MARYLAND STATEWIDE COMMUNICATIONS INTEROPERABILITY PLAN

2015

EXECUTIVE SUMMARY

The Maryland Statewide Communications 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. It should be considered a living document and is updated annually. For the purposes of this plan, interoperable communications includes but is not limited to traditional land mobile radio systems, broadband based systems, next generation 911, data interoperability, video interoperability, applications, systems and other forms of public safety communications.

The purpose of Maryland's SCIP is:

- To provide the strategic direction and alignment within Maryland's 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 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 cooperation[1] 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: Continue the development and implementation of statewide and local systems that will support communications interoperability and will facilitate real-time communications and data sharing across agencies, jurisdictions, levels of government, and ultimately, across State boundaries. Interoperable communications will ensure that Maryland's public safety providers can coordinate with one another, share information, and provide a coordinated response to any event or emergency.

Mission: Maryland has developed and implemented a series of technical solutions that provide secure, coordinated, real-time voice, video and data communications able to span jurisdictional and organizational boundaries. The aim of these efforts is to:

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[1] Only 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.

- Facilitate central command and control of State and local government communications as required to support multiple emergencies and coordinate the deployment of emergency services from federal, state, out-of-state, and local resources.

- Augment local government communications resources in major population areas through the implementation of a statewide public safety communications system that provides redundancy for local government communications systems.

- Serve as an interoperable communications infrastructure linking federal, State, and local government communications, when needed, for public safety agencies as well as governmental and non-governmental resources supporting disaster relief.

- Provide unique statewide and regional wide-area interoperable communications capabilities when necessary to meet extraordinary emergencies affecting multiple local jurisdictions.

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

- **Governance** –

  - Strengthen existing local, regional, and interstate partnerships and consider including additional stakeholders as applicable (e.g., IT, CIOs, critical infrastructure, non-governmental agencies, and federal agencies).
  - Work with the Radio Control Board and local governments to ensure Maryland FiRST is able to continue deployment, complement/integrate regional radio communication networks, and provide operational support and maintenance.
  - Establish subcommittees of SIEC to focus on technological issues, outreach, users, coverage, business models, policies and operations.
  - Participate in FirstNet meetings and federal-state-local contact events to provide comprehensive input as to Maryland's first responder requirements and desired levels of operations; e.g. FirstNet coverage, capacity, governance, prioritization of service, etc.
  - Work with regional and local consortiums, federal agencies such as CMARC, ESCA, WAGIN, OEC, DHS, FEMA and the National Capital Region to ensure a cohesive plan, avoid duplication of efforts and ensure effective coordination.

- **Standard Operating Procedures (SOPs)** –

- Establish and maintain a continuous statewide process that incorporates Standard Operating Guidelines (SOG) and best practices recommendations and keeps them contemporary.

- Coordinate with the National Capital Region to ensure cohesive operations with first responders not only in Maryland but also from the District of Columbia and the Commonwealth of Virginia.

- Address the unique territorial geography challenges of Allegany, Frederick, Garrett, Washington, and Worcester Counties, each of which is bordered by multiple states, to develop SOPs that recognize the natural interdependence upon out-of-state resources.

- Establish extraordinary communications command and control protocols for events involving multi-jurisdiction and interstate first responder resources.

- **Technology and Training** –

  - Coordinate and assist in the development, implementation and sustainment of emergency communications technology across the State to include funding support.

  - Develop and identify practical exercises with federal-state-local partners that realistically test interoperable communications at State-local, State-regional and interstate levels.

  - Work with the Department of Homeland Security, Technical Assistance Program to continue emergency interoperability communications training courses in Maryland.

- **Usage** –

  - Encourage local, State, and interstate support of interoperable public safety communications systems and technology.

  - Enhance exiting capabilities and identify new opportunities to share communications-related emergency information in real time.

  - Work to implement the Nationwide Public Safety Broadband Network (NPSBN), also known as FirstNet, for all Maryland First Responders Emergency Management, and appropriate non-governmental organization partners.

o Plan for nationwide interoperability communications stations in areas where multiple jurisdictions and/or states can access coverage[2].

o Conduct operational tests and exercising of relevant technologies to ensure that first responders can utilize systems effectively during periods of an emergency or extraordinary event.

- **Outreach and Continued Operations** –

    o Organize outreach efforts and familiarization/publicity materials in support of interoperable systems and technology in the State of Maryland.

    o Identify and provide access to critical radio channels across agency and county lines in partnership with local jurisdictions and other mutual aid partners.

    o Work with State, federal, and local law enforcement, fire and emergency medical services, allied public safety organizations, the Departments of Budget and Management, State Police, Information Technology, the Governor's Office, and the General Assembly to ensure that interoperable communications systems and technology in the State continues to receive funding for deployment as well as operational support and maintenance.

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[2] 7TAC54 at Lamb's Knoll, as an example, can support first responders in Frederick and Washington counties in Maryland as well as users in the adjoining counties in Pennsylvania and Virginia. The focus of other new stations might be the Delaware-Maryland border where there is extensive interoperability.

