



Maryland

Statewide Communication Interoperability Plan (SCIP)

2016

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EXECUTIVE SUMMARY

The Maryland Statewide Communication Interoperability Plan (SCIP) is a stakeholder-driven, multi-jurisdictional, and multi-disciplinary statewide strategic plan to enhance interoperable and emergency communications. The SCIP is a critical mid-range (three to five years) strategic planning tool to help Maryland prioritize resources, strengthen governance, identify future investments, and address interoperability gaps.

The purpose of the Maryland SCIP is to:

- To provide the strategic direction and alignment within Maryland's communications ecosystem for those responsible for interoperable, emergency communications at the State, regional, local, and Federal levels.
- To provide information for governmental leadership and elected officials on the vision for interoperable, emergency communications and demonstrate the need for sustainable funding.
- To recognize the unique geography of the State in which almost all counties border different states and/or the District of Columbia and tailor procedures to address the importance of interstate cooperation¹ and work with intrastate and interstate jurisdictions, as well as appropriate federal users, to promote interoperability.

The following are Maryland's Vision and Mission for improving emergency communications operability, interoperability, and continuity of communications statewide.

Vision: To have interoperable, secure, mission-critical communications programs ensuring that Maryland's public safety partners can coordinate, share information, and provide an effective and efficient response to any event or emergency incidents.

Mission: Maryland's Interoperable Communications Mission is:

- To achieve statewide, interoperable, secure, mission-critical communications through shared applications of technology, policy and procedures, and training;
- To maximize the state's communications ecosystem to provide a variety of robust, resilient and reliable interoperable systems for the purpose of providing communications interoperability for all public safety partners, and;
- To promote inter-agency cooperation and coordination to implement effective communications solutions spanning jurisdictional and organizational boundaries.

¹Only Anne Arundel, Calvert, Howard, and Talbot counties do not border another state and/or the District of Columbia. Allegany, Cecil, Frederick, Garrett, Montgomery, Prince George's, Washington, and Worcester counties border multiple states and/or the District of Columbia.

The following strategic goals represent the priorities for delivering Maryland's vision for interoperable, emergency communications.

- Governance
 - Define, establish and initiate the work of the Practitioner's Steering Committee (PSC) subcommittees
 - Revise the current Executive Order to enhance and expand capabilities of the State's interoperability office and its initiatives and consider making it law.
 - Establish a Radio Group to coordinate system updates with local entities
- Standard Operating Procedures (SOPs)
 - Establish and maintain a recurring statewide communications-related SOP / Standard Operating Guidelines (SOG) development process
 - Establish policies and a best practices clearinghouse for technology systems (e.g., body cameras, drone use, in-car video)
 - Establish best practices for mutual aid responses
 - Establish a document repository (e.g., Memorandum of Understandings (MOU), templates, Points of Contact (POC))
- Technology
 - Increase awareness and coordinating the use of nationwide interoperability channels
 - Evaluate the FirstNet State Plan for Maryland and provide opt in/opt out recommendations to the Governor
- Training and Exercises
 - Coordinate the development of regional communications-focused learning and exercises across the State
 - Develop plans to bridge the identified gaps in exercises
- Usage
 - Encourage familiarity of communications systems, interoperability technology, and emerging technologies
- Outreach and Information Sharing
 - Leverage partnerships with private sector to develop strategies / tools to incorporate cybersecurity awareness and training
 - Enhance capabilities to share communications-related emergency information in real time
 - Strengthen regional inter and intra-state partnerships and consider including additional partners as applicable (e.g., public works, critical infrastructure providers, private sector, Maryland State Department of Education, Federal agencies)
- Life Cycle Funding
 - Identify priorities and funding needed to complete initiatives

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1. INTRODUCTION

The Maryland Statewide Communication Interoperability Plan (SCIP) is a stakeholder-driven, multi-jurisdictional, and multi-disciplinary statewide strategic plan to enhance interoperable and emergency communications. The SCIP is a critical mid-range (three to five years) strategic planning tool to help Maryland prioritize resources, strengthen governance, identify future investments, and address interoperability gaps. This document contains the following planning components:

- Introduction – Provides the context necessary to understand what the SCIP is and how it was developed.
- Purpose – Explains the purpose/function(s) of the SCIP in Maryland.
- State’s Interoperable and Emergency Communications Overview–Provides an overview of the State’s current and future emergency communications environment and defines ownership of the SCIP.
- Vision and Mission – Articulates the State’s three- to five-year vision and mission for improving emergency communications operability, interoperability, and continuity of communications at all levels of government.
- Strategic Goals and Initiatives – Outlines the strategic goals and initiatives aligned with the three- to five-year vision and mission of the SCIP and pertains to the following critical components: Governance, Standard Operating Procedures (SOPs), Technology, Training and Exercises, Usage, Outreach and Information Sharing, and Life Cycle Funding.
- Implementation–Describes the process to evaluate the success of the SCIP and to conduct SCIP reviews to ensure it is up-to-date and aligned with the changing internal and external environment.
- Reference Materials–Includes resources that provide additional background information on the SCIP or interoperable and emergency communications in Maryland or directly support the SCIP.

Figure 1 provides additional information about how these components of the SCIP interrelate to develop a comprehensive plan for improving interoperable and emergency communications.

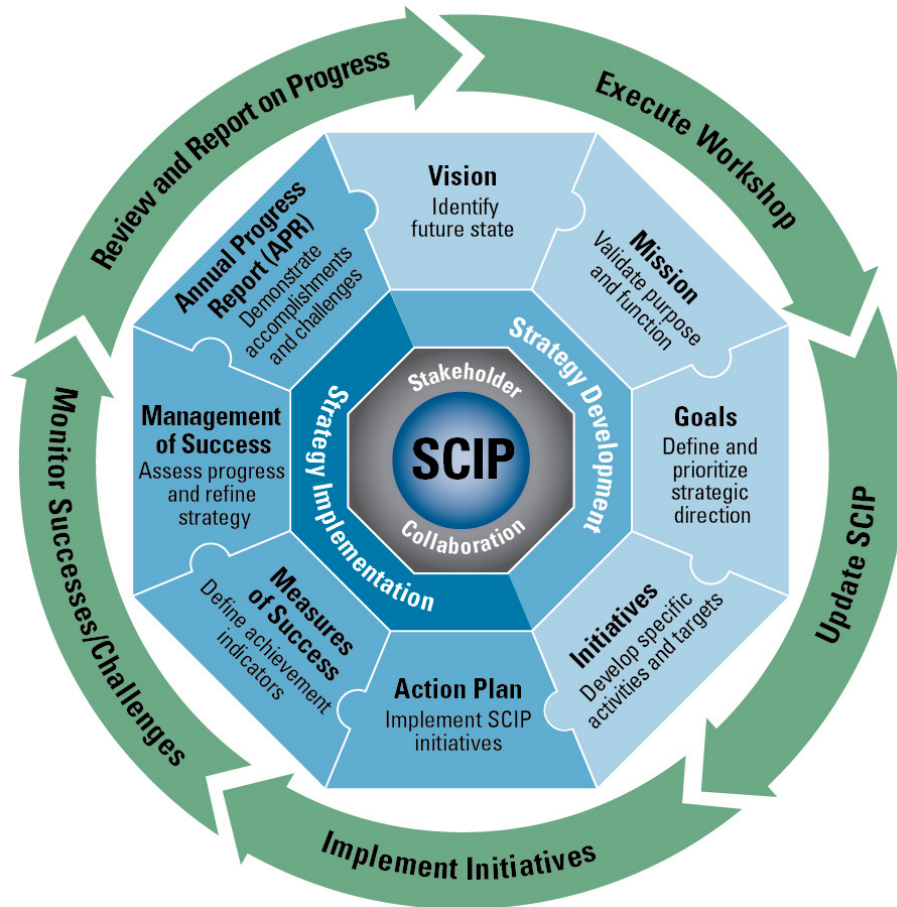


Figure 1: SCIP Strategic Plan and Implementation Components

The Maryland SCIP is based on an understanding of the current and mid-range interoperable and emergency communications environment. Maryland has taken significant steps towards enhancing interoperable and emergency communications, including:

- Creating strong interstate, intrastate, and regional coordination at all levels of government.
- Garnering executive support of emergency communications technologies.
- Development, deployment and support of new statewide systems such as the statewide Computer-Aided Dispatch and Records Management System (CAD/RMS), the Automated Crash Reporting System (ACRS), Electronic Traffic Information Exchange (E-TIX), and the Regional Automated Property Information Database (RAPID), Delta Plus, MView and Operational and Situational Preparedness for Responding to an Emergency (OSPREY), and Next Generation 911/related networks.
- Planning, development, and continuing deployment of Maryland's new statewide 700 MHz land mobile radio system.

However, more remains to be done to achieve Maryland’s vision. It is also important to note that this work is part of a continuous cycle as Maryland will always need to adapt to evolving technologies, operational tactics, and changes to key individuals (e.g., Governor, project champions). In the next three to five years, Maryland will encounter challenges relating to operability, interoperability, geography, aging equipment/systems, emerging technologies, changing project champions, and sustainable funding.

Wireless voice and data technology is evolving rapidly and efforts are underway to determine how to leverage these new technologies to meet the needs of public safety. For example, the enactment of the Middle Class Tax Relief and Job Creation Act of 2012 (the Act), specifically Title VI, related to Public Safety Communications, authorizes the deployment of the Nationwide Public Safety Broadband Network (NPSBN). The NPSBN is intended to be a wireless, interoperable nationwide communications network that will allow members of the public safety community to securely and reliably gain and share information with their counterparts in other locations and agencies. New policies and initiatives such as the NPSBN present additional changes and considerations for future planning efforts and require an informed strategic vision to properly account for these changes. Figure 2 illustrates a public safety communications evolution by describing the long-term transition toward a desired converged future.

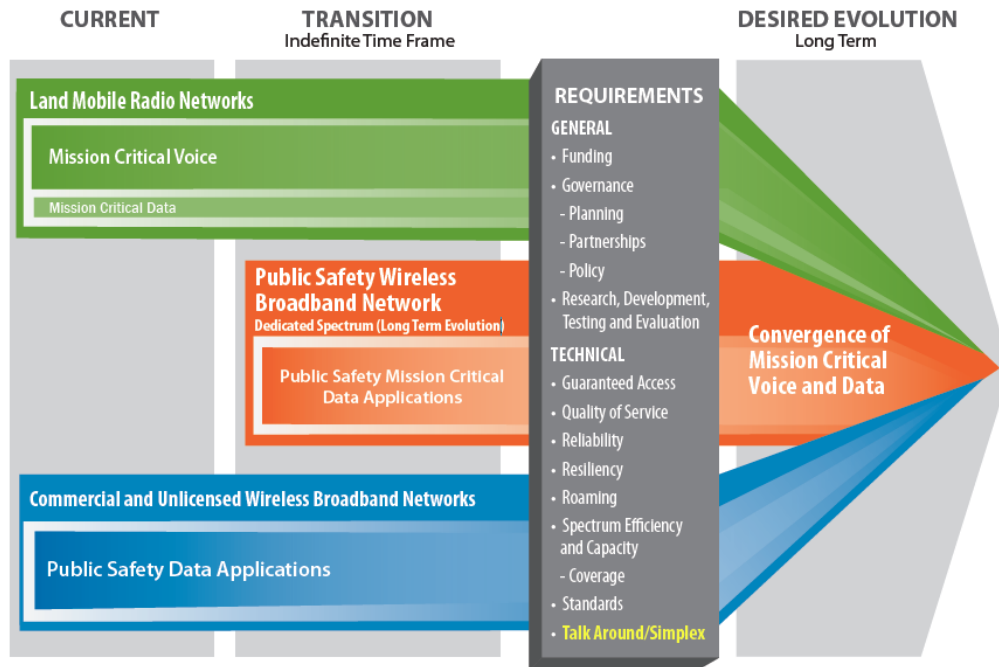


Figure 2: Public Safety Communications Evolution

Integrating capabilities such as MView, CAD to CAD interoperability, ACRS, E-TIX, RAPID, OSPREY, automatic vehicle location (AVL), CHATS, Patient Tracking and public safety broadband technologies provide an unparalleled opportunity for the future of interoperable communications in Maryland, the region and the Nation. Maryland’s public safety community recognizes that robust requirements and innovative business practices must be created for these initiatives prior to nationwide implementation. Maryland public safety organizations have developed partnerships within the region (Federal Emergency

Management Agency (FEMA) Region III) to ensure deployment of these technologies in a fully interoperable manner.

There is no defined timeline for the deployment of First Responder Network Authority (FirstNet) NPSBN; however, Maryland is keeping up-to-date with the planning and build-out of the NPSBN in the near and long-term in coordination with the FirstNet. FirstNet is the independent authority within the National Telecommunications and Information Administration (NTIA) and is responsible for developing the NPSBN, which will be a single, nationwide, interoperable public safety broadband network. The network build-out will require continuing education and commitment at all levels of government and across public safety disciplines to document network requirements and identify existing resources and assets that could potentially be used in the build-out of the network. It will also be necessary to develop and maintain strategic partnerships with a variety of stakeholder agencies and organizations at the national, State, regional, local, and tribal levels and design effective policy and governance structures that address new and emerging interoperable and emergency communications technologies. During this process, investments in land mobile radio (LMR) will continue to be necessary and in the near term, wireless data systems or commercial broadband will complement LMR. More information on the role of these two technologies in interoperable and emergency communications is available in the Department of Homeland Security (DHS) Office of Emergency Communications (OEC) Public Safety Communications Evolution brochure.²

Additionally, achieving sustainable funding in the current fiscal climate is a priority for Maryland. As State and Federal grant funding diminishes, states need to identify alternative funding sources to continue improving interoperable and emergency communications for voice and data systems. Key priorities for sustainable funding in Maryland are:

- Maryland First Responder Interoperable Radio System Team (FiRST), the statewide 700 MHz public safety radio system, which will have the ability, once completed, to provide interoperable communications on a local, regional, and statewide basis.
- Statewide and regional public safety data systems to improve fire, Emergency Medical Services (EMS), and law enforcement response to improve response to large-scale planned events and to man-made and natural disasters.
- Regional communications and data systems in high population areas providing interstate and intrastate public safety interoperable communications.
- NPSBN (FirstNet) system once implemented.

