

**OFFICE OF THE STATE INSPECTOR GENERAL**

**Report to Commissioner Kilpatrick**

*Performance Review*

*Virginia Department of Transportation*

**January 2015**



**June W. Jennings, CPA  
State Inspector General**

**OSIG Report Number 2014-PR-001**



**COMMONWEALTH OF VIRGINIA**  
**Office of the State Inspector General**

June W. Jennings  
State Inspector General

James Monroe Building  
101 North 14<sup>th</sup> Street, 7<sup>th</sup> Floor  
Richmond, Virginia 23219

Phone (804) 625-3255  
Fax (804) 786-2341  
[www.osig.virginia.gov](http://www.osig.virginia.gov)

January 22, 2015

Charles A. Kilpatrick, P.E.  
Virginia Department of Transportation  
1401 East Broad Street  
Richmond, VA 23219

Dear Commissioner Kilpatrick:

The Office of the State Inspector General (OSIG) recently completed a performance review of the Virginia Department of Transportation (VDOT), which focused on six risk areas within the agency: governance, third party administrator/contractor management, performance measurement and reporting, construction, maintenance, and environmental.

The review's objectives included identifying any areas of inefficiency; ineffectiveness; and/or uneconomical policies, procedures, and/or practices. This review was not intended to identify all potential inefficient, ineffective, and/or uneconomical functions/operations. Rather, the OSIG focused on identifying ways of enhancing operations in the six risk areas.

On August 19, 2014 an exit conference with VDOT executive management team was held to discuss a draft of this report, and per VDOT executive management's responses, the issues and recommendations of this report were revised where appropriate. VDOT executive management's official comments have been attached to this report.

On behalf of OSIG, I would like to express our appreciation for the assistance and cooperation the VDOT leadership team and staff provided during this review.

If you have any questions or require further information, please contact me at 804-625-3255 or by email at [june.jennings@osig.virginia.gov](mailto:june.jennings@osig.virginia.gov).

Sincerely,

A handwritten signature in cursive script that reads "June W. Jennings".

June W. Jennings  
State Inspector General

cc: Paul Reagan, Chief of Staff to Governor McAuliffe  
Suzette Denslow, Deputy Chief of Staff to Governor McAuliffe  
Aubrey Layne, Secretary of Transportation  
Senator Stephen Newman, Chairman of the Senate Transportation Committee  
Delegated Thomas Rust, Chairman of the House Transportation Committee

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## Executive Summary

The Office of the State Inspector General's (OSIG) statutory guidelines as set forth in *Code of Virginia (Code) § 2.2-309* [A](9) specify: "The State Inspector General shall have power and duty to: Conduct performance reviews of state agencies to assess the efficiency, effectiveness, or economy of programs and to ascertain, among other things, that sums appropriated have been or are being expended for the purposes for which the appropriation was made and prepare a report for each performance review detailing any findings or recommendations for improving the efficiency, effectiveness, or economy of state agencies, including recommending changes in the law to the Governor and the General Assembly that are necessary to address such findings."

This review is not comprehensive and not intended to identify all potential inefficient, ineffective, and/or uneconomical operations. Rather, OSIG review staff sought to identify ways VDOT could enhance the operations in six risk areas: governance, construction, maintenance, environmental, performance measurement and reporting, and third party administrator/contractor management.

This review was conducted October 1, 2013 through May 31, 2014, during which time OSIG review staff:

- Researched, gathered, and analyzed information obtained from public sources and agency personnel.
- Interviewed VDOT management and staff.
- Conducted telephone interviews with transportation management and staff from other states.

Overall, the OSIG staff found that the VDOT governance, construction, maintenance, environmental, performance measurement and reporting, and third party administrator/contractor management functions were operating effectively and efficiently. However, during this review OSIG review staff identified these following areas where operations could potentially be improved:

- Vendor inspector costs for highway construction projects and bridges significantly exceed the costs for VDOT employees to perform the same inspections.
- Potential technology may exist to streamline and improve bridge inspections and other activities.
- A current indirect cost allocation plan has not been developed.
- Only some turnkey asset maintenance services (TAMS) contracts are reconciled.
- A formal contingency planning process for potential loss of federal or state funds does not exist.

Below are several of the more significant recommendations, which, if implemented, will improve present processes.

- VDOT should consider analyzing the statewide usage and cost of vendor inspectors to identify the potential cost savings of using state employees instead. If results confirm significant savings, the General Assembly should be informed so that they may consider increasing VDOT's authorized employment level.

- VDOT should consider performing or partnering with other states to research the use of unmanned aerial vehicles for bridge inspections and other activities.
- VDOT should consider developing a current indirect cost allocation plan to improve its highway construction project funding flexibility.
- VDOT should reconcile all TAMS contract expenditures to ensure that all expenditures associated with the work performed are properly posted to the correct contract and work category.
- VDOT should consider developing a comprehensive contingency plan to address unexpected and unplanned federal and state funding shortfalls.

## Scope and Methodology

This review was conducted October 1, 2013 through May 31, 2014, and its scope was limited to six risks areas: governance, construction, maintenance, environmental, performance measurement and reporting, and third party administrator/contractor management. These risk areas were identified by Deloitte & Touche, LLP in its risk assessment of executive branch agencies performed for the OSIG in 2013. OSIG review staff developed several objectives in each risk area (see [Exhibit 1](#)); however, internal control systems in these risk areas were not analyzed.

The review was limited to interviews with VDOT personnel and other states' government transportation staff and management; reviews of relevant policies, procedures, and documentation; and data analysis.

## Issues and Recommendations

### *Issue 1: Vendor Inspector Costs*

While reviewing construction project practices, OSIG review staff were informed by VDOT staff that the agency not only hired vendors to inspect construction projects during the peak construction season, but also year-round instead of hiring additional employees as inspectors. To understand and compare costs concerning VDOT's usage of vendors and state employees, OSIG review staff examined VDOT information from the southern portion of the Richmond District. Information reviewed for this assessment included VDOT's Construction Inspection Services contract for the southern portion, information concerning vendor and VDOT staff used for various inspector positions, and vendor and state employee hourly pay rates.

#### Legislative-Determined Employment Level

VDOT management conveyed that the agency has not determined the least costly method (whether vendor or VDOT employee) for performing inspections because the General Assembly set the maximum employment level for the agency at about 7,500. For the last few years, the legislature has put a greater emphasis on increased use of vendors for highway and bridge work, which may not be the least costly way to perform this work. In addition, for complex inspections (such as certain bridge inspections), VDOT continues to share inspection services with industry, and to supplement VDOT inspectors to cover normal needs, peak delivery times, loss of VDOT inspection staff, or in the event that VDOT staff is untrained for needed inspections.

VDOT management told OSIG review staff the southern portion utilized staff of three construction inspection vendors full-time. OSIG review staff identified and sampled six of 15 staff identified as using the most recent task orders, and determined the amount of time worked in a year (an average amount of time worked was determined for the construction inspector senior and construction inspector regular positions):

- Construction manager (one individual)—100% of the year
- Construction inspector senior (three individuals)—49% of the year
- Construction inspector regular (two individuals)—43% of the year
- Construction inspector trainee (three individuals)—not tested

Vendor staff may be assigned to work in other districts and divisions under different task orders, but for this review OSIG review staff did not determine whether or not these individuals also worked under other task orders.

#### Comparison of Hourly Rates

For the four positions listed in [Figure 1](#), OSIG review staff compared the average hourly rate for the vendor staff to the VDOT employee average hourly rate (including fringe benefits such as health insurance, administrative overhead, and leave).



Figure 1 - Inspection Rate Comparison between Vendors' Staff and VDOT Employees

Construction Position	Hourly Rate		Difference	Annual Cost Difference <sup>1</sup>	Percent of Year Worked on Task Order	Cost Difference Based on Task Order Percent
	Vendor	VDOT				
Manager	109.65	64.06	45.59	\$94,827	100%	\$94,827
Inspector Senior	72.05	51.38	20.67	128,981	49%	63,201
Inspector Regular	59.60	37.67	21.93	91,229	43%	39,228
Inspector Trainee <sup>2</sup>	50.83	31.04	19.79	-	-	-
				<b>Total</b> \$315,037		<b>Total</b> \$197,256

OSIG review staff calculated that the average (cumulative) hourly rate for VDOT bridge inspector supervisors, seniors, and staff for all districts (including fringe benefits, overhead, and leave) was \$51.16. VDOT's Structure and Bridge Division management provided us with the cost and hours worked by vendor bridge inspectors from April 2011 – April 2014. Our analysis determined that if all vendor work had been performed by VDOT employees cost savings would have been approximately \$13,293,739 over a two to three year period. See details in [Exhibit 2](#).

**RECOMMENDATION 1-A**

VDOT pays substantially more for vendors to inspect construction projects and bridges than for employees to perform these tasks. This is due, at least in part, to the agency's maximum employment restriction, which is set at about 7,500 employees.

