



# **Existing Transportation Infrastructure**

## **Appropriation Act Item 444 B. (Special Session I, 2006)**

**Report to the Governor, General Assembly of Virginia, and Commonwealth  
Transportation Board**

Virginia Department of Transportation  
1401 East Broad Street  
Richmond, Virginia 23219

**November 2006**





# COMMONWEALTH of VIRGINIA

DEPARTMENT OF TRANSPORTATION  
1401 EAST BROAD STREET  
RICHMOND, VIRGINIA 23219-2000

David S. Ekern, P.E.  
COMMISSIONER

November 30, 2006

The Honorable Timothy M. Kaine  
Members of the General Assembly  
Members of the Commonwealth Transportation Board

Dear Ladies and Gentlemen:

The Virginia Department of Transportation (VDOT) was directed through Item 444 B of the 2006 Appropriation Act to develop a report on the condition of the existing transportation infrastructure and proposed measures to improve the operations of the transportation system and the interstate, primary and secondary maintenance services.

The report includes information on the following areas as requested by the legislation:

- Condition of infrastructure and initiatives to improve operations;
- General Asset Management Methodology with additional details to follow by separate report in December;
- Outsourcing, downsizing, and privatization as it relates to the infrastructure and operations;
- Major bridge projects; and
- Rail crossings.

Through VDOT's Asset Management Program, condition of the transportation assets is regularly assessed in order to track system performance and estimate needs for routine, preventative and restorative maintenance work. VDOT collects detailed condition data for its major assets, specifically pavements and bridges.

VDOT's Asset Management Methodology involves a Needs-Based Budgeting (NBB) process, which systematically identifies asset maintenance needs based on asset inventory and condition data. This process is used to develop the annual budget request, and to guide the allocation of available resources across maintenance activities and districts. A detailed report will be provided on the Asset Management Methodology by December 31, 2006 as requested by Item 444 A4 in the 2006 Appropriation Act.

VDOT has proactively addressed a significant number of projects and initiatives for outsourcing, privatization, and downsizing. A significant maintenance outsourcing project includes Turnkey Asset Maintenance Service (TAMS) contracts for interstate maintenance. Downsizing programs include initiatives involving full and partial devolution. A comprehensive report on outsourcing, downsizing, and privatization will be addressed in a separate report issued in accordance with Chapter 420 of the 2006 Acts of Assembly.

The Honorable Timothy M. Kaine  
Members of the General Assembly  
Members of the Commonwealth Transportation Board  
November 30, 2006  
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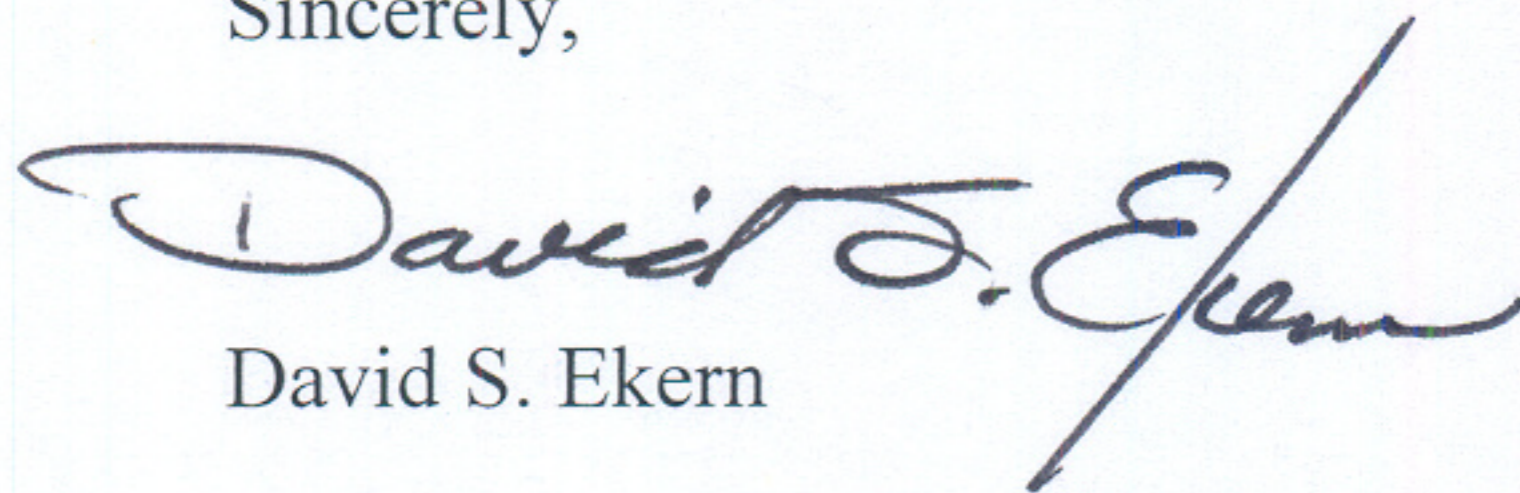
Comprehensive information and funding data for major bridge projects, which are currently programmed and/or planned, are identified in this report, including detailed information on:

- VDOT Structures Needing Repair/Rehabilitation
- Major Bridge Funding, FY 2007-FY2012
- State Funded Maintenance and Rehabilitation Projects
- Federal Funded Maintenance and Rehabilitation Projects

As of September 2006, there are 2,024 public at-grade crossings in the Commonwealth with 453 of these crossings in the metropolitan areas of Hampton Roads, Richmond, and Northern Virginia. Using the threshold of traffic counts, 314 of these rail crossings should be assessed. Thirty-six (36) of these rail crossings have a high Fatal Accident Prediction factor.

The attached performance report provides information on the condition of existing transportation infrastructure and measures to improve operations of the transportation system. If you have questions or need additional information, please let me know.

Sincerely,

A handwritten signature in cursive script that reads "David S. Ekern". The signature is written in black ink and is positioned to the right of the typed name.

David S. Ekern

Attachment

cc: The Honorable Pierce R. Homer



**2006 Virginia General Assembly  
HB-5002, Items 444 B**

**Legislative Report on VDOT's**

- **Condition of the Transportation Infrastructure and Initiatives to Improve Operations**
- **Outsourcing, Privatization and Downsizing**
- **Major Bridge Maintenance and Replacement**
- **Metropolitan Rail Crossings**

**Virginia Department of Transportation  
1401 East Broad Street  
Richmond, Virginia 23219**

**November 30, 2006**



## I. Preface

The 2006 Appropriation Act , Items 444.A4, 444.A5, and 444.B.1-4 required the Virginia Department of Transportation (VDOT) to develop and submit Highway System Maintenance documents to the General Assembly (see Appendix A). These documents included five major multi-functional programs.

These items in HB 5002, Item 444, require three (3) different due dates.

- Asset Management Methodology. VDOT shall report to the General Assembly by **December 31, 2006**, on progress made and future plans to incorporate principles of asset management into its maintenance and operations practices. This report will be submitted separately.
- Six-Year Maintenance and Operations Program. VDOT shall develop and submit to the General Assembly a six-year maintenance and operations program no later than **July 1, 2007**, to provide greater transparency, predictability and equity of funding, and stability of investment over time. This report will be submitted separately.
- Transportation Infrastructure Conditions and Measures. By **November 30** of each year, VDOT shall submit to the Governor, General Assembly, and the Commonwealth Transportation Board a report on the condition of existing transportation infrastructure and proposed measures to improve the operations of the transportation system and the service. This report will include systematic mechanisms to evaluate maintenance activities; all outsourcing, privatizing and downsizing initiatives; major bridge projects; and railroad grade crossings.

This report will identify information and data governing Transportation Infrastructure Conditions and Measures.





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## **II. Executive Summary**

### **Item 444 B – Condition of the Infrastructure and Initiatives to Improve Operations**

Virginia has the third largest state-maintained highway system in the country (behind North Carolina and Texas), with about 57,000 miles of roads and over 19,000 structures (bridges and large culverts). Through VDOT's Asset Management Program, asset condition is regularly assessed in order to track system performance and estimate needs for routine, preventative and restorative maintenance work. VDOT collects detailed condition data for its major assets – pavements and bridges. VDOT's Random Condition Assessment (RCA) surveys collect data on a sample basis for an additional eight traffic and drainage assets (signs, pavement markings, guardrail, guardrail terminals, pipes, paved and unpaved ditches, and unpaved shoulders.)

VDOT's state of assets reported here presents the most recent condition information for pavements, structures, and the eight assets collected in the RCA. Collectively, these ten assets account for roughly 80% of VDOT's asset maintenance expenditures on Interstate, Primary and Secondary systems.

The 2006 pavement condition survey found that 16.1% of the statewide pavement lane miles are deficient, on the interstate and primary system. This is within the established performance target to keep the percent of deficient pavements below 18%.

The latest (2006) structure inspection data shows that 38.5% of bridges statewide require repair or rehabilitation. This is within the statewide performance target of 40%.

The percentage of the inventory requiring work on other assets is quite high. For example, 74% of interstate guardrail needs work, 52% of primary pavement markings need work, and 25% of secondary pipes need work. The detailed percentages of eight traffic and drainage assets are identified in the details of this report in Table 1.

### **Item 444 B1 – Asset Management Methodology**

VDOT's Asset Management Methodology involves a Needs-Based Budgeting (NBB) process, which systematically identifies asset maintenance needs based on asset inventory and condition data. This process is used to develop the annual budget request, and to guide the allocation of available resources across maintenance activities and districts. A detailed report will be provided on the Asset Management Methodology by December 31, 2006 as requested by Item 444 A4 in the 2006 Appropriation Act.

### **Item 444 B2 – Outsourcing, Downsizing, and Privatization**

VDOT has proactively addressed a significant number of projects and initiatives for outsourcing, privatization, and downsizing. A significant maintenance outsourcing project includes Turnkey Asset Maintenance Service (TAMS) contracts for interstate maintenance. Downsizing programs include initiatives involving full and partial devolution. A comprehensive report on outsourcing, downsizing and privatization will be addressed in a separate report issued by VDOT's Management Services Division.

### **Item 444 B3 - Major Bridge Projects**

Comprehensive information and funding data for major bridge projects, which are currently programmed and/or planned, are identified in this report, including detailed information on:

- VDOT Structures Needing Repair/Rehabilitation
- Major Bridge Funding, FY 2007-FY2012
- State Funded Maintenance and Rehabilitation Projects
- Federal Funded Maintenance and Rehabilitation Projects

### **Item 444 B4 - Rail Crossings**

As of September 2006, there are 2,024 public at-grade crossings in the Commonwealth with 453 of these crossings in the metropolitan areas of Hampton Roads, Richmond, and Northern Virginia. Using the threshold of traffic counts, 314 of these rail crossings should be assessed. Thirty-six (36) of these rail crossings have a high Fatal Accident Prediction factor.

Details for these legislation components are documented on the following pages.

### **III. Item 444 B – Condition of the Transportation Infrastructure and Initiatives to Improve Operations**

The 2006 Appropriation Act, Items 444 B1-4, established a requirement for VDOT to submit an annual performance report to the Governor, General Assembly and Commonwealth Transportation Board by November 30 of each year. This performance report must include “a summary of the condition of existing transportation infrastructure and proposed measures to improve system operations.” The following Asset Condition Summary 2006 report was prepared to address the requirement for a summary of transportation infrastructure condition.

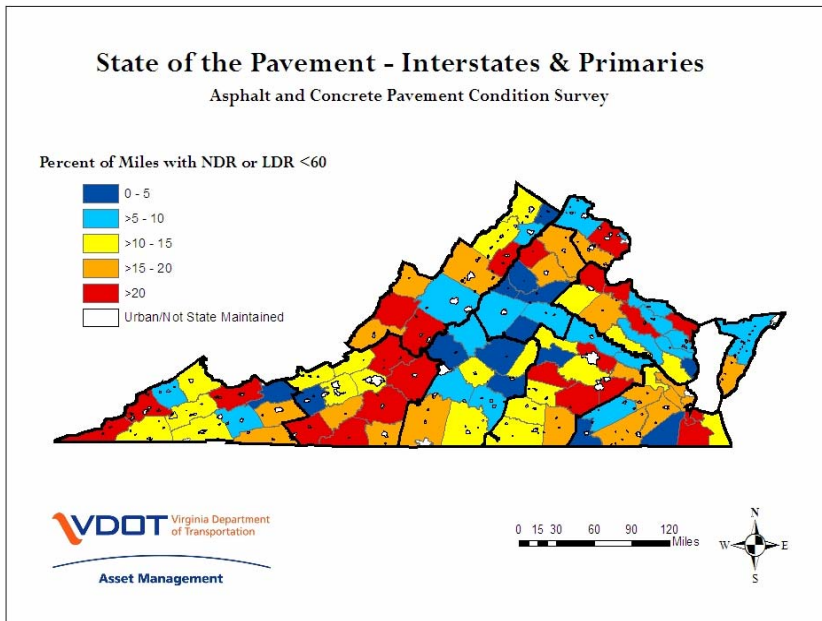
Virginia has the third largest state-maintained highway system in the country (behind North Carolina and Texas), with about 57,000 miles of roads and over 19,000 structures (bridges and large culverts). Through VDOT’s Asset Management Program, asset condition is regularly assessed in order to track system performance and estimate needs for routine, preventative and restorative maintenance work. VDOT collects detailed condition data for its major assets – pavements and bridges. VDOT’s Random Condition Assessment (RCA) surveys collect data on a sample basis for an additional eight traffic and drainage assets (signs, pavement markings, guardrail, guardrail terminals, pipes, paved and unpaved ditches, and unpaved shoulders.)

This report presents the most recent condition information for pavements, structures, and the eight assets collected in the RCA. Collectively, these ten assets account for roughly 80% of VDOT’s asset maintenance expenditures on Interstate, Primary and Secondary systems. Appendix C provides detailed charts for each of the assets and the condition of those assets.

#### **PAVEMENTS**

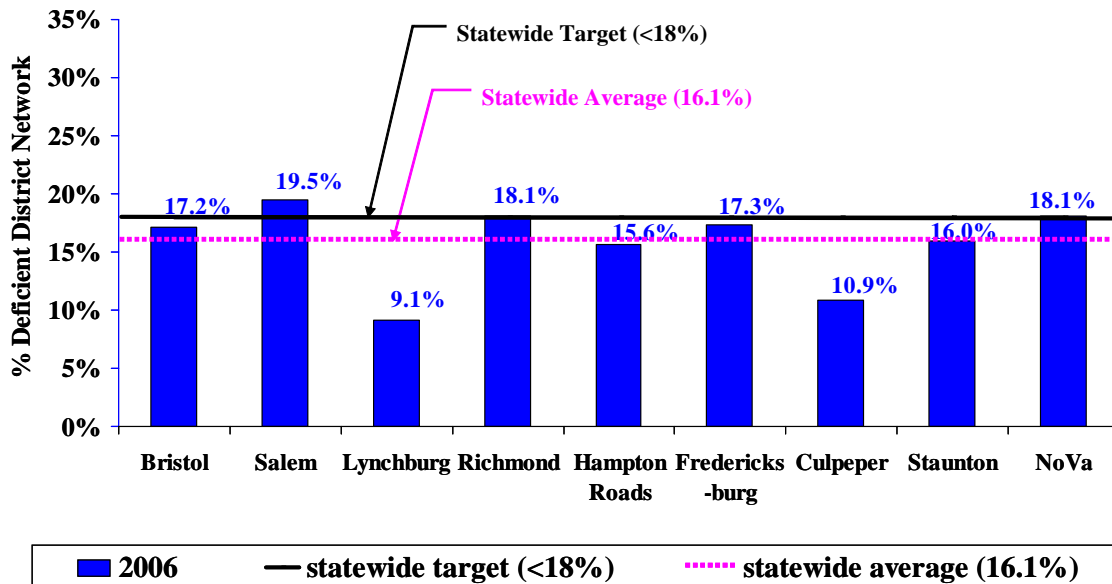
Pavement condition data are collected annually for 100% of Interstate and Primary pavements. Secondary pavements are surveyed on a sample basis – the 2005 survey covered 10% of the network. Detailed pavement condition information observed in the surveys is summarized into a condition index that range from 0 to 100, where 100 represents the best condition. Pavements with a condition index below 60 are considered to be in a deficient condition, which means that they require resurfacing, restorative maintenance, or rehabilitation.

The state map below shows the concentration of deficient pavements by county.



The 2006 pavement condition survey found that 16.1% of the statewide pavement lane miles are deficient, on the interstate and primary system. This is within the established target to keep the percent of deficient pavements below 18%. Figure 1 shows how pavement condition varies across the state – for example, Lynchburg and Culpeper districts have less than 11% deficient pavement lane miles – well below the statewide average.

**Figure 1. Percent deficient pavement by district.**



VDOT categorizes the maintenance activities performed on pavements as:

- Preventive Maintenance (PM)
- Corrective Maintenance (CM)
- Restorative Maintenance (RM)
- Major Rehabilitation (RC)

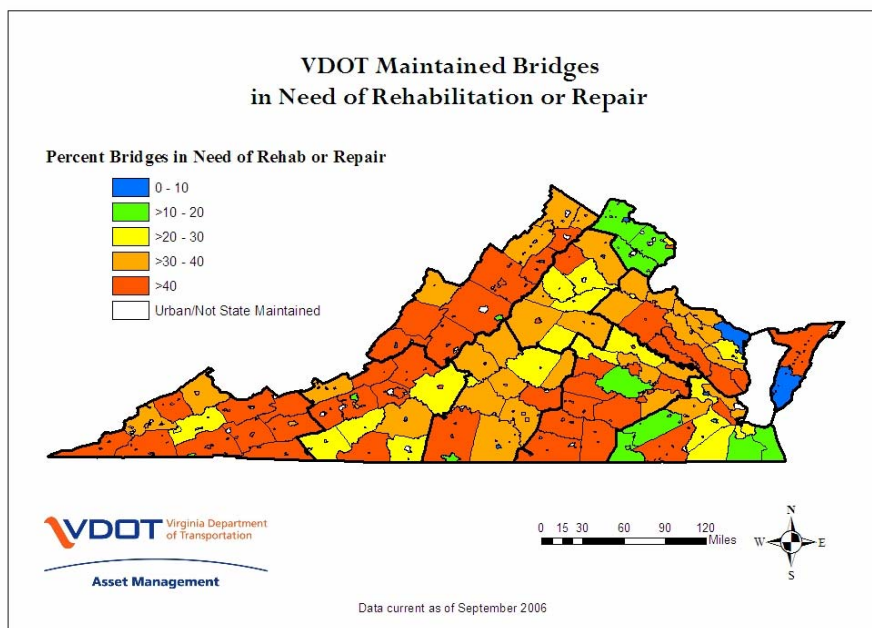
Pavement inventory and needs for maintenance by categories are shown in detail in Appendices C-1 through C-3, which illustrate the VDOT-maintained hard-surfaced pavement inventory by district and by system and the required maintenance needs based on the condition data collected in 2006. Appendix C-4 summarizes the hard surfaced pavement lane miles maintained by VDOT and the maintenance needs by system.

## STRUCTURES

In accordance with the Code of Federal Regulations, VDOT inspects bridges and culverts that are on public roadways and exceed 20 feet in length along the centerline. The structures receive a detailed inspection at regular intervals not exceeding 24 months. VDOT also conducts safety inspections for bridges 20 feet or less in length and large culverts on a 48 month cycle.