More information on a typical emergency communications system life cycle, cost planning, and budgeting is available in OEC's System Life Cycle Planning Guide.³

² OEC's Public Safety Communications Evolution brochure is available here:

http://publicsafetytools.info/oec_guidance/docs/Public_Safety_Communications_Evolution_Brochure.pdf

³ OEC's System Life Cycle Planning Guide is available here:

http://publicsafetytools.info/oec_guidance/docs/OEC_System_Life_Cycle_Planning_Guide_Final.pdf

The Interoperability Continuum, developed by SAFECOM and shown in Figure 3, serves as a framework to address all of these challenges and continue improving operable/interoperable and emergency communications. It is designed to assist emergency response agencies and policy makers with planning and implementing interoperability solutions for voice and data communications.

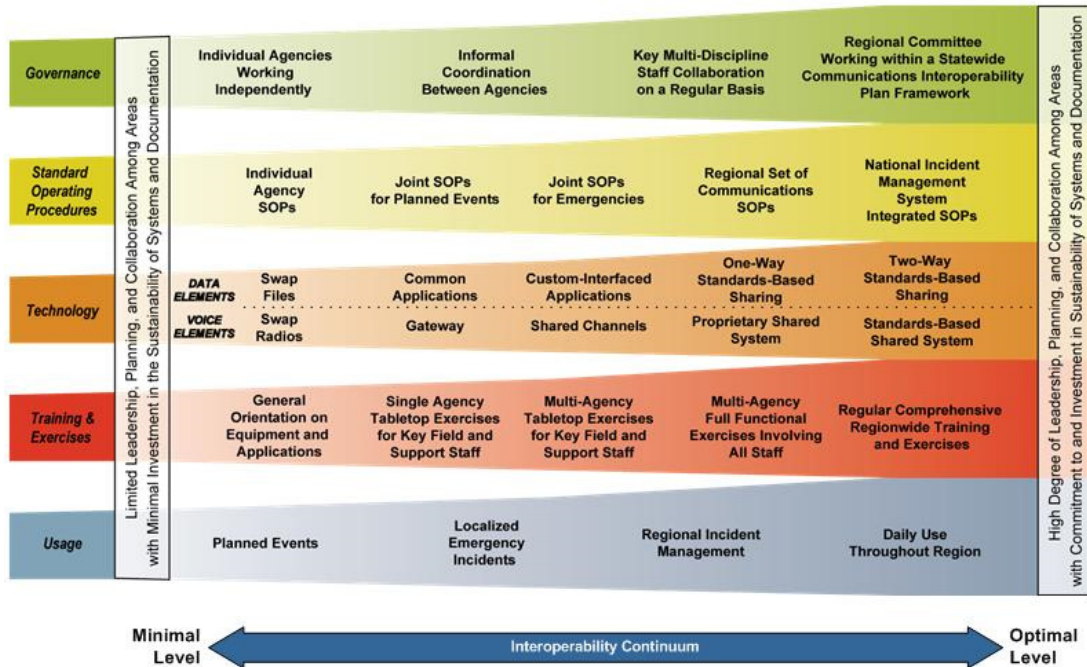


Figure 3: The Interoperability Continuum

The Continuum identifies five critical success elements that must be addressed to achieve a successful interoperable communications solution:

- **Governance** – Collaborative decision-making process that supports interoperability efforts to improve communication, coordination, and cooperation across disciplines and jurisdictions. Governance is the critical foundation of all of Maryland efforts to address communications interoperability.
- **SOPs**– Policies, repetitive practices, and procedures that guide emergency responder interactions and the use of interoperable communications solutions.
- **Technology**– Systems and equipment that enable emergency responders to share voice and data information efficiently, reliably, and securely.
- **Training and Exercises**–Scenario-based practices used to enhance communications interoperability and familiarize the public safety community with equipment and procedures.
- **Usage** –Familiarity with interoperable communications technologies, systems, and operating procedures used by first responders to enhance interoperability.

More information on the Interoperability Continuum is available in OEC's Interoperability Continuum brochure.⁴The following sections will further describe how the SCIP will be used in Maryland and Maryland's plans to enhance interoperable and emergency communications.

2. PURPOSE

The purpose of the Maryland SCIP is to:

- To provide the strategic direction and alignment within Maryland's communications ecosystem for those responsible for interoperable, emergency communications at the State, regional, local, and Federal levels.
- To provide information for governmental leadership and elected officials on the vision for interoperable, emergency communications and demonstrate the need for sustainable funding.
- To recognize the unique geography of the State in which almost all counties border different states and/or the District of Columbia and tailor procedures to address the importance of interstate cooperation⁵ and work with intrastate and interstate jurisdictions, as well as appropriate federal users, to promote interoperability.

The development and execution of the SCIP assists Maryland with addressing the results of the National Emergency Communications Plan (NECP) Goals and the Federal government with fulfilling the Presidential Policy Directive 8 (PPD-8)⁶ National Preparedness Goal for Operational Communications.⁷

In addition to this SCIP, Maryland will develop an Annual SCIP Snapshot that will be shared with OEC and other stakeholders to highlight recent accomplishments and demonstrate progress toward achieving the goals and initiatives identified in the SCIP. More information on the SCIP Snapshot is available in Section 6.4.

This SCIP is owned and managed by the Statewide Interoperability Executive Committee (SIEC). The SIEC has the authority to and is responsible for making decisions regarding this plan. The SIEC is also responsible for ensuring that this plan is implemented and maintained statewide. The SCIP is revised on an annual basis and distributed to the Practitioners Steering Committee (PSC) and other relevant stakeholders for review and

⁴ OEC's Interoperability Continuum is available here:

<http://www.safecomprogram.gov/oecguidancedocuments/continuum/Default.aspx>

⁵Only Baltimore City and Anne Arundel, Calvert, Howard, and Talbot counties do not border another state and/or the District of Columbia. Allegany, Cecil, Frederick, Garrett, Montgomery, Prince George's, Washington, and Worcester counties border multiple states and/or the District of Columbia.

⁶PPD-8 was signed in 2011 and is comprised of six elements: a National Preparedness Goal, the National Preparedness System, National Planning Frameworks and Federal Interagency Operational Plan, an annual National Preparedness Report, and ongoing national efforts to build and sustain preparedness. PPD-8 defines a series of national preparedness elements and emphasizes the need for the whole community to work together to achieve the National Preparedness Goal. <http://www.dhs.gov/presidential-policy-directive-8-national-preparedness>.

⁷National Preparedness Goal – Mitigation and Response Mission Area Capabilities and Preliminary Targets – Operational Communications: Ensure the capacity for timely communications in support of security, situational awareness, and operations by any and all means available, among and between affected communities in the impact area and all response forces.

1. Ensure the capacity to communicate with the emergency response community and the affected populations and establish interoperable voice and data communications between Federal, State, and local first responders.
2. Re-establish sufficient communications infrastructure within the affected areas to support ongoing life-sustaining activities, provide basic human needs, and transition to recovery.

input. The SCIP is then delivered to the SIEC for final review and approval and the final document is shared with the FEMA and other Region III states.

3. STATE'S INTEROPERABLE AND EMERGENCY COMMUNICATIONS OVERVIEW

Criterion 3.1: Provide an overview of the State's current and future interoperable and emergency communications environment.

In this section, provide a brief description of the interoperable and emergency communications landscape as it currently exists in the State, including governance structure, large State/regional interoperable and emergency communications systems, major funding streams, major initiatives, recent accomplishments, current challenges, and NECP Goal 2 results. Major systems should be listed in Appendix A of the SCIP.

4. VISION AND MISSION

The Vision and Mission section describes the Maryland vision and mission for improving emergency communications operability, interoperability, and continuity of communications statewide.

Maryland's Emergency Communications Vision

To have statewide, interoperable, secure, mission-critical communications ensuring that Maryland's public safety partners can coordinate resources and activities, and share information to provide an effective and efficient response to any event or emergency incidents.

Maryland's Interoperable and Emergency Communications Mission

- To achieve statewide, interoperable, secure, mission-critical communications through shared applications of technology, policy and procedures, and training;
- To maximize the state's communications ecosystem to provide a variety of robust, resilient and reliable interoperable systems for the purpose of providing communications interoperability for all public safety partners, and;
- To promote inter-agency cooperation and coordination to implement effective communications solutions spanning jurisdictional and organizational boundaries.

5. STRATEGIC GOALS AND INITIATIVES

The Strategic Goals and Initiatives section describes the statewide goals and initiatives for delivering the vision for interoperable and emergency communications. The goals and initiatives are grouped into seven sections, including Governance, SOPs, Technology, Training and Exercises, Usage, Outreach and Information Sharing, and Life Cycle Funding.

5.1 Governance

The Governance section of the SCIP outlines the future direction of the Maryland governance structure for interoperable and emergency communications. Maryland has established a governance structure that facilitates the development of a statewide, locally driven interoperability plan that meets the needs of public safety first responders.

On July 10, 2008, an Executive Order formally establishing Maryland's Statewide Interoperability Executive Committee (SIEC) and Interoperability Office was signed. The SIEC is comprised of senior elected and appointed officials from State, county, and municipal governments appointed by the Governor. The SIEC has the responsibility to provide policy-level advice regarding public safety communications interoperability and to promote the efficient and effective use of resources for matters related to public safety communications and interoperability. The order also establishes the position of Statewide Interoperability Director (SWID) who is responsible for the Statewide Interoperability Office and interoperable communications programs within the State. This position also serves as the Statewide Interoperability Coordinator (SWIC) and the Office and position is located under the Secretary of the Department of State Police.

The Practitioner Steering Committee (PSC) was established to provide recommendations and advice to the SIEC and the Governor's Office of Homeland Security (GOHS) on all matters pertaining to communications interoperability (e.g., assessment, acquisition, standardization, planning, management, use, and oversight of communications and related technology). The PSC is comprised of senior communications practitioners from all fields of public safety. The PSC established the following three permanent subcommittees that provide the subject matter expertise required to implement public safety communications and interoperability projects: 1) Administrative and Budgetary Support Subcommittee, 2) Technical Subcommittee, and 3) Operations Subcommittee. These subcommittees are being revisited as to value and need in governance and alternative/new subcommittees have been formed to identify statewide interoperability gaps, reach SCIP goals and provide recommendations to the PSC on funding and needs. The newly formed subcommittees are; Governance; Technology Policy; Planning, Training and Exercises; Radio Coordination and Operations; and Planning. These subcommittees will also be responsible for coordinating interoperable projects and system updates across the State to ensure greater interoperability among systems, identify interoperability gaps, funding needs and achieving SCIP goals.

On April 14, 2014, HB 308/SB 338 was signed creating a joint governance body, called the Radio Control Board (RCB), for the Statewide Public Safety Radio System. The governance body includes five representatives of local governments that will use the new system as well as six state representatives. The RCB oversees the building, operation, and maintenance of the Maryland FiRST system.

Maryland is also working with the other States within FEMA Region III to continue to strengthen regional communications partnerships through the implementation of Maryland FiRST and regionally available video and data systems. Maryland also continues working with other Region III states and the National Capital Region (NCR) through working groups, communications resources coordination groups, conferences,

DHS OEC meetings, the National Council of Statewide Interoperability Coordinators (NCSWIC), SAFECOM, and FEMA Region III's Interoperability Coordinator.

Table 1 outlines Maryland's goals and initiatives related to governance.

Table 1: Governance Goals and Initiatives

Governance Goals and Initiatives				
Goal #	Goals	Initiatives	Owner	Completion Date
1.1	Define, establish and initiate the work of define the Practitioner's Steering Committee (PSC) subcommittees	1.1.1 Establish work groups under PSC and identify membership and tasks	SWIC	August 2016- Completed
		1.1.2 Provide guidance on role/tasks	SWIC	August 2016- Completed
1.2	Revise the current Executive Order to enhance and expand capabilities of the State's interoperability office and its initiatives	1.2.1 Provide recommendations to the Governor's Office; update order and work with Governor's Office (e.g., term limits)	SWIC/Governor's Office	July 2017
1.3	Establish a Radio Group to coordinate system updates with local entities	1.3.1 Provide recommendations on specific work groups	Local System Owners; State Agencies	July 2017
		1.3.2 Conduct coordinated code-plug reprogramming	Local System Owners; State Agencies	July 2017

5.2 Standard Operating Procedures (SOPs)

The SOPs section of the SCIP identifies the framework and processes for developing and managing SOPs statewide. Maryland has several regional sets of SOPs for communications, including SOPs for each interoperability region in the State. The State has also put in place mutual aid agreements with neighboring states for specific events and incidents that may impact both intra- and inter-state jurisdictions. Agencies across the Eastern Shore of Maryland have mutual aid agreements with each other and with agencies in Delaware and Virginia. Maryland's counties in the NCR have mutual aid agreements with their counterparts in Washington, D.C. and Virginia, and counties in Western Maryland have mutual aid agreements with their public safety counterparts in Pennsylvania and West Virginia.

Additional work remains to identify the need for SOPs in the future. Maryland seeks to identify a formal working group to address arising SOP needs and establish a repeatable process to streamline the creation of SOPs as needed.

Table 2 outlines Maryland's goals and initiatives for SOPs.

