

STATEWIDE AGENCIES RADIO SYSTEM

Annual Status Report

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



October 2025

**Colonel Matthew D. Hanley
Superintendent**



COMMONWEALTH OF VIRGINIA

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TO: The Honorable Glenn Youngkin, Governor of Virginia

The Honorable L. Louise Lucas
Chair of the Senate Finance and Appropriations Committee

The Honorable Luke E. Torian
Chairman of the House Appropriations Committee

The Honorable Mark D. Sickles
Vice-Chair of the House Appropriations Committee

Pursuant to House Bill 1400 Item 429.C.2 of the 2024 Virginia Acts of Assembly, I am respectfully submitting herewith a report *on the Status of the Statewide Agencies Radio System (STARS) Program*.

Respectfully,

Superintendent

TAB/WJD

Enclosure

Executive Summary

Statewide Agencies Radio System 2025 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 now provides a multi-channel trunked digital voice and data wireless communications capability meeting APCO Project 25 Phase 2, 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 25 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 25 agencies. Representatives from each agency make up the User Agencies Requirements Committee (UARC):

1. Chesapeake Bay Bridge and Tunnel Police
2. Department of Agriculture and Consumer Services
3. Department of Alcoholic Beverage Control
4. Division of Capitol Police
5. Department of Conservation and Recreation
6. Department of Corrections
7. Department of Emergency Management
8. Department of Environmental Quality
9. Department of Fire Programs
10. Department of Forestry
11. Department of Wildlife Resources
12. Department of Health
13. Department of Juvenile Justice
14. Department Military Affairs
15. Department of Mines, Minerals, and Energy
16. Department of Motor Vehicles
17. Department of State Police
18. Department of Transportation
19. Virginia Information Technologies Agency
20. Virginia Marine Resources Commission
21. Virginia Port Authority
22. Buchanan County Sheriff's, Fire and EMS Departments and Grundy Police Department
23. Cumberland County Sheriff, Fire and EMS Departments
24. Wise County Sheriff's Office
25. Office of the Inspector General

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 Homeland Security, and Transportation. The Secretary of Public Safety and Homeland Security 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 responsibility for equipping new vehicles, aircraft, and boats that belong to the STARS agencies, removing equipment from decommissioned or crashed vehicles, and the refurbishment and re-installation of the reconditioned hardware into another vehicle. Per Chapter 725, 2025 Virginia Acts of Assembly, Item 415, and the FY2025 and FY2026 allotted funding for Telecommunications and Statewide Agencies Radio System (STARS) (30204) is \$40,622,738

Current Enhancement Projects

Maintaining technology today is a labor-intensive and costly proposition. STARS management has looked forward to future expansions and refresh of hardware and software and is in the last year of the current lifecycle program with the next six-year program beginning July 1, 2026. The 2026-2031 lifecycle program will focus on upgrade of dispatch center technologies, cybersecurity programs and monitoring, and continued training. The FY 2025 lifecycle cost to keep the core Motorola portion of the network current is \$1,709,431. 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:

1. Completed third-party Cybersecurity Audit and Penetration testing of the STARS system and dispatch phone systems

A cybersecurity risk assessment and analysis of STARS (Motorola Astro and VESTA 9-1-1) Systems were conducted between March 3, 2025, and March 7, 2025. The assessment was based on the National Institute of Standards and Technology (NIST) Cybersecurity Framework (CSF) Version 2.0, CISA CPGs, and best practices.

The cybersecurity assessment revealed the STARS system had several notable security strengths, balanced against certain identifiable risks. The results showed the system exceeding VITA's requirements and met NIST standards.

- Findings and Noted Security Strengths:
 - System Security Plan (SSP): The System Security Plan (SSP), represented a significant step forward in documenting the system's security posture. Its existence provides a centralized repository for security controls and procedures, enhancing transparency and facilitating review by stakeholders. This comprehensive documentation moved the VSP closer to achieving a well-documented system that can be effectively managed and continuously improved.
 - Proactive Team Engagement: The team demonstrated a strong commitment to continuous improvement and a willingness to adopt new security measures.
 - Effective Network Monitoring: The implementation of ActiveEye monitoring services provides robust network monitoring, malicious code detection, and threat identification.
 - Strong Physical Security: Comprehensive access controls and monitoring systems contribute to a strong physical security posture.
 - CJIS Training Compliance: All technicians with domain-level accounts have maintained compliance with CJIS training requirements. This ensures adherence to established security standards and safeguards sensitive criminal justice information.
 - Effective Back Up Process: The VSP team maintains a robust backup process, with engineers validating all data across both online and offline storage. Technicians oversee a dedicated backup system, ensuring that weekly backups are performed so that the integrity of the backup shows success. VSPs process includes both online and offsite storage for added data security and redundancy.

