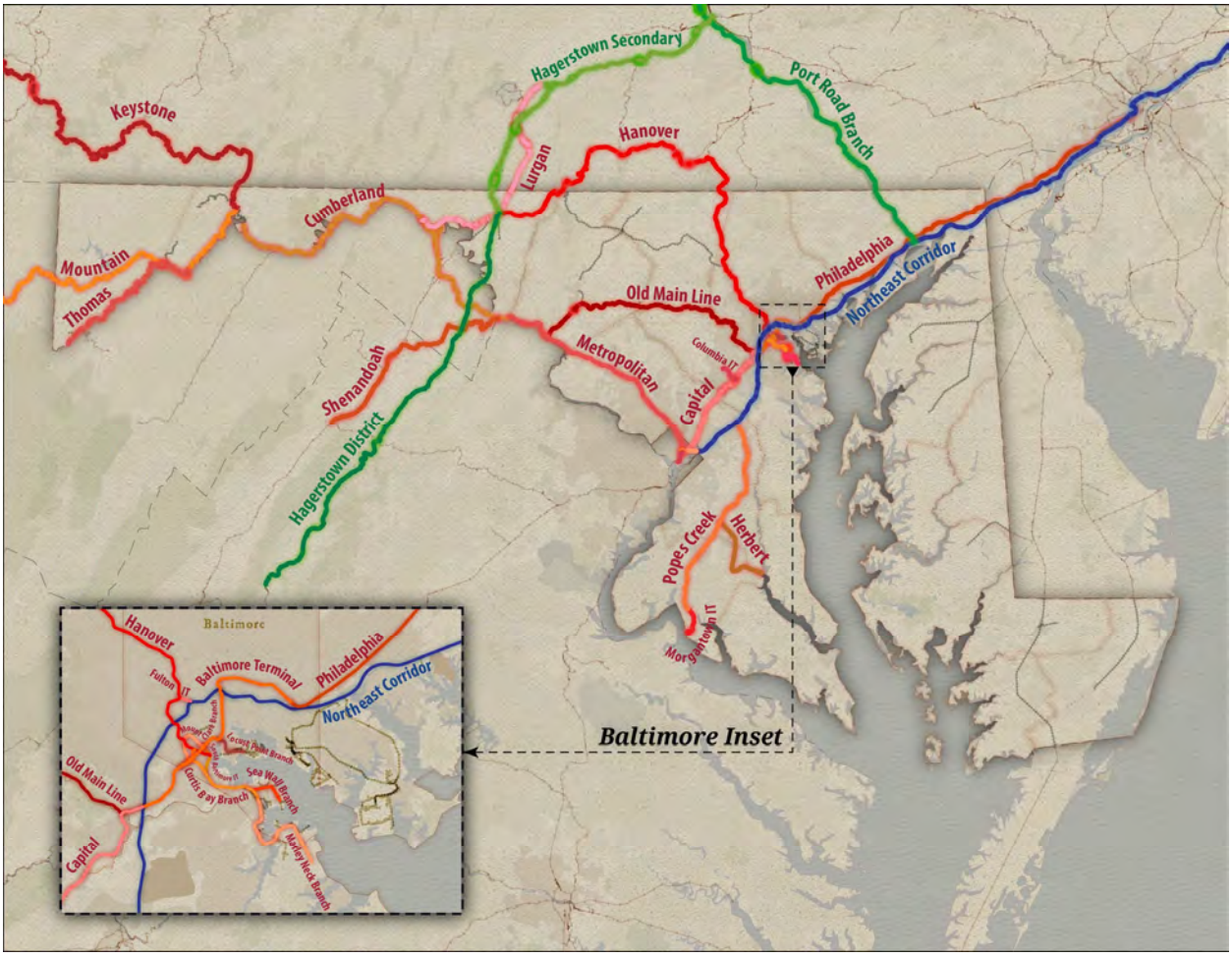
- Maryland Transportation Plan (2019)
- MARC Cornerstone Plan (2019)
- Maryland Strategic Goods Movement Plan (2017)
- Maryland Statewide Transit Plan (2022)
- Northeast Corridor Commission's CONNECT NEC 2035 (2021)
- Various Maryland MPO's planning efforts, including Long-Range Transportation Plans and specific rail-related studies
- Greater Washington Partnership's Capital Region Rail Vision (2021)

The Maryland Rail Plan also informs other plans, and the Maryland Statewide Freight Plan (2022), which has been prepared at the same time as, and in collaboration with, the State Rail Plan.

APPENDICES

Appendix A. Class I Railroads

Figure A-1. NS (Green) and CSX (Red/Orange) Subdivisions



Source: MDOT, CSX and NS Employee Timetables

Table A-1. CSX Subdivisions in Maryland

SUBDIVISION	FROM / TO	TRACKS	SIGNAL	MAXIMUM SPEED (MPH)	MILES IN MARYLAND	HEIGHT OR WEIGHT RESTRICTIONS
Baltimore Terminal	Baltimore / Baltimore	1 and 2	CTC	Passenger: 50, Freight: 40	10.9	None after Howard Street Tunnel work
Baltimore Terminal-Locust Point Branch	Baltimore / Baltimore	2	CTC	Passenger: 15, Freight: 10	0.7	No Double Stack
Baltimore Terminal – Mt. Clare Branch	Baltimore / Baltimore	1 and 2	CTC	10	2.8	No Double Stack
Baltimore Terminal – Westport Branch	Baltimore / Baltimore	2	Yard	10	0.5	18’5” one track, 16’ 5” the other
Baltimore Terminal – Curtis Bay Branch	Baltimore / Baltimore	2	CTC	15	3.3	No Double Stack
Capital	Baltimore / Washington	2	CTC	Passenger: 70, Freight: 55	29.2	18’ 2”
Cumberland	Sandy Hook / Harper’s Ferry	2	CTC	Passenger: 60, Freight: 40	2.2	Not Reported
Cumberland Terminal	Cumberland / Cumberland	2	CTC	Passenger: 60, Freight: 40	6.1	Not Reported
Hanover	Baltimore / PA border PA Border / Hagerstown	1	No Signal	40	38.4	No Double Stack
Herbert	Brandywine / Chalk Point	1	No Signal	30	17.3	No Double Stack
Keystone	Cumberland / PA Border	2	CTC	Passenger: 79, Freight: 50	5.6	Not Reported
Landover	Landover / DC Border	3	CTC	Passenger: 25, Freight 25	3.6	Not Reported

SUBDIVISION	FROM / TO	TRACKS	SIGNAL	MAXIMUM SPEED (MPH)	MILES IN MARYLAND	HEIGHT OR WEIGHT RESTRICTIONS
Lurgan	PA Border / WV Border	1	No Signal	40	23.8	Not Reported
Metropolitan	Washington DC / Sandy Hook	2	CTC	Passenger: 79, Freight: 55	72.4	Not Reported
Old Main Line	Baltimore / Sandy Hook	1	CTC	35	58.8	19' 2"
Philadelphia	Baltimore / DE Border	1 and 2	CTC	50	31.5	18' 2"
Pope's Creek	Bowie / Morgantown	1	No Signal	30	45.6	No Double Stack
Mountain	Cumberland / WV Border	2	ABS	45	32	No Double Stack
Thomas	McCool / WV Border	1	No Signal	25	20*	No Double Stack
George's Creek	Westernport / Consol 10	1	No Signal	10	12.8	No Double Stack