Table 2: Standard Operating Procedures Goals and Initiatives

Standard Operating Procedures Goals and Initiatives				
Goal #	Goals	Initiatives	Owner	Completion Date
2.1.	Establish and maintain a recurring statewide communications-related SOP / Standard Operating Guidelines (SOG) development process	2.1.1 Identify need for specific SOPs/SOGs	PSC and Committees	April 2017 (for Snapshot)
		2.1.2 Establishment of a formal working group to address the needs for SOPs/SOGs, develop SOPs/SOGs, vet SOPs/SOGs, and review SOPs/SOGs as needed	SIEC	July 2017 (for Snapshot)
		2.1.3 Present SOP/SOG recommendations to the SIEC	PSC and Committees	April 2017 (for Snapshot)
2.2	Establish policies and a best practices clearinghouse for technology systems (e.g., body cameras, drone use, in-car video)	2.2.1 Coordinate with regional entities to define and develop informational content and workable practices	PSC	December 2017
2.3	Establish best practices for mutual aid responses	2.3.1 Establish communications expectations for infrequently supported, remote mutual aid locations	PSC	December 2017
2.4	Establish a document repository (MOUs, templates, POCs)	2.3.1 Assess needs for documents; identify gaps	PSC	July 2017
		2.3.2 Develop or identify secured website	MEMA	December 2017
		2.3.3 Obtain content	MEMA	December 2017

5.3 Technology

The Technology section of the SCIP outlines Maryland's plan to maintain and upgrade existing technology; the roadmap to identify, develop, and implement new and emerging technology solutions; and the approach to survey and disseminate information on current and future technology solutions to ensure user needs are met. The State's mission is to achieve statewide, interoperable, secure, mission-critical communications through shared applications of technology, policy and procedures, and training. This aspiration is currently being recognized with the acquisition/development, configuration and deployment of multiple systems, including CAD/RMS, ACRS, E-TIX, RAPID, the 700 MHz Radio System, MView, and OSPREY. There are a number of current communications systems fully operational that support the State's interoperable communications aspirations including interagency coordination of jurisdictional radio systems to enable

daily mutual aid communications, eMEDS®, DEMSTel, MESIN, CMARC, ESCA, the Statewide EMS Communications Systems, CHATS, and FRED. More information about each of these systems and others can be found in Appendix A.

Table 3 outlines Maryland's goals and initiatives for technology.

Table 3: Technology Goals and Initiatives

Technology Goals and Initiatives				
Goal #	Goals	Initiatives	Owner	Completion Date
3.1	Increase awareness and coordinating the use of nationwide interoperability channels	3.1.1 Work with local partners to identify strategic locations (State Radio System)	Radio Committee	July 2017
		3.1.2 Final SOG on how nationwide interoperability channels will be used	Radio Committee	December 2017
		3.1.3 Document who has access to the nationwide interoperability channels, who needs them, and the location of the channels	Radio Committee	December 2018
		3.1.4 Coordinate operation/use of the channels	Radio Committee	December 2018
3.2	Evaluate the FirstNet State Plan for Maryland and provide opt in/opt out recommendations to the Governor	3.2.1 Establish working group to provide recommendations to the Governor; determine skill sets needed for working group members	SPOC/SIEC	TBD 2017
		3.2.2 Determine process for evaluating the state plan	SPOC/SIEC	TBD 2017
		3.2.3 Determine decision to opt-in/opt-out	SPOC/SIEC	TBD 2017
		3.2.4 Socialize plan with stakeholders across the state	SPOC/SIEC	TBD 2017
		3.2.5 Draft response to FirstNet	SPOC/SIEC	TBD 2017
3.3	Identify opportunities to establish or improve existing communications systems (data and voice) linkages	3.3.1 Conduct stakeholder meeting(s) to enumerate known needs/gaps	IT Committee	July 2017
		3.3.2 Identify existing systems (voice and data) to which others require interoperability/access	IT Committee	July 2017
		3.3.3 Map needed/existing linkages and prioritize based on stakeholder input	IT Committee	December 2017
		3.3.4 Identify funding requirements	IT Committee	December 2017

5.4 Training and Exercises

The Training and Exercises section of the SCIP explains Maryland's approach to ensure that emergency responders are familiar with operable and interoperable communications equipment and procedures and are better prepared for responding to real-world incidents and planned events. Maryland has utilized the DHS OEC Technical Assistance Program to develop interoperability-focused training and exercise classes that are joined with the State's broader emergency response training and exercise programs. These classes build on resources, tools, and programs that already exist. These current capabilities include the Maryland Exercise and Training Integration Committee (MD ETIC), the annual Training and Exercise Planning Workshops and subsequent Three Year Exercise and Training Plan, current capability-based planning initiatives, the Homeland Security Exercise and Evaluation Program (HSEEP) to include the Corrective Action Program, and current programs to train and exercise components of the Statewide Communications System. Maryland holds workshops around the State for Project Management for Communications Systems; Standard Operations Guideline for Backup Communications; Communications Unit Leader and Technician workshops; Broadband Planning Workshops; Tactical Interoperable Communications Field Operations Guidelines; and are planning to hold workshops on Data Systems Interoperability and Communications Asset Survey & Mapping (CASM) Next Generation (NextGen) Broadband Data Collection.

Table 4 outlines Maryland's goals and initiatives for training and exercises.

Table 4: Training and Exercises Goals and Initiatives

Training and Exercises Goals and Initiatives				
Goal #	Goals	Initiatives	Owner	Completion Date
4.1	Coordinate the development of regional communications-focused learning and exercises across the State	4.1.1 Increase awareness of regional interoperability exercise programs and coordination of regional and local exercises through leveraging MEMA's training calendar	MEMA Active Learning and Exercise Branch; SIEC Operations Committee	April 2017
		4.1.2 Plan for development of COML / COMT certification process	PSC/Radio Committee	December 2018
4.2	Develop plans to bridge the identified gaps in exercises	4.2.1 Utilize After Action Reports and Corrective Action Plans to identify common themes and impact	PSC/Training and Exercise Committee	December 2018

5.5 Usage

The Usage section of the SCIP outlines efforts to ensure responders adopt and familiarize themselves with operable and interoperable emergency communications technologies, systems, and operating procedures in the State. Regular usage ensures the maintenance and establishment of interoperability in case of an incident. The number of times that interoperability is required for regional incidents varies greatly across the State and from year to year. The most frequent need for interoperability occurs during major weather events. A single fire, mass causality incident, marine incident or hunt for a fugitive could involve two, three or more jurisdictions across multiple levels of government and across multiple states based upon its location. These types of events occur daily within the state. Additionally, real-world planned events and large public safety incidents, such as major sporting events, festivals, concerts, protests, National Special Security Events (e.g., Presidential Whistle-Stop Tour and Inauguration), and large-scale incidents like the Washington, D.C. sniper attacks and Baltimore City civil disturbances remind leaders of the importance of interoperability and drive public safety agencies to continually explore and implement improvements.

Table 5 outlines Maryland's goals and initiatives for usage.

Table 5: Usage Goals and Initiatives

Usage Goals and Initiatives				
Goal #	Goals	Initiatives	Owner	Completion Date
5.1.	Encourage familiarity of communications systems, interoperability technology, and emerging technologies	5.1.1 Provide shared training best practices	PSC and Committees	December 2017
		5.1.2 Make training recommendations on usage awareness to identify gaps	PSC and Committees	December 2017

5.6 Outreach and Information Sharing

The Outreach and Information Sharing section of the SCIP outlines Maryland's approach for building a coalition of individuals and emergency response organizations statewide to support the SCIP vision and for promoting common emergency communications initiatives. Maryland has made it a priority to promote interoperable communications. At the State level, the SIEC developed an outreach component. Every locality across the State has been made aware of the importance of interoperability, as well as the statewide interoperability vision and its eventual capabilities. Additionally, a representative from each of Maryland's five interoperability regions has been appointed by the Governor to a seat on the SIEC and its workgroup, the PSC, to bring expert local perspective and input to State projects. In the past year, interoperability leadership has briefed members of the legislature, representatives from every county, every State agency involved with radio communications, and Non-Governmental Organization (NGO) representatives from every spectrum of public safety and emergency management representation. On local levels,

interoperability is addressed during joint exercises, radio committee meetings, and training sessions.

Table 6 outlines Maryland's goals and initiatives for outreach and information sharing.

Table 6:Outreach and Information Sharing Goals and Initiatives

Outreach and Information Sharing Goals and Initiatives				
Goal #	Goals	Initiatives	Owner	Completion Date
6.1.	Leverage partnerships with private sector to develop strategies / tools to incorporate cybersecurity awareness and training	6.1.1 Conduct cybersecurity education initiatives	PSC / Technology Subcommittee	July 2017
		6.1.2 Develop document on liabilities and risk for leadership	PSC / Technology Subcommittee	July 2017
6.2	Enhance capabilities to share communications-related emergency information in real time	6.2.1 Continued statewide support/promotion of existing information sharing systems	MEMA and other existing system owners (with support from State)	December 2017
		6.2.2 Expand the use of existing state notification systems for communications and radio system managers	MEMA	December 2017
6.3	Strengthen regional inter and intra-state partnerships and consider including additional partners as applicable (e.g., public works, critical infrastructure providers, private sector, Maryland State Department of Education, Federal agencies)	6.3.1 Conduct statewide interoperability forum with representation from all regional interoperability committees	PSC / SWIC; County representatives	December 2017, Annually
		6.3.2 Identify representatives for individual forums (e.g., WAGIN) to act as liaisons for the SWIC Office	PSC / SWIC	October 2017
		6.3.3 Conduct quarterly conference calls by county regions to brief out to the SWIC's Office	SWIC	October 2017; Quarterly
		6.3.4 Engage with private sector entities and amateur radio clubs	PSC/Radio Committee	October 2017
		6.3.5 Continued engagement with / participation in Federal interoperability initiatives; identify point of contacts	PSC / SWIC	October 2017

5.7 Life Cycle Funding

The Life Cycle Funding section of the SCIP outlines Maryland's plan to fund existing and future interoperable and emergency communications priorities. Funding is a major priority in the State of Maryland – primarily due to the elimination of a significant portion of federal grant funds. Specifically, Maryland has identified a need for funding to address the long-term viability of legacy regional communications systems, ongoing maintenance and system administration costs of the new statewide 700 MHz system as well as training and exercise needs. Funding for enhancements, sustainability, development and logical next steps in system integration for video integration and other data systems are also needed.

The statewide capabilities assessment survey results identified the following challenges to interoperability:

- Funding limitations
- Systems with limited interoperability capabilities
- Coordination of resources(e.g. 8CALL90 and tactical channels)
- Aging systems in need of replacement
- Insufficient availability of frequencies
- System coverage limitations
- Underutilization of mutual aid channels
- Lack of a statewide common frequency band
- Limited use of wireless data systems
- Requirement for a robust statewide infrastructure.

Table 7 outlines Maryland's goals and initiatives for life cycle funding.

Table 7:Life Cycle Funding Goals and Initiatives

Life Cycle Funding Goals and Initiatives				
Goal #	Goals	Initiatives	Owner	Completion Date
7.1	Identify priorities and funding needed to complete initiatives	7.1.1 Make recommendations to Governor for projects and required funding	PSC / SIEC	July 2017

6. IMPLEMENTATION

6.1 Action Plan

The Action Plan section of the SCIP describes the process Maryland will use to execute the initiatives in the SCIP.

6.2 Measures of Success

The Measures of Success section of the SCIP defines the measures that Maryland will use to monitor progress and indicate accomplishments toward achieving the vision for interoperable and emergency communications. Measures of success are used to meaningfully assess the outcomes and impacts of program functions and processes in meeting strategic goals. Table 8 outlines these measures for Maryland. More information on how these measures are managed is included in Section 6.3.

Table 8: SCIP Measures of Success

Measures of Success					
Goal #	Strategic Goal(s) Supported	Initial State	Target Measurement	Measure Completion Date	Owner or Source
1.1	Define, establish and initiate the work of define the Practitioner's Steering Committee (PSC) subcommittees	Completed	Creation of work groups; Roles established	August 2016	SWIC
1.2	Revise the current Executive Order to enhance and expand capabilities of the State's interoperability office and its initiatives	In progress	Approval and re-issuance by December 2017	December 2017	SWIC
1.3	Establish a Radio Group to coordinate system updates with local entities	In Progress	Provide recommendations by October 2017; Conduct coordination by December 2017	October/ December 2017	Local System Owners; State Agencies
2.1	Establish and maintain a recurring statewide communications-related SOP / SOG development process	Ongoing	Completion of identified SOP/SOG; Working Group established and operational; Recommendations delivered to SIEC	April 2017 (for SCIP Snapshot)	State/SIEC
2.2	Establish policies and best practices clearinghouse for technology systems (e.g., body cameras, drone use, in-car video)	None	Identification of policies and needed documents	December 2017	PSC
2.3	Establish best practices for mutual aid response	None	Identification of policies and needed documents	December 2017	PSC

Measures of Success					
Goal #	Strategic Goal(s) Supported	Initial State	Target Measurement	Measure Completion Date	Owner or Source
2.4	Establish a document repository (MOUs, templates, POCs)	None	Identification of documents and gaps; Identify suitable repository; Begin document population	August/October 2017	PSC/MEMA
3.1	Increase awareness and coordinating use of nationwide interoperability channels	Ongoing	Basic location identification by December 2016; Finalize SOG by December 2017; Document agencies and locations by December 2018; Active coordination and operation by December 2018	December 2017 /December 2018	Radio Working Group
3.2	Evaluate the FirstNet State Plan for Maryland and provide opt in/opt out recommendations to the Governor	None	Working Group evaluates plan and makes recommendations to the Governor	TBD 2017	SPOC/SIEC
4.1	Coordinate the development of regional communications-focused learning and exercises across the State	Ongoing	Increase awareness and outreach by 10% of exercises; Complete standards and curriculum for COML / COMT	April 2017 / December 2018	MEMA Active Learning and Exercise Branch; SIEC Operations Committee; PSC
4.2	Develop plan to bridge the identified gaps in exercises	None	By July 1, 2017, list common gaps and propose recommendations to be addressed	December 2017	PSC/Training and Exercise Committee
5.1	Encourage familiarity of communications systems, interoperability technology, and emerging technologies	None	Publish training best practices; Publish recommendations	December 2017	PSC/Committee

Measures of Success					
Goal #	Strategic Goal(s) Supported	Initial State	Target Measurement	Measure Completion Date	Owner or Source
6.1	Leverage partnerships with private sector to develop strategies / tools to incorporate cybersecurity awareness and training	None	Number of education initiatives; Develop document(s)	March 2017	PSC / Technology Subcommittee
6.2	Enhance capabilities to share communications-related emergency information in real time	Existing groups/data bases	Increase usage by 25%	December 2016	MEMA and other existing system owners (with support from State)
6.3	Strengthen regional inter and intra-state partnerships and consider including additional partners as applicable (e.g., public works, critical infrastructure providers, private sector, Maryland State Department of Education, Federal agencies)	Conduct 4 forums in 2017; Some outreach with private sector entities	5/year (Central, North, South, East, West Regions); Identification of representatives for each regional group; 50% of regions participate; 3 engagements /year; Identification of appropriate Federal agencies	December 2017, Annually / October 2017; Quarterly	PSC / SWIC; County representatives
7.1	Identify priorities and funding needed to complete initiatives	None	Recommendations submitted	December 2017	PSC / SIEC

6.3 Management of Success

The Management of Success section describes the iterative, repeatable method Maryland will follow to add, update and refine the measures of success.

