

The Role of the

States



in Public Safety Wireless Interoperability



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Public Safety Wireless Interoperability is a Priority for the States

As a state leader, your ultimate goal is safe protection of the lives and property of the citizens of your state. In fact, public safety

is among the most basic and critical of the public services coordinated, regulated, and funded at the state level of government. To effectively do their job, public safety responders depend on sophisticated communications systems to relay mission-critical information in real time. They also require wireless systems that provide immediate channel availability. Today's wireless communications systems must support a growing set of missions, such as responses to weapons of mass destruction and domestic terrorism, requiring coordinated participation from agencies at all levels of government. Unfortunately, in many jurisdictions, public safety agencies operate and maintain largely independent radio systems. This type of system deployment is often referred to as the "stovepipe model," where systems are installed to serve the mission of a single agency, and where the individual systems lack the capacity to support interoperability with surrounding support agencies. This type of system deployment can cause potentially dangerous situations that risk lives.

Fortunately, state leaders are in an excellent position to help provide solutions to address this critical issue. States have the ability to serve as the linchpins for leading systemic improvements in our Nation's public safety communications infrastructure. These systemic improvements will allow governments at all levels to realize efficiencies in funding, spectrum allocation, and shared use of common infrastructure components. Among the various levels of government, states are best positioned to provide leadership by promulgating public policy that addresses public safety communications infrastructure. State leadership in public safety communications is central to outreach efforts that emphasize development of common approaches to regional and statewide interoperability and that promote adoption of this concept by local, state, and federal units of government. Mechanisms for engaging the public safety community regarding regional and statewide interoperability challenges can and should be developed at the highest levels of state government.

Moreover, state leader involvement at the earliest stages of the planning process will demonstrate senior executive support and help to position "interoperability" as a high-priority issue.

The very nature of public safety communications necessitates proactive leadership from elected officials at the highest levels. Without such high-level leadership, change is often slow. Governors and legislators are in a unique position to provide leadership and vision in drafting legislation and developing budgets. Governors can actively champion wireless interoperability as an issue that, when properly addressed, creates a safer, more effective environment for both public safety providers and the citizens they protect. Legislators can craft statutory rules and laws that codify policy guidance and ensure that vital funding requirements are met.

State officials have a vested interest in establishing and protecting statewide wireless infrastructures because public safety communications often must cross more than one local jurisdictional boundary. The more jurisdictions that are involved, the more constituents potentially benefit. A statewide approach, with leadership and support from the top, can ensure a public safety communications infrastructure that provides a uniform quality of service for everyone within the state. Without strong leadership and oversight, it may be very difficult to develop adequate support for public safety wireless communication system implementations. Our Nation's public safety personnel will continue to experience communications difficulties during emergency situations and crisis events.



Public Safety Wireless Interoperability Defined

To provide immediate and coordinated assistance in response to today's public safety threats, the Nation's public safety personnel must be able to communicate with each other effectively, securely, and in real time. The ability of the public safety community to provide a rapid, coordinated response to criminal activities, fires, medical emergencies, and natural disasters can mean the difference between life and death. Recent acts of domestic terrorism, natural disasters, and mass-casualty tragedies, such as those in Littleton, Colorado, and in Oklahoma City, Oklahoma, accentuate the importance of a coordinated response among public safety agencies from all levels of government.

Foremost among the obstacles that can hinder an effective multijurisdictional response is the lack of wireless interoperability among public safety agencies. Wireless interoperability is simply the ability of public safety officials to communicate across different wireless systems when necessary. Radio communications are often public safety personnel's only lifeline when operating in a crisis environment. Without communications interoperability, both life and property are put at significant risk.

Public safety agencies require three types of interoperability:

Day-to-day interoperability involves coordination during routine public safety operations. For example, day-to-day interoperability is required when county firefighters from various departments join forces to battle a structural fire or when neighboring law enforcement agencies must work together during a vehicular chase.

Mutual aid interoperability involves a joint and immediate response to catastrophic accidents or natural disasters and requires tactical communications among numerous groups of public safety personnel. Airplane crashes, bombings, forest fires, earthquakes, and hurricanes are all examples of mutual aid events.

Task force interoperability involves local, state, and federal agencies coming together for an extended period of time to address a public safety problem. Task forces lead the extended recovery operations for major disasters, provide security for major events, and conduct operations in response to prolonged criminal activity.