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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 improve public safety voice, data, video communications by implementing standards-based, interoperable communications technologies. 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. It should be considered a living document that is updated annually. 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.

- Scope – Identifies the governmental and non-governmental entities for which the SCIP is written.

- Vision and Mission – Articulates the State's three- to five-year vision and mission for improving emergency communications operations, interoperability, and continuity of communications at all levels of government.

- Governance and SOPs – Outlines the governance structure and the operating procedures developed, or in development, in support of statewide communications interoperability.

- Technology – Describes the statewide and other interoperable communications systems currently in use across the State

- Usage and Funding – Explains how usage of the various systems is both measured and encouraged, and how systems are funded to provide continued use by law enforcement and public safety teams statewide.

- Reference Documents – Includes documents that provide additional background information on the SCIP or interoperable and emergency communications in Maryland or directly support the SCIP.

Figure 1 on the following page provides additional information about how these components of the SCIP interrelate to develop a comprehensive plan for improving interoperable and emergency communications.
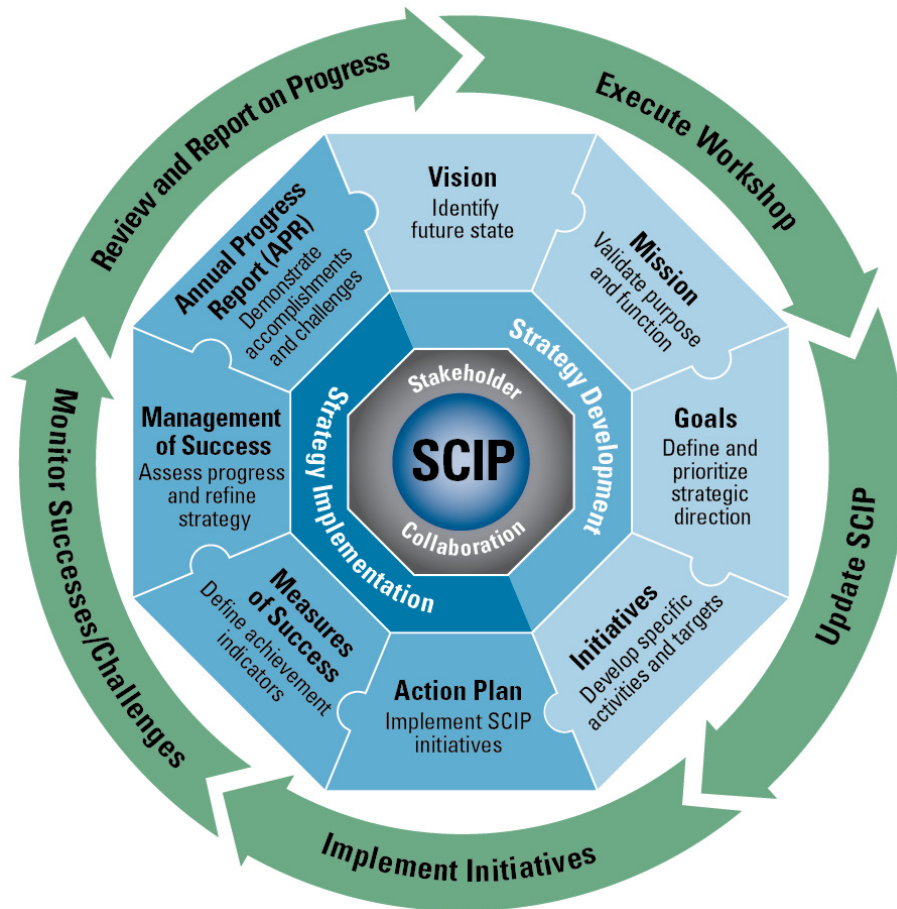
Figure 1: SCIP Strategic Plan and Implementation Components

The Maryland SCIP is based on an understanding of the current and mid-range interoperable and emergency communications environment or ecosystem. Maryland has taken significant steps towards improving and expanding interoperable 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 Osprey.
- Planning, development, and deployment of Maryland's new statewide 700 MHz Radio system

It is important to note that these efforts are part of a continuous cycle, as Maryland will always need to adapt to emerging technologies, operational changes, and changes to key stakeholder initiatives. In the next three to five years, Maryland will encounter

challenges relating to interoperability, geography, aging equipment/systems, emerging technologies, ongoing support and maintenance, 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 Title VI the Middle Class Tax Relief and Job Creation Act of 2012 authorizes the deployment of the Nationwide Public Safety Broadband Network (NPSBN). The NPSBN is intended to be a wireless, interoperable nationwide communications network utilizing twenty megahertz of the 700 MHz frequency band 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.

