Chapter 3
Overview of the Virginia Rail System

The year 2007 marked the 400th anniversary of Virginia and freight and passenger movement remains a critical part of the Commonwealth’s economy today. Factors that impact the state’s rail system are:

- Fourteen different railroads coordinate passenger and freight service over 3,200 miles of private track, most of which is operated by the state’s two Class I railroads – Norfolk Southern and CSX.
- Much of the rail system is single track, creating natural bottlenecks in high traffic areas.
- The largest commodity (by tonnage) carried by rail is coal (59 percent). The increased global appetite for coal that is shipped from Virginia ports is placing greater demand on Virginia’s east-west rail corridors.
- Shortlines often provide the critical first or last link in the business-to-business delivery of goods or materials by providing the intensive switching operations that are not profitable for the Class I railroads. Years of deferred maintenance and the trend toward the use of newer and heavier 286,000 pound railcars have created a need to invest in shortline infrastructure.
- Both Amtrak and VRE use Norfolk Southern and CSX owned tracks. Given the increases in freight demand and the desire to expand passenger rail, Amtrak, VRE and the railroads will need to collaborate to share costs and benefits of improvements.
- VRE is already at capacity and ridership is expected to double in the next 20 years.

These factors have been considered in the development of the Statewide Rail Plan. They are described in more detail in this chapter.

Virginia’s rail system dates from the 1800’s and has been evolving continuously since then. Today, it consists of more than 3,200 miles of private track (excluding trackage rights), most of which are operated by two Class I railroads – the Norfolk Southern Corporation (2,020 miles) and CSX (850 miles). Major rail lines run north-south and east-west and converge at key nodes: Norfolk, Richmond, Lynchburg, Roanoke and Alexandria. Figure 3-1 is the State Rail Map with the various freight and passenger lines noted.

Twelve freight railroads (shown in Figure 3-2) and two passenger railroads operate the Commonwealth’s rail system. Two are Class I national railroads (defined as line-haul freight railroads exceeding $319.3 million in annual operating revenue). The remaining 10 freight railroads are Class III (shortline) railroads (defined as line-haul carriers with annual revenues less than $25 million). Two of these are primarily switching railroads serving marine terminals and industrial facilities. There are no Class II Railroads in Virginia. Two passenger systems – Amtrak and VRE – utilize this private track freight railroad system.
Figure 3-1
EXISTING STATE RAIL MAP (2007)
Much of the rail system is single track. Single track railroads are natural bottlenecks, operating like a one-lane highway that must accommodate two-way traffic. Just as cars would need to stop and take turns proceeding on a stretch of single-lane road, trains must stop to allow other trains to pass. This type of operation requires careful dispatching procedures for safety reasons and can cause significant capacity constraints and on-time performance delays.

**Virginia Rail Tonnage**
The Virginia Statewide Multimodal Freight Study, Phase I, utilized a national freight database known as TRANSEARCH, which included a set of rail network flow maps, based on model assignments and freight data from 2004. Review of TRANSEARCH rail flow reveals that:

- For existing Virginia-based tonnage (moving inbound, outbound or within the Commonwealth), the highest volume flows are east-west and focused on the Ports of Hampton Roads. Coal represents a large share of current rail tonnage in this corridor, as well as intermodal movements on the Heartland Corridor. The north-south movement of Virginia rail traffic is a lesser share of rail business. (Figure 3-3).

- Rail tonnage that has both an origin and a destination outside of Virginia and passes through Virginia mirrors that of trucking. As shown in Figure 3-4, pass-through traffic is primarily utilizing the north-south network. North-south rail movements should increase significantly as major rail checkpoints on the I-95 (CSX National Gateway) and I-81 (Norfolk Southern Crescent Corridor) are removed and system improvements are completed in Virginia and adjacent states.

According to the most recent data from the Association of American Railroads (2005), there were a total of 2,426,523 carloads of freight carried in Virginia with a total tonnage of 178,423,334 tons. The largest commodity carried by tonnage was coal (59 percent). According to the most recent data available from the USDOT (2004), Virginia’s multimodal transportation system handled around 915 million tons of freight worth more than $2.1 trillion. This includes freight carried by trucking, rail, air, domestic water and international water. It also includes freight moving inbound to, outbound from, within and through the Commonwealth. On the basis of tonnage, trucking handled approximately 74 percent, followed by rail at 20 percent (183 million tons), water at 14 percent and air at less than one percent. On the basis of value, trucking handled approximately 94 percent, rail handled approximately four percent and air and water handled approximately two percent.

**Rail Types and Services**
Virginia’s rail freight traffic is generally one of three types (Figure 3-5):

- **Unit Trains** (long trains of 7,500 to 10,000 feet consisting of a single commodity, often coal). Coal trains move east-west, between the coalfields of Appalachia and Hampton Roads or between the coalfields and Tennessee/North Carolina. About half of the coal moving over Virginia’s rail system is through traffic, traveling to a non-Virginia destination.

- **General Merchandise Trains** (carload trains of varying lengths, consisting of different car types, such as tank cars, hopper cars, flatcars or traditional boxcars). Carloads carry varied commodities (agricultural products, chemicals,
Overview of the Virginia Rail System

Virginia Department of Rail and Public Transportation

The movement of general merchandise and intermodal trains has been significantly improved as a result of double-stack technology. In 1984, container trains began using specially engineered rail cars that could carry two tiers of containers instead of one, significantly reducing the locomotive power, track capacity and train crews required to move trains. The implementation of this technology is largely dependent on the railroad being able to sufficiently raise the height of tunnels, bridges and other structures to allow double-stack trains to operate. The Heartland Corridor Initiative between Norfolk...
Southern, the federal government and the states of Ohio, West Virginia and Virginia represented a major initiative to support freight rail movement through improvements to support double stack operations. The Heartland Corridor project doubles freight capacity along Route 460 through Virginia and significantly improves freight shipping time between the Ports of Hampton Roads and markets in the Midwest.