Without

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Achieving Wireless Interoperability in the States

There are five key issue areas that experts widely believe must be resolved for interoperability to become a reality. These areas are coordination and partnerships, funding, spectrum, standards and technology, and security. Additionally, the PSWN Program believes that there are a variety of system development efforts that offer efficient ways to improve interoperability. These issues have been studied and refined over time, and solutions addressing these issues provide the basic building blocks for achieving wireless interoperability. A description of these issues and a discussion of the state's role in addressing them help to more fully understand the political, policy, and technology changes that are needed to improve interoperability.

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A State's Role in Leading Interoperability Development

States are uniquely positioned to set the vision and direction for systemic improvements in public safety interoperability.

Successful state-level leadership can, and often does, lead to long-lasting, strategic impact on interoperability issues. There are a variety of ways states choose to address their interoperability challenges. Some states take up this challenge by leading public safety agencies at the local and state level toward developing interoperable statewide communications systems that provide robust networks for a wide variety of agencies. Other states see the need for regional systems that meet constituent needs more directly by focusing shared system efforts in densely populated areas. Finally, some states may choose to allow independent systems to develop around the state and then link them together with various, appropriate interoperability solutions.

In all cases, when states assume the leadership role in championing interoperability, participants at all levels of government can share the common benefits of a standard, highly interoperable communications platform. Whether public safety agencies adopt a common system approach or link existing systems together with technology, the greatest benefit is realized during major crises when immediate concerns focus on protecting life and property.

The implementation and operational use of shared, or linked interoperable systems is often the result of successfully addressing each of the five issue areas and overcoming the political complexities associated with system ownership and accountability for critical communications support. These systems provide the most reliable means of achieving direct interoperability among multiple agencies. Shared systems offer greater opportunities to achieve cost efficiencies by reducing duplicate infrastructure, streamlining maintenance activities, and leveraging economies of scale in equipment procurement. Shared systems also make implementation of enhanced features, such as over-the-air rekeying and mobile data, more cost effective.

Some states have begun implementing shared systems as a foundation for achieving interoperability. These states

are establishing best practices and lessons learned that can improve implementation efforts of other states. By learning from the successes and failures of others, state governments can shorten timelines required to implement viable solutions and can more quickly realize the benefits of using highly interoperable systems. State leaders can also support the development and implementation of a wide-area, shared system for use by all of the public safety agencies in the state. Efforts to coordinate statewide or regional planning for such systems can help state and local governments realize significant cost savings through shared investments and spectrum usage efficiencies, as well as resolve technical, operational, and organizational issues that impede interoperability.

Success in Michigan

The State of Michigan is deploying the final phase of an interoperable communications system based on a shared architecture. The Michigan Public Safety Communications System (MPSCS) is an advanced 800 megahertz (MHz) digital, trunked land mobile radio system that is compliant with the APCO Project 25 suite of standards. The system's final phase will be complete in January 2003. The State of Michigan allows local and federal public safety agencies to use the system infrastructure for a nominal fee, making the MPSCS a true shared interoperable system serving agencies at all levels of government. ★



The challenge is to

coordinate

personnel from **different** public safety agencies

ISSUE 1

A State's Role in Coordination & Partnerships

The need for coordinated statewide and regional approaches has long been seen as critical to solving the Nation's

interoperability problems. However, these approaches cannot be successful without sufficient coordination and partnership among participating agencies. Successful approaches to interoperability problems often rely on a complex relationship between two or more agencies. In general, these agencies can quickly solve technical problems, but the challenge is to coordinate the efforts of personnel from different public safety agencies in developing collaborative communications solutions. As states begin using a coordinated approach, they will begin to see many benefits. By using a statewide, coordinated, and cooperative approach for implementing interoperable radio systems, solutions can be tailored to reflect regional differences (e.g., geography, demographics, natural disasters, manmade disasters, or public safety response events) while still providing for sufficient statewide cohesion.

To make statewide interoperability a reality, executives can provide leadership and encourage a coordinated approach to solving interoperability problems within the state. One method of fostering coordination is by sponsoring and supporting partnerships that use outreach forums and other vehicles for identifying and exchanging best practices.