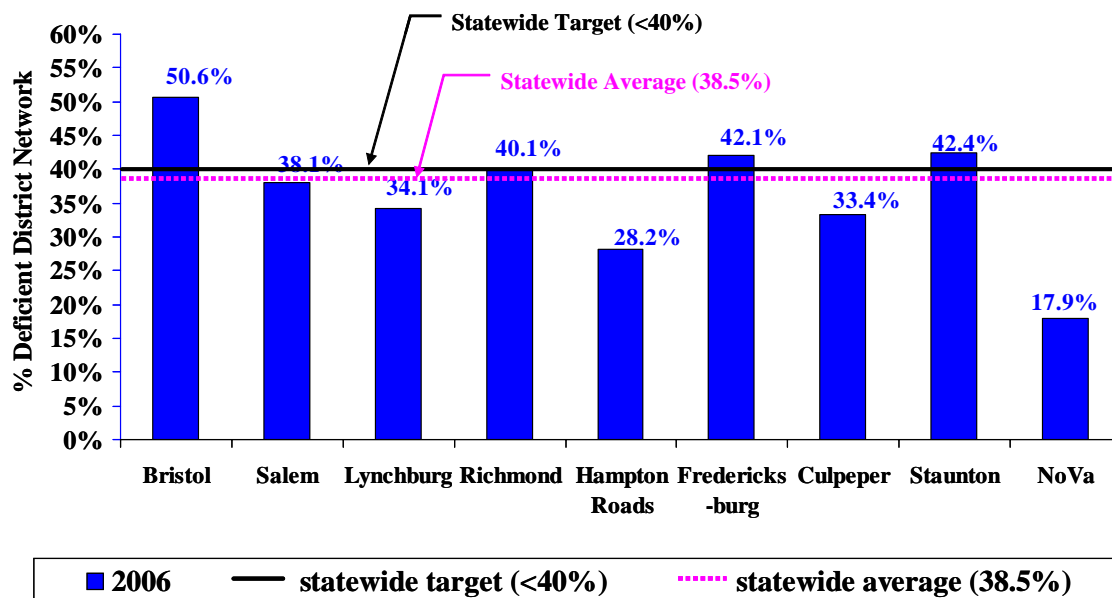
Inspectors use condition ratings to describe the existing, in-place structure as compared to the as-built condition. The physical condition of the deck, superstructure, substructure, or culvert is evaluated and assigned a general condition rating (GCR) based on a scale of 0-9. Nine indicates the best condition and zero indicates the worst condition. A structure with a condition rating less than 6 for deck, superstructure, substructure or culvert typically requires repair or rehabilitation work.

The state map below shows the concentration of bridges in need of repair or rehabilitation by county.



As shown in Figure 2, the latest (2006) structure inspection data shows that 38.5% of bridges statewide require repair or rehabilitation. This is within the statewide target of 40%. As is the case with pavements, there are significant variations across districts in structure condition.

**Figure 2. Percent of bridges needing repair or rehabilitation by district.**



Appendices C-5 through C-7 illustrate the VDOT-maintained bridge inventory and the number of bridges needing repair or rehabilitation by district and by system. Appendix C-8 summarizes this information for the entire state by system. Appendices C-9 and C-10 show the numbers of 25 and 50 years old bridges maintained by VDOT in different districts. Appendix C-11 shows the number of bridges posted for load by district and by system.

## OTHER ASSETS

Condition of selected drainage and traffic assets is assessed via random sampling. Data are collected for a total of 10,700 tenth-mile roadway sections – with a statistical sampling approach designed to achieve an acceptable level of accuracy and precision for estimating maintenance needs within each district by system (Interstate, Primary, Secondary).

The RCA survey identifies the type and extent of damage or deterioration to assets that can be related to the need for maintenance actions. For example, inspections of drainage pipes note conditions such as erosion, clogging, and structural soundness. Inspections of signs note damage to posts and panels, as well as obstructions that impact sign visibility. Inspection of guardrails record damage to rails and posts, and also includes assessment of where current federal safety standards are met. The RCA data are used to estimate the quantity of assets that require different types of maintenance work. This is done through application of well-documented and agreed upon business rules.

The estimated percentage of assets requiring some kind of maintenance work (including ordinary maintenance, corrective maintenance and replacement) based on the analysis of RCA data



collected in 2005 is displayed in Table 1. This metric was selected in order to provide a high-level, common yardstick of condition across these eight asset types. It can be seen that for two of these assets (guardrail and pavement markings), the percentage of the inventory requiring work is quite high. The high figure for guardrail is related to the fact that over 50% of the guardrails surveyed did not meet the current federal standards. (It should be noted that current VDOT policy is to replace substandard guardrails when they are damaged, when substandard guardrail is on a Federal maintenance contract, or when the guardrail is within the limits of a construction project.) For pavement markings, the high percentage is related to the short lifecycle for latex paint – current maintenance practice is to replace painted pavement markings every two years.

**Table 1 - Percent of Assets Needing Work by Roadway System**

Asset	Percent Needing Work			
	Interstate	Primary	Secondary	Total
Guardrail	74.0%	59.7%	61.1%	64.9%
Pipe	10.4%	24.7%	25.0%	24.5%
Unpaved Ditch	12.1%	10.5%	19.9%	18.3%
Guardrail End	41.1%	37.5%	32.2%	36.1%
Pavement Marking	15.3%	51.6%	73.0%	52.8%
Unpaved Shoulder	--	13.3%	12.1%	12.3%
Paved Ditch	17.4%	15.4%	15.2%	15.8%
Sign	9.0%	14.9%	17.4%	15.8%

Appendices C-12 through C-14 illustrate the estimated VDOT-maintained guardrail inventory and the replacement needs by district and by system. Appendix C-15 summarizes this information for the entire state by system.

## **Item 444 B1 – Asset Management Methodology**

VDOT's Asset Management Methodology involves a Needs-Based Budgeting (NBB) process, which systematically identifies asset maintenance needs based on asset inventory and condition data. This process is used to develop the annual budget request, and to guide the allocation of available resources across maintenance activities and districts.

VDOT's Asset Management Methodology includes the Asset Management System (AMS), which integrates systematic and economic decision tools that will enable VDOT to more efficiently and effectively manage roadway assets. AMS includes an Inventory Module, RCA Module, Planning Module, Work Accomplishments Module, and a Decision Tree Builder.

Pavement condition data is collected on an annual basis for 100% of the interstate and primary networks. Data for the secondary network has been collected on a sample basis; this method has recently been shifted to provide complete coverage of the secondary network every five years. The actual conditions of pavements are compared to a performance target.

Each structure (bridges and large culverts) is inspected at regular intervals by certified Bridge Safety Inspectors. The inspection quantifies the condition of the structure and provides the basis for asset preservation analysis. The actual conditions of structures are compared to a performance target.

VDOT's Random Condition Assessment (RCA) surveys collect data on a sample basis for an additional eight traffic and drainage assets (signs, pavement markings, guardrail, guardrail terminals, pipes, paved and unpaved ditches, and unpaved shoulders.) The RCA survey identifies the type and extent of damage or deterioration to assets that can be related to the need for maintenance actions.

Other maintenance needs such as traffic signals, overhead signs, tunnels, rest areas, ferries, smart traffic devices, movable bridges, and paved shoulders, are modeled outside of the current AMS. Needs assessment for these assets draws upon a variety of specialized asset inventories, together with generally accepted life cycle assumptions and first-hand knowledge of asset condition and serviceability. A detailed report will be provided on the Asset Management Methodology by December 31, 2006 as requested by Item 444 A4 in the 2006 Appropriation Act.

## Item 444 B2 – Outsourcing, Privatization and Downsizing

Two companion bills to HB 5002 (HB 676 and HB 544) also required the Commonwealth Transportation Commissioner to report on certain accomplishments, actions and initiatives involving outsourcing, privatization, and downsizing. During FY06, 73% of VDOT’s expenditures of \$2.9 billion went to the private sector or to localities/other agencies. VDOT continues to address more and more of its needs and delivery of services through outsourcing. In FY06, VDOT outsourced approximately \$742 million for asset management, which equates to 43% of VDOT’s total private sector spending.

### Outsourcing

Outsourcing is defined as a method of contracting with the private sector to provide a service or good. The government retains ownership and control over operations.

VDOT lets contracts at the statewide, district, region, and residency levels. Due to the large number and variety of contracts let by VDOT, this report summarizes VDOT’s outsourcing activity using standard categories established by the Department of Accounts (DOA).

This report is based on the integration of VDOT financial data with specific activity. VDOT’s financial data is organized by account code within its Financial Management System (FMSII). DOA defines the account codes used and these codes form the guideline which VDOT uses to record financial activity. Within FMSII, there are 11 categories that define general areas of expenditure. Within each of these categories expenditures are broken down further into specific areas which allow detailed allocation.

The following coded expenditures include all areas of VDOT spending. Although all areas of spending indicate outsourcing of some form, only those codes of categories which are considered as true outsourcing will be used to provide report data. Those account codes are: 1200, 1300, 1500, 2100, 2200 and 2300.

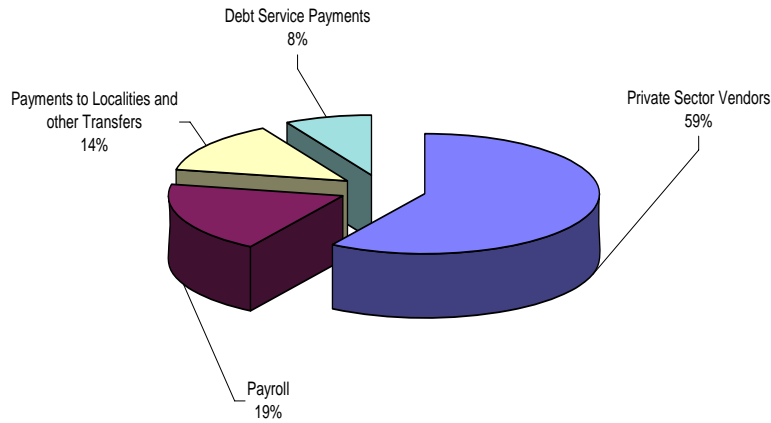
<i>CODE</i>	<i>EXPENDITURE DEFINITION</i>
1100	Personal Services
<b>1200</b>	<b>Contractual Services</b>
<b>1300</b>	<b>Supplies &amp; Materials</b>
1400	Transfer Payments
<b>1500</b>	<b>Continuous Charges</b>
<b>2100</b>	<b>Property &amp; Improvements</b>
<b>2200</b>	<b>Equipment</b>
<b>2300</b>	<b>Plant &amp; Improvements</b>
3100	Obligations

This section of the report will provide each of these categories in two levels: the first level being at the overall category and the second being the detailed breakdown within each category. A summary of outsourcing activity by account follows.

## **Fiscal Year 2006 Expenditures**

During fiscal year 2006, VDOT had expenditures totaling \$2.9 billion. A breakdown of these expenditures is shown below.

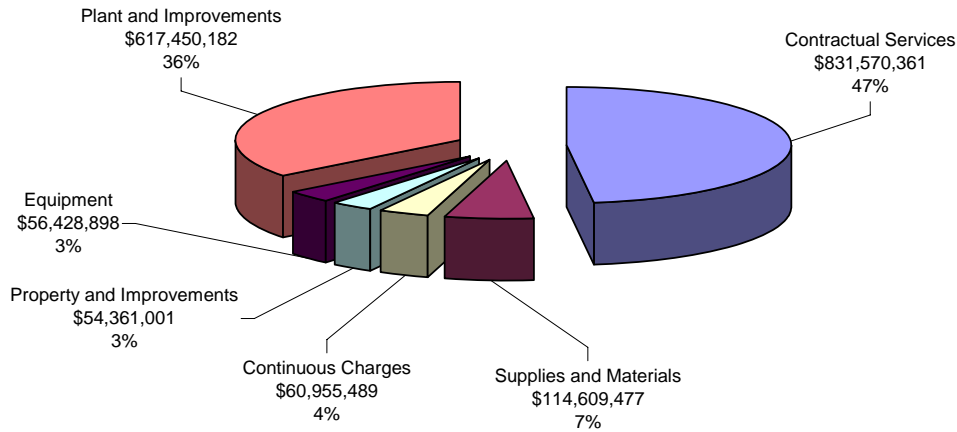
**FY 2006 VDOT Spending**



VDOT spent \$1.735 billion dollars in fiscal year 2006 with private vendors. These expenditures can be further broken down into six main categories as defined by DOA.

<b>Contractual Services</b>	\$ 831,570,361
<b>Supplies and Materials</b>	\$ 114,609,477
<b>Continuous Charges</b>	\$ 60,955,489
<b>Property and Improvements</b>	\$ 54,361,001
<b>Equipment</b>	\$ 56,428,898
<b>Plant and Improvements</b>	\$ 617,450,182
<b>Total</b>	<b><u>\$1,735,375,408</u></b>

## FY 2006 VDOT Private Sector Spending



A detailed explanation and breakdown of each of these six categories follows.

### Contractual Services

DOA defines contractual services as expenditures for communication services, employee development services, health services, management and informational services, repair and maintenance services, support services, technical services, and transportation services.

<b>Communication Services</b>	\$ 18,410,802
<b>Management and Information Services</b>	\$ 63,842,590
<b>Repair and Maintenance Services</b>	\$ 483,149,291
<b>Support Services</b>	\$ 222,606,025
<b>Technical Services</b>	\$ 25,101,077
<b>All Other Contractual Services</b>	\$ 18,460,576
<b>Total</b>	<u>\$ 831,570,361</u>

Communication services and technical services include services provided by VITA. Management and information services include audit and fiscal services. Repair and maintenance services includes custodial services, as well as outsourced highway repair and maintenance services such as guardrail repair, mowing, ditch cleaning, and sign maintenance. Support service expenditures include all outsourced design work, toll collection labor, and other skilled temporary labor services.

### Supplies and Materials

DOA defines supplies and materials as expenditures for administrative supplies, energy supplies, manufacturing and merchandising supplies, medical and laboratory supplies, repair and maintenance supplies, residential supplies, and specified use supplies.

<b>Energy Supplies</b>	\$ 26,476,862
<b>Repair and Maintenance Supplies</b>	\$ 75,257,674
<b>Specific Use Supplies</b>	\$ 8,925,186
<b>All Other Supplies</b>	\$ 3,949,755
<b>Total</b>	<u>\$ 114,609,477</u>

Supplies and materials may include any building, custodial, electrical, mechanical, or vehicle supplies, as well as coal, gas, gasoline, oil, and steam used by the agency. It also includes highway repair and maintenance items such as stone, sand, and marking paint. Specific use supplies include materials for emergency operations such as salt and abrasives.

**Continuous Charges**

DOA defines continuous charges as expenditures for insurance-fixed assets, insurance-operations, capital and operating lease payments, installment purchase and service charges.

<b>Insurance-Fixed Assets</b>	\$ 1,205,006
<b>Operating Lease Payments</b>	\$ 22,452,654
<b>Service Charges</b>	\$ 25,748,058
<b>Insurance-Operations</b>	\$ 10,856,645
<b>All Other</b>	\$ 693,126
<b>Total</b>	<u>\$ 60,955,489</u>

Expenditures in the services charges category include utility related charges such as electricity, refuse, and water and sewer bills.

**Property and Improvements**

DOA defines property and improvements as expenditures for property and improvements acquisition, natural resources acquisition, and site development.

<b>Acquisition of Property and Improvements</b>	\$ 48,574,563
<b>Site Development</b>	\$ 5,676,346
<b>All Other</b>	\$ 110,091
<b>Total</b>	<u>\$ 54,361,000</u>

## Equipment

DOA defines equipment as expenditures for computer, educational, cultural, electronic, photographic, medical, laboratory, motorized, office, specific use, and stationary equipment.

<b>Computer Hardware and Software</b>	\$ 3,163,048
<b>Electronic and Photographic Equipment</b>	\$ 6,720,278
<b>Motorized Equipment</b>	\$ 31,852,329
<b>Specific Use Equipment</b>	\$ 5,140,432
<b>Stationary Equipment</b>	\$ 5,594,847
<b>All Other</b>	\$ 3,957,964
<b>Total</b>	<u>\$ 56,428,898</u>

## Plant and Improvements

DOA defines plant and improvement as expenditures for acquisition and construction of plant and improvements. These are VDOT's construction expenditures.

<b>Total</b>	<u>\$ 617,450,182</u>
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Expenditures within this group include road and bridge construction

## Intelligent Transportation Systems

Intelligent Transportation System functions and services incorporate all the areas of "Smart Traffic Centers" to aid and support further operational monitoring, control, reporting and response on the areas covered by the respective STC (Smart Traffic Center).

VDOT's Intelligent Transportation System is operated statewide by five System Operations Regions. These five regions are: Southwestern, Northwestern, Northern, Central and Eastern each of which contain partially or completely an existing VDOT district. Each System Operational Region contains a Smart Traffic Center (STC).

The following table shows the approximate fiscal year 2006 outsourced expenditures for the five regions.

<b>Systems Operations Region</b>	Southwestern	Northwestern	Northern	Central	<i>Eastern</i>
<b>Expenditure</b>	\$2,062,948	\$1,960,000	\$22,703,114	\$403,615	\$11,555,740

Along with each regions expenditure, there exist some centrally administrated outsourcing efforts. These centrally administered expenditures consist of statewide effects directed at all

STCs. The approximate total for fiscal year 2006 was \$5,760,000 and covers functions and services such as cameras, 511 Traveler Information System, Roadway Weather Information Systems and technical on-call response.

### **Asset Management**

Asset Management, within VDOT, is defined as the systematic process of operating and maintaining the state system of highways by combining engineering practices and analysis with sound business practices to achieve cost-effective outcomes.

The function of asset management is to maintain the roads and is becoming a larger portion of spending each year. In fiscal year 2006, maintenance spending was approximately 25% of total expenditures.

VDOT is constantly changing from an internal to an outsourced workforce. In fiscal year 2006, VDOT outsourced roughly \$742 million for asset management which equates to 43% of VDOT's total private sector spending.

### **Turnkey Asset Maintenance Services (TAMS)**

The 2006 General Assembly passed a law requiring all interstate maintenance to be outsourced by July 2009. VDOT already has outsourced 77 percent of interstate maintenance expenditures. Seven contracts are planned to outsource all of Virginia's interstate maintenance by July 1, 2009. The new contracts will be different from those previously used to outsource maintenance. In the new contracts, called Turnkey Asset Maintenance Services (TAMS), VDOT will maintain control of the pavement and bridge rehabilitation and reconstruction work by bidding it on a project-by-project basis.

TAMS contractors will be primarily responsible for roadside work, incident management, snow removal, emergency response and incidental repair work, such as pothole repair. The first of these contracts is already in place on I-64 from Richmond to the Hampton Roads Bridge-Tunnel. The Commonwealth Transportation Board awarded the second contract on July 20, 2006 on I-64 to extend from Route 288 west of Richmond to the I-81 interchange in Augusta County. By July 1, 2007, VDOT will outsource all interstate mileage using TAMS contracts in five districts: Richmond, Hampton Roads, Culpeper, Salem, and Bristol. By July 1, 2008, Virginia's Staunton, Fredericksburg, and Northern Virginia districts will outsource their interstate systems with TAMS contracts. VDOT's remaining district, Lynchburg, does not contain interstate roads.

Concurrent with this timeline, VDOT will economize by consolidating facilities, equipment, and overhead that are currently associated with maintaining the interstate system. VDOT will look at a general consolidation of the area headquarters, moving toward more streamlined operations.



## **Fiscal Year 2007 Outsourcing**

Starting in fiscal year 2007, all outsourcing initiatives will be evaluated by a central outsourcing committee, which will make a recommendation to the Commonwealth Transportation Commissioner. Candidate outsourcing proposals will be evaluated on, among other criteria, the cost-benefit to VDOT and the adverse impact on protected classes of employees. Outsourcing candidates include, but are not limited to:

- Equipment Repair and Maintenance
- Primary and Secondary System maintenance (already partially outsourced)
- Safety Service Patrols (already partially outsourced)
- Sign Production
- Smart Traffic Centers (already partially outsourced)
- Special Facilities
- Surplus Equipment Auctions
- Toll Collection Facilities
- Records Retention

A decision will be made during fiscal year 2007 and fiscal year 2008 as to whether or not these candidates will be outsourced. The cost of outsourcing any work will be paid for by reducing direct and overhead costs.

## **Downsizing**

Downsizing is defined as a company's reduction in the number of employees, number of bureaucratic levels or overall size in an attempt to increase efficiency and profitability. VDOT can downsize four different ways:

1. Create efficiencies through business reengineering
2. Outsource or privatize functions previously performed in-house
3. Devolve service delivery responsibilities to localities
4. Lower the level of service provided to customers
5. Reduce or eliminate products and services to be no longer provided.

In fiscal year 2006, VDOT reduced its deployed Maximum Employment Level (MEL) from 10,320 to 9,822 through a concentrated effort to reduce the number of positions deployed by 5%. Strength (the number of positions filled) was reduced from 9,130 to 9,089. In the first three months of fiscal year 2007, VDOT's strength has fallen to 8,908. Made primarily through attrition, these reductions were made to reduce the size of VDOT on the whole. The Fiscal Year 2007 Business Plan lays a path that shows how VDOT plans to streamline its business to become a more nimble agency and better provide services. As a result, it anticipates that the number of VDOT employees needed to complete the mission will decrease. A copy of the Fiscal Year 2007 Business Plan is included in Appendix B.

### **Business Re-engineering**

The business plan focuses on business re-engineering as a way to primarily increase the level of service VDOT provides. The focus is process improvement and process efficiency vs. job elimination. However, the changing nature of the program will have an impact on administration staffing, both in the central office and the field. As the construction program slows, VDOT will have fewer projects to finance, design, acquire right-of-way, and construct. During fiscal year 2007, VDOT will examine the impact of this shift on staffing.