VDOT should consider developing a method to collect data and analyze the amount of time/money spent on inspections per vendor inspection position. If the results of the analysis show that significant monetary savings may be achieved, then VDOT should consider proposing an increase in the agency's employment level to the General Assembly so that additional inspectors for construction projects and bridges can be hired to handle the normal work load. The cost for the increased employment level would be funded by the reduction in vendor inspection contract costs. Vendor employees would continue to be used during peak periods and for complex inspections requiring unique skills. This change would potentially save the agency millions of dollars, which could then be used to execute other needed construction/maintenance projects.

**Vendor Contracts**

*Diving Inspectors*

We reviewed the eight contracts VDOT has in place for vendor diving inspectors (seven districts and one statewide) and found that each was signed on a different date, ranging from January 11, 2012 –

<sup>1</sup> The annual cost difference was determined by multiplying the hourly rate difference by the number of vendor employees utilized by VDOT times 2,080 hours (total work hours in a year). The cost difference for the state as a whole was not extrapolated because VDOT does not maintain a cumulative electronic record of the amount of time vendor inspectors are used to conduct inspections.

<sup>2</sup> As of the time of the review, VDOT did not have any inspector trainees employed; the VDOT hourly rate used was obtained from the last employee in the position. The inspector trainee category is included for illustrative purposes only.

October 11, 2013. VDOT's Structure and Bridge Division management informed OSIG review staff that "the statewide contract was executed in October 2010 and was procured to support the underwater inspections that were previously performed by the VDOT underwater inspection team. The current *Statewide Underwater Safety Inspection* contract is used to perform inspections on approximately 95% [of] structures. The *District Safety Inspection* contracts include underwater inspection services in the event of emergencies and to perform quality control of the statewide underwater inspection consultant."

**RECOMMENDATION 1-B**

VDOT should consider consolidating its solicitation process for district diving inspectors to improve the efficiency over that process.

*Vehicle Usage*

VDOT's memorandum of agreement (MOA) with three Subcontractors and a General Contractor signed on October 3, 2012 for Richmond district-wide construction inspection services includes direct-cost charges for the three Subcontractors' and the General Contractor's vehicle usage. According to VDOT management and invoices reviewed by OSIG review staff, the dollar amounts listed in the MOA are not considered binding, and vehicle types are not specifically identified, resulting in a wide variation in invoice billings. Vehicle usage rates for Subcontractors 1 and 2 and the General Contractor are typically higher than VDOT rental rates. For all three Subcontractors, vehicle costs do not include the gas usage or maintenance, whereas VDOT rental vehicles do include gas usage and maintenance. MOA and invoice details are in [Exhibit 3](#). Subsequent to the completion of our field work, the MOA was updated and signed on May 28, 2014 and now documents specific vehicle types to be used by Subcontractors and the General Contractor.

**RECOMMENDATION 1-C**

Management should consider standardizing rental rates for each vehicle type and define what costs the rates cover in the MOA with the contractors who rent VDOT vehicles so that invoice billings are consistent and can be agreed back to the MOA. Also, management should consider using its own vehicles or purchasing additional vehicles (primarily the SUVs [4WD] and the pickups [2WD]) if the cost benefit shown in [Exhibit 3](#) can be achieved.

***Issue 2: Research on the Use of Unmanned Aerial Vehicles in Inspections***

**Michigan Department of Transportation and Michigan Tech Research Institute**

While performing research for this review, OSIG review staff found that the Michigan Department of Transportation worked with the Michigan Tech Research Institute (MTRI) to determine if it was practical to use unmanned aerial vehicles (UAVs) for inspecting the state's inventory of unpaved roads.

With respect to an MTRI October 2013 report entitled *State of the Practice for Remote Sensing of Transportation Infrastructure Using Unmanned Aerial Vehicles*, OSIG review staff learned from the lead researcher that although little research had been conducted on the possibility of using UAVs to inspect

bridges, it was an area where UAV use could be beneficial. The MTRI report itself stated that “limited amounts of research have explored the practicability of using UAVs in infrastructure assessment pertaining to bridge and pavement conditions.”

The MTRI report mentioned a number of possible advantages for using UAVs when conducting inspections including:

- Larger fields of view.
- Operating with limited traffic interruptions.
- Fewer safety issues because traffic flow is not completely shutdown.
- Fewer traffic crashes.
- Fewer natural hazards due to elevation and weather.
- Flying payload technologies that allow for quicker data collection.
- Analyzing multiple locations due to the reduced time needed per assessment.
- Upon data collection completion, assessments of digital imagery and videos could be analyzed in safer and less stressful environments.
- More detailed condition ratings of roadways.

The MTRI report indicated that the primary drawback for using UAVs was that the Federal Aviation Administration (FAA) must approve their use. However, the FAA has collaborated with UAV analysts in New Jersey and Ohio, and the Ohio Department of Transportation has 13 active and five pending FAA-issued Certificates of Authorization.

The MTRI report also stated that the UAV’s maximum payload has to be considered, such as the camera, necessary hardware, and power supply. However, “current UAVs have incorporated interchangeable sensors that collect high resolution near- and thermal infrared, LiDAR (light detection and ranging), multi- and hyperspectral, and chemical sensors. Sensor technology is being developed at a quick rate, with payloads advancing to higher resolutions and becoming smaller in size. These advancements not only create a smaller, lighter payload, but have also helped create smaller UAVs, which result in a safer and more agile system.”

### ***Virginia Center for Transportation Innovation and Research***

OSIG review staff contacted the Virginia Center for Transportation Innovation and Research’s (VCTIR) executive management (responsible for VDOT research) regarding VCTIR’s research on UAV use. OSIG was told that VCTIR has “not done any formal research in this area. We have heard from several faculty from (the University of) Virginia and Virginia Tech who would like to get funding from us to do this very thing. However, we feel at this time there are a number of efforts already underway (including Michigan’s) and there are a number of issues that need to be worked out. One of the biggest is to really define exactly what will be gained from the use of these unmanned vehicles in bridge inspections. Without experts who know how to inspect the bridge elements working very closely with the folks who develop these unmanned vehicles we feel benefits will not be achieved.”

VDOT's Structure and Bridge Division management employees told OSIG review staff they were comfortable with the current methods used to inspect bridges, which includes vendor-conducted onsite and underwater inspections using sonar for assessing sea floor conditions around bridge foundations and divers for assessing bridge structures. They indicated that sonar was not good for assessing bridge structures due to poor imaging quality.

### Utah Department of Transportation's UAV Research Project

OSIG review staff also reviewed the Utah Department of Transportation's (UDOT) July 2012 research project, *Evaluation and Development of Unmanned Aircraft for UDOT Needs*. The project was conducted for UDOT's Research Division by the Utah State University's Utah Water Research Laboratory. The project documentation stated: "This project has focused on improving the performance and assessing the applicability of using a UAV for highway related problems at the UDOT. Two specific tasks were completed during the project. The UAV was used to take aerial images before, during, and after the completion of the Southern Parkway Highway corridor project and images taken by the UAV were utilized to classify wetland plant species at the Utah Lake wetland mitigation bank. During both applications, the digital images taken by cameras onboard the UAV were post-processed so that stitched and geo-referenced images could be accurately utilized in UDOT's geographic information system (GIS) databases and as a UDOT plant species classification tool."

The project's results indicated the following benefits of using UAVs:

- "Visualize highway construction progress, construction staging areas, and cut and fill regions."
- "High-resolution imagery allows for immediate updating of UDOT GIS databases, documentation and inventorying of roadway signage and other highway structures, and provides a historical record of the construction."
- "Small relative cost of acquiring the images."
- "Determine the best methods for passing traffic safely through the construction zone."
- "Provide much of the information needed to inventory highway features, monitor ongoing road construction, evaluate existing road conditions, and classify plant species (wetland features) that may be removed when a future road is constructed."
- "Economic tool for wetland mitigation permits as there is great potential for time saving and more accurate classification with the UAV."
- "If image post-processing improves for plant classification, mitigation ratios may be reduced and the total cost for mitigation projects may be reduced."
- "Using the UAV to monitor invasive plant species along ... highway corridors."
- "Using the UAV to evaluate and monitor erosion or hillside damage near roadways."
- "Using the UAV to measure paint reflectivity on roadway surfaces."
- "Using the UAV to inspect damage immediately after a flood, rockslide, or earthquake."
- "Using the UAV to provide historic timelines of specific roadway corridors for the purpose of evaluating environmental changes due to human impact."

#### RECOMMENDATION 2-A

VDOT should consider having its Structure and Bridge Division and other applicable divisions work with VCTIR to conduct research and carryout project(s) to assess possible uses of UAVs for improving the efficiency and effectiveness of:

- Bridge inspections.
- Underwater inspections.
- Highway inspections.
- Wetland inspections.
- Other miscellaneous inspections.

#### RECOMMENDATION 2-B

VDOT should consider partnering with the Michigan Department of Transportation, UDOT, and/or other applicable entities to assess and develop UAV inspection methods and techniques.