Success in Montana

In early 2000, Montana Governor Marc Racicot issued Executive Order 14-00 to reestablish the Montana Public Safety Communications Council. The purpose of this council is to provide policy-level direction for matters related to the planning, design, and implementation of approaches to solve the state's wireless communication interoperability problems. The order authorized the council to establish a coordinated approach to solving interoperability problems and to serve as a strategic advisor to the governor regarding Montana's public safety communications. Among the strategic issues the council is to address are fostering coordination and cooperation among agencies, identifying statewide standards, and serving as a policy contact for local, regional, and national interoperability matters. Montana's council is chaired by the Director of the Department of Administration and includes executive membership from local government, public safety associations, public safety agencies, tribal nations, and private utilities. ★

Success in Utah

In 1997, the State of Utah formed the Utah Communications Agency Network (UCAN) to help improve public safety radio services. UCAN is not a statewide initiative, but it is a quasi-state agency that serves as a board of directors for development of a wide-area public safety communications system that serves the nine-county region in the most densely populated portion of the state and along the Wasatch Mountain Range. Currently, UCAN is implementing a network that will bring 50 independent agencies onto a single system using a single frequency band and providing seamless, end-user interoperability.

UCAN is a voluntary association of agencies whose goals require a significant amount of coordination. UCAN has established an efficient structure for managing itself. Essentially, UCAN users are equals in managing the system. Users elect an Executive Committee to represent them, and membership on this committee rotates among member representatives. Advisory committees have been formed to address technical and funding issues, while users provide input on system requirements to various committees, as required. ★

Leaders can also promote the development of memoranda of understanding (MOU) to define interagency relationships, procedural agreements, regular meetings of statewide or regional interoperability committees, joint efforts to deploy communications technology, and mutual accountability for successful system operation.

Another high-impact way states can improve coordination is through a State Interoperability Executive Committee (SIEC) focused on public safety communications. Such high-level coordinating and rule-making bodies can play a vital role in helping state leaders to improve public safety wireless communications. These forums, often created with the participation and endorsement of the state's chief executive or through legislative action, can provide a rich venue to discuss and facilitate planning and policy development to improve wireless interoperability. The forum can

be a coordinating committee, council, or working group, or the role of an existing committee can be enhanced to address wireless interoperability issues. In addition to its coordination role, the body can be leveraged to help state leaders stay informed and engaged in the development of statewide communications interoperability.

Such a body should be composed of elected state officials, public safety leaders, subject-matter experts, and representatives for system users (e.g., public safety associations). A successful committee will include participants from all levels of government, commercial wireless services providers, and members from state chapters of professional public safety organizations. This body can be used to advise and inform key policy makers on issues related to public safety communications such as new and existing technology, development of standards, funding, and regulatory matters.

Specifically, statewide planning or coordinating bodies can serve the governor or state legislature in a number of ways. For example, such a body could be responsible for:

- Taking the lead in communicating plans to stakeholders
- Pursuing operational and interoperable spectrum allocations
- Assisting in developing a funding and finance strategy
- Establishing interoperability policy recommendations for executive or legislative action
- Encouraging cooperation and coordination in finalizing system design and preparing specifications.



Success in Illinois

In December 2000, Illinois Governor George Ryan approved a \$25 million grant from the Illinois FIRST Program to help the Illinois State Police purchase radio equipment to use on a leased statewide communications system. This innovative approach will allow the State Police to migrate from their old, outdated technology to more sophisticated equipment. The new equipment will be used on a system operated by an outside vendor rather than on a traditional, state-owned infrastructure. ★

ISSUE

2

A State's Role in Funding

Many existing public safety communications systems are not designed to support the modern technologies that make it easier

to achieve interoperability. Moreover, replacing public safety radio systems can be an expensive proposition. In fact, the Public Safety Wireless Network (PSWN) Program has estimated that the value of the current nationwide public safety communications infrastructure exceeds \$18 billion and that new, statewide wireless systems each cost around \$200 million. It is increasingly difficult for leaders to support projects that have such high price tags. Additionally, these projects face competition for state funds from compelling interests, such as transportation and education, that make it difficult to receive the necessary sustained funding.