### **Outsourcing and privatizing functions previously performed in-house**

This report has already outlined the functions VDOT currently outsources and what VDOT plans to outsource this fiscal year. Most of this work has been done by contractors for some time and will not result in any new staffing cuts. However, the Turnkey Assets Management System (TAMS) initiative is new. VDOT plans to eliminate 175 positions in the area of interstate maintenance as TAMS contracts are let. VDOT is also reducing its overhead associated with those positions by reducing the administrative budget.

### **Devolve service delivery responsibilities to localities**

VDOT may also devolve its responsibility for the secondary system to localities. Additionally, VDOT has several programs that enable localities to administer part of their construction programs.

- **Full Devolution:** In FY06, VDOT completed devolution of Suffolk's secondary system to the local government. This resulted in the closure of the Suffolk Residency and the reduction of 42 positions. Spotsylvania and James City Counties are currently working with VDOT to determine if they wish to pursue full devolution of their transportation program.
- **Partial Devolution:** The General Assembly has given localities the option to take greater control of their construction dollars through initiatives such as the Local Partnership and Urban Construction Initiatives. While these initiatives have enabled localities to experiment with administering their own construction projects, they have not significantly reduced VDOT's workload to the point of downsizing.

During fiscal year 2007, VDOT will develop a plan for pursuing more devolution strategies. As of now, devolution is an option for localities. Ultimately, each locality has to decide if it wants to be responsible for delivering transportation services.

## **Item 444 B3 – Major Bridge Maintenance and Replacement Projects**

VDOT maintains 19,276 bridges and large culverts. All bridges regardless of their lengths and culverts having an opening of 36 square feet or greater are inventoried and inspected on regular basis. The inventory and inspections are performed by qualified inspectors in accordance with the National Bridge Inventory (NBI), federal and state policies, and law.

**Major bridge project** is based on the overall scope of work and meets at least one of the following criteria:

- Requires a complete bridge replacement.
- Requires major rehabilitation of a bridge including strengthening and widening; bridge deck and bridge superstructure replacement.
- The total estimated cost of a project for a single bridge is equal to or greater than one million dollars.

**Structurally Deficient (SD) and Functionally Obsolete (FO):** According to FHWA, a deficient structure can be either Structurally Deficient or Functionally Obsolete.

- Structurally deficient (SD)—any general condition rating (deck, superstructure or substructure, or culvert) is 4 or less, or one of two appraisal ratings (structural condition or waterway adequacy) is 2 or less. In other words, a structurally deficient bridge is one that has been: (1) restricted to light vehicles only, (2) closed, or (3) requires immediate rehabilitation to remain open.
- Functionally obsolete (FO)—any appraisal rating (structural condition, deck geometry, under clearances, waterway adequacy or approach roadway alignment) is 3 or less. A functionally obsolete bridge is one that has deck geometry, load carrying capacity (comparison of the original design to current State legal load), clearance, or approach roadway alignment which no longer meet the usual criteria for the system of which they are a part.

**Bridge or Culvert in Need of Repair or Rehabilitation:** VDOT uses the National Bridge Inventory (NBI) General Condition Rating (GCR) criteria as an index to identify bridges and culverts that may need some type of repair or rehabilitation. GCR's range from 0 (failed condition) to 9 (excellent condition). A bridge or culvert component with a GCR of less than 6 (that is, less than a satisfactory condition) is used to identify those structures that require more than regular maintenance and are in need of repair or rehabilitation.

**National Bridge Inventory (NBI) Structure:** Any bridge or culvert having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of more than 20 feet between undercopings of abutments or spring lines of arches or extreme ends of openings for multiple boxes; it may also include multiple pipes, where the clear distance between openings is less than half of the smaller contiguous opening.

**Non-NBI Structure:** Any bridge or culvert having a track or passageway for carrying traffic or other moving loads, and having an opening measured along the center of the roadway of equal to or less than 20 feet between undercopings of abutments or spring lines of arches or extreme ends of openings for multiple boxes and pipes. All bridges regardless of their lengths are inventoried and inspected on regular basis. All culverts having an opening of 36 square feet or greater are also inventoried and inspected on regular basis. For example, a culvert having an opening greater than 36 square feet and a length measured along the centerline of the roadway of less than 20 feet, this culvert will be inventoried as a non-NBI culvert. (If the culvert’s length measured along the centerline of the roadway is greater than 20 feet, it is considered a NBI culvert.)

The inventory of both bridges and culverts are classified under the two main categories of NBI and Non-NBI bridges. VDOT uses both federal and state funds in the maintenance and construction programs. Project eligibility for using federal bridge funds, established by the Federal Highway Administration (FHWA), requires specific criteria. The bridge:

- 1) must be classified as NBI
- 2) must be structurally deficient or functionally obsolete
- 3) has a sufficiency rating equal or less than 80% for maintenance and rehabilitation projects
- 4) has a sufficiency rating less than 50% for complete replacement projects
- 5) had no major rehabilitation work in the last 10 years

In addition to the above criteria, VDOT uses the NBI’s General Condition Ratings (GCRs) and bridge element condition information as tools to identify and prioritize the maintenance, rehabilitation, and improvement needs. GCRs range from a numerical rating of “9” for excellent condition (typically, a new bridge) to “0” for a failed condition (out of service—beyond corrective action).

All bridges and culverts require some level of maintenance regardless of their condition. For example, a bridge that is classified in good condition generally will need to have a routine type of maintenance such as cleaning, and spot painting. However, for the purpose of this report, only major bridge projects are identified.

Detailed lists of major bridge projects, which are currently programmed and/or planned, are included in this report:

- VDOT Structures Needing Repair/Rehabilitation (Appendix D). Of VDOT’s 12,000 bridges, over 4,600 major bridges (39%) need repair or rehabilitation.
- Major Bridge Funding, FY07-FY12 (Appendix E). Bridge funding in the Six Year Improvement Program (SYIP) totals \$265.7 million.
- State Funded Maintenance and Rehabilitation Projects (Appendix F). District, county, route, project number and project description for FY07-FY12.
- Federal Funded Maintenance and Rehabilitation Projects (Appendix G). District, county, project description, and fund source for FY07-FY12.

<b>Transportation District</b>	<b>Major Bridge Projects</b>	
	<b>State Funded (Appendix F)</b>	<b>Federal Funded (Appendix G)</b>
Bristol	103	15
Salem	80	6
Lynchburg	2	8
Richmond	21	7
Hampton Roads	0	3
Fredericksburg	12	11
Culpeper	8	1
Staunton	0	1
Northern Virginia	7	16
<b>State Total</b>	<b>233</b>	<b>68</b>

## **Item 444 B4 – Metropolitan Railroad Crossings**

### **Background**

In response to Senate Joint Resolution 321 (SJR 321) in 1993, VDOT examined traffic congestion and safety-related problems at railroad grade crossings, with emphasis to grade crossings in Virginia's coastal plain. The entire inventory of 2,255 public grade crossings in the Commonwealth was analyzed using a benefit-cost approach to identify potential locations for grade separation projects. Sixteen potential projects in the state were identified as feasible at a total project cost of \$73.7 million. Interestingly, all 16 railroad grade crossings identified in the 1993 SJR 321 Report for potential improvements were in the same three metropolitan areas identified for study in 2006 Budget Item (B) 4: Hampton Roads (11), Richmond (4), and Northern Virginia (1).

Grade crossings are defined as intersections where a potential conflict exists between railroad traffic and road vehicle traffic. This conflict manifests itself in accidents and vehicle traffic delays. There are two ways to completely eliminate this conflict:

- Separate the railroad and highway traffic through an improvement project that involves the construction of a bridge or underpass.
- Either the railroad line or highway be eliminated through abandonment, closure, or relocation

In some instances, the problem can be relieved through actions that involve a less-than-grade separation project. In particular, accidents can be greatly reduced or eliminated through a targeted program of safety improvements involving vehicle warning devices. No ready solution to traffic delay problems exists short of grade separation.

The study included benefit-cost analyses to prioritize the various grade crossing projects. In addition, a 5-year accident history of all grade crossings, including traffic delays, was reviewed to identify the locations where improvements could reduce accidents. A combination of the two factors—accidents and delays—can provide the basis for the improvement or a high value of either can indicate the need for making the improvement.

The overall scope and conclusions of the grade crossing report for the 2006 legislative budget requirement are analogous to the 1993 SJR 321 Report.

### **Methodology for HB 5002 in 2006**

As of September 2006, there were 2,024 public at-grade crossings in the Commonwealth with 453 of these crossings in the three target metropolitan areas. Using the threshold of 1,500 annual average daily traffic (AADT), established by VDOT for this review, there are 314 crossings that should be assessed. Within the 314 crossings for the target areas, 23 were identified as being on state Primary routes. There were an estimated additional 15 possible non-primary 'landlocked' one way in/out rail grade crossings. Additional review and evaluation have to be conducted to verify the number of landlocked crossings. Further field inventory of all 314 crossings is required to establish the inclusion/exclusion of appropriate crossings in the final assessment (see

Table 1). The names of the affected railroad companies for these 314 crossings are identified in Table 2.

<i>Table 1 – An estimate of the number of crossings that will be assessed.</i>				
	<b>Richmond District</b>	<b>Hampton Roads District</b>	<b>Northern Virginia District</b>	<b>Total</b>
Total Public Crossings	152	260	41	453
AADT over 1,500	91	190	33	314
State Primary Routes	8	12	3	23
‘Landlocked’ crossings (est.)	4	9	2	15

<i>Table 2 - Affected railroads in the targeted areas.</i>			
<b>Target Area</b>	<b>Class 1</b>	<b>Shortline</b>	<b>Passenger</b>
Northern Virginia	Norfolk Southern CSX	—	Amtrak Virginia Railway Express
Richmond Metro	Norfolk Southern CSX	Buckingham Branch	Amtrak
Hampton Roads	Norfolk Southern CSX	Norfolk Portsmouth Beltline Commonwealth Railway Chesapeake and Albemarle Bay Coast	Amtrak

### **Highway-Rail Grade Crossing Improvement Funding and Procedures**

The Federal Highway Administration (FHWA) annually allocates funds to VDOT for improvements under its Highway Safety Improvement Program (HSIP) [Section 130 Program]. These funds were allocated under TEA-21 (up to FY05-06) and SAFETEA-LU (FY06-07 forward). Under the Federal guidelines, up to fifty percent (50%) of this annual allocation is available for elimination of hazards, including grade separation, crossing closure, highway or railroad relocation. Initially, fifty percent (50%) has to be used for the installation of active devices such as Flashing Lights, Flashing Lights and Gates. Table 3 identifies the project funding amounts programmed by VDOT under Section 130 since 2000.

**Table 3 - Project funding amounts programmed by VDOT under Section 130 since 2000.**

<b>VA Fiscal Year</b>	<b>\$ Programmed</b>	<b>Funding Source</b>	<b>Notes</b>
2001-02	\$6,023,130	TEA-21	\$1.5 million taken off top for Grade Separation Project in Manassas
2002-03	\$5,620,000	TEA-21	\$1.5 million taken off top for Grade Separation Project in Manassas
2003-04	\$5,955,000	TEA-21	\$1.5 million taken off top for Grade Separation Project in Manassas
2004-05	\$6,855,000	TEA-21	—
2005-06	\$7,350,000	TEA-21	Footnote <sup>1</sup>
2006-07	\$4,420,000	SAFETEA-LU	—
2007-08	\$4,420,000	SAFETEA-LU	\$88,400 allowed for planning <sup>2</sup>

Applications for monies allocated under the HSIP are solicited annually by VDOT’s Traffic Engineering Division (TED). The application period ending on June 30 gives all localities and railroads the opportunity to apply for funding to offset the cost of grade crossing improvements, including grade crossing surfaces, signals and interconnections. Cost estimates for improvements are provided with the application process packet (Appendix H). Due to factors involving rights of way and surrounding area impacts, no estimate is included for grade separations.

The applications are then reviewed and scored based on the FRA Fatal Accident Prediction (FAP) formula for inclusion in the program on a statewide competitive basis. The FAP formula includes various factors including highway and train traffic, number of main tracks, paved vs. unpaved highway, and functional class. The programmed projects are submitted to VDOT’s Programming Division for submission into the Six-Year Improvement Plan. Contract management and monitoring of the funded projects is performed by the Rail Projects Agreements group in VDOT’s Scheduling and Contract Development and Traffic Engineering Divisions.

The Shortline Railroads may submit application for grade crossings for improvement under DRPT’s Rail Preservation (RP) program as a safety enhancement project. The RP program does not fund grade separations, but will contribute funds for rehabilitation of existing highway or railway overpass bridges. These projects are submitted to DRPT annually by February 1. Final allocations under this program are determined by the CTB. Management and monitoring of Rail Preservation projects is performed by DRPT.

<sup>1</sup> Includes six crossing signal upgrade projects on Commonwealth Railway line in Portsmouth and five projects for High Speed Rail (CSX) corridor in Richmond.

<sup>2</sup> Beginning in FY2007-08, the FRA will allow VDOT to spend up to 2% of the Section 130 allocated funds on grade crossing planning and data collection



In the current Rail Enhancement Fund (REF) program, administered by DRPT, there are several grade separations that will be needed as the projects progress. Only one grade separation project relating to the Median Rail Safety Rail Relocation has been acknowledged for study by the Rail Advisory Board and funded for further study by the Commonwealth Transportation Board as part of a median rail corridor relocation study being administered by the Virginia Port Authority and conducted by the Commonwealth Railway, Incorporated.

Funds for grade separations are available on FRA designated High Speed Rail Corridors, through earmarks under the Section 1103 High Speed Rail program. These earmarks are introduced into the Federal Budget by the Virginia Congressional Delegation. Management of these projects is through VDOT's Rail Projects Agreements and Highway-Rail Safety sections.

### **Grade Separations**

From figures provided by VDOT's TED and Scheduling and Contract Development Division<sup>3</sup> (SCD), grade separations can range from \$3.9 to \$20.0 million. VDOT has only one grade separation project programmed. The current estimate for this project, on Route 629 in Prince George County, is \$7.0 million. The Highway-Rail Safety Section has programmed \$1.5 million (\$0.5 million in each of FY06-07, FY07-08, and FY08-09) of its FY2006-07 Section 130 Federal Funds for this project. DRPT is working with the Virginia Port Authority and Commonwealth Railway on a grade separation project related to the Median Rail Project on Route 164 in Portsmouth. This project, at the Route 17 intersection, is currently estimated at \$20.0 million.

Several grade separation projects have been cancelled due to rising costs. These include Route 617 in Pulaski (\$3.5 million) and Route 636 in Prince William (\$5.5 million). Residential development and environmental impact issues escalated the cost of the Prince William project. The major costs in grade separation projects include providing access and acquiring rights-of-way. Grade crossing improvement in the form of Four Quadrant Gates was recently completed at the Prince William location at a cost of \$200,000.

Under 23 CFR 646.210 (Code of Federal Regulations), railroads in the United States will contribute five percent for the elimination of a public grade crossing if active warning devices (flashing lights, flashing lights with gates, etc.) are in place. This elimination can either be through crossing closure and removal or by routing traffic to a nearby crossing or a grade separated crossing.

### **Crash History and FAP Target Crossings**

An analysis of a Fatal Accident Prediction (FAP) factor of 0.060 and above has shown that 36 crossings are in the Hampton Roads (21 crossings), Richmond (8), and Northern Virginia (7) metropolitan areas (see Appendix I). This figure is based on the number of train movements: train and highway speed, daily traffic on the highway, and vehicle-train crash history at the crossing.

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<sup>3</sup> The Rail Projects Agreements Group was located in DRPT prior to September 2005. After that date, DRPT has only been involved in grade crossing work related to Rail Preservation or Rail Enhancement.

These figures are calculated over a 5-year span and do not reflect improvements completed at the location during that period. Active grade crossing projects are also not reflected in these calculations. Further evaluation and continued review of these crossings will be needed to properly identify appropriate grade crossing projects and improvement strategies.

**Summary:** As of September 2006, there are 453 public at-grade crossings in the metropolitan areas of Hampton Roads, Richmond and Northern Virginia. If the threshold of 1,500 AADT were used, 314 of these rail crossings would be assessed. Thirty-six (36) of these rail crossings have a Fatal Accident Prediction factor of, or above, 0.060 (see Appendix I). VDOT and DRPT will continue to evaluate conditions at these 36 crossings.

## **IV. Conclusion**

HB 5002 Item 444 B, identified several major program areas to protect and enhance the transportation infrastructure and the safety of the traveling public. Asset Management needs are known and recognized. The Department continues to meet the successful delivery of the goals and strategies of these legislative requirements. The results of this successful delivery will help to enhance infrastructure effectiveness, mobility, safety, travel time reliability, and security.




## Appendix A: House Bill 5002, Item 444

### Highway System Maintenance (60400)

- A. 1. The Interstate, Primary and Secondary Maintenance service areas preserve the public's investment through the delivery of an effective and efficient statewide maintenance program to protect and enhance the transportation infrastructure and the safety of the traveling public.
2. The Transportation Operations Services service area improves mobility, safety, travel time reliability, and security on the transportation system through the deployment of a variety of operational strategies including regional smart traffic centers, emergency services, traveler services, congestion management and traffic signalization optimization.
3. The Highway Maintenance Program Management and Direction service area provides management, direction, and administration to support the program's activities.
4. The Department shall develop an asset management methodology for the review by the General Assembly in the 2007 Session. As part of the methodology, the Department shall develop and include performance targets to monitor and evaluate the effectiveness of maintenance activities. The methodology shall, in accordance with generally accepted engineering principles and business practices, identify and prioritize statewide and district maintenance and operations needs. These needs include, but are not limited to, pavement, structures and bridges, pipes and drainage, roadside operations and statewide programs such as snow removal and equipment replacement. The Commonwealth Transportation Board shall review the proposed methodology before submission to the General Assembly. The Department shall report to the General Assembly by December 31, 2006, on progress made and future plans to incorporate principles of asset management into its maintenance and operations practices.
5. Prior to adoption, the Department shall develop and submit to the General Assembly a six-year maintenance and operations program no later than July 1, 2007, to provide greater transparency, predictability and equity of funding, and stability of investment over time. This program shall equitably distribute maintenance funds to districts based on objectively identified needs, define the base needs for each district and include future adjustments based on additional funding in district budgets to address differences in need across them. The Commonwealth Transportation Board shall review and approve the six-year maintenance and operations program and the annual updates.
- B. By November 30 of each year, the Department shall submit to the Governor, General Assembly, and the Commonwealth Transportation Board a report on the condition of existing transportation infrastructure and proposed measures to improve the operations of the transportation system and the service areas listed in paragraph A. Such report shall include:
- 1) An assessment of the department's efforts to develop systematic mechanisms to evaluate its efforts as outlined in paragraph A.4. of this Item;

- 2) A report on all actions, accomplishments, achievements, and initiatives of the Virginia Department of Transportation, in the preceding fiscal year that involved outsourcing, privatization, and downsizing, as required pursuant to Chapter 420, Acts of Assembly of 2006;
- 3) An enumeration of the status of major bridge maintenance and replacement projects and the availability of federal highway bridge rehabilitation and replacement apportionments; and
- 4) In conjunction with the Department of Rail and Public Transportation, a report on the number of rail crossings in the metropolitan areas of Hampton Roads, Richmond and Northern Virginia. The report shall take into consideration the impediments to safety, mobility and economic development caused by the rail crossings as measured by the number of trains and frequency of train traffic; the vehicular traffic volumes at the crossings; and the lack of nearby rail and road alternatives. The report shall include an estimate of the costs to remove, relocate or remediate those rail crossings that have the greatest impacts on communities, including environmental.


## Appendix B: Fiscal Year 2007 Business Plan

 VDOT

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**FY 07 Business Plan**

Gregory Whirley  
VDOT Chief Deputy Commissioner  
September 21, 2006

 VDOT **Overview**

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Purpose  
Defining VDOT's Business  
Reforms for Improved Performance  
Strategies for Efficiencies  
Summary



## **Purpose of the Business Plan**

- Focus energy and resources on effective and efficient core business delivery
- Unite policy makers and practitioners
- Continue the transparency theme in all VDOT actions
- Respond to Appropriations Act
- Be a “nimble” business, able to respond to changing business conditions



## **Core Business**

### **Mission Statement:**

VDOT will plan, develop, deliver, operate and maintain, on time and on budget, the best possible transportation system for the traveling public.