### ***Issue 3: Indirect Cost Allocation Plan***

*Virginia Acts of Assembly*; Chapter 806; § 4-2.03 states: “Each state agency ... which accepts a grant or contract shall recover full statewide and agency indirect costs unless prohibited by the grantor agency or exempted by provisions of this act.” Item 451F states: “Notwithstanding § 4-2.03 of this act, the VDOT shall be exempt from recovering statewide and agency indirect costs from the Federal Highway Administration (FHWA) until an indirect cost plan can be evaluated and developed by the agency and approved by the FHWA.”

VDOT management informed OSIG review staff that each year the agency fully uses its FHWA highway funding allocation, and no additional allocation is available from the Federal government. However, once the allocation year is over, unused allocations from other states are redistributed to states that have completely used their allocations, as happened with Virginia in September 2013 when the former Governor announced that Virginia had “received an additional \$57.3 million in federal funds for transportation originally allocated to other states.”

VDOT management stated the agency had considered developing an indirect cost allocation plan during the recent recession because of concerns that it could not pay some of its administrative costs, but ultimately chose not to create one.

OSIG review staff reviewed other states’ Department of Transportation websites and found that Texas partially funds some highway projects with indirect cost recovery money. Texas Department of Transportation staff informed OSIG review staff that Texas utilizes indirect cost recovery funds to maintain flexibility with state funds.

In addition to providing flexibility of state funds usage, other reasons to develop an indirect cost allocation plan and use indirect cost recovery funds include:

- Increased cash flow for specific federal projects because indirect cost recovery funds increase individual federal project funding resulting in quicker usage of federal funds;
- More accurate reflection of a project's actual (full) cost;
- Funding limitations (total federal funds available do not increase because indirect cost recovery funds are used) which lead to a reduced number of federally funded projects resulting in less federal regulations to follow; and
- More state projects are subject only to state regulations, resulting in savings in time and money due to:
  - Faster project approval process.
  - Fewer environmental issues.
  - No delay in last project payment.

However, developing and periodic updating of the indirect cost allocation plan takes time to complete. In addition, mechanisms must be put in place to capture indirect costs.

OSIG review staff reviewed the FHWA website and found a map in a presentation that listed states (and Washington, D.C. and Puerto Rico) that use, plan to use, are considering using, or are not planning to use indirect cost recovery funds. In addition, we obtained a list from VDOT of states that were redistributed \$1.6 billion cumulatively in 2013, including the \$57.3 million that VDOT received. Twenty-two (21 states and Washington, D.C.) of 23 entities had indirect cost recovery plans and were redistributed funds, as well as 28 states that did not have plans (see [Exhibit 4](#)). California, with \$154.5 million, was ranked first, while Virginia was ranked ninth.

The FHWA calculates redistribution amounts using:

- The amount of formula obligation limitation that had not been obligated to projects.
- The projects and/or federal funds that were obligated by the state no later than September 26, 2013.
- The formula obligation limitations in excess of amounts that were obligated to projects in the fiscal year (FY) that were released by the state for redistribution.
- Any additional formula obligation limitation the state obligated to projects by September 26, 2013, if additional limitation was provided.

VDOT management told OSIG review staff that VDOT typically uses all of its formula obligation limitation.

### **RECOMMENDATION 3**

VDOT management should consider developing an indirect cost recovery plan for possible FHWA approval. Having an approved plan in place would provide:

- Greater flexibility of state funds for highway project use.

- More rapid use of federal funds.
- Improved efficiency in completion of state-funded projects where previously those projects may have been federally funded and required additional time to comply with federal regulations.
- The opportunity to receive additional federal funds due to redistribution as more projects may be available for funding.

## ***Issue 4: Turnkey Asset Maintenance Services (TAMS) Contract Differences***

*Code of Virginia § 33.2-301* states: “All maintenance on components of the Interstate Highway System in Virginia, excluding frontage roads, shall be carried out under contracts awarded by the Commissioner of Highways or the Commonwealth Transportation Board ...” VDOT has 13 competitively bid TAMS contracts for handling interstate highway maintenance. The contracts were competitively bid, and VDOT employees provided the low competitive bid for four of the contracts (see [Exhibit 5](#)). There are 10 different contract periods (typically five years in duration) for the 13 contracts. The oversight of the contracts breaks down as follows:

### *Nine TAMS Contracts*

- Overseen by contractors
- Contractors perform some maintenance
- Subcontractors perform remaining maintenance

### *Four TAMS Contracts*

- Overseen by VDOT employees
- Subcontractors perform all maintenance

## **Contract Analysis**

Contracts were analyzed based on cost per:

- Center lane miles (highway miles)
- Lane miles (highway miles, counting each lane of traffic separately)
- Both center lane miles and lane miles.

### *Regional Contract Cost Analysis*

For highways in nearby regions, we found that contracts overseen by VDOT employees (Richmond North and Staunton North) cost substantially more per mile to maintain than for vendors (Richmond South and Staunton South). A comparison of the costs for the VDOT contract for Richmond North and the TME contract for Richmond South is shown in [Exhibit 6](#). A few urban areas (NoVA I-95/395 and NoVA I-66) cost less on average to maintain than more rural areas such as Culpeper and Staunton North. The Woodrow Wilson Bridge contract (NoVA WWB) was the most costly per mile to maintain.

*Contracts and Unconnected Regions*

OSIG review staff observed that vendors overseeing interstate maintenance for VDOT often had multiple contracts in unconnected regions, limiting the possibility of equipment sharing between regions.

- TME—Richmond South and Culpeper
- ICA—Williamsburg, Salem, and NoVA
- DBI—Staunton South and NoVA (WWB)

**RECOMMENDATION 4-A**

VDOT should perform further analysis to determine the reason for the per mileage maintenance cost disparities among common areas, such as:

- Richmond North vs. Richmond South
- Urban areas (NoVA I-95/395) vs. rural areas (Culpeper)

**RECOMMENDATION 4-B**

VDOT should consider further consolidating its interstate maintenance contract areas by region to take advantage of equipment sharing and assigning common end dates for contracts to improve the efficiency of the contract solicitation process.

***Issue 5: TAMS Expenditures Reconciliation***

VDOT management told us that the agency reconciles the Richmond North contract's expenditures to ensure all work-related expenditures are properly posted to the correct contract and work category. Because the Richmond South contract includes Greenville County (located in the Hampton Roads District), we requested expenditures associated with that county. VDOT management told OSIG review staff that Hampton Roads District expenditures are not routinely reconciled to the appropriate contract and work category, and so had to spend some time, at OSIG's request, reconciling the expenditures associated with Greenville County prior to forwarding that information to the OSIG. In addition, reconciliations are performed for all TAMS expenditures in the Bristol and Staunton districts.

**RECOMMENDATION 5**

Each VDOT district should reconcile TAMS expenditures to ensure they are properly posted to the correct contracts and work categories.

***Issue 6: Contingency Planning due to Potential Loss of Federal or State Funds***

*History and Concerns*

On April 16, 2014, the VDOT website documented that the Commonwealth Transportation Board had released "the draft *Six-Year Improvement Program*, which allocates \$13.1 billion to transportation projects



over the next six fiscal years beginning July 1, 2014. Projects include highway, road, bridge, rail, transit, bicycle/pedestrian paths, and other transportation improvements across the state . . . ‘Later this year the program will be updated to comply with the new prioritization process recently signed into law by Governor Terry McAuliffe.’ . . . The \$13.1 billion program is \$1.3 billion less than last year’s program because state revenues and federal highway and transit funding have decreased.”

### **VDOT FY2014 - FY2015 Business Plan**

OSIG review staff reviewed VDOT’s FY2014 – FY2015 Business Plan, dated May 2013, which stated that Goal 6: Coordination of Transportation and Land Use, Objective 6.1 was: “To strengthen planning and programming processes for construction, maintenance, and operations projects to maximize the use of available funding.” However, details in the plan did not indicate ways to address funding shortfalls should they occur. In addition, OSIG review staff did not find any references to funding issues in Agency Risk Management and Internal Control Standards (ARMICS) documents.

### **2013 State Highway Funding Changes**

In 2013 the Governor and the General Assembly approved changes in how the state would fund highway construction and maintenance. Funding is now supported by:

- Wholesale Sales Tax on Motor Fuels
- Motor Vehicle Sales and Use Tax
- Motor Vehicle License Tax
- Retail Sales and Use Tax
- International Registration Plan
- Capital Project Revenue (CPR) Bonds
- Grant Anticipation Revenue Vehicle (GARVEE) Bonds
- Other revenue to support bond programs
- Insurance Premiums License Tax
- Localities
- Regional Transportation Funds
- Federal

Changes made in 2013 to increase funding sources for highways have helped shore up state funding deficits that occurred in prior years. However, highway funding approval from state and federal budgets has not always been provided in a timely manner. For example, Virginia did not have an approved budget for FY2015 until June 2014. In addition, the United States Congress only recently approved the Highway and Transportation Funding Act of 2014, which extends funding through the federal Surface Transportation Program through May 2015.