**Class I Railroads (Norfolk Southern and CSX)**

The two main Class I railroads operating in Virginia are Norfolk Southern and CSX Transportation. Norfolk Southern’s corporate headquarters is located in Norfolk. Figure 3-6 depicts the Norfolk Southern and CSX freight lines in Virginia. Interconnectivity of the overall system is shown in Figure 3-7, with system maps for Norfolk Southern and CSX shown in Figures 3-8 and 3-9 respectively. The vast majority of Virginia’s freight rail track infrastructure is in the possession of the two Class I railroads, Norfolk Southern (approximately 60 percent) and CSX (approximately 30 percent), with the remaining 10 percent being carried by the shortline railroads.

Virginia’s freight rail network is comprised of tracks, bridges, sidings and terminals. Both freight railroads offer major east-west connections between...
Spartanburg, SC (the Piedmont line). The second mainline segment parallels I-81 between Front Royal and Bristol, VA (the Shenandoah line) and serves the Commonwealth’s Virginia Inland Port (VIP) near Front Royal. The principal train types on the Crescent Corridor are intermodal, general merchandise and auto trains.

**The Heartland Corridor.** This heavily used line runs from the Ports of Hampton Roads to the West Virginia border in Southwest Virginia and then to Midwest markets in Ohio, Illinois and other states. The Heartland Corridor is Norfolk Southern’s primary intermodal train system connecting the Ports of Hampton Roads to national markets and is currently being improved in order to handle heavier double-stack intermodal trains.

**The Coal Corridor.** This is the line with the heaviest use, carrying unit trains of coal from the Appalachian coalfields to the Norfolk Southern Coal Marine Terminal at Lamberts Point in Norfolk. The Coal Corridor is a dual line section consisting of the former Virginia Line and the Norfolk and Western Line from the coalfields to Abilene, VA, where both lines merge to continue eastward to Norfolk.

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**CSX Transportation**

According to the Company’s profile, CSX Corporation, based in Jacksonville, FL, owns companies providing rail, intermodal and rail-to-truck transload services that are among the nation’s leading transportation companies, connecting more than 70 river, ocean and lake ports, as well as more than 200 shortline railroads. Its principal operating company, CSX Transportation Inc., operates one of the largest railroads in the eastern U.S. with a 21,000-mile rail network linking commercial markets in 23 states, Washington, DC and two Canadian provinces. In 2007, the principal operating revenue sources were: merchandise containers/trailers (58 percent); coal, coke and iron ore (30 percent); automotive (10 percent); and other miscellaneous freight (two percent).

CSX’s routes are:

**The National Gateway Corridor.** This north-south mainline runs from Alexandria to Richmond, then continues further south via Petersburg and Emporia, generally paralleling I-95. At Weldon, NC just below the Virginia-North Carolina border, the mainline has an eastward extension to the Ports of Hampton Roads. The National Gateway Corridor is CSX’s primary intermodal train system connecting the Ports of Hampton Roads to national markets and is currently being improved to handle double-stack intermodal trains.

**The Coal Corridor.** One of the most heavily used CSX lines carries unit trains of coal from the Appalachian coalfields through Richmond and down the Peninsula to CSX’s Coal Marine Terminal in Newport News.
Figure 3-7
NATIONAL RAIL NETWORK

Source: Cambridge Systematics
Class III Shortline Railroads

Shortline railroads (defined as line-haul carriers with annual revenues less than $25 million) have become a critical component of the rail industry, providing benefits to shippers and local communities trying to support economic development to industries. Shortlines act as the originating and terminating railroads for approximately one-third of all rail shipments, often providing the first or last link in business-to-business delivery by providing the intensive switching operations that are not profitable for the Class I railroads. Shortline tracks must handle 286,000 pound capacity railcars and container shipments in order to interface effectively with the Class I railroads.

In Virginia, the shortlines consist of 10 railroads (plus rail operations to the Port of Richmond) with approximately 489 route miles. Figure 3-10 shows the locations of the shortline system in the Commonwealth and Figure 3-11 provides a list of the number of carloads carried in 2007 by the shortline operators.

Many of the shortlines were built over 100 years ago using lighter weight rails and less ballast (gravel bed) and in many cases have experienced track and, consequently, operational problems due to postponement of regular maintenance (e.g., deferred maintenance). Many of the lines were previously owned by some of the major Class I railroads which divested them as a result of low traffic volumes or declining revenues. Maintenance of a railroad is a costly, continual operation and the smaller Class III shortline railroads are constrained by the financial challenges of balancing the cost of operations and track maintenance.
Over the past decade, the industry has generally moved from railcars with a weight and capacity equaling 256,000 pound cars, to 263,000 pound cars, to the current standard of 286,000 pound railcars for transporting heavy bulk materials like coal, grain and lumber. Portions of the Class I system have even been designed for 315,000 pound railcars. Studies have shown that the 286,000 pound railcars can operate on lighter weight rail if all the other track components are in good shape with tight rail joints. Given the typical soil conditions for Virginia, it is more cost-effective to install a heavier weight rail to help resist bending under load and to protect the investment to the rail infrastructure.

The combination of deferred maintenance and the trend towards the use of newer and heavier 286,000 pound railcars has created a need to invest in shortline infrastructure.

All of Virginia’s shortlines are classified by the Federal Railroad Administration (FRA) as Class III railroads (line-haul carriers with annual revenues less than $25 million), except for the Deepwater Terminal Railroad operated by the City of Richmond. This railroad has no official FRA designation. A brief description of the existing shortline railroads follows.

**Bay Coast Railway (BCR)**

BCR operates the former Eastern Shore Railroad line, providing service from Pocomoke City, MD, to Norfolk. This north-south route on the Delmarva Peninsula remains the most direct route between the Northeast and Norfolk. The rail line is unique in its ability to handle special over-height rail shipments –

![CSX Transportation System Map](image-url)
shipments that cannot be accommodated on the Norfolk Southern and CSX mainland corridors because of tunnel and bridge restrictions (particularly in urban city areas). BCR uses a rail ferry service to span the 26-mile water route across the Chesapeake Bay between Cape Charles and Norfolk. A tug boat is used to move a barge (car float) having a 25 railcar capacity. This float operation is one of only two remaining in the Eastern United States and is the longest water route in the country.

BCR interchanges with Norfolk Southern and the Norfolk and Portsmouth Belt Line Railroad in Norfolk and Norfolk Southern in Pocomoke City, MD.