Source: CSX Transportation
Note: * Estimate – the rail line crosses between Maryland and West Virginia at numerous locations

Table A-2. NS Subdivisions in Maryland

SUBDIVISION	FROM / TO	TRACKS	SIGNAL	MAXIMUM SPEED (MPH)	MILES IN MARYLAND	HEIGHT OR WEIGHT RESTRICTIONS
Hagerstown	Hagerstown / WV Border	1 and 2	CTC	40	16.8	Not Reported
Lurgan Branch	PA Border / Hagerstown	1	CTC	50	5.4	Not Reported
Port Road Branch	PA Border / Perryville	1	CTC	30	14.7	No Double-stack

Source: Norfolk Southern

Appendix B. Class III (Short Line) and Excursion Railroad Profiles

Table B-1. Summary of Short Line and Excursion Railroads in Maryland

RAILROAD ABBREVIATION / NAME	HEADQUARTERS LOCATION	MILEAGE OWNED / LEASED	MILEAGE TRACKAGE RIGHTS	MILEAGE OUT OF SERVICE	FRA TRACK CLASS	WEIGHT RESTRICTIONS
DCR / Delmarva Central Railroad	Harrington, DE	0 / 42.35	0	0	Class 2	Not Reported
WMSR / Western Maryland Scenic Railroad Development Authority	Cumberland, MD	17 / 2	0	1	Class 2 and above	Not Reported
CTN / Canton Railroad Company	Baltimore, MD	16 / 0	0	0	Class 2 and above	Not Reported
GCK / George's Creek Railway, LLC	Keyser, WV	14.14 / 0	0	7.54	Class 1	Not Reported
MDDE / The Maryland and Delaware Railroad Company	Federalsburg, MD	26.9 / 80.7	0	8.5	Excepted / Class 1 / Class 2 and above	Chestertown, Snow Hill, Centreville, Seaford lines – 263k
MMID / Maryland Midland Railway	Union Bridge, MD	64.8 / 0	0	0	Excepted / Class 2 and above	Not Reported
WW / Winchester and Western RailRoad - OmniTrax	Martinsburg, WV	1.7 / 0	5	0	Excepted	Not Reported
WS / Walkersville Southern Railroad, Inc.	Walkersville, MD	0 / 6.75	0	0	Class 1	Monocacy Bridge South 65.20 to 66.75 – 211k
TPR / Tradepoint Rail	Baltimore, MD	54.78 / 0	4	4.38	Excepted / Class 1	None

Source: Maryland SRP Class III Railroad Survey

Appendix C. Multimodal Facilities

Table C-1. Multimodal Facilities in Maryland

CITY	SERVING RAILROAD	FACILITY NAME	PRIMARY COMMODITIES HANDLED	CAPACITY	TYPE
Baltimore	CSX	Amports	Automotive	Not Reported	Auto Ramps
Baltimore	CSX	Auto Warehousing Company	Automotive	Not Reported	Auto Ramps
Jessup	CSX	North American Rail Solutions	Automotive	Not Reported	Auto Ramps
Baltimore	CSX	Fairfield Marine Terminal	Automotive	Not Reported	Auto Ramps
Baltimore	CSX	Seagirt Intermodal Container Transfer Facility	Container	Not Reported	Intermodal Terminal
Baltimore	NS	Baltimore Intermodal Facility	Container	Not Reported	Intermodal Terminal
Baltimore	CSX	Liquid Transfer Terminals Inc	Industrial chemicals, caustic soda, molasses, paraffin wax, latex, liquid fertilizer	15	Port
Baltimore	CSX	North Locust Point Terminal	Wood pulp, lumber, latex, steel, paper and containers	Not Reported	Port
Baltimore	CTN, NS	Rukert Terminals Corp	Bulk, break-bulk, steel, metals, forest products, wind turbines and other project cargoes, ro-ro	Not Reported	Port
Baltimore	CSX	South Locust Point Marine Terminal	Forest products	Not Reported	Port
Baltimore	CSX	BWC Terminals	Specialty chemicals, caustic soda, fertilizer, petroleum products, base oils, biodiesel, wax, vegetable oil, molasses	22	Port
Baltimore	NS	Cnx Marine Terminal	Utility and metallurgical coal	Not Reported	Port
Baltimore	CSX, NS	Dundalk Marine Terminal	Containers, autos, farm, construction and other ro-ro equipment, wood pulp, steel, and break-bulk	27	Port

CITY	SERVING RAILROAD	FACILITY NAME	PRIMARY COMMODITIES HANDLED	CAPACITY	TYPE
Baltimore	CSX	Cargill	Dry bulk	Not Reported	Port
Baltimore	CSX	Holcim	Liquid bulk	Not Reported	Port
Baltimore	CSX	US Gypsum	Gypsum	Not Reported	Port
Baltimore	CSX	CSX	Coal	Not Reported	Port
Baltimore	CSX	Kinder Morgan	Liquid bulk	Not Reported	Port
Baltimore	TPR	Access World USA LLC	Building materials, consumer goods	4	Transload
Baltimore	CSX	Baltimore Metals And Commodities Inc.	Steel products, coils, bulk in bags	Not Reported	Transload
Elkridge	CSX	Belts Corp	Consumer goods	5	Transload
Jessup	CSX	Merchants Terminal Corp	Food, consumer goods	7	Transload
Baltimore	CSX	Overflo Public Warehouse Inc	Building materials, food	5	Transload
Baltimore	CTN	The Terminal Corp	Building materials, food, paper, consumer goods	4	Transload
Baltimore	CSX	Transflo	Chemicals, plastics, ethanol, food, dry bulk, waste materials	139	Transload
Baltimore	CTN	B & E Storage Inc	Building materials, food, paper, consumer goods	20	Transload
Baltimore	CTN	Midatlantic Rail Services	Liquefied petroleum gas	8	Transload
Bishop	MDDE	Bishop Transload	Agriculture, chemicals, paper and forest products, food, metals, minerals, construction, waste, dimensional	25	Transload
Federalsburg	MDDE	Federalsburg Transload	Agriculture, chemicals, paper and forest products, food, metals, minerals, construction, waste, dimensional	5	Transload
Maugansville	NS	Clever Transfer LLC	Not Reported	4	Transload
Baltimore	NS	Ns Thoroughbred Bulk Transfer Terminal	Dry bulk, liquid bulk	20	Transload

CITY	SERVING RAILROAD	FACILITY NAME	PRIMARY COMMODITIES HANDLED	CAPACITY	TYPE
Baltimore	NS	Pacorini Metals	Steel	4	Transload
St. James	NS	Utility Supply Company	Not Reported	10	Transload
Baltimore	CTN	Boston Street Terminal	Alcohol, cornstarch, de-icer, glycerin, limestone, oil, roofing shingles, soybean/grain products, vinegar	30	Transload

Source: Rail Carrier websites, rail carrier responses to Rail Plan survey.