Figure 2 below illustrates a public safety communications evolution by describing the long-term transition toward a desired converged future.
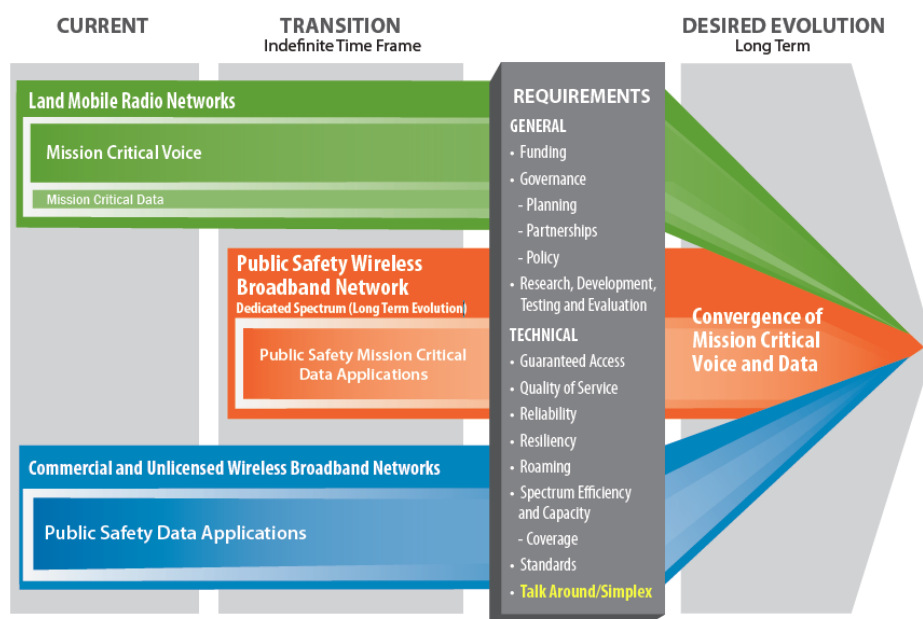
Figure 2: Public Safety Communications Evolution

Integrating capabilities such as MView, CAD to CAD, ACRS, E-TIX, RAPID, OSPRY, AVL, Patient Tracking and broadband radio provide an unparalleled opportunity for the future of interoperable communications in Maryland, the region and the Nation. Robust requirements and innovative business practices must be created for these initiatives prior to nationwide implementation. Maryland public safety organizations have developed partnerships within our region (FEMA Region III) to ensure deployment of these technologies in a fully interoperable manner.

Additionally, achieving sustainable funding in the current fiscal climate is a priority for Maryland. As 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 are:

- o Maryland FiRST, the statewide 700 MHz public safety radio system, which will have the ability, once completed, to provide interoperable communications on a local, regional, or statewide basis.

- o Statewide and regional public safety data systems to improve fire, EMS and law enforcement response to improve response to man-made and natural emergency events.

- o Regional communications and data systems in high population areas providing interstate and intrastate public safety interoperable communications.

- o NPSBN (FirsNet) 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]
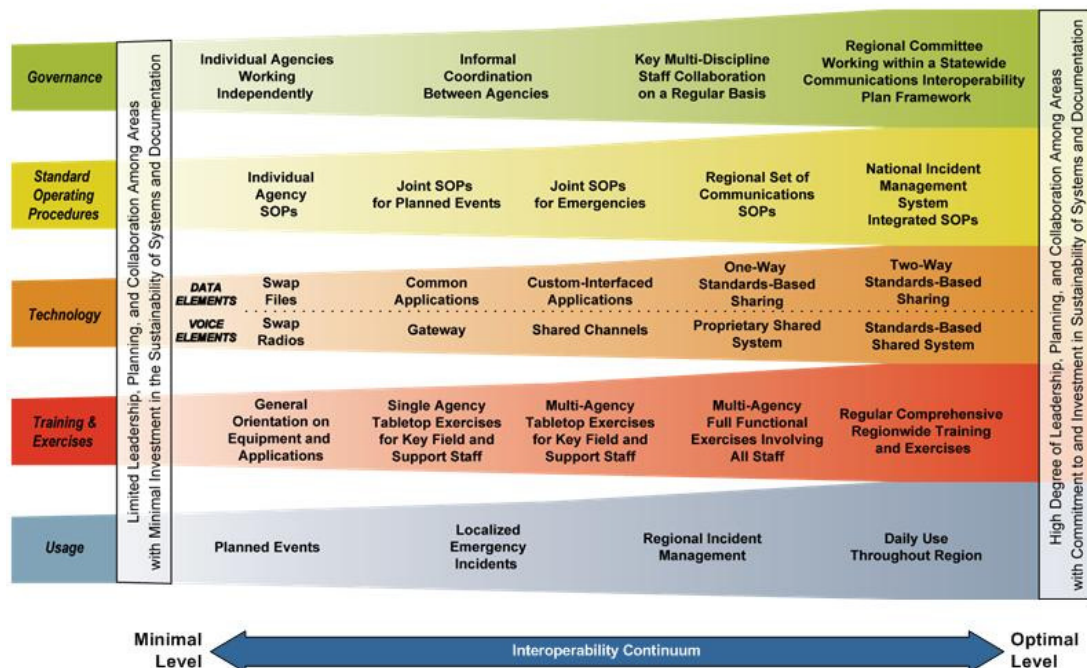
Figure 3: The Interoperability Continuum

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.