**Buckingham Branch Railroad (BB)**

BB is a family-owned shortline railroad operating over 219 miles of historic and strategic track in Central Virginia. The BB also leases and operates a 200 mile long line of railroad from Richmond to Clifton Forge. This line is known as the Richmond Alleghany Division and is further divided into the North Mountain, Washington and Piedmont Subdivisions. The 19-mile line of railroad from Dillwyn in Buckingham County northward to the CSX connection is owned by the BB.

BB receives freight cars from CSX, Norfolk Southern and the Shenandoah Valley Railroad. Amtrak operates the Cardinal passenger train route three days a week over approximately 130 miles of the 200-mile leased line, providing local station service along the line. CSX also originates unit rock trains that operate on the line.

**Chesapeake and Albemarle Railroad (CA)**

CA is operated by the North Carolina and Virginia Railroad and is owned by RailAmerica. It operates on 82 miles of trackage leased from Norfolk Southern from Chesapeake to Edenton, NC. CA interchanges with both Norfolk Southern and CSX.

**Chesapeake Western Railroad (CHW)**

CHW began as an intrastate railroad in west-central Virginia. Through many changes in ownership and the extent of its lines, today it operates as the CHW of Norfolk Southern. A portion of the line south of Harrisonburg to Pleasant Valley is now owned and operated by the Shenandoah Valley Railroad (SV).

**Commonwealth Railway, Inc. (CWRY)**

CWRY, owned by Rail Link Inc., operates 16.5 miles of track of the former Norfolk, Franklin and Danville Railway line from Suffolk, to Portsmouth. In May 2008, CWRY purchased the remaining interest in the line from Norfolk Southern with funding assistance from DRPT’s Rail Enhancement Program.

CWRY is the primary rail carrier to the new Maersk APM Terminal in Portsmouth, providing double-stack rail service to the new container terminal and the future Craney Island Marine Terminal proposed by the Virginia Port Authority. Existing industries, such as the BASF Chemical plant in the West Norfolk area of Portsmouth are also served by CWRY.
CWRY provides dual Class I railroad access to the marine terminals and industries in Portsmouth, with rail connections to both Norfolk Southern and CSX near Suffolk. CWRY also operates a new rail marshalling yard in Suffolk to assemble intermodal train segments from the Maersk APM Terminal into a full unit trains for transit to outlying areas.

**Norfolk and Portsmouth Belt Line (NPBL)**
NPBL has been operating in Norfolk, Portsmouth and Chesapeake since 1898. Its ownership is 57 percent Norfolk Southern and 43 percent CSX Transportation. The Belt Line interchanges with CA, CSX Transportation, BCR and Norfolk Southern. The Belt Line is a terminal switching company that owns 36 miles of track (plus 27 miles of trackage rights) and links commerce around the deepwater port from Sewells Point to Portsmouth Marine Terminal and including the Southern Branch of the Elizabeth River. All locomotives are leased from Norfolk Southern.

**North Carolina and Virginia Railroad (NCVA)**
NCVA started in 1987 on the former Seaboard Coast Line Railroad. It interchanges with CSX Transportation in Boykins. The line is owned by RailAmerica.

**Shenandoah Valley Railroad (SV)**
SV extends northward from Staunton to Pleasant Valley. The line was originally built by the Baltimore and Ohio Railroad and later purchased in 1942 by the CHW. The new shortline was formed in 1993 by several major shippers and adopted the old historic name which was not in use. SV is operated under contract by the Durbin and Greenbrier Valley Railroad (DGVR). DGVR operates four excursion trains on

*Figure 3-11*
**SHORTLINE RAILROADS – SUMMARY OF ANNUAL CARLOADS (2007)**

<table>
<thead>
<tr>
<th>COMMODITY</th>
<th>Bay Coast Railroad</th>
<th>Buckingham Branch Railroad</th>
<th>Chesapeake &amp; Allegheny Railroad</th>
<th>Chesapeake Western Railroad</th>
<th>Commonwealth Railway, Inc.</th>
<th>Norfork &amp; Portsmouth Belt Line</th>
<th>norfolk &amp; Virginia Railroad</th>
<th>Shenandoah Valley Railroad</th>
<th>Virginia Southern Railroad</th>
<th>Winchester &amp; Western Railroad</th>
<th>Deepwater Terminal Railroad</th>
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<td>Plastic and Rubber</td>
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<td>1,305</td>
<td>3,878</td>
<td>6,277</td>
<td>393</td>
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</tbody>
</table>

* Does not include containerized cargo from the new Maersk APM Terminal in Portsmouth which opened in late 2007 and will generate many new carloads in the future (as will the future VPA Craney Island Marine Terminal to open in 2017). ** DWT is not classified by FRA.
scenic routes in nearby West Virginia. The railroad interchanges with BB and Norfolk Southern railroads.

**Virginia Southern Railroad (VSRR)**
VSRR is a 75-mile line that runs from Burkeville to Oxford, NC. A portion of the line between Clarksville and Oxford, NC has not been in use for more than a decade. VSRR is operated by NCVA and is owned by RailAmerica. It is headquartered in Keysville and interchanges with Norfolk Southern. This line section is leased from Norfolk Southern.

**Winchester and Western Railroad Company (WW)**
WW is Virginia’s oldest operating shortline. The 54-mile railroad operates between Gore and Winchester and from Winchester, up though the Eastern Panhandle of West Virginia, to Hagerstown, MD. WW is exclusively a freight line with connections to CSX Transportation and Norfolk Southern. WW has a partnership with H.H. Omps Trucking to transport bulk materials from Omps’ facilities in Winchester.

**Deepwater Terminal Railroad (DWT)**
The Port of Richmond Deepwater Terminal Railroad (DWT) owns approximately four miles of track from downtown Richmond to the Port of Richmond on the west side of the James River. DWT is a terminal and switching shortline railroad served directly by CSX under an operating agreement and indirectly by Norfolk Southern via a switching agreement. DWT extends south between the James River and I-95 within Richmond City limits and primarily serves the Port’s imports and exports of containers and miscellaneous bulk cargo. Although DWT is not a Surface Transportation Board authorized railroad, DWT is recognized by the Commonwealth for its importance for preservation and continuance of operations to serve the Port of Richmond and industries along the line.