- Plan - design the network for an effective ground transportation program
- Develop – provide the engineering, technical and financial expertise necessary to implement the planned program
- Deliver – effectively & efficiently manage construction program delivery
- Operate – manage the operation of a safe, effective and efficient ground transportation system
- Maintain – effectively and efficiently manage and preserve transportation infrastructure assets





## Future Business Environment

- Long term financial uncertainty
- Increasing maintenance cost
- Declining construction program
- Aging maintenance facilities
- “Graying” employee pool
- No clear alternative candidate for foundation responsibility for emergency transportation response in critical situations/disasters
- Need to be a “nimble”, flexible business
- Need to maintain strong engineering, technical and technology expertise to respond to complex environment



## Reforms for Improved Performance

### ***We have:***

- Developed an award winning Dashboard that monitors real time project performance and places VDOT at the forefront of living the theme of “Open Government”
- Implemented an Asset Management System that tracks asset condition and develops a needs based maintenance budget
- Eliminated \$867 million of project deficits
- Set realistic cost estimates through the development of the Project Cost Estimation System
- Established realistic revenue estimates based on the official state forecast
- Re-established financial integrity and accountability for all to see
- Imbedded an on-time, on-budget mentality in all aspects of VDOT business
- Established an internal dashboard to measure executive level performance



**Reforms for Improved Performance  
(continued)**

**We have:**

- Established Innovative Project Delivery business unit to focus on encouraging PPTA and private investment in transportation
- Implemented recommendations made by the APA Cash Management Audit
- Received an additional \$30 million federal dollars as a result of obligating all of our federal dollars
- Become one of the few state DOT's to have established a System Operations program that is focusing on incident management, the use of technology to manage and reduce congestion and improve safety
- Established operations measures that will help us squeeze efficiencies out of the existing transportation network
- Established a keen focus on getting better without getting bigger



**Reforms in Action—On Time, On Budget**

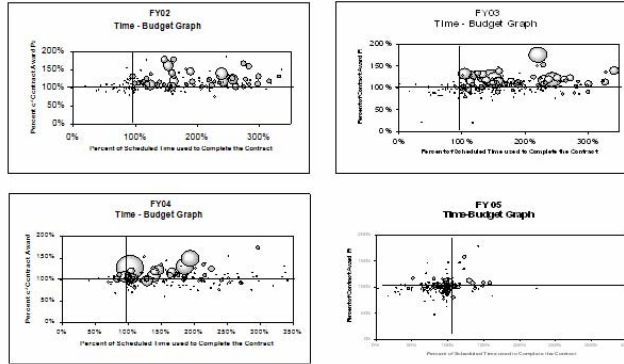
Measure Type	FY01	FY02	FY03	FY04	FY05	FY06
Construction On-Time	20%	30%	27%	36%	75%	84%
Construction On-Budget	51%	61%	65%	73%	78%	86%
Maintenance On-Time	38%	43%	38%	51%	74%	79%
Maintenance On-Budget	59%	71%	80%	81%	80%	88%

FY07	Target
Construction On Time	70%
Construction On Budget	85%
Maintenance On Time	75%
Maintenance On Budget	90%

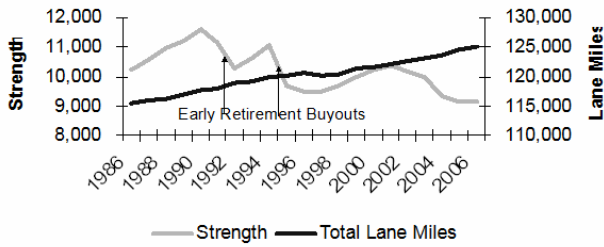


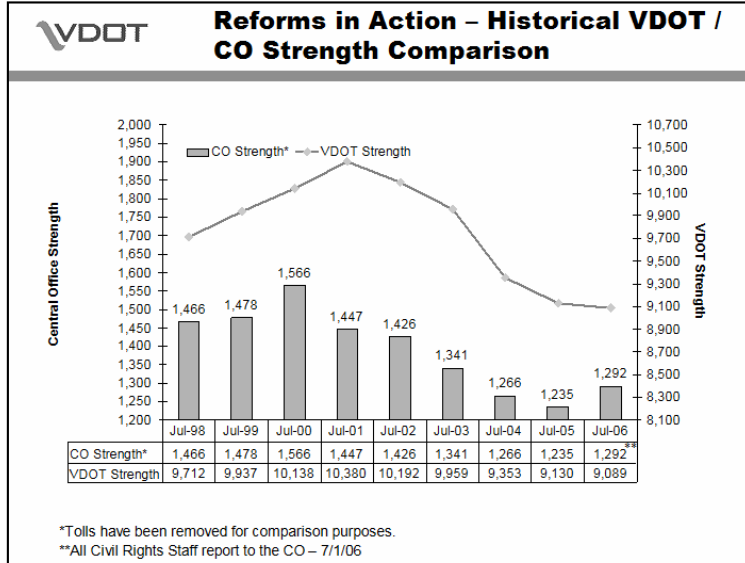
## Reforms in Action—On time, On Budget (continued)

### Each Bubble Represents a Completed Project



## Reforms in Action--VDOT Strength vs. Lane Miles





- VDOT Business Plan Guiding Principles**
- Establish a floor on field maintenance staffing to ensure ability to respond to emergencies
  - Staff at levels to manage core business efficiently and effectively--reasonable cost, high quality, timely delivery
  - Maintain strong engineering, technical, technology expertise to ensure proper management, oversight and innovation
  - Outsource in a rational, financially prudent manner
  - Continue to evaluate administrative support requirements for potential reductions
  - Take maximum advantage of retirements to restructure and staff with skills for the future
  - Use technology wherever feasible to reduce costs and improve efficiency



## **Business Plan Strategies**

- Improve internal business processes
- Encourage private investment
- Continue, where feasible, to transfer program delivery to localities
- Increase use of research and innovation
- Outsource where financially prudent
- Adjust staffing, facilities, other resources appropriately



## **Improve Internal Business Processes**

### Linking Land Use and Transportation Planning

*We will:*

- Design rules and procedures for reviewing local comprehensive plans and land development proposals
- Evaluate VDOT staffing and skill set requirements for analyzing comprehensive plans and development
- Provide technical assistance and training to localities on managing the impacts of land use on transportation
- Move forward with a state access management program to reduce traffic congestion and improve safety



## **Improve Internal Business Processes (cont.)**

### Program Delivery

*We will:*

- Establish a goal of reducing construction engineering and inspection (CEI) costs
  - Savings will be shifted to construction projects
- Reduce project delivery timeframes by examining current PE processes
  - Expand the use of "No Plan" projects to speed delivery and reduce costs
- Convene industry CEO forums to solicit suggestions on best practices to expedite project delivery
- Coordinate and provide technical assistance to localities as part of plan review in accordance with Acts of the General Assembly Chapter 527- in order to foster effective transportation planning and mitigate impacts of growth



## **Improve Internal Business Processes (cont.)**

### System Operations

*We will:*

- Improve highway safety to drive down deaths and fatalities by leading and implementing the Governor's Strategic Highway Safety Plan
- Institute primary route safety corridors
- Start the Safe Roads to Schools Program
- Continue to improve the needs assessment system and reporting of asset conditions to ensure maintenance funds are distributed to address the critical maintenance needs statewide.
- Partner with other state and local agencies to continue a high level of emergency preparedness and responsiveness



### Improve Internal Business Processes (cont.)

#### System Operations

*We will:*

- Deliver Maintenance Projects on time and on budget; Institute other performance measures for maintenance and operations.
- Reduce congestion by expanding safety service patrols and instituting a quick incident clearance capability on all major travel corridors
- Improve traveler information with improved 511 service coverage and start providing travel time information on critical corridors
- Consolidate district operations functions into regional service areas based on traffic patterns to better manage traffic operations
- Utilize traffic engineering research and new products to improve sign visibility and other safety features on highways
- Employ economic solutions to congestion management (HOT Lanes)



### Improve Internal Business Processes (cont.)

#### Asset Management Biennial Performance Report

	FY06 Targets	FY06 Results	FY07-08 Targets
% of Interstate Pavement Rated Deficient	No more than 18%	17.1%	No more than 18%
% of Primary Pavements Rated Deficient	No more than 18%	15.8%	No more than 18%
% of Bridges rated as needing repair/ rehabilitation	No more than 40%	38.6%	No more than 40%



## **Improve Internal Business Processes (cont.)**

### Administration

*We will:*

- Examine the impact of reduced 'program' staffing on the need and level of 'administrative & support' staffing
  - Initially targeted a minimum of \$15 million reduction in administrative expenditures for FY 07 (out of \$250 million administrative budget) – anticipate additional reductions in FY 08
- Benchmark and align administrative support staffing levels and costs to industry standards
- Effectively manage staffing and skills sets to support the changing role of VDOT
  - Establish workforce and development plans which assess current and needed skill sets and develop staffing strategies to fill skill gaps



## **Improve Internal Business Processes (cont.)**

### Administration: SWAM

*We Will:*

- Maintain focus on Statewide goal of 40%
- Identify specific SWAM goals for districts and Central Office based on level of discretionary spending (included in the District Administrators performance evaluation)
- Identify strategies to increase SWAM bidding and networking opportunities
- Achieve FY07 interim goal of 20%
  - Q4 FY06: 12.35%
  - Q4 FY05: 9.06%
  - Performance monitored on internal dashboard





## Improve Internal Business Processes (cont.)

### Administration: Internal Controls

- Have addressed or are implementing 50 recommendations from Special Review of Cash Management and Capital Budget Practices
  - Cash Management
  - Six-Year Improvement Program
  - Planning
  - Project Estimation & Budget Monitoring
  - Systems Environment
  - Project Management
  - Maintenance Asset & Project Management
- As the Department re-evaluates programs and implements outsourcing and downsizing initiatives, ensure that proper internal controls are maintained to promote accountability, stewardship, and fiduciary responsibilities.



## Encourage Private Investment

### *We will:*

- Continue with the Transportation Partnership Opportunity Fund
- Proceed with FY07 Scheduled PPTA and Design Build Projects:

#### PPTA

- Pocahontas Parkway - implemented concession agreement June 29, 2006 and met the financing requirements for the airport connector
- Coalfields Expressway - Project assigned to coal companies
- Hampton Roads Third Crossing - receive detailed proposals - December 15, 2006
- I-81 Corridor - Secure record of decision for Tier 1 EIS in early 2007
- I-95/395 HOT Lanes - Execute interim agreement by December 2006
- I-495 HOT Lanes - amend and restate comprehensive agreement by early 2007
- Midtown Tunnel - solicit conceptual proposals - Late 2007
- Route 460 PPTA [Petersburg - Suffolk] - receive conceptual proposals - September 14, 2006
- Route 28 - Received a \$20 million TPOF loan which will help finance the completion of the remaining four interchanges



## Encourage Private Investment (cont).

### *We will:*

- Proceed with FY07 Scheduled PPTA and Design Build Projects:

#### Design-Build

- Route 164, Portsmouth - complete interchange improvements for access to APM Terminals - November 2006
- Route 164 – Median Rail Project (Virginia Port Authority) – awaiting federal approval
- Route 609, Mathews County - complete procurement and issue contract - September 2006
- Gilbert's Corner, Route 50, Loudon County - solicit proposals and award contract - July 2007



## Encourage Private Investment (cont).

### *We will:*

- Identify candidate design/build and PPTA projects through the innovative project team
- Candidate PPTA projects under review:
  - Southeastern Expressway, Chesapeake to Virginia Beach
  - Midtown Tunnel, Portsmouth to Norfolk
- Candidate Design-build projects under review for feasibility and funding:
  - Route 713 Bridge, Giles County, Salem District
  - Third Street Bridge, Farmville, Lynchburg District
  - Givens Lane, Blacksburg, Salem District



## **Continue, where feasible, to transfer program delivery to localities**

*We will:*

- **Continue with First Cities Initiative**
  - The 8 cities in or about to join the initiative make up 35% of the Urban Program
  - Newport News filed a notice of intent to join (no date)
  - Lynchburg filed notice of intent to join July 1, 2007
  - Harrisonburg and Bridgewater joined July 1, 2006
  - Charlottesville joined July 2005
  - Hampton, Richmond, Virginia Beach joined July 2004
- **Consider more aggressive devolution initiatives**



## **Research and Innovation**

- **Increase emphasis on using latest research, engineering technology and other technical knowledge to design and build longer lasting facilities, reduce cost, and improve practices**
  - The project "A Performance Baseline for Stone Matrix Asphalt" helps VDOT save \$14 million per year
  - The project "First Bridge Structure with Lightweight High-performance Concrete Beams and Deck in Virginia" saved VDOT \$2 million
  - The project "The Impact of Smoothness Incentives/Disincentives on Hot Mix Asphalt Resurfacing Costs" documents savings by VDOT of \$4.68 million per year
- **Knowledge Management Center developed a Project Record Keeping System for field inspectors which increases inspectors' productive time by 10%**



## Outsource Where Financially Prudent

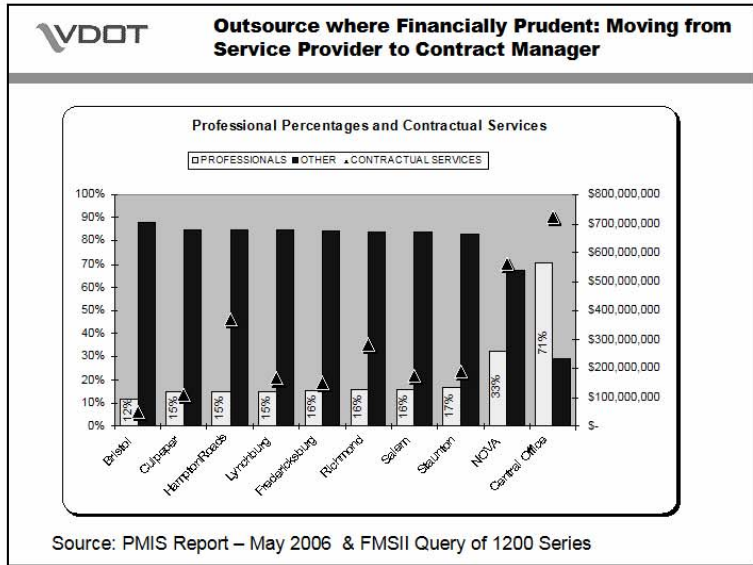
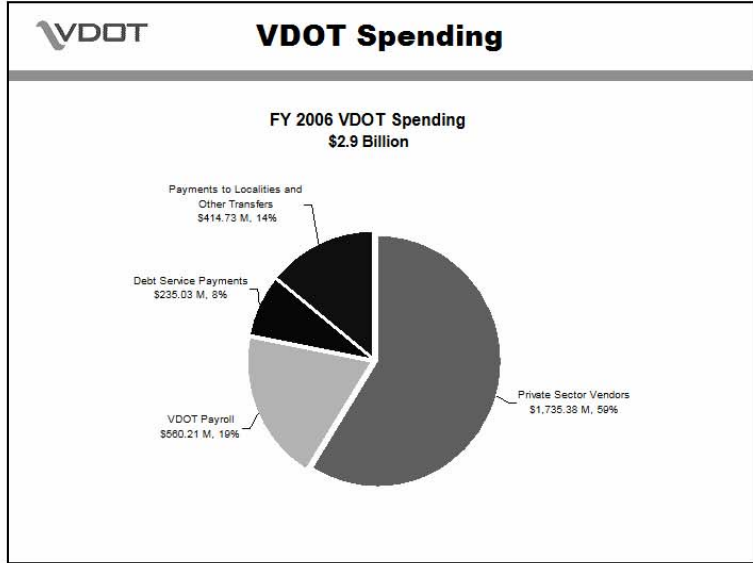
*We will:*

- Define Core Business Functions
- Determine base level resources where VDOT must retain capability
- Determine the most cost effective way to deliver services
- Move from a service provider to a contract manager



## Outsource Where Financially Prudent (continued)

- Chapter 544 of the 2006 Acts of Assembly requires the Commissioner to report in November 2006 on past and future plans for outsourcing, privatizing and downsizing of the agency
- VDOT Executive staff has established a methodology to evaluate operational areas for outsourcing. Candidate areas include:
  - Equipment repair and maintenance
  - Primary and Secondary System maintenance (already partially outsourced)
  - Safety Service Patrols (already partially outsourced)
  - Sign production and installation
  - Smart Traffic Centers
  - Special Facilities
  - Surplus equipment auctions
  - Toll Collection Facilities





### **Adjust Staffing, Facilities, Other Resources**

- These strategies will have a cumulative impact on the Department's staffing, facilities and organization.
  - In FY06, VDOT developed a methodology and decision making process for determining appropriate number and location of Area Headquarters – potential for at least 40 to be closed/consolidated
  - Study of Regionalizing Right of Way function completed. Recommendations under consideration
  - Optimize the mix of consultant and Department personnel for preliminary engineering and construction inspection
  - Staff will evolve from “do’ers” to program managers
  - Review Central Office and Field Administration for overhead reductions



### **Adjust Staffing, Facilities, Other Resources (continued)**

- Within the next 24 months:
  - VDOT will determine the benefits of candidate outsourcing proposals.
  - All proposals with a significant financial impact will be reviewed by an outsourcing steering committee. All analyses will include a section on the adverse impact to employees.
  - Contract costs will be paid for by reducing direct labor and overhead costs
- Department will constantly review organizational impact as strategies are implemented



### **Adjust Staffing, Facilities, Other Resources (continued)**

- We will continue to look for opportunities for efficiencies as they present themselves
  - Outsourcing – changing role of service provider to contract administrator may change not just the size, but also the shape of field and Central Office components
  - Funding – May have to reduce PE and Construction personnel if funding stays at or below current levels
  - Retirement – as key staff retire, will use opportunity to examine organization structure
- We will establish a methodology for determining the appropriate number and location of district facilities



### **Transitioning our Workforce and Changing the VDOT Culture**

- Accountable, Adaptable, and Results-focused
- Greater Transparency with our employees:
  - Improving and increasing communication between employee and management to keep them informed of business decisions impacting them
- Defining performance measures and expectations and holding people accountable
  - District quarterly performance reviews with Commissioner
  - Leadership goal setting for next performance cycle
- Workforce strategies to close skill gaps
  - Leadership development to include managing performance of others and leading them to successfully implement change and drive continuous improvements
  - Increase Contract Administration, Business analysis, and Project Management skills
- Workforce Reduction strategies which phase/consolidate/minimize employee impacts and increase assistance to them
  - Outplacement assistance
  - Negotiation of outsourcing contracts to include transition of employees



## Summary

- Continue to reform all areas of the business to improve performance
- Focus on Results
- Measure and report performance to the public
- Increase accountability at all levels of the organization
- Change the organizational culture from service delivery to program management
- Invest in changing employee skills to meet new demands of the workplace
- Measured, logical, incremental changes that become part of the culture without creating chaos throughout the organization
- 90% of leadership responding to survey felt prepared or very prepared to deliver change message and lead employees
- 87% of employees responding (n=4,347) indicated that leadership helped them to understand VDOT is changing