VDOT management told OSIG review staff that typically the agency can end contracts with vendors with a 30- to 60-day notice, and if financial difficulties occur any/all of these contracts could be ended.

However, VDOT did not provide OSIG review staff with a specific plan detailing how unexpected and unplanned funding difficulties would be managed.

On April 29, 2014 VDOT management provided OSIG review staff with the following information regarding federal and state government resources funding shortfalls:

“Both of these potentials (federal and state funding shortfalls) are so infrequent that a standard process is not in place. The impacts of each such instance must be reviewed and considered. However, we have faced the potential of State Government Operations being shuttered due to the potential lack of an Appropriation Act for the new biennium a few times. With the last potential state government shutdown (in 2012), we began with a notification to contractors in mid-April of potential actions that would need to be taken beginning in May of that year. VDOT is considering a similar approach (in 2014), but the specific actions remain undecided at this time.

“With regard to the federal highway funding, we are currently reviewing the impact of reduced or less frequent reimbursements from FHWA on the agency’s cash position. At this time, we are not considering the cancellation of projects or advertisements for planned work. We are continuing to monitor and assess the developments in Congress. We cannot obligate funding beyond what is expected from FHWA for a given fiscal year. Permanent reductions in federal funding available to Virginia would be assessed to determine if a modification to the budget and corresponding Six-Year Improvement Program are necessary.”

OSIG review staff found that several states (including, Arkansas, Missouri, and Tennessee) had made plans, prior to the United States Congress action, to reduce project expenditures in case federal funding was reduced.

**RECOMMENDATION 6**

Although VDOT has an informal process in place, the agency should consider developing a comprehensive contingency plan to address unexpected and unplanned funding shortfalls. Such a plan should address how VDOT would handle possible adverse funding scenarios (both at the state and federal level) and incorporate in the plan the Governor’s new prioritization process for funding projects.

***Issue 7: Project Closeout Procedures***

During reviews of specific construction and maintenance projects, VDOT employees informed OSIG review staff that VDOT’s administrative closeout process for projects often takes a year or more to complete. Staff responsible for project closeout procedures stated: “As our procedures were recently updated and are being implemented now (a significant training effort is in the final stages), it has been our objective to review the procedures after six to 12 months to reassess and then develop performance

metrics. This provides an opportunity to determine how well the process is working and to identify opportunities for improvement.”

*New Closeout Procedures*

- **Costs are less than**—If a federally aided project ends up costing less than the amount of federal funding received for the project, a final modification (decrease) should be made to the federal authorization as soon as possible. This will release excess federal funds for use on other projects. Timely review of federally aided projects allows for release of unexpended/unneeded funds, which can then be re-obligated to other existing or new projects, in accordance with *United States Code, Title 23 – Highways, § 118, (d) Obligation and Release of Funds*.
- **Costs are more than**—If a federally aided project ends up costing more than the amount of federal funding received for the project, a final modification (increase) should be made to the federal authorization as soon as possible so VDOT can bill excess costs to FHWA for reimbursement.
- **Balance and close out**—As soon as possible, balance and close out federal projects for preliminary engineering after final costs are incurred.
- **Projects with no fiscal activity**—If a phase/project remains open in the financial system even though final costs have been incurred or paid, the project becomes “fiscally inactive.” In accordance with 23 CFR 630, FHWA routinely monitors “projects with no fiscal activity.” VDOT must provide written justification for any item on the FIRE report, which uses up staff time and resources at VDOT’s central office and districts. If reasonable justification to inquiries cannot be provided, unexpended obligations may be de-obligated.

OSIG review staff requested statistics regarding the timing of project closeouts, but were told statistics were not available. When asked if VDOT planned to report closeout statistics in Dashboard (VDOT’s performance measures system used to monitor performance in key areas), VDOT staff stated: “We plan to perform an evaluation of our procedures to determine their effectiveness and to establish performance metrics ... We will consider your suggestion at that time. It is important to note that we did not begin the new procedures with performance metrics as we felt strongly that those involved in closeout needed an opportunity to become familiar with the new tools and resources and to complete training.”

**RECOMMENDATION 7-A**

VDOT should capture closeout statistics for projects to identify how well the agency is doing with improving its procedures for this process.

**RECOMMENDATION 7-B**

VDOT should consider including closeout statistics in Dashboard as an accountability measure over the process.

## ***Issue 8: On-Budget Dashboard Statistics***

VDOT uses a system called “Dashboard” to internally and externally report the agency’s performance in several key areas per internally-developed business rules.

### **Dashboard Statuses**

One of these key areas concerns whether projects are on-budget in relation to the original contract amount awarded and the percentage of the project completed. The system identifies a project’s status using green, yellow, or red, with green meaning that a project or a group of projects met the on-budget business rule requirement.

### **Completed Projects On-Budget Dashboard Statuses**

For completed projects, on-budget dashboard status was determined by how much the actual contract cost exceeded the original contract awarded amount:

- **Green status**—Less than or equal to 3%.
- **Yellow status**—Greater than 3%, but less than or equal to 10%.
- **Red status**—Greater than 10%.

For paving schedules (plant mix, slurry seal, surface treatment, etc.), VDOT’s business rules identify projects as on-budget when the actual contract cost exceeds the award amount by 25% or less. VDOT management indicated the reason for the greater allowance is because paving is seasonal. When weather conditions are appropriate for paving, the vendor is often authorized to continue working until expenses are less than or equal to 25% over budget or until the contract end date (typically around the first of December), whichever occurs first.

OSIG review staff reviewed seven other states to determine how they report on-budget statistics for all projects and found states considered projects on budget when contract costs were:

- Less than or equal to 10% above the awarded amount in Florida, Georgia, and Texas.
- Less than or equal to the awarded amount in Oregon and Wisconsin.
- Less than or equal to 3% above the awarded amount in North Carolina.
- Less than or equal to 5% above the awarded amount in Michigan.

#### **RECOMMENDATION 8-A**

For paving work, VDOT should consider changing the on-budget business rules. By adjusting the budget amount and possibly the time schedule for completing contracts that have been expanded (due to good weather), on-budget statistics are more clearly and accurately reflected.

#### **RECOMMENDATION 8-B**

If there is good weather at the end of a contract, VDOT should lengthen the contract time schedule so work may continue, allowing more work during the

paving season and an increase of highway maintenance activities during good working conditions.

### ***Issue 9: Project Cost Estimation Statistics on Dashboard***

Project Cost Estimation is an assessment of changes made to the cost estimate after a project's scope has been determined. There were 1,797 projects listed as of April 2014 with a status of "Not Rated." Most of these projects had not been rated because they had been created under an old measurement system. However, 178 of these projects had been created since Dashboard came into operation, and did not have a scope or current estimate recorded even though each project's status was advertised, awarded, construction started, or construction completed. The current Dashboard business rules for project cost estimation allows current projects without estimates recorded to not be measured.

#### **RECOMMENDATION 9**

VDOT should consider modifying its Dashboard business rules to detect projects subject to the current rules that are missing project cost estimates prior to and during the advertising and construction phases. Once such changes are made and applicable projects are identified, appropriate data should be entered to ensure that all such projects are subject to measurement.

### ***Issue 10: Dashboard and Locally Administered Project Data***

Highway projects for all Virginia cities, two counties, and certain state activities are locally administered (localities choosing to administer VDOT-funded projects). Through the legislative process, the General Assembly has encouraged localities to administer more of these projects. Currently, locally administered project data is manually keyed into the Dashboard database. The VDOT Dashboard Manager told OSIG review staff that VDOT has experienced challenges obtaining basic financial and project status reports from localities. In addition, OSIG review staff observed that many of the locally administered projects in the database were missing data.

#### **RECOMMENDATION 10-A**

To improve efficiency and enhance the timeliness and accuracy of information reported by localities on locally administered projects, VDOT and localities should collaborate to identify strategies for improving local project reporting, including developing a template compatible for the Dashboard upload process. This change would improve the efficiency of how the localities report project data, and how it is uploaded to Dashboard.

#### **RECOMMENDATION 10-B**

During VDOT's Dashboard training sessions for localities, extra emphasis should be placed on the importance of having an accurate reporting process and the impact that accuracy can have on future federal and state funding of locally

administered projects. The need for providing required data for the VDOT Dashboard database should be stressed as well.

## Exhibit 1—VDOT Review Objectives

### *Governance*

- To determine whether the VDOT effectively and efficiently communicates its mission, vision, goals, policies, procedures, clear lines of responsibility, and best practices to staff.
- To determine whether the VDOT ensures that its policies and procedures align with changes in federal, state, and local regulations.
- To determine whether new Commonwealth Transportation Board (CTB) members receive adequate training regarding their responsibilities and duties as Board members.
- To determine whether CTB members appear to have the background necessary to be an effective Board member.
- To determine whether VDOT executive management and CTB members are required to and have received periodic training regarding the Freedom of Information Act, Conflict of Interest Act, and have annually completed the Statement of Economic Interests forms.
- To determine whether VDOT has an adequate contingency plan in case of reduced funds.

