Research Report
Review of Statewide Interoperability Planning Efforts Across the Country

Introduction

As communications interoperability continues to be a priority at the local, state, tribal and federal levels, the ability to share knowledge and better practices is a critical success factor in the planning and implementation of statewide interoperability initiatives. Communications interoperability is the ability of public safety agencies to talk across disciplines and jurisdictions via radio communications systems, exchanging voice and/or data with one another on demand, in real time, when needed and as authorized.

The Commonwealth of Virginia and SAFECOM, a federal program managed by the Department of Homeland Security (DHS), have entered into a partnership premised upon applying SAFECOM principles to an effort to plan and implement statewide communications interoperability. Both parties are committed to an approach, which captures the lessons learned that arise throughout their partnership. Those lessons learned can serve as a sample model to others designing and implementing a communications interoperability plan.

Often the best place to start an effort as complex as this one is to collect insights and practices of other states and localities that have cleared their own path toward interoperability. This report profiles eighteen different states' planning efforts. The research highlights states and localities experiences with collaboration and participation across stakeholder groups. The information sought in the states' efforts included:

❑ Governance
❑ Planning
❑ Unique state characteristics impacting interoperability
❑ Identified measures of success
❑ Issues and challenges faced
❑ Critical success factors

The purpose of this report is to provide examples of individual planning efforts complemented by a brief analysis of how some of these efforts have been successful and fit within SAFECOM principles. By taking this approach, one might gain a sense of the broad, strategic perspective called for when initiating interoperable communication planning efforts at the local and state levels.

Background

Inadequate and unreliable wireless communications have been issues plaguing public safety organizations for decades. In many cases, agencies cannot perform their mission critical duties. These agencies are unable to share vital voice or data information via radio with other jurisdictions in day-to-day operations and in emergency response to incidents including acts of terrorism and natural disasters.

SAFECOM was established as the umbrella program within the federal government to help local, tribal, state, and federal public safety agencies improve public safety response through more effective and efficient interoperable wireless communications. Communications interoperability is the ability of public safety agencies to talk across disciplines and jurisdictions via radio communications systems, exchanging voice and/or data with one another on demand, in real time, when needed and as authorized.

While several government programs have made progress in addressing the issue of public safety communications and interoperability, much of this work has been disconnected, fragmented, and often conflicting. To fulfill its mission, SAFECOM is working to promote collaboration and coordination to leverage the ongoing activities of existing communications initiatives at all levels of government in order to move the nation towards interoperability and to maximize federal investments in public safety communications.

Furthermore, a distinguishing characteristic is that SAFECOM is a public safety practitioner driven program, working with existing federal communications initiatives and key public safety stakeholders at all levels of government to address the need to develop better technologies and processes for the cross-jurisdictional and cross-disciplinary coordination of existing systems and future networks.

SAFECOM's approach to addressing the needs of public safety agencies for interoperable wireless communications recognizes the following conditions:

- Local, tribal and state agencies will continue to own the vast majority of the public safety communications infrastructure.
- The priorities of local, tribal and state public safety communications systems are first and foremost to provide reliable agency-specific communications. Secondly, those systems should provide reliable local interagency communications. The requirement for reliable interagency communications between local, tribal, state, and federal agencies is tertiary.
- The functional and technical requirements for public safety communications equipment vary across jurisdictions and disciplines and are determined at a local level.
- Public safety communications will continue to operate on a variety of technologies across fragmented spectrum bands.

Based on those conditions, SAFECOM does not expect to promote a single solution to public safety interoperability across the nation, but will encourage the following:

- Technical and functional requirements should be defined at the local or tribal level up to the state and then to the federal level.

- Solutions should involve a "system of systems" approach that incorporates existing technologies and allows for the development of new technologies and functionality in the future.
- Standards should be open to allow the interoperability of equipment from a variety of technologies and vendors.

SAFECOM believes that the federal role in the promotion of public safety interoperability will be to advance the development of new technologies and improved processes. Another key federal responsibility for public safety communications interoperability is assisting local, tribal, state, and other federal agencies in the planning, implementation and operation of interoperable communications systems through outreach efforts to communicate best practices, coordinated funding assistance, and technical assistance.