## **FY 07 Business Plan**

Gregory Whirley  
VDOT Chief Deputy Commissioner  
September 21, 2006



### Appendix C: Graphs Illustrating Asset Conditions and Needs

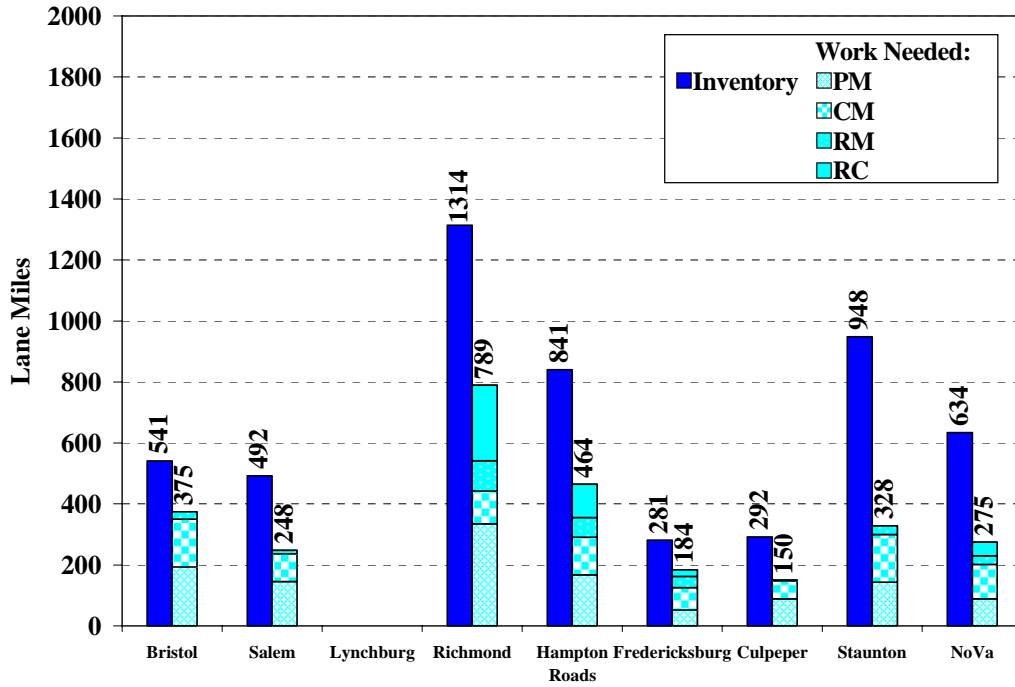
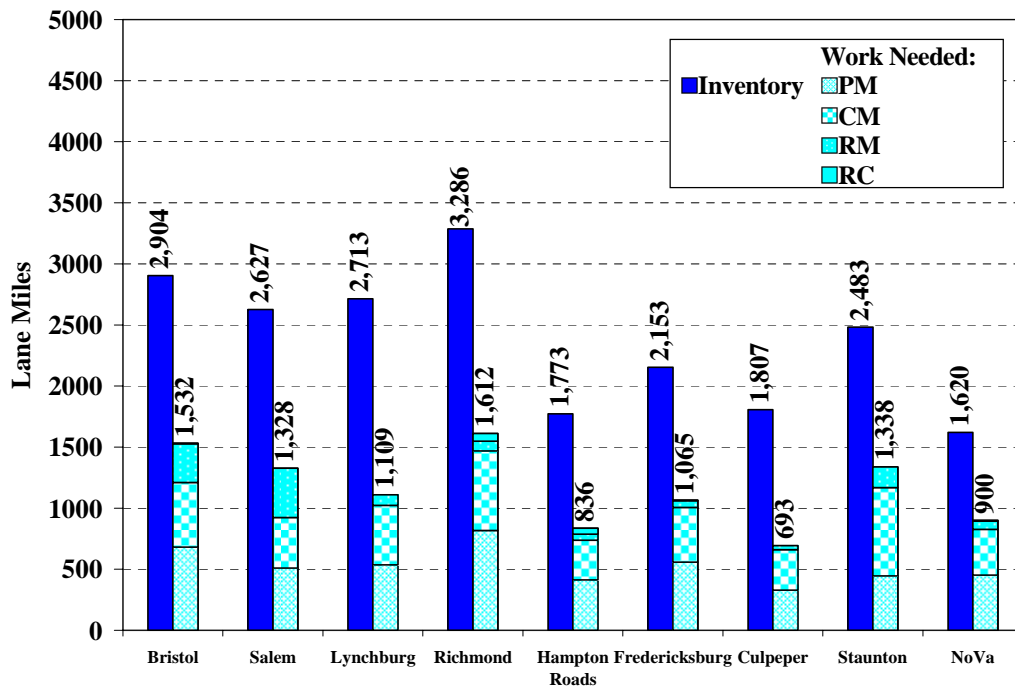
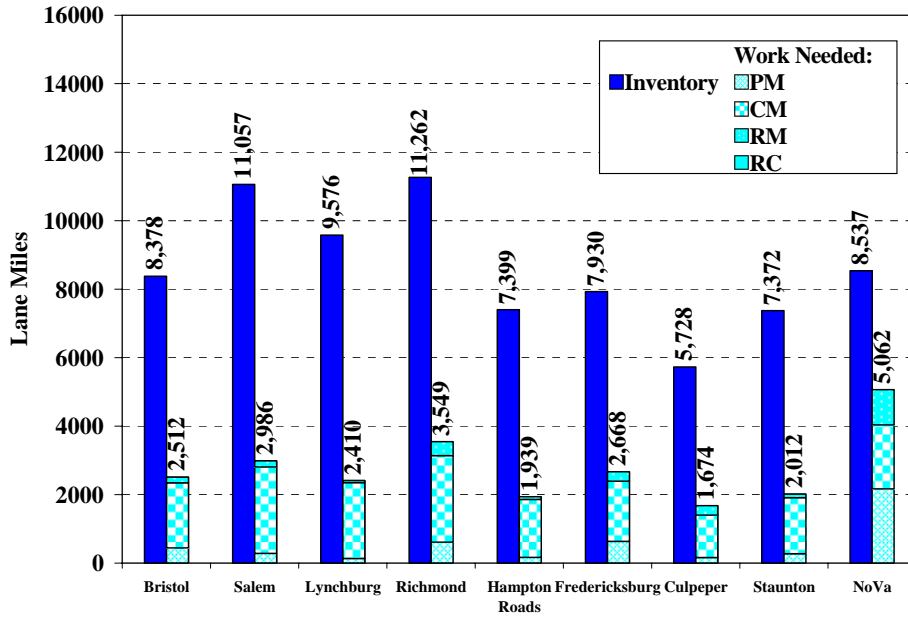


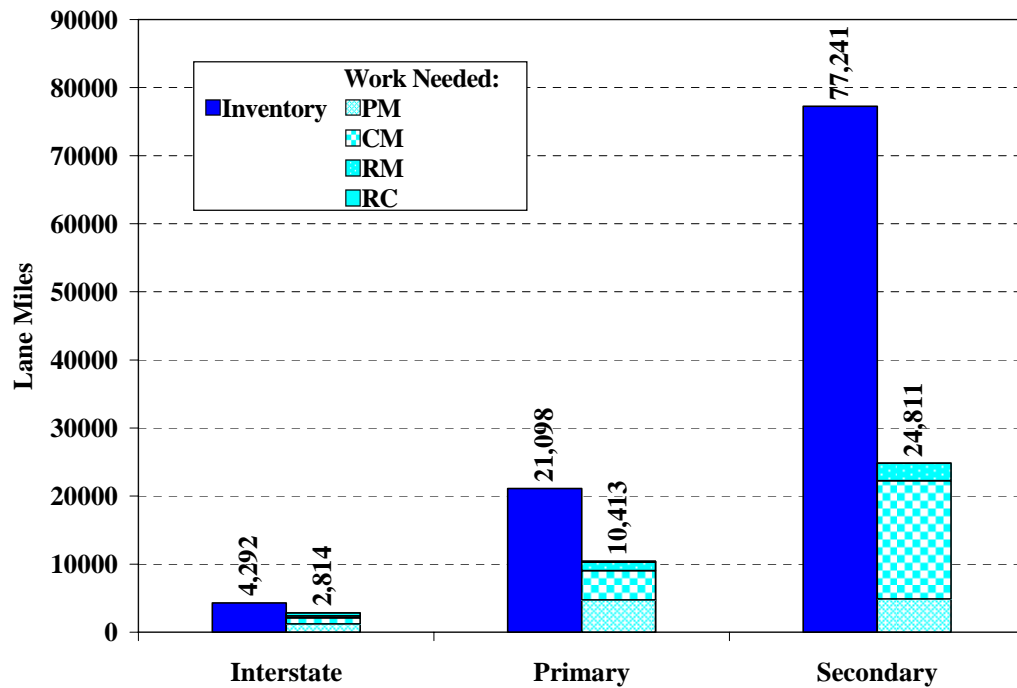
Figure C-1: VDOT maintained pavement inventory and different maintenance activities required by district – *Interstate System*



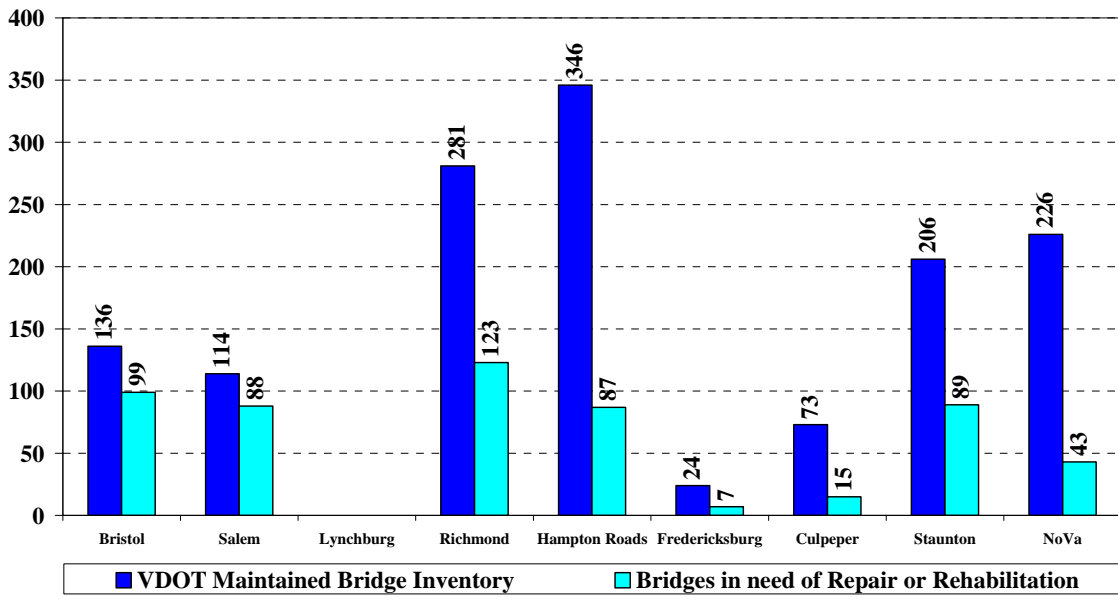
**Figure C-2: VDOT maintained pavement inventory and different maintenance activities required by district – Primary System**



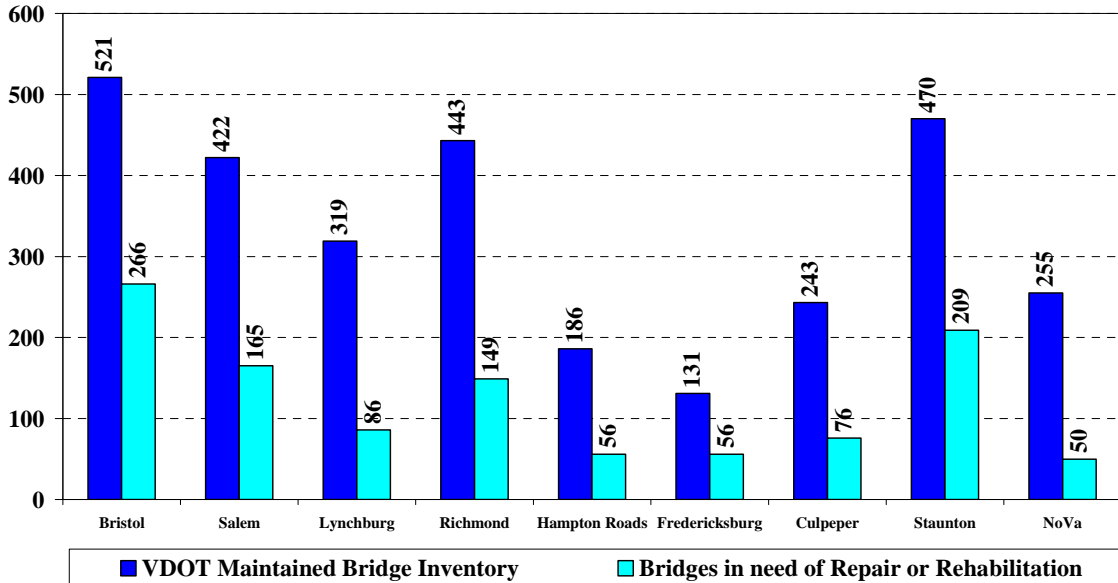
**Figure C-3: VDOT maintained pavement inventory and different maintenance activities required by district – Secondary System**



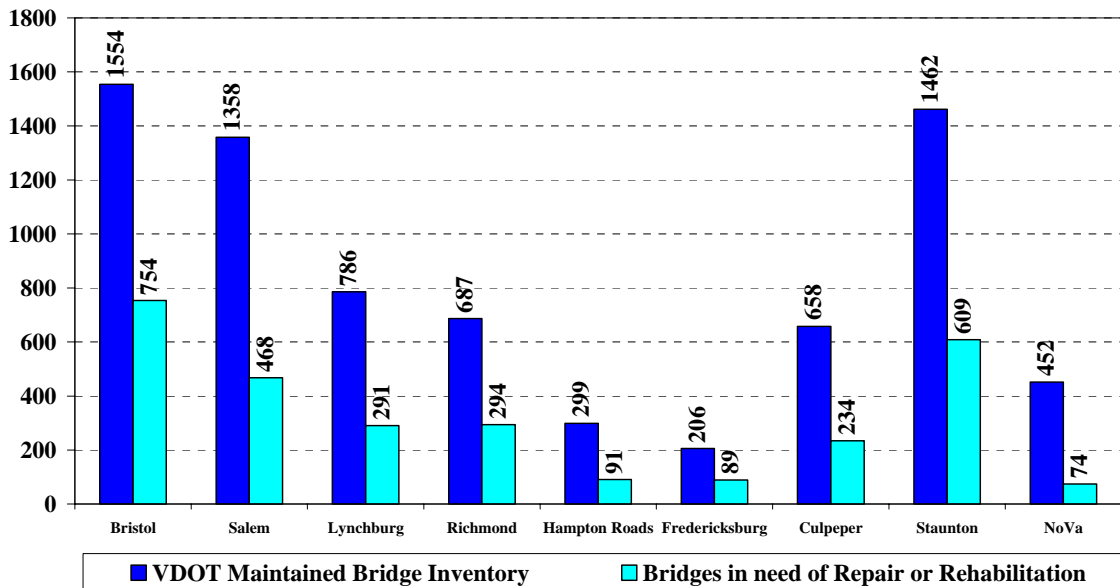
**Figure C-4: VDOT maintained pavement inventory and maintenance activity required by system**



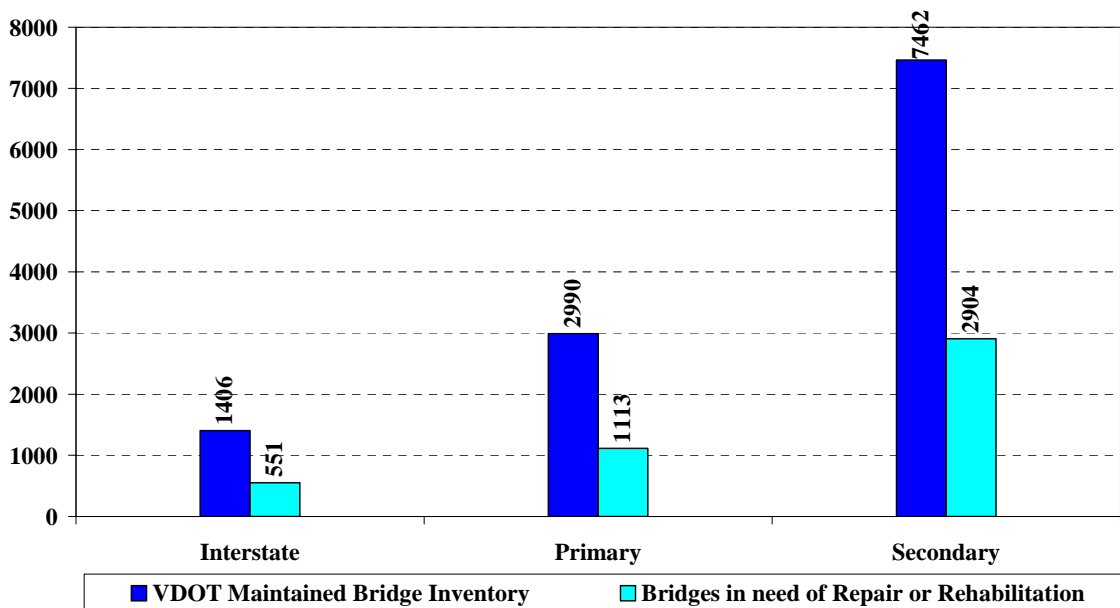
**Figure C-5: Inventory of VDOT maintained bridges and number of bridges in need of repair or rehabilitation by district – *Interstate System***



**Figure C-6: Inventory of VDOT maintained bridges and number of bridges in need of repair or rehabilitation by district – *Primary System***



**Figure C-7: Inventory of VDOT maintained bridges and number of bridges in need of repair or rehabilitation by district – *Secondary System***



**Figure C-8: Statewide Inventory of VDOT maintained bridges and number of bridges in need of repair or rehabilitation - by system**

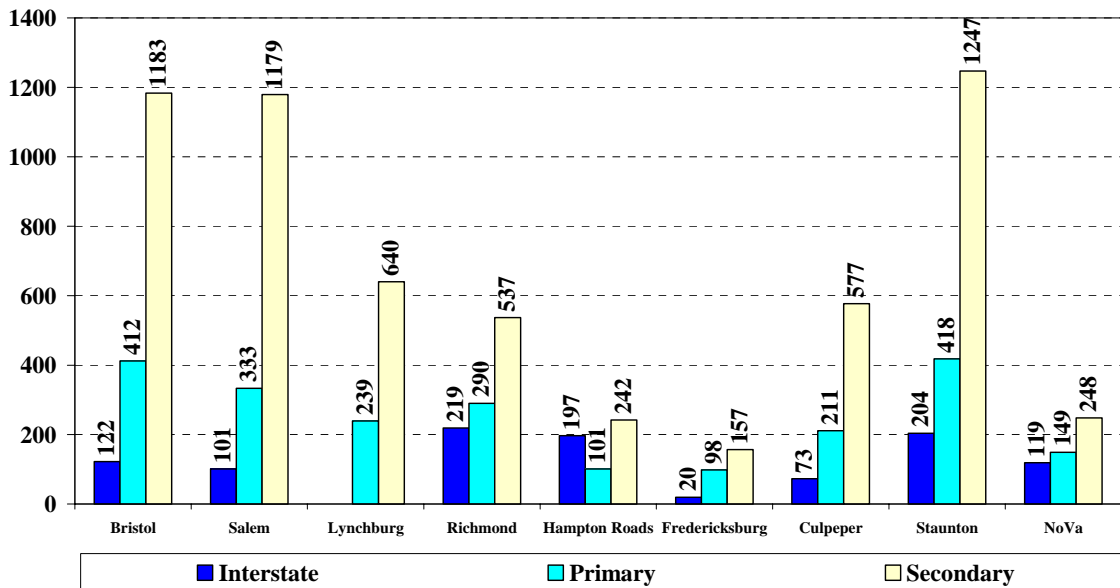


Figure C-9: Number of VDOT maintained bridges 25 years or older by district and system

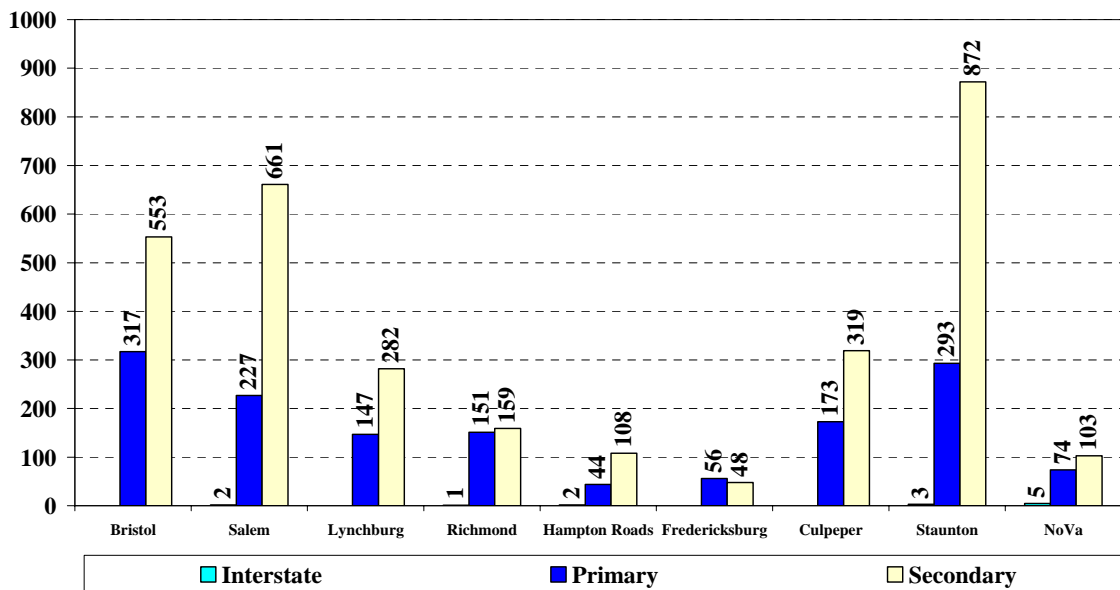


Figure C-10: Number of VDOT maintained bridges 50 years or older by district and system

