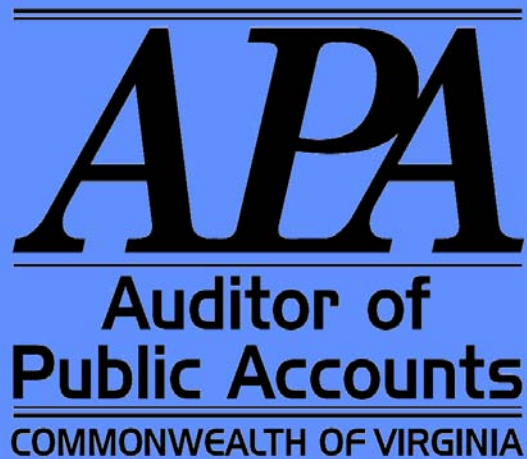


INTERIM REVIEW OF STARS PROJECT

NOVEMBER 2009



AUDIT SUMMARY

Estimates of the cost to complete the implementation of STARS in June, 2009 exceeded the total funds available for the project. As a result, State Police issued six change orders, which significantly alter the scope of the project from the original proposal and reduce the completion estimates by \$18 million. Some of the changes relate to the use of new technologies, other changes shift work from the vendors to State Police personnel and others eliminate planned functions of the radio and data network.

The Commonwealth issued a total of \$361.2 million in bonds and provided operating funding of \$21.8 million from the General Fund to pay for and implement STARS. STARS includes a \$321.7 million agreement with Motorola to design and install a new state of the art telecommunications and radio system for the Virginia State Police and 20 other agencies of the Commonwealth. In addition to Motorola, there are contracts with other vendors for a range of other services for the project.

Change Orders include the following items.

- Eliminate 41 proposed towers and associated equipment and labor from the system design – reducing the contract by \$15.7 million.
- Remove the original legacy interoperability solution for localities, reducing the contract by \$6.5 million.
- Extend the official project schedule completion date to December 23, 2010, increasing the contract by \$6 million.
- Replace existing and future Motorola laptop equipment with new or upgraded equipment as well as a three year warranty extension on all laptops – at no cost to State Police.
- Transfer of responsibility for installing 468 control stations from Motorola to State Police, reducing the contract by \$873 thousand, but State Police pay the cost of the work from their operations.
- Transfer construction of two towers to T-Mobile, but allow them to use existing STARS microwave paths, reducing the contract by \$1.1 million.
- Changes to the Department of Corrections' radio equipment, reducing the contract by \$13 thousand.

Several of these changes introduce new risks to the project.

- The State Police removal of the interoperability component will require 49 localities to find other funding sources to achieve interoperability with the STARS network; however this funding source is currently unknown.
- If Motorola cannot begin construction on five sites pending final approval before March, 2010, the project could go beyond December, 2010

- Reliance on T-Mobile to construct two towers at the current stage in the project increases the risk of potential further delays.

Finally, State Police recently submitted a budget request to the Department of Planning and Budget for the continued maintenance of the system over fiscal years 2011 through 2016. State Police requested over \$61 million of General Funds over the next six years, or a little more than \$10 million per year, to fund ongoing maintenance and operations of the system. However, we have not had the opportunity to review the development of these budget requests. The Governor and Legislature may also wish to consider allowing State Police to recoup a pro rata share of maintenance costs from the twenty other user-agencies.

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PROJECT OVERVIEW

Background

In July, 2000 the Virginia State Police began its effort to replace its existing statewide analog land mobile radio system to improve communications not only between State Troopers, but enhance interoperability with other public safety organizations as well. Motorola is the prime contractor to design, build, and implement the Statewide Agencies Radio System (STARS) at an original total project price of \$329.7 million.

The interoperability solution envisioned during the original design of STARS would allow each locality, at the county and city level, to communicate with users independent of their technology or radio frequency band. Additionally, twenty-one state agencies would participate in the STARS project.

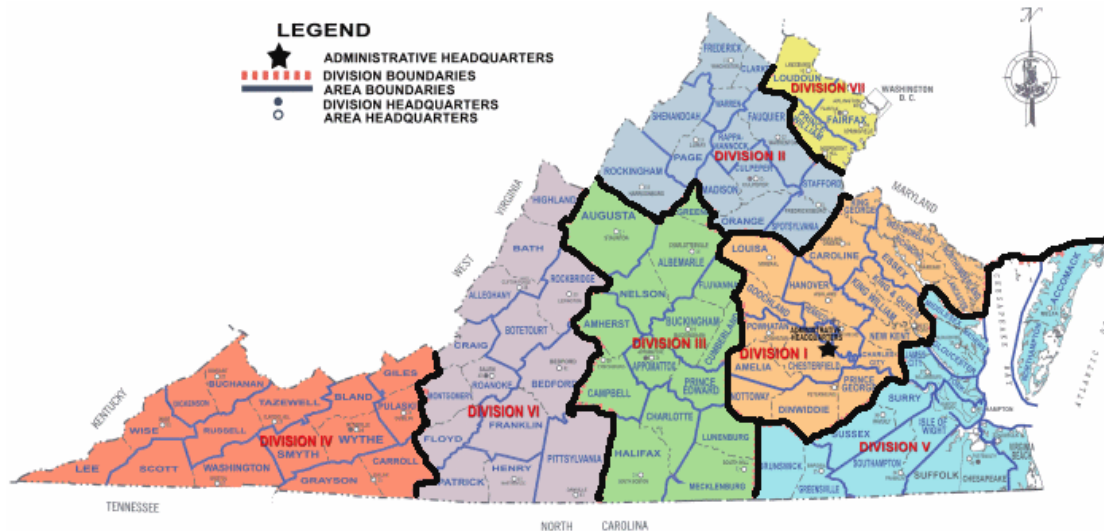
Project Scope

The STARS contract includes a number of components to enable statewide communication for emergency services. The original contract called for Motorola to construct or improve 121 site towers, including installation of all of the necessary communications equipment to allow system operability. Motorola is also responsible for supplying vehicle equipment, including new laptops for each fleet vehicle. Motorola is responsible for delivering a completely integrated and functioning communication network, which includes acquisition of the necessary bandwidth frequencies and providing training on the use and maintenance of the system.

Project Status

According to Motorola's July 14, 2009 project schedule, First Division is complete, Fifth and Second Division's are 85 percent complete, Third Division is 80 percent complete, Seventh Division is 65 percent complete, Sixth Division is 79 percent complete, and Fourth Division is 62 percent complete. Motorola also provides that subscriber migration, the process by which radio and laptop equipment is installed in vehicles, is 96 percent complete, training of STARS users on new equipment is 72 percent complete, and mobile DATA integration is 21 percent complete. While not complete, Fifth Division is fully operational, but awaits final inspection and testing of all operating equipment.

The following is the implementation schedule for the various divisions under the original schedule, as of our prior audit, and as of our current audit.



