STATEWIDE AGENCIES RADIO SYSTEM

Annual Status Report

A Report to the Governor, House Appropriations Committee, And Senate Finance Committee

October 2023

Colonel Gary T. Settle
Superintendent

COMMONWEALTH OF VIRGINIA

Colonel Gary T. Settle
Superintendent
(804) 674-2000

DEPARTMENT OF STATE POLICE
P. O. Box 27472, Richmond, VA 23261-7472

Lt. Colonel Kirk S. Marlowe
Deputy Superintendent

October 1, 2023

TO: The Honorable Glenn Youngkin, Governor of Virginia

The Honorable Janet D. Howell
Co-Chair of the Senate Finance Committee

The Honorable George L. Barker
Co-Chair of the Senate Finance Committee

The Honorable Barry D. Knight
Chairman of the House Appropriations Committee

The Honorable Terry L. Austin
Vice-Chair of the House Appropriations Committee

Pursuant to House Bill 1400 Item 429.C.2 of the 2023 Virginia Acts of Assembly, I am respectfully submitting herewith a report *on the Status of the Statewide Agencies Radio System (STARS) Program.*

Respectfully,

Gary T. Settle

Superintendent

TAB/WJD/BHK

Enclosure

Executive Summary

Statewide Agencies Radio System 2023 Status Report

Colonel W. Steven Flaherty, State Police Superintendent, and Mr. Mark Moon, Vice President and General Manager of Motorola, signed a $329 million contract between Motorola and the Commonwealth of Virginia for the design, construction, and implementation of the Statewide Agencies Radio System (STARS) on July 13, 2004. A ceremonial contract signing was held on July 16, 2004, in conjunction with a press conference.

Effective July 1, 2011, The Virginia State Police Communications Division assumed the engineering, installation, maintenance, and operations of the STARS system. The STARS Network, including the backbone microwave network, the land mobile radio network, the five (5) Tidewater tunnels, two (2) western tunnels, and all vehicle-based hardware and software for all twenty-one State Agencies, were operational.

STARS provides a multi-channel trunked digital voice and data wireless communications capability to meet APCO Project 25 public safety requirements. The core microwave network consists of Multiprotocol Label Switching (MPLS) ring-protected transmission paths providing the highest quality of service, security, and reliability possible through controlled system access and Advanced Encryption Standard (AES) encryption for law enforcement users when needed. This network supports the 22 participating agencies throughout the Commonwealth and facilitates interoperability with other state, local, and federal agencies.

Initial Bond Funding

Pursuant to the Code of Virginia §2.2-2264, the General Assembly authorized the Virginia Public Building Authority to issue revenue bonds not to exceed $159,300,000 for the constructing, improving, furnishing, maintaining, acquiring, and renovating buildings, facilities, improvements, and land for the STARS project. Chapter 245, approved by the Virginia General Assembly session on March 30, 2006, authorized additional funding via Bonds issued by the Virginia Public Building Authority in the amount not to exceed $201,900,000 to complete the STARS Network.

The revised Contract appropriation cost for STARS is	**$361,200,000**
Less $50,000 allocated to the Department of Forestry,	**$361,150,000**
Phase 1 Cost	**$346,186,399**
Bond Funds remaining after Phase I	**$14,963,601**
New site construction Phase 2	**$3,218,788**

New site construction Phase 3	**$1,619,871**
New site construction Phase 4	**$4,046,542**
Hampton Tower Site, GTR8000 Site Repeater Upgrade, -48VDC Power Upgrade, MDTs, and Telscan Upgrade	**$6,000,000**
New site construction Phase 6	**$78,400**
Projected Funding Balance at Project Completion	**$ - 0 –**

STARS Program Management Structure

The STARS participants are composed of the following 22 agencies. Representatives from each agency make up the User Agencies Requirements Committee (UARC):

Chesapeake Bay Bridge and Tunnel Police
Department of Agriculture and Consumer Services
Department of Alcoholic Beverage Control
Division of Capitol Police
Department of Conservation and Recreation
Department of Corrections
Department of Emergency Management
Department of Environmental Quality
Department of Fire Programs
Department of Forestry
Department of Wildlife Resources
Department of Health
Department of Juvenile Justice
Department Military Affairs
Department of Mines, Minerals, and Energy
Department of Motor Vehicles
Department of State Police
Department of Transportation
Virginia Information Technologies Agency
Virginia Marine Resources Commission
Virginia Port Authority
Buchanan County Sheriff's Department and Grundy Police Department

The STARS Management Group is a Board established by Executive Order 28 (2002) and composed of the Secretaries of Agriculture and Forestry, Commerce and Trade, Finance, Health and Human Resources, Natural Resources, Public Safety, and Transportation. The Secretary of Public Safety serves as the Chairman. The STARS Management Group provides direction and governance for STARS's development, implementation, and ongoing operation. In addition, they review all procurements and

contracts, coordinate radio frequency licenses granted by the federal government to agencies of the Commonwealth and promote interagency cooperation and coordination in the use of communications resources.