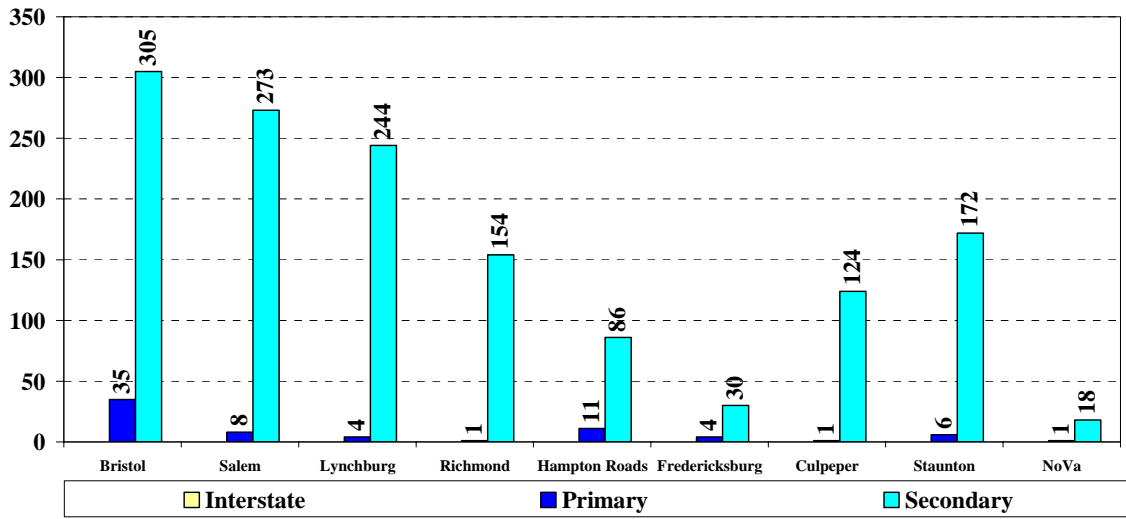


Figure C-11: Number of VDOT maintained bridges *posted for load* by district and system

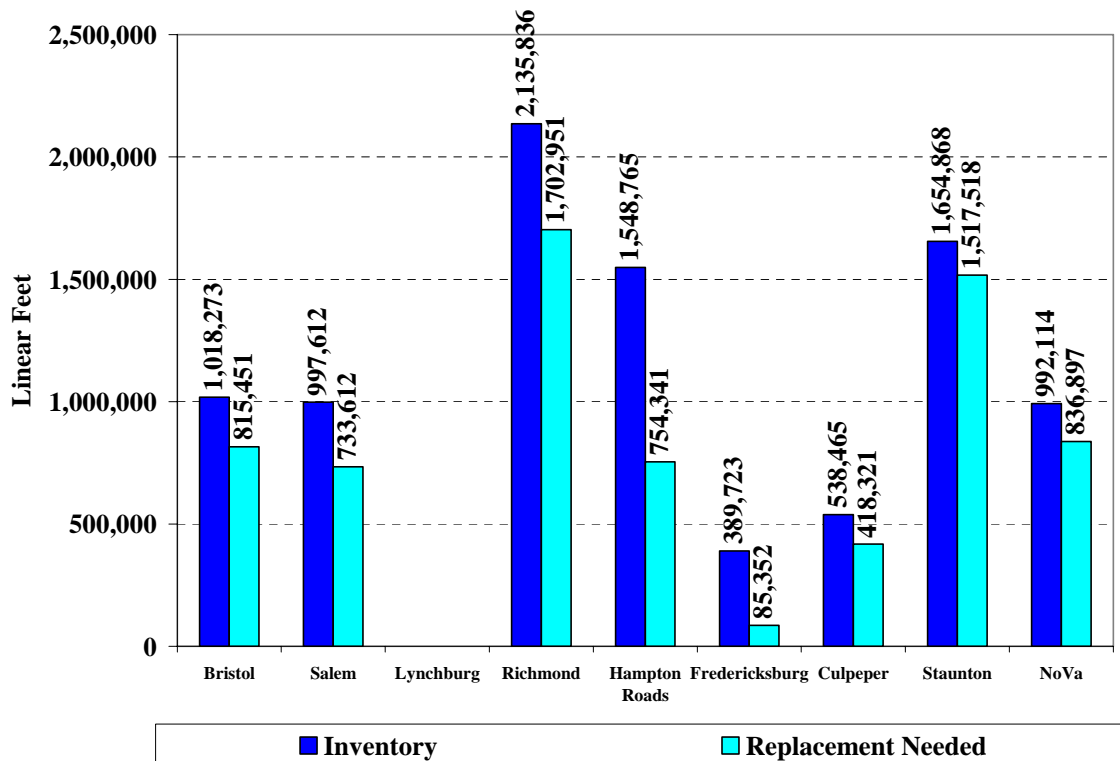
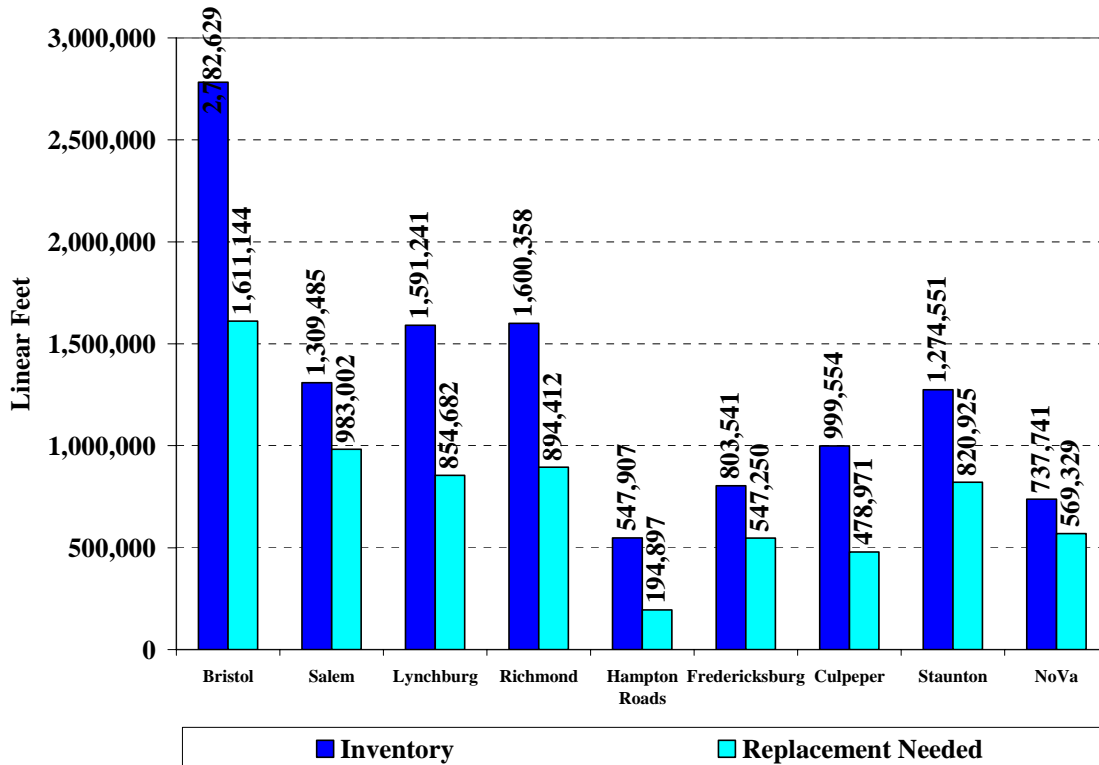
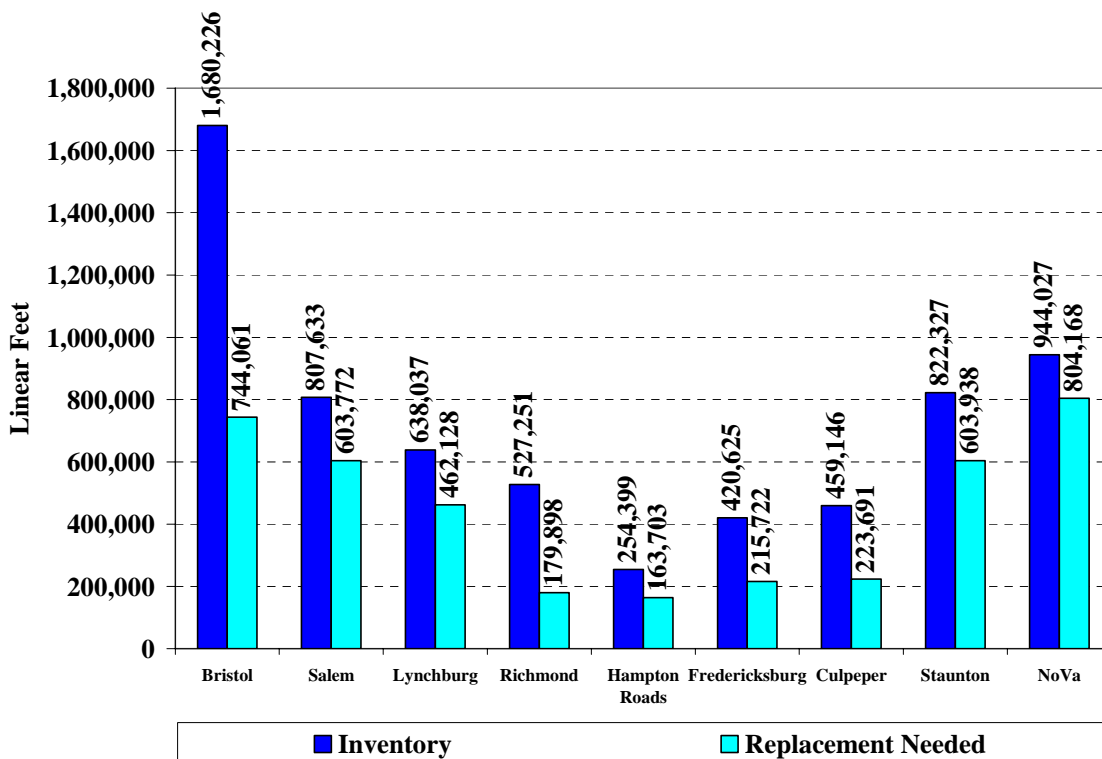


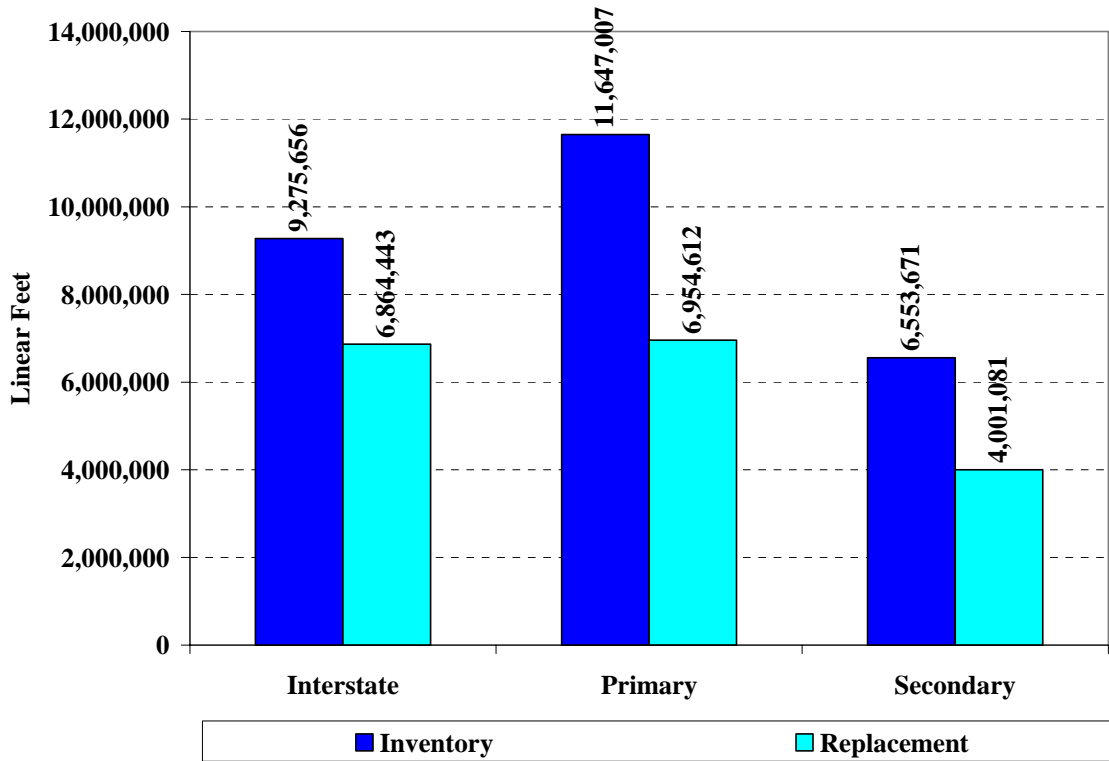
Figure C-12: Inventory of guardrail on VDOT maintained highways and replacement needed by district – Interstate System



**Figure C-13: Inventory of guardrail on VDOT maintained highways and replacement needed by district – Primary System**



**Figure C-14: Inventory of guardrail on VDOT maintained highways and replacement needed by district – Secondary System**



**Figure C-15: Inventory of guardrail on VDOT maintained highways and replacement needed - by System**



**Appendix D: Statewide Distribution of VDOT Structures**

Maintained By	Number of Bridges											
	Total	% of Total	NBI	% of Total	Non NBI	% of Total	SD <sup>4</sup>	% of Total	FO <sup>5</sup>	% of Total	Needing Repair/Rehab <sup>6</sup>	% of Total
<b>VDOT</b>	11,891	100%	9,125	77%	2,766	23%	351	3%	2,262	19%	4,604	39%
<b>Non-VDOT</b>	1,201	100%	1,013	84%	188	16%	38	3%	267	22%	386	32%
<b>Total</b>	13,092	100%	10,138	77%	2,954	23%	389	3%	2,529	19%	4,990	38%

Maintained By	Number of Culverts											
	Total	% of Total	NBI	% of Total	Non NBI	% of Total	SD	% of Total	FO	% of Total	Needing Repair/Rehab	% of Total
<b>VDOT</b>	7,385	100%	2,572	35%	4,813	65%	87	1%	13	0%	1,310	18%
<b>Non-VDOT</b>	478	100%	393	82%	85	18%	6	1%	9	2%	45	9%
<b>Total</b>	7,863	100%	2,965	38%	4,898	62%	93	1%	22	0%	1,355	17%

Maintained By	Number of all Structures (Bridges and Culverts)											
	Total	% of Total	NBI	% of Total	Non NBI	% of Total	SD	% of Total	FO	% of Total	Needing Repair/Rehab	% of Total
<b>VDOT</b>	19,276	100%	11,697	61%	7,579	39%	438	2%	2,275	12%	5,914	31%
<b>Non-VDOT</b>	1,679	100%	1,406	84%	273	16%	44	3%	276	16%	431	26%
<b>Total</b>	20,955	100%	13,103	63%	7,852	37%	482	2%	2,551	12%	6,345	30%

<sup>4</sup> Structurally Deficient (SD)

<sup>5</sup> Functionally Obsolete (FO)

<sup>6</sup> Major Bridges, per definition in Appendix C



**Appendix E: Major Bridge Funding for FY 2007-FY 2012**

<b>Hwy. Construction Funds--HBRRP<sup>7</sup></b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>TOTAL</b>
Statewide	\$0	\$0	\$0	\$0	\$0	\$389,601	\$389,601
Primary	\$12,164,455	\$18,680,349	\$13,666,968	\$18,526,894	\$18,248,989	\$23,954,281	\$105,241,936
Secondary	\$480,000	\$800,000	\$800,000	\$15,079,818	\$14,609,883	\$16,192,414	\$47,962,115
Urban	\$3,000,800	\$5,065,800	\$4,051,800	\$8,597,609	\$10,240,000	\$0	\$30,956,009
<b>TOTAL</b>	<b>\$15,645,255</b>	<b>\$24,546,149</b>	<b>\$18,518,768</b>	<b>\$42,204,321</b>	<b>\$43,098,872</b>	<b>\$40,536,296</b>	<b>\$184,549,661</b>

<b>System Formula<sup>8</sup></b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>TOTAL</b>
Interstate	\$0	\$0	\$0	\$0	\$0	\$288,000	\$288,000
Primary	\$31,404,874	\$21,579,474	\$31,438,376	\$0	\$0	\$0	\$84,422,724
Secondary	\$16,488,165	\$11,481,069	\$15,582,204	\$0	\$0	\$0	\$43,551,438
Urban	\$5,619,093	\$6,325,527	\$6,403,920	\$0	\$0	\$0	\$18,348,540
	\$53,512,132	\$39,386,070	\$53,424,500	\$0	\$0	\$288,000	\$146,610,702

<b>TOTAL Highway Construction</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>TOTAL</b>
Fed BR & Formula	\$69,157,387	\$63,932,219	\$71,943,268	\$42,204,321	\$43,098,872	\$40,824,296	\$331,160,363

<b>Maintenance System Operations</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>TOTAL</b>
<b>SYIP Amounts:</b>	\$22,845,000	\$34,466,000	\$27,520,000	\$58,087,000	\$59,246,000	\$63,616,000	\$265,780,000

<b>FEDERAL FUNDS FROM FINANCIAL PLANNING'S WORKSHEET (BROS = Bridge Off-System)</b>							
Federal BR Funds to Maintenance	\$22,844,745	\$34,465,851	\$27,820,232	\$55,087,359	\$56,246,000	\$60,615,800	
Federal BROS Funds to Maintenance				\$3,000,000	\$3,000,000	\$3,000,000	
<b>Total</b>	<b>\$22,844,745</b>	<b>\$34,465,851</b>	<b>\$27,820,232</b>	<b>\$58,087,359</b>	<b>\$59,246,000</b>	<b>\$63,615,800</b>	

<sup>7</sup> Bridge eligibility for rehabilitation and replacement is determined under criteria established by FHWA under the Highway Bridge Replacement and Rehabilitation Program (HBRRP).

<sup>8</sup> System Formula is the bridge funds that are provided in FY08 and FY09 and allocated by VDOT's Programming Division and residency staffs. It is provided in the 40/30/30 split by code to each of the three systems.