<u>Division</u>	<u>Original Planned Completion</u>	<u>Estimated Completion – Prior Audit</u>	<u>Current Planned Completion ^A</u>
Div 1 – Richmond	June 2006	March 2007 (Actual)	March 2007 (Actual)
Div 5 – Tidewater	May 2008	April 2009 ^A	November 2009 ^B
Div 2 - Culpepper	July 2008	April 2009	January 2010
Div 7 - Northern Virginia	October 2008	March 2010	March 2010
Div 6 - Salem	April 2009	August 2010	February 2011
Div 3 - Appomattox	May 2009	August 2009	December 2010
Div 4 - Wytheville	September 2009	August 2010	February 2011

Notes:

A – The project schedule reflects final acceptance of each division at the date shown here, the systems will become operational some time before each of the dates listed, however they may continue to have bugs worked out by Motorola and await inspection, testing, and formal acceptance by State Police after they are fully operational.

B – The Tidewater Division was substantially completed and operational as of June 2007, however the contractor must complete the punch-list items before final acceptance of Division 5 can take place. The dates above reflect anticipated final acceptance.

PROJECT DELAYS

The project did not meet the original scheduled completion date of September, 2009. STARS management re-baselined the project schedule in July 2008, changing the project's final acceptance date from September 2, 2009 to April 23, 2010, which was a change of 158 work days.

Recognizing additional delays, State Police once again re-baselined the project schedule in June, 2009, extending the project completion date to December 23, 2010, over one year and four months after the original completion date. While December 23, 2010 is the target date for an operational system with beneficial use state-wide, our review of the Motorola Project schedule

reflects final completion of the project in May, 2011 as Motorola works to remedy any bugs that exist in the system and await final inspection and acceptance by State Police.

State Police mitigated the risk of increased costs due to delays beyond December, 2010 by executing a contract modification in July, 2009. The modification formally extends the project schedule deadline from September 2, 2009 to December 31, 2010, but also states that the Commonwealth will not accept financial responsibility for any Motorola project office costs after September 30, 2010, which limits the financial risk of the Commonwealth for any further delays to \$6,060,464. This is the contractual cost of the Motorola Project office for the period September 2, 2009 to September 30, 2010.

Site Lock-Down

Since our last review, there are still six tower sites that State Police has not completely locked down. However, State Police authorized Motorola to do all site engineering and design work in anticipation of having all of the necessary legal agreements in the near future.

There are three tower sites that are currently pending required Federal Aviation Administration approval before construction can start; State Police has all other permits. There are three tower sites pending lease agreements, one is with a private landowner. The second one requires a lease arrangement with a publicly traded company. The third lease site is located within a wildlife sanctuary; however, the site is on a power company easement. Legal counsel from the Department of General Services is finalizing all three leases. Two additional tower sites are in the normal permitting process and are pending approval from the Secretary of Administration.

Project Risk

While these issues have not yet had an impact on the re-base lined project schedule, if Motorola cannot begin construction on these sites before March, 2010, this may delay the project beyond December, 2010. Further, if State Police needs to relocate any of the sites because of not reaching agreement, the project could experience significant delays as Motorola and State Police work to relocate and re-engineer the radio network.

Laptop Equipment Failures

Since our last review, State Police and Motorola began addressing the high failure rate of laptop components installed in vehicles. Motorola has agreed through a modification to their contract to replace 555 ML900 model laptops with newly manufactured ML910 laptops, upgrade 1,495 ML900 laptops with higher quality components that were consistently failing, and provide another 299 ML910 laptops in lieu of the ordered, but undelivered ML900 laptops. Further, Motorola will provide a three year warranty extension, commencing October 1, 2009 on all the above-mentioned equipment. This modification has no cost to the Commonwealth.

Motorola began installation of the new and refurbished laptops during the period of our review; therefore State Police was unable to provide us with inspection results, as they have not yet inspected the first batch of new equipment.

REDUCTION OF PROJECT SCOPE

As a result of risks including growing project delays, and recognition that the project could exhaust bond funds before completion, State Police executed a number of change orders reducing the scope and cost of the Motorola contract. State Police executed six modifications in July, 2009; two of which we have discussed above; and four that reduce the scope and cost of the remaining work for Motorola.

Note: Appendix A has the financial impact of these modifications and all prior contract modifications.

Towers Removed from Project Scope

The largest project reduction is the removal of forty-one microwave-only tower sites from the original network design. Removal of the civil engineering, tower and shelter construction, equipment, installation and testing for these towers results in a reduction of \$15.7 million to the Motorola contract. The original STARS network design included construction or renovation of 121 tower sites and shelters; however, a number of those planned sites are spurs from the central network and not necessary for digital voice or mobile data coverage.

The originally planned network consists of 76 microwave-only and 45 Land-Mobile-Radio (LMR) towers. Throughout the development and engineering process, Motorola and State Police determined that the central trunk of the STARS network would require a combination of 25 microwave-only towers and 48 LMR towers. These towers make up multiple Synchronous Optical Network (SONET) loops across the state. The system will broadcast digital transmissions through these continuous loops, and through the LMR towers to the portable radios carried by troopers, and to laptops in police cruisers. Microwave-only towers carry data point to point and do not broadcast, while LMR towers broadcast a signal to the portable radios and laptops on the network across the state.

The 41 towers that State Police removed from the contract were microwave-only spur sites from the network. This means they are not part of the central continuous SONET loop system that sends digital transmissions constantly, and they are not LMR sites which broadcast the signals to portable radios and laptops.

State Police originally planned to use these spur sites to have a self-supported wide-area network encompassing every State Police area office and locations of other agencies subscribed to the system. This would enable State Police to reduce reliance on third party communication and data lines that cost anywhere from \$80 to \$490 per month for each location. The spur towers that State Police removed consist of 27 State Police area offices, 12 VDOT residency or district offices, a correctional center, and a National Weather Service office.

Elimination of these tower sites means that State Police, VDOT, DOC and the National Weather Service must continue to use third party voice and data carriers for their land-lines at each of the 41 removed sites. Further, nearly all of the eliminated State Police sites currently have voice and data lines provided by VITA-Northrop Grumman through the IT Partnership, with few exceptions provided by Verizon. State Police concluded that the removal of these microwave-only towers will not impact essential public safety-related communication.