Appendix D. Passenger Rail Stations

Table D-1. Passenger Rail Stations in Maryland

STATION	OWNER	ADDRESS	SHELTER	ROUTES	2019 WEEKDAY FREQUENCY	LOCAL TRANSIT CONNECTIONS	PARKING	SHARED USES
Aberdeen	Amtrak (Parking owned by MDOT, MTA, City)	18 East Bel Air Ave. Aberdeen, MD	Station building (with waiting room)	MARC Penn Line, Amtrak Northeast Regional	10 Amtrak, 13 MARC	Harford County Transit	Same day, overnight	None
Barnesville	MARC	8 Beallsville Rd. Barnesville, MD	Station building (with waiting room)	MARC Brunswick Line	15	None	46	None
Bowie State	MARC	13900 Jericho Park Rd. Bowie, MD	Platform shelters	MARC Penn Line	46	WMATA	675	None
Boyds	MARC	15031 Clopper Rd. Boyds, MD	Platform shelter	MARC Brunswick Line	10		15	None
Brunswick	MARC	100 S. Maple Ave. Brunswick, MD	Station building (with waiting room)	MARC Brunswick Line	13	Frederick County TransIT	740	None
BWI Marshall	Amtrak	2 Amtrak Way Linthicum, MD	Station building (with waiting room)	MARC Penn Line	57 Amtrak, 50 MARC	MTA, BWI Marshall Airport Shuttle, Bay Runner Shuttle	3,200	None
Camden	MARC	301 West Camden St. Baltimore, MD	Station building (with waiting room)	MARC Camden Line	19	MTA	1,004	None
College Park	MARC	7202 Bowdoin Ave. College Park, MD	Platform shelters	MARC Camden Line	20	WMATA, PG County the Bus, RTA	574	None
Cumberland	CSX	201 East Harrison St. Cumberland, MD	Station building (with waiting room)	Amtrak Capitol Limited	2	Allegany County Transit (ACT)	N/A	None
Dickerson	MARC	22211 Mt. Ephraim Rd. Dickerson, MD	Station building (with waiting room)	MARC Brunswick Line	10	None	15	None

STATION	OWNER	ADDRESS	SHELTER	ROUTES	2019 WEEKDAY FREQUENCY	LOCAL TRANSIT CONNECTIONS	PARKING	SHARED USES
Dorsey	MARC	7000 Deerpath Rd. @ MD 100 between US 1 & MD 295 Elkridge, MD	Station building (with waiting room)	MARC Camden Line	21	MTA, RTA	802	None
Edgewood	MARC	2127 Old Edgewood Rd. Edgewood, MD	Station building (with waiting room)	MARC Penn Line	13	Hartford County Transit	295	None
Frederick	MARC	100 S. East St, Frederick, MD	Station building (with waiting room)	MARC Brunswick Line	6	Frederick County TransIT	740	None
Gaithersburg	MARC	5 S. Summit Ave. Gaithersburg, MD	Station building (with waiting room)	MARC Brunswick Line	19	Montgomery County Ride-ON	280	None
Garrett Park	MARC	11015 Rokeby Ave. Garrett Park, MD	Platform shelter	MARC Brunswick Line	12	Montgomery County Ride-ON	22	None
Germantown	MARC	19311 Mateny Hill Rd. Germantown, MD	Station building (with waiting room)	MARC Brunswick Line	19	Montgomery County Ride-ON	657	None
Greenbelt	MARC	5600 Greenbelt Metro Dr. Greenbelt, MD	Platform shelters	MARC Camden Line	15	WMATA, PG County The Bus	3,364	None
Halethorpe	MARC	5833 Southwestern Blvd. Baltimore, MD	Station building (with waiting room)	MARC Penn Line	41	MTA	770	None
Jessup	MARC	8 Old Jessup Rd. Jessup, MD	Platform shelter	MARC Camden Line	2	None	75	None
Kensington	MARC	3701 Howard Ave. Kensington, MD	Station building (with waiting room)	MARC Brunswick Line	16	Montgomery County Ride-ON	45	None
Laurel	MARC	22 Main St. Laurel, MD	Station building (with waiting room)	MARC Camden Line	21	RTA	396	None
Laurel Racetrack	MARC	Laurel Racetrack Rd. between US 1 & MD 19819 Laurel, MD 19		MARC Camden Line	3	RTA	300	None

STATION	OWNER	ADDRESS	SHELTER	ROUTES	2019 WEEKDAY FREQUENCY	LOCAL TRANSIT CONNECTIONS	PARKING	SHARED USES
Martin State Airport	MARC	2710 Eastern Blvd. Middle River, MD	Platform shelters	MARC Penn Line	19	MTA	320	None
Metropolitan Grove	MARC	3 Metropolitan Ct. Metropolitan Grove, MD	Platform shelters	MARC Brunswick Line	19	Montgomery County Ride-ON	352	None
Monocacy	MARC	7800 Genstar Dr. Frederick, MD	Station building (with waiting room)	MARC Brunswick Line	6	MTA, Frederick County TransIT	870	None
Muirkirk	MARC	7012-B Muirkirk Rd., Beltsville, MD	Platform shelters	MARC Camden Line	21	RTA	650	None
New Carrollton	Amtrak	4300 Garden City Dr. @ New Carrollton Metro Station New Carrollton, MD	Station building (with waiting room)	MARC Penn Line	40 Amtrak, 52 MARC	WMATA, Annapolis Bus, UMD Bus	3,400	None
Odenton	MARC	1400 Odenton Rd. Odenton, MD	Station building (with waiting room)	MARC Penn Line	50	RTA	1,977	None
Baltimore Penn Station	Amtrak	1500 N. Charles St. Baltimore, MD	Station building (with waiting room)	MARC Penn Line	79 Amtrak, 58 MARC	MTA, Charm City Circulator, Baltimore Collegetown Shuttle	550	None
Perryville	MARC	650 Broad St. Perryville, MD	Station building (with waiting room)	MARC Penn Line	13	Cecil County Transit	135	None
Point of Rocks	MARC	4000 Clay St. Point of Rocks, MD	Platform shelters	MARC Brunswick Line	13	Frederick County TransIT	503	None
Riverdale	MARC	6200 Rhode Island Ave. Riverdale, MD	Platform shelters	MARC Camden Line	12	Prince Georges County The Bus	94	None
Rockville	MARC	307 S. Stonestreet Ave. Rockville, MD	Station building (with waiting room)	MARC Brunswick Line, Amtrak Capitol Limited	2 Amtrak, 19 MARC	WMATA, Montgomery County Ride-ON	532	None
Savage	MARC	9009 Dorsey Run Rd. Annapolis Junction, MD	Platform shelters	MARC Camden Line	21	RTA	914	None
Seabrook	MARC	6221 Seabrook Rd. Lanham, MD	Platform shelters	MARC Penn Line	16	WMATA	264	None

