

PERFORMANCE AUDIT REPORT

Governor's Office of Administration

Pennsylvania State Police

Statewide Radio Network System

January 2020



Commonwealth of Pennsylvania
Department of the Auditor General

Eugene A. DePasquale • Auditor General

This page left blank intentionally



Commonwealth of Pennsylvania
Department of the Auditor General
Harrisburg, PA 17120-0018
Facebook: Pennsylvania Auditor General
Twitter: @PAAuditorGen
www.PaAuditor.gov

EUGENE A. DePASQUALE
AUDITOR GENERAL

January 14, 2020

The Honorable Tom Wolf
Governor
Commonwealth of Pennsylvania
Room 225 Main Capitol Building
Harrisburg, PA 17120

Dear Governor Wolf:

This report contains the results of the Department of the Auditor General's (Department) performance audit of Contract Number 4400016094, the "20-Land Mobile Radios Upgrade", related to the Statewide Radio Network System, known as PA-STARNet. The term of the contract extends from October 1, 2016 to November 30, 2021. This audit was conducted under the authority of Sections 402 and 403 of The Fiscal Code, 72 P.S. §§ 402-403, and in accordance with applicable *Government Auditing Standards*, issued by the Comptroller General of the United States. 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.

Our performance audit covered the period from when the Commonwealth determined the upgrade was necessary, March 1, 2015, to the final acceptance of Troop J, March 26, 2019, unless otherwise noted, with updates through the report date. Our performance audit of the "20-Land Mobile Radios Upgrade" included the following three objectives:

- Evaluate the process in the development of Request for Proposals 6100033543 (P25 RFP).
- Determine whether Contract Number 4400016094 was procured properly in accordance with the Procurement Code and applicable policies and procedures. Evaluate what, if any, performance measurements and performance criteria (e.g., Performance Bond) exist.
- Evaluate the current status of contract implementation.

We found that the Statewide Radio P25 RFP was developed in accordance with the *Pennsylvania Procurement Handbook* (Handbook), but we identified needed areas of improvement. Specifically, we found that the Pennsylvania State Police (PSP) and the Governor's Office of Administration (OA) lacked documentation regarding the evaluation committee members' selection and qualifications and that OA failed to adequately review the *Certification of Confidentiality and No Conflict of Interest* forms completed by the P25 RFP evaluation committee members.

We also found that although the "20-Land Mobile Radio Upgrade" contract related to the Statewide Radio Network System was procured in accordance with the Handbook, scoring errors were identified. While we determined that the errors did not impact the outcome of the contract award, the failure to ensure that the individual scores are correctly transferred to the final summary score sheet could result in the wrong contractor being awarded a contract in the future.

Further, we found that the implementation of the "20-Land Mobile Radio Upgrade" contract has remained on-time and on-budget; however, PSP needs to adequately document required operational tests as evidence of the reliability and long-term stability of the new system. As this statewide installation continues over the next 18 months, we strongly recommend that PSP implement a more formal process to document the 30-day Operational Tests for remaining troop installations to ensure the new system is functioning properly and is reliable when being used by a large volume of troopers as part of day-to-day operations.

We offer ten recommendations, including five to OA and/or PSP related to the function of acting as the issuing office for an RFP, four to PSP related to contract implementation, and one to the Pennsylvania Department of General Services (DGS) to amend the Handbook for future Commonwealth procurements.

Overall, OA and PSP agree with each of the findings and recommendations. Because the responsibility for all Commonwealth Information Technology procurements was transferred from OA to DGS during the audit period, DGS responded to the recommendation that involved Commonwealth procurement policy changes. DGS agreed to consider policy changes based on our recommendation.

Included with this report is a brief summary of the history Pennsylvania's statewide radio system dating back to the mid 1990's as provided by PSP for background purposes only and was not audited by this Department. We will follow up at the appropriate time to determine whether and to what extent all recommendations have been implemented.

Sincerely,



Eugene A. DePasquale
Auditor General

A Performance Audit

Governor’s Office of Administration
Pennsylvania State Police

Statewide Radio Network System

TABLE OF CONTENTS

Executive Summary 1

Introduction and Background 5

Pennsylvania’s Troubled History with OpenSky® 14

Finding One: The Statewide Radio Request For Proposals was developed in accordance with the *Pennsylvania Procurement Handbook*, but we identified needed areas of improvement23

Recommendations31

Finding Two: Although the “20-Land Mobile Radio Upgrade” contract related to the Statewide Radio Network System was procured in accordance with the *Pennsylvania Procurement Handbook*, scoring errors were identified32

Recommendations37

Finding Three: The implementation of the “20-Land Mobile Radio Upgrade” contract has remained on-time and on-budget; however, the Pennsylvania State Police needs to adequately document required operational tests as evidence of the reliability and long-term stability of the new P25 LMR system38

Recommendations47

Agencies’ Responses and Auditor’s Conclusion48

Appendix A – Objectives, Scope, and Methodology58

Appendix B – Contract Implementation Milestones64

Appendix C – Distribution List68

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Executive Summary

This report presents the results of our performance audit of the contracting process and the status of contract implementation for the Statewide Radio Network System's "20-Land Mobile Radios Upgrade," Contract Number 4400016094, extending from October 1, 2016 to November 30, 2021. Our performance audit was conducted under the authority of Sections 402 and 403 of The Fiscal Code.¹ Our performance audit had three objectives and covered the period of March 1, 2015 through March 26, 2019, unless otherwise noted, with updates through the report date. Refer to *Appendix A* of this report for a detailed description of the audit objectives, scope, and methodology.

Pennsylvania's Statewide Radio Network System, also known as PA-STARNet, is a wireless voice and data network used for public safety and emergency communications by various Commonwealth agencies and other public safety and emergency response organizations. It is comprised of a Land Mobile Radio system (LMR), microwave system, and high-profile steel towers. PA-STARNet was initiated in 1996 by Act 148 and began construction in 1999. The Governor's Office of Administration (OA) created its Radio Project Office to oversee the construction of the PA-STARNet.

Since the Pennsylvania State Police (PSP) began using the PA-STARNet system in 2001, users have experienced numerous problems, including poor radio reception and unreliable performance due to interference with other radio signals, software and infrastructure problems (See the section titled *Pennsylvania's Troubled History with OpenSky®*). As a result, PSP developed a lack of confidence in the system over the years. After taking over responsibility for PA-STARNet in 2012, PSP determined that the LMR system needed to be replaced by a reliable public safety grade LMR.

In 2015, PSP issued RFP 6100033543 (P25 RFP) to secure a contract for a new P25 LMR system. The goal of the contract was to provide voice and data communications for public safety users including, robust reliability, redundancy, availability, and backup, without any single points of failure. Contract 4400016094 was awarded to Motorola Solutions, Inc. in October 2016. The contract involves the design and installation of a P25 LMR system that provides at least 95 percent coverage reliability across the Commonwealth. Installation of the P25 LMR system began in Warren County in October 2016 and progressed south through the western-most counties during the July 1, 2017 through June 30, 2018 fiscal year. It continued east across the

¹ 72 P.S. §§ 402 and 403.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

southern tier of the Commonwealth. Our audit covers the completion of seven PSP troops through March 2019.²

Our audit results are contained in three findings, summarized below, and ten recommendations, which include five recommendations directed to OA and PSP, four others directed to PSP only, and one recommendation made to the Department of General Services (DGS). Overall, OA and PSP agree with each of the findings and recommendations. Because the responsibility for all Commonwealth Information Technology procurements was transferred from OA to the DGS during the audit period, DGS responded to the recommendation that involved Commonwealth procurement policy changes. DGS agreed to consider policy changes based on our recommendation.

Finding 1 – The Statewide Radio Request For Proposals was developed in accordance with the Pennsylvania Procurement Handbook, but we identified needed areas of improvement.

We conducted procedures to determine if the P25 RFP was developed in accordance with the *Pennsylvania Procurement Handbook* (Handbook), which provides the policies, procedures, and guidelines for Commonwealth agencies to follow when procuring materials and services. Our procedures included a detailed review and comparison of the P25 RFP and associated documentation to the Handbook. We determined that:

- The decision made by OA and PSP to utilize the Competitive Sealed Proposals procurement method was appropriate.
- The P25 RFP's content complied with the Handbook and it was properly approved and posted on DGS' website.
- The consultant hired to develop the P25 RFP's Statement of Work (SOW) appears to have possessed sufficient technical expertise and the SOW appears to be written in an objective manner.
- PSP and OA lacked documentation regarding the evaluation committee members' selection and qualifications and OA failed to adequately review the *Certification of Confidentiality and No Conflict of Interest* forms completed by the P25 RFP evaluation committee members.

² PSP provides public safety and related services in each of PA's 67 counties through 16 designated troops. Troop T patrols the PA Turnpike, while the other 15 troops cover regions of the Commonwealth typically defined by the geographical boundaries of a grouping of three to nine adjacent counties. As of March 26, 2019, installation of the P25 LMR was completed for Troops A, B, D, E, G, H, and J, covering 32 counties. See the map included in the *Background* section.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Although we were able to independently determine that the consultant selected to develop the P25 RFP SOW appeared qualified, current PSP management could not locate documentation to validate its decision to select the consultant. PSP management stated that the consultant's contract was already in place when the current PSP management team became responsible for the procurement.³

Likewise, PSP did not document why the evaluation committee members were selected to participate in the evaluation of vendor proposals received in response to the P25 RFP. Although this lack of documentation does not violate Commonwealth procurement policy, it prevents external parties, such as auditors, from verifying that each evaluation committee member was qualified to serve on the committee.

Additionally, we identified an oversight that occurred during OA's review of evaluation committee members' *Certification of Confidentiality and No Conflict of Interest* forms. Although we found no evidence indicating that it had any impact on the P25 LMR procurement process, it is important that the confidentiality forms are completed and properly reviewed prior to the individual's involvement with the procurement process.

Finding 2 – Although the “20-Land Mobile Radio Upgrade” contract related to the Statewide Radio Network System was procured in accordance with the Pennsylvania Procurement Handbook, scoring errors were identified.

In response to the P25 RFP, two proposals were received from the Harris Corporation (Harris) and one from Motorola Solutions, Inc. (Motorola). We developed audit procedures to determine if the P25 contract award process complied with the Handbook. Through our review of documentation related to the vendors' proposals, the evaluation committee's scoring sheets, and two bid protests filed by Harris, we determined that:

- Each proposal was properly evaluated and the contract was awarded to Motorola in accordance with the Handbook.
- Although we identified two errors on the final evaluation score sheet, these had no impact on the outcome of the contract award.
- OA and PSP properly and timely responded to the two bid protests received regarding the procurement.

³ PSP selected the consultant (Mission Critical Partners) from a list of vendors pre-qualified through the Commonwealth's Invitation to Qualify (ITQ) process, which establishes multi-award contracts for a myriad of related supplies or services. This permits agencies to more efficiently obtain goods or services under a specified dollar threshold without requiring multiple bids. Other vendors having the expertise to develop the P25 RFP SOW may have been also been available for consideration on the ITQ list.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Regarding the two scoring errors, one score from two different individual scoring sheets was incorrectly entered on the summary score sheet for one of the Harris proposals, which caused its overall score to be overstated. We determined that the errors did not impact the outcome of the contract award because the proposal, even with an overstated score, did not receive the minimum technical score required to warrant further consideration in the award process. The failure to ensure that the individual scores are correctly transferred to the final summary score sheet could result in the wrong contractor being awarded a contract in the future.

Finding 3 – The implementation of the “20-Land Mobile Radio Upgrade” contract has remained on-time and on-budget; however, the Pennsylvania State Police needs to adequately document required operational tests as evidence of the reliability and long-term stability of the new P25 LMR system.

We consider the 30-day Operational Tests to be a critical LMR implementation contract requirement because it is intended to ensure the P25 LMR system operates reliably in the field for troopers' day-to-day operations. These tests should be successfully completed before PSP management determines the use of the system for a troop is ready for final approval; however, we could not verify the effectiveness of the 30-day Operational Tests because PSP management stated that the tests were conducted informally and testing timeframes, procedures, and results were not documented. With installation of the P25 LMR continuing westward across the northern half of the Commonwealth, we strongly recommend that PSP implement a more formal process to document the 30-day Operational Tests to ensure the new system is functioning properly and is reliable when being used by a large volume of troopers as part of day-to-day operations.

We conducted additional procedures to determine the status of the contract implementation and noted that as of March 26, 2019, contract expenditures totaled approximately \$22.8 million, or 50 percent, of the total contract value. This amount is reasonable when compared to the progress of the LMR installation, which includes the completion and PSP approval of the new LMR system in seven of the fifteen PSP troops. We also found PSP reviewed and approved Motorola's completion of contract milestones prior to making contract payments; that all contract change orders were reasonable; and Motorola utilized Small Diverse Business subcontractors as described in its contract proposal and submitted its Quarterly Utilization Reports timely.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Introduction and Background

This report presents the results of our performance audit of the contracting process and the status of contract implementation for the Statewide Radio Network System's "20-Land Mobile Radios Upgrade," Contract Number 4400016094, extending from October 1, 2016 to November 30, 2021. As a whole, the Statewide Radio Network System is commonly referred to as PA-STARNet. Our performance audit was conducted under the authority of Sections 402 and 403 of The Fiscal Code.⁴ Our performance audit had three objectives and covered the period of March 1, 2015 through March 26, 2019, unless otherwise noted, with updates through the report date. Refer to *Appendix A* of this report for a detailed description of the audit objectives, scope, and methodology.

In the sections that follow, we provide information pertaining to:

- PA-STARNet defined
- The inception of PA-STARNet
- The administration of PA-STARNet
- The transition to the P25 Standard
- Procuring the new P25 system
- The rollout and status of the new P25 system.

PA-STARNet defined

PA-STARNet is the Commonwealth's statewide wireless voice and data network used for public safety and emergency communications by various Commonwealth agencies and other public safety and emergency response organizations. PA-STARNet is comprised of three components: the Land Mobile Radio system, a microwave system, and high-profile steel towers.

Land Mobile Radio (LMR) system:

LMR systems serve as the primary means of communication between emergency responders. These systems typically consist of network equipment, handheld portable radios, mobile radios in vehicles, base stations, and repeaters that transmit a localized signal. The image below demonstrates the flow of communications between first responders on a basic LMR system.⁵

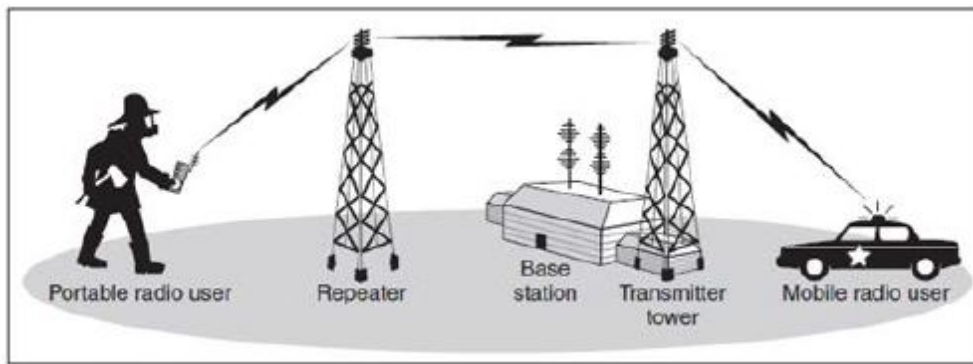
⁴ 72 P.S. §§ 402 and 403.

⁵ <https://www.dhs.gov/sites/default/files/publications/LMR%20101_508FINAL.pdf> (accessed July 9, 2019).

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System



Source: <https://www.dhs.gov/sites/default/files/publications/LMR%20101_508FINAL.pdf> (accessed July 9, 2019).



Microwave system:

PA-STARNet is connected by a digital microwave system for the transmission of voice and data.⁶ Microwave systems transmit information between two fixed locations using radio waves in the microwave frequency range.⁷ The Federal Communications Commission, or “the microwave backbone network,” licenses this microwave system.⁸ The image to the left of a high-profile steel tower shows the attached microwave equipment.

High-profile steel towers:

PA-STARNet’s high-profile steel towers transmit radio communications throughout the Commonwealth. The image to the left is an example of a high-profile steel tower used by PA-STARNet.

Source: <https://www.motorolasolutions.com/en_us/states/pennsylvania.html#about_system> (accessed July 10, 2019).

⁶ Management Directive 245.15 Amended, December 5, 2016, <https://www.oa.pa.gov/Policies/md/Documents/245_15.pdf> (accessed July 10, 2019).

⁷ <https://ethw.org/Microwave_Link_Networks> (accessed July 10, 2019).

⁸ Management Directive 245.15 Amended, December 5, 2016, <https://www.oa.pa.gov/Policies/md/Documents/245_15.pdf> (accessed July 10, 2019).

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Twenty-two Commonwealth agencies, both chambers of the Pennsylvania General Assembly, business partners, and external organizations, including county and municipal emergency response agencies, use PA-STARNet.⁹

Inception of PA-STARNet

PA-STARNet was originally authorized and funded in 1996 by Act 148 to replace multiple incompatible radio systems with a single, centrally-managed system that would provide at least 95 percent coverage within every county in the Commonwealth.¹⁰

In 1999, the Commonwealth awarded four contracts with a combined value of more than \$203 million for construction of PA-STARNet. The largest of the four contracts was awarded to AMP Inc. for \$95 million for the construction of the LMR system, known as OpenSky®.¹¹ Pennsylvania was the first state to use the system for public safety — FedEx and the Orange County Transit Authority in California were the only other entities using OpenSky® at that time.