Generally, states have an 18- to 24-month capital budget planning cycle that requires considerable preparation and positioning before they begin any system implementations. To obtain the necessary funding, public safety agencies must use this time to convince public officials and concerned citizens of the critical need for modern radio communications. Tight budgets and high costs of upgrading systems are compelling states and others also to explore innovative approaches to funding communications systems (e.g., fee for service). Furthermore, government executives need to raise the priority of radio system initiatives within budget debates by establishing and fully

It is critical that governors be

Strong advocates for funding

public safety communications

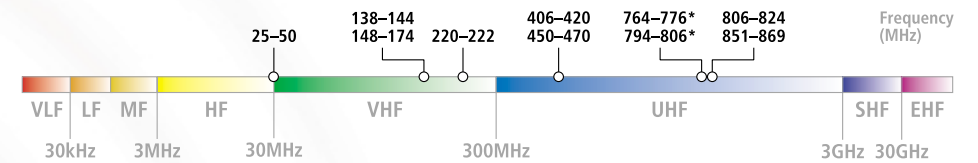
supporting dedicated and sustainable funding sources. Additional funding processes include identifying dedicated or sustained funding mechanisms, securing project funding, and developing strategies for participating governmental units to share funding, common infrastructure, and in-kind services.

States that have completed these initial steps must continue on to identify funding to plan and implement upgraded systems in order for interoperability to become a reality. Very often, the budget proposed by the governor provides the most comprehensive plan for action put before the legislature. As such, it is critical that governors be strong advocates for public safety

communications and that they require that funding needs be met. The considerable fiscal resources required to upgrade or replace public safety radio systems necessitates inclusion of these systems when developing capital plans and projecting financial forecasts. Incorporating the future cost of public safety radio communication systems in budget forecasts greatly reduces the possibility of an unexpected budget request for additional funds for upgrading or replacing radio systems. Perhaps even more importantly, it allows these projects to be included in the same funding streams as other large multiyear capital improvement projects.

Success in Pennsylvania

The Commonwealth of Pennsylvania has been very successful in garnering support for funding its statewide public safety communications system. Early in the system development process, project leaders obtained the endorsement of Governor Tom Ridge. The governor worked closely with the state's general assembly to pass Legislative Act 148, which started development of the new network. To date, \$222 million has been allocated for planning and construction of the public safety radio system. ★



Obtaining additional

requires spectrum broad support

ISSUE **3** **A State's Role in Spectrum**

As society finds more sophisticated uses for wireless voice and data applications, available spectrum to support public safety

applications becomes increasingly difficult to identify. Public safety agencies are also finding more complex uses for wireless data that demand greater bandwidth requirements. Unfortunately, wireless spectrum is a fixed and limited resource that can be neither created nor destroyed. Additionally, activities on any one band of spectrum have significant potential to interfere with operations on any number of other bands. Therefore, the efficient and responsible allocation of spectrum resources for public safety organizations and other entities is of paramount importance.

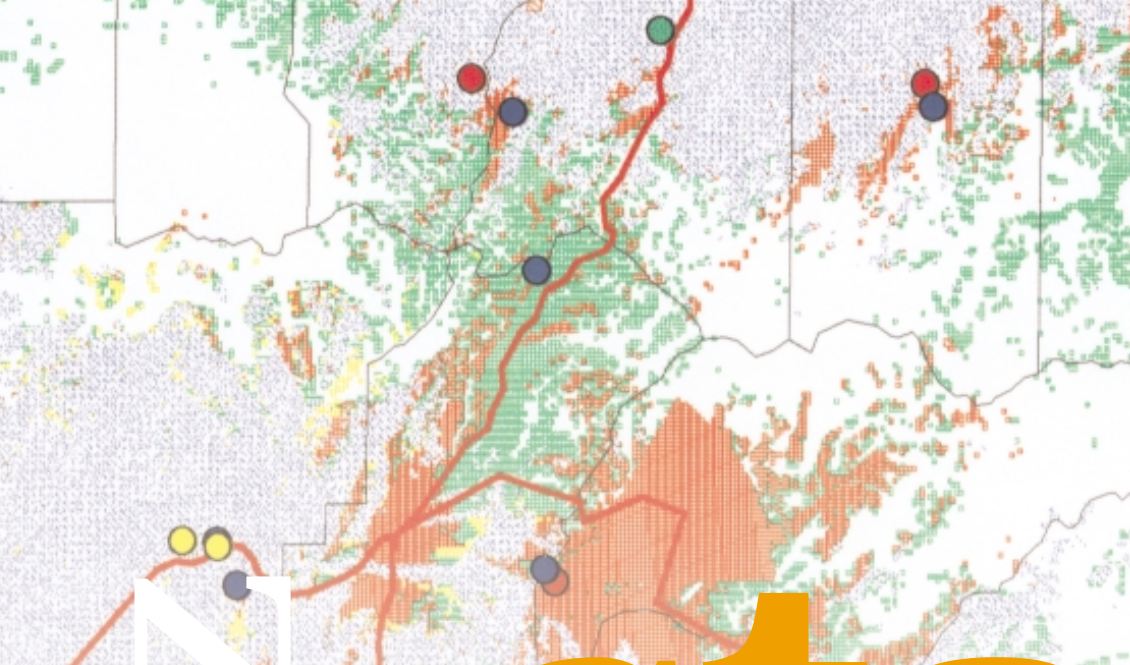
A 1996 study by the Public Safety Wireless Advisory Committee (PSWAC) concluded that the aggregate spectrum allocated for public safety use was insufficient to meet the needs of the public safety community. Based on the PSWAC recommendations, an additional 97.5 MHz of spectrum is needed to support current and emerging public safety applications, including narrowband and broadband data communications. Of this request, 24 MHz has been satisfied through recent congressional and Federal Communications Commission (FCC) actions. This leaves 73.5 MHz of spectrum needs that are not being addressed. This spectrum will be critical to support mission-critical functions of personnel at all levels, from senior decision makers to end users in the field.