STATION	OWNER	ADDRESS	SHELTER	ROUTES	2019 WEEKDAY FREQUENCY	LOCAL TRANSIT CONNECTIONS	PARKING	SHARED USES
Silver Spring	MARC	1170 Bonifant St. Silver Spring, MD	Station building (with waiting room)	MARC Brunswick Line	40	MTA, WMTA, Montgomery County Ride-ON	716	None
St. Denis	MARC	1734 Arlington Ave. Baltimore, MD	Platform shelters	MARC Camden Line	6	None	15	None
Washington Grove	MARC	100 Railroad St. Washington Grove, MD	Platform shelter	MARC Brunswick Line	10	Montgomery County Ride-ON	15	None
West Baltimore	MARC	401 Smallwood St. Baltimore, MD	Platform shelters	MARC Penn Line	43	MTA, UMBC Shuttle	327	None

Source: MARC, Amtrak, Great American Stations

Appendix E. Proposed Projects

Table E-1. Proposed Projects

PROJECT TYPE	CATEGORY	COUNTY	SPONSOR	RAILROAD	PROJECT	MORE DETAILED DESCRIPTION (IF AVAILABLE)	COSTS IN $2020	BENEFIT	SOURCE
Freight projects on short line railroads	Rail capacity	Allegany	WMSR	WMSR	Cumberland Shop: City Junction Complex		$4,000,000	Diversifies RR into passenger rail car repair market, creates 15FT jobs, permits, permits transload pad development and shortline freight development, eliminates need out of state tracks	Maryland SRP Class III Railroad Survey
Freight projects on short line railroads	Transload	Allegany	WMSR	WMSR	Transload facilities		$500,000	Freight development opportunities for local businesses to transload goods, creates long-term MD jobs, diversifies railroad	Maryland SRP Class III Railroad Survey
Freight projects on short line railroads	Industrial access	City of Baltimore	CTN	CTN	Municipal Waste Facility		$6,000,000	Deliver Long-haul Waste removal for Baltimore City and County, MD	Maryland SRP Class III Railroad Survey
Freight projects on short line railroads	Industrial access	Wicomico, Somerset, Worcester	DCR	DCR	Several confidential industrial access projects		$3,500,000	Economic development, divert traffic from roadways	Maryland SRP Class III Railroad Survey

PROJECT TYPE	CATEGORY	COUNTY	SPONSOR	RAILROAD	PROJECT	MORE DETAILED DESCRIPTION (IF AVAILABLE)	COSTS IN $2020	BENEFIT	SOURCE
Freight projects on short line railroads	Rail capacity	Worcester	MDDE	MDDE	Snow Hill Line Upgrade to 286k		$8,000,000	Ensure long-term viability of rail corridor. Retain existing customers and attract new customers. Improve safety and efficiency. Economic development in an economically challenged part of the state.	Maryland SRP Class III Railroad Survey
Freight projects on short line railroads	Rail capacity	Kent	MDDE	MDDE	Chestertown Line Upgrade to 286k		Not Reported	Ensure long-term viability of rail corridor. Retain existing customers and attract new customers. Improve safety and efficiency. Economic development in an economically challenged part of the state.	Maryland SRP Class III Railroad Survey
Freight projects on short line railroads	Rail rehabilitation	Kent	MDDE	MDDE	Chestertown Line Track Safety Improvements		$8,500,000	Stabilize rail corridor and improve safety. Retain existing rail customers and create opportunity to attract new customers. Improve efficiency of rail system.	Maryland SRP Class III Railroad Survey

PROJECT TYPE	CATEGORY	COUNTY	SPONSOR	RAILROAD	PROJECT	MORE DETAILED DESCRIPTION (IF AVAILABLE)	COSTS IN $2020	BENEFIT	SOURCE
Freight projects on short line railroads	Rail rehabilitation	Queen Anne's	MDDE	MDDE	Centreville Line Track Safety Improvements		$16,500,000	Stabilize rail corridor and improve safety. Retain existing rail customers and create opportunity to attract new customers. Improve efficiency of rail system.	Maryland SRP Class III Railroad Survey
Freight projects on short line railroads	Transload	Worcester	MDDE	MDDE	Improvements to Bishop Transload Terminal		$200,000	Increase transload capacity. Create on-site storage for transload customers. Attract additional transload customers. Job creation (transload terminal operators). Reduce roadway congestion.	Maryland SRP Class III Railroad Survey
Freight projects on short line railroads	Transload	Caroline	MDDE	MDDE	Expansion of Federalsburg Transload Terminal (Annex)		$1,000,000	Increase transload capacity (current terminal nearing max capacity). Attract additional customers. Job creation (terminal operators). Reduce roadway congestion.	Maryland SRP Class III Railroad Survey
Freight projects on short line railroads	Rail rehabilitation	Carroll	MMID	MMID	WM Subdivision Rail		$580,000	Replacement of 10,000LF heavily worn rail between Union Bridge and Highfield	Maryland SRP Class III Railroad Survey

PROJECT TYPE	CATEGORY	COUNTY	SPONSOR	RAILROAD	PROJECT	MORE DETAILED DESCRIPTION (IF AVAILABLE)	COSTS IN $2020	BENEFIT	SOURCE
Freight projects on short line railroads	Rail rehabilitation	Washington	WW	WW	1000 Tie Renewal		Not reported	Not reported	Maryland SRP Class III Railroad Survey
Freight projects on short line railroads	Rail rehabilitation	Washington	WW	WW	Rail Switch		Not reported	Not reported	Maryland SRP Class III Railroad Survey
Freight projects on short line railroads	Crossing improvement	Frederick	WS	WS	Upgrading existing road crossings due to increased vehicle traffic		$300,000	Improved safety and vehicle flow	Maryland SRP Class III Railroad Survey
Freight projects on short line railroads	Industrial access	Frederick	WS	WS	Upgrade the line to Class II to serve a potential Industrial Park		$600,000	Restore rail freight service to Central Frederick County, reducing truck and highway traffic	Maryland SRP Class III Railroad Survey
Freight projects on short line railroads	Rail connection	Frederick	WS	WS	Acquisition and restoration of embargoed track		$100,000	Allow interchange service with the Maryland Midland, expand potential for car storage and repair	Maryland SRP Class III Railroad Survey
Freight projects on short line railroads	Rail rehabilitation	City of Baltimore	TPR	TPR	TPR Turn Out Replacement		$4,975,000	Curve negotiability radius	Maryland SRP Class III Railroad Survey