The User Agencies Requirements Committee (UARC) consists of two representatives (primary and alternate) from each member agency and institution. The STARS Management Group selects the Chairman of the UARC. The UARC shall have two co-chairs. The VSP Communications Officer shall serve as co-chair, and the UARC membership shall recommend the second co-chair. The UARC meets as necessary, but at least quarterly. The specific duties of UARC are to advise on the needs of member agencies for the planning, design, establishment, and operation of STARS, provide advice on proposals for other federal, state, or local agencies to join STARS, and on any proposals for third party use of any STARS infrastructure or component, and assist the STARS Management Team with the development of a comprehensive management plan and procedures for the operation of STARS.

STARS Annual Operating Costs

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 with access to repair parts, test equipment, and vehicles on a 24/7 basis. On July 1, 2011, the Department assumed the responsibility for equipping new vehicles, aircraft, and boats that belong to the 22 STARS agencies, removing equipment from decommissioned or crashed vehicles, and the refurbishment and re-installation of the reconditioned hardware into another vehicle. Per Chapter 1289, 2022 Virginia Acts of Assembly, Item 429, and the FY2023 and FY2024 allotted funding for Telecommunications and Statewide Agencies Radio System (STARS) (30204) is $40,585,306

Current Enhancement Projects

Maintaining technology today is a labor-intensive and costly proposition. Hardware and software are typically obsolete when purchased and installed, and STARS is no exception. The FY 2023 lifecycle cost to keep the core Motorola portion of the network current is $1,659,642. This does not include the hardware and software upgrades, repair parts, and labor necessary to keep the transport network at top operational efficiency.
Current enhancement projects include:

- Upgrading to a Managed Detection and Response cybersecurity platform from a Detection only platform.

STARS has submitted a budget decision package request to the Executive Staff to provide a real-time managed detection and response cybersecurity solution to monitor the STARS network 24/7 by Motorola Solutions Security Operations Center (SOC) network for security threats. The five-year solution cost is $2,077,165.

- Upgrading all seven division dispatch phone systems and two for continuity of operations and training.

With the current dispatch phone system reaching the end of serviceable life, components cannot be repaired, and the phone system is being replaced. Motorola Solutions, Vesta 9-1-1 Call Handling platform will allow any dispatcher to go to any other dispatch location and take the assigned numbers from that division with them without having to forward numbers one at a time. This system will have two core servers: one in Richmond and one in Salem for redundancy. This solution can also be managed and expanded to include other UARC agencies on the STARS network to help keep maintenance and operation costs down with a single platform. The five-year solution cost is $4,480,977.

Interoperability Between STARS and Outside Agencies

Local, state, and federal radio systems operate in several specific frequency bands (VHF low-band, VHF high-band, UHF, 700 and 800 MHz). Radios operating in different frequency bands cannot communicate directly. **The Commonwealth Link to Interoperable Communications (COMLINC)** allows dispatchers at the state, federal, county, and city communications centers to establish communications patches between themselves and other agencies regardless of the frequency band. For example, a Sheriff's Department can patch the Fire Department regardless of the frequencies used by each agency. Patches can also be made to phone networks to establish dispatcher conferences. Using COMLINC, each dispatcher initiates the patch at their console in coordination with the participating agency. COMLINC also provides instant recall of recorded audio.

COMLINC was initially implemented in 16 localities in VSP Division 1 and State Police Divisions 1 and 5, along with STARS Network Operations Center (NOC). The network has grown through grants to over 140 fixed sites and 20 mobile command posts or tactical units, providing interoperability between all State Police Divisions, most localities, colleges and universities, and other state and federal agencies.