In June 2003, the Deputy Fire Chief of Charlottesville, Virginia participated in the development of a public safety communications and interoperability strategy session sponsored by the SAFECOM program. At this session, SAFECOM brought together public safety practitioners and stakeholders from all levels of government to develop its national strategic plan to improve communications and interoperability for first responders. Based on this experience, Deputy Chief Werner decided to apply a similar process to develop a plan to improve communications capabilities among first responders within the Commonwealth of Virginia. With grant funding Virginia received from the National Institute of Justice, Virginia is in the process of developing a plan to create a model for interoperable communications planning that incorporates the SAFECOM guiding principles of:

- Active involvement of public safety practitioners at the local level as part of the planning process.
- Implementation through the development of an in-depth and comprehensive strategic plan that describes the vision, mission, goals and objectives required to achieve interoperability.
- Fostering of a culture of collaboration.
- Reduction of redundant efforts through effective collaboration.

In developing a strategic plan for interoperable communications, Virginia, with help from SAFECOM, will leverage information pertaining to: governance, coordination, planning, state characteristics, measures for success, challenges, and lessons learned from the insights and practices of other states that have cleared their own path toward interoperability.

Governance

As emphasized in the National Task Force on Interoperability (NTFI, February 2003) report, a successful interoperability plan requires leadership participation on several levels; an executive champion at the state level, such as the governor or Secretary of

Public Safety, as well as a dedicated state resource to drive the planning process. A critical aspect of the current Virginia initiative is the inclusion and involvement of local level public safety and government officials. Local practitioners will be the primary users of the communications system and are often responsible for the life-cycle costs of systems; therefore, they need to be involved from the planned inception through implementation.

The purpose of creating a governance structure is to ensure that key stakeholders have an ongoing role in the planning, design, implementation and maintenance of the communications interoperability plan. Case examples illustrate that by enrolling a majority of local representatives on the leadership team, states establish trust at the local level which, in turn, eases barriers to cooperation and implementation. Governance structures that incorporated a participatory, inclusive and a locally driven approach towards decision making find success in the implementation phase of a statewide system.

> Local representation on the governance body and in interoperability planning is critical. The state governance board that oversees the development of public safety wireless communications should include local public safety agency requirements for emergency communications. Local officials should be included in planning and decision making early.[1]

Many governing committees are formalized through executive orders from the governor. One example is **Indiana's** Integrated Public Safety Commission (IPSC) which is the governing body that oversees Project Hoosier SAFE-T. IPSC, created by the Indiana General Assembly in 1999, consists of 12 members representing a variety of public safety agencies, along with municipal and county executives. The commission has representation from jurisdictions throughout Indiana.[2] The IPSC was formed out of the Integrated Law Enforcement Council (ILEC), originally created in 1998 as a state agency tasked with developing a strategy plan for interoperability. The ILEC held focus group sessions across Indiana to gather input on communications issues from local public safety practitioners. The information from the focus groups went into what became Indiana's Strategic Plan to improve public safety voice and data communications systems. By involving people that were dedicated to solving interoperability, Indiana was able to create an effective interoperability plan.

The key factor in winning the support of the locals is the way in which the IPSC structured the State's relationship to them. IPSC illustrated how Project Hoosier SAFE-T would save lives *and* save money. The State would construct the backbone of the system—towers, controllers, and connectivity between the components of the system—and the locals could join the system with no user fees. The locals were only required to

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[1] "Strategies for States to Achieve Public Safety Wireless Interoperability", National Governor's Association Center for Best Practices, March 2004, available at http://www.nga.org/cda/files/0903INTEROP.pdf

[2] *Project History.* March 2004. The Project Hoosier SAFE-T website - http://www.in.gov/ipsc/safe-t/history/

purchase their user equipment. IPSC determined that the difference in cost between constructing a State-only system and an integrated, interoperable statewide communications system was 4 percent. Indiana's experience highlights the way in which user fees can be a major impediment to local participation. Most important of all, there was consistent communication with all interested parties throughout the process.