PA-STARNet is not only used for daily communications, but also for planned events and emergency situations. It serves as the platform between state agencies and local first responders and is critical for coordinating and controlling activities across all levels of government throughout the Commonwealth. In 2010, a national association acknowledged that “PA-STARNet is one of the largest public safety communications systems in North America, with one of the largest privately constructed microwave networks in the world.”¹²

The Administration of PA-STARNet

According to Pennsylvania State Police (PSP) management, the Governor's Office of Administration (OA) originally managed PA-STARNet through its Radio Project Office (RPO).¹³ In July 2012, however, PSP assumed responsibility for the operation and administration

⁹ <<https://www.psp.pa.gov/About%20Us/pages/pastarnet.aspx>> (accessed August 19, 2019).

¹⁰ The Capital Budget Project Itemization Act's supplement for 1996-1997 provided an initial \$179 million to establish a new radio system called PA-STARNet, which would replace the various prior systems. (See Act 148 of 1996).

¹¹ M/A-COM, Inc. developed OpenSky® and was acquired by AMP in 1995.

¹² National Association of State Chief Information Officers (NASCIO) 2010 Awards Information and Communications Technology Innovation Commonwealth of Pennsylvania STARNet, page 4, <<https://www.nascio.org/portals/0/awards/nominations2010/2010/2010PA8-PA%20-%20StarNET%20-%20Info.%20Communications%20Technology%20Innovation.pdf>> (accessed July 15, 2019).

¹³ The RPO was created within the OA to oversee the implementation of the new system.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

of the system.¹⁴ Management Directive 245.15 (Amended) designates PSP, through the STARNet Division, as the single agency responsible for the development, operation, regulation, management, maintenance, and monitoring of PA-STARNet. This includes all infrastructure, equipment, software, services, and licenses supporting its application to public safety and emergency communications.¹⁵

The directive also established a PA-STARNet Committee. This committee consists of two workgroups — the PA-STARNet Strategic Workgroup and the PA-STARNet Communications Operations Workgroup. These workgroups meet quarterly in order to provide a standing forum for participating agencies to ensure coordination and cooperation in the development and use of PA-STARNet.¹⁶

PSP established a Network Operations Center (NOC) and contracted with a vendor to monitor the Statewide Radio Network on a 24/7 basis. According to PSP management, the NOC receives automated alerts when equipment problems are detected. Such problems may involve generators, heating and air conditioning equipment, microwave network components, and other LMR electronics. Technicians review every alert and take the necessary actions to resolve the problems.

The Transition to the P25 Standard

In 1989, the Association of Public Safety Communications Officials and associated organizations collaborated in the creation of APCO-NASTD-Fed Project 25, or P25 Standard.¹⁷ The P25

¹⁴ The General Assembly of Pennsylvania, Senate Resolution No. 237, Session of 2017.

¹⁵ Management Directive 245.15 Amended, <https://www.oa.pa.gov/Policies/md/Documents/245_15.pdf> (accessed July 7, 2019). The PA-STARNet Division establishes policies, standards, and procedures for the specification, procurement, development, testing, configuration, operations, use, replacement, and maintenance of all PA-STARNet resources.

¹⁶ Management Directive 245.15 Amended, <https://www.oa.pa.gov/Policies/md/Documents/245_15.pdf> (accessed July 7, 2019). The PA-STARNet Strategic Workgroup is co-chaired by the OA and PA-STARNet Division. The workgroup includes one member from each of the following: OA, Pennsylvania State Police, Pennsylvania Emergency Management Agency, Department of Transportation, Department of Conservation and Natural Resources, Department of Military and Veterans Affairs, and other agencies as determined by the co-chairs based on the needs of the workgroup. The PA-STARNet Communications Operations Workgroup is chaired by the STARNet Division.

¹⁷ Including National Association of State Technology Directors; National Communications System; National Telecommunications and Information Administration; and National Security Agency.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Standard enhances interoperability through national standardized specifications for manufacturing radio equipment.¹⁸

In April 2016, there were 34 radio equipment manufacturers and service providers offering P25 compliant solutions for organizations' critical communications needs.¹⁹ The P25 Standard enables interoperability among multiple manufacturers' P25 products. This means that users operating a P25 system are able to communicate with other P25 systems regardless of the manufacturer. The P25 Standard has been widely adopted by local, state, and federal agencies in the United States. Currently, there are over 1,000 P25 systems on air supporting interoperable communication in the United States, Australia, Canada, and the United Kingdom. Additionally, the P25 Standard has the support of the United States Department of Homeland Security (DHS).²⁰

Shortly after taking over PA-STARNet in 2012, PSP performed an assessment of the system's strengths and weaknesses. The STARNet Division found that the greatest strengths of the system were the microwave system and the capital investments in towers. It found that the LMR (OpenSky®) component of the system, however, was unreliable and prevented the radio system from being a true "public-safety grade" system.²¹ See the section *Pennsylvania's Troubled History with OpenSky®* below for a detailed history of OpenSky®.

In 2015, PSP determined it was necessary to replace OpenSky® due to its lack of reliable operability and the age of the technology. Also, certain components, parts, and service support were being discontinued in 2018. PSP decided to upgrade its LMR system to a P25 system in order to provide the highest level of public safety and emergency responsiveness. The new system would utilize the existing microwave network and tower structures.²²

¹⁸ Management Directive 245.15 Amended defines interoperability as the "ability of emergency responders to communicate among jurisdictions, disciplines, frequency bands, and levels of government as needed and as authorized. System operability is required for system interoperability." See also U.S. Department of Homeland Security, National Emergency Communications Plan, 2014, Appendix 9, "Glossary," p. A-39.

¹⁹ <http://www.project25.org/images/stories/ptig/Benefits_of_P25_Final_April_2016_REV_02_160407.pdf> (accessed June 1, 2019).

²⁰ <<http://www.project25.org/index.php/news-events/414-ptig-publishes-updated-list-of-p25-trunking-systems-may-2019>> (accessed August 12, 2019).

²¹ <<http://pasenategop.com/communications/wp-content/uploads/sites/15/2017/06/stackhouse.pdf>> (accessed June 1, 2019).

²² <https://www.psp.pa.gov/About%20Us/Documents/PA-STARNet_Fact_Sheet_2019-03-06.pdf> (accessed June 1, 2019).

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

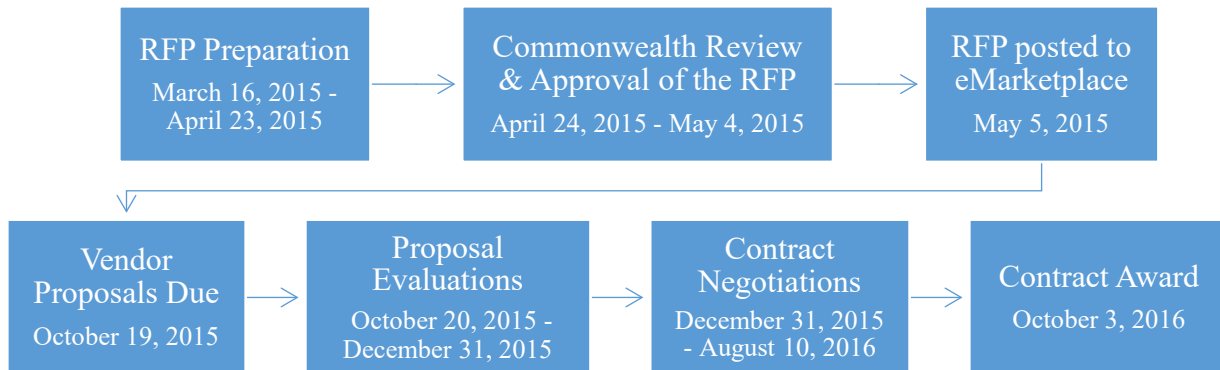
Statewide Radio Network System

Procuring the new P25 system

The Competitive Sealed Proposal method of the Commonwealth of PA procurement requirements under the Commonwealth Procurement Code and the *Pennsylvania Procurement Handbook*, generally referred to as the Request for Proposals (RFP) process, was used to award the contract for the LMR upgrades to PA-STARNet.²³ Developing the RFP was a joint effort between PSP and OA. PSP acted as the project manager, responsible for developing the Statement of Work (SOW), whereas OA acted as the issuing office, responsible for ensuring the RFP was developed and issued in accordance with Commonwealth procurement requirements.

In March 2015, PSP hired Mission Critical Partners, Inc. (MCP), a public safety consulting and information technology (IT) support services firm, to help draft the SOW. MCP was previously qualified by the Commonwealth to provide services for IT-related procurements through a Master Invitation to Qualify contract.²⁴ MCP and PSP subject-matter experts formed a RFP development committee. The following timeline presents the stages of the procurement process from RFP preparation to contract award.

RFP 6100033543 Timeline



Source: Produced by the Department of the Auditor General using information provided by OA.

²³ 62 Pa.C.S. § 101 *et seq.* (Act 57 of 1998, as amended) and the *Pennsylvania Procurement Handbook*. See <<https://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/62/62.HTM>> and <<https://www.dgs.pa.gov/Materials-Services-Procurement/Procurement-Handbook/Pages/default.aspx>> (accessed August 19, 2019).

²⁴ <<http://www.emarketplace.state.pa.us/BidContractDetails.aspx?ContractNo=4400008626>> (accessed June 1, 2019).

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

The Rollout and Status of the New P25 System

On October 3, 2016, Motorola Solutions, Inc. (Motorola) was awarded Contract Number 4400016094 for \$44.5 million to upgrade the LMR system in response to RFP 6100033543.²⁵ The contract was structured to ensure that payments were not made until Motorola satisfactorily completed specific milestones defined in the contract. The six payment milestones included:

- Detailed Design Review
- Delivery of Equipment
- Staging of Equipment
- Installation of Equipment
- System Acceptance
- Final Acceptance

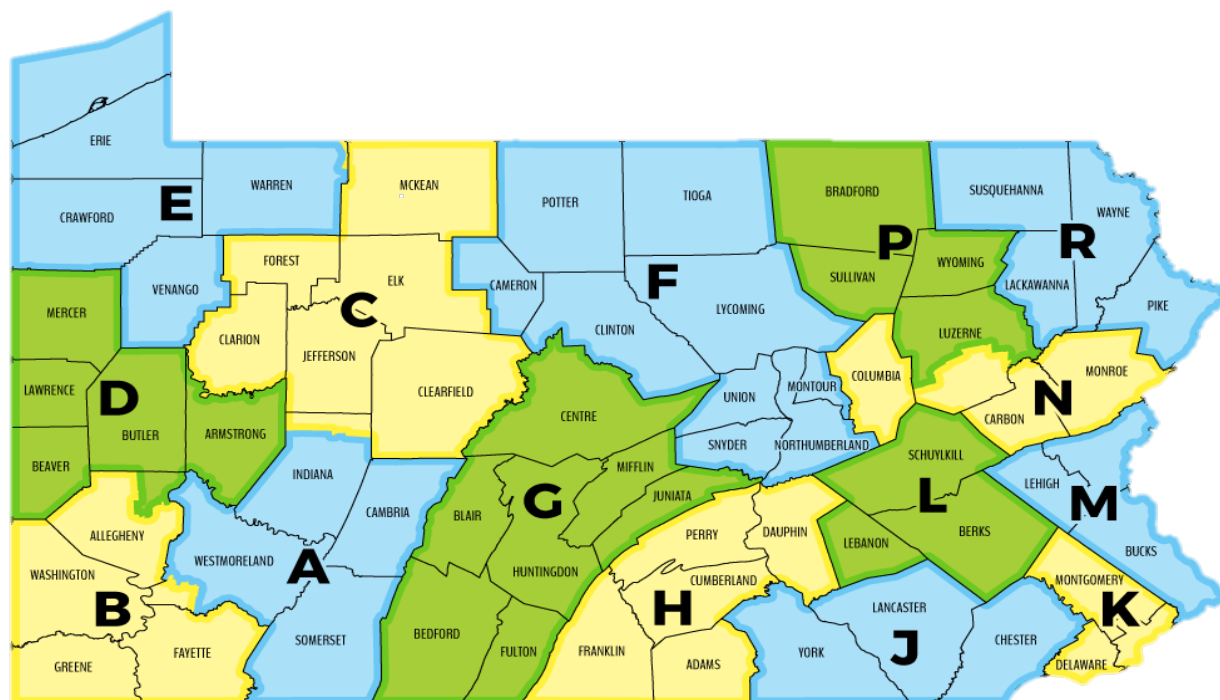
This set of milestones applied to each of the 15 PSP Troops indicated by letter on the following map, plus a set for the initial deployment in Warren County only, known as Pilot I. Each troop is comprised of three to nine counties, except for PSP Troop T, which covers the PA Turnpike (not shown on map). Troop T's coverage area is included within several other troops' deployments based on geographic region and therefore, there is not a Troop T deployment requiring completion of the milestones.

²⁵ <<http://www.emarketplace.state.pa.us/BidAwardDetails.aspx?RecordNo=13291>> (accessed June 1, 2019).

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System



Source: <<https://www.psp.pa.gov/troop%20directory/Pages/default.aspx>> (accessed July 8, 2019).

The contract required Motorola to design the system for a specific troop, order the equipment, and configure it prior to installation onsite. Once installed, the contract required coverage area testing be conducted so that each county within the troop achieved at least 95 percent coverage. PSP personnel oversee the completion of each milestone and sign a certificate of acceptance when successfully completed. At that time, Motorola may invoice the Commonwealth for payment for its costs associated with the milestone completed.

Completing the design, installation, and acceptance of the P25 system across the entire Commonwealth was divided into three stages:

- Pilot Stage 1 (PSP Troop E: Warren County only)
- Pilot Stage 2 (Troop E: All remaining counties)
- Remaining troops (The last troop is scheduled to be completed by June 30, 2021.)

The P25 system is comprised of 85 Very High Frequency sites, thirty 800 Megahertz tower sites, and a redundant microwave system.²⁶ Because of the interoperability of the system, PSP has

²⁶ <https://www.psp.pa.gov/About%20Us/Documents/PA-STARNet_Fact_Sheet_2019-03-06.pdf> (accessed June 1, 2019).

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

offered shared service models with county governments, as well as the federal government. A shared service model means these other government entities can use PA-STARNet in exchange for sharing frequencies with the Commonwealth. PSP executed intergovernmental agreements for shared services with Mifflin, Columbia, Montour, and Warren counties, and the U.S. Department of Justice. This mutually benefits PSP in obtaining frequencies as well as potentially providing cost savings for government entities.²⁷

²⁷ <<https://www.psp.pa.gov/About%20Us/pages/pastarnet.aspx>> (accessed June 1, 2019).

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Pennsylvania's Troubled History with OpenSky®

The majority of information presented in this section was provided directly from the Pennsylvania State Police (PSP) as background information in connection with this audit of the Land Mobile Radio (LMR) upgrades to the Statewide Radio Network (PA-STARNet) contract awarded in October 2016. Additional information was obtained from not only PSP staff member testimonies before Pennsylvania Senate Committees, but also consultant reports and news articles. This information is presented here for background purposes only and was not audited by the Department of the Auditor General.²⁸

OpenSky®: PA's costly and unreliable land mobile radio system.

Prior to the implementation of the Project 25 (P25) system as PA-STARNet's LMR system, the Commonwealth operated the OpenSky® LMR system. PSP management described the Commonwealth's history with the OpenSky® system as nearly 20 years of unreliable functionality, software problems, and lackluster coverage requiring costly modifications that prevented it from becoming a "public safety grade" system. At times, it jeopardized the public's safety, as well as the safety of its troopers and other emergency responders.

The original cost to create PA-STARNet was estimated to be \$179 million. The OpenSky® system's history of software and coverage issues, however, ultimately cost taxpayers hundreds of millions of dollars more than the initial estimate. As discussed in the *Introduction and Background* section of this report, PA-STARNet is comprised of three components: LMR, a microwave system, and high-profile steel towers. In total, all of the components of PA-STARNet, including employee payroll and benefits, travel expenses, maintenance costs, utilities, leases, and radio equipment, have cost the Commonwealth more than \$850 million over 20 years.²⁹ The following chart shows a breakdown of PA-STARNet costs from its origin in 1995 to the early implementation stages of the P25 LMR system in May 2018.

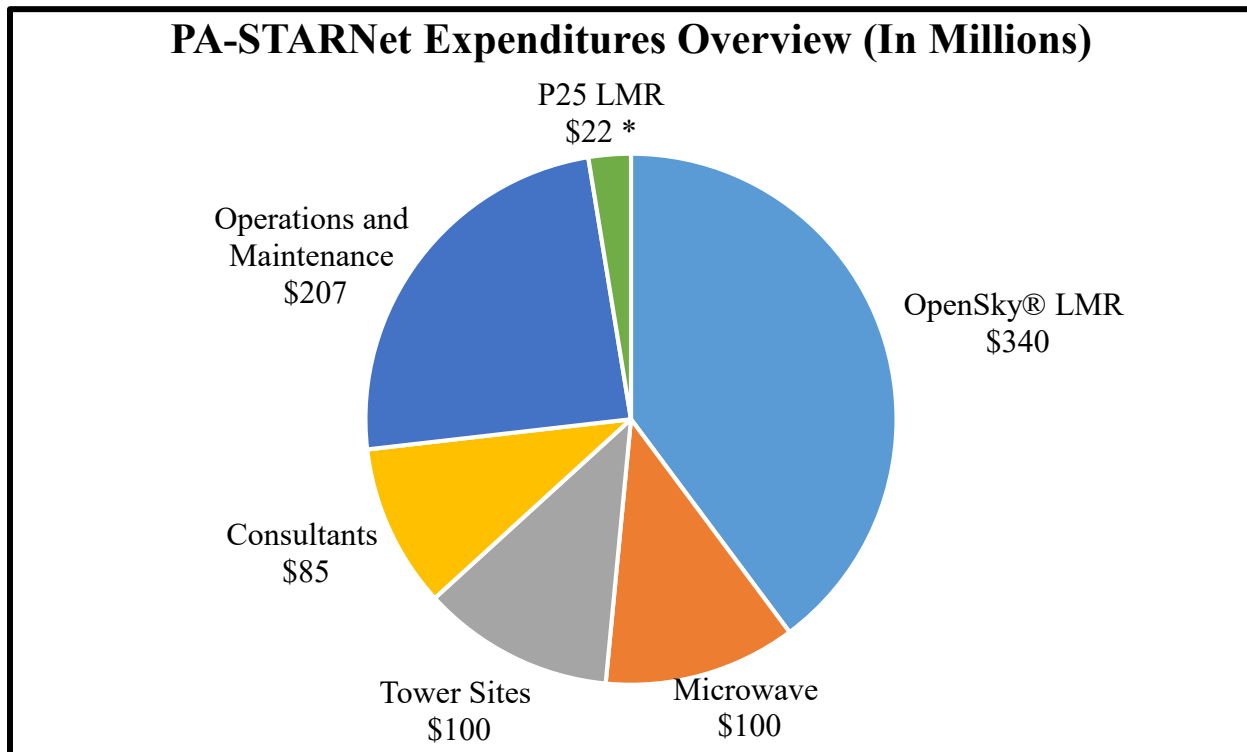
²⁸ On June 28, 2019, the Governor signed Act 15 of 2019 (Act 15) into law. Act 15, in part, amended the duties of the State Inspector General by requiring him to inspect, evaluate, investigate, and review all contracts entered into by the Pennsylvania Statewide Radio Network after June 30, 1996. Act 15 further stipulates that the State Inspector General shall submit a report no later than one year after the effective date of the section on the implementation of above provision, including any finding relating to PA-STARNet, to the General Assembly. *See* 71 P.S. § 213(c)(1) (Admin. Code § 503-A(c)(1)) and Section 10(1) of Act 15. The effective date of report requirement is **60 days** after the enactment date of August 27, 2019 (i.e., the report is due no later than August 27, 2020). <https://www.legis.state.pa.us/cfdocs/billInfo/billInfo.cfm?sYear=2019&sInd=0&body=H&type=B&bn=1461> (accessed July 24, 2019).