## Appendix F: Major Bridge Projects—State Funded

### Funding Source: Six Year Improvement Program (State Maintenance)

Dist.	Co.	Rte.	VA Struc. No.	State Project No.	Project Description	Estimate	Total Plan FY07	Total Plan FY08	Total Plan FY09	Total Plan FY10	Total Plan FY11	Total Plan FY12
1	95	19	1097	0019-095-1097,SR02	Superstructure Replacement	\$2,308,727	\$727,381	\$50,000				
1	95	19	1098	0019-095-1098,SR02	Superstructure Replacement	\$2,308,727	\$727,381	\$50,000				
1	97	63	1132	0063-097-1132, SR01	Repairs	\$75,000	\$56,200					
1	97	72	1093	0072-097-1093,SR00	Superstructure Replacement	\$296,000	\$229,694					
1	25	72	1020	0072-025-1020,SR00	Superstructure Replacement	\$230,000	\$179,115					
1	86	624	6034	0624-086-6034,SR00	Major Bridge Rehabilitation	\$490,206	\$490,206	\$0				
1	13	83	1026		Superstructure Replacement	\$269,861	\$269,861					
1	38	16	1001	BR01-038-200,C501	Superstructure Replacement	\$400,000		\$400,000				
1	84	71	1033	PM07-084-186,C501	Superstructure Replacement	\$1,535,500	\$310,000	\$1,225,500				
1	95	670	1035	BR01-095-198,C501	Superstructure Replacement	\$175,000		\$350,000				
1	13	680	6257	BR01-013-201,C501	Superstructure Replacement	\$400,000	\$50,000	\$717,175				
1	92	625	6174	0625-092-6174	Superstructure Replacement	\$150,000		\$150,000				
1	97	790	6204	0790-097-6204	Superstructure Replacement	\$486,111		\$411,111				
1	84	613	6012	0613-084-6012	Superstructure Replacement	\$420,000		\$220,000				
1	84	671	6093	BR01-084-199,C501	Superstructure Replacement	\$350,000		\$440,750				
1	98	749	6069	0749-098-6069	Superstructure Replacement	\$450,000		\$150,000	\$300,000			
1	98	642	6243	0642-098-6243	Superstructure Replacement	\$800,000		\$200,000	\$600,000			
1	102	81	2815	0081-102-2815	Deck Replacement	\$622,200			\$311,100	\$311,100		
1	98	671	6045	0671-098-6045	Replacement	\$90,000			\$45,000	\$45,000		
1	13	628	6165	0628-013-6165	Superstructure Replacement	\$598,950			\$299,475	\$299,475		
1	25	605	6096	0605-025-6096	Superstructure Replacement	\$77,000			\$38,500	\$38,500		
1	25	644	6111	0644-025-6111	Superstructure Replacement	\$289,900			\$144,950	\$144,950		
1	25	600	6131	0600-025-6131	Superstructure Replacement	\$247,000			\$123,500	\$123,500		
1	25	625	6144	0625-025-6144	Superstructure Replacement	\$328,050			\$164,025	\$164,025		
1	38	697	6062	0697-038-6062	Superstructure Replacement	\$134,400			\$67,200	\$67,200		
1	38	601	6126	0601-038-6126	Superstructure Replacement	\$1,166,400			\$583,200	\$583,200		
1	38	759	6266	0759-038-6266	Superstructure Replacement	\$126,525			\$63,263	\$63,263		
1	38	797	6326	0797-038-6326	Superstructure Replacement	\$76,000			\$38,000	\$38,000		
1	52	58	1032	0058-052-1032	Deck Replacement	\$2,330,496			\$1,165,248	\$1,165,248		

1	52	684	6068	0684-052-6068	Superstructure Replacement	\$156,000			\$78,000	\$78,000		
1	52	687	6070	0687-052-6070	Superstructure Replacement	\$173,000				\$173,000		
1	52	724	6077	0724-052-6077	Superstructure Replacement	\$132,250			\$66,125	\$66,125		
1	52	612	6098	0612-052-6098	Superstructure Replacement	\$110,250			\$55,125	\$55,125		
1	52	612	6111	0612-052-6111	Superstructure Replacement	\$137,700				\$137,700		
1	52	602	6359	0602-052-6359	Superstructure Replacement	\$78,325			\$39,163	\$39,163		
1	52	611	6389	0611-052-6389	Deck Replacement	\$81,940			\$40,970	\$40,970		
1	52	740	6401	0740-052-6401	Replacement	\$148,712				\$148,712		
1	52	708	6424	0708-052-6424	Superstructure Replacement	\$96,400			\$48,200	\$48,200		
1	52	611	6455	0611-052-6455	Superstructure Replacement	\$135,625			\$67,813	\$67,813		
1	52	738	6461	0738-052-6461	Superstructure Replacement	\$130,000			\$65,000	\$65,000		
1	52	612	6467	0612-052-6467	Superstructure Replacement	\$78,000			\$39,000	\$39,000		
1	52	643	6468	0643-052-6468	Superstructure Replacement	\$141,600			\$70,800	\$70,800		
1	52	610	6478	0610-052-6478	Superstructure Replacement	\$78,000			\$39,000	\$39,000		
1	52	656	6503	0656-052-6503	Superstructure Replacement	\$126,000			\$63,000	\$63,000		
1	52	672	6504	0672-052-6504	Superstructure Replacement	\$84,000			\$42,000	\$42,000		
1	52	680	6505	0680-052-6505	Superstructure Replacement	\$84,000			\$42,000	\$42,000		
1	83	642	6062	0642-083-6062	Superstructure Replacement	\$504,700			\$252,350	\$252,350		
1	83	678	6246	0678-083-6246	Superstructure Replacement	\$234,300			\$117,150	\$117,150		
1	84	603	6007	0603-084-6007	Superstructure Replacement	\$194,400			\$97,200	\$97,200		
1	84	624	6039	0624-084-6039	Replacement	\$209,248				\$209,248		
1	84	649	6066	0649-084-6066	Superstructure Replacement	\$293,250			\$146,625	\$146,625		
1	84	669	6091	0669-084-6091	Superstructure Replacement	\$264,475			\$132,238	\$132,238		
1	84	680	6097	0680-084-6097	Superstructure Replacement	\$159,375			\$79,688	\$79,688		
1	84	689	6103	0689-084-6103	Replacement	\$189,875			\$94,938	\$94,938		
1	84	696	6133	0696-084-6133	Replacement	\$117,600			\$58,800	\$58,800		
1	84	778	6261	0778-084-6261	Superstructure Replacement	\$96,400			\$48,200	\$48,200		
1	84	704	6300	0704-084-6300	Superstructure Replacement	\$105,925			\$52,963	\$52,963		
1	84	759	6325	0759-084-6325	Superstructure Replacement	\$74,200			\$37,100	\$37,100		
1	84	700	6387	0700-084-6387	Superstructure Replacement	\$106,575			\$53,288	\$53,288		
1	84	902	6417	0902-084-6417	Superstructure Replacement	\$70,725			\$35,363	\$35,363		
1	84	671	6455	0671-084-6455	Superstructure Replacement	\$230,850			\$115,425	\$115,425		
1	84	682	6462	0682-084-6462	Replacement	\$100,000			\$50,000	\$50,000		
1	84	622	6480	0622-084-6480	Superstructure Replacement	\$97,750			\$48,875	\$48,875		
1	84	671	6491	0671-084-6491	Superstructure Replacement	\$117,500			\$58,750	\$58,750		
1	84	685	6522	0685-084-6522	Superstructure Replacement	\$132,550			\$66,275	\$66,275		
1	84	659	6530	0659-084-6530	Superstructure Replacement	\$162,000			\$81,000	\$81,000		

1	84	636	6544	0636-084-6544	Replacement	\$116,000			\$58,000	\$58,000		
1	86	348	1072	0348-086-1072	Superstructure Replacement	\$71,500			\$35,750	\$35,750		
1	86	617	6019	0617-086-6019	Superstructure Replacement	\$172,550			\$86,275	\$86,275		
1	86	622	6024	0622-086-6024	Superstructure Replacement	\$163,350			\$81,675	\$81,675		
1	86	620	6026	0620-086-6026	Superstructure Replacement	\$179,100			\$89,550	\$89,550		
1	86	622	6028	0622-086-6028	Superstructure Replacement	\$252,000			\$126,000	\$126,000		
1	86	672	6078	0672-086-6078	Replacement	\$126,750			\$63,375	\$63,375		
1	86	742	6292	0742-086-6292	Superstructure Replacement	\$72,000			\$36,000	\$36,000		
1	92	91	1104	0091-092-1104	Superstructure Replacement	\$120,750			\$60,375	\$60,375		
1	92	625	6025	0625-092-6025	Superstructure Replacement	\$268,720			\$134,360	\$134,360		
1	92	643	6069	0643-092-6069	Superstructure Replacement	\$131,250			\$65,625	\$65,625		
1	95	80	1047	0080-095-1047	Superstructure Replacement	\$312,375			\$156,188	\$156,188		
1	95	616	6025	0616-095-6025	Superstructure Replacement	\$250,275			\$125,138	\$125,138		
1	95	634	6195	0634-095-6195	Superstructure Replacement	\$57,000			\$57,000			
1	95	684	6410	0684-095-6410	Superstructure Replacement	\$65,450			\$65,450			
1	97	686	6004	0686-097-6004	Superstructure Replacement	\$153,900			\$76,950	\$76,950		
1	84	687	6102	0687-084-6102	Replacement	\$269,700			\$134,850	\$134,850		
1	84	683	6427	0683-084-6427	Superstructure Replacement	\$145,350			\$72,675	\$72,675		
1	52	811	6507	0811-052-6507	Superstructure Replacement	\$272,000			\$136,000	\$136,000		
1	84	627	6140	0672-084-6140	Superstructure Replacement	\$334,375			\$167,188	\$167,188		
1	86	658	6104	0658-086-6104	Superstructure Replacement	\$225,000			\$112,500	\$112,500		
1	98	77	2053	0077-098-2053	Superstructure Replacement	\$209,831			\$104,916	\$104,916		
1	98	749	6068	0749-098-6068	Superstructure Replacement	\$184,000			\$92,000	\$92,000	\$80,000	
1	98	749	6179	0749-098-6179	Superstructure Replacement	\$184,000			\$92,000	\$92,000		
1	102	81	2813	0081-102-2813	Superstructure Replacement	\$138,814			\$69,407	\$69,407		
1	95	1212	6110	1212-095-6110	Superstructure Replacement	\$642,864			\$321,432	\$321,432	\$279,506	
1	84	71	1032		Superstructure Replacement	\$1,100,000				\$1,100,000		
1	25	63	1042		Superstructure Replacement	\$1,059,984				\$529,992	\$529,992	
1	95	58	1067		Superstructure Replacement	\$1,028,972				\$514,486	\$514,486	
1	95	58	1061	0058-095-114, B604	Superstructure Replacement	\$2,368,000						
1	52	665	6012	0665-052-P73, B634	Replacement	\$125,000						
1	84	613	6014	0613-084-282, B639	Replacement	\$932,000						
1	84	714	6116	0714-084-270, B637	Replacement	\$582,000						
1	84	812	6002	0812-084-280, B638	Replacement	\$430,000						
1	83	652	6096	0652-083-315, B635	Replacement	\$1,544,914						
1	10	612	6081	0612-010-189, B629	Replacement	\$150,000						
1	38	734	6084	0734-038-P95, B638	Replacement	\$238,000						

2	60	11	1030	M203BOB39764	Superstructure replacement	\$826,050	\$2,446						
2	128	101	1812	M205BRA39524	Structural Steel Repairs	\$336,309	\$336,308						
2	17	94	1010	M206BOA39636	Deck rehab; joints; super & sub repairs	\$213,000	\$114,000	\$99,000					
2	77	100	1015	M20-78302-M00	Superstructure replacement	\$1,346,748	\$1,346,748						
2	70	40	1041	M205BRA39794	Superstructure replacement	\$737,000	\$234,142	\$502,858					
2	80	115	6261	M206BOA39524	Deck overlay; super & sub repairs	\$719,925	\$130,476	\$589,449					
2	33	890	6214	M206BOB39864	Deck overlay; super/sub repairs	\$710,000	\$50,000	\$660,000					
2	11	43	1015	M205BRA39617	Replace Structure - Precast Box	\$553,800	\$39,000	\$514,800					
2	60	11	1008	M205BOA39764	Superstructure replacement	\$713,934	\$31,967	\$681,967					
2	11	11	1106	M206BRA39617	Superstructure replacement	\$698,360	\$49,180	\$649,180					
2	60	81	2006	M20-78310-M00	Bearing repairs; joints; deck overlay	\$1,172,500	\$52,500	\$1,120,000					
2	60	81	2007	M20-78311-M00	Bearing repairs; joints; deck overlay	\$1,172,500	\$52,500	\$1,120,000					
2	22	311	1036	M207BRA39650	Superstructure replacement	\$832,557	\$0	\$832,557					
2	44	701	6007		Replace structure	\$2,879,550	\$84,560	\$2,794,990					
2	33	220	1046		Superstructure replacement	\$1,587,032			\$644,732	\$942,300			
2	70	103	1027		Total rehab	\$511,157			\$511,157				
2	9	122	1013		Deck overlay; super/sub repairs	\$431,640			\$431,640				
2	31	221	1016		Deck overlay; super/sub repairs	\$1,168,703			\$350,611	\$818,092			
2	77	81	2028		Repair overlay; paint; joints; repair lighting	\$337,292			\$337,292				
2	35	61	1079		Deck overlay; sub repairs	\$689,004			\$310,052	\$378,952			
2	77	81	2029		Deck overlay; paint; super/sub repairs	\$1,159,295			\$295,687	\$863,608			
2	22	311	1022		Superstructure replacement	\$692,460			\$279,959	\$412,501			
2	44	220	1079		Total rehab	\$228,365			\$228,365				
2	11	81	2026		Deck super & sub repairs; polymer overlay	\$396,000			\$213,000	\$183,000			
2	11	81	2027		Deck super & sub repairs; polymer overlay	\$396,000			\$213,000	\$183,000			
2	11	81	2028		Deck super & sub repairs; polymer overlay	\$396,000			\$213,000	\$183,000			



2	11	81	2029		Deck super & sub repairs; polymer overlay	\$396,000			\$213,000	\$183,000		
2	9	634	6371		Deck overlay; paint	\$430,320				\$430,320		
2	44	57A	1070		Total rehab	\$1,171,602				\$433,392	\$738,210	
2	44	57A	6241		Deck overlay; super repairs	\$1,359,670				\$433,392	\$926,278	
2	11	81	2008		Deck overlay; sub repairs	\$462,000				\$462,000		
2	154	81	2001		Deck overlay; super repairs	\$506,697				\$506,697		
2	11	81	2009		Deck overlay; sub repairs	\$512,160				\$512,160		
2	154	81	2000		Deck overlay; super repairs	\$604,658				\$604,658		
2	33	919	6211		Superstructure replacement	\$826,880				\$719,431	\$107,449	
2	35	1404	6187		Deck overlay; super/sub repairs; paint	\$301,110					\$301,110	
2	77	100	1041		Deck overlay; super/sub repairs	\$330,818					\$330,818	
2	11	11	1032		Deck overlay; sub repairs	\$645,120					\$645,120	
2	35	460	1082		Replace deck; paint; super. repairs	\$680,745					\$651,636	\$29,109
2	77	100	1022		Superstructure replacement	\$741,505					\$741,505	
2	80	116	1087		Deck replacement	\$962,579					\$962,579	
2	11	630	6077		Deck overlay; paint	\$1,178,673					\$1,178,673	
2	11	11	1004		Repair deck; sub. repairs	\$64,994						\$64,994
2	70	649	6154		Replace timber deck; paint	\$142,465						\$142,465
2	9	666	6087		Repair truss members; paint truss	\$142,988						\$142,988
2	77	658	6032		Superstructure replacement	\$143,299						\$143,299
2	60	679	6050		Replace timber deck; paint	\$155,744						\$155,744
2	33	641	6051		Replace timber deck; paint	\$157,824						\$157,824
2	128	581	2814		Deck overlay; sub. repairs; lighting; seal cracks in beams	\$207,775						\$207,775
2	33	754	6471		Repair undermining; paint; repair wearing surface	\$219,273						\$219,273
2	9	689	6019		Replace w/ culvert	\$236,972						\$236,972
2	44	622	6129		Paint truss; truss/sub. repairs	\$247,711						\$247,711
2	35	700	6052		Deck overlay; super/sub repairs	\$249,628						\$249,628
2	33	613	6481		Replace timber deck; paint	\$254,903						\$254,903

2	70	701	6123		Replace deck; paint; super. repairs	\$264,890						\$264,890
2	33	927	6358		Superstructure replacement	\$270,182						\$270,182
2	60	685	6014		Deck rehab; paint; super. repairs	\$277,658						\$277,658
2	77	660	6165		Paint; deck; sub. repairs	\$285,656						\$285,656
2	60	81	2004		Paint; bearing repairs; joints; deck overlay	\$304,292						\$304,292
2	128	581	2818		Joints; drains; paint; sub. repairs; deck overlay	\$1,706,127						\$360,973
2	60	773	6132		Repair truss members; paint truss	\$362,979						\$362,979
2	33	705	6463		Replace bridge	\$367,014						\$367,014
2	60	81	2005		Paint; bearing repairs; joints; deck overlay	\$369,378						\$369,378
2	11	81	2005		Deck overlay; sub. repairs; paint	\$386,265						\$386,265
2	128	0	8031		Joints; drains; paint; sub. repairs; deck overlay	\$420,122						\$420,122
2	11	81	2004		Deck overlay; sub. repairs; paint	\$483,318						\$483,318
2	33	40	1009		Repaint; structural steel repairs; scour repair	\$1,021,362						\$1,021,362
2	80	81	2004		Deck overlay; paint; super/sub repairs	\$1,150,392						\$1,150,392
2	80	81	2005		Deck overlay; paint; super/sub repairs	\$1,359,076						\$1,359,076
2	17	703	6107		Replace truss	\$227,821						
2	33	641	6054		Replace timber deck; paint	\$137,760						
2	33	1019	6370		Superstructure replacement	\$360,470						
2	35	61	1037		Deck rehab; joints; super, bearings, & sub repairs; repaint	\$2,103,206						
2	44	220	1026		Total rehab	\$600,090						
2	60	603	6316		Deck overlay; paint; sub. repairs	\$485,025						
2	70	626	6031		Replace timber deck; paint	\$449,484						
2	70	739	6280		Replace timber deck; paint	\$132,697						
2	70	772	6153		Replace truss	\$135,392						

2	80	81	2022		Deck overlay; sub. repairs; paint	\$447,114							
2	128	581	2806		Repair steel cracks; paint; sub. repairs; joints	\$512,614							
3	71	734	6144	0734-071-287, B678	Rte 734 - Reconstruction and Bridge over Cane Creek	\$2,015,000	\$1,725,000						
3	108	0	8006	U000-018-109, B606	Worsham Street - Bridge Demolition	\$5,396,000	\$4,459,000	\$46,000	\$35,000	\$78,000	\$70,000	\$85,000	
4	20			Rte 60 WBL/ NSRR	Superstructure Replacement		\$1,000,000	\$280,000					
4	127			Belv/Rte 95	Deck Latex Overlay		\$1,652,058	\$220,000					
4	43			Meadow/Rte 64	Deck Latex Overlay		\$978,673						
4	37			Ashland Rd/Rte 64	Deck Replacement		\$1,394,692						
4	58			15/58/Roanoke River	Deck Latex Overlay		\$1,962,192						
4	74			Rte 156/James River	Paint Truss/Repair Misc Stl		\$3,000,000	\$3,000,000	\$800,000				
4	127			Rte 64 EB/Shockoe Creek	Superstructure Replacement		\$800,000	\$700,000	\$2,925,000	\$3,900,000	\$1,500,000		
4	127			Rte 64 WB/Shockoe Creek	Superstructure Replacement		\$800,000	\$700,000	\$2,700,000	\$3,600,000	\$1,250,000		
4	74			Rte 301/Warwick	Superstructure Replacement			\$400,000	\$100,000				
4	58			Rte 58/No. 3 Branch	Superstructure Replacement			\$700,000	\$429,000				
4	123			Syc. Str/Rte 85	Superstructure Replacement			\$1,860,000	\$1,440,270				
4	12			Rte 1/ Waqua Cr	Deck Overlay/ Repairs			\$1,045,000	\$131,960				
4	58			Rte. 85/ 629	Superstructure Replacement			\$708,750	\$472,500				
4	127			Rte 360/64 & CD	Deck Replacement			\$2,729,025	\$1,819,350				
4	26			Rte. 226/NSRR	Deck Replacement/Paint				\$1,000,000	\$900,000			
4	67			Rte 49/NSRR	Superstructure Replacement					\$730,000	\$315,000		
4	42			Rte 1/CSX	Substructure Repair/Deck Overlay					\$1,755,270	\$250,000		
4	67			Rte 360 EB/E&W 460 & RR	Deck Replacement					\$1,292,130	\$700,000		
4	67			Rte 360 WB/E&W 460 & RR	Deck Overlay/ Repairs					\$1,175,265	\$550,000		
4	43			Rte 301/ Brook Run	Superstructure Replacement						\$950,000		
4	63			Rte 33&64/Btms. BR	Deck Replacement						\$2,800,000		
6	59	3	1959	0003-059-1959	Scour Remediation	\$1,220,000	1,210,000						
6	16	95	2000, 2001	0095-016-2000, 20001, SR02	Bridge Rehabilitation	\$1,300,000	800,000	500,000					
6	16	207	1026	0207-016-1026, SR01	Bridge Rehabilitation	\$410,000	60,000	350,000					