**Passenger Rail**

**Amtrak Intercity Rail**
When established in 1971, Amtrak was required to operate a basic system of corridor and long distance routes as designated by the U.S. Department of Transportation. Amtrak’s enabling legislation (Rail Passenger Service Act) provided for states to contract for additional service. Under this provision, known as Section 403(b), the percentage of costs paid by states changed many times. Section 403(b) of the Rail Passenger Service Act was repealed in 1997 and subsequent legislative directives and current funding levels preclude Amtrak from operating additional services unless those services are state-supported. Therefore, any expansion of rail passenger service in Virginia has to be funded by the Commonwealth.

*Figure 3-12* depicts the existing Amtrak national passenger service map and *Figure 3-13* depicts the eight existing Amtrak routes serving Virginia. Ridership by station is shown in *Figure 3-14* and *Figure 3-15* depicts the annual ridership on Amtrak routes between 2000 and 2007. As can be seen from *Figure 3-15*, there has been a steady increase in passenger rail usage in Virginia since 2003, averaging approximately five percent per year. This has been lower than Amtrak’s 12 percent national annual average in ridership increase since 2002.

However, recent increases in fuel and energy prices have generated a higher demand for passenger rail that should result in an even higher annual ridership increases than those experienced over the past few years.

In 2007, Amtrak operated 20 daily intercity trains and two tri-weekly trains in the Commonwealth with 929,594 passengers either boarding or alighting within Virginia (a state ridership of 464,797). Including passengers on the routes from other states that are passing through Virginia, the total ridership was 2,006,171 passengers. Additionally, Amtrak estimates that of the 3.7 million Amtrak passengers who annually use the Washington DC Union Station, well over one million reside in Virginia.

Amtrak expended $50,021,407 for goods and services in Virginia in FY2007. At the end of FY2007, Amtrak employed 760 Virginia residents and the total wages of Amtrak employees living in Virginia were $50,219,471.

Unfortunately, according to Amtrak’s 2006 Annual Report, one key performance indicator that has not moved in the right direction is the relatively poor on-time performance of many long-distance and (non-Northeast Corridor) corridor trains. Where Amtrak owns the track and controls the dispatching of trains (the Northeast Corridor), on-time performance is generally good. However, on routes where Amtrak operates over rail infrastructure owned, operated and dispatched by freight railroad companies (as is the case in Virginia), on-time performance is often
Figure 3-12
AMTRAK NATIONAL PASSENGER RAIL ROUTES

Source: Amtrak
Amtrak delays are usually due to insufficient rail capacity and the need for additional infrastructure investment by freight railroads. There is also a fundamental contradiction between freight and passenger rail. Freight rail succeeds when demand is greater than capacity. Passenger rail, on the other hand, succeeds when capacity is greater than demand. Bridging this operational chasm is critical to resolving the dilemma of on-time performance for passenger rail. Certainly the current scenario hampers growth and impedes Amtrak’s ability to provide reliable service. However, Virginia can only do so much absent national policy changes.

A brief description of Amtrak’s eight passenger routes serving Virginia follows.

**Northeast Corridor Regional Route**
- Daily passenger rail service from Newport News to Boston, MA.
- Amtrak station stops in Virginia include Newport News, Williamsburg, Richmond (Main Street and Staples Mill), Ashland, Fredericksburg, Quantico, Woodbridge, Springfield, Alexandria and Washington, DC.
- Service is provided on CSX tracks.
- Currently there are four daily round trips to Richmond with two continuing to Newport News.
- Annual ridership in 2007 was 224,760 passengers from Virginia and a total ridership of 401,510 passengers including out-of-state passengers.
- On-time performance for the first quarter of 2008 was 60 percent.
- This regional service (which includes the I-95 and I-64 transportation corridors) carried approximately 49 percent of all Amtrak passengers in Virginia in 2007 as shown in Figure 3-17.

**Carolinian Route (Train 79/80)**
- Daily passenger rail service from Charlotte, NC to New York City.
- Amtrak station stops in Virginia include Petersburg, Richmond (Staples Mill), Fredericksburg, Quantico, Alexandria and Washington, DC.
- Service is provided on a combination of Norfolk Southern, CSX and Amtrak tracks.
- Annual ridership in 2007 was 33,221 passengers from Virginia and a total ridership of 256,212 passengers, including out-of-state passengers.
- On-time performance for the first quarter of 2008 was 27 percent.
- This rail service is part of the I-95 transportation corridor.
Palmetto Route (Train 89/90)
- Daily passenger rail service from Savannah, GA to New York City.
- Amtrak station stops in Virginia include Petersburg, Richmond (Staples Mill), Alexandria and Washington, DC.
- Service is provided on a combination of CSX and Amtrak tracks.
- Annual ridership in 2007 was 18,997 passengers from Virginia and a total ridership of 156,998 passengers, including out-of-state passengers.
- On-time performance for the first quarter of 2008 was 55 percent.
- This rail service is part of the I-95 transportation corridor.
Silver Star Route (Train 91/92)
- Daily passenger rail service from Miami and Tampa, FL to New York City.
- Amtrak station stops in Virginia include Petersburg, Richmond (Staples Mill), Alexandria and Washington, DC.
- Service is provided on a combination of CSX and Amtrak tracks.
- Annual ridership in 2007 was 17,754 passengers from Virginia and a total ridership of 329,132 passengers including out-of-state passengers.
- On-time performance for the first quarter of 2008 was 55 percent.
- This rail service is part of the I-95 transportation corridor.

Silver Meteor Route (Train 97/98)
- Daily passenger rail service from Miami, FL to New York City.
- Amtrak station stops in Virginia include Petersburg, Richmond (Staples Mill), Alexandria and Washington, DC.
- Service is provided on a combination of CSX and Amtrak tracks.
- Annual ridership in 2007 was 10,602 passengers from Virginia and a total ridership of 291,735 passengers including out-of-state passengers.
- On-time performance for the first quarter of 2008 was 55 percent.
- This rail service is part of the I-95 transportation corridor.

Auto Train Route (Train 53/52)
- Direct daily passenger rail service and automobile transfers between Lorton and Sanford, FL (no station stops in between).
- Service is provided on CSX tracks.
- Annual ridership in 2007 was 108,911 passengers from Virginia and a total ridership of 217,822 passengers including out-of-state passengers.
- On-time performance for the first quarter of 2008 was 55 percent.
- This rail service is part of the I-95 transportation corridor.