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

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[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

- Governance – Collaborative decision-making process that supports interoperability efforts to improve communication, coordination, and cooperation across disciplines as well as jurisdictions within and adjacent to Maryland. Governance is the critical foundation of all of Maryland's efforts to address communications interoperability.

- SOPs – Policies, best practices, and procedures that guide emergency responder interactions and the use of interoperable communications solutions.

- Technology – Promote technical standards that permit 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[4]. The following sections will further describe how the SCIP will be used in Maryland and Maryland's plans to enhance interoperable and emergency communications.

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[4] OEC's Interoperability Continuum is available here:
http://www.safecomprogram.gov/oecguidancedocuments/continuum/Default.aspx

2. PURPOSE

The purpose of the Maryland's SCIP is:

- To provide the strategic direction, goals and alignment for those responsible for interoperable and emergency communications at the State, interstate, regional and local levels.
- To provide detail to executive leadership and elected officials on the vision for interoperable emergency communications and demonstrate the need for funding.
- To identify, refine, and distribute best practices to first responders and representatives of non-governmental organizations supporting disaster relief or when responding to incidents.

The development and execution of the SCIP assists Maryland with addressing the results of the NECP Goals, and the Federal government with fulfilling the Presidential Policy Directive 8 (PPD-8)[5] National Preparedness Goal for Operational Communications[6] as well as the provisions of the Middle Class Tax Relief and Job Creation Act of 2012 (the Act), specifically Title VI, related to Public Safety Communications.

Each year Maryland will develop an Annual Progress Report (APR) to the SCIP 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.

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[5] PPD-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.

[6] National 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 both 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.

3. VISION AND MISSION

This section describes Maryland's vision and mission for improving emergency communications operability, interoperability, and continuity of communications statewide.

Maryland's Interoperable Emergency Communications Mission:

Maryland's Interoperable Emergency Communications Mission is to facilitate the achievement of statewide and regional communications interoperability through applied technology. To maximize the State's communications ecosystem and provide a variety of robust, resilient and reliable interoperable systems for the purpose of maximumizing communications interoperability for all users. To migrate from inter-agency, silo and jurisdictional based technology solutions to statewide and regional systems that span jurisdictional and organization boundaries.

Maryland's Interoperable Emergency Communications Vision:

Deploy statewide and regional systems that will support communications interoperability across agencies, jurisdictions, levels of government, and across state boundaries within FEMA Region III. Interoperable communications will ensure that Maryland's public safety providers can coordinate and communicate with one another, share information, and provide an effective, coordinated response to events or emergencies.

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4. GOVERNANCE

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) 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 Interoperable Communications programs within the State. The Practitioners 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). 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.

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 will oversee the building, operation, and maintenance of the new Maryland FiRST system.

Governance Goals and Initiatives			
Goals	Initiatives	Owner	Planned Completion
Strengthen regional inter and intra-state partnerships and consider including additional stakeholders as applicable (e.g., public works, critical infrastructure, private	Conduct regular outreach to additional stakeholders through the regional interoperability committees and other forms of outreach	State	On going
	Establish a statewide interoperability workshop with representation from all regional interoperability committees	State	Annually

Governance Goals and Initiatives			
Goals	Initiatives	Owner	Planned Completion
sector, Maryland State Department of Education, Federal agencies)	Strengthen existing governance relationships with Delaware, Pennsylvania, Virginia, District of Columbia, West Virginia	State Interoperability and Regional Planning Committees	Ongoing
	Continued engagement with / participation in Federal interoperability initiatives	State Interoperability Committees and Regional Planning Committees: local representatives	Ongoing
Codify existing governance structure (existing by way of executive order) through legislation	Passed bill creating the Radio Control Board on April 14, 2014	State	Completed

Maryland is also working with the States within FEMA Region III to develop plans for a future regional deployment of the broadband public safety network and continues to strengthen partnerships with regional communications on Maryland FiRST and regional video and data systems. The consortium, known as MACINAC, has held several meetings with the Region III SWICs to assure interoperability is addressed during the planning and deployment of this new technology. In conjunction with OEC, Maryland held a Broadband workshop in March of 2012 to introduce the new Broadband Network to State and local agencies and to begin planning the State's approach.

Maryland also continues working with other Region III states and the NCR through conferences, meetings with the Department of Homeland Security, Office of Emergency Communications, the National Council of Statewide Interoperability Coordinators (NCSWIC), SAFECOM, and FEMA Region III's Interoperability Coordinator.

5. STANDARD OPERATING PROCEDURES (SOPs)

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 in many 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, DC 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 address 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.

The table below outlines Maryland's goals and initiatives for SOPs.