²⁹ This total includes costs associated with the implementation of the new P25 LMR system.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System



* Includes P25 LMR infrastructure and installation costs (Contract 4400016094), as well as PSP costs from other P25-related contracts for two-way radio equipment, maintenance and related services, etc.

Source: Produced by the Department of the Auditor General using information provided by the Pennsylvania State Police. These expenditures are presented for informational purposes only and were not audited.

The system was problematic and unreliable beginning with the failed attempt to launch OpenSky® in 2000 at Presque Isle Park in Erie County. The widely publicized 48-day Eric Frein manhunt in 2014 illustrated how extremely hazardous and alarming it was for emergency responders to conduct operations using an unreliable radio system. By way of background, Frein fled into the woods of the Pocono Mountains after ambushing two PSP troopers outside their barracks, killing one and critically injuring the other. Hundreds of troopers and other law enforcement officers from numerous federal, state, and local agencies coordinated efforts to locate the fugitive and bring him to justice.³⁰

*“OpenSky® was
worthless during the
Frein manhunt.”*

– PSP management

According to PSP management testimony before a joint Senate committee in March 2018, “OpenSky® was

³⁰ <https://www.pennlive.com/politics/2018/03/senators_call_for_investigatio.html> (accessed July 17, 2017).

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

worthless during the Frein manhunt.”³¹ PSP management stated that the system exhibited poor coverage and erratic performance. Issues such as inadequate battery life, excessive beeps and blinking lights on portable radios that could not be disabled, insufficient coverage from signal repeaters in vehicles, and the lack of interoperability hindered the operation and jeopardized the safety of the individuals involved. Consequently, PSP contacted Motorola which deployed two VHF simulcast sites to provide reliable coverage and interoperability between local, state, and federal law enforcement officers during the manhunt.

The Frein manhunt was not the only instance when law enforcement experienced problems related to the OpenSky® system. System outages and poor coverage occurred during other major events, such as the 2009 G20 Summit in Pittsburgh and the 2015 Papal visit in Philadelphia. For periods of time during both events, the OpenSky® system became overwhelmed and crashed, leaving officers without a statewide radio system for vital communications.

Today the proprietary OpenSky® system is a dying technology which is no longer marketed for public safety. In 2009, PSP's OpenSky® vehicle radios were discontinued with service and parts support ending in 2014. Likewise, its OpenSky® portable radios were discontinued in 2014 with parts and service support ending in 2018.

After years of poor performance and hundreds of millions of dollars expended, PSP decided in 2015 that upgrades to the land mobile radio system of PA-STARNet were necessary to provide proper levels of public safety. The following sections provide a detailed history of PA-STARNet leading up to the implementation of the current P25 system.

1995 to 2000: Pennsylvania invested less than half of the estimated cost determined by its consultant to fund OpenSky®.

In the mid-1990s, PSP was designated as the project manager for development of a new 800 MHz statewide radio network to replace multiple incompatible radio systems that prevented communications between different state agencies. PSP contracted with the consultant firm SE Technologies, Inc. to determine the estimated cost of a new radio system. The study estimated a total cost of nearly \$381 million.³²

³¹ PSP Director of the Bureau of Communications and Information Services' testimony before a Senate committee. See minute 31:13 in the following video: <<https://communications.pasenategop.com/032618/>> (accessed July 26, 2019).

³² SE Technologies, Inc. *Phase Two Report of Commonwealth of Pennsylvania System Design*, January 1995, page 46.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

In 1996, the newly established Radio Project Office (RPO) within the Office of Administration (OA) took over as the project manager for the new radio network.³³ Despite the SE Technologies, Inc. cost estimate of nearly \$381 million, the RPO submitted an initial funding request of only \$179 million. This amount was based on Michigan's statewide radio system installation that did not use the OpenSky® system, which cost approximately \$180 million. Governor Tom Ridge signed Act 148 of 1996, appropriating \$179 million for a new statewide radio system for use by multiple state agencies.³⁴

In 1999, the Commonwealth awarded four contracts totaling more than \$203 million to build a statewide radio network. AMP, Inc. received the largest contract (\$95 million) for construction of the land mobile radio system component, known as OpenSky®.³⁵ It was to be completed in 20 months. After a series of corporate acquisitions involving AMP, Inc., Harris Corporation became the prime contractor for PA-STARNet in 2009.³⁶ The amount of the contracts awarded to Harris Corporation and the three other contractors are shown in the following chart.

³³ The RPO was created within the OA oversee the implementation of the new system. iXP Corporation, *Commonwealth of Pennsylvania, Office of Information Technology Statewide Public Safety Radio System Project Review Consulting Services*, August 31, 2004, page 5.

³⁴ See the Capital Budget Project Itemization Act's supplement for 1996-1997 (P.L. 921, No. 148). In 1999, the legislature appropriated an additional \$43 million for the creation of PA-STARNet. (See the Capital Budget Project Itemization Act's supplement for 1999-2000 (P.L. 237, No. 35).

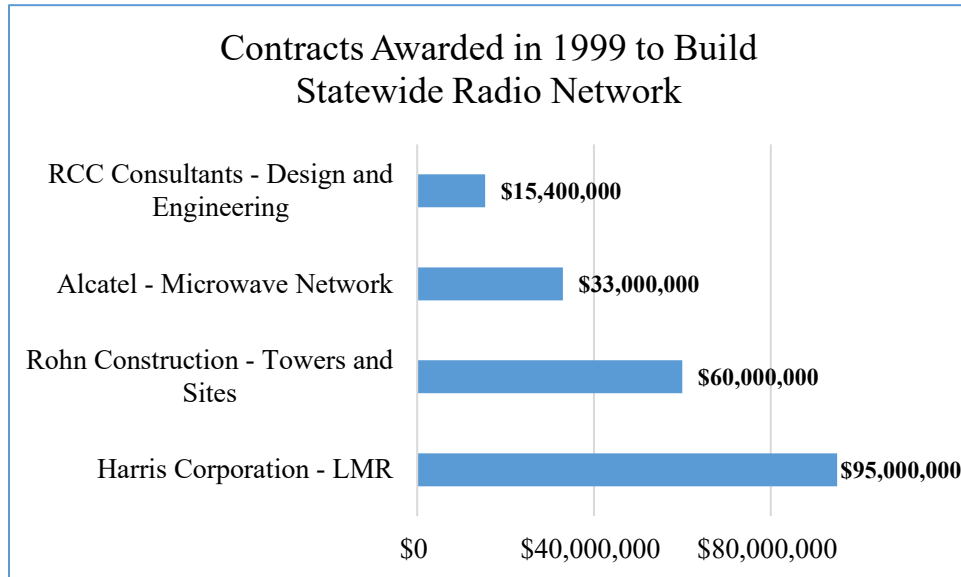
³⁵ OpenSky® was developed by M/A-COM, Inc., which AMP acquired in 1995.

³⁶ In April 1999, Tyco Electronics acquired AMP Inc. for \$12.22 billion. In 2009, Tyco sold its wireless systems business to Harris Corporation, which became the prime contractor for PA-STARNet. <<https://www.nytimes.com/1999/04/06/business/tyco-completes-acquisition-of-amp.html>> (accessed February 28, 2019).

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System



Source: Produced by the Department of the Auditor General staff from information provided by PSP management.

2000 to 2004: The initial rollout of the OpenSky® system failed and \$42 million was invested to erect additional sites to improve coverage, but was ultimately unsuccessful.

In 2000, the initial rollout of the OpenSky® system was attempted at Presque Isle State Park in Erie County. This pilot failed and was aborted due to significant OpenSky® system software issues and coverage problems. The following year, PSP was able to begin using OpenSky® for mobile data only, however, transitioning voice communications was delayed until 2006 because of difficulties experienced by other agencies as described below.

In 2002, the Pennsylvania Department of Transportation (PennDOT) attempted to transition to OpenSky® in Adams, Cumberland, Dauphin, and York counties, but experienced unsatisfactory results. PennDOT officials reported poor coverage, poor audio quality, dropped and missed calls, and poorly-installed radios. As a result, PennDOT decided to reinstall its old radios to ensure adequate communications necessary for effective operations.

In January 2003, the Capitol Police attempted to use OpenSky® for the first time during Governor Rendell's inauguration, but poor coverage and software issues yielded unsatisfactory results. The vendor resolved the issues three years later, finally allowing the Capitol Police to complete the transition to OpenSky® in 2006.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Amid rising concerns about the OpenSky® system's actual operability and rising costs for installation, the RPO deemed the OpenSky® system "public safety ready" based on the completion of factory acceptance testing conducted by the contractor.³⁷ During implementation, the contractor determined that microcell sites were necessary to improve coverage. Since 2003, 770 microcell sites were installed. Nearly 60 percent of them were wooden pole sites, which cost approximately \$42 million. It was later determined, however, that the wooden pole sites worsened the existing problem of dropped calls due to "hand-off" between sites. The more wooden pole sites there are, the more hand-off there is, increasing the opportunity for a dropped call. Additionally, these sites are not considered "public safety grade" because they fail during power or telephone outages.³⁸ The image to the right is an example of a microcell site used by the OpenSky® system.



Source: The Pennsylvania State Police

In 2003, Rohn Construction declared bankruptcy. According to PSP management, the tower contractor had been paid nearly \$70 million by that point, which was \$10 million more than its original contracted amount. This caused a nine-month cessation of work on additional towers.³⁹

2004 to 2006: Despite a declaration to the contrary by the Office of Administration Radio Project Office, a Commonwealth study found that the system was not public safety ready and the project office staff lacked an understanding of the project and its required technology.

Although the OpenSky® implementation was originally projected to be completed in 20 months, five years after the contract was signed, the system was far from being fully functional.⁴⁰ According to the Commonwealth's Chief Information Officer (CIO) during the implementation,

³⁷ iXP Corporation, *Commonwealth of Pennsylvania, Office of Information Technology Statewide Public Safety Radio System Project Review Consulting Services*, August 31, 2004, page 7.

³⁸ *Ibid.*, page 28.

³⁹ <<http://pasenategop.com/lawjustice/wp-content/uploads/sites/47/2014/03/white1.pdf>> (accessed July 17, 2019).

⁴⁰ The study did not address the project's cost or the Commonwealth's procurement process and rationale for the contract award. Source: iXP Corporation, *Commonwealth of Pennsylvania, Office of Information Technology Statewide Public Safety Radio System Project Review Consulting Services*, August 31, 2004, page 7.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

the delays were caused by a series of national and local events, including the September 11, 2001 terror attacks, Hurricane Katrina, and the Rohn Construction (tower contractor) bankruptcy.⁴¹

Because of the above delays, installation difficulties, and poor performance of the new system, Governor Rendell commissioned an independent study of the statewide radio system in 2004 to

“iXP has found the user agencies, specifically and most importantly PSP, do not have confidence that the current software release, accepted by the RPO, satisfies the requirements for a public safety system.” – iXP Corporation

determine whether the Commonwealth should continue with the project. The consulting firm, iXP Corporation, addressed the following areas in its report: the overall technical solution, including system coverage; the project's communications interoperability capability, based on the current regional interoperability plan and approach; the transition strategy and concerns associated with both state agency users and county users; and the overall project's program management capability moving forward.⁴²

The 2004 study found that the overriding issue hindering successful completion of the project was the structure of the RPO. One major issue noted in the report involved the RPO staffing. Specifically, the report stated “[m]any agencies believe[d] the RPO [was] not staffed to adequately address their concerns.”⁴³ For example, the agencies cited concerns with the RPO's ability in areas such as training, flow of information, and an understanding of the product and technology. Another major issue identified in the report was the lack of adequate transition plans and support for users of the system.⁴⁴ The report noted that the RPO did not have the primary responsibility for the transition activities of state agencies. This responsibility fell on the users of the system. It stated, “The Commonwealth should have ensured that the user agencies were partnered with the RPO, with shared responsibility for the successful rollout of the system, from the initial phases of the project through final transition of the system to the users.”⁴⁵

In addition, contrary to the RPO's declaration in 2003, the report stated that the system was not “public safety ready.”⁴⁶ This was based on coverage testing on August 11, 2004, which revealed a statewide total of only 77.5 percent coverage. While eight counties achieved 95 percent

⁴¹ <<http://pasenategop.com/lawjustice/wp-content/uploads/sites/47/2014/03/white1.pdf>> (accessed July 23, 2019).

⁴² iXP Corporation, Commonwealth of Pennsylvania, Office of Information Technology Statewide Public Safety Radio System Project Review Consulting Services, August 31, 2004, page 4.

⁴³ Ibid., page 8.

⁴⁴ Ibid., pages 6-7.

⁴⁵ Ibid., page 9.

⁴⁶ Ibid., page 6.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

coverage, 24 counties fell below 77.5 percent.⁴⁷ The report also stated that PSP lacked confidence in the system and thus, it should not have been deemed “public safety ready.”⁴⁸ Specifically, the report stated “iXP has found the user agencies, specifically and most importantly PSP, do not have confidence that the current software release, accepted by the RPO, satisfies the requirements for a public safety system.”⁴⁹

The report concluded that implementation of the project should continue with the following changes:

- (1) Restructure the RPO to include the responsibility for overall development and implementation including transition plans and support for users of the system.
- (2) Construct high profile towers rather than microcells (wooden pole sites).
- (3) Reevaluate operational needs and rewrite software to address user-agency needs.
- (4) Review current system coverage testing procedures and consider the use of automated testing tools.
- (5) Allocate resources to lead interoperability and transition plans.⁵⁰

The Commonwealth reportedly restructured the RPO, improved the training system, and established a centralized help desk to assist agencies as they joined the system.⁵¹ Contrary to the report's recommendations, however, the contractor continued to build microcell sites in the years to come in an attempt to improve system performance. An additional 482 sites were installed after the report was issued.⁵²

2006 to 2012: Due to the continuous coverage problems with the OpenSky® system, PSP troopers were required to maintain their old VHF radios as backup communications until the new P25 system was operational.

In 2006, PSP began transitioning to the OpenSky® system for voice communications in Lancaster. Troopers experienced many problems such as missed calls, dead zones, unreliable emergency button functionality, and poor audio quality. PSP did not complete the migration to OpenSky® for voice communications statewide until 2010. However, due to continued performance problems with OpenSky®, PSP decided it was necessary to maintain a second VHF

⁴⁷ Ibid., pages 68-70.

⁴⁸ Ibid., page 10.

⁴⁹ Ibid., page 7.

⁵⁰ Ibid., page 10.

⁵¹ <<https://www.poconorecord.com/article/20040909/features/309099975>> (accessed August 13, 2019).

⁵² According to PSP management, the OpenSky® system relied on 770 microcells. The iXP report identifies 288 cell sites used by PA-STARNet as of May 31, 2004. Ibid., at page 28.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

radio in its patrol cars for backup communications using the old system. These backup radios required an additional annual cost of approximately \$2 million to operate and maintain.

On November 17, 2010, the Commonwealth made the final contractual payment to Harris Corporation in the amount of approximately \$5.6 million as a final acceptance of the OpenSky® radio system, even though it was not a “public safety grade” system. As noted above, it continued to be unreliable. Before a Senate panel in 2011, PSP management reported that its troopers were experiencing 161 service outages on average each month.⁵³

In 2012, the Commonwealth's CIO commissioned a consultant to conduct a study on PA-STARNet that compared it to other states' systems and public safety market trends. The consultant and the Commonwealth identified four key characteristics to examine: interoperability, core system, coverage, and data. The consultant reported that Pennsylvania's heavy use of wooden pole microcell sites does not align with public safety practices.⁵⁴ As mentioned above, this same finding appeared in the 2004 consultant report.

In addition, the report noted that OpenSky® is not interoperable with P25 technology.⁵⁵ It predicted that P25 will continue to be the primary radio interoperability standard; therefore, the report recommended the future investment in P25 technology.⁵⁶

In July 2012, PSP took over all responsibilities for PA-STARNet. PSP adopted the recommendations from the most recent consultant report and began the process to procure a P25 system as explained in the *Introduction and Background* section of this report.

⁵³ <https://www.pennlive.com/midstate/2011/04/pa_radio_system_is_full_of_dea.html> (accessed July 30, 2019).