6	89	95	2000, 2001, 2031	0095-089-2000, 2001, 2031	Structural Steel Repair	\$154,000	154,000	900,000					
6	89	95	2000	0095-089-2000	Superstructure Replacement	\$1,078,000			157,000	440,000	481,000		
6	89	95	2001	0095-089-2001	Superstructure Replacement	\$936,000			136,000	400,000	400,000		
6	36	198	1005	0198-036-1005	Bridge Widening	\$420,000				70,000	350,000		
6	66	201	1013, 1014	0201-066-1013, 1014	Culvert Replacement	\$760,000	20,000	700,000	40,000				
6	16	207	1025	0207-016-1025	Bridge Rehabilitation	\$460,000			60,000	200,000	200,000		
6	88	208	1945	0208-088-1945	Bridge Rehabilitation	\$1,250,000	50,000	500,000	700,000				
6	50	360	1008	0360-050-1008, SR02	Deck Replacement	\$900,000					150,000	750,000	
6	79	360	1945	0360-079-1645	Bridge Rehabilitation	\$4,330,000			2,000,000	2,170,000			
7	30	55	1062	0055-030-1062	Superstr.. Replacement	\$ 699,627	\$ 750,000						
7	2	601	6261	0601-002-6261	Emergency Repairs	\$ 418,530	\$ 450,000						
7	78	621	6020	0621-078-6020	Superstr. Replacement	\$ 374,785	\$ 400,000						
7	2	618	6018	0618-002-6018	Superstr. Replacement.	\$ 725,000	\$ 100,000	\$ 700,000					
7	30	681	6320	0681-030-6320	Superstr. Replacement.	\$ 375,000	\$ 75,000	\$ 325,000					
7	23	672	6108	0672-023-6108	Superstr. Replacement.	\$ 550,000		\$ 550,000					
7	2	665	6055		Superstr. Replacement	\$ 400,000		\$ 200,000	\$ 200,000				
7	23	15	1907		Major Rehab.	\$ 550,000			\$ 300,000	\$ 250,000			
9	53	699	1003		Major Rehabilitation, Rte 699 over W&OD Trail	\$935,000	\$753,000	\$0	\$0	\$0	\$0	\$0	\$0
9	100	395	2800	PM09-000-194, C501	Major Rehabilitation, I-395 Ramp over I-395 & Rte 236	\$180,000	\$160,000	\$20,000	\$0	\$0	\$0	\$0	\$0
9	0	395	2009	PM09-000-196, C501	Major Rehabilitation, I-395 over Country Club Rd	\$82,000	\$72,000	\$10,000	\$0	\$0	\$0	\$0	\$0
9	0	395	2020	PM09-100-197, C501	Major Rehabilitation, I-395 over Country Club Rd	\$82,000	\$72,000	\$10,000	\$0	\$0	\$0	\$0	\$0
9	29	690	6084		Major Rehabilitation, Rte 690 over Pimmit Run	\$52,000	\$10,000	\$42,000	\$0	\$0	\$0	\$0	\$0
9	29	683	6081		Major Rehabilitation, Rte 683 over Difficult Run	\$154,000	\$152,000	\$1,000	\$1,000	\$0	\$0	\$0	\$0
9	53	705	6908		Major Rehabilitation, Rte 705 over Bull Run	\$735,000	\$0	\$0	\$75,000	\$40,000	\$312,000	\$308,000	

**Appendix G: Major Bridge Projects—Federal Funded**

<b>Dist</b>	<b>Co.</b>	<b>Struc. ID</b>	<b>Project Description</b>	<b>Fund Source</b>	<b>Estimate</b>	<b>Phase</b>	<b>Total \$ Plan FY2006</b>	<b>Total \$ Plan FY2007</b>	<b>Total \$ Plan FY2008</b>	<b>Total \$ Plan FY2009</b>	<b>Total \$ Plan FY2010</b>	<b>Total \$ Plan FY2011</b>
1	97	19265	Major Rehabilitation of Structure 1100 on Rte. 23 over Roaring Fork Creek	BR	\$3,159,120	CON	\$0	\$1,811,993	\$1,347,127	\$0	\$0	\$0
1	86	17384	Bridge Rehabilitation, State structure 1073	NHS	\$699,345	CON	\$0	\$279,738	\$419,607	\$0	\$0	\$0
1	97	19343	Bridge Rehabilitation, State structure 1042	BR	\$551,931	CON	\$0	\$220,772	\$331,159	\$0	\$0	\$0
1	86	17710	Bridge Rehabilitation, State structure 6309	NHS	\$676,888	CON	\$0	\$270,755	\$406,133	\$0	\$0	\$0
1	97	19338	Bridge Rehabilitation, State structure 1009	BR	\$577,850	CON	\$0	\$346,710	\$231,140	\$0	\$0	\$0
1	13	03803	Bridge Rehabilitation, Rte. 460, State Structure 1003	NHS	\$1,117,673	CON	\$0	\$1,117,673	\$0	\$0	\$0	\$0
1	13	03803	Bridge Rehabilitation, Rte. 460, State Structure 1003	STP	\$284,627	CON	\$0	\$284,627	\$0	\$0	\$0	\$0
1	84	16605	Bridge Rehabilitation, Rte. 71, State Structure 1033;Over Big Moccasin Creek	STP	\$1,535,500	CON		\$461,000	\$1,074,500	\$0	\$0	\$0
1	97	19318	Bridge Rehabilitation, Rte. 68, State Structure 1127	STP	\$460,000	CON		\$115,000	\$345,000	\$0	\$0	\$0
1	92	02963	Bridge Rehabilitation, Rte. 52, State Structure 1009	STP	\$820,000	CON		\$136,667	\$683,333	\$0	\$0	\$0
1	13	03968	Bridge Rehabilitation, Rte. 680, State Structure 6257	BR	\$400,000	CON		\$50,000	\$350,000	\$0	\$0	\$0

1	84	16812	Bridge Rehabilitation, Rte. 671, State Structure 6093	BR	\$350,000	CON		\$50,000	\$300,000	\$0	\$0	\$0
1	95	19089	Bridge Rehabilitation, Rte. 670, State Structure 1035	BR	\$350,000	CON		\$50,000	\$300,000	\$0	\$0	\$0
1	38	08686	Bridge Rehabilitation, Rte. 16, State Structure 1001	BR	\$400,000	CON		\$50,000	\$350,000	\$0	\$0	\$0
1	92	18457	Bridge Rehabilitation, Rte. 19, State Structure 1125	NHS	\$1,600,000	CON			\$750,000	\$850,000		
2	77	1015	Route 100 Bridge Rehabilitation	BR	\$1,311,748	CON	\$0	\$1,311,748	\$0	\$0	\$0	\$0
2	35	1002	Route 460 Bridge Rehabilitation	BR	\$891,682	CON	\$891,682	\$0	\$0	\$0	\$0	\$0
2	60	2006	Route 81 Bridge Rehab	NHS	\$1,137,500	CON	\$0	\$1,137,500	\$0	\$0	\$0	\$0
2	60	2007	Route 81 Bridge Rehab	NHS	\$1,137,500	CON	\$0	\$1,137,500	\$0	\$0	\$0	\$0
2	11	1007	Route 11 Bridge Rehab	NHS	\$550,337	CON	\$0	\$550,337	\$0	\$0	\$0	\$0
2	35	1001	Route 460 Bridge Rehab	BR	\$226,209	CON	\$226,209	\$0	\$0	\$0	\$0	\$0
3			Southbound Lane Rt 15 over Buffalo Creek	BR	\$653,593	CON	\$653,593	\$0	\$0	\$0	\$0	\$0
3	5	01341	Minor Bridge Rehabilitation - Rt 29 over James River (VA no. 1950)	NHS	\$2,020,000	CON	\$0	\$888,800	\$1,131,200	\$0	\$0	\$0
3	62	12374	Route 6 over NS Railway (VA no. 1002)	BR	\$568,000	CON	\$0	\$568,000				
3	62	12375	Route 6 over Hickory Creek (VA no. 1003)	BR	\$496,000	CON	\$0	\$496,000				
3	15	04168	Rte. 43 Campbell Co. (VA no. 1909)	BR	\$100,000	PE	\$0	\$100,000	\$0	\$0	\$0	\$0
3	15	04168	Rte. 43 Campbell Co. (VA no. 1909)	BR	\$379,000	CON	\$0	\$379,000	\$0	\$0	\$0	\$0
3	71	13444	NBL 29 Bus. Over 29	BR	\$1,063,530	CON	\$0	\$500,000	\$563,530	\$0	\$0	\$0
3	19	04971	Bridge Rehabilitation - Rte 712 over Rte 15&360 - Charlotte Co -	BR	\$478,765	CON	\$0	\$478,765	\$0	\$0	\$0	\$0

			Str 019-0712-6173									
4	58	11858	Overlay, Paint, Minor Repair	BR	\$3,337,192	CON	\$3,337,192	\$0	\$0	\$0	\$0	\$0
4	43	9632	Bridge Repairs and Overlay	BR	\$1,448,673	CON	\$1,448,673	\$0	\$0	\$0	\$0	\$0
4	City of Richmond	21392	Bridge Repairs and Overlay	BR	\$2,622,058	CON	\$2,622,058	\$0	\$0	\$0	\$0	\$0
4	37	8639	Deck Replacement and Repairs	BR	\$2,024,692	CON	\$2,024,692	\$0	\$0	\$0	\$0	\$0
4	20	5012	Superstructure Replacement	BR	\$2,006,076	CON	\$2,006,076	\$0	\$0	\$0	\$0	\$0
4	74	14069	Rte 156 Bridge over James River - Painting	BR	\$6,000,000	CON	\$0	\$4,000,000	\$2,000,000	\$0	\$0	\$0
4	20	5011	Overlay of Rte 36 Bridge over Appomattox River	BR	\$950,000	CON	\$0	\$950,000	\$0	\$0	\$0	\$0
5	46	10364	James River Bridge Repainting	BR	\$7,562,464	CON	\$7,562,464	\$0	\$0	\$0	\$0	\$0
5	Chesapeake	21868	Clean and Repaint High Rise Bridge- Rte. 64 over E. br. Eliz. River, Chesapeake	IM	\$8,053,868	CON	\$0	\$0	\$4,331,000	\$3,722,868	\$0	\$0
5	Newport News	20752	Waterproof Concrete Beams 2 Structures, Rte 664 , Newport News	IM	\$2,168,433	CON	\$0	\$0	\$1,084,217	\$1,084,216	\$0	\$0
6	57	11836	Minor Bridge Rehabilitation, Rte 223 Gwynn's Island Bridge	BR	\$2,014,418	CON	\$1,232,400	\$782,018	\$0	\$0	\$0	\$0
6	59	12088	Bridge Rehabilitation Rt. 227 over Urbanna Creek	BR	\$886,000	CON	\$0	\$886,000	\$0	\$0	\$0	\$0
6	89	18127	Bridge Rehabilitation Rt.608 over Accakeek Creek	BR	\$142,000	CON	\$0	\$142,000	\$0	\$0	\$0	\$0

6	89	18094	Bridge Rehabilitation NBL Rt. 95 over Potomac Creek	NHS	\$131,000	CON	\$0	\$131,000	\$0	\$0	\$0	\$0
6	89	18093	Bridge Rehabilitation SBL Rt. 95 over Potomac Creek	NHS	\$132,000	CON	\$0	\$132,000	\$0	\$0	\$0	\$0
6	59	12083	Bridge Overlay Rte 3 over Rappahannock 0003-059-1959	STP	\$11,000,000	CON		\$0	\$7,150,000	\$3,850,000	\$0	\$0
6	89	18113, 18114	Bridge Painting Contract for I-95 over Rappahannock (2)	STP	\$4,000,000	CON	\$0	\$2,200,000	\$1,800,000	\$0	\$0	\$0
6	59	12083	Bridge Painting Contract for Norris Bridge	STP	\$20,000,000	CON	\$0	\$0	\$6,000,000	\$8,000,000	\$6,000,000	\$0
6	111	20243	Bridge Rehabilitation Fall Hill Ave. over I-95, BR06-111-120,M400	STP	\$640,000	CON	\$0	\$640,000	\$0	\$0	\$0	\$0
6	50	10648	Bridge Rehabilitation WBL Rt. 360 over Pamunkey River, BR- 06-050-119,M400	STP	\$710,000	CON	\$0	\$710,000	\$0	\$0	\$0	\$0
6	88	17991	Bridge Rehabilitation Rt 608 over Rt 95, BR06- 088-117,M400	STP	\$2,100,000	CON	\$0	\$1,600,000	\$500,000	\$0	\$0	\$0
7	2	535	Latex Overlay - Rte 64 over Rivanna and CSX		\$1,750,000					\$1,250,000	\$500,000	
8	3	00932	Bridge Major Rehab over C & O Railroad	BR	\$1,534,000	CON	\$0	\$532,000	\$1,000,000	\$0	\$0	\$0
9	000	1027	Superstructure Replacement Rt 50 over 27	BR	\$7,882,000	CON	\$7,882,000	\$0	\$0	\$0	\$0	\$0
9	000	2009	Bridge Rehabilitation on I-395 over Country Club Rd	NHS	\$989,000		\$0	\$0	\$497,000	\$492,000	\$0	\$0
9	000	2020	Bridge Rehabilitation on I-395 over Country Club Rd	NHS	\$989,000		\$0	\$0	\$497,000	\$492,000	\$0	\$0



9	100	2800	Bridge Rehabilitation on I-395 over I-395/Rte 236	IM	\$3,184,000		\$0	\$0	\$1,125,000	\$2,059,000	\$0	\$0
9	100	2800	Major Rehabilitation, I-395 Ramp over I-395 & Rte 236	BR	\$3,184,000		\$0	\$0	\$1,125,000	\$2,059,000	\$0	\$0
9	000	2009	Major Rehabilitation, I-395 over Country Club Rd	BR	\$989,000		\$0	\$0	\$497,000	\$492,000	\$0	\$0
9	000	2020	Major Rehabilitation, I-395 over Country Club Rd	BR	\$989,000		\$0	\$0	\$497,000	\$492,000	\$0	\$0
9	0029	6084	Major Rehabilitation, Rte 690 over Pimmit Run	BR	\$987,000		\$0	\$0	\$298,000	\$689,000	\$0	\$0
9	0002	6081	Major Rehabilitation, Rte 683 over Difficult Run	BR	\$615,000		\$0	\$0	\$0	\$615,000	\$0	\$0
9	0029	2014	Major Rehabilitation, I-95 over SRR	BR	\$1,323,000		\$0	\$0	\$85,000	\$4,000	\$455,000	\$779,000
9	000	5002	Major Rehabilitation, 2nd Street over Rte 50	BR	\$2,660,000		\$0	\$0	\$160,000	\$40,000	\$1,652,000	\$808,000
9	100	2803	Major Rehabilitation, Rte 420 over Van Dorn St	BR	\$2,055,000		\$0	\$0	\$50,000	\$146,000	\$789,000	\$1,070,000
9	000	2005	Major Rehabilitation, I-395 over Boundary Channel Drive	BR	\$1,370,000		\$0	\$0	\$126,000	\$9,000	\$690,000	\$545,000
9	000	1034	Major Rehabilitation, Rte 27 over Ramp B of I-395	BR	\$735,000		\$0	\$0	\$0	\$0	\$111,000	\$624,000
9	000	2050	Major Rehabilitation, I-395 over GW Parkway	BR	\$837,000		\$0	\$0	\$0	\$51,000	\$145,000	\$641,000
9	0076	6022	Major Rehabilitation, Rte 646 over Cedar Run	BR	\$197,000		\$0	\$0	\$0	\$0	\$60,000	\$137,000



## **Appendix H: Rail Crossings Improvement Costs for FY 2007-2008**

### **Crossing Surface Improvement**

Hi-type Rubber Crossing Surface – Single track, two lane road - \$65,000

Hi-grade Rubber - Single track, two lane road - \$120,000

Lay-In Concrete - Single track, two lane road - \$55,000

Platform Concrete - Single track, two lane road - \$65,000

### **Signal Improvements**

Upgrade to 12” Lens - \$50,000

Flashing Lights only - \$110,000

Flashing Lights and Gates - \$195,000

Cantilever Flashing Lights - \$245,000

Cantilever Flashing Lights and Gates - \$290,000

Four-Quadrant Gates - \$350,000

If sidewalk present at Highway/Rail Grade Crossing:

- Pedestrian Gate – separate pedestal - \$45,000
- Pedestrian Gate – add to gate - \$25,000

Interconnection of Railroad Signals and Highway Traffic Signals:

- NS - \$15, 000 - \$20,000
- CSX - \$30,000 – \$45,000

*Source VDOT – Rail Projects Agreements Group and Norfolk Southern Railway*



**Appendix I: High Fatal Accident Crossings**

<b>Area</b>	<b>City/County</b>	<b>Street Name</b>	<b>Location</b>	<b>AADT (2004)</b>	<b>Hwy Speed</b>	<b>Max Train Speed</b>	<b>Total Trains Per Day</b>	<b>Total Crashes</b>	<b>Total Fatalities</b>	<b>FAP</b>
Northern Virginia	Alexandria	Slaters Lane	237' W Abingdon	13160	25	10	1	3	0	0.14495
	Alexandria	Washington St	241' S Slaters Ln	39362	45	10	1	1	0	0.06446
	Manassas Park	Manassas Ln	.45Mi E Euclid	14818	35	79	32	1	0	0.10741
	Manassas	Main St	244' S Center St	3450	25	25	32	1	0	0.08032
	Prince William	Balls Ford Rd	.02Mi S Rt 781	17616	45	25	18	1	1	0.08215
	Prince William	Lee Hwy	.02Mi W Rt 55	41239	45	25	18	2	0	0.01497
	Quantico	Potomac Ave	239' E Barnett	10353	25	79	51	1	0	0.10070
Richmond Metro	Richmond	Valley Rd	.04Mi E 2 <sup>nd</sup> St	2438	25	20	15	1	0	0.06125
	Richmond	Hospital St	Int 7 <sup>th</sup> St	5905	25	20	15	1	0	0.06950
	Richmond	Bells Rd	.05Mi E Meridian	10000	35	25	14	1	0	0.08776
	Richmond	Broad Rock Rd	0.8Mi W Rt 161	18907	35	79	18	3	0	0.22018
	Richmond	Hull St	Int 2 <sup>nd</sup> St	16177	25	10	3	1	0	0.06906
	Richmond	Forest Hill Ave	.04Mi S Powwhite	19658	40	10	2	1	0	0.07871
	Chesterfield Co	Kingsland Rd	.40Mi E Rt 637	2094	40	60	18	1	0	0.06360
	Chesterfield Co.	Curtis St	23' E Rt 1509	2729	25	79	26	3	0	0.18808

*Source: Based on a Fatal Accident Prediction factor of 0.060 and above.*

Area	City/County	Street Name	Location	AADT (2004)	Hwy Speed	Max Train Speed	Total Trains Per Day	Total Crashes	Total Fatalities	FAP
Hampton Roads	Chesapeake	Providence Rd	.17Mi E Rt 168	18184	35	20	10	2	1	0.12514
	Chesapeake	Military Hwy	53' S of W Military	6803	25	10	6	3	0	0.12875
	Chesapeake	Old Atlantic Ave	.29Mi E Liberty	5758	25	15	16	4	0	0.20152
	Chesapeake	Portlock Rd	.39Mi E Franklin	5027	35	5	36	1	0	0.08679
	Hampton	LaSalle Ave	67' N Pembroke	17312	35	15	2	1	0	0.08949
	Hampton	Old Aberdeen Rd	38' N Pembroke	1627	35	15	2	3	0	0.11273
	Hampton	Aberdeen Rd	52' N Pembroke	10627	40	15	2	1	0	0.07448
	Newport News	Harpersville Rd	.45Mi W Rt 143	12059	25	79	25	1	0	0.08679
	Newport News	Yorktown Rd	63' NE Rt 60	5216	25	79	25	1	0	0.08347
	Newport News	Jefferson Ave	321' N 36 <sup>th</sup> St	13068	25	15	4	1	0	0.08932
	Norfolk	Granby St	39' S 23 <sup>rd</sup> St	9558	25	25	50	1	0	0.09360
	Norfolk	Granby St	.10Mi N Little Creek	26033	25	50	12	2	0	0.15760
	Norfolk	Little Creek Rd	10Mi E Rt 460	33178	25	50	12	1	0	0.87192

Area	City/County	Street Name	Location	AADT (2004)	Hwy Speed	Max Train Speed	Total Trains Per Day	Total Crashes	Total Fatalities	FAP
Hampton Roads, cont.	Norfolk	Hampton Blvd	Int International Terminal	31106	35	10	8	1	0	0.13587
	Portsmouth	Western Branch Blvd	.16Mi N Tyreneck	22048	45	10	2	1	0	0.08582
	Portsmouth	Frederick Blvd	.15Mi S Turnpike	39272	45	20	6	1	0	0.12322
	Portsmouth	Turnpike Rd	.65Mi E Frederick	9745	30	8	6	1	0	0.07864
	Suffolk	E Washington	22' S Hall Ave	14473	25	40	42	1	0	0.09360
	Suffolk	Saratoga St	25' S Hall Ave	4546	25	40	42	1	0	0.08679
	Suffolk	Wellons St	.06Mi S Wilson	2330	25	40	42	1	0	0.07815
	Suffolk	Moore St	.04Mi S Pinner	5912	25	49	5	2	0	0.10087