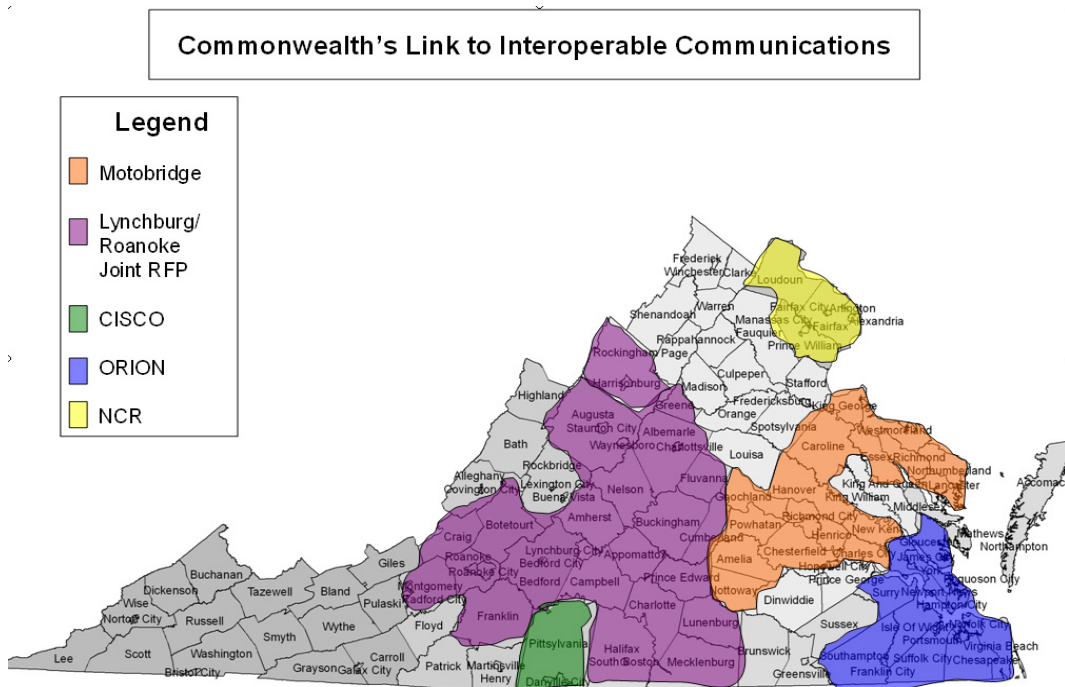
Remove Interoperability from Project Scope

The most significant portion of this modification is the removal of all remaining agency and locality interfaces originally in the Motorola contract. State Police and Motorola agreed to replace 58 of the planned agency and locality interfaces with MOTOBRIDGE IP software in March, 2007. The July, 2009 contract modification removes the remaining planned interfaces with localities and non-STARS agencies in the other six State Police Districts from the scope of the Motorola contract. State Police funded the MOTOBRIDGE IP software implementation with federal grants and anticipates funding all future interoperability solutions in the same manner.

The removal of interfaces for localities and non-STARS agencies in Divisions 2, 3, 4, 5, 6, and 7 generates nearly \$6.5 million in contract reductions for the STARS project. However, State Police has, and will continue to incur costs, funded by a number of federal grants, to provide interoperability with STARS to all of the local governments in the Commonwealth. Below, we discuss the State Police plan to achieve interoperability with local governments and non-STARS agencies throughout the state, including the cost and funding sources.

Plan to Achieve State-wide Interoperability

To compensate for the removal of interoperability interfaces between local governments and non-STARS agencies and the STARS network; the State Police Communications Division will customize regional solutions for localities outside of the scope of the current STARS project. The plan to provide statewide interoperability is the *Commonwealth's Link to Interoperable Communications* (COMLINC). The map below shows the existing interoperability solutions in place, discussed in more detail below.



MOTOBIDGE IP

Through a contract modification, Motorola implemented the first of these regionalized solutions, MOTOBIDGE IP, which is software that interfaces existing communication devices with STARS for fourteen localities within First Division, by way of the First and Fifth Division Headquarters' and the STARS Network Operations Center. State Police received a 2004 Homeland Security Grant, administered by the Department of Criminal Justice Services in the amount of \$1.4 million for this solution.

Radio gateways allow dispatchers in counties and cities to establish radio patches. Localities can use a patch to the STARS network, providing communications among the STARS agencies. The local dispatchers may use other patches to connect agencies within their jurisdictions or to other localities.

For example, a sheriff's department can patch to the fire department regardless of the frequencies used by each agency. Patches can also establish dispatcher conferences. By using MOTOBIDGE, the requirement to call by phone to establish a patch no longer exists; each dispatcher initiates the patch themselves at their console.

MOTOBIDGE also provides instant recall of recorded audio. It enables the use of advanced calling features such as Emergency ID, and allows monitoring of the interoperability network activity and associated operations. For agencies requiring end-to-end encryption, MOTOBIDGE provides encryption over the network. The current participants are the Counties of: Caroline, Charles City, Chesterfield, Essex, Goochland, Hanover, Henrico, King George, Lancaster, New Kent, Northumberland, Powhatan, Richmond, Westmoreland, Amelia, and Nottoway; and the Virginia Department of Transportation (VDOT).

Lynchburg-Roanoke Joint RIOS Implementation

Both the Roanoke and Lynchburg Metropolitan Statistical Areas (MSA) received a combined \$2.27 million from the US Department of Justice, Office of Community Oriented Policing Services (COPS) Interoperable Communications Technology Grants in 2005. The two regions coordinated the procurement of interface equipment and installation, and both awarded contracts to SyTech to implement RIOS, a Voice-over IP interoperability solution. The functionality of the RIOS solution is similar to that of the MOTOBIDGE technology implemented in First Division, allowing patching into the STARS network.

The RIOS solution, through implementation at the Appomattox and Salem State Police Communication Centers, provides interoperability with STARS to the following local governments and agencies: the Counties of Albemarle, Amherst, Appomattox, Augusta, Botetourt, Buckingham, Campbell, Charlotte, Craig, Cumberland, Fluvanna, Franklin, Greene, Halifax, Mecklenburg, Montgomery, Nelson, Prince Edward, and Rockingham; the Cities of Bedford, Lynchburg, Roanoke, Salem, and Waynesboro; the Towns of Staunton and Vinton; and Virginia Tech and Liberty University.

ORION

The localities in the Tidewater region have interoperability through the Overlay Regional Interoperability Network (ORION). ORION is also a federally funded grant project. All STARS law enforcement portable radios have the ORION talk-groups programmed in their equipment providing interoperability with member agencies of ORION. The ORION network will encompass: the Counties of Accomack, Brunswick, Gloucester, Greensville, Isle of Wight, James City, Mathews, Middlesex, Northampton, Southampton, Surry, Sussex, and York; and the Cities of Chesapeake, Emporia, Franklin, Hampton, Newport News, Norfolk, Poquoson, Portsmouth, Suffolk, Virginia Beach and Williamsburg.

Localities without Planned Interoperability

The removal of the legacy interfaces with local government public safety departments from the STARS project affects 35 counties and 14 cities that currently have no plan to implement interoperability with STARS. The localities affected are listed below.

Counties without Planned Interoperability:

Alleghany County	Arlington County
Bath County	Bedford County
Bland County	Buchanan County
Carroll County	Clarke County
Dickenson County	Floyd County
Frederick County	Giles County
Grayson County	Henry County
Highland County	Lee County
Loudoun County	Madison County
Montgomery County	Orange County
Page County	Patrick County
Pulaski County	Rappahannock County
Rockbridge County	Rockingham County
Russell County	Scott County
Shenandoah County	Smyth County
Tazewell County	Warren County
Washington County	Wise County
Wythe County	

Cities without Planned Interoperability:

Alexandria	Buena Vista
Bristol	Covington
Fairfax	Falls Church
Galax	Lexington
Manassas	Manassas Park
Martinsville	Norton
Radford	Winchester

Project Risk

Removal of the planned legacy interfaces with localities and agencies foregoes achieving state-wide interoperability, a cornerstone of the original STARS proposal, within the project. While the technology placed in operation under the COMLINC program is superior to the original Motorola contract, there are 49 localities without a current plan to achieve interoperability with the STARS network.