Standard Operating Procedures Goals and Initiatives			
Goals	Initiatives	Owner	Planned Completion
Establish and maintain a recurring statewide communications-related SOP / Standard Operating Guidelines (SOG) development process	Identify need for specific SOGs	State	Ongoing as system needs are identified
	Establishment of a formal working group to address the needs for SOGs, develop SOGs, vet SOGs, and review SOGs as needed	SIEC	Operations Committee established May 2014 with ongoing meetings
	Present SOG recommendations to the SIEC	State	Ongoing as system needs are identified

6. TECHNOLOGY

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 table below outlines Maryland's goals and initiatives for technology.

Technology Goals and Initiatives			
Goals	Initiatives	Owner	Planned Completion
Add nationwide interoperability channels and establish related process or structure to tie the channels into the new statewide 700 megahertz (MHz) system	Work with local partners to identify strategic locations	State, local partners	Ongoing
	Final SOG on how nationwide interoperability channels will be used	State; MEMA; Maryland State Police (MSP)	Ongoing
Provide Plan for access to the NPSBN for all Maryland first responders and emergency management partners	Secure grant funds to start planning for NPSBN in Maryland that serves the needs of local, State, Federal, and regional partners for daily operations and is capable of expanding to meet the needs of large scale events	State	Funds awarded - August 2013 and planning and work is continuing with FirstNet

The State's long-term strategy for statewide interoperable communications is currently being implemented with the development and deployment of multiple systems, including CAD/RMS, ACRS, E-TIX, RAPID, the 700 MHz Radio System, MView, and OSPREY.

6.1 Computer-Aided Dispatch / Records Management System/Automatic Vehicle Located/Mobile CAD (CAD/RMS/AVL/Mobile)

The CAD/RMS/AVL/Mobile project has completed the implementation phase and has been successfully deployed at all Maryland State Police Barracks, the Mass Transit Administration Police, Department of Natural Resources Police and the Maryland Transportation Authority Police. The cloud-based Records Management System 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.

6.2 Automated Crash Reporting System (ACRS)

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 1st, 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.

6.3 Electronic Traffic Information Exchange (E-TIX)

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 Maryland State Police 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 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.

6.4 Regional Automated Property Information Database (RAPID)

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 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.

6.5 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.

Live streaming video sharing has increased to over 3300 CCTV, an increase of 299% from January 2013 with expected growth to 5300 by fall 2015; 35 organizations provide video from federal, NCR, state, county, and municipal organizations. Our user base has grown to almost a 2000 users representing over 100 federal, NCR, state, county, and municipal organizations.   Aerial video is being provided by Anne Arundel County, Baltimore City and County, and US Park Police; we continue to work with MD ARNG until resolution of their connectivity to complete streaming into MView and plan to work with Prince George's County in the near future. Mobile Command Posts are integrated from Maryland State Police, Anne Arundel and Howard County, USPP, and plans to include Prince George's County in the near future.   The system supports over 25 regional events in 2014 and several thus far in 2015.

6.6 700 MHz Radio – Maryland FiRST

The construction and roll-out of a statewide P25 700 MHz system for voice communications to be used by all authorized[7] 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 Maryland State Police 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 enabling its fire, 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. It is anticipated that the Anne Arundel Baltimore, Cecil, Harford, and Howard cells of Maryland FiRST will be complete by the end of 2015.

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

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[7] See 47 U.S.C. §337(f)(1)(a)

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 Joint Operations Center ("MJOC") and MIEMSS' 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 law enforcement agencies, interoperability with other State agencies was facilitated through the use of the MD CALL radio zone 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.

In the past, Maryland FiRST was designed to support on a primary basis 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 the Maryland Institute for Emergency Medical Services Systems (MIEMSS). The microwave provides connectivity between the County Public Safety Answering Point (PSAP) locations and the many radio communications towers throughout the State.

6.7 Nationwide 700 and 800 MHz Interoperability Channels

6.7.1 – 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 SIEC, Maryland FiRST deployed 700 MHz nationwide interoperability channels will be controlled centrally on a statewide basis at the MEMA Joint Operations Center.

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 MEMA[8].

6.7.2 – 800 MHz nationwide interoperability channels

800 MHz nationwide interoperability channels have been installed through much of Maryland. The FCC's 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 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 Joint Operations Center 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.

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

6.8   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 rules[9], 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 Order[10] 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.

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 COMAR.

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[9] *See* 47 C.F.R §90.423
[10] *See* FCC 14-172 issued October 24, 2014.

6.9   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.

6.9.1   Central Maryland Area Radio Communications Network ("CMARC")

CMARC Jurisdictions - Anne Arundel, Baltimore (City and County), Carroll, Frederick Harford, and Howard.

In Central Maryland, infrastructure was established (as required by the Federal Communications Commission or 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.