Successful state level coordinating bodies for interoperable communications have three common objectives. First, they promote systems development that maximizes interoperability, infrastructure sharing, and economies of scale. Second, they initiate consolidated planning, budgeting, systems procurement, training, and maintenance activities. Lastly, they provide a forum for developing coordinated approaches, building relationships, and sharing information in order to effectively address key public safety interoperability issues throughout a state or region. State level coordinating bodies have found that holding ongoing meetings for stakeholders is an extremely effective way to collaborate and share information.

Oregon's governor created the Statewide Interoperability Executive Council through an executive order in 2002. The Council is comprised of two legislative assembly members interested in public safety and wireless communications, as well as twelve members from state departments and public safety associations. The executive order states:

> The purpose of the State Interoperability Executive Council is to provide policy level direction for matters related to planning, designing and implementing guidelines, best practices, and standard approaches to address Oregon's public safety communications interoperability issues. The Council shall also recommend funding strategies that support development of a statewide system, including seeking federal funding, or other funding, for statewide interoperability. In an effort to improve wireless interoperability in Oregon, the Council shall:
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> a. recommend strategies with regard to improving Oregon's wireless interoperability between agencies;
> b. research and evaluate the best practices for the purchasing of equipment and the sharing of communications infrastructure;
> c. strive to foster cooperation and improve inter-agency wireless communications among state, federal, and local jurisdictions;
> d. serve as a central coordination point for local, regional, and national interoperability matters; and
> e. develop recommendations for legislation or other state action that may be required to further promote wireless interoperability in Oregon.[3]

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[3] Oregon EXECUTIVE ORDER NO. EO 02-17 which created the Statewide Interoperability Executive Council
http://arcweb.sos.state.or.us/governors/Kitzhaber/web_pages/governor/legal/execords/eo02-17.pdf

Bringing dedicated and knowledgeable people, from all levels, into the planning process creates the ideal environment for establishing interoperability among local and state public safety entities.

Coordination and Partnerships

The concept of coordination and partnerships is a principal philosophy upon which successfully interoperability plans are founded. Since ultimate interoperability occurs when local, state, and federal first responders from various disciplines can communicate with each other, a successful interoperability plan can only be developed when local, state, and federal planners from various disciplines coordinate with each other. To clarify, true interoperability happens when all levels and all disciplines can communicate when needed and when authorized. Partnerships between disciplines and jurisdictions can be utilized to increase the pool of available funding and purchase similar equipment.

In **Tennessee**, the Mobile Communications Alliance Team (MOCAT) was created to provide direction in the areas of planning, designing, funding, implementing and governing for a shared communications system. MOCAT is an example of an organization that fosters coordination and partnerships among its members, including public safety associations; local, state and federal agencies; and public utilities. MOCAT implemented the idea of collaboration as they conducted strategic planning sessions across the state to determine common interests, develop relationships and set measurable goals across partner agencies.

Through coordination and partnerships, interoperability planners can develop robust plans, addressing the needs of all stakeholders. These partnerships can continue after a plan is implemented to increase the pool of available funds as well as leverage combined buying power.

Planning

Research found that planning for public safety communications interoperability is a vital first step in a state becoming truly interoperable.   Some states have begun with the implementation phase without first considering the needs of the emergency responders and involving them in the process. In these cases, the implementation soon lost momentum and there was not enough buy in from leadership and practitioners to drive the implementation. Planning on the front end of this effort could potentially save millions of dollars in the long run.

For the most part, states have chosen Land Mobile Radio (LMR) systems for mission critical communications. No other existing technology has proven to be operationally superior or less expensive. There are many benefits to a LMR system that are not attainable with commercial cellular or satellite technology. LMR technology provides

critical "push to talk" capability which allows users to push a button and communicate immediately instead of being required to dial a phone number which results in time delays that are not reasonable in an emergency situation. LMR also allows for point-to-multi-point dispatch, which is critical for a system that will serve public safety. Other benefits of the system include voice and data capability and digital trunking, which allows for more efficient use of frequencies and talk groups that enhance interoperability while still allowing agencies to have local autonomy over their communications.