PROJECT TYPE	CATEGORY	COUNTY	SPONSOR	RAILROAD	PROJECT	MORE DETAILED DESCRIPTION (IF AVAILABLE)	COSTS IN $2020	BENEFIT	SOURCE
Projects to benefit commuter and intercity passenger rail on the Northeast Corridor	Rail capacity	City of Baltimore	Amtrak	Amtrak	Baltimore & Potomac (B&P) Tunnel Replacement	Replace 1,000 feet of track slap and block ties and renew track inside the tunnel to keep the tunnel in good working condition; build a new four-track tunnel system to replace the existing tunnel	$5,000,000,000	The new tunnel will eliminate a major choke-point on the Northeast Corridor, the expanded capacity allows Amtrak to meet the increasing demand of passenger trip	Amtrak FY 2019 Fact Sheet, state of Maryland
Projects to benefit commuter and intercity passenger rail on the Northeast Corridor	Rail capacity	Harford	Amtrak	Amtrak	Susquehanna River Rail Bridge	Replace the existing moveable bridge with two new high-level, fixed bridges with a total of four tracks, up from the current four; one of the new bridge levels would be built primarily to serve highspeed trains operating at speeds up to 160 mph	$1,700,000,000	The project will provide future improvements to capacity, trip time, and safety for commuter, freight, and intercity passenger rail services on the NEC consistent with State and Amtrak plans	Amtrak FY 2019 Fact Sheet, state of Maryland
Projects to benefit commuter and intercity passenger rail on the Northeast Corridor	Rail capacity	Harford	Northeast Corridor Commission	Amtrak	Gunpowder River Bridge Replacement	Replace one-mile river bridge connecting Chase and Joppa, MD.	$614,100,000	Expand capacity over what is available with this two track bridge.	NECC Critical Infrastructure Needs on the Northeast Corridor

PROJECT TYPE	CATEGORY	COUNTY	SPONSOR	RAILROAD	PROJECT	MORE DETAILED DESCRIPTION (IF AVAILABLE)	COSTS IN $2020	BENEFIT	SOURCE
Projects to benefit commuter and intercity passenger rail on the Northeast Corridor	Rail capacity	Harford	Northeast Corridor Commission	Amtrak	Bush River Bridge Replacement	Replace half mile bridge connecting Edgewood and Perryman, MD.	$446,600,000	Increase reliability, save operating and maintenance costs. The current bridge is costly to maintain and costly to open for boat traffic. It is also only two track, so a replacement will add capacity.	NECC Critical Infrastructure Needs on the Northeast Corridor
Projects to benefit commuter and intercity passenger rail on the Northeast Corridor	Passenger rail	City of Baltimore	Amtrak	Amtrak	Baltimore Penn Station Renovation and Platform Expansion	Renovate existing Penn Station, expand existing platform	$90,000,000	Improve passenger experience, increase capacity	Amtrak, FY 2019 Fact Sheet
Projects to benefit commuter and intercity passenger rail on the Northeast Corridor	Passenger rail	City of Baltimore	Amtrak	Amtrak	Baltimore Penn Station Developments	Amtrak is seeking a public-private partnership to redevelop/expand the station facility and Amtrak's adjacent land parcels	$500,000,000	To generate additional investment capital for station infrastructure needs and serve as an economic catalyst for the city	Amtrak FY 2019 Fact Sheet, state of Maryland
Projects to benefit commuter and intercity passenger rail on the Northeast Corridor	Passenger rail	Anne Arundel	Amtrak	Amtrak	BWI Marshall Airport Station	New building, new platform, and a fourth track between Grove and Winans	$600,000,000	Expand the capacity and operational flexibility of the Northeast Corridor	Amtrak FY2019 Fact Sheet, project environmental documents

PROJECT TYPE	CATEGORY	COUNTY	SPONSOR	RAILROAD	PROJECT	MORE DETAILED DESCRIPTION (IF AVAILABLE)	COSTS IN $2020	BENEFIT	SOURCE
Projects to benefit commuter and intercity passenger rail on the Northeast Corridor	Passenger rail	Prince George's	Amtrak	Amtrak, MARC	New Carrollton station	Track 1 platform work that enables MARC trains leaving Union Station to give way to through trains	$36,000,000	Amtrak's construction will provide benefits to both Amtrak and MARC Train service by facilitating the more-efficient movement of trains through the area	Amtrak FY2019 Fact Sheet, project website
Projects to benefit commuter and intercity passenger rail on the Northeast Corridor	Passenger rail	Prince George's, Howard, Baltimore City, Baltimore, Harford	Amtrak	Amtrak	Signal Capacity Improvements	Reducing the size of blocks along with some other work; rule 562 signals		Boost the capacity of the Northeast Corridor; allowing 110 mph operations with few lineside signals	Maryland SRP Call with Amtrak
Projects to benefit commuter rail on and off the Northeast Corridor	Passenger rail		MDOT MTA	MARC	Vehicle Overhaul	GP39H-2 locomotive mid-life overhaul by replacing key components	$17,000,000	Keep the locomotives operating reliably and extend their useful life	MARC Cornerstone Plan
Projects to benefit commuter rail on and off the Northeast Corridor	Passenger rail		MDOT MTA	MARC	Vehicle Overhaul	MP36PH-3C mid-life overhaul that overhauls or replaces all major systems and components	$65,000,000	Ensure the locomotives' continued reliability	MARC Cornerstone Plan

PROJECT TYPE	CATEGORY	COUNTY	SPONSOR	RAILROAD	PROJECT	MORE DETAILED DESCRIPTION (IF AVAILABLE)	COSTS IN $2020	BENEFIT	SOURCE
Projects to benefit commuter rail on and off the Northeast Corridor	Passenger rail		MDOT MTA	MARC	Vehicle Overhaul	MARC IV railcar overhaul that includes the replacement of major component parts, electrical systems, seats, and other elements	$60,000,000	Ensure a safe and pleasant ride for passengers	MARC Cornerstone Plan
Projects to benefit commuter rail on and off the Northeast Corridor	Passenger rail		MDOT MTA	MARC	Fleet Replacement	New railcar procurement expected to begin in 2035 to replace MARC II and MARC III railcars	$920,000,000	Allow MDOT MTA to standardize MARC's railcar fleet, reduce the need for specialized equipment, parts, and training. Also provides an opportunity to explore the inclusion of additional features for passengers including bike racks, electrical and USB outlets, and any other modern features available.	MARC Cornerstone Plan
Projects to benefit commuter rail on and off the Northeast Corridor	Passenger rail		MDOT MTA	MARC	Fleet Replacement	Replace the existing locomotives as they reach their useful life	$580,000,000	Allow MDOT MTA to standardize MARC's locomotive fleet, reduce the need for specialized equipment, parts, and training	MARC Cornerstone Plan

PROJECT TYPE	CATEGORY	COUNTY	SPONSOR	RAILROAD	PROJECT	MORE DETAILED DESCRIPTION (IF AVAILABLE)	COSTS IN $2020	BENEFIT	SOURCE
Projects to benefit commuter rail on and off the Northeast Corridor	Passenger rail		MDOT MTA	MARC	Non-Revenue Vehicle Investments	Continued investment on non-revenue vehicles such as automobiles, trucks, and other special vehicles found in stations and/or yard facilities	$5,000,000	Maintain a state of good repair and maintain the efficient operation of MARC service	MARC Cornerstone Plan
Projects to benefit commuter rail on and off the Northeast Corridor	Passenger rail		MDOT MTA	MARC	Improve Station Access	MDOT MTA will seek opportunities to install bike racks at stations, and providing or improving sidewalks, crosswalks and other access infrastructure that would better accommodate people accessing the stations by biking or on foot. MDOT MTA will continue to monitor for opportunities to expand parking at the appropriate stations where feasible.	$104,000,000	Improve access to MARC Train stations by foot, bike, local transit or rail, and car	MARC Cornerstone Plan