Crescent Route (Train 19/20)
- Daily passenger rail service from New Orleans, LA to New York City.
- Amtrak station stops in Virginia include Danville, Lynchburg, Charlottesville, Culpeper, Manassas, Alexandria and Washington, DC.
- Service is provided on a combination of Norfolk Southern and Amtrak tracks.
- Annual ridership in 2007 was 33,550 passengers from Virginia and a total ridership of 257,608 passengers including out-of-state passengers.
- On-time performance for the first quarter of 2008 was 68 percent.
- This rail service is part of the I-81 and Route 29 transportation corridors.
Cardinal Route (Train 50/51)

- Passenger rail service three times a week from Chicago, IL to New York City.
- Amtrak station stops in Virginia include Clifton Forge, Staunton, Charlottesville, Culpeper, Manassas and Washington, DC.
- Service is provided on a combination of Norfolk Southern, CSX, BB and Amtrak tracks.
- Annual ridership in 2007 was 17,004 passengers from Virginia and a total ridership of 95,154 passengers, including out-of-state passengers.
- On-time performance for the first quarter of 2008 was 18 percent.
- This rail service is part of the I-81 and Route 29 transportation corridors.

Virginia Railway Express

VRE was founded in 1992 with a vision to provide a safe, convenient, energy-efficient public transportation alternative to driving congested highways from the Northern Virginia suburbs to the business districts of Alexandria, Crystal City and Washington, DC. Organizationally, VRE is a joint operation undertaken by two commissions – the Northern Virginia Transportation Commission (NVTC) and the Potomac and Rappahannock Transportation Commission (PRTC) – which represent the Northern Virginia counties and municipalities in the service area. Members of both entities sit on the VRE Operations Board, which governs VRE. Daily operations and capital projects are financed from a combination of federal, state and local grants and through the sale of tickets (often referred to as the fare box revenues).

In 2007, VRE reported a total ridership of 3,435,561 passengers as follows:

- An average of 15 trains per day on the Fredericksburg Line with 1,816,826 passengers per year (I-95 corridor), operated on CSX tracks.
- An average of 16 trains per day on the Manassas Line with 1,618,735 passengers per year (I-66 and Route 29 corridors), operated on Norfolk Southern tracks.

As illustrated in Figure 3-18, VRE has been successful in providing an alternative to driving. Since 1992, daily trips have increased from 6,500 to upwards of 15,000 passenger trips per day today. Each weekday, VRE’s 29 revenue trains operate over two branch lines, covering 90 route miles and serving 18 stations in eight Northern Virginia jurisdictions. From 2005 to 2007, VRE experienced declines in ridership due to lowered on-time performance brought about by equipment breakdowns, train traffic congestion and heat and other weather delays. Increasing fares and service cutbacks also impacted VRE ridership during this three-year period. The summer of 2006 marked the worst extended on-time performance in the history of VRE. Figure 3-19 illustrates on time performance trends while Figure 3-20 illustrates delay causes for FY2007.

VRE’s improved performance can be largely attributed to investments made by the Commonwealth as part of VTA2000 and a 2007...
general fund special appropriation that provided funding for projects to add capacity and improve operational efficiency. These improvements, totaling $77.45 million of state funding, supported the costs for projects to add third track, improve signaling and build a new bridge over Quantico Creek. In addition, CSX performed significant rail infrastructure improvement programs, including replacing over 80,000 ties and several miles of rail. These improved on-time performance and increased capacity. In exchange for these investments, the Commonwealth was able to secure four round trip
train slots to operate expanded passenger rail service. The Commonwealth has also allocated $20 million for the purchase of 50 railcars and $15 million to provide for the purchase new locomotives.

VRE commuter trains are operated by Amtrak under contract with NTC and PRTC.
The Business of Freight Railroads

Railroads’ Capital Investment
U.S. railroads are private corporations that own their rail rights-of-way, including the tracks. These companies are large publicly owned stock companies with a fiduciary responsibility to conduct their business in a manner that maximizes stockholder fiscal returns. To develop effective public private partnerships, DRPT and the railroads work together to create “win-win” situations where the railroads meet their responsibility to minimize risk and maximize profits for their shareholders, the public need for effective and efficient passenger rail service is provided, freight is diverted from trucks to rail on crowded highways to reduce congestion and improve safety and air quality in urban areas. Operating in a highly competitive environment, some of the detailed operations of railroad companies is privileged information and is not shared with the public when developing these projects.

Norfolk Southern and CSX operate in many states other than Virginia and their corporate decisions on which rail improvement projects are to be financed within any particular year are based on the best interests of the respective railroads after considering the business climate, risk and return on investment. Rail projects that are important to the Commonwealth compete with other states asking Norfolk Southern and CSX to use finite financial resources to implement rail improvement projects in their states.

Passenger Rail Service on Property Owned by Freight Railroads
The position of the freight industry with respect to passenger rail service has been clear and consistent:

:: Passenger rail service must be complementary to, not in conflict with, freight rail development.
:: Freight railroads should be fully compensated for the use of their property by passenger trains.
:: Absent voluntary negotiated agreements, freight railroads should not be forced to give passenger rail operators access to their property.
:: Freight railroads should not be expected to subsidize passenger rail.
:: Freight railroads do not want exposure to any liability associated with passenger train service. At a minimum, freight railroads expect some enforceable limits on freight rail liability. Without such limits set at a policy level by the federal government, liability issues will remain a major obstacle in the growth of passenger rail service.

The nation’s privately-owned freight railroads want passenger rail to succeed and at present freight railroads are successful partners with passenger rail operators across the country, including in Virginia. Amtrak is the only continental U.S. intercity passenger railroad. Approximately 97 percent of the double-stack containers literally double the capacity of freight trains, delivering twice the amount of freight on just one train and removing an average of 200 trucks at a time from highways.
22,000 miles that Amtrak currently operates over is owned by freight railroads. Many new passenger rail routes are being considered in Virginia and throughout the nation to relieve highway traffic congestion, improve travel mobility and protect the environment; most of these are on tracks owned by freight railroads.