Maryland will complete an annual Snapshot that will be shared with OEC. This report will provide a status check on goals and initiatives, identify successes and roadblocks to success, and will assist OEC in providing targeted services that address gaps in Maryland.

6.4 Strategic Plan Review

The Strategic Plan Review section outlines the process Maryland will use to conduct reviews of the SCIP to ensure it is up to date and aligned with the changing internal and external interoperable and emergency communications environment as well as to track and report progress against the defined initiatives and measures of success.

The SWIC will initiate the review of the current SCIP and make the initial revisions. The revised SCIP will then be sent to members of the PSC and the SIEC during a 30 day review period to collect input from all applicable stakeholders.

Maryland conducts a review of SCIP on an annual basis and updates goals and initiatives accordingly to ensure the plan is up to date and aligns with the changing internal and external interoperable and emergency communications environment.

In addition, Maryland will develop the SCIP Snapshot on an annual basis starting in 2015 and prepare for submission by the specified deadline. The State (SWIC) will collect input on the annual SCIP Snapshot submission from a broad range of stakeholders to highlight recent accomplishments and demonstrate progress toward achieving the goals and initiatives identified in the SCIP.

7. REFERENCE MATERIALS

The Reference Materials section outlines resources that contribute additional background information on the SCIP and interoperable and emergency communications in Maryland. Table 9 includes the links to these reference materials.

Table 9: SCIP Reference Materials

Title	Description	Source/Location
State Interoperability Website	The State Police is creating a web site for statewide interoperability and the Statewide Interoperability Office that lists the various activities and progress towards our goals as well as tools, interoperability products.	TBD March 2017

APPENDIX A: MAJOR TECHNOLOGY SYSTEMS

A.1 Computer-Aided Dispatch/Records Management System/Automatic Vehicle Located/Mobile CAD

The Computer-Aided Dispatch/Records Management System/Automatic Vehicle Located/Mobile CAD (CAD/RMS/AVL/Mobile) project has completed the implementation phase and has been successfully deployed at all Maryland State Police (MSP) Barracks, the Mass Transit Administration Police, Department of Natural Resources Police and the Maryland Transportation Authority Police. The cloud-based Records Management System (RMS) enables all of these agencies to share data. The RMS also relates data, and allows for any user to easily map incidents by date range, type and geographic area. A data sharing agreement allows data sharing with other county, local and out of state users of the system across the country. Several Maryland counties and municipalities have implemented the system, or have plans to implement the system, which will further expand MSP's and other State agency's data sharing benefits.

The new CAD/RMS system allows cloud based and interagency sharing and opens the way for statewide data mining and analysis as well as crime and incident mapping, predictive policing, and better resource allocation. The CAD/RMS provides an automated vehicle locator for officer safety and better resource dispatching, HAZMAT data sharing for homeland security, and address information on calls for service which will increase officer safety.

The mobile application interfaces with the existing CAD/RMS solution and allows the law enforcement forces at the various agencies to self-dispatch, update incident status and view stacked calls from mobile units. Additionally, the live location of the dispatched vehicles displays on a map at the dispatch station. Unlike most CAD/RMS systems, which are locally driven and limited to jurisdictional boundaries, the statewide CAD system provides data sharing across jurisdictional boundaries and interfaces which access state databases and other information, allowing true interoperability.

A.2 Automated Crash Reporting System

ACRS been developed within Delta Plus at the Department of State Police. ACRS is being used by all Maryland law enforcement agencies and required all crash reports to be submitted using this system by law effective January 1, 2015. All crash data is now validated, GPS coordinates are pulled from the vehicle, and crash data is reported electronically, including crashes involving commercial motor vehicles to the Federal Motor Carrier Safety Administration. This allows a faster reporting of crashes which allows Maryland to stay in acceptable reporting requirements and allows for federal funding to be made available faster to all jurisdictions. This system meets new federal crash reporting requirements and allows much greater detail on causation and other crash elements. Besides faster reporting, accurate data and detail allows for better statewide and local analysis and mapping. The National Highway Traffic Safety Administration is working with the State Police and other State partners on a pilot program using ACRS data and the statewide Fatal Accident Reporting System.

A.3 Electronic Traffic Information Exchange

Another project which has significantly enhanced the capabilities of law enforcement armed with a Mobile Data Computer (MDC) is the State's electronic citation initiative. The MSP partnered with the District Court of Maryland to bring electronic citations to law enforcement across the State. There are 120 agencies using this system and over 10,000 users, accounting for over 85% of all citation issuance in Maryland. To address the need for an electronic citation collection system, the MSP IT Division developed a Delta Plus module called Electronic Traffic Information Exchange (E-TIX). E-TIX software is capable of collecting citations, warnings and vehicle safety equipment repair orders by making use of a mobile data computer and barcode reading hardware to read the barcode information off driver's licenses and registrations. Once the information is scanned, E-TIX automatically checks it against local databases and against Maryland Electronic Telecommunications Enforcement Resource System (METERS) and National Crime Information Center (NCIC). After the Trooper adds the location of the violation and the charges, E-TIX sends the data to State Police servers and prints a copy for the violator. The entire process takes approximately three minutes. This allows officers to conduct informed traffic stops based on violator history including non-court reported contacts. The citation data can be transferred to the District Court of Maryland on a near real time basis.

Electronic citation systems such as E-TIX enable law enforcement agencies to meet ever-growing data collection and reporting requirements without compromising officer safety or effectiveness. Officers can use mobile computers, barcode scanners and printers to complete traffic stops faster while devoting more of their attention to personal safety during roadside contacts. Computer-assisted operations also provide more accurate information than manual methods, producing complete, enforceable citations that improve conviction rates, reduce court administration time and increase deterrence monitoring data. This system has decreased time on stop, increasing officer safety and increased manpower efficiency, assisted in investigations and allowed unprecedented data sharing.

A.4 Regional Automated Property Information Database

Maryland updated several laws involving the reporting of second hand property transactions and recently passed laws regulating Eco ATM systems. Statewide, there are four major areas of the industry now required to submit data: pawn dealers, precious metal dealers, scrap dealers, and vehicle scrappers – dismantlers – and recyclers. To collect these transactions, the State Police, recognizing the need for uniformity, took the lead in adopting a regional application called Regional Automated Property Information Database (RAPID) to allow dealers the ability to self-report and law enforcement to perform real time investigations. Additionally State Police, through grant funding, has provided licensing, auditing, and personnel to provide program administration and technical support. Allied agency partnerships remain a priority and so far the Maryland RAPID team continues to foster strong partnerships by training new users, adding new agencies in Maryland. Also additional users were trained in an advance class, *RAPID for Investigators*. The value in maintaining border state partnerships is to enhance further the capabilities of the RAPID system by identification of suspects who utilize statewide borders as a means to frustrate apprehension and stolen property identification/recovery.

RAPID is now linked to Craigslist and EBay and system access is shared with the National Capital Region (NCR). Pennsylvania, Delaware, West Virginia, Virginia, Washington, D.C., and all of the counties in Maryland use the system. Recently, the Carolinas, New York, New Jersey and Connecticut have expressed interest in joining.

Since 2009, the system has resulted in over \$24.9 million recovered in stolen property and over 5,628 arrests with 8,930 cases closed. Major cases, including homicides have been solved using this system, including 2 major federal cases.

A.5 MView

The state and regional CCTV program and video sharing portal, MView, provides situational awareness from Transit, Port, Stadiums, Police, Fire, EM, Parks, Schools & Universities, and Transportation using stationary, mobile, and aerial video to MCAC's Watch Center, MEMA's MJOC, DC's WRTAC, 911 and various command centers for federal, NCR regional, state, county, and municipal organizations, and public safety/1st responders users via desktop, laptop, tablets, and smartphones.

MView Stats: Video at 6870; Accounts at 2480; Organization base at 135.

New opportunities in Maryland: MView is continuing to work with **Johns Hopkins University facilities** in Maryland and DC. **MIEMSS** is working to gauge the **University of Maryland Shock Trauma's** interest in sharing into MView.

New opportunities in the National Capital Region (NCR): The **Pentagon Force Protection** division is a new organization for MView. MView was able to work with them to enable streaming video to be viewed across one of their secured networks.

Ongoing Maryland, non-NCR region:

Baltimore City PD and the Mayor's Office of Information Technology (MoIT): MView continues to add CitiWatch video with BPD and MOIT support.

Cecil County: Exploring the potential to share critical infrastructure video.

DNR: To work with DNR-Sandy Point this summer and fall in determining if MView can pull in some of their marine video.

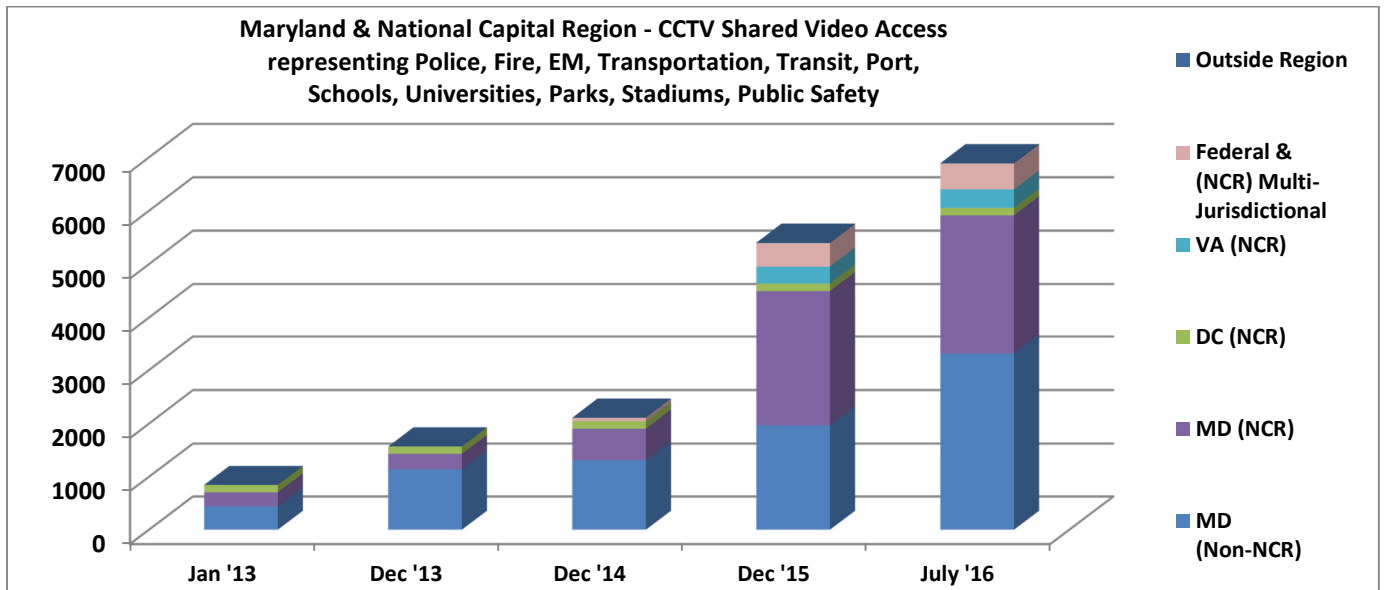
MTA: To add approx. 300+ cameras which includes several Light Rail and MARC stations that are not currently in MView.

MCPS: To add the remaining high school, Wheaton; to add floor plans over the next several months for each school

WMATA: Continue to grow their current sharable camera base [445]; discussions and interest to add over 1000+ cameras to MView.

WSSC: Continue to add cameras from their facilities as they upgrade cameras

Video Growth in MView								
Period	MD (Non-NCR)	MD (NCR)	DC (NCR)	VA (NCR)	Federal & (NCR) Multi-Jurisdictional	Outside Region	NCR CCTV Shared Access	Total CCTV Shared Access
Jan '13	441	266	140	0	0	0	406	847
Dec '13	1141	292	140	0	0	0	432	1573
Dec '14	1315	591	140	0	64	0	795	2110
Dec '15	1969	2526	142	317	442	6	3427	5402
July '16	3290	2604	140	346	484	6	3574	6870



Organizations that provide video, in outreach or in the process of providing video into MView:

Maryland State, and Non-NCR County and Local Jurisdictions:

- State Police; MEMA; Transit Admin; Stadium Authority; Port Authority; General Services; Natural Resources; State Highway; Transportation Authority; Annapolis PD; Anne Arundel Co PD/Fire/EM & DPW&T; AACC-Anne Arundel Community College; Baltimore City PD/Fire/EM & DOT; University of Baltimore; Baltimore Co PD; Carroll County, Harford Co DPW&T; Howard Co PD; Naval Academy Athletic Association; St Mary's

Maryland NCR Counties and Local Jurisdictions:

- Gaithersburg City, Montgomery Co DOT and Public Schools, M-NCPPC Parks-Planning; Prince George's Co DPWT, Police, and Public Schools, WSSC—Washington Suburban Sanitary Commission; University of MD- College Park; and assets from State Highway and Transportation Authority in the NCR

Federal &NCR Multi-Jurisdictional (MD, DC and VA):

- DHS/Federal Protective Services; US Park Police; WMATA-Washington Metro Area Transit; DDOT/HSEMA; Arlington VA-PD/EM; Fairfax City VA; VDOT-Virginia Transportation, MWAA Fire Department-Metropolitan Washington Airports Authority

Private Approved Partners (MD and DC):

- MedStar Health; Johns Hopkins outreach

Outreach - Outside Maryland and the NCR - Long-term video assets to assist in evacuation management

- Southern and Western Virginia, Delaware, Pennsylvania, and West Virginia transportation video

A.6 WebEOC

WebEOC© – Crisis management software used to document the management of incidents at the State and local levels. Any federal, State, or local agency that has a role in response operations for the State of Maryland has access to share information through this crisis management system. It gives MEMA the capability to communicate in real-time with emergency management partners, and track and record the response to an incident. WebEOC© also facilitates the development of planning products and the tracking of plan implementation.