6.9.2   Eastern Shore Communications Alliance ("ESCA")

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 Eastern Shore Communications Alliance (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 jurisidictions.   The organization maintains sub-committees for operations, technical and training. ESCA is responsible for maintaining and updating the regional TICP, disseminating plans, establishing training recommendations, promoting interoperability, initiating MOUs, promotion of interoperability testing, and reviewing interoperability related SOPs.

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 NetworkFirst IP solution and Harris Mastr III stations. Adopting a "no band left

behind" approach, the system consists of VHF, UHF and 800MHz stations with a total of fifteen RF sites. The use of all national interoperability channels is coordinated by the Maryland Emergency Management Agency's Maryland Joint Operations Center (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 Public Safety Answering Points plus the Town of Ocean City's communications center.

6.9.3 National Capital Region (NCR) and the Metropolitan Washington Council of Governments "MWCOG")

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

MWCOG's 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 National Capital Region 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.

6.9.4 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 P2 infrastructure design and acquisition. Calvert County is working toward the development and release of a RFP for a P25 system (infrastructure and subscriber devices). 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.

6.9.5 Washington-Allegany-Garrett Interoperability Network ("WAGIN")

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 (Washington Allegany Garrett Interoperability Network). 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 Maryland State Police and State Highways units.

To control the radios at each site an IP based solution was decided upon and the product chosen was Cisco 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 VoIP circuits to allow to PTT communications to the other county and some State communication centers (i.e. MEMA-MJOC, SHA's SOC and DNR 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.

6.10   Interstate Communications Interoperability

Most of the counties in Maryland border other states and/or the District of Columbia. Many counties, such as those in the National Capital Region, 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.

6.10.1 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 Maryland State Police 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.

6.10.2 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 Maryland State Police radio for interoperability with the Metropolitan Police Department (MPD). Additionally, all MPD and Fire and Emergency Medical Services 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 WAWAS (Washington Watch and Warning System), 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 Maryland Coordination and Analysis Center (MCAC), which was funded through UASI funding.

6.10.3 Interoperability with Pennsylvania State Police

The Commonwealth of Pennsylvania is currently in the process of planning a replacement 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. Pennsylvania is planning a migration from OpenSky to the utilization of P25 technologies operating in both the Very High Frequency ("VHF") and 800 MHz bands in conjunction with evolving local government systems.

Members of the Maryland State Police Electronic Services Division have been meeting with 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.

6.10.4 Interoperability with Virginia State Police

The Commonwealth of Virginia has developed the State Agency Radio System or STARS. The Virginia State Police 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 license[11] VHF control stations installed at Maryland FiRST sites close to the Commonwealth. This will allow Maryland FiRST users to appear to Virginia State Police communications' officers as a mobile user that can be activated as needed for interoperability between troopers in both states. Eventually Maryland State Police Barracks will have interoperability with VSP communications officers in the First (Richmond), Fifth (Chesapeake), and Seventh (Fairfax) divisions of the Virginia State Police.

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.

### 6.10.5 Interoperability with West Virginia State Police

The West Virginia State Police operate in the ultra-high frequency ("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.

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[11] See WQRV585

6.10.6 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 point[12] 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 thirty ("30") simultaneous talkpaths.
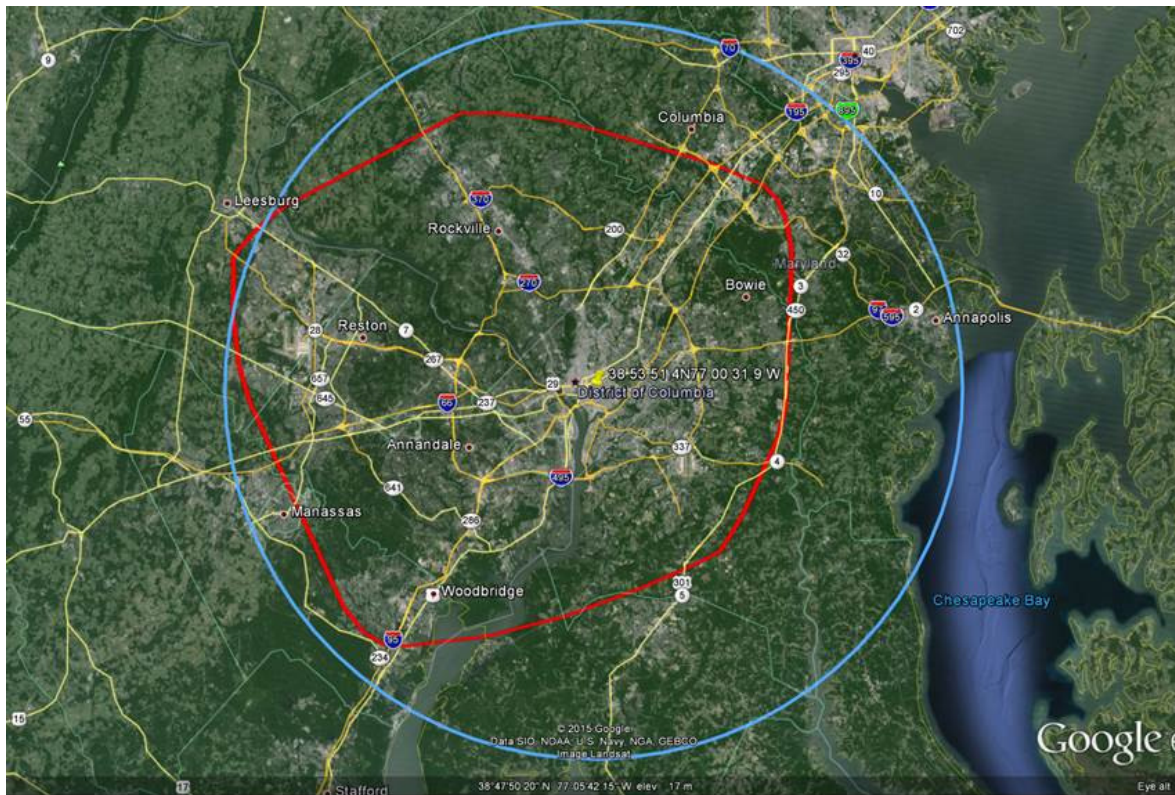
WMATA has proffered to the jurisdictions in the NCR that the proposed system can also be used as a regional communications overlay permitting member jurisdictions to interoperate over a wide area. Once constructed, the WMATA system should facilitate interoperability throughout the National Capital Region.