PROJECT TYPE	CATEGORY	COUNTY	SPONSOR	RAILROAD	PROJECT	MORE DETAILED DESCRIPTION (IF AVAILABLE)	COSTS IN $2020	BENEFIT	SOURCE
Projects to benefit commuter rail off the Northeast Corridor	Passenger rail	Prince George's, Howard, Baltimore City, Anne Arundel	MDOT MTA	MARC	Camden Line Station Renovations	MDOT MTA will continue to make improvements with the lifecycle of each of the 11 stations on Camden Line by replacing amenities and elements of the stations. MDOT MTA also will include enhancements with improved technology and features available, include upgraded security, communication systems, wayfinding, and other improvements as appropriate	$80,000,000		MARC Cornerstone Plan

PROJECT TYPE	CATEGORY	COUNTY	SPONSOR	RAILROAD	PROJECT	MORE DETAILED DESCRIPTION (IF AVAILABLE)	COSTS IN $2020	BENEFIT	SOURCE
Projects to benefit commuter rail on the Northeast Corridor	Passenger rail	Prince George's, Howard, Baltimore City, Baltimore, Harford	MDOT MTA	MARC	Penn Line Station Renovations	MDOT MTA will continue to make improvements with the lifecycle of each of the 12 stations on Penn Line by replacing amenities and elements of the stations. MDOT MTA also will include enhancements with improved technology and features available, include upgraded security, communication systems, wayfinding, and other improvements as appropriate	$90,000,000		MARC Cornerstone Plan
Projects to benefit commuter rail on the Northeast Corridor	Passenger rail	City of Baltimore	MDOT MTA	MARC	West Baltimore Station	Capital improvement to provide ADA accessible platforms. Relocate existing West Baltimore MARC Station farther south. This will be consistent with construction of new B&P Tunnel.	$58,000,000		MARC Cornerstone Plan

PROJECT TYPE	CATEGORY	COUNTY	SPONSOR	RAILROAD	PROJECT	MORE DETAILED DESCRIPTION (IF AVAILABLE)	COSTS IN $2020	BENEFIT	SOURCE
Projects to benefit commuter rail off the Northeast Corridor	Passenger rail	Prince George's, Howard, Baltimore City, Montgomery, Frederick, W. Virginia	MDOT MTA	MARC	Eliminate At-Grade Pedestrian Crossings	Required by CSX, at-grade pedestrian crossings will be eliminated as part of any significant station improvements on the Brunswick and Camden lines	$370,000,000		MARC Cornerstone Plan
Projects to benefit commuter rail off the Northeast Corridor	Passenger rail	Montgomery, Frederick, W. Virginia	MDOT MTA	MARC	Brunswick Line Station Renovations	MDOT MTA will continue to make improvements with the lifecycle of each of the 18 stations on Brunswick Line by replacing amenities and elements of the stations. MDOT MTA also will include enhancements with improved technology and features available, include upgraded security, communication systems, wayfinding, and other improvements as appropriate	$22,000,000		MARC Cornerstone Plan

PROJECT TYPE	CATEGORY	COUNTY	SPONSOR	RAILROAD	PROJECT	MORE DETAILED DESCRIPTION (IF AVAILABLE)	COSTS IN $2020	BENEFIT	SOURCE
Projects to benefit commuter rail on the Northeast Corridor	Passenger rail	City of Baltimore	MDOT MTA	MARC	Penn Station Transit Oriented Development	MDOT MTA will coordinate closely with Amtrak to ensure that development is coordinated with MARC Train service needs and goals, one such need involves the impacts to MARC Train storage and maintenance that currently occurs at the station.	Cost Neutral	Support economic development, promote transit ridership, and maximize the efficient use of transportation infrastructure	MARC Cornerstone Plan
Projects to benefit commuter rail off the Northeast Corridor	Passenger rail	Prince George's	MDOT MTA	MARC	Laurel Transit Oriented Development	The MDOT parking lot and adjacent land have been proposed for redevelopment in the past and MDOT MTA will coordinate with stakeholders to support redevelopment of this property to enhance access between the station and the community	Cost Neutral	Support economic development, promote transit ridership, and maximize the efficient use of transportation infrastructure	MARC Cornerstone Plan

PROJECT TYPE	CATEGORY	COUNTY	SPONSOR	RAILROAD	PROJECT	MORE DETAILED DESCRIPTION (IF AVAILABLE)	COSTS IN $2020	BENEFIT	SOURCE
Projects to benefit commuter rail off the Northeast Corridor	Passenger rail	Howard	MDOT MTA	MARC	Dorsey Transit Oriented Development	MDOT MTA has been evaluating the site to determine requirements for supporting existing and anticipated MARC service while accommodating mixed-use development	Cost Neutral	Support economic development, promote transit ridership, and maximize the efficient use of transportation infrastructure	MARC Cornerstone Plan
Projects to benefit commuter rail off the Northeast Corridor	Passenger rail	Frederick	MDOT MTA	MARC	Monocacy Transit Oriented Development	MDOT MTA will work with stakeholders to support development that preserves and supports MARC operations	Cost Neutral	Support economic development, promote transit ridership, and maximize the efficient use of transportation infrastructure	MARC Cornerstone Plan
Projects to benefit commuter rail off the Northeast Corridor	Passenger rail	Montgomery	MDOT MTA	MARC	Germantown Transit Oriented Development	MDOT MTA has begun evaluating the site to determine how development on the surface lots can be accommodated while also supporting convenient station access for MARC passengers and meet the demands of passengers accessing the station by car	Cost Neutral	Support economic development, promote transit ridership, and maximize the efficient use of transportation infrastructure	MARC Cornerstone Plan

PROJECT TYPE	CATEGORY	COUNTY	SPONSOR	RAILROAD	PROJECT	MORE DETAILED DESCRIPTION (IF AVAILABLE)	COSTS IN $2020	BENEFIT	SOURCE
Projects to benefit commuter rail on the Northeast Corridor	Passenger rail	Prince George's, Howard, Baltimore City, Baltimore, Harford	MDOT MTA	MARC	Passenger Rail Investment and Improvement Act (PRIIA) – Penn Line	A cost-sharing arrangement for NEC infrastructure that seek to advance the development of improvements along the MARC Penn Line	$600,000,000		MARC Cornerstone Plan
Projects to benefit commuter rail off the Northeast Corridor	Passenger rail	Montgomery, Frederick, W. Virginia, Prince George's, Howard, Baltimore City, Anne Arundel	MDOT MTA	MARC	CSX Joint Benefits – Brunswick and Camden lines	As part of the operating agreement with CSX, MDOT MTA provides funding to CSX to support the necessary improvements to maintain CSX-owned railway for the Brunswick and Camden Lines, this includes the upgrading of signal systems, switches, grade crossings and other infrastructure shared by both railroads	$135,000,000		MARC Cornerstone Plan