Complicating matters is the fact that very little of the currently allocated spectrum is available for interoperability purposes; spectrum assigned for this use will be essential in linking various public safety entities together during emergencies and routine operations. Obtaining additional spectrum in the current era of competition with private and other governmental entities will require broad support from state leaders. Adding further complexity to the spectrum issue, the rules for managing spectrum are not generally well understood by public safety agencies. The FCC manages spectrum at the state level and in developing the rules and regulations for managing spectrum, the FCC seeks comments from any interested party.

When the opportunity arises, states must be poised to make informed arguments documenting needs for available spectrum and for spectrum requirements necessary

to support future applications. Only through active participation in spectrum regulatory and management processes can public safety entities at all levels of governments ensure that their interests, as well as those of the larger public safety community, are considered and acted upon. Ongoing involvement will also ensure that state entities are kept informed concerning national allocation strategies and allow them to take substantial and early advantage of any new spectrum made available for public safety use. Individual states may also consider employing a spectrum manager to provide policy guidance and subject-matter expertise to the executive and legislative branches on spectrum related issues. This individual's role could also include ensuring that the state adheres to all relevant federal rules and regulations associated with public safety spectrum.





standards,

ISSUE **4**

A State's Role in Standards & Technology

A number of new radio technologies are becoming popular as agencies consider plans to replace or upgrade their existing

systems. However, competing equipment vendors continue to manufacture these technologies in a proprietary manner forcing public safety agencies to continue to purchase equipment that is not interoperable. These incompatibilities preclude interoperability even when the radios operate in the same spectrum bands. Without technical standards, vendors will continue producing "closed systems" that create significant barriers to interoperability for the public safety community.