In 1970, for permission to exit the passenger business, freight railroads agreed to a number of Amtrak terms:

- Freight railroads must give Amtrak access to their tracks upon request
- Freight railroads must charge heavily discounted rates for that access
- Freight railroads must give Amtrak trains priority over all other trains

Amtrak pays fees to freight railroads to cover some of the costs associated with Amtrak corridor and long-distance intercity passenger train operations on freight tracks, but, according to the freight industry, these do not come close to the full costs incurred by freight railroads for hosting Amtrak trains. However, passenger trains run at higher speeds on rigorous schedules and require certain track standards and design to do so. The freight trains benefit because a higher grade track enables them to run their trains at higher speeds and even better schedules. These tighter schedules improve freight railroads’ ability to operate intermodal freight movement.

Based on Association of American Railroad (AAR) data, the issue of full compensation has become more important in recent years as rail capacity has become increasingly constrained. When Amtrak was created in 1970, there were few commuter trains providing corridor services. Since then, average freight rail density has increased 379 percent, with the result that available train “slots” on major rail corridors have become scarce. If passenger trains fill these slots at below-market prices, the result is a major subsidy from freight to passenger rail. If slots are not available to freight trains, this also limits the ability of freight railroads to serve those areas.

Freight railroads are not required to allow commuter rail operators like VRE to operate over their rail lines. Lacking Amtrak’s statutory rights of access to freight railroads, commuter railroads must negotiate with freight railroads. These negotiations often are very difficult because commuter rail is typically operated in larger metropolitan areas along corridors where intermodal trains and other high priority scheduled freight trains also operate to support larger population and employment centers. The AAR reports that in 2006, the Class I railroads operating in the US had an average Revenue per ton mile of $0.0284 and that the average tons per train was 3,163. It can be calculated that, on average, a U.S. Class I railroad earns approximately $89.83 per train-mile. Compare that to VRE, for example, which pays the host freight railroad a $17.47 per train-mile access fee under its operating agreements. Accordingly, the railroads’ key negotiation requirement is the provision of sufficient capacity to support the desire for new and or expanded commuter rail service.

Commuter railroad operators have learned that capacity is just one of the issues that needs to be negotiated with the railroad owner. Issues related to passenger priority, slow orders on the railroad and maintenance needs and practices also impact the ability to provide efficient commuter rail service. The current VRE operating agreement that allowed VRE access to CSX rail lines requires the replacement of track capacity through the addition of a third track between Fredericksburg and Washington, DC. This requirement must be fulfilled for additional train capacity necessary to operate increased commuter rail service in the corridor. Since VRE’s inception in 1992, VRE and its funding partners have invested over $100 million dollars towards capital improvement associated with the third track requirement. Improvements to date will be dwarfed by future costs for improvements associated with major bridges such as the Potomac River, Aquia Creek, Powell’s Creek, Neabsco Creek, Rappahannock River and Occoquan River.

While all commuter rail transit agencies share their operations with freight railroads to different degrees, they have the option to avoid negotiations with railroads by electing to acquire dedicated right-of-ways and facilities to support passenger rail service. However, rail transit agencies have not chosen this option due to land use considerations, efficiency and cost. From a land use perspective, in dense metropolitan areas it would be nearly impossible to acquire the land needed to support rail right-of-way — consider the difficulty of acquiring right-of-way for a new line or interstate through Hampton Roads, Richmond and the Northern Virginia regions. It would also be inefficient to have a dedicated right-of-way for most commuter rail operations since these are typically designed and operated to accommodate peak hour
travel only. Finally, the cost of acquiring right-of-way in metropolitan regions is expensive, ranging from $32 - $95 per square foot in Northern Virginia and $0.75 - $1.50 per square foot in agricultural areas, based on VDOT right-of-way. Combining this with the expense of constructing rail (ranging from $5 to $6 million per mile) makes it cost prohibitive to construct dedicated commuter rail infrastructure.

Preemptive Rights: The Railroad’s Right to Build Facilities

Class I railroads are regulated by the Surface Transportation Board (STB, the former Interstate Commerce Commission [ICC]), not by local or state governments. The ICC Termination Act of 1995, Pub. L. No. 104-88, 109 Stat. 803 (1995) (ICCTA), shields railroad operations and facilities from the application of most state and local laws. This is known as the Federal preemption provision and is contained in 49 U.S.C. 10501(b). While railroads can be required to comply with some local health and safety rules, such as fire and electric codes, this provision exempts railroads from local land use and zoning requirements. Preemptive rights, however, do not exempt railroads from certain Federal environmental statutes, such as the Clean Air Act (locomotive emissions) and the Clean Water Act (e.g., wetlands protection).

Projects that utilize federal funds must be in compliance with appropriate National Environmental Policy Act (NEPA) requirements as administered by the Federal Railroad Administration (FRA) and/or the Federal Highway Administration (FHWA). Since most rail improvement projects are within existing rights of way with minimal environmental impacts, the majority of rail projects qualify for a “Categorical Exclusion” in accordance with federal NEPA requirements and regulations. In situations where the anticipated environmental impacts might be moderate, FRA and/or FHWA may require the preparation of an “Environmental Assessment”; or for large projects with portions of the project outside of existing rail rights of way and where the anticipated environmental impacts might be significant an “Environmental Impact Statement” may be required. The preemptive rights of railroads exempt railroads from local land use and zoning requirements. However, these rights do not exempt the railroads from these environmental requirements.

Indemnification

The operating agreement between CSX and VRE states: The Commissions shall protect, defend, indemnify and hold harmless Railroad…and all liability for death personal injury or property damage (including, but not limited for death, personal injury or property damage [including, but not limited to the property and employees of a Railroad]), which is attributable in any way to, or which is exacerbated by, the operation of the Service over the Tracks of Railroad, or to the presence of cars, equipment, personnel, contractors, agents or passengers of the Commissions or an Operator on or about the property of Railroad. The Commissions shall indemnify and hold Railroads harmless under Article Nine whether or not such death, injury or damage is caused, in whole or in part, by the negligence, regardless of its character or degree, of Railroad and whether the damages are compensatory, punitive or exemplary; provided that the liability of the Commissions under this Article shall not exceed Two Hundred Million Dollars ($200,000,000).