PROJECT TYPE	CATEGORY	COUNTY	SPONSOR	RAILROAD	PROJECT	MORE DETAILED DESCRIPTION (IF AVAILABLE)	COSTS IN $2020	BENEFIT	SOURCE
Safety and crossing projects	Passenger rail	Frederick	MDOT MTA	MARC	Frederick Branch Guideway Improvement	MDOT MTA will be making improvements to grade crossings to improve safety, replacing switch machines, and replacing rail ties	$10,000,000		MARC Cornerstone Plan
Projects to benefit commuter rail on and off the Northeast Corridor	Passenger rail	City of Baltimore	MDOT MTA	MARC	Penn-Camden Connector	The Penn-Camden Connector is a new rail link between Penn Line and Camden Line	$295,000,000	The new link will enable efficiencies through the consolidation of vehicle maintenance and repair for both the Penn and Camden lines, leverage the capital investment in the Riverside Heavy Maintenance Building, and facilitate access to a new storage and maintenance facility for Penn Line MARC trains	MARC Cornerstone Plan

PROJECT TYPE	CATEGORY	COUNTY	SPONSOR	RAILROAD	PROJECT	MORE DETAILED DESCRIPTION (IF AVAILABLE)	COSTS IN $2020	BENEFIT	SOURCE
Projects to benefit commuter rail on and off the Northeast Corridor	Passenger rail	City of Baltimore	MDOT MTA	MARC	Riverside Yard Acquisition and Heavy Maintenance Building	MDOT MTA is in the process of acquiring the Riverside Maintenance facility from CSX. This facility currently provides heavy maintenance to MARC locomotives and serves as an overnight storage facility for Camden Line trains	$80,000,000	MDOT MTA will be able to construct the appropriate facilities needed to adequately maintain and inspect its locomotives	MARC Cornerstone Plan
Projects to benefit commuter rail on the Northeast Corridor	Passenger rail	City of Baltimore	MDOT MTA	MARC	Martin's Yard Expansion	MDOT MTA is working to expand the storage capacity at Martin's Yard to accommodate two additional train sets	$17,000,000	When complete, the facility will be able to accommodate up to four seven-car train sets	MARC Cornerstone Plan
Projects to benefit commuter rail on the Northeast Corridor	Passenger rail	TBD	MDOT MTA	MARC	Replacement Penn Line Storage Yard	In response to Amtrak's future plans for the redevelopment of the Station, MDOT MTA has actively been exploring alternative locations to store trains for Penn Line service	$40,000,000		MARC Cornerstone Plan

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Projects to benefit commuter rail off the Northeast Corridor	Passenger rail	Frederick	MDOT MTA	MARC	Brunswick Yard Maintenance Facility	MDOT MTA to acquire CSX Brunswick Yard	$40,000,000	The acquisition of Brunswick Yard would enable MDOT MTA to make the necessary improvements to perform heavy maintenance on rail vehicles	MARC Cornerstone Plan
Projects to benefit commuter rail off the Northeast Corridor	Passenger rail	Montgomery, Frederick	MDOT MTA	MARC	Brunswick Line Service Improvement	Gradually increase service on the Brunswick Line, the service increase will depend on CSX agreement. Improvements required for increasing service would require partnerships with multiple stakeholders including CSX	$1,340,000,000	Help to support the growing I-270 corridor	MARC Cornerstone Plan
Projects to benefit commuter rail off the Northeast Corridor	Passenger rail	Prince Georges, Howard, Baltimore City, Anne Arundel	MDOT MTA	MARC	Camden Line Service Improvement	Increase service on the Camden Line. Improvements required for increasing service would require partnerships with multiple stakeholders including CSX	$660,000,000		MARC Cornerstone Plan

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Projects to benefit commuter rail on the Northeast Corridor	Passenger rail	Harford, Baltimore, Baltimore City, Howard, Prince Georges	MDOT MTA	MARC	Penn Line Service Improvement	Increase service on the Penn Line. Improvements required for increasing service would require partnerships with multiple stakeholders including Amtrak	$5,700,000,000		MARC Cornerstone Plan
Passenger Rail Expansion	Passenger rail	Frederick, Montgomery	MDOT MTA		I-270 Monorail	Monorail within the I-270 corridor from the City of Frederick in Frederick County to the Shady Grove Metro Station in Montgomery County	$3,726,000,000	Allow passengers to reliably make the 28-mile trip in 42 to 46 minutes, especially for those who want to avoid driving, reduce traffic on I-270	MDOT MTA
Projects to benefit commuter rail on the Northeast Corridor	Passenger rail	Cecil	MDOT MTA	MARC	MARC Service	Fill Northeast Corridor commuter rail gap by providing commuter rail service between Perryville, MD and Newark, DE.	$78,000,000	Provide additional service to Harford County, including reverse commute, late evening service, and weekend service	WILMAPCO
Projects to benefit commuter rail off the Northeast Corridor	Passenger Rail	Washington, DC; Arlington, Alexandria City, Fairfax counties, VA	MDOT MTA	MARC	Run through service to Northern Virginia	Facilitate connectivity between Maryland and Northern Virginia by extending MARC into Northern Virginia	TBD	Increase connectivity between residential and employment centers	MDOT MTA, Greater Washington Partnership

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Projects to benefit commuter rail on and off the Northeast Corridor	Passenger Rail	Various	Greater Washington Partnership	MARC	Fare Integration and Other Operational Integration	Integrate MARC ticketing with other regional ticketing	TBD	Customer convenience, efficiencies across organizations	Greater Washington Partnership
Projects to benefit commuter rail on the Northeast Corridor	Passenger rail	Harford	MDOT MTA	MARC	Aberdeen MARC Station	Transit Oriented Development (TOD); new train station, additional parking, US 40 "Green Boulevard," and Station Square Plaza - new pedestrian underpass and green, terraced plaza/amphitheater	$70,000,000		Maximize 2045
Projects to benefit commuter rail on the Northeast Corridor	Passenger rail	City of Baltimore	MDOT MTA	MARC	Bayview MARC and Intermodal	New station to support local economic development efforts and connect to a major employment center at Johns Hopkins Bayview Medical Center.	$73,000,000		Baltimore Regional Transit Needs Assessment

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Projects to benefit commuter rail on the Northeast Corridor	Passenger rail	Cecil	TBD	MARC	North East Transit Hub/ Train Station	The North East TOD Plan that was developed by WILMAPCO in partnership with the Town of North East, Cecil County, Maryland Department of Planning and the Maryland Department of Transportation with guidance from the North East TOD Advisory Committee. The plan identifies a potential location for a future train station/transit hub, as well as future land use and transportation to promote future reintroduction of rail service to North East		Implementation of the plan promotes greater use of existing and planned bus transit, enhance community character, improves regional access and local walking, bicycling and transit, support local and state smart growth and economic development, and embraces the community history while preparing for the future	WILMAPCO 2050 Regional Transportation Plan