A.7 700 MHz Radio – Maryland FiRST

The construction and roll-out of a statewide P25 700 MHz system for voice communications to be used by all authorized⁸ disciplines in State agencies is being constructed in multiple phases and, when completed, will allow first responders in every region of the State to communicate with each other using a single radio. The Maryland Transportation Authority Police and the JFK Highway barrack of the MSP went live on the system in 2012 in an area called Region 1-A. This is the Maryland Transportation Authority's (MDTA) service area and covers a portion of Central Maryland that is home to about one-third of the State's population and much of its critical infrastructure. Addition, in 2012, Kent County joined Maryland First Responder Interoperable Radio System Team (FiRST) enabling its fire, Emergency Medical Services (EMS), and law enforcement providers operate on the new system, In December 2013, the second phase of the project was turned on providing coverage for the eastern shore. In 2016, Anne Arundel, Baltimore, Cecil, Harford, and Howard cells of Maryland FiRST were completed.

Allegany, Garrett, Talbot, Caroline, and Queen Anne's counties are planning to join Maryland FiRST and other localities are also considering joining that state system as local radio systems reach end of their service life. This potential expansion of the Maryland FiRST communications system potentially impacts the capacity of the system's backhaul infrastructure which will merit an evaluation as to an appropriate means of financial support if capacity and related enhancements are required.

Maryland FiRST provides a unique capability not found in any other radio system in the State. Once completed, the system will provide local, regional, and when needed, statewide communications interoperability for all first responders including fire, EMS and law enforcement. The radio system was used extensively during the April 2015 civil unrest in Baltimore and provided superior support and capabilities not previously available to State law enforcement users. Through Maryland FiRST capable 700/800 MHz radios, the on-scene incident commanders could not only communicate with Baltimore City officials (on the City's communications' system) as needed, but had instant access to critical communications centers in State government such as the MEMA MJOC and the Maryland Institute for Emergency Medical Services Systems' (MIEMSS) Systems Communications Center (SYSCOM).

As one lesson learned, the scope of the civil unrest, which spread into Baltimore City and County, necessitated coverage greater than provided typically by a single site nationwide interoperability station repeater. To that end, the unique capabilities of the Maryland FiRST system required that some radios for out-of-state law enforcement responders be programmed with the MD CALL zone for effective interoperability. Notwithstanding the unique capabilities of Maryland FiRST, local 800 MHz National Public Safety Planning and Advisory Committee (NPSPAC) channels were also used, as coverage permitted, as another communications layer to facilitate interoperability. Because Maryland FiRST is designed to support all State government first responder agencies, interoperability with other State agencies was facilitated through the use of the MD CALL radio zone

⁸ See 47 U.S.C. §337(f)(1)(a)

programmed into every Maryland FiRST radio. This zone is the component within the system that supports regional and when necessary, statewide communications through preprogrammed talkgroups. A formalized COMU or COM T program could have assisted during this incident and is a goal that the SIEC is working toward.

In the past, Maryland FiRST was designed to support on a primary basis Project 25 (P25) Phase II communications with P25 Phase I reserved for extraordinary events. The scope of communications requirements during the Baltimore event necessitated the use of P25 Phase I operations on multiple talkgroups. A key assessment event going forward will be the consideration of expanding the pre-programming of the MD CALL zone in any law enforcement radio in the State capable of operation in the 700 MHz frequency band. Additionally, the State will explore the issues associated with pre-programming this zone into the radios of out-of-state first responders who might be called into Maryland to meet an emergency. Finally, with the necessity of using P25 Phase I during wide-scale extraordinary events, capacity impacts require re-evaluation for the Baltimore cell of Maryland FiRST.

Additionally, State agencies and many of the county jurisdictions have cooperated in the installation of a statewide digital microwave system overseen by MIEMSS. The microwave provides connectivity between the County Public Safety Answering Point (PSAP) locations and the many radio communications towers throughout the State.

A.8 Nationwide 700 and 800 MHz Interoperability Channels

A.8.1 – 700 MHz nationwide interoperability channels

As an adjunct to the development of the Maryland FiRST system, a limited number of 700 MHz nationwide interoperability channels have been planned. Pursuant to the direction of the Statewide Interoperability Executive Committee (SIEC), Maryland FiRST deployed 700 MHz nationwide interoperability channels will be controlled centrally on a statewide basis at the MEMA MJOC.

To ensure that the interoperability channels are used in a coordinated manner and to minimize the potential of interference, the SIEC has directed that any locality may apply to construct a 700 MHz nationwide interoperability repeater; however, the assignment of the resource, once constructed, must be coordinated through the SIEC and managed by MEMA⁹.

A.8.2 – 800 MHz nationwide interoperability channels

800 MHz nationwide interoperability channels have been installed through much of Maryland. The Federal Communications Commission's (FCC) Universal Licensing System (ULS) reports that there are twenty-eight licenses issues in Maryland to operate on 8CALL90, the hailing frequency used for the 800 MHz nationwide interoperability

⁹ One exception was contemplated to permit Frederick and Allegany counties to interoperate through 7TAC54 located on Lamb's Knoll Mountain.

channels. In addition to the hailing channel, 8CALL90, there are only four tactical channels authorized in this frequency band (8TAC91-94).

There is no central mechanism within or external to Maryland to control the use of the 800 MHz nationwide interoperability channels. As a result, it is not uncommon for these stations to experience interference when operating or attempting to operate. The SIEC adopted a resolution offering to manage the use of the nationwide interoperability channels through the MEMA MJOC and some localities have permitted the MJOC to control these resources. The value of centralized management was observed during the Baltimore civil disturbances when MEMA coordinated the use of the 8TAC channels between Baltimore City and the State's first responders. However, other jurisdictions have not relinquished management of these resources.

A.8.3 700 MHz Air-Ground Communications

Air to ground communications is a vital part of State government's delivery of essential support for law enforcement and emergency medical services. By previous FCC rules¹⁰, there are no public safety radio frequencies reserved for air-ground communications. In addition, air to ground communications has limitations which can affect the reliability of operations. In the rules, all air to ground radio use is deemed as "secondary" meaning that an aircraft cannot cause interference and if the aircraft radio experiences interference, there is no requirement for the cause of the interference to be corrected. The "secondary" status imposed by the FCC's rules on aircraft radio is a particular problem for the Maryland State Police as the current radios operate in the "low-band" as analog devices making them susceptible to interference from hundreds of miles away.

To strengthen air-ground communications, the State launched an effort to revise FCC rules to adopt specific 700 MHz frequencies for "primary air-ground operations to eliminate the potential for interference. Through a cooperative effort with the National Public Safety Telecommunications Council (NPSTC), a Petition for Rule Making was filed with the FCC seeking eight (8) 700 MHz frequencies reserved for primary air-ground communications. Initially the FCC issued a "waiver of its rules" to Maryland permitting the initiation of air-ground 700 MHz channels. In October of 2014, the FCC issued a Report and Order¹¹ authorizing the use of the requested frequencies for exclusive air-ground use.

Maryland has initiated a program to implement the 700 MHz air-ground channels throughout the State for use by the State Police Aviation Command for the command and control of the aircraft as well as to provide communications with emergency medical services physicians at trauma and specialty centers. A third channel has been designated for landing zone coordination, which is an important link to ensure that ground personnel can immediately alert pilots of impending dangers when landing or departing from an improvised landing zone.

¹⁰See 47 C.F.R §90.423

¹¹See FCC 14-172 issued October 24, 2014.

Air-ground transceivers have been installed in Baltimore and Salisbury with control at SYSCOM in Baltimore. An additional station in Washington County is pending. Future stations are planned to be installed in Allegany, Prince George's, and St. Mary's counties. In addition to providing support for Maryland's aircraft, radios installed in aircraft from other states will be requested to coordinate all activities while in Maryland through SYSCOM as required by the Code of Maryland Regulations (COMAR).

A.9. Regional Interoperability Operations

All of the counties and the City of Baltimore have formed regional public safety communications groups to foster interoperability with neighboring jurisdictions. The levels of functional interoperability within these regions vary based upon many factors.

A.9.1 Central Maryland Area Radio Communications Network

Central Maryland Area Radio Communications Network (CMARC) Jurisdictions - Anne Arundel, Baltimore (City and County), Carroll, Frederick Harford, and Howard

In Central Maryland, infrastructure was established (as required by the FCC) to make use of the 800 MHz Hailing and Tactical channels in support of area or sub-regional mutual aid agreements and to meet FCC requirements for communications with "itinerant users." This infrastructure is available for use by public safety or public service providers employed by a local jurisdiction in Central Maryland or by others who are involved in an incident where mutual aid communications involving portable on-street coverage is needed. This infrastructure is best used for static and not mobile incidents. Coverage is limited to the range of the repeater site activated.

Additionally, infrastructure was established to provide regional trunked/simulcast interoperable radio communications using 700 MHz frequencies. This infrastructure is available for use by public safety or public service providers employed by a CMARC jurisdiction or by others when there is a need for region-wide interoperable communications for emergency events.

A.9.2 Eastern Shore Communications Alliance

Eastern Shore Communications Alliance (ESCA) Jurisdictions - Cecil County, Kent County, Caroline County, Queen Anne's County, Talbot County, Dorchester County, Wicomico County, Worcester County, Somerset County and the Town of Ocean City

The ESCA functions as an interoperability coordinating entity for the Eastern Shore of Maryland. ESCA's Executive Committee is comprised of the Directors of Emergency Services from member jurisdictions. The organization maintains sub-committees for operations, technical and training. ESCA is responsible for maintaining and updating the regional Tactical Interoperable Communications Plan (TICP), disseminating plans, establishing training recommendations, promoting interoperability, initiating Memorandum of Understandings(MOU), promotion of interoperability testing, and reviewing interoperability related Standard Operating Procedures(SOP).

The Maryland Eastern Shore Interoperability Network (MESIN) provides for National Common Public Safety interoperability channels and is managed by Worcester County, MD on behalf of ESCA. The system consists of a Harris Network First IP solution and Harris Master III stations. Adopting a “no band left behind” approach, the system consists of Very High Frequency(VHF), Ultra High Frequency(UHF), and 800MHz stations with a total of fifteen Radio Frequency(RF) sites. The use of all national interoperability channels is coordinated by MEMA’s MJOC on behalf of ESCA. The platform provides for system-wide voting of calling channels at the MJOC with all RF channels accessible from all Eastern Shore Primary PSAPs plus the Town of Ocean City’s communications center.

A.9.3 National Capital Region and the Metropolitan Washington Council of Governments

NCR Jurisdictions - Montgomery and Prince George’s counties. Both Charles and Frederick counties also interface with the NCR jurisdictions as necessary.

Metropolitan Washington Council of Governments’(MWCOG) ongoing public safety programs include law enforcement, fire protection, 911 and disaster and emergency preparedness. These programs fall under the purview of the Human Services and Public Safety Policy Committee which is comprised of elected officials and public safety directors and managers. They provide policy direction to committees, review and approve committee reports; develop policies that are directed to the MWCOG Board of Directors for approval and resolution; and share areas of common concern on behalf of local governments.

Interoperability within the NCR is extremely challenging because it is comprised of multiple local jurisdictions and agencies found in the District of Columbia, Maryland, and Virginia. Because of the multi-state relationship of jurisdictions, as they are both members of MWCOG and are contiguous to the NCR.

A.9.4 Southern Maryland

Calvert, Charles, and St. Mary’s Counties are considered the Southern Maryland area for public safety interoperability. Interoperability within these counties has been a challenge as Calvert and Charles have used a different technology than St. Mary’s County. St. Mary’s has recently acquired a modern P25 communications system, which is interoperable with Maryland FiRST subscribers. Charles County subscribers, but not its infrastructure, are P25 capable and can interoperate with Maryland FiRST, Calvert and St. Mary’s. Charles County is about to begin a gap analysis / needs assessment as the first step in the P25 infrastructure design and acquisition. Calvert County has awarded a contract to Motorola for a Next Gen P25 system. All five of the 800 MHz nationwide interoperability frequencies are common to all three jurisdictions. They can be used when interoperability is required until a P25 platform is available in all three counties.

A.9.5 Washington-Allegany-Garrett Interoperability Network

Washington-Allegany-Garrett Interoperability Network (WAGIN) Jurisdictions – Washington Allegany and Garrett Counties

In 2008, the three Western Maryland Counties entered into a cooperative radio interoperability agreement which is known as WAGIN. Prior to the new agreement each county was operating its own radio system, but they differed so much that none of the systems could be shared in any of the other county's radios.