It is standard practice for railroads to request indemnification and hold harmless contractual language in its access or operating agreements with public entities related to accidents or incidents that occur as a result of allowing passenger rail operations on freight rail. The request to be indemnified and held harmless is often broad and includes coverage for events that are attributable to gross negligence or unsafe practices by the host railroad. This language is problematic for special transportation districts and can be a “deal breaker” for state governments that are unwilling to waive sovereign immunity. Typically, a state requires activity by its legislature before allowing a state agency to enter into an agreement that holds a private company harmless from liability for damages, loss or injuries caused by the sole or joint negligence of the private company.

The cost for insurance for public entities that enter into these agreements is typically very expensive, especially in the early years of operation, since there is insufficient accident information for an insurance carrier to assess risk. The request for indemnification has been exacerbated by concerns associated with acts of terrorism. VRE has experienced significant increases in insurance premiums since 2001. It’s insurance premium has increased by 86 percent since 2001 and totals approximately $3.9 million (FY2008) annually, representing 6.6 percent of its FY2008 operating budget.
High Speed Rail

Background
In the late 19th and early 20th centuries, passenger railways were the major form of mass transportation. Railway companies in the U.S. and Europe used streamlined trains from the early 1930's for high speed services with an average speed of up to 80 mph and top speeds of more than 100 mph. With this service they were able to compete with airline travel at that time.

Following World War II, significant improvements to automobiles and aircraft placed personal transport within the means of most Americans. With severe antitrust restrictions on railroads and with government subsidization of interstate highways and airports, automobile travel surged and passenger rail travel experienced a significant decline. In Europe and Japan, emphasis was given to rebuilding the railways after WWII, whereas in the U.S., emphasis was given to building a vast national interstate highway system and airports.

Urban mass transport systems in the United States were largely abandoned in favor of road expansion. Compared to Europe and Japan, U.S. passenger railways have been less competitive partly because the federal government has tended to encourage and fund road and air transportation. But today — as population grows and population density increases in major urban corridors, as highway and airline congestion increase and as energy costs increase — rail ridership is increasing across the country.

It is instructive to compare U.S. passenger and freight rail service with other major countries in the world. For other developed nations of the world, there is significantly more passenger rail ridership on rail lines than freight. Inversely, for the United States, there is significantly more freight hauled by rail than passenger rail. India has one of the highest uses of passenger rail (251 billion passenger-miles) and among the lowest usage of freight rail (175 billion ton-miles per year). The opposite is true for the U.S., where passenger rail use is low when compared with developed countries (six billion miles per year) but freight rail usage is the highest in the world (1,390 billion ton-miles per year).

High speed rail is primarily a type of passenger rail service that operates significantly faster than the normal speed of rail traffic. In the U.S., the FRA has established a threshold of 90 mph for high speed rail, whereas in Europe the threshold has been set at 124 mph. There are no single standards and lower speeds are often required even on a high speed corridor by local constraints.
Figure 3-21
HIGH SPEED CORRIDORS

[Map of the United States showing high-speed rail corridors, including Federally Designated and Existing Amtrak Service.]

High-Speed Rail Corridors
Federally Designated
Existing Amtrak Service
(Conventional)
The world’s first “high speed train” service occurred in Japan, which started in 1964 with trains speeds of approximately 125 mph on the Tokyo–Nagoya–Kyoto–Osaka route. In Europe, the first high speed rail was Italy’s 125 mph service in 1969. The only high speed rail service at present in the U.S. is Amtrak’s Acela Express, which operates in the Northeast Corridor between Boston, MA, New York City and Washington, DC; it uses tilting trains to achieve speeds of up to 150 mph on existing tracks. While high speed rail is designed mainly for passenger travel, it also offers possibilities for freight service such as mail, overnight deliveries and other types of cargo.

High-speed rail tracks must have high-turn radii, be welded together and be extremely well-supported and anchored to avoid vibrations and other damage. The track itself in most cases is uninterrupted, with roads and other tracks crossing over bridges. Although most existing forms of high speed rail are electrically driven via overhead cables, other forms of propulsion, such as diesel locomotives, may be used – particularly the new generation of environmentally friendly and fuel-efficient diesel-electric locomotives. Magnetic levitation (maglev) trains are considered high speed rail; however, due to their unique track-oriented vehicles and their inability to operate on conventional railroads, they are usually considered a separate type of high speed transport system.

In 2002, the FRA designated 10 high speed corridors under Section 1010 of the Intermodal Surface Transportation Act of 1991 (ISTEA) and Section 1103(c) of the Transportation Efficiency Act for the 21st Century (TEA-21) for passenger rail service in high population density and congested intercity sections of the nation. This designation allows a corridor to receive specially targeted funding for highway-rail grade crossing safety improvements and recognizes the corridor as a potential center of high speed rail activity. These designated corridors are shown in Figure 3-21. They include a high speed rail corridor from Washington, DC to Richmond and the Southeast High Speed Rail Corridor between Richmond and Charlotte, NC.

According to FRA, a number of states are planning high speed rail systems and making the necessary improvements. The technologies these states are planning to use typically involve upgrades of existing rail lines, rather than entirely new rail lines exclusively devoted to 150 to 200 mph trains, such as operate in Europe or Japan or 250-300 mph maglev, such as planned in Germany and Japan. Amtrak has also offered to operate “Acela Regional” type service in other state-sponsored corridors if funds are made available for the necessary capital upgrades. In addition to upgrading a number of rail lines, California has prepared a business plan to construct a 200 or 300 mph system.

High-Speed Rail in Virginia
Fast, efficient passenger rail service is important for Virginia. The Commonwealth has initiated studies and preliminary design associated with high speed rail corridors passing through Virginia and has participated in Multi-State Coalitions looking at improving passenger rail services in the mid-Atlantic region. Because of the high capital cost associated with high speed rail systems, the Commonwealth has been following an incremental approach in past years to construct rail improvements that eliminate key rail chokepoints and to increase rail speeds and on-time performance on existing passenger rail corridors – particularly the I-95 and I-81 transportation corridors. Virginia, like all states, has been awaiting federal legislation that would provide a national policy and funding framework (similar to the development of the interstate and airport system) to allow high speed passenger rail services to become a reality in Virginia in the not-to-distant future. Bordering Virginia from Washington, DC to the north, is Amtrak’s 165 mph high speed Northeast Corridor. The Northeast Corridor has recently been extended northward from New York City to Boston, MA. This extension has proven that high speed passenger rail in the United States is a new stakeholder in the growth of America’s ground transportation system. Key considerations for high speed rail will be available funding and the development of capacity to support increased freight flows and safe operations.