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Projects to benefit commuter rail on the Northeast Corridor	Passenger rail	Cecil	TBD	MARC	Perryville Train Station Parking Improvements	The development of a transit-oriented center has been established in the Town's 2009 Comprehensive Plan, along with the goal of developing a transit-oriented/mixed-use development, across from the Town Hall on an existing mobile-home park. This proposed mixed use area would connect to the existing Perryville MARC station via a pedestrian walkway extension and bridge over the Baltimore and Ohio Railroad right of way. Parking solutions identified include a parking garage on the south side of Broad Street and vacant lots adjacent to the train station.		Identify strategies to enhance community character in Perryville, promote opportunities for transit supportive redevelopment within the town center and train station areas, promote local and regional accessibility, connectivity, and mobility, particularly by walking, bicycling and transit, support Maryland Smart Growth policies, and support improvements regional ambient air quality through the reduction of vehicle travel and traffic congestion in downtown Perryville	WILMAPCO 2050 Regional Transportation Plan

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Passenger Rail Expansion	Passenger rail	City of Baltimore	FRA, BWRR	BWRR	Baltimore-Washington SCMAGLEV	Baltimore-Washington Rapid Rail (BWRR), a private company based in Maryland, is proposing to construct an SCMAGLEV train system between Baltimore, Maryland and Washington, DC with an intermediate stop at BWI Marshal Airport. An Environmental Impact Statement (EIS) is being prepared to evaluate the potential impacts of the construction and operation of such a system. This phase of the project is being funded by a grant from the Federal Railroad Administration with matching funds provided by BWRR.	$10,000,000,000	Construction of the SCMaglev project will create 161,000 job years in the Washington--Baltimore-Arlington CSA over seven years -- including 123,000 construction job years and 38,000 professional services job years	Northeast Maglev Website

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Freight projects on Class I railroads	Rail capacity	Washington	NS	NS	Hagerstown Bypass Track Project	This project would include the addition of a bypass track around Vardo Yard	$13,000,000	The project would create increased fluidity in both switching operations and meeting through trains, allowing through trains to bypass the mainline, alleviate the current bottle next of traffic surrounding Hagerstown	Information Request to NS for the 2020 Maryland State Rail Plan
Project to benefit freight and passenger rail on the Northeast Corridor	Rail capacity		NS	NS	NEC Double-Stack Clearance, freight separation	Resolving clearance constraints on the Northeast Corridor, or establishing another double-stack-cleared route	TBD	Allow Norfolk Southern to provide competitive and efficient double-stack service to the Baltimore Metropolitan Area	Information Request to NS for the 2020 Maryland State Rail Plan
Freight projects on Class I railroads	Rail capacity	Harford	CSX	CSX	1.5 Mile bridge over Susquehanna		$85,800,000	Replace old bridge that serves the Port of Baltimore on our I-95 corridor.	Information Request to CSX for the 2020 Maryland State Rail Plan
Freight projects on Class I railroads	Rail capacity	Montgomery, Frederick, Howard	CSX	CSX	Double-stack clearance on Old Main Sub		TBD	Increase capacity	Information Request to CSX for the 2020 Maryland State Rail Plan

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Freight projects on Class I railroads	Rail capacity	Allegany	CSX	CSX	Bypass from Cumberland to Mountain Sub		TBD	Avoid bottleneck	Information Request to CSX for the 2020 Maryland State Rail Plan
Freight projects on Class I railroads	Rail capacity	Cecil	CSX	CSX	Add 2.2 miles double track MD state line to East Singerly, upgrade three sidings		$9,700,000	Increase capacity	Information Request to CSX for the 2020 Maryland State Rail Plan
Freight projects on Class I railroads	Rail capacity	Harford	CSX	CSX	Add 13.6 miles second main and upgrade Van Bibber Siding (BAK 70-BAK 72.1). Segment includes CSX Susquehanna River Bridge (MP 56.8 – 58.1, 1.3 miles)		$53,700,000	Increase capacity	Information Request to CSX for the 2020 Maryland State Rail Plan
Freight projects on Class I railroads	Rail capacity	Harford, Baltimore County, Baltimore City	CSX	CSX	Second track, 39.3 miles from Wilmington to Baltimore		$20,400,000	Increase capacity	Information Request to CSX for the 2020 Maryland State Rail Plan

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Freight projects on Class I railroads	Rail capacity	Frederick	CSX	CSX	Build second main from Doubs to Frederick Junction on CSX Old Main Line Sub		$42,900,000 - $48,300,000	Increase capacity	Information Request to CSX for the 2020 Maryland State Rail Plan
Freight projects on Class I railroads	Rail capacity	Frederick	CSX	CSX	CSX Brunswick Yard – add longer tracks to stage unit trains to/from Baltimore		TBD	Increase capacity	Information Request to CSX for the 2020 Maryland State Rail Plan
Freight projects on Class I railroads	Rail capacity	TBD	CSX	CSX	CSX Hanover Sub – replace ties and rail to allow increased speed and capacity		TBD	Increase capacity	Information Request to CSX for the 2020 Maryland State Rail Plan
Freight projects on Class I railroads	Rail capacity	City of Baltimore	CSX	CSX	Add connection track from Consol facility to the CSX Hanover Sub			Avoid conflict with other railroads	Information Request to CSX for the 2020 Maryland State Rail Plan
Freight projects on Class I railroads	Rail capacity	Anne Arundel	CSX	CSX	Jessup – Extend CSX freight leads east to Dorsey		$16,100,000	Increase capacity, avoid conflict with MARC service	Information Request to CSX for the 2020 Maryland State Rail Plan

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Freight projects on Class I railroads	Rail capacity	City of Baltimore	CSX	CSX	North Maryland second main: Add one-mile second main track on CSX Sparrows Point Branch		$4,300,000	Increase capacity	Information Request to CSX for the 2020 Maryland State Rail Plan
Safety and crossing projects	Rail crossing	Washington	TBD	CSX	Weverton Rail Crossing Feasibility Study	A feasibility study seeks to identify environmental concerns and assess potential design options to provide a formal and safe crossing of the CSX railroad. Two alternatives are studied and compared in the study -- bridge crossing and at-grade crossing	At-grade: $475,000, bridge: $3,470,000	Improve safety of the rail crossing	Hagerstown/Eastern Panhandle Metropolitan Planning Organization (HEPMPO)
Project to benefit freight and passenger rail on the Northeast Corridor	Rail capacity	Harford	CSX	CSX	Aberdeen: CSXT track connection to NEC for freight		$75,100,000		2015 Maryland SRP
Freight projects on Class I railroads	Rail capacity	City of Baltimore	CSX	CSX	CSX Bay View Yard runaround track		$10,700,000		2015 Maryland SRP

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Passenger Rail Expansion	Passenger rail	TBD	DelDOT	TBD (Delmarva Central host)	Passenger Rail into the Delmarva Peninsula		$616,000,000	Provide passenger transportation options on the Delmarva Peninsula, reduce congestion	DelDOT
Passenger Rail Expansion	Passenger rail	St. Mary's, Prince Georges, Charles	Charles County	CSX	MARC service in southern Maryland	Provide commuter rail service on a corridor through Prince George's, Charles, and St. Mary's Counties	$1,722,000,000	Provide transportation choices to residents of southern Maryland	Southern Maryland Commuter Rail Service Feasibility Study