⁵⁴ Gartner Consulting, *Public Safety Radio Market Assessment: A comparison of PA-STARNet to the public safety radio market*, page 8.

⁵⁵ *Ibid.*, page 6.

⁵⁶ *Ibid.*

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Finding 1 – The Statewide Radio Request For Proposals was developed in accordance with the *Pennsylvania Procurement Handbook*, but we identified needed areas of improvement.

As mentioned in the *Pennsylvania's Troubled History with OpenSky®* section of this report, the Commonwealth's Chief Information Officer commissioned a consultant in 2012 to conduct a study on Pennsylvania's Statewide Radio Network (PA-STARNet) that compared it to other states' systems and public safety communications market trends. The consultant's report noted that PA-STARNet did not conform to public safety practices and recommended the future investment in a P25-compliant Land Mobile Radio (LMR) system. This recommendation, combined with the continued unreliability of the OpenSky® system and its aging technology, guided the Pennsylvania State Police's (PSP) decision to secure a contract for the installation of a P25 LMR system.

On May 5, 2015, the Commonwealth issued Request For Proposals 6100033543 (P25 RFP) to seek vendor proposals for P25-compliant Land Mobile Radio (LMR) upgrades to the PA-STARNet.⁵⁷ At that time, the Office of Administration (OA) was responsible for all Information Technology (IT) procurement activity for the Commonwealth and was the issuing office.⁵⁸ Because PSP managed PA-STARNet, it worked with OA to develop the P25 RFP. Additionally, PSP hired an IT consulting firm, Mission Critical Partners, Inc. (MCP), to develop the Statement of Work (SOW) that is included in the P25 RFP.⁵⁹ The SOW provides prospective vendors with a detailed description of the work needed, so the prospective vendors can prepare a responsive proposal.

The Commonwealth Procurement Code (Code) provides the authority for Commonwealth agencies to purchase goods and services needed to carry out their mission. The Code "applies to every expenditure of funds, other than the investment of funds, by Commonwealth agencies under any contract, irrespective of their source . . ."⁶⁰ DGS subsequently published the revamped

⁵⁷ See the sections titled *Introduction and Background* and *Pennsylvania's Troubled History with OpenSky®* for details on the prior LMR system, the new P25 Standard, and why the P25 RFP was necessary.

⁵⁸ The issuing office is the sole point of contact for the vendors to contact the purchasing agency with any questions in regard to an RFP. The Department of General Services (DGS) is responsible to establish procurement policies and procure supplies, services, and construction for all Commonwealth agencies, with exceptions delegated by DGS. Previously, DGS had delegated the procurement of IT services to OA; however, it rescinded the delegation and resumed responsibility as of July 1, 2017, per the Commonwealth of Pennsylvania Governor's Office Manual, Procurement Handbook, M215.3 Amended, dated June 30, 2017.

<https://www.oa.pa.gov/Policies/Documents/m215_3.pdf> (accessed September 6, 2019).

⁵⁹ MCP is a public safety consulting and support company that offers a variety of public safety solutions and services to its clients <<https://www.missioncriticalpartners.com/>> (accessed June 24, 2019).

⁶⁰ 62 Pa.C.S. § 102(a).

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Pennsylvania Procurement Handbook (Handbook) (previously the Department of General Services' *Procurement Handbook*) to provide the policies, procedures, and guidelines for agencies to follow when procuring materials and services.⁶¹

To determine if the P25 RFP was developed in accordance with the Handbook, we performed a detailed review of the P25 RFP and associated documentation. Specifically, we tested the P25 RFP for compliance with the following Handbook chapters.

- Part I, Chapter 6 – Methods of Awarding Contracts (see below)
- Part I Chapter 37 – Contract Performance Security (see *Finding 2*)
- Part I, Chapter 38 – Payment Bonds (see *Finding 2*)
- Part I, Chapter 58 – Bid Protests (see *Finding 2*)
- Part II, Chapter 7 – Competitive Sealed Proposals (see below)

In addition, we performed tests to ensure the P25 RFP was objective and contained a precise and complete SOW designed to meet the needs of the PA-STARNet. Based on the results of our audit procedures, we found that:

- The decision made by OA and PSP to utilize the Competitive Sealed Proposals procurement method was appropriate.
- The P25 RFP's content complied with the Handbook and it was properly approved and posted on DGS' website.
- The consultant hired to develop the P25 RFP's SOW appears to have possessed sufficient technical expertise and the SOW appears to be written in an objective manner.
- PSP and OA lacked documentation regarding the evaluation committee members' selection and qualifications and OA failed to adequately review the *Certification of Confidentiality and No Conflict of Interest* forms completed by the P25 RFP evaluation committee members.

The following sections describe our procedures and results related to the selection of the Competitive Sealed Proposals procurement method and subsequent development of the P25 RFP.

⁶¹ <<https://www.dgs.pa.gov/Materials-Services-Procurement/Procurement-Handbook/Pages/default.aspx>> (accessed June 12, 2019).

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

The decision made by OA and PSP to utilize the Competitive Sealed Proposals procurement method was appropriate.

According to the Handbook, the Competitive Sealed Proposals method of procurement should be used when it is not practical or advantageous to use the typical Competitive Sealed Bidding procurement method. Competitive sealed bidding is the traditional and usual method of contractor selection when the supply, service, or construction can be satisfactorily described and price is the only factor to be considered in the award (after bidder responsibility is determined).⁶²

Given the magnitude and complexity involved in the design and construction of a new statewide LMR system, the project required a vendor-developed solution. The contract award could not be based solely on price, but also needed to consider a contractor's qualifications, experience, financial capability, as well as service and delivery capability. As a result, OA and PSP agreed that the Competitive Sealed Proposals procurement method was most appropriate to procure the new LMR system. Agencies that opt to use the Competitive Sealed Proposals procurement method are required to complete the *Determination to Use Competitive Sealed Proposals Method of Procurement Form* (Form BOP-124) to document the justification for use of this procurement method. This form, along with a *Notice of Forthcoming Procurements* document, is to be submitted to DGS.⁶³ We reviewed Form BOP-124 and the *Notice of Forthcoming Procurements* document and determined the forms were completed and properly approved in accordance with the Handbook. We conclude that the use of the Competitive Sealed Proposals procurement method was reasonable, properly justified in writing, and in accordance with the Handbook.

⁶² Handbook, Part I, Chapter 6, "Methods of Awarding Contracts," Section A, Subsection 1.

⁶³ Handbook, Part I, Chapter 6, "Methods of Awarding Contracts," Section B, Subsection 1.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

The P25 RFP's content complied with the Handbook and it was properly approved and posted on DGS' website.

The Handbook provides specific requirements for the content and structure of an RFP. It defines an RFP as “all documents, including those either attached or incorporated by reference, used to solicit proposals.”⁶⁴ The Handbook identifies five specific parts an RFP must include as shown in the following table.

RFP Section	Contents
General Information	Provides the general conditions of the RFP issuance, including a general description of the needed service, date of any preproposal conferences, and proposal response deadline.
Information Required	Contains instructions on the format and nature of the information to be included in the proposals.
Criteria for Selection	Identifies the factors that will be used to evaluate the proposals, including the relative importance (weight) of the selection criteria.
Statement of Work	Includes a detailed description of the needed services, objectives to be achieved, parameters of measuring contractor performance, reporting requirements, and specific tasks to be completed.
Contract Terms and Conditions	Describes the standard contract terms and conditions, such as the contract term and scope, payment terms, confidentiality clause, and contractor integrity provisions.

Source: Produced by the Department of the Auditor General staff based on information from the Handbook Part I, Chapter 6, “Methods of Awarding Contracts,” Section B, Subsection 4. The content information included in the table is related to more significant areas and does not represent all requirements within these parts.

We reviewed the P25 RFP and found that it contained the proper sections, content, and requirements as specified in detail within the Handbook.

In addition to the above content, the Handbook also requires that the RFP must be reviewed and approved by the appropriate officials prior to being posted on the DGS website (eMarketplace), be properly advertised, and provide the opportunity for vendors to submit questions and receive answers no later than five days prior to the proposal submission deadline.⁶⁵

We requested evidence of the Commonwealth's approval of the P25 RFP from OA management to ensure it was properly reviewed and approved before being publically issued. In accordance

⁶⁴ Ibid., Subsection 4.

⁶⁵ Handbook, Part I, Chapter 6, “Methods of Awarding Contracts,” Section B, Subsections 5 and 7 and Part II, Chapter 7, “Competitive Sealed Proposals,” Section C, Subsection 7.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

with OA's IT Investment Review Process, the P25 RFP was reviewed and approved using the Commonwealth of Pennsylvania Procurement and Architectural Review (COPPAR) system.⁶⁶ OA management explained that the P25 RFP and all attachments were submitted electronically for the COPPAR review, which required a review and electronic approval by staff from the following four groups: Legal; IT Procurement; Technical Subject Matter Experts; and Comptroller. We reviewed the system screenshots for the P25 RFP COPPAR review and approval. They included the P25 RFP general information and list of attached appendices, detailed questions submitted by technical subject matter expert reviewers with OA's responses, and 19 electronic approvals from reviewers within the four groups noted above. We determined that the P25 RFP was properly approved using the COPPAR system prior to issuance and posting to eMarketplace.⁶⁷

The Handbook also requires that the purchasing agency complete an online *Request for Advertisement* form to advertise the RFP on eMarketplace, the Commonwealth's website for viewing current state contracts and bidding on upcoming contract awards. We reviewed this form for the P25 RFP and found it was properly completed. Based on the date/time stamps from the COPPAR and eMarketplace systems, within two hours after it received approval in the COPPAR system on May 5, 2015, the P25 RFP was posted to eMarketplace.

Finally, the Handbook requires that vendors are provided the opportunity to submit questions about the RFP and receive responses no later than five days prior to the proposal due date. The due date for submitting questions as noted in the P25 RFP was May 15, 2015, and the Commonwealth's responses were to be posted to eMarketplace by May 20, 2015. We obtained the Questions and Answers document from the eMarketplace and confirmed it was posted by May 20, 2015, in accordance with the P25 RFP.

Overall, we found that the P25 RFP was developed in compliance with the Handbook.

The consultant hired to develop the P25 RFP's SOW appears to have possessed sufficient technical expertise and the SOW appears to be written in an objective manner.

Staff from OA, PSP, and MCP formed the P25 RFP development team. OA staff provided guidance related to the Commonwealth's procurement process and IT strategy, while PSP staff provided guidance on its operations and needs. To determine if MCP was qualified to assist in

⁶⁶ OA Information Technology Policy, ITP-BUS002 (Eff. May 13, 2005), formerly ITP-PRO001.

⁶⁷ We conducted corroborative audit procedures to validate the electronic approvals for five reviewers. See *Appendix A* for additional information regarding data reliability.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

the development of the SOW, we interviewed OA and PSP personnel, reviewed the MCP contract, and researched the MCP firm. MCP was pre-qualified by the Commonwealth to provide IT services through the Master Information Technology Services Invitation to Qualify (ITQ) contract. The ITQ process enables the Commonwealth to establish multiple-award contracts for a myriad of related supplies or services and was established to address IT service requirements of the Commonwealth's agencies. According to the ITQ policies and procedures, PSP management could select any vendor pre-qualified to provide the services needed without obtaining multiple quotes because the estimated cost of the project was less than \$50,000.⁶⁸ On March 13, 2015, PSP issued a PO for MCP to develop the P25 RFP SOW for approximately \$49,500.

We attempted to evaluate PSP's decision to select MCP as the consultant to develop the SOW from the ITQ listing; however, PSP management stated that the MCP contract was already in place when current management took over responsibility for the PA-STARNet on March 16, 2015, and no documentation could be located regarding MCP's selection. PSP and OA management were not aware if the previous PSP management considered any other vendors for this contract. Through our research, however, we found that MCP is a recognized entity within the public safety communications industry. Since 2009, MCP has completed more than 700 public safety consultant projects and has expertise with P25 LMR technology.⁶⁹ Based on the company's history in public safety communications consulting, we believe that MCP was qualified to assist with the development of the SOW.

We reviewed MCP's proposal dated February 26, 2015, and the contract PO. The proposal included MCP's plan to develop the SOW and listed its project team members and their positions. We also compared the SOW to a template created by the United States General Services Administration (GSA) to be used as a guide for developing an LMR project SOW.⁷⁰ Our comparison identified similar work statement criteria, and it appears the SOW for the P25 RFP was precise, complete, and adequately designed to meet the needs of the PA-STARNet.

In addition, while reviewing the P25 RFP, we did not identify any references to the use of a specific vendor's equipment for the new P25 LMR system, nor any other biased wording towards or against vendors or products. The P25 RFP, therefore, appears to have been written objectively.

⁶⁸ <<https://www.dgs.pa.gov/Documents/ITQ%20Documents/Helpful%20Information/INSTRUCTION%20ITQ%20PROCESS%20IN%20JAGGAER.pdf>> (accessed September 17, 2019).

⁶⁹ <<https://www.missioncriticalpartners.com/about-us/our-philosophy-mission/>> (accessed June 13, 2019) and <<https://www.missioncriticalpartners.com/solutions-services/land-mobile-radio/>> (accessed July 25, 2019).

⁷⁰ <<https://www.gsa.gov/cdnstatic/connectionsII-land-mobile-radio-sow-template.docx>> (accessed February 8, 2019).

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

PSP and OA lacked documentation regarding the evaluation committee members' selection and qualifications and OA failed to adequately review the *Certification of Confidentiality and No Conflict of Interest* forms completed by the P25 RFP evaluation committee members.

Prior to issuing an RFP, the Handbook requires that the agency requesting the procurement appoint an evaluation committee to evaluate the technical merit of the vendors' proposals submitted in response to an RFP.⁷¹ The evaluation committee consists of voting and non-voting members. The voting members are responsible for scoring the technical proposals submitted by vendors, while non-voting members solely participate in meetings and discussions regarding the vendor proposals. The committee should be comprised of a minimum of three Commonwealth employees "who possess technical and managerial expertise in the appropriate field" and possibly individuals from other agencies "who possess expertise in a product or service being procured."⁷² Our review found that the number of evaluation committee members exceeded the minimum required by the Handbook.⁷³

According to PSP and OA management, however, neither agency documented the areas of expertise for each evaluation committee member or its reasoning as to why these individuals were selected to serve on the evaluation committee. Because DGS assumed responsibility for all Commonwealth IT procurement activities in 2017, we questioned DGS management about the selection of evaluation committee members. According to DGS management, the agency requesting the procurement selects the committee members, however, it is not a formal process and documentation of the committee members' qualifications is not required by policy within the Handbook.

We agree that although the Handbook addresses the importance of having qualified individuals on the committee, it does not specifically require the agency's selection methodology and that the committee members' qualifications be documented in order to justify their selection. This lack of documentation, however, prevents external parties, such as auditors, from verifying that each evaluation committee member was qualified to participate on the committee or validating the agency's methodology used to select each member. Not having qualified evaluation committee members, especially scoring members, significantly hinders the agency's ability to properly evaluate vendor proposals and select the most advantageous vendor for the

⁷¹ Handbook, Part II, Chapter 7, "Competitive Sealed Proposals," Section C, Subsection 7.

⁷² Handbook, Part I, Chapter 6, "Methods of Awarding Contracts," Section B, Subsection 3.

⁷³ Ibid. At the request of OA and DGS, the actual number of members is not reported. DGS protects the identity of evaluation committee members and other related information to ensure the integrity of the procurement process. Omitting this information does not significantly impact this finding.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Commonwealth as required. It could also potentially increase the risk of manipulation of the procurement process.

In addition to the evaluation committee members needing sufficient expertise in the subject matter, the Handbook requires that each member evaluate the proposals in an unbiased manner and without conflicts of interest, and that the contents of the proposals remain confidential throughout the evaluation process. Each evaluation committee member must complete and sign a *Certification of Confidentiality and No Conflict of Interest* form (COI form) in which the member certifies confidentiality and that no conflicts of interest exist.⁷⁴

We reviewed the COI forms for the Commonwealth employees serving on the P25 RFP evaluation committee.⁷⁵ Additionally, we reviewed *Consultant Certification of Confidentiality* forms for MCP employees who were not part of the evaluation committee, but were directly involved with the SOW development. We found most of the COI forms and each of the *Consultant Certification of Confidentiality* forms were properly completed and signed, however, 17 percent of the COI forms had an unchecked box indicating that the signor had an exception to report that could impact their certification.⁷⁶ Former OA management, now at DGS, should have reviewed the signed COI forms to identify any exceptions, disclosures, and unchecked boxes. If found, the Handbook requires these items to be resolved through consultation with DGS' Office of Chief Counsel Legal Purchasing Unit to ensure signors are independent and have no conflicts of interest that may impair their judgment and ability to fairly evaluate vendor proposals or allow them to influence other committee members.⁷⁷

DGS management stated that the failure to refer the COI forms with unchecked boxes to its legal office was an oversight. As a result of our inquiry, DGS management stated that it contacted all but one of the signors and confirmed that the boxes should have been checked when the form was originally signed. The individual who was not contacted is no longer a Commonwealth employee and therefore could not be contacted for confirmation.

Although we found no evidence indicating these oversights had any impact on the P25 LMR procurement process, it is important that the confidentiality forms are completed and properly reviewed prior to the individual's involvement with the procurement process.

⁷⁴ Handbook, Part II, Chapter 7, "Competitive Sealed Proposals," Section C, Subsection 7.

⁷⁵ At the request of OA and DGS, the actual number of COI forms reviewed is not reported. DGS protects the identity of evaluation committee members and other related information to ensure the integrity of the procurement process. Omitting this information does not significantly impact this finding.

⁷⁶ OA/DGS management provided these forms, and although we were unable to determine the completeness of the number of forms, which may affect the precision of the numbers we present, there is sufficient evidence in total to support our findings and conclusions.