Further, funding these localities' interoperability solutions depends on their finding sources other than the original bond proceeds for the STARS project. It is unknown if and when these remaining 49 localities will receive funding.

Subsidization of Construction Costs

State Police entered into two microwave relocation agreements with T-Mobile USA Incorporated. These agreements, forced by the Federal Communication Commission, will require State Police to provide existing microwave licenses within their existing network to T-Mobile. In order to make State Police whole for the relocation, T-Mobile must provide a new microwave path for the STARS system as well as construct two towers within the radio system. Through these relocation agreements, State Police reduced the scope of the Motorola contract by removing construction of these two towers, which reduces the project cost by \$1,064,562.

T-Mobile must meet all of the design specifications set out within the contract and pass inspection by State Police and Motorola for constructing these towers. Motorola will install the required equipment on the towers once they are constructed. While this modification results in one million dollars in savings on the contract, it also adds an additional dependency to Motorola's schedule for which State Police will now bear the risk.

Project Risk

Reliance on a third party vendor to construct two towers at this stage in the project increases the risk of further delays in the project schedule due to the non-performance or non-timely performance of the third party. State Police should carefully monitor the third party vendor's timely completion of their construction responsibilities so as not to further delay the project schedule.

Installation of Control Station Equipment

State Police will assume responsibility for the installation of equipment, project management, engineering, and asset and configuration management for 468 control stations. Removing this activity from Motorola's contract reduces the price by \$872,952; however, because State Police must now perform these installations and acquire the materials to install the equipment, they will incur additional costs which offset the savings from the Motorola contract reduction.

The State Police Communications Division will perform the installations. State Police estimate that the total material cost to install all necessary control station equipment is \$418,860, and total labor cost is \$187,200. State Police includes the material costs in their estimate to complete the project, but excludes labor because the Communication Division employees installing the equipment will be paid from the agency's General Fund operating budget. The total real savings of this change is approximately \$266,892; but by subsidizing \$187,200 in labor costs with operating appropriations, State Police effectively releases \$454,092 of bond proceeds for the project.

Corrections Equipment Changes

State Police also executed a modification to the Motorola contract, which exchanges the Department of Corrections' original equipment selection with a revised equipment list to meet the Department's needs. The change results in a reduction of \$13,316 to the contract price.

PROJECT FINANCING

Project Funding

Funding for the capital portion of the STARS project uses revenue bonds authorized by the General Assembly. Chapter 522, Virginia Acts of the Assembly - 2004 Session, authorized the Virginia Public Building Authority to issue the initial \$159.3 million in revenue bonds for Phase I of the project. Repayment of these bonds would come from an increase in the tax on rental vehicles within the Commonwealth. Chapter 245, Virginia Acts of the Assembly - 2006 Session, authorized an additional bond issue in the amount of \$201.9 million for Phase II of the project. To date, the Commonwealth has issued all of the related revenue bonds for the project.

Expenses against the major contract with Motorola total \$230.3 million through July 31, 2009. This represents 71.6 percent of the current contract amount. In addition to the contract with Motorola and the internal project management costs of State Police, the STARS project has issued contracts or purchased goods and services from a number of other vendors for facility construction, frequency licensing, computers and computer software, among other items. Capital payments to other vendors for work performed on the STARS project total \$18.3 million through July 31, 2009.

Through July 31, 2009, State Police spent 68.8 percent of their total capital bonding authority for the project with two of seven Divisions completed and five over 60 percent complete. For a schedule of all capital project expenses from bond funds as well as the estimate to complete the project see Appendix A.

The total cost of the project not only includes State Police payments to Motorola or other vendors from capital bond proceeds, but also includes incurred project management costs for consulting, management, testing, inspection, and other operating costs. These costs are funded by General Funds designated for administration of the project. State Police has received a \$2.5 million appropriation for the administration of the STARS project for the past 6 years. The table below shows the total anticipated cost (including capital and operating) to complete the STARS project, irrespective of funding source.

Table 1: Estimated Total Cost of STARS Implementation

Project management costs (General Fund)*	\$ 24,213,898
Original Motorola contract	329,673,698
Add: modifications for project enhancements	1,624,682
Add: modifications for unanticipated costs	11,145,274
Add: modifications for adding users	7,542,212
Less: modifications for project scope reductions	(27,711,836)
Less: equipment cost savings passed on to State Police	<u>(595,782)</u>
Net contract modifications	<u>(7,995,450)</u>
Current Motorola contract	321,678,248
Non-Motorola capital expenses	24,457,080
State Police estimate to complete	<u>15,700,000</u>
Capital project cost	<u>361,835,328</u>
Total Anticipated Project Cost	<u>\$386,049,226</u>

* Includes actual project expenses from fiscal year 2001 through 2009 and the full General Fund appropriation for fiscal year 2010 of \$2,510,000.

Since the first appropriation for STARS operating expenses in fiscal year 2003, State Police has spent \$13.6 million through fiscal year 2009. State Police also incurred \$8.1 million of project development costs from July 2001 through June 30, 2003 before the General Assembly provided the annual General Fund allocation of \$2.5 million. The total cost of project management and inspection services for the project through nine years is \$21.7 million plus an additional \$2.5 million appropriated for fiscal year 2010. For a schedule of project management and inspection expenses incurred from General Funds, see Appendix B.

Cost to Complete the Project

We reviewed past project expenses and analyzed State Police's estimated cost to complete the project. The project costs include not only the master contract with Motorola, but work by a number of vendors on various parts of the project including renovation of some existing facilities, inspection and testing services, and other capital related activities.

The estimated cost to complete the project uses the remaining Motorola contract costs as well as the outstanding commitments to the vendors for their contract completion. State Police currently estimates the total cost to complete the project will be \$361.8 million, excluding inspection and project management services paid from the General Fund appropriation to State Police.

If the project continues as planned, State Police will nearly break even at completion with approximately \$733 thousand in bond funds, which could offset a portion of the debt service obligation or pay future system maintenance. Although State Police has managed to reduce the size of the project thereby reducing costs, they will need to closely monitor future costs on the project as the margin for completing this project with resources is very thin (less than one percent).

Additional expenses the project is likely to incur result from potential increased costs of constructing towers in the mountainous regions of the state, which are part of the estimate to complete the project. State Police has included this in their estimate due to past unanticipated construction costs at one site in Division 1 (\$181,341), and 8 sites in Division 5 (\$1,244,161). Motorola has not yet started construction on a number of towers located in the mountainous regions of the state. These sites are at higher risk of cost overruns than those sites in Divisions 1 and 5. State Police's estimate for potential overruns is reasonably based on increased risk due to the location of remaining construction sites and the historical overruns mentioned above.