Due to the disparate radio systems a "Tac-Stack" radio interoperability concept was chosen. In the "Tac-Stack" concept, radio tower sites are established, each containing the National Interoperability Conventional Channels for the VHF, UHF and 800 MHz frequency bands. Each site has the "Call In" analog channel along with one "Tac" channel for each of those frequency bands. In addition, two Low Band channels are located at each site, 39.26 MHz and 47.26 MHz. These were chosen to give connectivity to MSP and State Highways units.

To control the radios at each site, an IP based solution was decided upon and the product chosen was Cisco IP Interoperability and Collaboration System (IPICS). At each of the counties' emergency communications center there is a personal computer based IPICS Console. The Consoles are connected to a dedicated server in Allegany County. Each console has access to all of the radios on the system, along with several Voice over IP(VoIP) circuits to allow to push-to-talk (PTT) communications to the other county and some State communication centers (i.e. MEMA-MJOC, the State Highway Administration's Statewide Operations Center, and the Department of Natural Resources at Sandy Point). The connectivity between the sites and the communications centers rides across the State's Public Safety Interoperability Network (PSINet).

The IPICS consoles also allow the counties to "patch" these National Interoperability radio channels to their home systems' channels or talk-groups. Operationally, when responder from outside a county's system comes to assist on an incident, that unit would "call-in" on their radio on the band in which they operate (VCALL10, UCALL40, or 8CALL90). Once recognized by a WAGIN communications center, they would be given a "Tac" channel assignment (i.e. VTAC11, UTAC43, or 8TAC92) and, if needed, that "Tac" channel could be patched to the county's operations channel or talk-group for that incident.

The sites in each county were chosen because of coverage, availability and connectivity. They were:

Allegany Co – Dan's Mountain, Martin's Mountain, Mount Savage and Westernport.

Garrett Co – Grantsville, Thayerville and Route 135.

Washington Co – Elliott Parkway. Washington County also has an additional five Tac-Stack sites control by a Motorola Motobridge with connectivity to the WAGIN system.

They are; Sideling Hill, Fairview Mountain, Md. Rt. 65 and I-70, Quirauk Mountain and Lamb's Knoll.

In May of 2015 the WAGIN system went through a hardware and software upgrade with new server and console equipment being installed along with the newest version of Cisco IPICS software being installed.

A.10. Interstate Communications Interoperability

Most of the counties in Maryland border other states and/or D.C. Many counties, such as those in the NCR, have developed sophisticated programs of public safety communications interoperability with jurisdictions in adjoining states. In addition to the NCR, other programs providing interoperability with jurisdictions in adjoining states are emerging such as those in CMARC, WAGIN, and the ESRA.

Maryland FiRST is developing programs of interoperability with adjoining public safety partners. This is particularly challenging as Pennsylvania, Virginia, and West Virginia operate systems in other frequency bands.

A.10.1 Interoperability with the State of Delaware State Police

The State of Delaware has a statewide Motorola Smartzone system with a core switch that has been recently upgraded to ASTRO25 technology as used by Maryland FiRST. The MSP have programmed into their APX radios appropriate talkgroups of the Delaware State Police barracks. The APX radios are capable of operation with Smartzone technology radios. The Delaware State Police utilize a variety of mobile and portable radios not all of which are P25 capable. Delaware fire and EMS units along the Maryland border have radios programmed to operate on the Maryland First System when responding into Kent County (a Maryland FiRST System) on mutual aid calls. Delaware's use of non-P25 radios limits the ability of these devices to interoperate with Maryland FiRST. There are system-to-system linkages between Maryland FiRST and Delaware either installed or planned for interoperability with Delaware's county cells. As Delaware acquires P25 radios, interoperability with Maryland FiRST will become more routine.

A.10.2 Interoperability with the District of Columbia

The District of Columbia has numerous ways of communication (voice, data and video). The District of Columbia operates a new Motorola ASTRO25 700/800 MHz system that is interoperable with Maryland FiRST technology. The District uses a variety of encryption programs for law enforcement which provides a layer of security when communicating between agencies. The encrypted primary dispatch and tactical talkgroups use regional shared encryption keys that are used by partner law enforcement agencies. All interoperability talk groups, including "Citywide, MA1 and MA2" are not encrypted. "Citywide" has been programmed into each MSP radio for interoperability with the Metropolitan Police Department (MPD). Additionally, all MPD and Fire and EMS Department radios' configurations include the national interoperability talkgroups/channels (800 MHz NPSPAC and 700 MHz 7CALL50/7LAW61/7FIRE63/7MED6).

Moreover, Maryland operation centers have the ability to communication via the Washington Watch and Warning System (WAWAS), Washington area system, along with the NAWAS, national system. The NCR has recently switched over to Everbridge paging system for the regional paging. Video sharing of CCTV continues to expand through the MCAC, which was funded through Urban Area Security Initiative(UASI) funding.

A.10.3 Interoperability with Pennsylvania State Police

The Commonwealth of Pennsylvania is currently in the process of planning a replacing the radio system for the State Police, which currently utilizes non-standard OpenSky technology. As a non-standard technology, OpenSky is not compatible with standard P25 operations. Motorola was selected as the vendor. Pennsylvania is migrating from OpenSky to the utilization of P25 technologies operating in both the VHF and 800 MHz bands in conjunction with evolving local government systems.

Members of the MSP Electronic Services Division and Interoperability Office have been meeting with Pennsylvania State Police (PSP) personnel to discuss interoperability issues. Today, the only means of interoperability between PSP and MSP is the use of the VLAW31 frequency (155.475 MHz). VLAW31 was the first frequency reserved for nationwide law enforcement interoperability by the FCC. MSP has a VLAW31 base station located in every State Police Barrack communication's center.

Maryland and Pennsylvania continue to meet and refine the interoperable use of VLAW31 as a short-term interoperability method and further, to monitor the Commonwealth's progress in developing their plans for longer-term strategies for interstate interoperability.

A.10.4 Interoperability with Virginia State Police

The Commonwealth of Virginia has developed the State Agency Radio System (STARS). The Virginia State Police (VSP) manage STARS and are the largest users of the system. There are a total of 21 state agencies using the STARS system. The STARS system was developed based upon two essential and interrelated components; P25 mobile radios operating in the VHF band and mobile repeaters using 700 MHz frequencies.

Because Maryland and Virginia operate in different frequency bands, interoperability must be facilitated through consolettes. Maryland has acquired (and will continue to acquire) as well as license¹² VHF control stations installed at Maryland FiRST sites close to the Commonwealth. This will allow Maryland FiRST users to appear to VSP communications' officers as a mobile user that can be activated as needed for interoperability between troopers in both states. Eventually MSP Barracks will have interoperability with VSP communications officers in the First (Richmond), Fifth (Chesapeake), and Seventh (Fairfax) divisions of the VSP.

Virginia troopers also have 700 MHz portable radios capable of operation on Maryland FiRST as well as the nationwide interoperability channels. In the future, the communications' leadership of both states will continue to discuss the appropriate strategies for linking communications for troopers operating in border areas. Maryland continues to coordinate with Virginia State Police on coordinating interoperability between the states.

¹²See WQRV585

A.10.5 Interoperability with West Virginia State Police

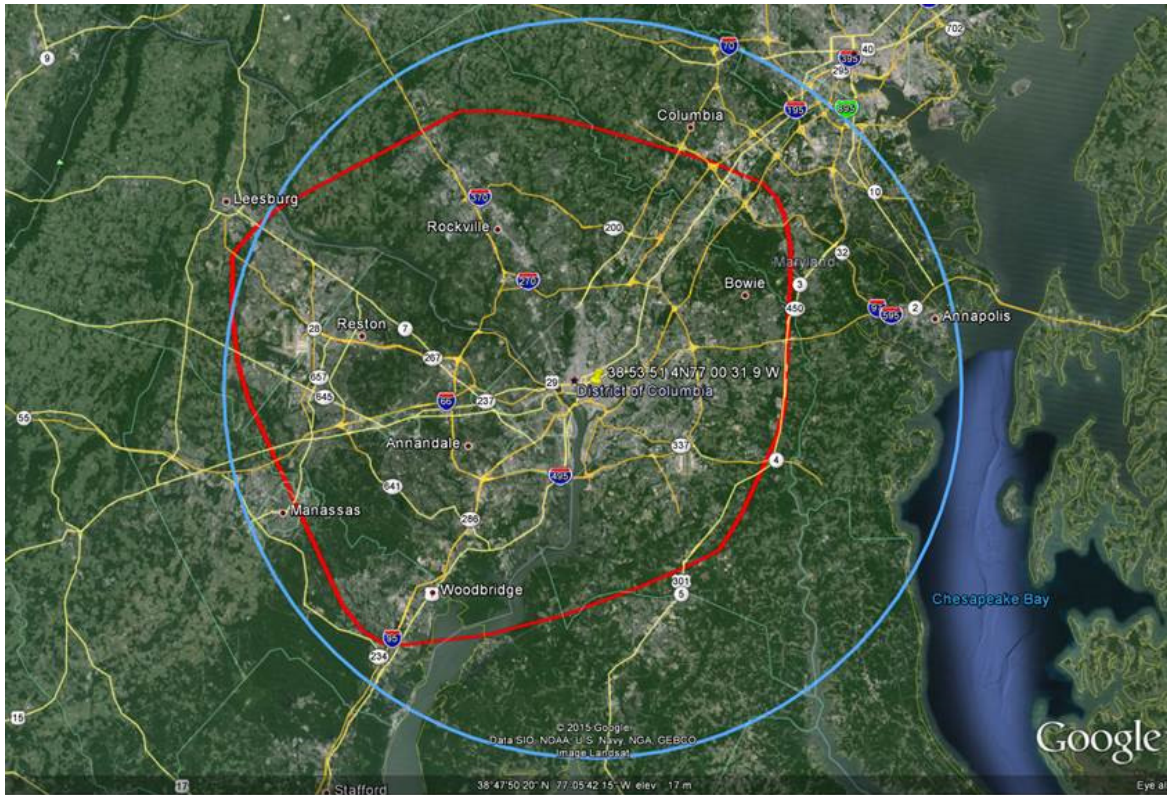
The West Virginia State Police operate in the UHF band. While the P25 technology is used, multi-band UHF/700/800 MHz radios would be required to facilitate direct communications between the two states. MSP and the West Virginia State Police have started discussions on two fronts to facilitate interoperability. As part of Maryland FiRST Phase IV, it is contemplated that a UHF interoperability station will be installed at Dan's Mountain for a communications linkage to the West Virginia State Police Barrack in Romney. This strategy is expected to provide interoperability in border areas of Allegany, Garrett, and Washington counties in Maryland and the bordering counties in West Virginia.

Like Virginia, the limitation to this strategy is that troopers in each respective state must be able to affiliate with their home systems for interoperable communications. Direct radio-to-radio communications are not available due to field operations in different frequency bands. As an interim strategy to facilitate direct simplex trooper-to-trooper communications, one strategy being explored is the use of a low-band nationwide interoperability frequency as both state police forces continue to have these radios in agency vehicles. To further this strategy, Maryland has licensed the use of the 39.46 MHz nationwide low-band interoperability channel on a statewide basis. Maryland State Police have met with West Virginia State Police and their SIEC on establishing interoperable communications between the western Maryland Counties, State Police and possibly console connectivity from facilities.

A.10.6 Washington Metropolitan Area Transit Administration

The Washington Metropolitan Area Transit Administration (WMATA) currently operates in the T-Band frequencies that will be deleted in 2021 pursuant to Congressional action. Regional Planning Committee Twenty (Region 20) has identified sixteen 700 MHz radio frequencies for WMATA that can be used in an area of thirty miles from a center point¹³ in the District of Columbia. This area will encompass the District of Columbia as well as parts of Maryland and Northern Virginia as noted in the graphic below. The proposed system will support 30 simultaneous talkpaths.

¹³See 47 CFR §90.303(b)



WMATA has proffered to the jurisdictions in the NCR that the proposed system can also be used as a regional communications overlay permitting member jurisdictions to interoperate over a wide area. Once constructed, the WMATA system should facilitate interoperability throughout the NCR.

A.10.7 Regional Interservices Channels

There are six Regional Interservice (RINS) 800 MHz radio channels assigned by the Region 20 Plan. They are for specific services to provide mutual aid/interservice channels for daily interagency communications during normal conditions with flexible use during emergencies. It is the objective of the interservice channels of this plan to foster interoperability of local, state, and federal agencies and provide interface capability for all public service radio bands of the various services.

The RINS channels are for the exclusive use by multi-agency users, multiple jurisdictions or single service users involved in inter-agency communications, both routine and emergency. Emergency traffic shall take precedence over routine traffic. These channels may be employed for large scale or extended emergency conditions. Use of the RINS channels, which have a power limitation of 15 watts, is permitted in the NCR and Southern Maryland counties as well as the District of Columbia and the Region 20 portion of Northern Virginia.

A.10.8 Fire Mutual Aid Radio System

Fire Mutual Aid Radio System (FMARS) is a regional coordination system for the use of fire mutual aid radio frequency 154.295 MHz (FMARS 1), the calling channel, and 154.280 MHz (FMARS 2), the tactical operations channel, in the metropolitan Washington area and is designed to give area fire/rescue services the capability of communications with one or more other fire/rescue services in the region although other systems are used more frequently. FMARS participants include the fire/rescue services of Alexandria, Arlington County, Fairfax County, Loudoun County, and Prince William County in the Commonwealth of Virginia; the District of Columbia; Montgomery County and Prince George's County in the State of Maryland; Washington National Airport in Arlington County, Virginia; Washington Dulles International Airport and Fort Belvoir Army Base in Fairfax County, Virginia.

The metropolitan Washington area FMARS is controlled by the Fire Chiefs' Committee of the MWCOG and operationally maintained by the Fire Communications Officers' Subcommittee. System equipment is licensed, maintained, funded and operated by participating agencies.