⁷⁷ Handbook, Part II, Chapter 7, "Competitive Sealed Proposals," Section C, Subsection 7.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Recommendations for Finding 1

We recommend that DGS:

1. Consider revising the Commonwealth procurement policies by issuing a Policy Directive that would amend the *Pennsylvania Procurement Handbook* to include a requirement that agencies must document and maintain the justification for selecting RFP evaluation committee members and vendors serving as consultants in the procurement process (if applicable), to include how each member and/or vendor satisfies the requirement of technical and managerial expertise in the subject matter.

When acting as the issuing office for an RFP, we recommend that OA and/or PSP:

2. Comply with any DGS procurement policy changes made in Recommendation 1 above in regard to documenting and maintaining justification for selecting a specific vendor from the ITQ list of vendors when utilizing a vendor in the development of a Statement of Work for purposes of a procurement.
3. Comply with any DGS procurement policy changes made in response to Recommendation 1 above in regard to documenting and maintaining justification for selecting RFP evaluation committee members, including how each member satisfies the requirement of technical and managerial expertise in the subject matter.
4. Evaluate its procedures to ensure the *Certification of Confidentiality and No Conflict of Interest* forms are carefully reviewed and any identified concerns are appropriately and timely resolved.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Finding 2 – Although the “20-Land Mobile Radio Upgrade” contract related to the Statewide Radio Network System was procured in accordance with the *Pennsylvania Procurement Handbook*, scoring errors were identified.

Motorola Solutions, Inc. (Motorola) was awarded the “20-Land Mobile Radio Upgrade” contract on October 3, 2016, for \$44.5 million to construct a new P25-compliant Land Mobile Radio (LMR) system.⁷⁸ Approximately ten months earlier, the P25 Request For Proposal (P25 RFP) evaluation committee reviewed the technical submissions of three proposals received in response to the P25 RFP. The voting members of the committee scored Motorola’s single proposal and two proposals submitted by the Harris Corporation (Harris), which were called the Harris-Base proposal and the Harris-Alternate proposal.⁷⁹

To determine if the Commonwealth, through the Governor’s Office of Administration (OA), properly awarded the Motorola contract in accordance with the Department of General Services’ (DGS) *Pennsylvania Procurement Handbook* (Handbook), we conducted interviews with OA and DGS management. We also closely reviewed documentation related to the evaluation process for the Harris and Motorola proposals. Based on our audit procedures, we found that:

- Each proposal was properly evaluated and the contract was awarded to Motorola in accordance with the Handbook.
- Although we identified two errors on the final evaluation score sheet, these had no impact on the outcome of the contract award.
- OA and Pennsylvania State Police (PSP) properly and timely responded to the two bid protests received regarding the procurement.

The following sections describe our procedures and results related to the procurement of the contract.

⁷⁸ See RFP number 6100033543 and contract number 4400016094.

⁷⁹ The P25 RFP provided vendors the opportunity to submit up to two proposals; however, these proposals were required to be complete, separate proposals that would be evaluated independently from one another. Therefore, Harris submitted two proposals, the Harris-Base proposal and Harris-Alternate proposal in response to the P25 RFP. Motorola submitted a single proposal in response to the P25 RFP.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Each proposal was properly evaluated and the contract was awarded to Motorola in accordance with the Handbook.

According to the P25 RFP, each submitted vendor proposal had to include three separately-sealed submittals: Technical Submittal, Cost Submittal, and Small Diverse Business (SDB) Participation Submittal.⁸⁰ Because cost is a secondary factor when awarding a contract using the RFP procurement process, the issuing office reviews the cost submittals separately after the evaluation committee scores the technical submittals. If a technical submittal does not meet the minimum technical threshold, the proposal is eliminated from any further consideration and the associated cost submittal is not evaluated. DGS' Bureau of Small Business Opportunities reviews the SDB participation submittal. The scores from the three separate reviews are accumulated to determine the winning proposal.⁸¹

Our conclusions regarding the evaluation of proposals and awarding process for the contract are based on the following audit procedures and results:

- Prior to evaluating the proposals received, the Handbook required OA's legal counsel, as well as one other non-voting member of the evaluation committee, to review the proposals for responsiveness to the RFP. If a proposal did not meet one or more of the mandatory requirements in the RFP, then the proposal was required to be rejected.⁸² For the P25 RFP, the proposals were required to be received timely and properly signed by the vendor. We reviewed each of the three proposals and OA's completed checklist for each proposal as evidence of its review and determination of initial proposal responsiveness. We found that all three proposals were received by the date and time stipulated in the P25 RFP and contained a proper signature. We were unable to verify the signatures on the two Harris proposals because they were redacted, but we reviewed the printed names. We also verified that these checklists were signed by an attorney within OA's Legal Office and a non-voting member of the committee, which complies with the Handbook.
- The Handbook specifies minimum weighting for the scoring categories used to evaluate the proposals during the competitive sealed proposal award process. It also requires that the weights be established before the opening of the RFP proposals.⁸³ We found that the

⁸⁰ RFP 6100033543, Part II Proposal Requirements.

⁸¹ Handbook, Part I, Chapter 6, "Methods of Awarding Contracts", Section B, Subsection 10.

⁸² Ibid.

⁸³ Technical Criterion – 50% of the total points; Cost Criterion – 30% of the total points; Small Diverse Business (SDB) Participation – 20% of the total points; and Domestic Workforce – 3% bonus points. Handbook, Part I, Chapter 14, "Contractor Responsibility", Section Q, Subsection 1.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

minimum weights were assigned to each of the categories in accordance with the Handbook. Additionally, the scoring categories and weighting were included in the P25 RFP and therefore, the weights were established prior to the opening of proposals. Finally, we reviewed the final score sheet and confirmed that the weighting used to score the proposals agreed with the weighting presented in the P25 RFP.

- The Handbook states that an agency only scores “cost submittals for those proposals meeting the minimum technical threshold (70% of the available technical points).”⁸⁴ The technical submittals from both of the Harris proposals failed to receive the minimum technical score, and therefore, were eliminated from further consideration for the contract award. Cost submittals are ranked and awarded points using the DGS RFP Scoring Formula.⁸⁵ The submittal with the lowest cost receives the maximum number of cost points available, then all other cost submittals receive points based on the formula. Because Motorola had the only qualifying technical submittal, its cost submittal received the maximum amount of points available according to the P25 RFP.
- Management Directive 215.9 (Amended) established the Contractor Responsibility Program (CRP), which requires that “a determination of contractor responsibility must be made prior to any contract award, renewal, extension, or assignment.”⁸⁶ We reviewed four CRP Check Certification Forms for Motorola that were conducted prior to the contract award and found that Motorola was determined to be a responsible contractor all four times.⁸⁷ Therefore, we found that the OA complied with the CRP requirement.
- Because the Commonwealth encourages a significant commitment by prime contractors to use SDBs as subcontractors, vendors may submit SDB participation information with their proposals to be evaluated for additional points.⁸⁸ Based on our review of Motorola’s SDB documentation included with its proposal, we found that Motorola committed nearly

⁸⁴ Handbook, Part II, Chapter 7, “Competitive Sealed Proposals”, Section C, Subsection 9.

⁸⁵ Handbook, Part I, Chapter 6, “Methods of Awarding Contracts”, Section B, Subsection 10. The RFP Scoring Formula is available at the following webpage: <https://www.dgs.pa.gov/Materials-Services-Procurement/Procurement-Resources/Pages/RFP_SCORING_FORMULA.aspx> (accessed June 19, 2019).

⁸⁶ Management Directive 215.9 Amended, Section 5, Subsection b and Handbook, Part I, Chapter 14, “Contractor Responsibility”, Section E, Subsection 3.

⁸⁷ The Handbook requires the issuing office to perform a CRP check after the receipt of proposals and prior to the award of a contract if three months has passed from the initial CRP check. See Handbook, Part I, Chapter 06, “Methods of Awarding Contracts”, Section B, Subsection 9.

⁸⁸ Handbook, Part I, Chapter 21, “Small and Diverse Businesses”, Section C.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

ten percent of the contract total to two SDB subcontractors and was properly awarded additional bonus points in accordance with the Handbook.⁸⁹

- We reviewed the contract to ensure it incorporated the standard contract terms and conditions, contained the negotiated proposal and the P25 RFP with all attachments, and was authorized by the appropriate officials as required by the Handbook. We determined that it contained these items and that it was properly authorized.⁹⁰
- We reviewed the contract terms to evaluate the Commonwealth's exposure to unsatisfactory contractor performance. In accordance with the Handbook, Part I, Chapters 37 and 38, the P25 RFP only required a performance bond if the contractor was unable to prove sufficient financial capability.⁹¹ According to its summary report, the Commonwealth's financial analysis of Motorola did not identify any concerns related to the company's financial condition or its ability to fulfill its contractual obligations. According to PSP management, the determination of financial stability coupled with the PSP's knowledge of the PA-STARNet, which would be utilized to monitor the implementation of the new LMR system, minimized the risk of unsatisfactory performance, and therefore, the Commonwealth did not require a performance bond. Although the absence of a performance bond increases the Commonwealth's exposure, the contract was structured to ensure no payments were dispersed until Motorola satisfied specific contract deliverables and milestones (See *Finding 3* for more information).

Although we identified two errors on the final evaluation score sheet, these had no impact on the outcome of the contract award.

As explained in *Finding 1*, PSP appointed an evaluation committee to review the technical submittal portion of the proposals, but only scoring members scored the technical submittals.⁹² We met with DGS management to discuss the proposal evaluation and scoring process because the responsibility for Information Technology procurement activities moved from OA to DGS in 2017. The OA management involved with the P25 procurement also moved to DGS at that time.

⁸⁹ Given that neither of the Harris proposals received the minimum number of technical points, its SDB submittals were not scored. As of March 31, 2019, Motorola reported SDB participation at 7.8 percent with approximately 50 percent of the contract completed.

⁹⁰ Handbook, Part I, Chapter 31, "Contract Signatures".

⁹¹ Handbook, Part I, Chapter 37, "Contract Performance Security," Section A, and Chapter 38, "Payment Bonds," Section B.

⁹² At the request of OA and DGS, the actual number of evaluation committee scoring members is not reported. DGS protects the identity of evaluation committee members and other related information to ensure the integrity of the procurement process. Omitting this information does not significantly impact this finding.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

According to DGS management, the scoring evaluation committee members meet to receive the technical submittals and scoring instructions. Initially, scorers individually review each technical submittal and complete the individual technical submittal scoring sheets without discussing them with any of the other scorers. After the individual scoring is completed, the evaluation committee, including any non-scoring member, meets to discuss the scores. The scorers have the opportunity to reconsider and change their initial scores based on the committee's discussions. Once everyone is satisfied with their scoring and all questions are answered, the issuing officer collects the individual scoring sheets. Using a computer at the meeting, the issuing officer enters the scores onto the summary score sheet.

We recalculated the scores recorded on the individual scoring sheets to ensure accuracy. Then we traced the individual score sheets to the final summary score sheet and noted two exceptions. One score from two different scorers was incorrectly entered on the summary score sheet. Both errors involved scores for the Harris-Base proposal in which one score was overstated and the other was understated, with the overall total score being overstated. DGS management agreed that the scores were incorrectly transferred to the final summary score sheet after we informed them of the errors. DGS management stated that the scorers should have reviewed the final summary score sheet to ensure their scores were correctly transferred. DGS management, however, could not provide documentation showing that the review procedure was performed and attributed it to being an oversight.

As noted above, the scoring compilation errors had no impact on the contract award because the Harris-Base proposal, even with an overstated score, did not receive the minimum technical score required to warrant further consideration in the award process. However, the failure to ensure that the individual scores are correctly transferred to the final summary score sheet could result in the wrong contractor being awarded a contract in the future.

OA and PSP properly and timely responded to the two bid protests received regarding the procurement.

According to the Handbook, Part I, Chapter 58, "Bid Protests," Section A, any vendor or prospective vendor "*...who is aggrieved in connection with the solicitation or award of a contract may file a protest.*" The Handbook outlines the time frame for filing bid protests, the form of the protest, the procedures that must be followed to evaluate and settle the protest, and potential remedies.

Harris submitted its first bid protest in response to the P25 RFP on June 11, 2015 and submitted another bid protest on January 21, 2016. The claim in the first bid protest was that the initial proposal due date did not allow enough time for vendors to develop a responsive proposal. In

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

response to the protest, the proposal submission due date was extended. The second protest was submitted after Motorola was selected to enter into contract negotiations with the Commonwealth. The claim in this bid protest was that Harris' proposal was not fairly evaluated due to an improper Contractor Responsibility Program system entry related to an existing contract with PSP. The Commonwealth determined that this bid protest was premature because a contract was not yet awarded. Harris was informed that it had the right to file a bid protest after a contract was awarded. Harris did not appeal the Commonwealth's decision nor did it file another bid protest after the contract was awarded to Motorola in October 2016.

To ensure the bid protests were handled in accordance with the Handbook, we reviewed the circumstances surrounding both bid protests and the associated documents, including the Commonwealth's responses. We found that the Commonwealth properly handled both bid protests in accordance with the Handbook.

Recommendations for Finding 2

When acting as the issuing office for an RFP, we recommend that OA and PSP:

1. Ensure proposals are properly scored and that the scores are properly accumulated and transferred to the final score sheet.
2. Require each voting member to review the final score sheet and document their affirmation of the accuracy of the final scores.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Finding 3 – The implementation of the “20-Land Mobile Radio Upgrade” contract has remained on-time and on-budget; however, the Pennsylvania State Police needs to adequately document required operational tests as evidence of the reliability and long-term stability of the new P25 LMR system.

The “20-Land Mobile Radio Upgrade” contract (contract) between the Pennsylvania State Police (PSP) and Motorola Solutions, Inc. (Motorola) spans the five-year period from October 2016 to November 2021. The services required by the contract, which involve the installation of a P25 Land Mobile Radio (LMR) system across the Commonwealth, were approximately 50 percent complete as of March 26, 2019.

In October 2016, the design and installation of the P25 LMR system began with the Pilot Stage 1 phase in Warren County followed by the Pilot Stage 2 phase in the remaining three counties of PSP’s Troop E. As shown on the following map, the design and implementation for the other troops progressed south through the western-most PA counties during the 2017-18 fiscal year, and then continued east across the southern tier of the Commonwealth. Our audit covers the completion of the troops through Troop J in March 2019. Troops K and M have been completed since that time; however, due to timing were not subject to our audit. According to PSP management, Troops L, N, R, and P are scheduled to be completed by June 30, 2020, and Troops F and C in the final year of the contract.⁹³

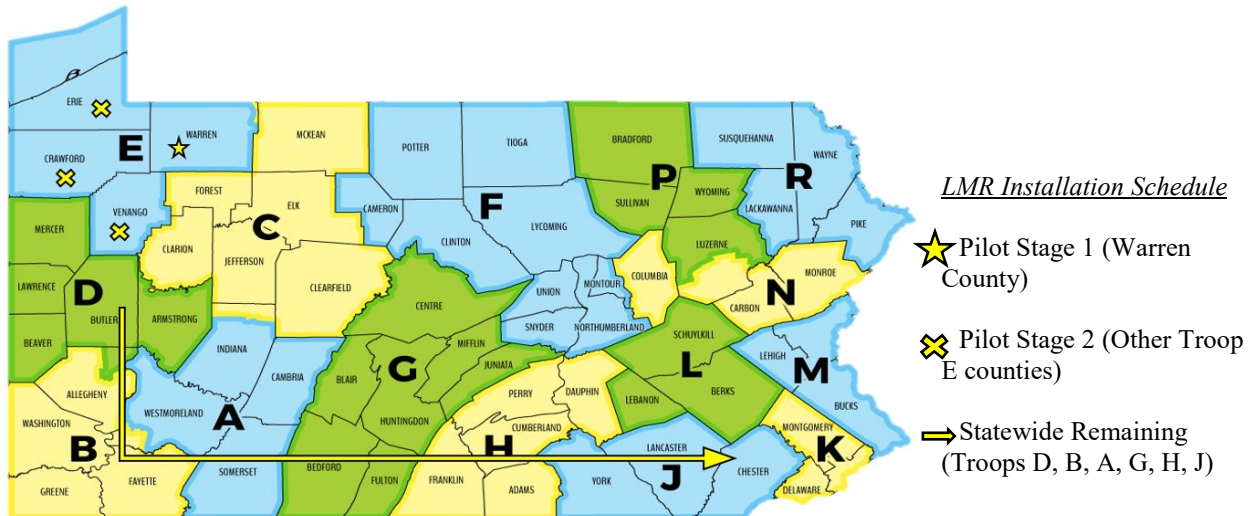
⁹³ <https://www.psp.pa.gov/About%20Us/Documents/PA-STARNet_Fact_Sheet_2019-03-06.pdf> (accessed July 22, 2019).

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

PSP Troop Map of LMR Installation Progression (October 3, 2016 – March 26, 2019)



Source: <<https://www.psp.pa.gov/troop%20directory/Pages/default.aspx>> (accessed July 8, 2019). Legend and map icons added by the auditors.

Our audit procedures included gaining an understanding of the contract implementation and acceptance process developed by PSP management to ensure the LMR installation remained on schedule. We reviewed documentation through March 26, 2019, showing the coordinated efforts of the PSP and Motorola to complete the very large and complex LMR installation in accordance with the contract. Specifically, we found:

- PSP management designed the P25 LMR implementation and acceptance process to ensure the efficient installation and timely completion of a LMR system that is reliable; however, PSP failed to adequately document the required 30-day Operational Tests as evidence of the system's reliability and long-term stability.
- Expenditures as of March 26, 2019, appear to correspond with the current status of contract implementation and all completed services were accepted by PSP prior to payment.

The following sections describe the implementation and acceptance process as well as the results of our audit procedures.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

PSP management designed the P25 LMR implementation and acceptance process to ensure the efficient installation and timely completion of an LMR system that is reliable; however, PSP failed to adequately document the required 30-day Operational Tests as evidence of the system's reliability and long-term stability.