Cost to Maintain the System

With any project it is the project manager's responsibility to inform stake-holders of the continued cost of maintaining or operating the completed project. The project manager should make the operational and maintenance costs part of the total cost of the project, as soon as there are reasonable estimates available. Disclosing operational and maintenance costs during the project allow management to ensure that sufficient funding will be available to support the project after completion for the remainder of its useful life.

State Police continues to lack the necessary funding to maintain the STARS system once it is complete. Current funding for the STARS project may be sufficient to cover construction and implementation, but does not include any funds for the continued maintenance of the system.

Since our last review, State Police submitted its second budget request for maintenance funding for the project after the 2009 General Assembly Session. State Police received its first estimate of the anticipated future maintenance cost of the system in 2007, when both Motorola and the project consultant submitted annual maintenance estimates. Those estimates have been revised a number of times to include items such as software and property-lease costs among other things.

The original estimate provided by CTA Communications based on 2007 estimated requirements was nearly \$17 million annually. State Police revised its business requirements in 2009 and updated maintenance estimates, which CTA again provided with anticipated costs of about \$13.9 million annually. State Police decided they would provide maintenance and operate the STARS system rather than relying on Motorola's maintenance services, because Motorola did not meet the 24-hour, seven day-a-week availability requirements of State Police.

State Police recently submitted a budget request to the Department of Planning and Budget for the continued maintenance of the system over fiscal years 2011 through 2016. State Police requested over \$61 million of General Funds over the next six years, averaging more than \$10 million per year, to fund ongoing maintenance and operations of the system. The estimate includes

hiring as many as 49 new positions and includes significant costs to replace equipment, software licensing, and radio repair and preventative maintenance services from Motorola.

In addition to State Police, there are twenty other agencies that will or already receive beneficial use of the system. To date, State Police incurred all costs related to the STARS projects, and plans to incur all future maintenance costs of the system while the other twenty agencies receiving beneficial use of the system currently do not reimburse State Police for those costs.

Project Risk

Without a source of funding for maintaining this \$360 million investment, the Commonwealth faces the risk of having a failed or faulty system in the future. Although State Police has submitted budget requests to fund this system, no action is expected until the Governor releases his budget in December, 2009.

The Governor and Legislature may also wish to consider allowing State Police to recoup a pro rata share of maintenance costs from the twenty other user-agencies.



Commonwealth of Virginia

Walter J. Kucharski, Auditor

Auditor of Public Accounts
P.O. Box 1295
Richmond, Virginia 23218

October 29, 2009

The Honorable Timothy M. Kaine
Governor of Virginia
State Capital
Richmond, Virginia

The Honorable Thomas J. Norment
Chairman, Joint Legislative Audit
and Review Commission
General Assembly Building
Richmond, Virginia

We have completed an interim review of the **Virginia State Police (State Police) management of the Statewide Agencies Radio System** project, and submit our report entitled, "Interim Review of STARS." We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

The STARS implementation is a six-year, \$361 million project to design and install a new state of the art telecommunications and radio system for the Virginia State Police and twenty other agencies of the Commonwealth. Our office monitors the status of major Commonwealth contractual commitments such as the Statewide Agencies Radio System to help identify and prevent failures related to contract management in order to minimize loss to the Commonwealth.

Audit Objectives

Our objectives for this interim review of the STARS project were to determine whether:

- State Police maintains a reasonable estimate to complete the project based on expenses, both planned and incurred;
- State Police is adequately planning for the future costs and schedule of the project, including post-project maintenance;
- The modifications State Police executed on the Motorola contract do not negatively impact the completed project.

Audit Scope and Methodology

Our review examined the management of the STARS project, including the contractual agreement between State Police and Motorola and agreements between State Police and AECOM Services, Inc. Our review focused on recent actions taken by State Police management to reduce the overall scope of the contract with Motorola and the impact on the project's finances.

Our work consisted of management inquiries; examination of contractual agreements, project budget, and project schedule; review of current procedures, project documents, network diagrams, and correspondence; and attendance at STARS progress and schedule review meetings to track implementation progress.

Conclusion

Overall, we found that State Police does maintain a reasonable estimate to complete the project and that estimate is based on expenses already incurred and existing commitments.

We found that State Police is adequately planning for the future costs and schedule for completing the project, however there is not a source of funding for future maintenance of the STARS network. A decision package was submitted to the Department of Planning and Budget to fund future costs of maintaining the STARS network however; no action is expected until the Governor releases his budget in December, 2009.

We found that State Police has reduced the contract with Motorola significantly in order to keep the project on-budget, however we have concerns about the removal of interoperability and the lack of a plan to provide interoperability to the remaining 49 localities. There is also significant risk that if not completed on time, the construction of two STARS towers by a third party contractor, T-Mobile, could further delay the overall completion of the project. There is additional risk that if final agreements are not obtained from property owners on three sites, or FAA permission is not obtained for three sites, the project could face further delays.

Exit Conference and Report Distribution

We discussed this report with Virginia State Police's management at an exit conference on December 3, 2009. Management's response has been included at the end of this report.

This report is intended for the information and use of the Governor and General Assembly, management, and the citizens of the Commonwealth of Virginia and is a public record.

AUDITOR OF PUBLIC ACCOUNTS

AWP/alh



Colonel W. S. (Steve) Flaherty
Superintendent

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COMMONWEALTH OF VIRGINIA

DEPARTMENT OF STATE POLICE

P.O. Box 27472 Richmond, Va. 23261-7472

Lt. Colonel Robert B. Northern
Deputy Superintendent

December 7, 2009

Mr. Walter J. Kucharski
Auditor of Public Accounts
P. O. Box 1295
Richmond, Virginia 23218

Dear ~~Mr. Kucharski:~~ *WJF*

Auditors from your office completed an interim review of the State Police Project Management Team's oversight and administration of the Statewide Agencies Radio System (STARS) Project. The STARS project includes a six-year agreement with Motorola to design and install a new state of the art telecommunications and radio system for the Virginia State Police and 20 other agencies of the Commonwealth.

The results of the review were discussed with Virginia State Police's management at an exit conference on December 3, 2009. Included are the responses to the four audit recommendations.

The auditors that conducted the review were competent and helpful. I am confident that working together the management of the STARS project can be completed and closed out in an efficient manner. The recommendations made during the review have provided the guidance to keep the project successful. Any questions may be directed to Lieutenant Colonel Robert G. Kemmler at (804) 674-4606.

Sincerely,

A handwritten signature in dark ink, appearing to be "W. S. Flaherty", written over a horizontal line.

Superintendent

WSF/MEB/bdc

Attachment

Department of State Police's 2009 Audit Summary Response

Project Risk: Site Lock- Down

While these issues have not yet had an impact on the re-base lined project schedule, if Motorola cannot begin construction on these sites before March 2010, this may delay the project beyond December 2010. Further, if the State Police need to relocate any of the sites because of not reaching agreement, the project could experience significant delays as Motorola and State Police work to relocate and re-engineer the radio network.