A.10.9 Police Mutual Aid Radio System

The Metropolitan Washington Area Police Mutual Aid Radio System (PMARS) is a regional law enforcement system designed to give law enforcement communications/emergency operations centers the ability to communicate with one or more other participating agencies. Its members include law enforcement agencies in the Metropolitan Washington area. The system is controlled by the Police Chiefs Technical Committee of the MWCOG and operationally maintained by the Police Chiefs - Police Communications Subcommittee. System equipment is licensed, maintained, funded and operated by participating agencies. PMARS control stations operate on a conventional analog transmit frequency of 851.3625 MHz and a receive frequency of 806.3625 MHz utilizing a single base station repeater located at Merrifield, Virginia and maintained by a contract with Wireless Communications, Inc. of Arlington, VA. The system uses a Continuous Tone-Coded Squelch System (CTCSS) tone of 156.7 Hz.

PMARS acts as a station-to-station radio communications network that allows participating communications/emergency operations centers to exchange both routine and emergency messages. These messages can and should be monitored by any station on the net. During non-emergency operations PMARS allows the participating agencies to relay routine notifications and requests between agencies. When used for emergency operations, PMARS serves as an alerting system that allows participating agency communications centers to inform field officers of situations where joint operations may occur.

A.10.10 Low Power 700 MHz Channels

The FCC created twelve "low-power" 700 MHz radio frequency pairs for use by first responders. Nine of these frequency pairs, which are standardized throughout the nation, are under the control of the Regional Planning Committees and three are designated for

nationwide itinerant use. Maryland has licensed¹⁴ the use of these frequencies on behalf of all State and local government first responders. These frequencies are unique in that they are limited to two watts effective radiated output (ERP) and can be used in either the digital or analog mode. They may also be used in the simplex or duplex mode. The intended use of these frequencies is for incident related on-scene communications. Through the low power restrictions, frequent frequency re-use is intended.

A.11 Interoperability with federal law enforcement and emergency officials

Pursuant to compliance with the provisions of 47 U.S.C. §337(f)(1)(a), federal law enforcement and other federal agency personnel, as authorized by statute, are permitted to operate on the Maryland FiRST system when approved by the State of Maryland Radio Control Board (RCB). Federal operations are primarily limited to law enforcement interoperability relative to the enforcement of the laws of the United States and the State of Maryland. However, in some cases, the RCB may permit primary federal agency operations on the Maryland FiRST system as subject to appropriate uses and other conditions promulgated by the RCB.

When federal agencies utilize Maryland FiRST as their primary means of land mobile communications, they must acquire subscriber radios capable of operation in the P25 Phase II mode in conjunction with radio authentication. Subscriber device identification numbers will be issued in accordance with the Regional Planning Committee Twenty (700 MHz) plan as well as all other policies and guidelines as adopted by the RCB.

A.12 Deployable 700 MHz Interoperable Trunking Radio Systems

In late 2014, the FCC issued new guidelines¹⁵ for the use of 24 700 MHz frequency pairs that had been held in reserve since the original band plan was adopted. Included in the new permitted uses was a proposal for the adoption of six to eight frequency pairs restricted to nationwide deployable trunked radio systems. Pursuant to the FCC's Report and Order, the NPSTC and the National Regional Planning Committee (NRPC) adopted 6 frequency pairs for nationwide deployable trunked radio systems. The FCC accepted the NPSTC and NRPC recommendation for the 6 deployable trunked radio frequencies. Subsequently Regional Planning Committee Twenty (700 MHz) adopted these channels within its revised Plan.

NPSTC is now in the process of developing operating guidelines for these channels. As trunked radio systems designed for deployable infrastructure on a nationwide basis, it is extremely important that radios be programmed with uniform information to permit consistent operation throughout the nation. Deployable trunked radio systems offer the potential to be important adjunct communications tools; however, to be effective, it will be essential that such use be coordinated carefully following technical and operational tests of codeplugs as well as uniform guidance from competent authorities such as a Statewide Interoperable Communications Office (SWIC).

¹⁴ See WQJU874

¹⁵ See FCC 14-172 released October 24, 2014.

With respect to the Maryland Statewide Communication Interoperability Plan (SCIP), the SWIC is monitoring the development of events associated with the deployable trunked radio technology. While the technology has merit, once Maryland FiRST is fully deployed, the primary benefit of deployable trunked radio systems to State government will be to serve as a capacity adjunct if needed. As was learned during the recent Baltimore disturbances, there is great merit in keeping communications operations simple and uncomplicated. Additionally, deployable trunked radio systems will offer restricted operating range due to the limitations on antenna height which again, suggest that the primary benefit in Maryland or localities will be to add capacity in limited geographical areas as a complement to Maryland FiRST or the local government public safety communications system.

It is also important to note that the FCC assigned these deployable channels to the Regional Planning Committees for coordination. This suggests that a Region could permit licenses to any qualifying locality. As result, there is the potential for uncoordinated use of the deployable trunked radio systems during emergencies. In addition to the technological challenges, it will be just as important for SWICs to also participate in programs of coordination not only with adjoining states, but intrastate governmental units as well. This is an issue that will be monitored by the SWIC and SIEC.

A.13 Continuing Technical Challenges to Interoperability

Although great progress is being made in Maryland in the development of first responder communications' interoperability, challenges remain. A principle goal of interoperability is that any first responder radio has the technical ability to interoperate with the communications devices of another first responder. The road to interoperability ranges from the simplest forms of communications to more complex strategies such as the P25 standard. The P25 standard permits radios produced by multiple manufacturers to interoperate within the scope of certain industry wide standards adopted by the Telecommunications Industry of America (TIA).

Currently, 20 of Maryland's jurisdictions¹⁶ employ radio systems that operate in the 700/800 MHz radio bands. Cecil County operates a system in the VHF frequency band and Washington County operates a system in the UHF band. By operating in the VHF and UHF bands, these counties have a barrier to interoperability with Maryland's other jurisdictions. Allegany and Garrett counties also have systems operating in frequency bands outside of 700/800 MHz; however, are engaged in discussions with the RCB to join Maryland FiRST.

Another barrier to interoperability is found in the fundamental communications architectures used in non-standard systems. In Maryland, the operating architecture of systems ranges from non-standard analog technology to non-standard digital technology. These are older systems that are being replaced by users migrating to the Maryland FiRST system or acquiring new independent P25 systems. Older systems incapable of

¹⁶ References Maryland's twenty-three counties and the City of Baltimore

P25 operations are found throughout the Eastern Shore and Southern Maryland. Many of these local jurisdictions have plans to acquire new P25 radio systems in the future.

Achieving interoperability with jurisdictions employing non-standard technologies is often required to meet day-to-day operating requirements. Maryland FiRST has adopted a technological approach that facilitates interoperability between its State users and local government systems employing non-standard technologies; however, the cost of such modifications is expensive. Additionally, through the practice of cross-technology patching, or the joining of non-standard and standard P25 systems through a technological patch, radio system capacity is affected on both systems as each must rebroadcast all of the radio traffic from one system to the other without regard to the importance of communications. Stated another way, routine radio traffic not necessary for interoperability is continually rebroadcast on both the standard (P25) and non-standard system.

To make progress relative to the goal of communications interoperability, it is important for the State to encourage jurisdictions with non-standard communications systems to consider the benefits of migration to P25 technology in the 700/800 MHz frequency bands. Additionally for those jurisdictions operating systems in frequency bands other than 700/800 MHz, consideration should be given to the acquisition of multi-band subscriber radios that are capable of operation on their primary frequencies as well as the 700/800 MHz systems that permeate the State of Maryland.

There are at least three manufacturers producing radios capable of operation in the VHF, UHF, and 700/800 MHz frequency bands while supporting P25 Phase II technology as used by Maryland FiRST. To facilitate a maximum level of interoperability, some counties, such as Allegany, Frederick, Garrett, and Washington might benefit from the so-called “tri-band” radio as it would facilitate communications within Maryland as well as with West Virginia to the south and Pennsylvania to the north of their jurisdictions. The UHF band is commonly employed in West Virginia while in Pennsylvania, all frequency bands are used for public safety communications.

A.14 Communications Security

There has been a continual migration to encrypted communications in the recent Maryland history. Encryption uses various strategies to make communications unintelligible to persons monitoring communications. Additionally, new technologies have been adopted that provide greater security and prevent unauthorized radios from affiliating with radio systems. While security measures for public safety communications are a positive development, each comes with unique requirements that can adversely affect interoperability. The technologies in this section all come with positive and negative operational aspects that merit very careful review as relates to interoperability.

A.14.1 Encryption

Encryption permits radio users to utilize various algorithms which have the effect of preventing unencrypted radios from the ability to decipher radio communications. While a very appropriate tool when needed by first responders, the utilization of encryption

comes with myriad technological and operational challenges. It also engenders complaints from citizens and members of the news media who believe that there is a fundamental right of citizens to monitor public safety communications.

As encryption has evolved over the years, multiple forms of the technology have been developed and varieties of the product are in use throughout Maryland. The ability to use encryption is also affected by the technological level of the jurisdiction's radio system. The so-called "gold-standard" for encryption is the Advanced Encryption System (AES) technology found in advanced standard P25 systems such as Maryland FiRST. AES is the only encryption technology approved by the Department of Homeland Security as older previous forms of encryption have flaws allowing unauthorized deciphering.

Because some jurisdictions have adopted older forms of encryption, or began using encryption before AES was available, the State and some other jurisdictions have been required to expend additional funds for radios that can support multiple encryption technologies. In addition to cost, this adds complexity to radio system programming and when encryption keys must be changed, it is a serious challenge to reprogram every radio requiring the new key; particularly those operating on a statewide or regional basis. In an emergency requiring users from multiple jurisdictions to come into a locality experiencing the extraordinary event, the further complexity of encryption becomes another issue of consideration as first responder radios from outside of the affected jurisdiction may not be capable of encrypted operations using the technology of the affected locality.

The use of encryption is a local decision based upon the needs of the jurisdiction's first responders. However, in the event of an extraordinary emergency requiring out of jurisdiction resources, encryption becomes an issue mandating significant pre-planning. The SIEC will be monitoring the deployment of encrypted systems and as necessary, assisting in the development of strategies to use encryption without negatively affecting interoperability.

A.14.2 Radio Authentication

One of the challenges faced by many jurisdictions is the unauthorized reading and duplication of a trunked radio system codeplug. The codeplug contains the essential programming parameters of the radio and when uncontrolled, it has not been uncommon for some technicians to duplicate codeplugs and install them in radios not authorized for operation within a system.

There is a P25 standard called "radio authentication" which determines that a radio is authorized to operate on the radio system. Radio authentication is used with Maryland FiRST and can be differentiated to permit an itinerant radios to use the system for interoperability while managing routine use more precisely.

A.14.3 Advanced System Key

Advanced System Key or as commonly known, "ASK¹⁷" is a technology used by certain manufacturers to minimize the possibility of unauthorized radio programming. ASK

¹⁷ Advanced System Key

requires that a “hard key,” typically a thumb-drive device, be installed within a computer when programming a radio. Without the hard-key, a radio cannot be programmed with files protected by the ASK.

While the ASK may preclude some cloning, experienced technicians may devise methods to improperly “clone” a radio’s programming. There are also companion technologies to identify multiple radios using the same identification number at the same time which alerts a system operator to the potential of an authorized radio on a system.

Like radio authentication and encryption, ASK, while helpful in managing system access and operation, also presents problems during an emergency when radios must be programmed. As an example, had Maryland troopers been required to go into another State in response to an emergency, technicians from Maryland would have been also required to provide the Maryland “hard-keys” which would allow new programming to be added to a Maryland FiRST radio. The State Radio Control Board recently approved use of a soft key for non-state users to make the task of reprogramming and updates easier and faster.

A.15 Inter-RF Sub-System Interface

An evolving technology is the Inter RF Sub-system Interface (ISSI) which is an emerging P25 technology designed to permit high level system sharing. The ISSI technology can facilitate interoperability by allowing one P25 system to “roam” onto another P25 system provided that each system has been upgraded to support the use of the ISSI technology and appropriate administrative agreements are in place. Additionally, there are licensing fees that must be paid to one or more manufacturers depending upon the type of ISSI implementation.

While the ISSI technology provides the promise of extending the operation of systems through affiliation with other compatible P25 systems, there are technical limitations. There are no P25 standards for the extension of data functionality through the ISSI. This may affect emergency radio location identification, radio disablement, radio ID and other features that are transmitted through the data function of a P25 system. It is unknown if the TIA, the developers of the P25 standard, have any plans to add data functionality through the ISSI.

Two trials of the ISSI technology are scheduled for 2018. Fairfax and Prince William County will be testing the technology starting in the summer of 2015 and Maryland FiRST and Prince George’s County will launch a test in the fall of 2015. With respect to Maryland FiRST and the Prince George’s test, a primary focus will be the impact of the technology as it affects State agency operations. One of the major lessons learned through the implementation of Maryland FiRST is that the major State agencies can have different protocols for operation and system modifications are occasionally required to support the operations of agencies.

Unique capabilities may relate to something which seems to be as simple as first responder scanning. As an example, in the deployment of Maryland FiRST, scanning has been a major issue in certain areas and limited the implementation of the system until work-arounds were developed to meet functional agency requirements. Public Safety

agencies, such as the MSP, desire the ability to scan their radios not only for intra-county situational awareness, but also require awareness of events occurring in adjoining Barracks. Because affiliation/de-affiliation is continually required when scanning, it is unclear as to how use of the ISSI technology will impact daily operations within the State Police.

State officials also require wide-area communications that may extend to a statewide operation. On the native Maryland FIRSt system, this is not a challenging requirement. However, it is unclear how the ISSI will support the important MD Call radio zone which was used extensively during the recent Baltimore unrest.

A.16 OSPREY

In 2014, Maryland updated its State Geographic Information System (GIS) mapping data system called Operational and Situational Preparedness for Responding to an Emergency (OSPREY). OSPREY uses GIS and data sharing technologies to provide public safety and emergency managers with a variety of tools to monitor and manage emergencies. It was used extensively during the 2011 earthquake to monitor regions without power as well as to show flooding during the aftermath of Hurricane Irene. A public view was placed in service in time for both of these events (<http://mema.maryland.gov/current/Pages/Osprey.aspx>).