PSP management developed a contract implementation and acceptance process that has been used to oversee the installation of the new LMR system and monitor Motorola's performance to ensure the contract services will be completed on-time and on-budget. Additionally, it was developed to avoid the problems that have plagued the previous LMR system for nearly two decades.⁹⁴ The process was designed to ensure the new LMR system is designed effectively, the equipment works properly and provides the required coverage, as well as that it operates reliably across the Commonwealth.

The process involves PSP staff reviewing and approving Motorola's work in stages for each PSP troop installation. PSP staff also actively participate in certain aspects of the troop installations. To document its review and approval, a PSP official signs and dates a *Certificate of Milestone Acceptance* form (acceptance form). This process serves as a roadmap for Motorola to complete the installation in accordance with the performance/payment milestones schedule in the contract.

The following chart shows the contract implementation and acceptance process, which consists of six performance/payment milestones. Under each milestone are the procedures that must be performed and deliverables that must be received in order for the milestone to be considered complete. Once PSP signs the acceptance form for the milestone, Motorola can submit an invoice requesting payment for that stage. Each of the six milestones are described in more detail in *Appendix B*.

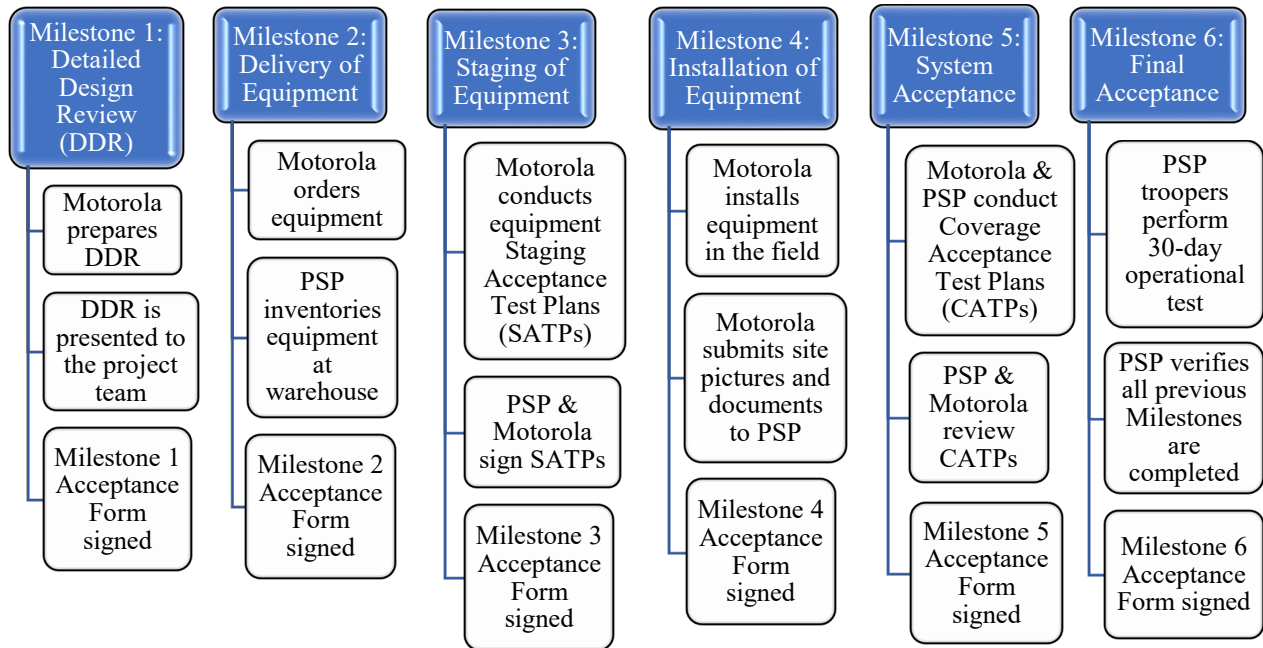
⁹⁴ A description of the problems with the previous LMR system is presented in the section of this report titled *Pennsylvania's Troubled History with OpenSky®*.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

P25 Contract Performance/Payment Milestones



Source: Produced by the Department of the Auditor General using information provided by PSP.

PSP's oversight of contract implementation includes its active participation in the following: 1) design of the system within each PSP troop, 2) testing the equipment, and 3) testing the functionality within every county. We found the design of PSP's implementation and acceptance process to be adequate to ensure the efficient installation and timely completion of the LMR system; however, PSP failed to adequately document the 30-day Operational Tests. This testing requirement is intended to ensure that the P25 LMR system operates reliably in the field for troopers' day-to-day operations and should be completed before PSP management determines a troop is ready for final approval, as indicated under Milestone 6 (above).⁹⁵

Ensuring that the P25 LMR system operates properly and reliably throughout the Commonwealth is of the utmost importance within PSP's implementation and acceptance process. The tests under Milestones 5 and 6 are designed to test the functionality of the P25 LMR system within each troop and are critical tasks necessary to achieve this goal. As part of Milestone 5, the Coverage Acceptance Test Plan (CATP) is conducted for each county within a troop.⁹⁶ CATP testing verifies that the radio coverage within each county meets the required

⁹⁵ 20-Land Mobile Radio Upgrade Contract (No. 4400016094), Statement of Work, Page 59 of 66.

⁹⁶ A description of the CATP testing is presented in *Appendix B*.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

parameters as stipulated in the contract. The purpose of the 30-day Operational Test under Milestone 6 is “. . . to demonstrate the reliability, long-term stability and maintainability of the [P25 LMR system].”⁹⁷ PSP management stated that the 30-day Operational Tests were successfully conducted for each troop completed through March 26, 2019 (see the PSP Troop Map of LMR Installation Progression).

We requested documentation to confirm that each troop successfully completed the 30-day Operational Test. PSP management stated that no documentation existed to show that these tests were completed. According to PSP, the 30-day Operational Test was an informal process. They explained that at the appropriate time during a troop's LMR installation, the PSP staff overseeing it would notify troop commanders when they would 'Go Live', i.e., the date troopers would begin using the new LMR system in the field for day-to-day operations. Troopers were instructed to report any problems encountered to the troop commanders who would pass the information on to PSP management involved with the implementation. If necessary, a resolution would be developed and rolled out to correct a problem.

The process PSP management described above however, could not be verified because sufficient documentation was not created or maintained. For example, we could not:

- Determine when the tests were conducted for each troop.
- Identify who was responsible for conducting the test in each troop.
- Review any testing/reporting instructions given to the troopers.
- Validate testing results for each troop.
- Evaluate the resolution of any problems encountered.
- Ensure the 30-day Operational Test for each troop was conducted for an entire 30 days.
- Confirm that the new LMR system demonstrated reliability and stability during day-to-day operations.

PSP's failure to adequately document the operational tests prevented us from determining whether or not PSP adequately ensured the new P25 LMR system is functioning properly and is reliable when it is being used by a large volume of troopers as part of day-to-day operations. Because the previous LMR system reportedly crashed during several large events, such as the Papal visit to Philadelphia in 2015, confirming the reliability and stability of the P25 LMR under operational usage should not be an informal process, but rather thoroughly documented to instill confidence in the troopers and the public that the new system will properly function when it is needed.⁹⁸

⁹⁷ 20-Land Mobile Radio Upgrade Contract (No. 4400016094), Statement of Work, Page 58 of 66.

⁹⁸ A description of the problems with the previous LMR system is presented in the section of this report titled *Pennsylvania's Troubled History with OpenSky®*.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

The only documents PSP management provided in response to our questions about the 30-day Operational Tests were a memo and an email showing the 'Go Live' dates for the Pilot Stages 1 and 2, respectively, and documents from February 2018 about poor radio performance encountered in Troop E due to electronic interference from other PSP equipment in the patrol vehicles.⁹⁹ Additionally, PSP management provided a typed list of 'Go Live' dates for the troops completed during the Statewide Remaining phase. They stated there were no other documents or emails to support those 'Go Live' dates because they may have only been communicated verbally to troop commanders.

Although no evidence was provided to validate the 'Go Live' dates noted on the typed list provided by PSP, we reviewed the list and noted for Troops A and G that there were less than 30 days between the 'Go Live' date and PSP's Final Acceptance (Milestone 6) of the troops' installation. Upon inquiry, PSP management acknowledged that the acceptance forms were signed prematurely in June 2018 because its staff erroneously believed that the funds appropriated for that fiscal year would no longer be available after June 30 and it would not be able to pay Motorola for work completed if an invoice was not submitted before June 30. According to policy, however, as long as the commitment still exists on June 30, the funds remain available through October and possibly until the end of the subsequent fiscal year.¹⁰⁰ Our analysis of other acceptance forms found the same issue with a third form prematurely signed in June, before the work was completed.¹⁰¹ PSP management stated that this would not occur again, now that its staff understands the policy.

Expenditures as of March 26, 2019 appear to correspond with the current status of contract implementation and all completed services were accepted by PSP prior to payment.

The contract has a total value of nearly \$44.5 million, with the design and implementation of the LMR system accounting for 90 percent of the contract value. The following chart shows a breakdown of these funds between the different contract components.

⁹⁹ We reviewed documents related to an issue identified during the Pilot Stage 2 phase. The PSP-issued Mobile Video Recorders (MVRs) in the patrol vehicles caused interference with the P25 mobile radios. The PSP purchased ferrite beads for approximately \$5,300 to be installed on the MVRs to reduce the interference to an acceptable level.

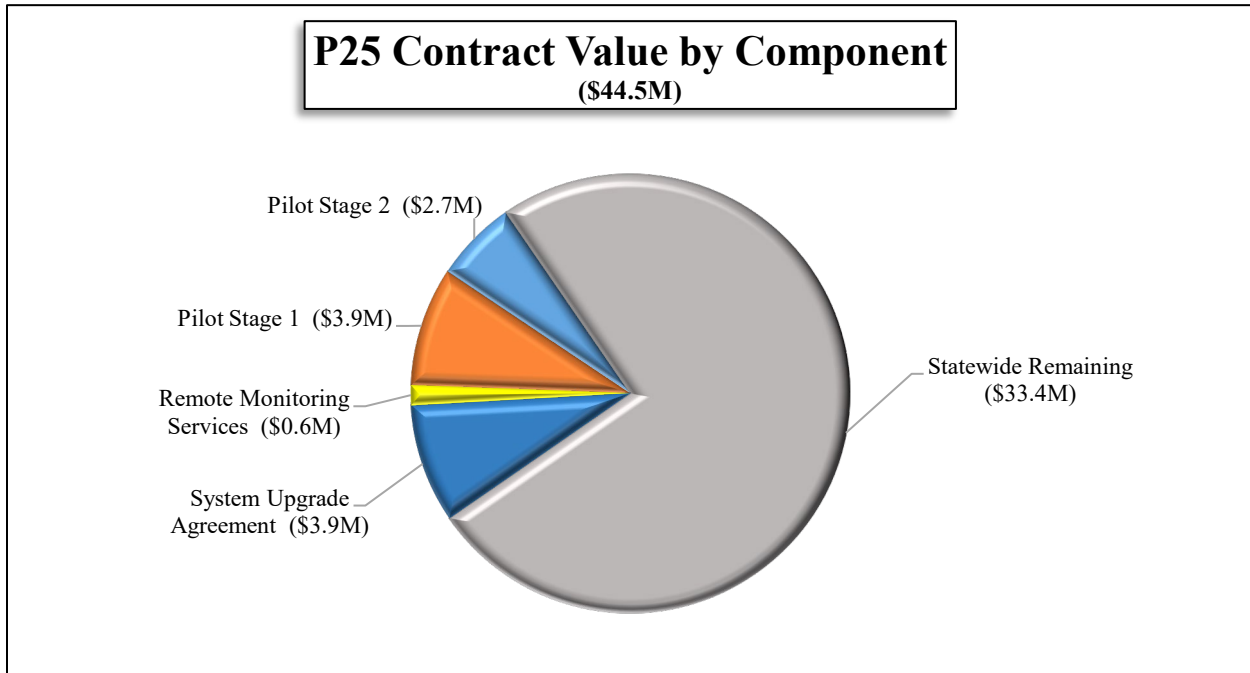
¹⁰⁰ Management Directive 310.3 Amended, Encumbering and Lapsing of Appropriations.

¹⁰¹ The Troop G Milestone 5 acceptance form was signed on June 18, 2018, ten days before the CATP testing was completed for Mifflin County.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System



Source: Created by the Department of the Auditor General based on information received from the Governor's Office of Administration.

The above pie chart shows the five contract components and related costs. As noted above and shown on the troop LMR installation progression map, the installation of the P25 LMR was divided geographically into three phases; Pilot Stage 1, Pilot Stage 2, and Statewide Remaining. The phases are identified as separate components in the contract with the cost of each phase listed. The System Upgrade Agreement and Remote Monitoring Services are the other two contract components and involve services that Motorola will provide during the final three years of the contract term. The System Upgrade Agreement provides for periodic system upgrades of the hardware and software of the LMR system in order to keep the LMR network up-to-date and the Remote Monitoring Services component involves LMR system monitoring by Motorola's Network Operations Center.

In order to make contract payments to Motorola as it installs the LMR system across the Commonwealth, PSP issues a Purchase Order (PO) for each PSP troop's installation as the work begins. After PSP management reviews and accepts Motorola's work according to the contract performance/payment milestones, Motorola submits an invoice and a payment is made against the specific troop's PO. As part of our audit procedures to review contract expenditures, we obtained the POs associated with the Pilot phases in PSP Troop E and for Troops A, B, D, G, H, and J, to determine whether:

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

- Contract expenditures seemed reasonable as compared to the amount of work completed as of March 26, 2019.
- PSP reviewed and approved all acceptance forms prior to paying Motorola for those services.
- Change orders issued against the contract appeared reasonable.
- Motorola utilized Small Diverse Business (SDB) subcontractors as described in its contract proposal and submitted its Quarterly Utilization Reports timely.

Contract expenditures seemed reasonable as compared to the amount of work completed as of March 26, 2019.

Because the installation of the P25 LMR is not scheduled to be completed until June 2021, we evaluated the reasonableness of the contract funds expended through the final acceptance of the Troop J installation (March 26, 2019). We reviewed the contract POs issued by PSP, its records of paid Motorola invoices, and agreed those amounts to contract payments recorded on the Commonwealth's accounting system, SAP. We compared the total amount paid to the contract funds remaining to determine whether the project appeared to be on-budget. Motorola had been paid approximately \$22.8 million, or 51 percent of the total contract value, to complete seven of the fifteen PSP troops (32 of 67 counties) across the Commonwealth. This amount is reasonable knowing that the cost of the two Pilot phases (Troop E) was slightly higher than the troops completed during the Statewide Remaining phase.

Additionally, we reviewed documentation of the amount of work completed between October 2016 and April 2019 to determine if the installation rollout was on schedule to be completed within the contract timeframes. According to project documents and the contract's installation schedule, the work has been completed timely over the first 31 months of the five-year contract term. As of March 26, 2019, the P25 LMR system installation had been completed for seven troops. Because of the fast-paced contract implementation schedule, installation work had begun in some of the eight remaining troops, but our audit procedures ended with the completion of Troop J in March 2019.

PSP reviewed and approved all acceptance forms prior to paying Motorola for those services.

As explained above, before Motorola receives a contract payment for the completion of a contract milestone, PSP and Motorola management must sign an acceptance form. According to PSP management, this serves as a form of performance security for the Commonwealth as Motorola does not receive payment until both parties sign these forms.

There were seven troops in total where the LMR installation was completed through final acceptance as of March 26, 2019. To ensure the acceptance forms were signed by PSP and

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Motorola management before Motorola received a payment, we obtained the acceptance forms for each of the six payment milestones for the seven troops rolled out as of March 26, 2019. There were separate acceptance forms for the Pilot Stages 1 and 2, which covered a single troop, so we reviewed a total of 48 acceptance forms.

We compared the date each form was signed by PSP and Motorola with the invoice paid date. We found that every acceptance form was signed and dated prior to the invoice paid date. Based on these audit procedures, we determined that PSP complied with the payment schedule in the contract and ensured Motorola satisfactorily completed the work before the associated payment was made, excluding the operational testing under Milestone 6 that could not be verified due to the lack of documentation as described above.

Change orders issued against the contract appeared reasonable.

The *Pennsylvania Procurement Handbook* (Handbook) defines a change order process that agencies may use when a contract needs to be corrected or changed.¹⁰² We requested all change orders issued against the contract and PSP explained that three change orders were needed to add equipment, relocate a transmitter, and add a tower site in Bedford County to achieve the required coverage percent. We reviewed each change order and found that no costs were added to the contract. Motorola provided the equipment at no charge to the Commonwealth. As noted above, all contract payments agreed to the POs. No additional funds were paid as of March 26, 2019. We concluded that the change orders were properly approved and reasonable.

Motorola utilized Small Diverse Business (SDB) subcontractors as described in its contract proposal and submitted its Quarterly Utilization Reports timely.

In its proposal submitted to win the contract award, Motorola planned to use nearly ten percent of the contract's value to pay two subcontractors that qualified as SDBs. The contract requires Motorola to submit a Prime Contractor's Quarterly Utilization Report so the Commonwealth can monitor usage of the SDBs. Our review of these reports found that Motorola submitted the reports timely and was utilizing the SDB subcontractors as planned.

¹⁰² *Pennsylvania Procurement Handbook*, Part III, Chapter 15, "Change Orders," Section A, Requirements.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Recommendations for Finding 3

We recommend that PSP:

1. Continue to closely oversee the installation of the P25 LMR system to ensure it remains on-time, on-budget, and in compliance with the contract.
2. Ensure that milestone acceptance forms are only signed after the completed work is reviewed and accepted.
3. Formalize the 30-day Operational Test process by developing detailed written instructions for troop commanders to use. These instructions should provide the troop commanders with a mechanism for recording the 30-day Operational Tests, including the time period the test occurred, any problems or a lack of problems, and an acknowledgement by the troop commander that the test was properly and successfully completed. This documentation should be maintained.
4. Immediately implement the formalized process for each remaining troop installation to ensure that an external party can independently verify that the 30-day Operational Test was properly performed and any issues identified were properly corrected.