Response:

There are three tower sites that are currently pending which require Federal Aviation Administration approval before construction can begin; all other permits have been obtained. One site is awaiting coordination of tower location with existing facilities of the FAA. The second site is also awaiting coordination of some antenna equipment with the FAA to be placed on our tower. The third site is awaiting approval from the FAA concerning some radar radio frequency exposure assurances while our personnel are constructing the new tower. There are three tower sites pending lease agreements, one is with a private landowner. The private landowner is negotiating with us and DGS over the lease document to be executed so that he can place his existing equipment on our facilities. The second one requires a lease arrangement with a publicly traded company. That particular lease is in final form and should be sent to the company for execution very shortly. The third lease site is located within a wildlife sanctuary; however, the site is on a power company easement. We are obtaining two documents for letters on consent to not sue and both documents are anticipated to be received with one week. Legal counsel from the Department of General Services is finalizing all three leases. There are two tower sites that are in the normal permitting process and are pending approval from the Secretary of Administration.

Project Risk: Interoperable Communications

Removal of the planned legacy interfaces with localities and agencies foregoes achieving state-wide interoperability, a cornerstone of the original STARS proposal, independent of the project. While the technology placed in operation under the COMLINC program is superior to the original Motorola contract, there are 49 localities without a current plan to achieve interoperability with the STARS network.

Further, funding these localities' interoperability solutions depends on them finding sources other than the original bond proceeds for the STARS project. It is unknown if and when these remaining 49 localities will receive funding.

Response:

The original plan for interoperability in the STARS contract was to establish a single path Radio Frequency (RF) connection from each locality to the STARS dispatch center in the division where the locality is located. This would allow dispatchers from the locality to talk to the STARS dispatcher. It would not allow multiple localities to patch together or to create patches without the STARS dispatcher. The technology using radio gateways has emerged since 2004 where radio gateways allow dispatchers in counties and cities to establish radio patches independently. Localities can use a patch to the STARS network; providing communications among the STARS agencies. The local dispatchers may use other patches to connect agencies within their jurisdictions or to other localities. It would be unwise to implement the antiquated RF patches when radio gateways provide a much more robust solution.

The *Code of Virginia* § 9.1-1200 requires the Commonwealth Interoperability Office to create and maintain the Commonwealth of Virginia Strategic Plan for Statewide Communications Interoperability. The Office of the Governor shall ensure that the annual review and update of the statewide interoperability strategic plan is accomplished and implemented to achieve effective and efficient communication between state, local, and federal communication systems.

All state agencies and localities shall achieve consistency with and support the goals of the statewide interoperability strategic plan by July 1, 2015, in order to remain eligible to receive state or federal funds for communications programs and systems.

The *Code of Virginia* § 2.2-2733 requires the State Interoperability Executive Committee review all communications-related grant requests from state agencies and localities as required by § 2.2-305 making award recommendations to the Governor's Office through the Commonwealth Interoperability Office.

As required by the *Code of Virginia* § 2.2-2732, the Department of State Police and the STARS Program are represented on the State Interoperability Executive Committee and participates in maintaining the Strategic Plan and promoting interoperability projects.

Efforts are on-going to secure additional funding to provide interoperability between all of the localities within the Commonwealth and STARS.

The current interoperability projects are:

MOTOBIDGE

Through a contract modification, Motorola implemented MOTOBIDGE the first of these regionalized solutions, which is software that interfaces existing communication devices with STARS for fourteen localities within Division One by way of the Division One and Five Headquarters and the STARS Network Operations Center. State Police received a 2004 Homeland Security Grant, administered by the Department of Criminal Justice Services in the amount of \$1.4 million for this solution.

Lynchburg-Roanoke Joint RIOS Implementation

Both the Roanoke and Lynchburg Metropolitan Statistical Areas (MSA) received a combined \$2.27 million from the US Department of Justice, Office of Community Oriented Policing Services (COPS) Interoperable Communications Technology Grants in 2005. The two regions coordinated the procurement of interface equipment and installation and both awarded contracts to SyTech to implement RIOS, a Voice-over IP interoperability solution. The functionality of the RIOS solution is similar to that of the MOTOBIDGE technology implemented in Division One, allowing patching into the STARS network.

COMLINC

Department of State Police and localities, 16 entities, along the I-95 corridor are currently implementing an interoperability solution through a public safety interoperable communications (PSIC) grant program from the US Department of Homeland security (DHS) in the amount of \$1,628,850. The equipment utilized is the same as the Lynchburg-Roanoke Joint RIOS Implementation.

ORION

The localities in the Tidewater region have interoperability through the Overlay Regional Interoperability Network (ORION). ORION is also a federally funded grant project. All STARS law enforcement portable radios have the ORION talk-groups programmed in their equipment providing interoperability with member agencies of ORION.

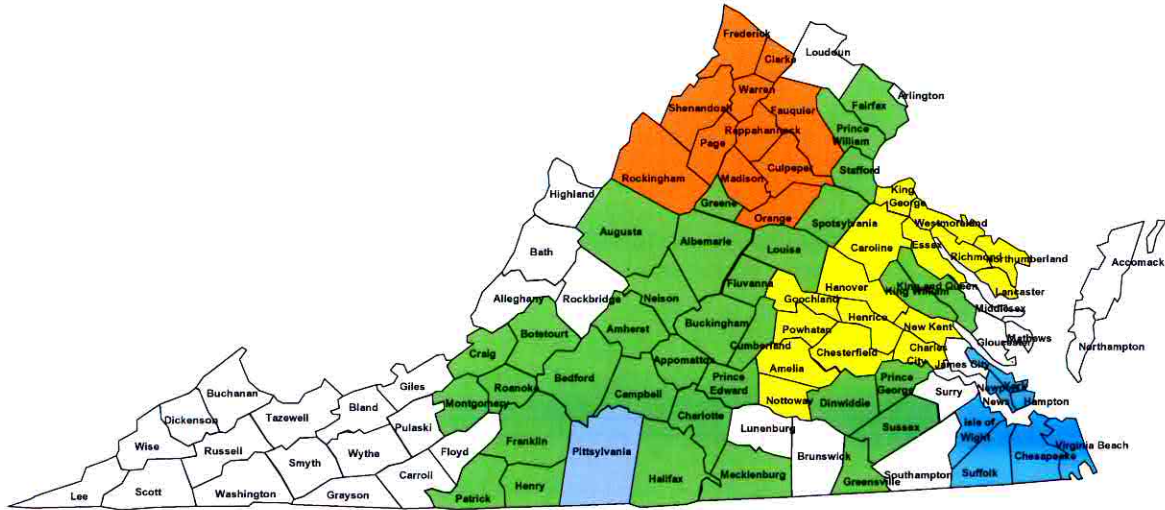
Stafford County Sheriff's Office Project

This project will provide radio gateways to the 16 localities within Second Division. There will be a procurement to determine what equipment will be implemented. Implementation should begin by the second quarter of 2010. This extension of the COMLINC system through Region 2 is funded by State Homeland Security Grant Program (SHSGP) grant in the amount of \$1,455,000.

