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2009 Infrastructure Report Card


Commonwealth of Virginia

## **Rail/Transit Report**

The following Report Card has been prepared by the Virginia Section of ASCE in accordance with ASCE's national report card program to highlight the condition of vital infrastructure around the Commonwealth. This assessment will be updated at three year intervals to help track trends in managing Virginia's Infrastructure, this is the first Report Card prepared for all of Virginia.

Virginia Section of the American Society of Civil Engineers

9/1/2009



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# 2009 INFRASTRUCTURE REPORT CARD

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### RAIL/TRANSIT

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### RAIL/TRANSIT

#### OVERVIEW

##### Rail

While highway miles in Virginia have shown significant increase, rail miles have actually decreased in the 77 year period from 1930 to 2007. Freight and passenger rail generally share the same network. Twelve freight and two passenger railroads operate on more than 3,400 miles of railway in Virginia. Over the next two decades, the forecast is for significant growth in the demand for freight movement into, out of, within and through Virginia. Much of the Commonwealth's freight infrastructure will be challenged by the growth in the amount, type and location of freight movement and the increased passenger traffic over the shared rail corridors. The largest commodity in tonnage carried by rail is coal (59 percent). The two passenger railroads operating in Virginia have experienced explosive growth in annual ridership and will be challenged by capacity constraints as freight rail operations and capital needs increase. According to the most recent date from the Association of American Railroads (2005), Virginia carries over 1 percent of the nation's rail freight tonnage (2.4 million/178.4 million). Initiated in 2005 Virginia developed the first dedicated source of funding, the Rail Enhancement Fund, for freight and passenger rail improvements in the state's history.<sup>1</sup>

##### Transit

In many areas of the Commonwealth, transit services are an essential part of the transportation infrastructure. Transit increases access and mobility for Virginia residents by enabling more efficient use of the transportation network, saving time, conserving energy, and providing economic benefits to the customers and communities served. Transit ridership in Virginia grew by 20 percent (30 million trips) between FY2002 and FY2006. This compares to a national growth rate of only 4 percent during the same period. The operating cost per passenger trip, the key measure of system efficiency, was 15 percent lower in Virginia than the national average in FY2006. Virginia's operating cost per passenger trip grew 17 percent from FY2002 to FY2006. Funding levels need to grow to meet the future demands<sup>2</sup>

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<sup>1</sup> Statewide Rail Plan, Commonwealth of Virginia, Working Draft; July 14, 2008; Virginia Department of Rail and Public Transportation.

<sup>2</sup> Virginia Transit Performance Report (FY 2002 – FY 2006), December 31, 2007, Virginia Department of Rail and Public Transportation.

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### INTRODUCTION AND BACKGROUND

#### Rail

Railroads are a significant part of Virginia's present and a critical part of the future for effective passenger and freight rail movements, particularly as energy costs and fuel prices continue to rise. In 2002 Virginia ranked 18<sup>th</sup> nationally for the number of rail carloads and 25<sup>th</sup> for the number of rail tons carried.<sup>3</sup>

Virginia's rail system dates from the 1800's. The records indicate that the first railroad incorporated in Virginia was the Richmond and Danville Railroad in 1847. Its main line, connecting Richmond and Danville, was opened in 1856. Because its charter prohibited the acquisition of any but connecting lines, the Richmond and Danville created the Richmond and West Point Terminal Railway and Warehouse Company in 1880 to acquire properties not directly connected with it. The Richmond and Danville Railroad and the Richmond Terminal Company went into receivership in the mid-1890s, were reorganized and emerged in 1894 as the Southern Railway Company, which controlled over 4,000 miles of line at its inception.<sup>4</sup>

The Norfolk and Western Railroad was organized in 1881 from the Atlantic, Mississippi and Ohio Railroad. The Atlantic, Mississippi and Ohio had been created in 1870 by the merger of three Virginia railroads with antebellum origins: the Norfolk and Petersburg (connecting these two cities), the Southside (running from Petersburg to Lynchburg), and the Virginia and Tennessee (running from Lynchburg to Bristol on the Tennessee border). The Norfolk and Western rapidly became associated with the mineral development of the southwestern part of Virginia and West Virginia. In mid-1881 it acquired the franchises to four other lines: the New River Railroad, the New River Railroad, Mining and Manufacturing Company, the Bluestone Railroad, and the East River Railroad. In 1890, it acquired the Shenandoah Valley Railroad, which ran from Roanoke, Virginia, to Hagerstown, Maryland. Its program of expansion in the early 1890s, coupled with the economic depression of the 1890s, forced the railroad into receivership in 1895. It emerged as the reorganized Norfolk and Western Railway the next year.<sup>5</sup>

Today the Virginia freight rail system is comprised of two classes of railroad companies: 2 Class I freight railroad systems – Norfolk Southern (2,100 miles) and CSX (1,050 miles)<sup>6</sup>; and 10 Class III (short-line) line-haul carriers (approximately 489 route miles). The Class I railroads are defined as line-haul freight

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<sup>3</sup> Virginia Statewide Multimodal Freight Study, Phase 1, Final Report, April 2008: Virginia Department of Transportation.