A Performance Audit

**Governor's Office of Administration
Pennsylvania State Police**

Statewide Radio Network System

Agencies' Responses and Auditor's Conclusion

We initially provided our draft audit findings and related recommendations to the Governor's Office of Administration (OA) and the Pennsylvania State Police (PSP) for their review. Subsequently, since the responsibility for all Commonwealth Information Technology procurements was transferred from OA to the Pennsylvania Department of General Services (DGS) during the audit period, OA provided the draft audit findings and related recommendations to DGS and requested its review of the information related to Commonwealth procurement policy included in the draft. On the pages that follow, we included the responses received from PSP, OA, and DGS in their entirety. Following the agencies' responses is our auditor's conclusion.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Audit Response from the Pennsylvania State Police

Performance Audit Report
Statewide Radio Network System
PA State Police Response

FINDING 1

1. Not applicable to PSP
2. PSP agrees to comply with DGS procurement policy.
3. PSP agrees to comply with DGS procurement policy.
4. PSP agrees to ensure Certification of Confidentiality and No Conflict Interest forms are carefully reviewed.

FINDING 2

1. PSP agrees to ensure proposals are properly scored and final scores transferred to the final score sheet.
2. PSP agrees to have voting members review the final score sheets and affirm accuracy.

FINDING 3

1. PSP agrees.
2. PSP agrees. Employees assigned to the Bureau of Communications and Information Services (BCIS) have been educated by the auditors and PSP's Fiscal Department regarding how payments can be made using previous fiscal year's funding but services are subsequently rendered in the next fiscal year.
3. PSP agrees, in part, with this recommendation. The Director, BCIS will begin sending Department correspondence, to the Area and Troop Commander, announcing the "GO-LIVE" date and commencement of the 30-day Operational Test. PSP will immediately institute a procedure whereby the Network Operations Center provides data, at the conclusion of the 30-day period, that the new LMR infrastructure system demonstrated 99.999 percent reliability and stability. Additionally, BCIS will formally document and track any issues during the 30-day operational test.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

4. PSP agrees to comply with this recommendation. PSP has developed and will commence the formalized process in Troop P, February 2020, which is the next deployed Troop.

Current P25 Deployment Procedures – Radio Services Section

The Pennsylvania State Police, Bureau of Communications and Information Services (BCIS), offers the following detailed information regarding current P25 deployment procedures, before, during the 30-day Operational testing and post testing. The agency's below response is provided for additional clarity regarding the care and oversight with which the agency is handling this critical project:

The Director, BCIS, establishes the "GO LIVE" schedule. Once the Go Live date is established, the following steps occur to include the programming, set up and installation of equipment, training, and Go Live support by personnel assigned to the Radio Services Section.

The Commander of the Radio Services Section prepares the template for the Dispatch Consoles at each station, within the Troop, and that template is provided to the Statewide Radio Network Division. The template is then, in turn, provided to Motorola for programming and set up. This is typically completed three months in advance of the Troop's Go Live date.

The Radio Services Section then obtains all equipment necessary to complete the programming and roll out for all stations within the Troop, from the stock of previously ordered supplies. A quote is requested for the programming and installation of all necessary radio equipment. Once the quote is received, an Agency Requisition form is submitted to Fiscal for approval. Once approval is granted, a Purchase Order is provided to the vendor. The quote is requested approximately two months in advance of the Go Live date. The portable and mobile radios are then programmed by Motorola at Capital Area Communications. The mobile radios are then installed into the fleet vehicles. Installation includes removal of the non P25 APX radio and installation of all components required for the P25 APX radio. This would include installation of a Digital Vehicle Repeater System, antennas, etc. Installation of the mobile radios is completed at least two weeks prior to Go Live.

The portable radios are then assembled by the Radio Services Section and delivered to the stations once field training begins, two to three weeks prior to the Go Live Date.

An email is sent by the Commander, Radio Services Section to the Troop Command Staff, Station Commanders within the Troop, and the entire Staff Services Section approximately three months in advance of the Go Live schedule. The purpose

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

of this email is to set up the Dispatch Console Training for all Police Communications Operators (PCOs), members who supervise PCOs, and any member who may have to work desk on a regular basis. (Attachment 1, P25 Console Training) Also, additional training records, Attachment 2, P25 Mobile and Portable Training for members and Attachment 3, P25 Elite Dispatch Sign-In Sheets, are maintained. Approximately two months in advance, training is given at Troop Headquarters. Generally, six dates of training and two training sessions per date are provided. Training can accommodate up to 10 individuals per session.

Approximately four or five weeks before a Station's Go Live date, the Radio Services Section sends out an email to the respective Station Commanders to set up dates/times for mobile and portable training to the enlisted members. Additionally, Station Commanders are reminded that the portable radios use a different belt holster which must be ordered through Central Supply so that each member will have the proper holster prior to the Troop going live. Two to three weeks prior to the Go Live date, the Radio Services Section then reports to the station with the portable equipment and accessories and begins training the field. A representative at the station would then sign the Pennsylvania State Police Invoice-Transfer and Receipt of State Property to document receipt of this equipment. The Radio Services Section will return to the station as often as needed to train all enlisted members. The representative from the Radio Services Section keeps a roll call list to record all members who have received the training. If a member was unable to attend a training session, the Radio Services Section will train him/her during Go Live. The Troop Communications Specialist at each Troop would then provide additional training support as needed. On a few occasions, a Station Commander has reached out to the Radio Services Section and requested follow-up training for the members after they have been live on the new system, and we always accommodate those requests as well. Additionally, handouts with instructions and colored diagrams of the portable and mobile radios are provided to each member to retain for future reference during training.

Troop Headquarters and one or two substations are selected to Go Live with the P25 radio system on that Monday, depending on the size of the Troop. The remaining substations are selected to Go Live that Wednesday. During Go Live, the Radio Services Section offers a minimum of 18 hours of hands on support to the station, PCO's, and members. This would involve beginning our support for the last hour of the midnight shift, the entire eight hours for the morning shift, the entire eight hours for the afternoon shift, and the first hour of the following midnight shift. We are flexible and will stay beyond that timeframe if needed. During the Go Live, we will train anyone who was unable to attend one of the training sessions for the portable and mobile radios, offer refresher training to anyone who may need it, help set up scan lists and presets on both radios, and troubleshoot any issues found along the way. The Radio Services Section also keeps in close contact with Motorola to report any issues in need of correction throughout the Go Live process.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Support continues after a Troop "goes live" with the P25 radio. Members are strongly encouraged to report areas of weak coverage via a GPS tracking system which allows the Radio Services Section and Statewide Radio Network Division to monitor radio coverage. Additionally, conference calls are held with Troop personnel and staff from the Radio Services Section, approximately once every eight weeks, whereby personnel are able to report any issues regarding the new radio system. These conference calls have been invaluable in identifying interference issues with a private paging business as well as a vehicular repeater software problem.

Dispatch console issues are reported to the Network Operations Center (NOC) at BCIS headquarters and issues with the mobile and portable radios, and the dispatch consolets are reported to the Public Safety Service Desk. All NOC helpdesk tickets are forwarded to the Radio Services Section Commander via email for tracking purposes. Additionally, all Public Safety Service Desk tickets regarding mobile and portable radio issues are monitored and tracked by the Radio Services Section to ensure resolution is achieved.

Reference guides have been created and distributed to all Stations and kept in the Communications Room regarding the set-up of patches between two talk groups and how to set up a scan list on the back-up consolets.

Finally, bi-weekly meetings are held between the Radio Services Section and Motorola regarding the above-mentioned procedures. The Commander, Radio Services Sectional also attends the STARNet/Motorola bi-monthly meeting for P25 infrastructure discussions.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Audit Response from the Governor's Office of Administration



December 26, 2019

Scott D. King, CPA
Acting Director
Bureau of Performance Audits
Department of Auditor General
302 Finance Building
Harrisburg, PA 17120
sking@paauditor.gov

RE: Department of Auditor General: Performance Audit Report – Statewide Radio Network System

Dear Mr. King:

Thank you for providing the Office of Administration with an opportunity to review and provide comments to the Auditor General's December 20, 2019, Performance Audit Report, Draft Findings, Statewide Radio Network System Audit Report (Draft Findings). The Office of Administration is providing the below response to the Draft Findings. In addition, the Department of General Services was asked by the Office of Administration to review the Draft Findings that pertain to procurement policies. The Department of General Services' responses are attached hereto.

Response to Recommendations:

Finding 1:

1. **Recommendation 1:** We recommend that DGS consider revising the Commonwealth procurement policies by issuing a Policy Directive that would amend the *Pennsylvania Procurement Handbook* to include a requirement that agencies must document and maintain the justification for selecting RFP evaluation committee members and vendors serving as consultants in the procurement process (if applicable), to include how each member and/or vendor satisfies the requirement of technical and managerial expertise in the subject matter.

Response: The Office of Administration has no response as this finding pertains to DGS.

2. **Recommendation 2:** When acting as the issuing office for an RFP, we recommend that OA and/or PSP comply with any DGS procurement policy changes made in Recommendation 1 above in regard to documenting and maintaining justification for selecting a specific vendor from the ITQ list of vendors when utilizing a vendor in the development of a Statement of Work for purpose of a procurement.

Response: The Office of Administration agrees to continue to follow DGS policy as it pertains to procurement.

Office of Administration
207 Finance Building | Harrisburg, PA 17120 | T 717.787.9945 | F 717.783.4374 | www.oa.pa.gov

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System



3. **Recommendation 3:** When acting as the issuing office for an RFP, we recommend that OA and/or PSP comply with any DGS procurement policy changes made in response to Recommendation 1 above in regard to documenting and maintaining justification for selecting RFP evaluation committee members, including how each member satisfies the requirement of technical and managerial expertise.

Response: The Office of Administration agrees to continue to follow DGS policy as it pertains to procurement.

4. **Recommendation 4:** When acting as the issuing office for an RFP, we recommend that OA and/or PSP evaluate its procedures to ensure the Certification of Confidentiality and No Conflict of Interest forms are carefully reviewed and any identified concerns are appropriately and timely resolved.

Response: The Office of Administration agrees with this recommendation.

Finding 2:

1. **Recommendation 1:** When acting as the issuing office for an RFP, we recommend that OA and PSP ensure proposals are properly scored and that the scores are properly accumulated and transferred to the final score sheet.

Response: The Office of Administration agrees with this recommendation.

2. **Recommendation 2:** When acting as the issuing office for an RFP, we recommend that OA and PSP require each voting member to review the final score sheet and document their affirmation of the accuracy of the final scores.

Response: The Office of Administration agrees with this recommendation.

Finding 3:

Response: The Office of Administration has no response to Finding 3 or any recommendations included in Finding 3 as they pertain to PSP, not OA.

Conclusion:

The Office of Administration and the Department of General Services request that our responses be included or provided along with any public dissemination of the Auditor General's Performance Audit Report.

Sincerely,

A handwritten signature in black ink that reads 'Michael Newsome'.

Michael Newsome
Secretary
Governor's Office of Administration

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Audit Response from the Department of General Services

December 24, 2019

To: Patti Chapman
Office of Administration

From: Janice M. Pistor
Chief Procurement Officer, Department of General Services

Re: DEPARTMENT OF THE AUDITOR GENERAL: PERFORMANCE AUDIT REPORT – STATEWIDE
RADIO NETWORK SYSTEM
Governor's Office of Administration
Pennsylvania State Police
20-Land Mobile Radios Upgrade, Contract Number 4400016094

Thank you for providing the Department of General Services (DGS) with the Department of Auditor General's (DAG) November 13, 2019, Performance Audit Report, Draft Findings, Statewide Radio Network System (Draft Findings). Consistent with DAG's dissemination of the Draft Findings for discussion purposes, DGS is providing this response to the Draft Findings issued in this matter which pertain to procurement policies maintained by DGS within its Bureau of Procurement.

DGS RESPONSE

While DGS was not one of the two Commonwealth entities audited during this DAG performance audit, since the completion of the LMR Contract DGS has rescinded the delegation of IT procurement activities from OA and resumed these responsibilities as of July 1, 2017. Additionally, DAG makes recommendations directed specifically at DGS and changes to agency procurement policy both of which are within the statutory authority of DGS to develop and maintain under the Commonwealth Procurement Code.¹ DGS submits this response to the Draft Findings to address concerns within the audit report itself, and to detail concerns related to Finding 1, Recommendations 1-3.

1. Finding 1, Recommendations 1 & – Recommending That the Issuing Office Document and Maintain the Justification for Selecting RFP Evaluation Committee Members, Including How Each Member Satisfies the Requirement of Technical and Managerial Expertise in the Subject Matter

DAG Finding 1, Recommendation 1 suggests that DGS amend the *Pennsylvania Procurement Handbook* to require that agencies document and maintain the justification for selecting RFP evaluation committee members and vendor consultants (if applicable), including how each member satisfies the requirement of technical and managerial expertise in the subject matter.

¹ 62 P.S. § 301(a); 62 P.S. § 311.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Fundamentally all members of RFP evaluation committees are *volunteers* that are completing tasks beyond those that are their core employment duties. DGS has and will continue to formulate policies that protect members of evaluation committees from exposure to undue scrutiny, fear of reprisals, or unnecessary criticism. If DGS fails to protect members of RFP evaluation committees from this sort of personal and professional harm it will be exceedingly difficult to identify individuals willing to participate in this vital role. In its role as policy author for the Procurement Handbook, DGS will consider this recommendation alongside all other potential policy edits during its policy review process.

With regard to the documentation and maintenance of a consultant's (if applicable) technical and managerial subject matter expertise in the subject matter, as indicated above for similar justification for employee members of an RFP evaluation committee, in its role as policy author for the Procurement Handbook, DGS will consider this recommendation alongside all other potential policy edits during its policy review process.

CONCLUSION

DGS appreciates the opportunity to provide responses to the DAG's Draft Performance Audit, and the DAG's inclusion of these responses in the report.

A Performance Audit

**Governor's Office of Administration
Pennsylvania State Police**

Statewide Radio Network System

**Auditor's Conclusion to the Pennsylvania State Police's and Governor's
Office of Administration's Responses**

Overall, the Pennsylvania State Police and Governor's Office of Administration (OA) agree with each of the findings and recommendations. Because the responsibility for all Commonwealth Information Technology procurements was transferred from OA to the Pennsylvania Department of General Services (DGS) during the audit period, DGS responded to the recommendations that involved Commonwealth procurement policy changes. DGS agreed to consider policy changes based on our recommendations. We will follow up at an appropriate time to determine whether, and to what extent, all recommendations have been properly implemented.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Appendix A

Objectives, Scope, and Methodology

The Department of the Auditor General conducted this performance audit of Contract Number 4400016094, the “20-Land Mobile Radios Upgrade”, related to the Statewide Radio Network System, known as PA-STARNet, under the authority of Sections 402 and 403 of The Fiscal Code of the Commonwealth of Pennsylvania.¹⁰³ The term of the contract extends from October 1, 2016 to November 30, 2021. We conducted this audit in accordance with applicable *Government Auditing Standards*, issued by the Comptroller General of the United States. 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.

Objectives

Our audit objectives were to:

- Evaluate the process in the development of Request for Proposals 6100033543 (P25 RFP). [See *Finding 1*]
- Determine whether Contract Number 4400016094 was procured properly and in accordance with the Procurement Code and applicable policies and procedures. Evaluate what, if any, performance measurements and performance criteria (i.e., Performance Bond) exist. [See *Finding 2*]
- Evaluate the current status of contract implementation. [See *Finding 3*]

Scope

The audit objectives covered the period March 1, 2015 through March 26, 2019, unless otherwise noted, with updates through the report date.

The Pennsylvania State Police (PSP) management along with the Governor's Office of Administration (OA) management are responsible for establishing and maintaining effective internal controls to provide reasonable assurance of compliance with applicable laws,

¹⁰³ 72 P.S. §§ 402 and 403.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

regulations, contracts, grant agreements, and administrative policies and procedures.¹⁰⁴ In conducting our audit, we obtained an understanding of PSP and OA internal controls, including any information system controls, if applicable, that we considered to be significant within the context of our audit objectives.

For those internal controls that we determined to be significant within the context of our audit objectives, we also assessed the effectiveness of the design and implementation of those controls as discussed in the *Methodology* section that follows. Any deficiencies in internal controls that were identified during the conduct of our audit and determined to be significant within the context of our audit objectives are included in this report.

Methodology

To address the audit objectives, we performed the following procedures:

- Developed an understanding of the history and operation of PA-STARNet and OpenSky® LMR through PSP management inquiries and Timeline of PA-STARNet overview document. We also reviewed PA legislative committee hearing testimonies, consultants' reports, and news articles. The information, presented in the *Pennsylvania's Troubled History with OpenSky®*, was obtained for background purposes only and was not audited.
- Interviewed PSP, OA, and DGS management and staff to gain an understanding of the individuals involved in the development, procurement, and implementation of the Land-Mobile Radio (LMR) upgrades contract for the statewide radio system.
- Researched the consultant, Mission Critical Partners, Inc. (MCP), hired to develop the P25 RFP Statement of Work (SOW) to determine if they were qualified to provide technical expertise needed to develop the P25 RFP SOW. We used the internet to review MCP's history, including other MCP public safety communications-related projects completed for numerous entities across the country. Additionally, we reviewed MCP's proposal and contract, which listed the MCP staff assigned to complete the project.
- Compared the P25 RFP SOW with the United States General Services Administration's Land Mobile Radio SOW Template to identify similar work statement criteria (i.e., radio frequency infrastructure, testing and deployment, project management, etc.).

¹⁰⁴ On July 1, 2017, the responsibility for all IT procurements and related internal controls was moved from OA to the Department of General Services (DGS).