### *Construction, Maintenance, and Environmental*

- To determine whether the VDOT utilizes an efficient and effective planning process to select construction projects for the Six-Year Improvement Plan (SYIP).
- To determine whether the VDOT utilizes an efficient and effective planning process to select maintenance projects for funding.
- To determine whether construction projects are delivered by the original specified completion date.
- To determine whether construction projects are delivered within budget.
- To determine whether the VDOT is in compliance with the Construction Quality Improvement Program specification checkpoints.
- To determine whether maintenance projects are delivered by the original specified completion date.
- To determine whether maintenance projects are delivered within budget.
- To determine whether VDOT employees are less expensive than vendors when inspecting construction projects and bridges.
- To determine whether the Environmental Review Process (ERP) projects are initiated and completed on time.
- To determine whether the VDOT efficiently and effectively utilizes research performed by the Virginia Center for Transportation Innovation and Research in its construction and maintenance programs.
- To determine whether the VDOT fully utilizes federal toll credits to match federal revenues.
- To determine whether toll operations are efficiently and effectively handled.

- To determine whether the VDOT has evaluated and developed an indirect cost plan to have it approved by and to recover statewide and agency indirect costs from the FHWA to help fund state highway activities.
- To determine whether system support (Asset Management System) for maintenance project planning is adequate to ensure that state highway/bridge assets are maintained efficiently and effectively.

*Performance Measurement and Reporting*

- To determine whether Dashboard effectively, efficiently, and accurately captures performance measures.
- To determine whether Dashboard captures performance measures in a timely manner for use by management.
- To determine whether Dashboard captures performance measures that support the achievement of the VDOT's strategic objectives.
- To determine whether detective and preventative controls are in place during the Dashboard collection and reporting process to help ensure that no fraud, waste, or abuse is present.

*Third Party Administrator/ Contractor Management*

- To determine whether contract management policies provide for an effective degree of oversight over TAMS vendors.
- To determine whether performance measures and commitments contained in TAMS contracts ensure manageable contractual risk and provide for efficient contractual oversight.
- To determine whether TAMS relationships increase efficiency through meaningful improvements in process.
- To determine whether TAMS expenditures are properly reconciled.
- To determine whether detective and preventative controls are in place to help ensure that no fraud, waste, or abuse is present during the TAMS contract management process.



## Exhibit 2—Analysis of Cost of Vendor Bridge Inspectors vs. VDOT Employee Bridge Inspectors

Figure 2 - Analysis of Cost of Vendor Bridge Inspectors vs. VDOT Employee Bridge Inspectors

Contract	Work Dates	\$ Amount Spent on Contract	Contract Hours				
SB2009-06	4/6/11-1/6/14	5,567,151.88	38,599.69				
SB2010-05	8/1/11-3/12/14	6,454,586.66	36,020.14				
SB2011-01	2/9/12-2/12/14	5,611,018.28	30,231.66				
SB2011-07	1/31/12-3/13/14	3,850,768.48	20,818.76				
SB2011-17	4/2/12-3/17/14	8,554,460.00	46,813.82				
SB2011-18	7/20/12-3/24/14	1,701,964.07	9,752.60				
SB2012-03	10/22/12-2/10/14	2,539,757.49	10,980.25				
SB2012-04	10/10/12-4/4/14	5,112,380.00	26,945.78				
SB2012-05	7/29/13-3/18/14	1,073,353.00	4,435.00				
SB2013-03	1/15/14-3/6/14	243,120.00	2,148.00				
<b>Total (\$ amount)</b>		<b>40,708,559.86</b>		<b>Total Contract Hours</b>	<b>Avg Hourly Rate for VDOT Employees</b>	<b>Calculated VDOT Employee Cost (\$ amount)</b>	<b>Cost Difference (\$ amount)</b>
<b>Less direct expenses (\$ amount)</b>		<b>15,814,511.20</b>					
<b>Salaries only (\$ amount)</b>		<b>24,894,048.66</b>					
			<b>226,745.70</b>	<b>51.16</b>	<b>11,600,310.01</b>	<b>13,293,738.65</b>	

Note: The average hourly rate for VDOT employees to inspect bridges was calculated by obtaining and summing up the salaries for all VDOT bridge inspectors, multiplying the sum of their salaries by the VDOT-calculated fringe benefit rate of 1.8 and the resulting amount by 1.115 overhead rate, and dividing the result by the hours in a work year (2080; 52 weeks x 40 hours per week). Cost difference of \$13,293,738.65 was over a two to three year period.

## Exhibit 3—VDOT Vehicle Usage Charges vs. Vendor Vehicle Usage Charges for Construction Inspections

**Figure 3 - VDOT vs. Vendor and Subcontractor Vehicle Usage Charges for Construction Inspections**

(Note 1) VDOT Vehicle Type	(Note 2) VDOT Monthly Rental Charge	----- Subcontractors' and General Contractor's Contract Terms-----				
		Time	Subcontractor 1	Subcontractor 2	Subcontractor 3	General Contractor
SUV 4WD	\$580.36	Monthly	\$1,483.13	\$,1393.00	\$554.10	\$950.00/mth for 3 mths, maintenance, and 1,500 miles
Pickup 2WD	\$519.15	12 months	\$1,350.00	\$1,340.00		\$1,000.00/mth for 3 mths, maintenance, and 1,500 miles
Pickup 4WD	\$877.53	24 months	\$815.00	\$1,033.00		
Van	\$928.46	36 months	\$635.00	\$875.00		
<b>Vehicle Type on Vendor Invoice</b>						
		<b>Time</b>	<b>Subcontractor 1</b>	<b>Subcontractor 2</b>	<b>Subcontractor 3</b>	<b>General Contractor</b>
Unlisted vehicles		1/1-1/31/14	\$638.52			
Chevrolet Silverado		1/1-1/31/14				\$900.00
Unlisted vehicles		11/12- 12/13/13				\$1,837.52

**Note 1:** VDOT vehicle types are listed to show the rental charge by type of vehicle. The MOA dated October 3, 2012 that VDOT signed with Subcontractors 1, 2, and 3 and the General Contractor did not identify specific vehicle types.

**Note 2:** VDOT's monthly rental charge includes gas and maintenance. Charges for Subcontractors 1, 2, and 3 do not include gas or maintenance. Charges for the General Contractor include maintenance and gas up to 1,500 miles of usage. Although OSIG review staff did not quantify potential cost savings, VDOT rental charges are less than the contract terms for Subcontractors 1 and 2 and the General Contractor and less than the charges on the invoices we reviewed.

## Exhibit 4—Analysis of States with Indirect Cost Recovery (IDCR) Plans

Figure 4 - Analysis of States with Indirect Cost Recovery Plans

State	Has an IDCR Plan	Plans to Prepare an IDCR Plan	Is Considering Preparing an IDCR Plan	Has Not Prepared an IDCR Plan	Received 2013 Funds Redistribution	Amount of Funds Redistribution	Rank
Alabama	X				X	30,311,469	19
Alaska	X				X	7,238,261	50
Arizona	X				X	30,930,029	17
Arkansas				X	X	21,012,620	28
California	X				X	154,502,305	1
Colorado	X				X	25,515,737	25
Connecticut				X	X	10,000,000	45
Delaware				X	X	14,030,143	36
Florida	X				X	75,409,571	4
Georgia				X	X	58,473,346	8
Hawaii		X			X	17,000,000	31
Idaho	X				X	12,415,868	40
Illinois				X	X	67,471,930	6
Indiana	X				X	37,122,368	13
Iowa				X	X	22,156,462	27
Kansas				X	X	27,416,577	24
Kentucky				X	X	27,863,195	23
Louisiana	X				X	34,231,491	14
Maine				X	X	8,258,632	48
Maryland				X	X	31,649,190	16
Massachusetts				X	X	65,999,478	7
Michigan			X		X	50,970,348	10
Minnesota				X	X	30,120,464	20
Mississippi	X				X	22,949,266	26
Missouri	X				X	44,161,916	12
Montana	X				X	15,714,098	33
Nebraska				X	X	14,000,000	37
Nevada				X	X	7,305,060	49
New Hampshire	X				X	8,661,939	47
New Jersey	X					0	51
New Mexico			X		X	12,820,770	39
New York	X				X	80,898,136	3
North Carolina	X				X	45,136,565	11
North Dakota				X	X	10,841,110	43
Ohio	X				X	72,247,387	5
Oklahoma			X		X	28,273,234	22
Oregon				X	X	14,704,976	34
Pennsylvania				X	X	85,223,062	2
Puerto Rico			X			0	51

State	Has an IDCR Plan	Plans to Prepare an IDCR Plan	Is Considering Preparing an IDCR Plan	Has Not Prepared an IDCR Plan	Received 2013 Funds Redistribution	Amount of Funds Redistribution	Rank
Rhode Island	X				X	10,435,509	44
South Carolina				X	X	30,624,599	18
South Dakota				X	X	11,669,136	41
Tennessee				X	X	17,862,112	29
Texas	X				X	30,000,000	21
Utah	X				X	16,690,664	32
Vermont			X		X	11,009,991	42
Virginia				X	X	57,368,265	9
Washington	X				X	14,331,987	35
Washington, D.C.	X				X	9,147,205	46
West Virginia				X	X	17,477,622	30
Wisconsin		X			X	32,557,406	15
Wyoming	X				X	13,437,031	38
<b>Total</b>	<b>23</b>	<b>2</b>	<b>5</b>	<b>22</b>	<b>50</b>	<b>1,595,648,530</b>	

**Note:** This exhibit documents those states (including Washington, D.C. and Puerto Rico) that have developed, are planning or considering to develop, or have not considered developing a federally-approved indirect cost recovery (IDCR) plan. Also included are the redistributed federal highway funds each state/entity received and the ranking of the states by most redistributed funds received in 2013.