6.10.7 Regional Interservices Channels ("RINS")

There are six ("6") 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

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[12] *See* 47 CFR §90.303(b)

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 fifteen ("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.

6.10.8 Fire Mutual Aid Radio System (FMARS)

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 Metropolitan Washington Council of Governments and operationally maintained by the Fire Communications Officers' Subcommittee. System equipment is licensed, maintained, funded and operated by participating agencies.

6.10.9 Police Mutual Aid Radio System (PMARS)

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 Metropolitan Washington Council of Governments (C.O.G.) 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 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.

6.10.10 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 licensed[13] 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.

6.11 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.

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[13] See WQJU874

6.12   Deployable 700 MHz Interoperable Trunking Radio Systems

In late 2014, the FCC issued new guidelines[14] for the use of twenty-four 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 National Public Safety Telecommunications Counsel ("NPSTC") and the National Regional Planning Committee ("NRPC") adopted six frequency pairs for nationwide deployable trunked radio systems. The FCC accepted the NPSTC and NRPC recommendation for the six 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").

With respect to the Maryland 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 Statewide Interoperability Executive Committee ("SIEC").

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[14] *See* FCC 14-172 released October 24, 2014.

6.13   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 or "TIA."

Twenty-two of Maryland's jurisdictions[15] 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 ultra-high frequency band or "UHF." 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 Radio Control Board 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 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

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[15] References Maryland's twenty-three counties and the City of Baltimore

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.

6.14   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.

6.14.1 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 or "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.

6.14.2 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.

6.14.3 Advanced System Key

Advanced System Key or as commonly known, "ASK[16]" is a technology used by certain manufacturers to minimize the possibility of unauthorized radio programming. ASK 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

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[16] Advanced System Key

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.

6.15   Inter-RF Sub-System Interface ("ISSI")

An evolving technology is the Inter RF Sub-system Interface 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 Telecommunications Industry Association ("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 2015. 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 Maryland State Police, 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.

6.16 OSPREY

In 2014, Maryland updated its State Geographic Information System (GIS) mapping data system called OSPREY (Operational and Situational Preparedness for Responding to an EmergencY). 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).

7. TRAINING AND EXERCISES

Maryland has utilized the United States Department of Homeland Security (DHS) Office of Emergency Communications Technical Assistance Program ("OECTAP") to develop interoperability-focused training and exercise classes that are joined with the State's broader emergency response training and exercise program. 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. We have held workshops around the State for Project Management for Communications Systems; Standard Operations Guideline for Backup Communications; Communications Unit Leader and Technician workshops; Broadband Planning Workshop; Tactical Interoperable Communications Field Operations Guideline; and in 2015, we are planning to hold workshops on Data Systems Interoperability and CASM NextGen Broadband Data Collection.

The table below outlines Maryland's goals and initiatives for training and exercises.

Training and Exercises Goals and Initiatives			
Goals	Initiatives	Owner	Planned Completion
Coordinate the development of regional communications-focused learning and exercises across the State	Plan for development of regional interoperability exercise programs and coordination of regional and local exercises	MEMA Active Learning and Exercise Branch; SIEC Operations Committee	Ongoing
	Plan for development of COML / COMT certification process	State	Ongoing
	Work with OEC and FirstNet to establish a COM-B training course to be implemented just prior to NPSBN deployment in Maryland and region.	State; OEC, FirstNet	Ongoing

8. USAGE AND OUTREACH

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 event, marine event or hunt for a fugitive could involve two or three jurisdictions / states based on their proximity. These types of events occur daily within the state) Additionally, real-world events, 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 force agencies to explore continual improvements.