<sup>4</sup> Virginia Tech University Libraries' Special Collections; Records of Southern and Norfolk & Western Railways.

<sup>5</sup> Ibid.

<sup>6</sup> Same as Footnote 3.

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railroads exceeding \$319.4 million in annual operating revenue. The Class III railroads are defined as line-haul carriers with less than \$24 million in operating revenues. There are no Class II railroads in Virginia. Two passenger systems, Amtrak and Virginia Railway Express (VRE), utilize the private track freight railway system.<sup>7</sup>

### Transit

In this report transit includes traditional mass transit (i.e. bus, fixed route rail, vans, and ferryboats) and passenger rail. The Virginia Department of Rail and Public Transportation (DRPT) is the state agency supporting the state's transit systems. DRPT is the designated recipient and administrator of federal funds for FTA and state grant programs. DRPT provides technical assistance to transit systems in the areas of: key corridor and system specific capital and operations planning; financial planning, vehicle purchases and inspections, marketing, training, program project management, project development, and program compliance. Local governments in the Commonwealth are typically the direct owners and operators of the transit systems. They also provide significant financial support. The Commonwealth experienced continued growth in transit ridership and service effectiveness. Transit operators outperformed the national averages on key performance indicators.<sup>8</sup>

Virginia's 56 transit systems are divided into three categories:

- Urban/small urban agencies (21)
- Rural agencies (34)
- Passenger rail - Amtrak and Virginia Railway Express (2).

Most of the agencies operate buses and/or vans only. Washington Metropolitan Area Transit Authority (WMATA) fleet includes 954 heavy rail passenger cars. Hampton Roads Transit (HRT) is constructing Virginia's first light rail system, The Tide. Scheduled to open The Tide for operation in mid or late 2010,

HRT has ordered 9 light rail vehicles and has an option to purchase 2 more. Both WMATA and HRT also operate buses and vans. HRT additionally operates a fleet of 3 ferryboats.

In 2007, Amtrak had eight passenger routes serving Virginia and operated 20 daily intercity trains and two tri-weekly trains. Virginia Railway Express, founded in 1992, provides a transportation alternative to driving congested highways from Northern Virginia suburbs to the business districts of Alexandria, Crystal City, and Washington, DC. For 2007, VRE reported operating an average of 31 trains per day on two

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<sup>7</sup> Statewide Rail Plan, Commonwealth of Virginia, Working Draft; July 14, 2008; Virginia Department of Rail and Public Transportation.

<sup>8</sup> Virginia Transit Performance Report (FY 2002 – FY 2006); Virginia Department of Rail and Public Transportation.

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branch lines, the Fredericksburg Line and the Manassas Line. VRE's 29 revenue trains cover 90 route miles in eight Northern Virginia districts.<sup>9</sup>

### CONDITION AND ADEQUACY

#### Rail

Today's critical issues for Virginia's railroads are<sup>10</sup>:

- System preservation and maintenance (lines, bridges, and tunnels).
- Modernizing historic, aging infrastructure to handle heavier, larger railcars in faster and/or scheduled services.
- Port accessibility and quality of service.
- Inland ports, intermodal yards, "integrated logistics centers".
- Increased demand for passenger rail service conflicts with private freight railroad business on shared rail lines.
- Diversion of long haul trucks to rail.
- East-west and north-south corridors.
- Multistate coordination.

By 2035 Virginia will have to decide how to handle a doubling of rail traffic, while offsetting investment needs in other modes.

#### Transit

Virginia's transit operators are performing well against the national average and that of neighboring states as born out by the following results of the 2007 Virginia Transit Performance Report.<sup>11</sup>

**Ridership.** From FY2002 to FY2006, transit ridership in Virginia grew by 20 percent compared to a national growth rate of 4 percent. The Virginia transit agencies reporting the highest ridership growth were

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<sup>9</sup> Statewide Rail Plan, Commonwealth of Virginia, Working Draft; July 14, 2008; Virginia Department of Rail and Public Transportation.