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

- Reviewed the *Pennsylvania Procurement Handbook* (Handbook) and noted that Chapters 6, 7, 37, 38 and 58 contained applicable procedures required to procure the LMR upgrades contract based on our understanding of the highly technical nature of the procurement, the expertise needed to design and install a new LMR, and the cost.¹⁰⁵
- Evaluated the details of the procurement to determine compliance with the Handbook. Specifically, we:
 - Assessed the magnitude and complexity of the project as described in the P25 RFP SOW to determine if the Competitive Sealed Proposal procurement method was appropriate to award the LMR upgrades contract.
 - Identified the performance security measures included in the P25 RFP to determine if they sufficiently protected the Commonwealth and minimized the risk of unsatisfactory contractor performance.
 - Compared the content and structure of the P25 RFP to the Handbook requirements.
 - Viewed system screenshots as evidence that the P25 RFP was approved by OA Legal, OA IT Procurement, technical subject matter experts, and the comptroller prior to its issuance, as required by the Commonwealth of Pennsylvania Procurement and Architectural Review (COPPAR) process. We additionally conducted corroborative procedures by contacting five of the nineteen reviewers directly to confirm their approvals.
 - Verified that the P25 RFP was publicly advertised on the Commonwealth's eMarketplace website and agreed the date to the P25 RFP's established timeline.
 - Interviewed PSP, OA, and DGS management to gain an understanding of the selection methodology used to select evaluation committee members to ensure the members' qualifications were considered.¹⁰⁶
 - Verified the evaluation committee members completed the *Certification of Confidentiality and No Conflict of Interest* forms prior to the issuance of the P25

¹⁰⁵ Handbook, Part I, Chapter 6, "Methods of Awarding Contracts"; Part II, Chapter 7, "Competitive Sealed Proposals"; Part I, Chapter 37, "Contract Performance Security"; Part I, Chapter 38, "Payment Bonds"; Part I, Chapter 58, "Bid Protests".

¹⁰⁶ At the request of OA and DGS, the actual number of evaluation committee members is not reported. DGS protects the identity of evaluation committee members and other related information to ensure the integrity of the procurement process. Omitting this information does not significantly impact the report.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

- RFP. We also determined that any issues disclosed on the forms were properly resolved.
- Ensured compliance with the Contractor Responsibility Program (CRP) by viewing documentation that the CRP check was properly conducted for both vendors that submitted a proposal in response to the P25 RFP.
 - Determined if the proper scoring weights that were applied during the evaluation committee proposal scoring process were assigned to each of the P25 RFP proposal categories before the proposals were opened.
 - Evaluated the propriety of the P25 RFP proposal scoring process to ensure the contract was awarded to the most responsive vendor. To do this, we viewed the detailed scoring sheets completed by evaluation committee members and:
 - Verified that each detailed scoring sheet was signed by the evaluation committee member as evidence that the individual completed the sheet.¹⁰⁷
 - Recalculated the individual scoring of the Technical Criterion sections for each proposal to ensure accuracy of the detailed score sheet totals.
 - Traced totals from the individual detailed scoring sheets to the summary score sheet to ensure the scores were correctly recorded, which were used to determine the most responsive vendor for the Technical Criterion.
 - Reviewed the summary score sheet to identify any unexplained modifications or other anomalies, such as large scoring fluctuations between evaluation committee members.
 - Determined that the most responsive vendor was awarded the LMR upgrades contract according to the Handbook's RFP proposal scoring procedures. We confirmed after recalculating the scores that only one vendor's proposal exceeded the minimum technical score to qualify for the contract award.
 - Ensured that Contract Number 4400016094 was properly executed by viewing the authorizing signatures.

¹⁰⁷ Ibid.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

- Interviewed PSP management to gain an understanding of the contract implementation and acceptance process established to ensure the timely completion of the LMR installation that meets the agreed upon reliability parameters.
- Reviewed *Certification of Milestone Acceptance* forms used to document the satisfactory completion of the six performance milestones for each of the seven PSP troops completed during the audit period to evaluate the effectiveness of the contract implementation and acceptance process. Specifically, we:
 - Ensured each milestone acceptance form contained PSP approval signatures and dates.
 - Ensured appropriate documents were completed before PSP signed and dated each milestone acceptance form.
 - Visited a warehouse to observe equipment testing procedures, or staging, to ensure the equipment is correctly configured before it is installed in the field.
 - Observed the Coverage Acceptance Testing conducted for a portion of Lehigh County by PSP and Motorola personnel in order to verify LMR system coverage. We reviewed all testing procedures, results, and documentation generated during our observation to ensure that the LMR system meets the minimum coverage requirement of 95% for both the inbound and outbound transmissions. Our staff simultaneously observed the testing procedures conducted in the field from a vehicle and at the communications center.
 - Interviewed PSP management about the 30-day Operational Tests required to be conducted during the Final Acceptance milestone before PSP signs the *Certificate of Milestone Acceptance* form, which completes the LMR installation for a troop.
 - Ensured PSP complied with the contract payment process by verifying that PSP did not pay an invoice before it signed the *Certificate of Milestone Acceptance* form associated with the work included on the invoice.
- Agreed PSP's contract invoice records to the contract payments recorded on the Commonwealth's SAP accounting system.
- Evaluated the reasonableness of the contract funds expended through March 26, 2019 as compared to the percentage of the project completed based on the number of PSP troops completed and the remaining troops scheduled to be completed by the end of the contract

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

term. Used this comparison to determine if the contract implementation was on schedule. We also calculated the amount of contract funds remaining to determine if the contract implementation is on budget.

Data Reliability

Government Auditing Standards require us to assess the sufficiency and appropriateness of computer-processed information that we used to support our findings, conclusions, or recommendations. The assessment of the sufficiency and appropriateness of computer-processed information includes considerations regarding the completeness and accuracy of the data for the intended purposes.

- To assess the completeness and accuracy of the expenditure by troop spreadsheet provided by PSP management, we reconciled to the expenditures recorded in the Commonwealth's SAP accounting system. The SAP accounting system is an independent source that is evaluated as part of the annual audit of the Commonwealth's Comprehensive Annual Financial Report. These annual audits are conducted jointly by the Department of the Auditor General and a certified public accounting firm. Based on the procedures performed, we found no limitations on using the data for our intended purposes. In accordance with *Government Auditing Standards*, we concluded that PSP's expenditures as of March 26, 2019 under Contract Number 4400016094 were sufficiently reliable regarding completeness and accuracy for the purposes of this engagement.
- To assess the validity COPPAR system approvals, we conducted corroborative audit procedures. After obtaining a copy of the electronic approvals from OA, we contacted five of the nineteen reviewers directly. Each provided independent confirmation of their review and approval of P25 RFP. In accordance with *Government Auditing Standards*, we conclude that these COPPAR system approvals were sufficiently reliable regarding completeness and accuracy for the purposes of this engagement.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Appendix B

Contract Implementation Milestones

The following sections explain the six performance/payment milestones required under the “20-Land Mobile Radio Upgrade” contract (contract) as briefly described in *Finding 3*. Under each milestone are the procedures that must be performed and deliverables that must be received in order for the milestone to be considered complete.

Milestone 1 – Detailed Design Review

In order to complete the rollout for a troop, which consists of three to nine counties, Motorola first develops the Detailed Design Review (DDR) for the entire troop. The DDR is Motorola's determination of the number of tower sites and equipment needed to achieve the contractually required 95 percent coverage for each county within a troop. The plan is discussed at a project team meeting with the Pennsylvania State Police (PSP), Motorola, and its subcontractors. After the plan is agreed upon, PSP management signs the acceptance form for milestone 1. This permits Motorola to bill the Commonwealth for the DDR work completed for the specific troop under milestone 1.

Milestone 2 – Delivery of Equipment

After the P25 equipment arrives at PSP's warehouse, PSP management inventories the equipment to ensure all components have arrived. After the inventory is completed, PSP management signs the acceptance form for milestone 2. Motorola can then bill the Commonwealth for the equipment needed for the specific troop installation.

Milestone 3 – Staging of Equipment

Motorola is required to test and configure the equipment for each tower site and each terminal that will be placed at each PSP station. This in-depth equipment testing is documented in the Staging Acceptance Test Plans (SATP) for every tower site within the troop. The purpose of SATP testing is to demonstrate proof of equipment performance before Motorola installs it in the field. All of the equipment within a troop must pass the SATP testing before Motorola receives payment for the completion of this milestone. PSP management reviews Motorola's testing procedures conducted for each troop's equipment to ensure the test results are valid. Following the completion of the SATP testing for every tower site within the troop, PSP management signs the acceptance form for milestone 3, at which time Motorola can request payment.

Milestone 4 – Installation of Equipment

Milestone 4 involves installation of the P25 equipment at tower sites and PSP stations in the field. After installing the equipment, Motorola is required to send site pictures and documents to PSP management. This is done county by county within the troop in order to permit coverage area testing to begin, which is described under *Milestone 5 – System Acceptance* below. After

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

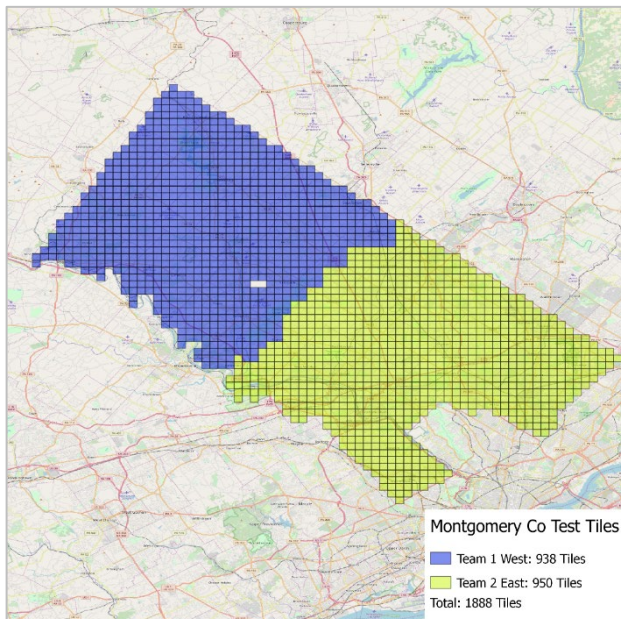
Statewide Radio Network System

PSP management reviews the site pictures and documents, PSP management signs the milestone 4 acceptance form, which allows Motorola to bill for this work.

Milestone 5 – System Acceptance

Milestone 5 is a significant stage of a troop installation because it involves the determination of the Service Area Reliability. The Service Area Reliability is determined through the Coverage Acceptance Test Plan (CATP) conducted for every county within the troop. The purpose of the CATP testing is to ensure that the newly installed P25 LMR system provides a Service Area Reliability of at least 95 percent within the boundaries of each Commonwealth county, as required by the contract. This means that 95 percent of the time the Delivery Audio Quality (DAQ) must be 3.4 or greater within 95 percent of the county.¹⁰⁸ According to industry standards, a 3.4 DAQ score means that, “Speech [is] understandable with repetition only rarely required. Some noise/distortion.”¹⁰⁹

The testing is conducted using a two-man dispatch team and one or multiple two-man field teams. The dispatch team includes a PSP dispatcher and a Motorola subcontractor staff member at a communications center. Depending on the size of the county, multiple two-man field teams



Source: PowerPoint presentation provided by the PSP.

in vehicles may conduct testing at the same time while they travel throughout the county. The two-man field teams include a PSP staff member who drives the vehicle and a Motorola subcontractor staff member who operates the mobile radio and a laptop computer to track their location and record the testing results.

Before a CATP test can begin, all vehicle-accessible areas of the county are divided into ½ mile by ½ mile tiles to form a grid. Inaccessible areas may include lakes or large forests. The map at the left shows the grid developed for Montgomery County. The tiles are shaded to represent the areas each field team will test. The total number of tiles is listed at the bottom right corner of the map. Inaccessible tiles during testing will be

¹⁰⁸ According to PSP and Motorola staff, a DAQ test is used for the CATP testing. Unlike other coverage prediction tests, DAQ tests use actual voice calls in both directions, talk-in and talk-out tests, to validate the prediction model. DAQ tests use a 1 to 5 scoring scale, with 5 being the best meaning that “Speech [is] easily understood.”

¹⁰⁹ Telecommunications Industry Association’s Telecommunications Systems Bulletin (TSB-88).

A Performance Audit

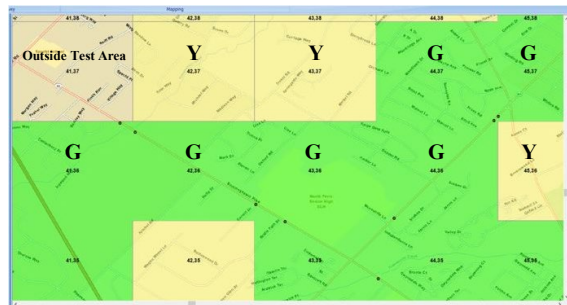
Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

subtracted from the total before the coverage percent is calculated.

The field teams travel through their assigned area and test each accessible tile. The laptop has specialized software that utilizes road maps overlaid with the constructed grid and Global Positioning System software that allows the field teams to track their progress and test results as they drive throughout the county.

The image to the right shows a laptop screen during testing. Tiles are shaded green to track tiles that passed the test (G = Green), red for tiles that failed the test (Not shown), and yellow for tiles that need to be tested (Y = Yellow). The software tracks the team's location on the grid so they can move efficiently through the test area and test every tile. While within each tile, the field team transmits a scripted verbal message to the dispatch team at the communications center. This is known as a Talk-In test. The dispatch team evaluates the transmission. If it was received clearly, the dispatch team records the tile as 'Passed'. If not, the PSP dispatcher requests the field team to repeat its message and evaluates the second transmission. If it is not clear, the dispatch team records the tile as 'Failed'. If the dispatch team never responds, the field team, during the next transmission, informs the dispatch team that they received no response for the previous tile and both teams record that tile as 'Failed'.



Source: PowerPoint presentation provided by the PSP.

For the Talk-Out test, the dispatcher's scripted response to the field team's Talk-In test transmission is evaluated by both members of the field team. They evaluate how clearly it was received. Both field team members in the vehicle must agree that the message was received with at least a 3.4 DAQ score for the tile to be recorded as 'Passed'. As with the Talk-In test, the field team may request the dispatcher to repeat the message once.

The Talk-In/Out tests are repeated in every accessible tile on the county's grid and the results recorded. Some tiles may not be accessible due to poor road conditions or vehicle limitations, or they are on private property. According to PSP management, the teams attempt to get permission to test on private property if the owner is available to ask. Inaccessible tiles are removed from the final calculation to determine the Service Area Reliability percentage. At the end of each testing day, the teams download the day's results and a report is sent to PSP management and Motorola to closely monitor the CATP testing activities. Typically, it takes two to four days to complete the testing for an entire county. After every accessible tile in the county has been tested, the overall Service Area Reliability percentage is calculated. If it is 95 percent or greater, the

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

county's testing is deemed successfully completed. If the percentage is less than 95 percent, Motorola must determine a solution to increase the coverage in the county to achieve the required coverage percentage.

PSP directly participates in the CATP testing for every county. PSP management stated that this is critical to ensure the reliability of the new LMR system in order to provide the level of safety for the public and its troopers. After the CATP testing is successfully completed and signed off for each county within a troop, PSP management signs the milestone acceptance form for Milestone 5 and Motorola can bill the Commonwealth.

Milestone 6 – Final Acceptance

After the CATP tests are successfully completed for a troop, the operational test must be conducted according to the contract. This test allows troopers to use the new LMR system in the field for day-to-day operations. The contract stipulates that all troops rolled out during the Statewide Remaining phase of the installation will undergo a 30-day operational test to ensure the system functions properly and critical failures do not occur (60-day operational tests were required for both Pilot phases). The tests begin on the 'Go Live' date scheduled for each troop by the PSP. Once the operational test is successfully completed and PSP management has verified that the acceptance forms for milestones 1 through 5 are completed and signed, the milestone 6 acceptance form is signed, signifying the final acceptance of Motorola's installation for that troop.

A Performance Audit

Governor's Office of Administration Pennsylvania State Police

Statewide Radio Network System

Appendix C

Distribution List

This report was distributed to the following Commonwealth officials:

The Honorable Tom Wolf

Governor

The Honorable Michael Newsome

Secretary
Governor's Office of Administration

The Honorable Colonel Robert Evanchick

State Police Commissioner
Pennsylvania State Police

The Honorable John MacMillan

Deputy Secretary for Information
Technology and Chief Information Officer
Governor's Office of Administration

The Honorable Major Diane M. Stackhouse

Director
Bureau of Communications and
Information Systems
Pennsylvania State Police

The Honorable Mike Regan

Majority Chair
Senate Veterans Affairs and Emergency
Preparedness Committee

The Honorable Pam Iovino

Democratic Chair
Senate Veterans Affairs and Emergency
Preparedness Committee

The Honorable Stephen Barrar

Majority Chair
House Veterans Affairs and Emergency
Preparedness Committee

The Honorable Chris Sainato

Democratic Chair
House Veterans Affairs and Emergency
Preparedness Committee

The Honorable Kristin Phillips-Hill

Majority Chair
Senate Communications and Technology
Committee

The Honorable Tim Kearney

Democratic Chair
Senate Communications and Technology
Committee

The Honorable Jen Swails

Secretary of the Budget
Office of the Budget

The Honorable Joseph M. Torsella

State Treasurer
Pennsylvania Treasury Department

The Honorable Josh Shapiro

Attorney General
Office of the Attorney General

A Performance Audit

**Governor's Office of Administration
Pennsylvania State Police**

Statewide Radio Network System

Mr. William Canfield

Director

Bureau of Audits

Office of Comptroller Operations

Ms. Mary Spila

Collections/Cataloging

State Library of Pennsylvania

This report is a matter of public record and is available online at www.PaAuditor.gov. Media questions about the report can be directed to the Pennsylvania Department of the Auditor General, Office of Communications, 229 Finance Building, Harrisburg, PA 17120; via email to: News@PaAuditor.gov.