## Exhibit 5—Analysis of TAMS Contracts

**Figure 5 - Analysis of TAMS Contracts**

Location	Vendor	1-Year Budget	Center Lane Miles (CLM)	Lane Miles (LM)	Per Lane Cost for 100% CLM	Below Avg Cost	Per Lane Cost for 50% CLM/ 50% LM	Below Avg Cost	Per Lane Cost for 100% LM	Below Avg Cost
Richmond North	VDOT	\$11,475,515	171.40	1,102	\$66,952		\$38,681		\$10,409	
Richmond South	TME	\$4,949,197	138.35	621	\$35,773	Yes	\$21,871	Yes	\$7,968	Yes
Williamsburg (I-64E)	ICA	\$6,403,155	67.00	357.00	\$95,569		\$56,753		\$17,936	
Culpeper (I64W)	TME	\$3,619,120	88.00	374.00	\$41,126	Yes	\$25,402	Yes	\$9,677	Yes
Bristol	VDOT	\$4,577,438	149.00	670.00	\$30,721	Yes	\$18,777	Yes	\$6,832	Yes
Salem	ICA	\$2,976,615	109.00	460.00	\$27,308	Yes	\$16,890	Yes	\$6,471	Yes
Staunton South	DBI	\$2,947,117	120.00	503.00	\$24,559	Yes	\$15,209	Yes	\$5,859	Yes
Staunton North	VDOT	\$7,761,433	101.00	428.00	\$76,846		\$47,490		\$18,134	
Hampton Roads	VDOT	\$12,422,400	109.00	691.00	\$113,967		\$65,972		\$17,977	
NOVA (I95/I395)	ICA	\$3,224,745	113.00	651.00	\$28,538	Yes	\$16,746	Yes	\$4,954	Yes
NOVA (I66)	ICA	\$2,604,479	66.00	392.00	\$39,462	Yes	\$23,053	Yes	\$6,644	Yes
NOVA (I495)	ICA	\$1,362,192	18.00	211.00	\$75,677		\$41,067		\$6,456	Yes
NOVA (WWB)	DBI	\$9,372,697	10.00	103.00	\$937,270		\$514,133		\$90,997	
<b>Overall Average (12 locations, excluding NOVA (WWB))</b>					\$54,708		\$32,326		\$9,943	

**Note:** This exhibit documents an analysis of the budget for each TAMS contract, individually and cumulatively, to the center lane miles (highway miles) and lane miles (highway miles, counting each lane of traffic separately). For analysis purposes, OSIG assumed that all maintenance duties under the TAMS contracts were based on center lane miles, lane miles, or 50 percent using each method. OSIG excluded the NOVA (WWB) contract because the cost was substantially greater than the other locations and would have skewed the averages.

## Exhibit 6—Analysis of TAMS Regional Contract Costs

**Figure 6 - Analysis of TAMS Regional Contract Costs**

Location	Vendor	1-Year Budget	Center Lane Miles (CLM)	Lane Miles (LM)	Per Lane Cost for 100% CLM	% Dif.	Per Lane Cost for 50% CLM / 50% LM	% Dif.	Per Lane Cost for 100% LM	% Dif.
Richmond North	VDOT	\$11,475,515	171.40	1,102.42	\$66,952	87%	\$38,681	77%	\$10,409	31%
Richmond South	TME	\$4,949,197	138.35	621.12	\$35,773		\$21,871		\$7,968	
<b>Difference</b>		\$6,526,318	33.05	481.30	\$31,179		\$16,810		\$2,441	

**Note:** This exhibit documents an analysis of TAMS regional contract costs for the Richmond North contract (managed by VDOT) versus the Richmond South contract (managed by the vendor TME). The % difference columns document the percentage calculation for the difference in cost between the Richmond North and Richmond South contracts divided by the Richmond South cost.

## Exhibit 7—VDOT Management Response



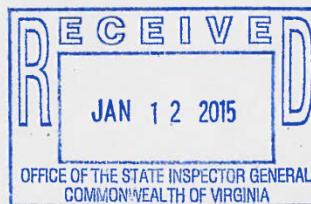
### COMMONWEALTH of VIRGINIA

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

Charles A. Kilpatrick, P.E.  
Commissioner

January 5, 2015

June W. Jennings  
Office of the State Inspector General  
101 North 14<sup>th</sup> Street, 7<sup>th</sup> Floor  
Richmond, Virginia 23219



Dear Ms. Jennings:

The Virginia Department of Transportation (VDOT) appreciates the opportunity to respond to the Office of the State Inspector General (OSIG) performance review of six evaluation areas. Your review has identified opportunities for the Department to enhance our current practices, for which we give our highest level of attention and consideration.

VDOT is the recipient of numerous audits and reviews by regulatory agencies, including the Federal Highway Administration (FHWA), the Auditor of Public Accounts (APA), and the Joint Legislative Audit and Review Commission (JLARC). These reviews are fairly consistent and provide expected types of recommendations/reports. This is the first VDOT review from OSIG. As each audit or review requires a certain amount of VDOT staff resources, I am hopeful that audit coverage will be coordinated to ensure state resources are used efficiently.

With respect to the review, we agree with items 5, 6, 7A, 9, and 10. We disagree with items 1B, 1C, and 8. Further, we understand the value of items 1A, 2, 3, 4, and 7B, but question what actions should be taken and how immediately VDOT should study and commit resources to addressing OSIG's recommendation on these items. I have included an attachment that addresses each recommendation and whether VDOT intends to take corrective action. While we may not agree that corrective action is needed for all items included in the OSIG report, VDOT will look for opportunities, as we update our Business Plan, to incorporate OSIG recommendations into new action items in the Plan.

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June Jennings  
January 5, 2015  
Page two

I understand that your staff worked within limited timeframes and resources but the performance report seems to approach complex situations and dynamic business needs from a simplistic or one-dimensional viewpoint. Some staffing and outsourcing recommendations are based on an assumption that VDOT has the ability to control its business environment and does not consider basic state government issues, such as limitations on agency staff size, limitations on agency activities that are constrained by funding and funding availability, the complexities involved with operating a large state agency within the confines of state and federal law, and the fact that certain services must be delivered, regardless of whether staff and funding are available or sufficient. The same simple review and analysis could be applied to many other types of contracts (mowing, pothole patching, emergency operations) with the result being a question on whether a state employee could perform the service cheaper. Cost is not always a primary focus with privatization or outsourcing of services. A review of introduced and/or enacted legislation demonstrates interest in VDOT operations by the Virginia General Assembly. Over the past decade, it also clearly shows a steady reduction in staff size and direction to outsource VDOT services that are available in the private market.

As stated before, VDOT will endeavor to address the recommendations in the review. We will continue to capture and analyze information to consider best business case scenarios. Thank you for the opportunity to comment on this report.

Sincerely,



Charles A. Kilpatrick, PE  
Highway Commissioner

C: The Honorable Aubrey Layne  
Secretary of Transportation

Attachment



**VDOT agrees with the following review recommendations and will take the steps outlined in the response:**

***Issue 5: TAMS Expenditures Reconciliation***

VDOT agrees that there is information to be gleaned from establishing unique charge distributions for specific TAMS contracts and establishing a certification of expenditures process on TAMS contracts. VDOT will establish unique Cardinal IDs and implement the certification process by June 30, 2015.

***Issue 6: Contingency Planning due to Potential Loss of Federal or State Funds***

Transportation is special revenue funded by revenues dedicated for transportation purposes. VDOT develops its budget based on state transportation revenues forecasted by the Virginia Department of Taxation, VDOT's estimate of federal revenues, and the planned use of bond proceeds. The VDOT budget is incorporated in to the Governor's introduced budget which is submitted to the General Assembly for consideration. The approved budget provides the appropriation amounts for VDOT's programs.

The Commonwealth Transportation Board (CTB) is responsible for allocating the appropriated and projected construction funds to projects. The CTB allocates funding to projects through a rolling six-year planning process to support the funding of selected construction projects. By July 1 of each year, the CTB is required to approve an annual budget and a six-year improvement program (SYIP). Funding is allocated as needed to support the project's lifecycle, from preliminary engineering, right of way and construction. During the year, the CTB may transfer funding between projects as needed to support changes in funding needs.