<sup>10</sup> Virginia Statewide Multimodal Freight Study, Phase I Overview, Oct. 17, 2007; Commonwealth Multimodal Transportation Office.

<sup>11</sup> Virginia Transit Performance Report (FY 2002 – FY 2006); Virginia Department of Rail and Public Transportation.

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Williamsburg Area Transit (2,875 percent) and Loudon County Transit (184 percent). The Virginia systems with the most annual passenger trips were Metropolitan Area Transit Authority (WMATA) at 115.7 million and Hampton Roads Transit (HRT) at 21.2 million.

**Total Transit Miles Operated.** Between FY2002 and FY2006, the total transit miles operated in Virginia, measured in vehicle revenue miles, grew by 13.1 million, or 20 percent. The nation growth in vehicle revenue miles for the same period was 7 percent.

**System Efficiency.** Measured as the operating cost per passenger trip, system efficiency is higher for transit systems which serve passengers at a lower operating cost. From FY2002-FY2006, Virginia's operating cost per passenger trip grew from \$2.34 to \$2.73, a 17 percent increase. However, this was a slower rate increase than the national increase of 24 percent. For the same period the operating cost per passenger trip was lower in Virginia, than in the three neighboring states of North Carolina (\$3.42), Maryland (\$3.95), and Tennessee (\$4.15). The Williamsburg Area Transport decreased its operating cost per passenger trip by 89 percent from \$10.63 to \$1.13 per trip, the lowest in the state. Loudoun County Transit experienced a 39 percent decrease in the operating cost per passenger trip.

**System Effectiveness.** System effectiveness is measured in terms of the number of passenger trips served per vehicle revenue hour. Therefore, the more trips served per hour, the more effective the transit system. Between FY2002 and FY2006, passenger trips per vehicle revenue hour in Virginia increased one percent compared to a national decline of three percent. In FY2006 the national average was 38 trips per vehicle revenue hour compared to 37 passenger trips per revenue hour served by Virginia transit operators. At 63 passenger trips per vehicle hour, Virginia Railway Express had the highest number of trips served per hour among Virginia transit agencies. Williamsburg Area Transit had the greatest system effectiveness among Virginia bus operators with 44 trips per hour and the greatest increase at 529 percent. Loudoun County Transit saw a 127 percent increase.

**State Government Funding.** In FY2006 the level of state government funding available to transit operators was 42 percent higher than in FY2002. Nationally, state funding available to transit operators grew 13 percent from FY2002 to FY2006. In Virginia the state funding for capital and operating expenses has fluctuated from year to year. In 2007 the General Assembly passed House Bill 3202 which is anticipated to provide a record increase in of about \$103 million in state and regional transit funding.

**Local Government Funding.** Combined local government capital and operating funds available for transit operators in Virginia grew by 38 percent from FY2002 to FY2006. When broken down, the available local operating funds grew by 28 percent and the available local capital funds grew by 98 percent between FY2002 and FY2006. For the same period local government funding, nationally, for transit operators grew by 20 percent with an 18 percent decline in capital funds and a 40 percent increase in operating funds.

**Farebox Recovery.** Farebox recovery is significantly impacted by fare policies adopted on the local level. Transit operators in Virginia paid for approximately 41 percent of their operating cost through collection of fares in FY2006 which was equal to the percent of costs paid out of fares nationally. This represented an 11 percent growth rate from FY2002. The national growth rate was only 5 percent between FY2002 and FY2006. Of the Virginia transit agencies Loudoun County had the highest rate of farebox recovery at 77 percent. The City of Fairfax CUE bus system had the greatest increase in the percentage of operating

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expenses covered by fares collected at 98 percent. Williamsburg Area Transport had an increase of 93 percent.

**Average Age of Vehicles.** The average age of transit vehicles in Virginia rose from 6.1 to 7.4 years (not including WMATA's vehicles) from FY2002 to FY2006, a 22 percent increase. However, the national average age of vehicles was 9.4 years in FY2006. Therefore, the average age of Virginia vehicles are 21 percent below the national average.