As the network has grown, the Virginia State Police Communications Division accepted responsibility for engineering, installation, maintenance, and technical support for the entire statewide COMLINC network. The upgrade project for COMLINC has 104 sites live, and all the VSP dispatch center sites have been completed. All upgraded systems will be using Windows 10 and will receive new hardware to replace aging equipment. Each new upgrade will be calibrated to ensure optimized audio performance with the radio equipment connected to it. Weekly roll calls between the State and localities are underway to provide better performance through repeated system use and user familiarity. The southwest regions of the State are heavy users of the system, with nearly daily usage being observed. The COMLINC system has other state agencies that are excellent partners. VDOT and VDH are large contributors and users of the system daily in all regions of the State. Four new COMLINC Technician positions have been funded, and all have been hired and trained.

Network Operations Center/Virginia Criminal Information Helpdesk

The Virginia State Police Network Operation Center has 13 Operator positions and 1 Network Operations Center Supervisor who: monitors the STARS Land Mobile Radio and point-to-point microwave radio systems statewide, emergency power, and environmental systems and makes routine infrastructure inputs and changes that allow authorized users access to the network. Along with monitoring the STARS Network, they are also the Virginia Criminal Information Network (VCIN) Help Desk support staff. They are providing support 24/365 for VCIN and STARS.

New STARS Site Construction

During the initial network construction, the VSP Communications Division took over the engineering and installation of several subsystems of the STARS network resulting in cost savings for the Commonwealth. STARS Network Operations Center personnel gathered locations and opened informational trouble tickets that enabled the engineers to test coverage to determine the best location for new sites. Subsequently, the Communications Division requested permission from the STARS Management Group to use the remaining funds from the Phase 5 bond to install additional land mobile radio sites to fill in coverage gaps in the original network. STARS Engineering proposes adding eight new sites to improve coverage for all user agencies.

Upgrades to STARS Infrastructure Network

The 2019 Legislature approved phased bond funding over four years for the following improvements:

Microwave Radios Replacement: The STARS statewide point-to-point microwave backhaul network replacement was awarded to AVIAT Networks, which has completed the installation and commissioning with the entire system carrying traffic.

MPLS: Converting existing Time Division Multiplex (TDM) network architecture to newer technology, Multiprotocol Label Switching (MPLS). With the discontinuation of support for T1 technologies within our infrastructure MPLS has become the industry standard in data transport. Therefore, STARS infrastructure utilizes NOKIA routers for conversion and future transport throughout the network. Testing and acceptance were completed on August 17, 2022.

Radio Authentication: Adds another layer of security to all subscriber radios in the STARS fleet. These features allow only properly registered radios to access the network and prevent the cloning of radios from spoofing the system. The infrastructure equipment installation is in place, and testing has been completed. This new system will be implemented as the new subscriber units are installed through the second quarter of 2024.

TDMA: Convert the entire STARS Land Mobile Radio fleet to Time Division Multiple Access (TDMA) technology from current Frequency Division Multiple Access (FDMA). This act will almost double radio traffic capacity because TDMA provides two radio voice conversations for each existing voice channel. This change required every STARS Federal Communications Commission (FCC) license to be modified, and the Commission has approved all the requested modifications. The infrastructure is in place, and initial testing has been completed. A petition for a waiver was filed and given by VSP to the FCC to increase the talk-in power of the mobile radios. This act will increase the output of the radios from 60 Watts to 100 Watts, helping to improve coverage in known weak areas and enhance the ability of the mobile radios to reach tower sites.

DSR: Dynamic System Resilience will provide real-time backup and switching between the Richmond and Salem zone controller cores in the event of a major failure. DSR will duplicate each location and will provide uninterrupted redundancy without human intervention for a switch to occur. DSR is currently live and operational.

Subscriber Radio Replacement: Replacement of the entire STARS subscriber fleet (mobile, portable, and DVRS or equivalent) due to the existing radio platform (Motorola XTS/XTL) - reaching the end of life and support, and furthermore this platform does not have the capabilities of Radio Authentication and TDMA. The Request for Proposal (RFP) closed on June 3, 2021, with two vendors responding and was awarded to Motorola Solutions, Inc. on December 30, 2021, for $71,353,074. With the award, STARS will be the first statewide radio system in the nation to combine Public Safety Land Mobile Radio (LMR) with cellular Long-Term Evolution (LTE), increasing the system's capabilities and allowing features to be added as requirements change in operational needs. The project is on track to completion in June 2024, with five agencies remaining to install upgraded radios into the fleet.

These improvements will position STARS as the first VHF statewide radio system to be P25 Phase 2 in the nation.