This budgetary process provides needed opportunity and flexibility to adjust to changes in funding and/or spending. The budget and SYIP is updated annually and is based on the official revenue forecast. If the forecast is updated mid-year for a material change, the budget and SYIP can be revised to adjust planned spending to the new revenue forecast. The construction project lifecycle is also conducive to change as new phase starts can be delayed if needed to address revenue reductions. Mid-year budget adjustments can also be made to address spending priorities, such as increased maintenance costs due to snow or storms.

VDOT also uses a cash forecast model to monitor projected cash balances. This tool can identify potential cash balance issues in the future, providing the opportunity to adjust planned spending. We are currently running scenarios to determine impact on cash solvency under different scenarios of reduced federal reimbursements. The scenario results will help us determine the actions needed to preserve financial position.

The following options will be considered:

- Reduce / eliminate future:
  - Construction advertisements and/or awards

- New PE starts
- R/W acquisitions
- Utilize bond program flexibility between projects, using bonds in lieu of federal funds
- AC conversions – maximize to collect reimbursements for previously incurred expenditures
- As last resort, stop work on existing contracts

As part of this effort and the implementation work associated with HB 2, VDOT will formalize its process for addressing changes, as explained above, in expected revenues and/or planned spending. The process will outline the options that should be considered and implemented to adjust to respond to the new outlook. This effort should be completed during FY15.

***Issue 7A: Project Closeout Procedures - Capture Closeout Statistics***

VDOT agrees and has been actively developing solutions for project closeout timeliness. A thorough review of this process is underway and is due to be completed in FY15. VDOT has already initiated significant changes to expedite and resolve issues in the process and is also documenting these new procedures to ensure they are repeatable. The results of the study should remove some of the unnecessary burdens on staff.

***Issue 9: Project Cost Estimation Statistics on Dashboard***

VDOT agrees that project estimating needs attention and this has been under study and recommendations will be implemented in FY15. This should limit the number of projects that are missing cost estimates in the future. Additionally, a periodic review, using data mining tools, will be performed for new projects to identify missing estimate data needing further investigation.

***Issue 10: Dashboard and Locally Administered Project Data***

To strengthen the support for the LAP program, VDOT will update the LAP Manual, clarifying roles and responsibilities, and additionally will carry out the following:

- Establish a District Local Projects Advisory Group to provide input on development of guidance and local program administration. This group would complement the Local Project Stakeholders Group (local governments) established in 2013. From the membership of both of these groups, establish a joint subcommittee to identify strategies for improving local project delivery by July 1, 2015. This group will also make recommendations to improve tracking of project delivery data as part of their review efforts.
- Meet with VITA to explore any/all options associated with providing reliable, consistent access for local government partners to VDOT business systems. Reliable access is key and will enable local governments to effectively manage project and program data that feeds into the Dashboard.

**VDOT disagrees with the following review recommendations:**

***Issue 1B: Vendor Inspector Costs - Consolidate Diving Inspector Contract Solicitation Process***

VDOT does not agree with the recommendation regarding consolidating the solicitation for diving inspectors. There is one Statewide Underwater Inspection contract that covers 95% of these inspections. This contract is managed by the Central Office Structure and Bridge Division and all underwater inspections are coordinated by this Division. Underwater diving inspection services are included in all bridge safety inspection limited term contracts, on an exceptional basis, in the event that the Statewide Underwater Inspection contract cannot handle the work and to provide a quality control review effort on the Statewide Underwater Inspection contractor. Less than 5% of the underwater inspections are handled by these secondary contracts. Underwater inspection was added to these secondary contracts in order to provide greater flexibility in getting the work done, in case there was a conflict with the Statewide Underwater Inspection contract.

***Issue 1C: Vendor Inspector Costs - Leased Vehicles***

VDOT tightened the requirements regarding consultant leased/rental vehicles in CY2013. The MOAs selected by OSIG for review pre-date this change. While VDOT staff feels that a correction in this area has already been made, VDOT continually considers methods to improve contracts and to look for ways to make them more cost effective. VDOT will continue assessing if the CY2013 change has had the desired impact, however, this will be done as part of our routine efforts to assess contract provisions.

***Issue 8: On-Budget Dashboard Statistics***

The rationale and the business rule for a 25% allowance over the original award amount for on-time paving schedules is congruent with the programmatic approaches in setting the maintenance budget and managing the paving program. In the construction program's budget, a project has a specific start point and end point, and a fixed budget. This does not hold true for paving schedules in the maintenance program. A significant portion of the maintenance program budget is spent on Cost Centers, not projects. Paving schedules are conglomerations of routes to be treated.

If maintenance funding becomes available, or if VDOT realizes lower than expected bid prices, additional routes may be added to the paving schedules. VDOT may issue a work order on a paving schedule to add work over the contract award and the on-budget performance measure has a 25% tolerance. The flexibility to add additional work, allows VDOT to maximize a paving schedule contract and budget accordingly. This practice has provided VDOT a method to increase the capacity and output of the paving program, while minimizing the total cost, and measuring the program's on-budget performance to the baseline award amount. VDOT feels that following this simple contracting method and applying the 25% rule is the most efficient manner to handle this process. OSIG is comparing the contracting for construction contracts and maintenance paving schedules and the Dashboard rules; these are different in nature and we feel the process and rule are effective.

**VDOT feels that there is additional discussion needed or does not agree to take foreseeable actions related to the following review items:**

***Issue 1A: Vendor Inspector Costs - Cost Savings and Staff Size***

**Bridge Inspection** - The inspection of structures and bridges is a serious topic and one with much public sentiment attached, as demonstrated when a Minnesota bridge collapsed several years ago. There is an expectation that bridges are safe, and if they are not, that the bridge either be repaired or closed to traffic. Since the Minnesota event, there has been increased scrutiny of this program by the media, citizens, the federal government, and the General Assembly. Virginia has over 21,000 bridges and structures that must be inspected on a 2-year cycle. Virginia is in compliance with conducting these inspections, and is in good standing as regards addressing actual bridge maintenance needs. Many other states are struggling in this area. VDOT achieves this level of compliance by partnering with the private sector. OSIG, through the analysis included, suggests that cost should be a primary driver in deciding whether VDOT conducts inspections with VDOT staff or with consultants. OSIG suggests that if it costs VDOT less, then VDOT should request the General Assembly to assign VDOT additional staff. This ignores the additional equipment that VDOT would need to purchase/maintain, the hiring/housing of the additional staff and equipment, the cost of required training and licensing, the administrative burden of these positions, the fact that complex inspections will still be outsourced to vendors with specialized equipment, and the need to perform these inspections within a required timeframe, in addition to the fact that VDOT may not be granted additional staff, as is predicated by OSIG. Theoretically, VDOT could conduct a detailed review to prove a state employee is cheaper, and still not be granted additional staff.

VDOT disagrees that the OSIG analysis accurately reflects the cost of consultant versus state inspectors. There is more data needed to definitively make a conclusion on the cost. This is a complex area that OSIG has treated in a very simplistic manner. However, use of consultant inspectors, to adjust inspector manpower for peak and low demand, is critical to the success of VDOT's delivery of services today. VDOT also believes OSIG is oversimplifying the process to justify the need for additional staff and assumes that analysis to demonstrate cost savings in this area would result in VDOT getting additional staff.

VDOT will, working with staff and industry professionals, conduct further study to develop a method to collect additional information regarding the cost and use of hired consultants. VDOT will continue dialogue, internally and externally, to improve the scope, expectations, and cost of consultant inspection and project management services. The study will consider the mix of state inspectors and consultant inspectors, as well as how inspection services are conducted, in order to ensure that the public is receiving good value for the services. This study may take several years to complete due to the volume of contracts, the cost of the study, and the need to develop a methodology to identify data needed. VDOT will continue the inspector trainee program.

***Issue 2: Research on the Use of Unmanned Aerial Vehicles in Inspections***

**Unmanned Aerial Vehicles Research** - OSIG also includes in the report the concept of using Unmanned Aerial Vehicles (UAV) to perform bridge inspections. VDOT has explicitly stated that we do not agree with that utilization, but agree there is potential usage for other VDOT activities. Additionally, as previously provided to OSIG, there are National Inspection requirements that the inspector must perform that UAV's do not have the ability to perform. One example of this is when pack rust is encountered; it must be removed in order to determine the extent of the deterioration. Another example is when a crack is identified, the paint needs to be removed and non-destructive testing performed to identify the length of the crack. OSIG recommends VDOT study UAVs, but ignores that there are other, very deserving research projects that may have a greater impact and utilization in VDOT service delivery. VCTIR has a very established method for prioritization of research projects to ensure research funding and commitment of resources yield the highest return on VDOT's research dollar investment. VDOT's research program supports VDOT's mission and core functions. The program ranges from materials research to build longer lasting pavements and bridges to research efforts in traffic operations and safety to ensure our roadways are operating at peak efficiencies and are as safe as possible. These are examples of areas where improvements resulting from research can have an immediate impact for the traveling public.