In **Alaska**, a governance structure, the Alaska Land Mobile Radio (ALMR) Executive Council (EC), was formed. The ALMR EC's responsibilities included developing a set of requirements as well as a migration plan from their aging communications system to a shared trunked radio system. One such requirement involved developing a system capable of handling disaster response/crisis management in addition to day to day use. The system also required the ability to transition seamlessly to a full-featured, on demand, and in real time interoperable system for public safety responders. The ALMR EC identified their stakeholders as local and state governments, the Department of Defense (DOD) and other federal agencies. To meet the goals listed above, the ALMR EC decided upon a cost shared Project 25/TIA 102 trunked land mobile radio communications system.   Based on the completed needs assessment that incorporated the diverse needs of its stakeholders, the ALMR EC was able to move forward with the implementation of a new system with the support of local practitioners state executives.

In **Mississippi**, a mandate from the governor has helped to expedite the move towards interoperable communications for first responders. The creation of an incident command system in 2001, as well as the formation of a State Interoperability Executive Committee (SIEC) in 2003, has set the state on a path to dramatically improve the response, communications, and coordination of first responders. The governor's mandate focused the work of these bodies specifically on coordinating information between all levels of government to provide recommendations on both immediate and long-term improvements for public safety wireless communications. Throughout the planning process, officials stressed the need to examine current capabilities, assets and resources that could be leveraged to achieve better communications between local, state and federal agencies. For example, the Mississippi Department of Transportation conducted a statewide needs analysis and invited several state agencies to participate in order to investigate the shared systems concept. After going through the process, Mississippi hosted a conference to spread knowledge on the state's interoperability issues and challenges as well as lessons learned from other states such as **West Virginia** and **Tennessee**. Also, the SIEC stressed the need to obtain consensus among key stakeholders and state executives, educate public safety professionals and institute a coordination committee. Finally, Mississippi officials recognized five key areas surrounding interoperability; coordination and partnerships, funding, spectrum, standards and technology, and security. Mississippi officials stressed the need for long range planning to account for issues associated with these areas.

New York has addressed its interoperability problem with the development of a Statewide Wireless Network (SWN). The SWN incorporates new infrastructure, which allows for gateways and interfaces to other public safety/service communication systems. Another feature of the SWN is voluntary partnerships with local government organizations. These partnerships ensure maximum interoperability; minimize overall costs of the system through the sharing of towers; land, equipment, etc.; and reduce the time necessary for implementation. Local agencies will be responsible for the cost of radios, but no network access fees will be charged.

A **South Dakota** interoperability system was funded entirely with grants and legislative appropriations. Because of this comprehensive funding, the system does not assess user fees, and a yearly budget is only needed for maintenance. The system supports about 95% of all public safety agencies in the state, and this, coupled with the lack of user fees, allows for the greatest possible local participation. **Delaware** has also implemented a system where there are no subscriber fees and went one step further by buying equipment for localities. Both South Dakota and Delaware officials felt local participation was critical to the overall success of the planning process.

In **Pennsylvania**, the initial price tag on a plan to build a statewide radio system was turned down by the legislature. The project ultimately received funding when project planners incorporated cost efficiency techniques such as consolidation of current infrastructure followed by presenting a more enticing business case that highlighted the amount of money that would be saved in the long run if the project was successfully funded. **Florida**, a state where interoperability is one of the Governor's top ten initiatives, also faced similar budgetary constraints. Implementation was set to occur over a five phase process; however the project ran out of money after completing only the first two. This resulted in the legislature establishing a trust fund that yields approximately $12 million per year from vehicle registration fees to support the effort partially. The resulting gap in funding caused the State of Florida to seek out public-private partnership options to supplement their current revenue stream. One feature of the public-private contract allowed the state to purchase portable radios on an extended credit line for those agencies that typically could not afford to participate. While dealing with funding issues, Florida has achieved some degree of interoperability using patches and mutual aid channels through the establishment of regional working groups.

When designing the **Maryland** Incident Management Interoperable Communications System (MIMICS), the planners clearly stated their intentions with a simple memorandum of understanding (MOU). This MOU laid out standard operating procedures and stated that the system would only be for operation during mutual-aid or catastrophic incidents, not day-to-day interoperability use. The MOU also defined the participants (local law enforcement, federal agencies, state police, fire departments, EMS, Department of Natural Resources and the State Highway Department). By defining the goals before the implementation process, Maryland was able to avoid the pitfalls that sidetracked other states.