2. Completion of third-party engineering feasibility study for the expansion of STARS to localities and other users

This report assessed the feasibility of expanding STARS to public safety stakeholders, a cost sharing model to ensure joining counties bear the cost of such services, and a labor

model to identify staffing impacts. The analysis also includes a study of STARS coverage at the county level, assessing the degree to which the current system might satisfy local needs. Additionally, the project provided a recommended process for bringing county agencies on to the STARS network. Finally, the project reviewed STARS network operations to identify potential recommended improvements.

Conclusions

- The STARS network provides impressive outdoor mobile radio coverage statewide. Only five counties and cities lacked public safety's targeted 95 percent coverage: Giles (94%), Rockingham (93%), City of Covington (91%), Bath (84%), and Highland (75%).
- The study found that much of the STARS network has substantial excess capacity that can accommodate additional demand from county and VDOT users. The study developed models to predict how the additional demand from both user groups will leverage resources from the individual STARS sites.
- An extensive analysis of STARS financials and labor was conducted to review all elements of county cost impacts on the STARS organization. Importantly, STARS provides a number of services to counties that factor in the overall determination of the labor and cost ramifications of additional county users.
- A detailed financial and labor model was developed to allow for county selections and to cover STARS costs and labor associated with the additional devices and usage by the counties. The model covers the one-time costs associated with consultations, engineering, subscriber equipment, and installation. In addition, the model includes a methodology to fund capacity enhancements intended to fairly attribute capacity expansion costs to each joining county. This will include the one-time equipment and labor to expand the network appropriately as well as the increase in annual operating costs and labor incurred due to the new users.
- This report also provides a proposed process for onboarding county agencies including an application process, coverage testing, development of cost exhibits and other steps intended to provide both parties with opportunities to ensure expectations and obligations are identified up-front.

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 within VSP Division 1 and State Police Divisions 1 and 5, along with the 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 all the sites live, and all the VSP dispatch center sites have been completed. All upgraded systems are using the latest Windows operating systems and have received new hardware to replace aging equipment. Each new upgrade is 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.

Regional meetings with all COMLINC localities have begun to formulate a plan for what the next version of the program will entail. End user input is the cornerstone of the next upgrade which will begin over the next two to three years, ensuring COMLINC remains technologically relevant and provides end users connectivity to STARS that is easy to use, reliable, and scalable to each locality. An RFP process will be needed to ensure the best, most advanced and financial sound solution is implemented.

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 monitor the STARS Land Mobile Radio and point-to-point microwave radio systems statewide, emergency power, and environmental systems and make 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 hours a day, 365 days a year 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. 2025 will see the following three sites built:

- Craig County – Preliminary design has begun for the construction of a 150-foot tower that will allow co-location of Craig County Emergency Services at no cost to the County.
- Washington Building Roof Top - Enhance the coverage inside of Capitol Square facilities for Capitol Police and the VSP Executive Protection Division, with less reliance on Richmond City's network.
- Blue Mt. I-66 – Fauquier County – co-location on a Fauquier County tower to enhance coverage around the I-66 area of Delaplane, Marshall, and Markham.

Upgrades to STARS Infrastructure Network

The 2019 General Assembly approved phased bond funding over four years, the last two elements of the project were completed on January 24, 2025, with the implementation of the following:

Radio Authentication: Authentication within P25 Phase 2 systems, also known as Link Layer Authentication (LLA) or P25 Radio Authentication, plays a crucial role in securing critical communications for public safety and other agencies.

The authentication process is initiated by the P25 radio system when a subscriber unit (radio) attempts to register with it. The system sends an authentication challenge to the subscriber radio. The subscriber radio generates a response using a unique, pre-programmed AES-128-bit authentication key. This response is sent back to the radio system for verification. If the response is correct, the authentication is successful, and the radio is allowed to operate on the system. If the authentication fails, the radio is denied access to the system. These features allow only properly registered radios to access the network and prevent the cloning of radios from spoofing the system. This is now live.

Encryption: P25 Phase 2 uses encryption to secure radio communications, primarily employing the Advanced Encryption Standard (AES) with 256-bit keys. This encryption scrambles the digital signal, making it unreadable to those without the appropriate decryption key.

STARS is 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 installations were completed in June 2024.

Final project close-out was on-time and under budget by over \$20,000,000.