OSIG recommends that VDOT perform UAV research, while citing that several other states are already conducting studies. A key function of VCTIR, beyond conducting research, is to actively participate in national and regional organizations that are focused on transportation research, such as the Transportation Research Board, the National Research Advisory Committee of AASHTO, and the Southeast Region Research Advisory Committee. Additionally, VCTIR research staff participate in FHWA Pooled Fund Studies and serve on research project panels funded by the National Cooperative Highway Research Program. This allows us to expand our research program and opens opportunities for VDOT to benefit from these research efforts. VDOT has successfully implemented many research findings resulting from these research efforts that are external to VCTIR's funded research program. The UAV research cited by OSIG is just one of many examples of efforts in transportation research that exist beyond the borders of the Commonwealth that may provide benefit back to VDOT.

VDOT agrees that there is potential for application of UAVs in VDOT's delivery of services. VDOT does not agree that required bridge inspection (above or below water) is the appropriate area of study due to a multitude of identified issues<sup>1</sup>. Research funding is limited and assignment to specific studies should be based on careful analysis of the potential for practical implementation into VDOT services. There are many unknowns regarding costs and risks; the technology to support UAV data; and post-production study and analysis of the data.

VDOT, in conjunction with pertinent parties like the Virginia Department of Aviation and Virginia Tech and/or through attendance at TRB meetings, will continue monitoring studies being conducted, such as the ones included by OSIG, to explore the use of UAVs in VDOT's delivery of services. If the results are

promising, VDOT, with VCTIR as the lead, could develop potential uses and, if warranted, request a research project at some point in the future.

***Issue 3: Indirect Cost Allocation Plan***

VDOT's position historically has been to utilize federal funds for direct work. It should be noted that Virginia has both fully used federal obligation authority and received bonus obligation authority for many years. Since IDC recovery would consume existing apportionments and obligation authority, it was felt that the effort to implement and manage would be too great.

However, there are some potential benefits to having an IDC recovery plan. VDOT will research and determine how an IDC recovery plan could be implemented and the benefits that could be realized. This effort will be completed during FY15. If an IDC recovery plan is determined to be beneficial to VDOT, we will work to implement for Fiscal Year 2016.

***Issue 4: Turnkey Asset Maintenance Services (TAMS) Contract Differences***

VDOT agrees that there are areas, including TAMS contracting, where we need to continually explore for the most cost effective results.

VDOT continues to develop methods to improve these contracts and is currently working with industry to identify other issues. VDOT has been working on getting some of the TAMS contracts on the same start/end cycle. VDOT has issued a single solicitation to replace three of the existing NOVA TAMS contracts. It has four lots that will be awarded based upon a two-step evaluation including low-bid assessment for each lot. All four lots will have the same contract start date and end date.

VDOT does not feel that the OSIG analysis considers enough of the real differences between contracts, for example, the major difference in costs displayed by OSIG is the inclusion or exclusion of snow and ice removal. Inclusion of items such as snow and ice removal and other emergency operations, as well as establishing TAMS contracts in areas of the state with significant pavement deterioration, adds complexity to the contract vehicle and the ability to standardize contracts and compare contract pricing. However, VDOT overall agrees to continue studying the contracts and other contract vehicles for more efficiency, better contracts, and better service. These study efforts are part of our normal process to improve contracts and are not intended to commit to any specific action in the foreseeable future.

***Issue 7B: Project Closeout Procedures - Include Closeout Statistics on Dashboard***

VDOT will also begin reporting performance metrics related to closeouts internally in FY15. VDOT and FHWA routinely discuss project closeout numbers as part of the FIRE process. Since this is a new process and new performance metrics, VDOT will assess if this area needs to be added to the Dashboard for public consumption at a point in the future. Project closeout is an administrative process and has little

to do with the delivery of core services. While VDOT sees the opportunity to track success in the number of projects closed and the value for internal staff, VDOT will consider if this is a viable candidate for Dashboard. We do not anticipate taking any action related to Dashboard reporting in the near future.

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<sup>1</sup> Specific Information Related to UAVs for bridge/underwater inspection:

The subject of the use of UAVs in the inspection of bridges was discussed at the Bridge Research Advisory Committee (BRAC) meetings in March 2013 and again in April 2014. While there was some interest from the engineering and scientific community, the use of UAVs is impractical for safety inspection activities for the following reasons:

- The National Bridge Inspection Standards (NBIS) found in the Code of Federal Regulations Title 23 Highways – Part 650, Subpart C and The Manual for Bridge Evaluation (MBE), published by the American Association of State Highway and Transportation Officials (AASHTO) are the national governing documents for the bridge safety inspection program.
- Physical constraints associated with bridge elements (utility conduits, cross frames etc) restrict access to critical areas and creates significant challenges for the operation of the UAV.
- The majority of the structures in the inventory provide only the minimum amount of vertical clearance required by AASHTO and VDOT guidelines. Therefore, there is no possibility of using a UAV to inspect the structure and travel from one girder bay to the adjacent without violating the vertical clearance for approaching traffic. Using a UAV for inspection of a structure over traffic will still require maintenance of traffic considerations which does not reduce the cost associated with the inspection.
- Global positioning of the UAV in relationship to the structural bridge elements is a significant problem when recording data.
- The AASHTO's Manual for Bridge Evaluation (MBE), included by reference into the National Bridge Inspection Standards (NBIS) and VDOT, require components to be cleaned to allow the inspection personnel to detect deficiencies or the degree of deterioration. If areas are identified that need to be cleaned and measured to quantify defects, the inspection personnel would need to make arrangements to access these areas using access, MOT, or both resulting in no reduction in inspection costs.
- Documentation of all deficiencies for a particular structure, including size (area, depth, crack width, remaining section, etc.) and location is required. These deficiencies including section loss of steel members and reinforcing steel due to corrosion, spalls and delaminations in concrete, cracks in both steel and concrete members, and impact damage. The quantification and location of the deficiencies allows us to have baseline data on the components, track changes which may occur over time, and assess the structural capacity of the component/structure. Personnel are required to perform tasks/measurements which results in no reduction in inspection costs.

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- There are structures which require a hands on inspection (inspected within arm's reach or closer); these include all fracture critical members and connections, category D and lower fatigue prone details (including impact damaged areas), and any other areas as determined by the inspection personnel to determine the extent or existence of structural issues. Personnel are required to perform tasks which results in no reduction in inspection costs.
  - At this time, it is not allowed by the FHWA or VDOT to use videos or photographs to replace a hands on inspection; the reason for this is the difficulty in determining cracks in steel members even at a very close range – there is a need to look at the details from different angles/lighting, brush away loose paint, and possibly use a non-destructive evaluation technique (dye penetrant, UT, mag particle testing, etc.). Personnel are required to perform tasks which results in no reduction in inspection costs.
  - Safety inspections require the sounding of concrete elements. Personnel are required to perform tasks which results in no reduction in inspection costs.
  - Delaminated concrete and steel rust packs are required to be removed during inspections. Personnel are required to perform tasks which results in no reduction in inspection costs.
  - The NBIS requires that a qualified Team Leader be present during each bridge safety inspection. Having a UAV and an operator does not alleviate the need to have inspection personnel on site; additionally, it may be difficult for the UAV to pick up more global issues with the structure, i.e. settlement, tilting, misalignment, stream issues, etc.
  - There is a major safety concern for using UAVs over traffic because of the drivers not paying attention to the roadway and potentially increasing accidents.
  - There have been recent news articles about FAA regulating the industry of drones (i.e. UAVs)
  - There would need to be some level of post-processing of the data to determine specific sizes and locations of defects, and for someone to document the defects in an inspection report.
  - There has been significant research already conducted on non-destructive evaluations for bridge inspections conducted by AASHTO and FHWA, resulting in quantifiable benefits associated with different types of technologies. Rather than doing preliminary research evaluations on uses and benefits of using UAVs, the Department could reap more benefit for the investment by increasing our usage of the bridge inspection technologies already researched and available to supplement our current inspection procedures.
  - UAVs have more promise in technical areas requiring less detailed analysis and not requiring multiple sensory activities and testing. The following areas are good examples:
    - Wetlands inspections
    - Slope survey for stability analysis
    - Construction monitoring and documentation for large projects



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- Remote access to hazardous locations
  - Emergency response and assessment
  - For underwater inspections, our consultant divers typically do not have much, if any, visibility and are required to perform a tactile inspection of the substructure units. They also need to probe the streambed and bottom portion of the substructure units to determine the depth of silty, sandy material and to check for undermining. The divers perform underwater inspections in tidal zones and in waterways with swift currents, and we would need to consider any limitations to the UAVs for these applications.
  - The availability and level of research funds is a finite amount and thus must be used efficiently in order to maximize the benefits associated with the research. The S&B Division and the Virginia Center of Transportation Innovation and Research work very closely in identifying research needs. The topic of UAVs for inspection purposes has been discussed and was determined not to have a benefit to the S&B inspection program area.