Interagency Radio Work Group of **Texas** (IRWG) works in cooperation with the Texas First Responder Preparedness Program. The IRWG is an informal group of representatives from state agencies and affiliated public safety associations chartered to promote interoperability and improve public safety communications statewide. This group is developing near, mid and long term goals with special attention being paid to funding sources as well as technical and operational solutions that can be implemented using existing funds to provide limited interoperability in the immediate future.

Inclusive planning for communications interoperability can help states save money and time by ensuring buy in from the local practitioners as well as from state level decision makers in the beginning of the process. In soliciting involvement across all levels of government as well as across all disciplines, states are able to implement communications systems that meet the real needs of the responders using the systems more efficiently and at a lower cost.

State Characteristics

A multi state review of interoperability planning tends to yield a significant amount of similarity in approach and development of statewide efforts. Some states, however, had circumstances that made their strategic planning efforts unique. In order to best leverage the learning from other state's methodologies and procedures, it is essential for those responsible for a state's planning effort to reflect on how differences in geography, population and topography to name just a few, might impact statewide interoperability implementation. Examples of a few state's unique features are outlined below. Distinctions may appear in a variety of formats, this reality can serve as a reminder for strategic planners to reflect on what may fall into this category for their particular state, and design features into a the plan that account for these differences.

Alaska has a strong tradition of intergovernmental cooperation, a situation that has allowed the ALMR Project to have had some success. ALMR has the support at the senior executive level of various federal, state and municipal governments because it meets the needs of public safety, mutual aid/emergency response, first responders, military support to civil authority and consequence management. As a result, ALMR feels that by having a joint local, state and federal effort, the program should be eligible for additional funding over programs that did not have such a collaborative effort.

New York, as well as other states, has used established infrastructure to achieve interoperability through gateways and other interfaces developed by the SWN program. By approaching interoperability in this manner, the state has avoided the need to replace functioning equipment and has leveraged a backbone of towers and repeaters that are already in place.

Texas has significant illegal immigrant and homeland security border control issues. The state also serves as a major North American Free Trade Agreement trade corridor and contains three regions identified as High Intensity Drug Trafficking Areas. As a large state, Texas faces geographic challenges that affect wireless interoperability. There are inherent operational and technical challenges in its size covering 267,339 square miles of both extremely rural and urban areas. All of these factors pose significant challenges in developing a plan for interoperable wireless communications for first responders.

Establishing rapport with all stakeholder groups can offer a comprehensive perspective on what makes each state unique when it comes to interoperability efforts. The value comes in posing the question early on the planning process to identify unique state features and then revisiting these features as implementation begins as a way of keeping these key elements at the forefront of the collaborative problem solving process.

Measures/Metrics for Success

Revisiting a project's objectives and/or external standards used to develop objectives is one way to determine the metrics by which a planning process should be assessed. Due to a lack of uniform best practices for interoperability planning, it would be unwise to qualify the success of various state approaches to communication planning for first responders. It is worthwhile to offer a few examples of successful measures states have used to mark their progress toward statewide interoperability.

The **Alaskan** ALMR Program utilized the Public Safety Wireless Network (PSWN, now part of SAFECOM) Program's "How2 Guide" for System Planning, Design, and Procurement as a source for system planning. Additionally, they used a standards based approach for communications systems to propagate interoperability.

Documenting lessons learned and determining benchmarks for state planning are critical areas of attention for states beginning the strategic planning process. Informed decision making enables a steering committee to begin the process of highlighting the gaps between intended and actual results. A broad spectrum of diverse yields the best results during planning and implementation.

Issues/Challenges Faced

Pulling back from the detail of each state planning process, reveals a number of shared issues and challenges states tend to encounter when addressing interoperability. There appear to be at least five aspects of interoperable communication planning that show up as points of high friction. Coordination and partnering refer to the people side of the planning and implementation process. Earlier in the report, attention is called to better strategies for collaboration and structured leadership of the operation and maintenance

of interoperability efforts. Standards and technology obstacles can show up as the lack of shared agreement on frequency bands available and used across local, state and federal agencies. As states and localities attempt to leverage existing systems in the development of expanded interoperability, issues can arise when older systems fail to meet the security measures necessary to meet present day challenges. Funding and spectrum challenges are best exemplified by the state scenarios described below.