There are 21 cities and 33 counties pending an interoperability solution; most of these cities and counties are in divisions that will not have STARS network until mid-2010. Following is the current status of the interoperability projects, including the participating localities:

Commonwealth of Virginia

COMLINC Participating Agencies/Localities



Division 1

				MOTOBIDGE	RIOS	ORION	CISCO	Stafford County Grant
Division One	VSP	DIV 1 Dispatch		X				
	Counties:	Amelia		X				
		Caroline		X				
		Charles City		X				
		Chesterfield		X				
		Essex		X				
		Dinwiddie			X			
		Goochland		X				
		Hanover		X				
		Henrico		X				
		King and Queen			X			
		King George		X				
		King William			X			
		Lancaster		X				
		Louisa			X			
		New Kent		X				
		Northumberland		X				
		Nottoway		X				
		Powhatan		X				
		Prince George			X			
		Richmond County		X				
		Westmoreland		X				
	Cities:	Colonial Heights			X			
		Hopewell						
		Petersburg			X			
		Richmond						

NOTES:

1. Amelia and Nottoway equipment is currently not connected due to cost of leased T-1 lines. Project is in progress to convert to internet connections.

Division 2

				MOTOBIDGE	RIOS	ORION	CISCO	Stafford County Grant
Division Two		VSP	DIV 2 Dispatch		X			
	Counties:		Clarke					X
			Culpeper					X
			Fauquier					X
			Frederick					X
			Madison					X
			Orange					X
			Page					X
			Rappahannock					X
			Rockingham					X
			Shenandoah					X
			Spotsylvania		X			X
			Stafford		X			X
			Warren					X
	Cities:		Fredericksburg		X			X
			Harrisonburg					X
			Winchester					X

NOTES:

1. Stafford County – Grant awarded for COMLINC Project in Region 2; the technology has not been determined.
2. Spotsylvania, Stafford & Fredericksburg already have RIOS. The grant equipment will go to three other localities.

Division 3

				MOTOBIDGE	RIOS	ORION	CISCO	Stafford County Grant
Division Three		VSP	DIV 3 Dispatch		X			
	Counties:		Albemarle					
			Amherst		X			
			Appomattox		X			
			Augusta		X			
			Buckingham		X			
			Campbell		X			
			Charlotte		X			
			Cumberland		X			
			Fluvanna		X			
			Greene		X			
			Halifax		X			
			Lunenburg					
			Mecklenburg		X			
			Nelson		X			
			Prince Edward		X			
	Cities:		Charlottesville		X			
			Lynchburg		X			
			South Hill					
			Staunton		X			
			Waynesboro		X			

Division 4

				MOTOBIDGE	RIOS	ORION	CISCO	Stafford County Grant (
Division Four	VSP	DIV 4 Dispatch						
	Counties:	Bland						
		Buchanan						
		Carroll						
		Dickenson						
		Giles						
		Grayson						
		Lee						
		Pulaski						
		Russell						
		Scott						
		Smyth						
		Tazewell						
		Washington						
		Wise						
		Wythe						
	Cities:	Bristol						
		Galax						
		Norton						

Division 5

				MOTOBIDGE	RIOS	ORION	CISCO	Stafford County Grant (
Division Five	VSP	DIV 5 Dispatch			X			
	Counties:	Accomack						
		Brunswick						
		Gloucester						
		Greensville			X			
		Isle of Wight						
		James City						
		Mathews						
		Middlesex						
		Northampton						
		Southampton						
		Surry						
		Sussex			X			
		York						
	Cities:	Chesapeake				X		
		Emporia						
		Franklin						
		Hampton				X		
		Newport News				X		
		Norfolk				X		
		Poquoson						
		Portsmouth				X		
		Suffolk				X		
		Virginia Beach				X		
		Williamsburg						

Division 6

				MOTOBIDGE	RIOS	ORION	CISCO	Stafford County Grant (
Division Six	VSP	DIV 6 Dispatch			X			
	Counties:	Alleghany						
		Bath						
		Bedford			X			
		Botetourt			X			
		Craig			X			
		Floyd						
		Franklin			X			
		Henry			X			
		Highland						
		Montgomery			X			
		Patrick			X			
		Pittsylvania					X	
		Roanoke			X			
		Rockbridge						
	Cities:	Bedford						
		Buena Vista						
		Covington						
		Darville					X	
		Lexington						
		Martinsville						
		Radford						
		Roanoke			X			
		Salem			X			

Division 7

				MOTOBIDGE	RIOS	ORION	CISCO	Stafford County Grant (
Division Seven	VSP	DIV 7 Dispatch (PSTOC)			X			
	Counties:	Arlington						
		Fairfax						
		Loudoun						
		Prince William			X			
	Cities:	Alexandria						
		Fairfax						
		Falls Church						
		Manassas						
		Manassas Park						

Project Risk: Subsidization of Construction Costs

Reliance on a third party vendor to construct two towers at this stage in the project increases the risk of further delays in the project schedule due to the non-performance or non-timely performance of the third party. State Police should carefully monitor the third party vendor's timely completion of their construction responsibilities so as not to further delay the project schedule.

Response:

The Department of State Police is obligated by the Federal Communications Commission pursuant to ET Docket 00-258, reallocation and auction of the 2110-2150 MHz band and the 2160-2200 MHz band, to negotiate in good faith and release affected band microwave frequencies as long as the cellular carrier who purchased the frequency can replace the frequency and, if required upgrade equipment and infrastructure that allows the Department's communication network to remain operational without degradation. The two towers being constructed by a cellular carrier are part of this mandatory process. The towers are under construction and are within schedule for completion by February 2010. The department will continue to monitor the construction to ensure completion without STARS schedule impact.

Project Risk: Cost to Maintain the System

Without a source of funding for maintaining this \$360 million investment, the Commonwealth faces the risk of having a failed or faulty system in the future. Although State Police has submitted budget requests to fund this system, it is unclear what the incremental funding requirements are above the existing radio system maintenance requirements.

State Police should demonstrate what additional services and costs are necessary for the current system compared to its pre-STARS radio system requirements. The Governor and Legislature may also wish to consider allowing State Police to recoup a pro rata share of maintenance costs from the twenty other user-agencies.

Response:

The Department of State Police and the STARS Management Group realized at the signing of the Motorola contract in 2004 there will be a significant cost to maintain the STARS, post warranty.

The STARS network is a public safety grade wireless communications system that must be maintained in an operational status 24 hours per day, seven days per week. To accomplish this, a well trained staff of engineers and technicians must be available and have access to parts, tower sites and vehicles on the network on a 24/7 basis. Commercial service is cost prohibitive, will not maintain the required level of knowledge of this network, and is not available on a 24/7 basis. The Department has always maintained our own communications network with Department employed engineers and technicians. There is no other practical way to maintain the STARS network and the vehicles on the network.

The Department will assume the responsibility for the equipping of new vehicles and boats that belong to the 21 STARS agencies. In addition to installation of new vehicles, retired or crashed vehicles would be brought to the Department's garage for removal of the STARS radio equipment and re-installation into another vehicle.