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[17] has been appointed by the Governor to a seat on the SIEC and its workgroup, the Practitioner Steering Committee, 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 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.

The table below outlines Maryland's initiatives for usage and outreach.

Usage and Outreach Initiatives			
Goals	Initiatives	Owner	Planned Completion
Encourage familiarity of communications systems, interoperability technology, and emerging	Conduct regular SIEC and PSC meetings	State	Reviewed on an annual basis
	Revise existing interoperability website. [Website could contain communications tools, educational and support materials, and PowerPoint presentations]	State	Ongoing

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[17] The interoperability regions include the National Capital Region ("NCR"), Southern Maryland Interoperability Executive Committee ("SMIEC"), western Maryland ("WAGIN"), the Eastern Shore ("MESIN") and Central Maryland ("CMARC").

Usage and Outreach Initiatives

technologies	Distribute SCIP progress reports	State	and as needed
Enhance capabilities to share communications-related emergency information in real time	Continued statewide support/promotion of existing information sharing systems	MEMA and other existing system owners (with support from State)	Ongoing
	Expand the use of existing state notification systems for communications and radio system managers	MEMA	Ongoing

9. 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 on video 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.

The table below outlines Maryland's goals and initiatives for life cycle funding.

Life Cycle Funding Goals and Initiatives			
Goals	Initiatives	Owner	Planned Completion
Invest to build a state-of-the-art computer aided dispatch and records management (CAD/RMS) system for Maryland's State law enforcement agencies and share real-time data on emergency service dispatches and critical records with local jurisdictions	Initiative	CAD Executive Steering Committee	Completed

Life Cycle Funding Goals and Initiatives

Goals	Initiatives	Owner	Planned Completion
Develop a process to establish a long-term funding plan for the operations maintenance and system administration of the 700 MHz System and current LMR systems while addressing the long-term needs of the state (Life Cycle Funding)	Governor created a Radio Control Board to develop long-term funding plan for communications needs	Radio Control Board	Completed

10. STRATEGIC PLAN REVIEW

This 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 Statewide Interoperability Coordinator will review and revise the initial draft of the revised 2014 SCIP. The document 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. This revised SCIP will have a lifecycle of 4 years and will undergo a revision process in 2019.

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

11. REFERENCE DOCUMENTS

Title	Description	Document
State Interoperability Website	The State maintains a web site that lists the various activities and progress towards our goals.	http://doit.maryland.gov/marylandfirst/Pages/default.aspx

APPENDIX A: LIST OF ACRONYMS

APR	Annual Progress Report
BWI	Baltimore Washington International (Airport)
CAD	Computer Aided Dispatch
CMARC	Central Maryland Area Radio Communications System
CAPWIN	Capital Wireless Information Net
COML	Communications Unit Leader
COMT	Communications Unit Technician
DHS	U.S. Department of Homeland Security
EDACS	Enhanced Digital Access Communications System
FCC	Federal Communications Commission
FY	Fiscal Year
FiRST	First Responder Interoperable Radio System Team
FirstNet	First Responder Network Authority
FOG	Field Operations Guide
GEMAC	Governor's Emergency Management Advisory Council
GIS	Geographic Information Systems
GOHS	Governor's Office of Homeland Security
HSEEP	Homeland Security Exercise and Evaluation Program
MHz	Megahertz
LMR	Land Mobile Radio
MACINAC	Mid-Atlantic Consortium for Interoperable Nationwide Advanced Communications
MD ETIC	Maryland Exercise and Training Integration Committee
MDTA	Maryland Transportation Authority
MEMA	Maryland Emergency Management Agency
MESIN	Maryland Eastern Shore Interoperability Network
MIEMSS	Maryland Institute for Emergency Medical Services Systems
MOU	Memorandum of Understanding
MSP	Maryland State Police
MSFM	Maryland State Fire Marshal
NCR	National Capital Region

NECP	National Emergency Communications Plan
NG911	Next Generation 911
NIMS	National Incident Management System
NGO	Non-Governmental Organization
NPSBN	Nationwide Public Safety Broadband Network
OEC	Office of Emergency Communications
OMBN	One Maryland Broadband Network
PMO	Program Management Office
PPD	Presidential Policy Directive
PSAP	Public Safety Answering Point
PSC	Practitioner Steering Committee
RACES	Radio Amateur Communications Emergency Services
RECCWG	Regional Emergency Communications Coordination Working Group
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
SMIEC	Southern Maryland Interoperable Communications
SOG	Standard Operating Guideline
SOP	Standard Operating Procedure
SWIC	Statewide Interoperability Coordinator
SYSCOM	Systems Communications Center
TEP	Training and Exercise Plan
TEPW	Training and Exercise Planning Workshop
TICP	Tactical Interoperable Communications Plan
UHF	Ultra High Frequency
VHF	Very High Frequency
WAGIN	Washington Allegany Garrett Interoperability Network
WebEOC	Web Based Emergency Operations Center