The I-95 corridor has been identified as a priority corridor for high speed rail. The Southeast High Speed Rail (SEHSR) corridor would extend high speed rail service south from Washington, DC, to Richmond and on to Raleigh and Charlotte, NC. The SEHSR corridor would later expand further south from Charlotte, NC to New Orleans, LA via Atlanta, GA and from Raleigh, NC to Jacksonville, FL and east from Richmond to Hampton Roads. DRPT and the rail division of the North Carolina department of...
transportation have joined forces to support the planning and engineering of projects in Virginia and North Carolina.

The project length is approximately 168 miles, of which 99 miles are in Virginia. The capital cost of implementing the SEHSR will likely be a multi-billion dollar project. The Tier 1 Environmental Impact Study (EIS) of SEHSR ridership and fare structure indicated that the project would require no subsidies and would pay for itself in terms of annual operating costs. While the Tier 1 EIS ridership and revenue forecasts are positive, DRPT will take a more conservative approach in estimating ridership and revenue as the project progresses through the planning and engineering process. The next phase of the EIS preparation is currently underway and includes preliminary design of the system. This should be completed by 2011 at which time final design and construction could be initiated.

In addition to the SEHSR Tier 1 EIS, DRPT is working to select the corridor’s route alignment between Richmond’s Main Street Station and Doswell. The actual route selection was not made in the SEHSR Tier 1 EIS and FRA requires an Environmental Assessment to select one of the two route options to continue through the federal planning process. Analysis to select the high speed rail route between Main St. Station and Doswell, compares the Eastern route along the Buckingham Branch line and the...
Western route along the CSX line sections began in February 2008 and is scheduled for completion in the summer of 2009. Work on this project includes identifying track infrastructure and facility needs, assessing environmental impacts and receiving public comments.

**Rail Safety**

Highway-rail grade crossing safety is a critical rail safety issue. According to AAR, from 1980 through 2007 the number of grade crossing incidents fell 74 percent, while the grade crossing incident rate (incidents per million train-miles) fell 77 percent. Based on accident data, 2007 was the safest year ever in terms of grade crossing safety.

AAR estimates that there are approximately 145,000 public grade crossings in the United States and that improving grade crossing safety represents an enormous challenge that will take the combined efforts of railroads; state, local and federal governments; public safety officials; and the public. A freight train moving at 55 miles an hour can take a mile or more to stop. According to a June 2004 report issued by DOT’s Inspector General, 94 percent of all grade crossing accidents are caused by risky driver behavior and about half of all grade crossing accidents occur at crossings that are already equipped with active warning devices such as bells, gates and lights.

- **National**: At the national level there were 2,728 collisions, 986 injuries and 330 fatalities associated with highway-rail grade crossings. There were 393 injuries and 486 fatalities associated with trespassers on railroad rights of way.

- **Virginia**: Within the Commonwealth, there were 64 injuries and **no fatalities** associated with highway-rail grade crossings. There were six injuries and five fatalities associated with trespassers on railroad rights of way.

In Virginia, DRPT and VDOT have responsibilities involving grade crossing safety. VDOT administers the Federal Section 130 Grade Crossing Safety Funds, but often DRPT Rail Preservation Funds are use to improve grade crossings as part of a series of improvements in a stretch of shortline railroad.

The Commonwealth through VDOT has received approximately $6.7 million in federal funds under Section 1103(f) since 1993 for its portion of the designated Southeast High-Speed Corridor. These funds have been used to install lights, gates and constant warning time devices at 36 crossings, construct a pedestrian overpass over the high speed corridor in Prince William County and support design and construction of three grade separations completed with Section 148 funds.

Under the FHWA Section 148 Highway Safety Improvement Program (HSIP), the Commonwealth receives $4.4 million per year for highway-rail grade crossing safety projects. These Section 148 funds are not restricted to passenger rail lines, but can be used for freight rail crossings as well. By designating additional federal safety funds for railroads, VDOT has been able to complete between 15 and 40 projects per year. Support is also provided for grade separations that will be paid for by other funds. Closures of existing at-grade crossings are made where possible under this funding program.

A recent rail safety project example is the Commonwealth Railway Mainline Safety Relocation project currently under construction and scheduled for completion by the end of 2009. The project consists of relocating approximately 4.5 miles of existing shortline rail tracks (Commonwealth Railway) to the medians of the Western Freeway (Route 164 and I-664) through Portsmouth, Chesapeake and Suffolk. In the early 1980s, both roadways were built to accommodate a dual set of rail tracks within their medians. This rail-ready corridor will be used to serve both the planned Craney Island Marine Terminal and the recently completed Maersk APM Terminal. Rail traffic from these two facilities is expected to exceed one million TEUs annually. As shown in Figure 3-22, relocation of the existing rail line to the Route 164/I-664 Median Rail-Ready Corridor will:

- Move the rail line away from densely populated areas of Chesapeake and Portsmouth, to a secure, guard-rail protected rail corridor away from pedestrian and motorist traffic.

- Eliminate the potential for rail-related accidents at the 14 at-grade crossings currently used by motorists and pedestrians.
Limit the noise levels and pollution emissions from automobiles idling at railroad crossings as well as from trains passing through the neighborhoods in the vicinity of the existing lines.

Divert containerized cargo traffic away from regional highways, thereby reducing highway congestion and improving highway safety.

As the number and frequency of trains continue to increase in Virginia, concern has been raised by municipalities and communities where past land use decisions have allowed residential neighborhoods to be built near mainline rail tracks and where crossing of rail tracks by automobiles is an accepted practice to access main highways.

A recent study by the Hampton Roads Planning District Commission identified a number of at-grade crossings in the Suffolk area where communities have been adversely impacted by the increase in the number of trains carrying coal and intermodal cargo. Where significant impacts occur, VDOT serves as the Commonwealth’s agency with the responsibility to evaluate the need for crossing improvements or the elimination of the crossing by constructing a grade separating bridge to carry the highway over the existing rail tracks.