## INVESTMENT NEEDS AND FUNDING DEDICATED

### Rail

Virginia needs to invest in upgrades to the freight rail system infrastructure to accommodate the increasing levels of traffic. There are significant limitations throughout Virginia's railroad system that prevent the railroads from routing traffic over the primary corridors. According to the Association of American Railroads study released in September 2007, the most heavily used rail line in Virginia is the CSX north-south line, which combines freight and passenger movements. The CSX north-south line is the only line in Virginia's railroad system that is considered to be operating at Level of Service (LOS) D, near capacity. Other rail lines have significant unused or "latent" capacity which can be utilized if certain improvements are made. The most pressing rail infrastructure improvements where the investment of funds would yield significant results are:

- Adding track to reduce congestion and improve reliability
- Upgrade track speed, weight capacity, and clearances to reduce travel time, improve reliability and safety
- Upgrade tunnels to allow double stacking
- Improve track alignments to increase reliability and reduce accidents
- Improve short-haul rail to increase speed, capacity, and reliability.<sup>12</sup>

Four funding sources are specifically authorized to support Virginia's capital improvements on privately owned rail lines.<sup>13</sup>

1. The Rail Enhancement Fund – Established in 2005 to provide dedicated state funding for acquiring, leasing, and/or improving railways or railroad equipment, rolling stock, rights of way,

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<sup>12</sup> Virginia Statewide Multimodal Freight Study, Phase 1, Final Report, April 2008; Virginia Department of Transportation.

<sup>13</sup> Statewide Rail Plan, Commonwealth of Virginia, Working Draft; July 14, 2008; Virginia Department of Rail and Public Transportation.

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- or facilities for freight and/or passenger rail transportation. Source: a portion of the three percent vehicle rental tax and the interest earned on cash balances.
2. The Rail Preservation Fund – Established in 1991 to provide state financial support to preserve, continue, and increase the productivity, safety and efficiency of shortline railway transportation logistics. Source: \$3 million annual allocation of highway construction funds and the interest earned on cash balances.
  3. Capital Project Bonds – Established in 2007, includes a minimum of 4.3 percent of available bond funds specifically for rail transportation until a total of \$3 billion of authorized bonds are fully allocated in FY2018.
  4. The Rail Industrial Access Fund – Established in 1986 to provide financial support for projects that produce freight rail access to businesses in conjunction with the Virginia Economic Development Partnership, County and Municipal Economic Development Departments, railroads and private industry. Funding for this program is expected to average \$1.5 million per year for future years.

The DRPT 2008 Statewide Rail Resource Allocation Plan was developed to provide a clear vision and strategy to address the rail needs in the Commonwealth. The plan identifies several potential projects to address rail needs in Virginia. A Rail Action Plan was developed to provide funding strategies and detailed implementation plans.

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### RAIL PROGRAM REVENUE OUTLOOK

Fiscal Year	Rail Enhancement Estimated Revenue (\$ Million)	Rail Preservation Estimated Revenue (\$ Million)	Capital Project Bonds Estimated Revenue (\$ Million)	Rail Industrial Access Estimated Revenue (\$ Million)	Total (\$ Million)
2009	24.2	3.3	12.9	1.5	41.9
2010	25.0	3.3	12.9	1.5	42.7
2011	25.8	3.3	8.6	1.5	43.5
2012	26.7	3.3	12.9	1.5	44.4
2013	27.6	3.3	12.9	1.5	45.3
2014	28.6	3.3	12.9	1.5	46.3
2015	29.6	3.3	12.9	1.5	47.3
2016	30.6	3.3	12.9	1.5	48.3
2017	31.6	3.3	12.9	1.5	49.3
2018	32.7	3.3	12.9	1.5	46.1
2019	33.8	3.3	0	1.5	38.6
2020	35.0	3.3	0	1.5	39.8
2021	36.1	3.3	0	1.5	40.9
2022	37.4	3.3	0	1.5	42.2
2023	38.6	3.3	0	1.5	43.4
2024	40.0	3.3	0	1.5	44.8
2025	41.3	3.3	0	1.5	46.1
2026	42.7	3.3	0	1.5	47.5
2027	44.2	3.3	0	1.5	49.0
2028	45.7	3.3	0	1.5	50.5
2029	47.2	3.3	0	1.5	52.0
2030	48.8	3.3	0	1.5	53.6
2031	50.5	3.3	0	1.5	55.3
2032	52.2	3.3	0	1.5	57.0
2033	54.0	3.3	0	1.5	58.8
2034	55.8	3.3	0	1.5	60.6
2035	57.7	3.3	0	1.5	62.5
<b>Total</b>	<b>\$1,043.4</b>	<b>\$89.1</b>	<b>\$124.7</b>	<b>\$40.5</b>	<b>\$1,297.7</b>

### Transit

Virginia provides financial support for public transportation systems in the Commonwealth to support capital and operating expenses for transit systems. State funding is often used to help provide matching funds for federal grants from the Federal Transit Administration. DRPT is the lead state agency for supporting the Commonwealth’s transit systems. Local governments are typically the direct owners and operators of the transit systems and provide significant financial support. Transit increases access and mobility for Virginia residents by enabling more efficient use of the transportation network. The growing interest in transit will only increase the unmet needs. Therefore, a sustainable source of funding for new or expanded transit services is critical to the future success of rail transit in Virginia. The state should consider additional funding for fixed route transit providers where the population densities justify the investment. Additionally, the US Congress should authorize new federal surface transportation policy utilizing a needs-based approach to determine funding.