A.17 eMEDS®

eMEDS® (electronic EMS Data System) is a pre-hospital emergency data collection, analysis and reporting system that integrates information across the entire EMS community in Maryland. eMEDS® provides patients data collection and provides electronic transport of information to other systems (included hospitals and specialty centers) and agencies to improve communications and to share pertinent information. The system operates near real-time and track system activity (such as tracking heat emergencies during periods exceptionally hot summer weather) and can support syndromic surveillance.

A.18 CHATS

The CHATS (County Hospital Alert Tracking System) system is the central hub for EMS providers, 911 centers, and hospital users to visualize hospital diversion status. The State of Maryland utilized a statewide hospital diversion model made of up at least four general diversion alerts and additional specialty diversion alerts for tertiary referral centers. The four alerts identify varying levels of hospital capacity and capability and inform EMS providers on the need to divert certain patients to more capable facilities.

The public dashboard is not password protected and is viewable to anyone with an internet-connected device. From this page users can perform three functions:

- Visualize the current status of all hospitals.
- Visualize the status of county-based “blue alert”.
- Run historical statistical reports on hospital diversion.

A.19 FRED

FRED (Facility Resource Database System) is a mass notification and data collection system. The system provides a mechanism to request and collect information on pre-hospital and hospital inventory and resources to assist in responses to significant event including mass casualty incidents. This includes automatic notifications through email and text messaging.

Additionally, FRED also contains an embedded Mass Notification System (MNS). The MNS provides the capability to send abbreviated messages to all stakeholders associated with the Maryland EMS System. Messages may be initiated by administrative staff at MIEMSS or through an automated trigger generated by the CHATS module in certain instances (e.g. Mini-Disaster notification). Messages are distributed to recipients through a combination of email, SMS/Cell Phone, and notifications to users logged into the HC Standard application on their desktop computer (e.g. Hospital EDs or 911 Centers). The MNS is utilized to send both emergency and routine communications to EMS System stakeholders. Recipients may include but are not limited to: EMS Jurisdictions, Hospitals, Emergency Management Agencies, Public Health Departments, State Government Officials, MIEMSS, and Out of State Partners in DC and Northern Virginia.

A.20 Digital EMS Telephone

Digital EMS Telephone (DEMSTel), a Voice over IP (VoIP) system, is an application that runs on the private Public Safety Interoperability Network (PSINet) permitting multiple public safety and allied agencies to communicate during routine and emergency events. DEMSTel phones are deployed into EMRC/SYSCOM, jurisdictional PSAP (Police, Fire and EMS) Centers, emergency operation centers (EOCS), hospitals, health departments, MEMA, Maryland State Police Barracks and Hangers, State Highway Administration, offices of select key officials, Amtrak, and other allied agencies. This system operates on the Public Safety Interoperability Network (which operates on the PSINet) and functions independently of the public switched telephone network (PSTN) and commercial wireless carriers.

A.21 Independent Jurisdiction Radio Systems

Most of Maryland's 24 jurisdictions operate their own radio systems. MOUs existing between most to share radio system access to channels or talk groups for use during mutual aid response (Fire, EMS and Law Enforcement) into nearby jurisdictions. These MOUs provide interoperability while is used on a daily basis. Some jurisdictions have handshake agreements (or provisions in the MOU) to share access to each other's system during system outages.

A.22 EMS Communications System

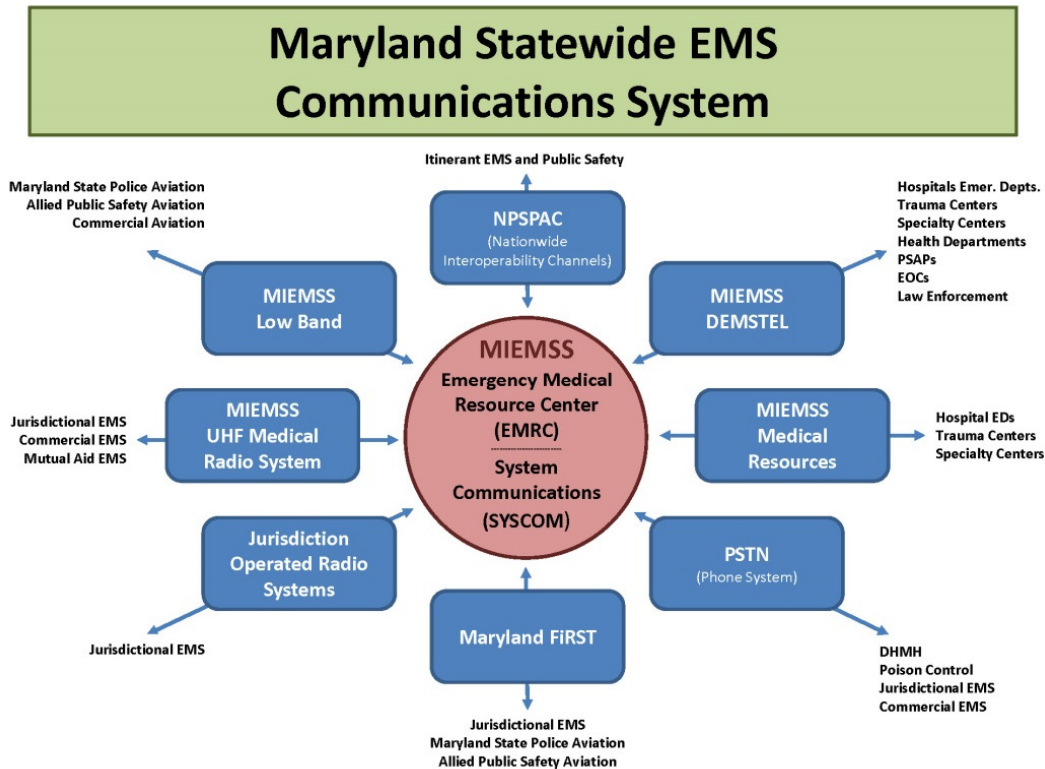
The EMS Communications System is an essential component of Maryland's statewide EMS system, enabling voice and data linkages between emergency departments, trauma and specialty hospitals, field EMS providers, and Maryland State Police helicopters. It is a complex network that ties together all components of the emergency care system so that seamless, rapid, and reliable communications can be completed to ensure that

patients along the entire continuum of care receive the most appropriate life-saving interventions in the field, are transported to the most appropriate facility, and that hospitals are prepared to provide timely care to patients with trauma, heart attacks, strokes, and other time critical conditions. The EMS communication system also links to public health and emergency operations centers supporting system coordination during major public health incidents, mass casualty incidents, or disasters.

Communications occur through three operational centers, located in Baltimore (SYSCOM and EMRC), Talbot County (EMRC) and Allegany County (EMRC), and the actual voice and data communications are transmitted via radios, radio towers, microwave and fiber connections, supporting equipment and hardware located throughout the State.

This statewide EMS Communications System is a true interoperability solution which brings together a number of communications systems (utilizing gateways, proprietary share shared systems, and standards-based shared system) to permit effective life-saving communications across the state involving state and local government agencies, healthcare institutions and both commercial and jurisdiction public safety agencies/providers. The communications systems supporting Maryland's EMS System include (see the Maryland Statewide EMS Communication Systems graphic below):

- MIEMSS Low Band – Supports Maryland State Police Aviation, Allied Public Safety Aviation, and Commercial Aviation
- MIEMSS UHF Medical Radio System – Supports Jurisdictional EMS, Commercial EMS. and Mutual Aid EMS
- Jurisdiction Operated Radio Systems – Supports Jurisdiction EMS
- Maryland FiRST – Supports Jurisdictional EMS, Maryland State Police Aviation, and Allied Public Safety Aviation
- PSTN (Public Switch Telephone Network)– Supports Maryland Department of Health and Mental Hygiene, Poison Control, Jurisdictional EMS, and Commercial EMS
- MIEMSS Medical Resource – Supports Hospital Emergency Departments, Trauma Centers, and Specialty Centers
- MIEMSS DEMSTel (Private VoIP Phone System) – Supports Hospitals Emergency Departments, Trauma Centers, Specialty Centers, State and Local Health Departments, PSAPs, State and Local Emergency Operations Centers (EOCs), and Law Enforcement
- NPSPAC (Nationwide Interoperability Channels) – Supports Itinerant EMS and Public Safety



A.23 Licensure System

The Licensure System is a registry containing the licensure and certification data on Maryland's 27,000 Emergency Medical Services providers – Paramedic, Cardiac Rescue Technician (CRT), Emergency Medical Technician (EMT), and Emergency Medical Dispatcher (EMD). This web-based system is designed to manage all EMS education, licensing, and certification activities of EMS providers in Maryland. There is a secure public portal allowing providers to login to access and manage their information as well as permitting jurisdictional administrators to access provider information and produce run provider and jurisdictional reports. The system synchronizes provider data with State's electronic patient care reporting system, eMEDS[®]. Additionally, it exchanges provider data with the National Registry of Emergency Medical Technicians (NREMT) and International Academies of Emergency Dispatch (IAED).

A.24 Next Generation 911 Status

The Maryland Emergency Number Systems Board is developing a requirements document that may be used in a RFP for an ESINet and call routing. The Board and the counties have not yet decided if this will be a statewide RFP issued by the Department of Public Safety and Correctional Services or the Department of Information Technology, or will be done by the counties individually or regionally. The Board is working with the Metropolitan Washington Council of Governments 911 Directors' Committee on an RFP

issued by Fairfax County for NG911. Additionally, there are two tariffed offerings in Maryland (West Public Safety and Airbus DS Communications) which may provide an alternative to an RFP. The Board is moving forward with the process in a thoughtful and deliberate manner.

APPENDIX B: LIST OF ACRONYMS

ACRS	Automated Crash Reporting System
AES	Advanced Encryption System
ASK	Advanced System Key
AVL	Automatic Vehicle Located
CAD	Computer-Aided Dispatch
CASM	Communications Asset Survey & Mapping
CCTV	Closed-Circuit Television
CHATS	County Hospital Alert Tracking System
CMARC	Central Maryland Area Radio Communications System
COMAR	Code of Maryland Regulations
COML	Communications Unit Leader
COMT	Communications Unit Technician
CTCSS	Continuous Tone-Coded Squelch System
DEMSTel	Digital Emergency Medical Services Telephone System
DHS	U.S. Department of Homeland Security
EM	Emergency Management
EMRC	Emergency Medical Resource Center
EMS	Emergency Medical Services
ESCA	Eastern Shore Communications Alliance
E-TIX	Electronic Traffic Information Exchange
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FiRST	First Responder Interoperable Radio System Team
FirstNet	First Responder Network Authority
FMARS	Fire Mutual Aid Radio System
FRED	Facilities Resource Emergency Database
GIS	Geographic Information Systems
GOHS	Governor's Office of Homeland Security
GPS	Global Positioning System
HSEEP	Homeland Security Exercise and Evaluation Program
IPICS	Cisco IP Interoperability and Collaboration System

ISSI	Inter-RF Sub-System Interface
LMR	Land Mobile Radio
MACINAC	Mid-Atlantic Consortium for Interoperable Nationwide Advanced Communications
MCAC	Maryland Coordination and Analysis Center
MD ARNG	Maryland Army National Guard
MDC	Mobile Data Computer
MD ETIC	Maryland Exercise and Training Integration Committee
MDTA	Maryland Transportation Authority
METERS	Maryland Electronic Telecommunications Enforcement Resource System
MEMA	Maryland Emergency Management Agency
MESIN	Maryland Eastern Shore Interoperability Network
MHz	Megahertz
MIEMSS	Maryland Institute for Emergency Medical Services Systems
MJOC	Maryland Joint Operations Center
MOU	Memorandum of Understanding
MPD	Metropolitan Police Department
MSP	Maryland State Police
MWCOG	Metropolitan Washington Council of Governments
NCIC	National Crime Information Center
NCR	National Capital Region
NCSWIC	National Council of Statewide Interoperability Coordinators
NECP	National Emergency Communications Plan
NextGen	Next Generation
NG911	Next Generation 911
NIMS	National Incident Management System
NGO	Non-Governmental Organization
NPSBN	Nationwide Public Safety Broadband Network
NPSPAC	National Public Safety Planning and Advisory Committee
NPSTC	National Public Safety Telecommunications Council
NRPC	National Regional Planning Committee
NTIA	National Telecommunications and Information Administration

OEC	Office of Emergency Communications
OSPREY	Operational and Situational Preparedness for Responding to an Emergency
P25	Project 25
PMARS	Police Mutual Aid Radio System
POC	Point of Contact
PPD	Presidential Policy Directive
PSAP	Public Safety Answering Point
PSC	Practitioner Steering Committee
PSINet	Public Safety Interoperability Network
PSP	Pennsylvania State Police
PTT	Push-To-Talk
RAPID	Regional Automated Property Information Database
RCB	Radio Control Board
RF	Radio Frequency
RINS	Regional Interservices Channels
RMS	Records Management System
RPC	Regional Planning Committee (20, 28, 36, 42, 44 = FEMA Region III)
SCIP	Statewide Communication Interoperability Plan
SIEC	Statewide Interoperability Executive Committee
SOG	Standard Operating Guideline
SOP	Standard Operating Procedure
SPOC	State Point of Contact
STARS	State Agency Radio System [Virginia]
SWIC	Statewide Interoperability Coordinator
SYSCOM	Systems Communications Center
TIA	Telecommunications Industry of America
TICP	Tactical Interoperable Communications Plan
UASI	Urban Area Security Initiative
UHF	Ultra High Frequency
ULS	Universal Licensing System
USPP	U.S. Park Police
VHF	Very High Frequency

VoIP	Voice over IP
VSP	Virginia State Police
WAGIN	Washington-Allegany-Garrett Interoperability Network
WAWAS	Watch and Warning System
WMATA	Washington Metropolitan Area Transit Administration
WRTAC	Washington Regional Threat Analysis Center