Alaska has the largest area of any state coupled with one of the lowest populations. Since most grant funding formulas are based off of a population per area formula, Alaska is at a disadvantage compared to other states when applying for federal funding. To combat this, the ALMR Program relied heavily on the collaboration of local, state and federal entities to maximize results with limited funding.

In **Indiana** the IPSC first looked to fund their project through a surcharge on the 9-1-1 fees on land-based and wireless phones. When that legislation did not pass, they attempted to obtain proceeds from riverboat gaming for one lump sum of funding. This also failed. Finally the program was able to get a bill passed in the Indiana General Assembly that pulls funding from the Indiana Bureau of Motor vehicles service fees until 2019. The main factor in passing this bill was gaining strong support from the Lieutenant Governor who championed the bill and helped it pass.

Interstate dialogue and knowledge sharing offer two direct routes to resolving the challenges to interoperability that currently exist. As planning processes evolve into methodologies, these familiar obstacles will be identified at the onset of strategic planning endeavors and tracked to eventually have less significant impact on the overall success of interoperability planning and implementation.

Critical Success Factors/Lessons Learned

Many things affect the positive or negative outcome of a project; however, lessons learned from past projects can help foster positive outcomes for communications interoperability projects in the future. While there is not one correct set of critical success factors to adhere to, listed below are a few examples.

The **Alaskan** ALMR Program repeatedly points to their collaboration among local, state and federal entities as the source for their success.

Since the **South Dakota** interoperable system supports 95% of all public safety agencies in the state, participating agencies were asked to relinquish any available VHF so that it could be used in the state system. This allows a greater amount of spectrum to be available in any one area. South Dakota also found that having political and local support, a dedicated project manager, a comprehensive funding plan, realistic expectations for timeframes and completion dates, and continuing funding support (allowing support staff and on-going planning) to be critical success factors.

Officials in **Missouri** were urged to look beyond traditional sources of public safety funding and seek opportunities such as private donors, corporations, foundations, or trusts to fund their interoperable communications program. The state was also advised to seek funds outside the traditional sources (DHS, Department of Justice) and look to the Department of Energy or the Department of Transportation for aid. Finally, they found that state and local applicants might be able to pool grants from multiple sources to address joint communications needs.

The application of critical success factors and lessons learned from previous interoperability planning efforts will save time and money as states are offered a realistic perspective on what they may encounter.

Conclusion

The advantage of offering a wide range of planning solutions for statewide interoperability is in realizing the true complexity that feeds this initiative. There may never be one ideal model for planning and implementation efforts for interoperable communications. Diversity across states and regions creates the need for plans that are unique and distinct, designed with the most all inclusive picture in mind. A comprehensive group of stakeholders begins to frame this picture, along with strong relationships across agency, jurisdiction and government level. It appears that the coupling of government powers with the universal urgency to save more lives, generates the momentum needed to carry out the true change needed to make emergency responders interoperable.

Void of any one perfect model for statewide interoperability planning, collaborative processes can be refined and enhanced to continually place the interoperability expertise in the hands of local practitioners.   By establishing a mechanism for complete communication between a state level decision maker and a local emergency responder, accountability for the inadequacy of our current communications systems can be shared. Positioning individuals to have an impact in their local community is a motivating factor that can drive all affected parties toward interoperable solutions that are both timely and realistic.

A review of the states called out in this report suggests that paying attention to the following factors would best serve statewide planners as they develop strategies to improve interoperability. States are positioned for success when issues relating to partnering and governance, funding, spectrum, technology and privacy are taken into careful consideration during the early stages of interoperable planning efforts.

Enrolling local and state level authorities in the design and development of strategic plans sends forth a message that despite the inevitable challenges that will arise, full

participation and commitment to the needs of the whole are what make interoperability across a state, a reality.

Attempts to fully implement interoperable communications will continue at the local, state and federal levels. We will all be served by continuing to set farther reaching goals that force us to work as one entity and model the communications system we wish to create.

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