The STARS network must be maintained by the Department of State Police. The STARS network represents an investment of **\$361,150,000.**

The only alternative is to enter into a service contract with Motorola certified service shops. The cost to maintain the infrastructure, tower sites and the STARS vehicles is annually \$7,956,920 (NOTE: this does not include parts). This service includes Motorola equipment only and does not include the microwave network. The Department's Communications Division has always maintained the microwave network and will continue to do so. This service requires the vehicles to be brought to a Motorola service shop during business hours for service. This practice is not acceptable for police vehicles. Currently the radios are repaired within 24 hours by a Communications Division technician who drives to the vehicle, and during an emergency the vehicle service is made available 24/7. This service contract would place restoration of infrastructure, and tower sites under the control of Motorola and would be subject to the contract response times. Currently, the Communications Division technicians respond to these types of trouble calls on a 24/7 basis.

Budget decision package submissions to the Department of Planning Budget seek funding for the upcoming biennium. It was not practical to make a budget submission prior to the closing years of STARS implementation. Therefore, the first decision package was submitted for the 2008 – 2010 biennium and was not considered. The second decision package was submitted for the 2010 – 2012 biennium and has been presented to the Department of Planning Budget and is currently under review. The submission showed future year costs beyond the biennium through the year 2016. The currently submitted decision package requests cost sharing among the 21 STARS participating agencies.

The decision package submission covers services provided by Motorola, where Motorola is the sole source of the service, such as, Depot repair service for vehicular radio components, and a preventive maintenance service for those radio components. Motorola must also provide the software subscriptions and updates.

The decision package submission contains funding for asset and configuration management, parts to maintain the vehicular equipment and infrastructure. Also, there is funding requested to replace equipment as it reaches the end of its life cycle. Tools and test equipment to maintain the network are included.

A new garage/radio installation facility that is not funded by the STARS project is being built on State Police property using the Department's Federal Asset Forfeiture Funds approved by the U. S. Department of Justice. This facility will support the installation/removal of vehicular STARS equipment for the 21 STARS participating agencies.

The decision package submission requests the required personnel positions to support the maintenance of the STARS network. The costs for the 2010 – 2012 biennium for the first year are \$7,821,603 and \$10,186,546 for the second year.

DEPARTMENT OF STATE POLICE

Colonel W. Steven Flaherty
Superintendent

Lt. Col Robert G. Kemmler
Director, Bureau of Administration
And Support Services

Capt. Michael E. Bolton
STARS Program Director

OFFICIALS

John W. Marshall
Secretary of Public Safety

Leonard M. Pomata,
Secretary of Technology

George F. Coulter
Chief Information Officer

APPENDIX A

STATEWIDE AGENCIES RADIO SYSTEM CAPITAL PROJECT ESTIMATE TO COMPLETE Through the Month ended July 31, 2009

	Total Estimated Cost	Actual through July 2009
Total bonding authority	\$ 361,200,000	\$ 361,200,000
Add: grant for Motobridge	1,418,520	1,418,520
Less: allocation to Forestry	(50,000)	(50,000)
Available bond funding	<u>362,568,520</u>	<u>362,568,520</u>
Original Motorola contract	329,673,698	
Add: modifications for project enhancements	1,624,682	
Add: modifications for unanticipated costs	11,145,274	
Add: modifications for adding users	7,542,212	
Less: modifications for project scope reductions	(27,711,836)	
Less: equipment cost savings passed on to State Police	(595,782)	
Net contract modifications	<u>(7,995,450)</u>	
Current Motorola contract	<u>321,678,248</u>	<u>230,317,586</u>
Non-Motorola capital expenses	24,457,080	18,375,382
State Police estimate to complete	<u>15,700,000</u>	<u>-</u>
Total project cost	<u>361,835,328</u>	<u>248,692,968</u>
Net funds remaining	<u>\$ 733,192</u>	<u>\$ 113,875,552</u>

Source: State Police budget-to-actual reports reconciled to Commonwealth Accounting and Reporting System by auditor.

APPENDIX B

STATEWIDE AGENCIES RADIO SYSTEM

PROJECT MANAGEMENT AND INSPECTION SOURCES AND USES

From July 1, 2003 through June 30, 2009

Operating Sources:

	<u>2009</u>	<u>2008</u>	<u>2007</u>	<u>2006</u>	<u>2005</u>	<u>2004</u>
State Police Operating Budget	\$ -	\$ -	\$ -	\$ 1,417,139	\$ -	\$ -
General Fund STARS Appropriation	<u>2,510,000</u>	<u>2,510,000</u>	<u>2,510,000</u>	<u>2,754,359</u>	<u>2,633,599</u>	<u>3,000,000</u>
Total sources	<u>2,510,000</u>	<u>2,510,000</u>	<u>2,510,000</u>	<u>4,171,498</u>	<u>2,633,599</u>	<u>3,000,000</u>

Project Uses

Hayes, Seay, Matter, & Mattern	519,433	896,639	956,120	1,155,139	705,100	512,762
State Police payroll and internal services	942,872	823,567	841,564	1,068,681	718,714	483,634
Motorola services	-	15,828	-	781,820	-	-
Other Miscellaneous Vendors*	<u>822,045</u>	<u>519,406</u>	<u>348,867</u>	<u>1,165,857</u>	<u>175,481</u>	<u>142,792</u>
Total uses**	<u>2,284,350</u>	<u>2,255,440</u>	<u>2,146,551</u>	<u>4,171,498</u>	<u>1,599,295</u>	<u>1,139,188</u>
Net of sources over uses	<u>\$ 225,650</u>	<u>\$ 254,560</u>	<u>\$ 363,449</u>	<u>\$ -</u>	<u>\$ 1,034,304</u>	<u>\$ 1,860,812</u>

Source: Commonwealth Accounting and Reporting System

* Other miscellaneous operating vendors includes travel reimbursements for inspection and project management teams as well as miscellaneous supplies and services to support the operation of the Project Management Team.

** State Police incurred project development costs from fiscal years 2001 through 2003 which total \$8,107,575. These expenses were paid from State Police General operating funds before a separate appropriation was dedicated to the project for fiscal year 2004 and beyond.

APPENDIX C: STARS USER AGENCIES

Twenty-one agencies are included in the STARS project as they will directly benefit from sharing and using the technology and network developed under STARS. The Governor designated State Police as the lead agency for this project. The 21 participating agencies on the STARS project are:

Chesapeake Bay Bridge Tunnel	Department of Game and Inland Fisheries
Department of Alcoholic Beverage Control	Department of Health
Division of Capitol Police	Department of Juvenile Justice
Department of Charitable Gaming	Department of Military Affairs
Department of Conservation and Recreation	Department of Mines, Minerals, and Energy
Department of Corrections	Department of Motor Vehicles
Department of Emergency Management	Department of State Police
Department of Environmental Quality	Department of Transportation
Department of Fire Programs	Virginia Information Technologies Agency
Department of Forestry	Virginia Marine Resources Commission
Virginia Port Authority	