Three rail projects in Virginia currently receive both federal and state public transportation grants: VRE commuter rail, the Richmond Main Street Station, and Norfolk’s light rail.

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The 2005 ASCE Report Card for America's Infrastructure listed mass transit among the top three infrastructure concerns and it still is today. Investing in the expansion of rail transit will:

- Help relieve Virginia's congested urban roads
- Reduce personal vehicle travel miles
- Meet the needs of the growing state population.

### BASIS OF GRADE

#### Rail

It is difficult to determine the overall grade for the freight and passenger rail system because most of it is privately owned. The Virginia Department of Rail and Public Transportation (DRPT) as the leading state agency for rail (and transit), is responsible for providing transportation solutions and focusing on projects that deliver public benefits for the investment of public funds. DRPT has led some key recent accomplishments including the creation of the first dedicated source of rail funding – the Rail Enhancement Fund.

However, the current funding is not sufficient to meet the increasing demand for rail and passenger service or complete the much-needed rail infrastructure improvements and upgrades in the short term. Rail infrastructure projects are competing with other transportation projects for the limited public funds in the midst of an economic recession. Even with the recently passed 2009 Economic Stimulus Package, it will take years before the infrastructure capacity and upgrade needs are fully met.

The Virginia Section of ASCE gives Virginia's freight and passenger railroads a grade of **D**.

#### Transit

Virginia has shown improvement across all performance indicators from FY2002 to FY2006 except for farebox recovery, which remained flat, as shown in table following table.

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Table 1: Trends for Transit Performance Indicators in Virginia

Performance Indicator	Trend
Ridership	↑
Total Transit Miles Operated	↑
System Efficiency	↑
System Effectiveness	↑
State Government Funding	↑
Local Government Funding	↑
Farebox Recovery	—
Average Age of Vehicles	↓

In spite of this significant achievement the funding levels for all modes of transit needs to grow in order to meet the demands on the transit infrastructure.

The Virginia Section of ASCE gives transit in Virginia a grade of **C**.

## CONCLUSIONS AND RECOMMENDATIONS

### Rail

Given the current funding levels for freight and passenger rail, it will take years for the capacity improvements and infrastructure upgrades to catch up with the need, especially given that the increasing demands on the shared rail system. The demand for rail services continues to outpace state resources. Rail tracks are privately owned by freight companies, which is a challenge because of the responsibility to return shareholder value. In short there is a competing and contradictory demand for the limited resource.

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The recommendations of the Virginia Section of ASCE are:

- Maintain and improve freight system performance;
- Make the most efficient use of state resources, public-private partnerships, and innovation;
- Continue to develop a multi-modal approach to freight and passenger rail planning and programming;
- Consider appropriate increases of fares for passenger rail service;
- Increase state funding to move forward on the eight priority projects recommended by the DRPT in the 2008 Statewide Rail Resource Allocation Plan.

### **Transit**

Although the results of the 2007 Virginia Transit Performance Report indicate that Virginia's transit operators are performing well when compared with the national average and neighboring states, the continued growth in transit ridership the Commonwealth is experiencing and the projected population growth emphasizes the need for increased funding for transit. Transit services have become an essential part of the transportation infrastructure. As access to transit increases, mobility for transit customers will increase and reduce the burden on the Virginia's overcrowded highways and roads and reduce the dependence on fossil fuels.

Virginia Section of ASCE makes the following recommendations for transit:

- Continue to identify ways to maximize performance of transit service by increasing the performance indicators: ridership, vehicle revenue miles, system efficiency, and system effectiveness;
- Provide additional state and local funding to offset operating and capital costs for fixed route transit where population densities merit;
- Consider increasing fare box revenues for all modes of transit as appropriate.
- Replace aging transit vehicles to lower the average vehicle age.
- Implement a Federal funding framework for high speed rail as soon as possible to improve passenger rail service.