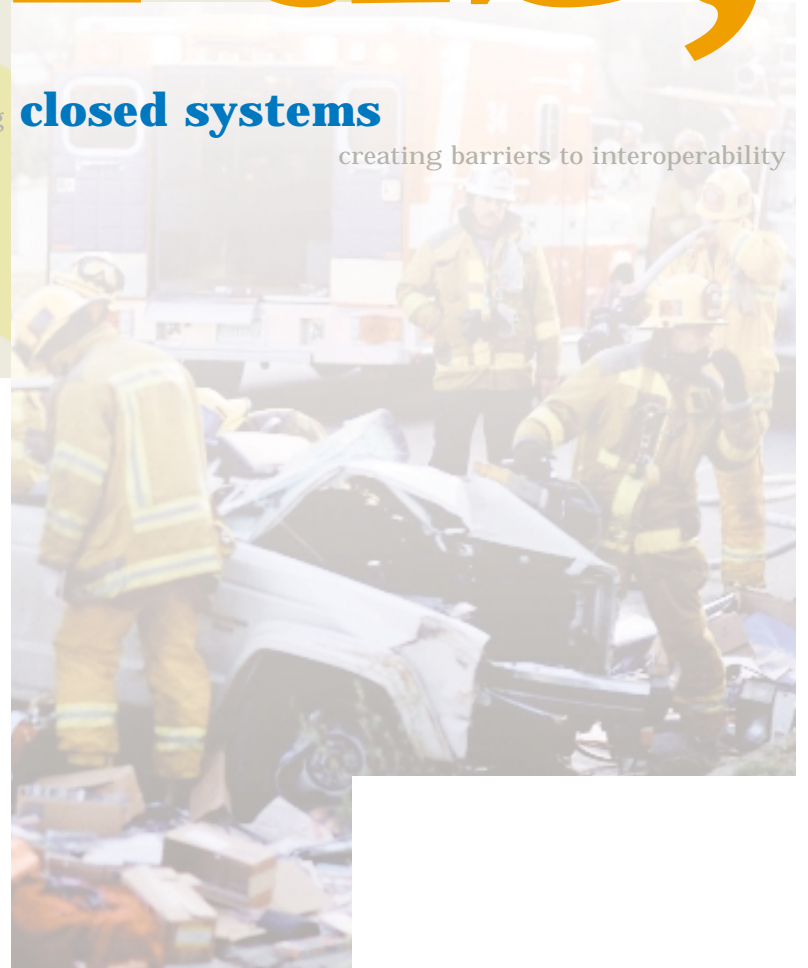
The best example of how standards have helped an industry is the computer industry. Many computer users remember when personal computers from competing manufacturers were completely incompatible. The inconvenience was extremely frustrating. But with the advent of standards-based networks, such as the Internet, computers from different vendors (i.e., IBM and Apple) can now "communicate" with one another. This type of innovation is needed for public safety wireless systems.

Without **technical**

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States can, and must, take the lead in bringing the industry and the public safety community together for collaboration and to foster development of standards and compatible equipment. As a state leader, you should be aware that effective standards development will introduce competition in the marketplace, allowing governmental units to purchase wireless systems at reduced costs. It will also encourage valuable research into emerging technologies such as open interfaces, modular audio switches, and transportable communications systems.



States must ensure the
physical & electronic

Security

ISSUE **5** **A State's Role in Security**

Security for public safety communications systems is an issue that has gained increased importance over the last

several years. In fact, since 1996 the security of networked systems has become a prominent national issue. It was at that time that the President articulated the need to protect America's eight critical infrastructures. One of these critical infrastructures was the public safety infrastructure, including public safety communications systems. One reason these systems are being increasingly scrutinized is that modern communications systems are based on computer technology, which introduces a host of new security threats. Furthermore, secure communications are necessary because routine and emerging security threats, such as transmission interception, frequency jamming, and physical attacks can cripple public safety agencies' ability to talk with one another and place valuable lives and resources at risk.

When the focus turns to interoperable systems, security becomes more of an issue than ever before. As systems become increasingly interoperable, the number of vulnerable access points increases; however, interoperable systems also provide redundant communications paths that help to mitigate these new vulnerabilities. When security is successfully addressed, it has the added benefit of enabling greater participation in the development of interoperable systems. For instance, federal agencies may be more

willing to participate in local and state shared systems, or develop interoperable links to state systems, if they were assured of an appropriate level of system security. Similarly, local agencies may be more likely to participate in shared, statewide systems if they can be assured of the confidentiality of their information.

In the future, states should work to ensure the physical and electronic security of their wireless communications systems and the information transmitted over these systems. State leadership in this area can facilitate interoperability by establishing far-reaching security policies that make participation in a shared system a compelling proposition to agencies with strong security concerns. State leaders should also build significant security requirements into their specifications for new system procurements and work to identify the necessary funding to secure existing systems.

of their wireless communications systems as well as the **information** transmitted over these systems





Summary

A robust public safety communications infrastructure is a critical component in fulfilling a state's public safety mission. Through their chief executive officers, states can provide the leadership and the common vision that ensures modern public safety communications technology will continue to enhance the delivery of public safety services well into the 21st century.

Public safety agencies at the state and local government level very often have similar regional coverage requirements and would benefit greatly from coordinating and working together to develop shared systems that improve interoperability. Just as states are recognizing the need to maintain wireless coverage that encompasses the majority of land within their borders, local governments are finding it necessary to expand their coverage area and mission scope as jurisdictions grow through the annexation process.

The states should take advantage of growing opportunities to elevate public safety communications on both local and national agendas. By taking an active role in promoting public safety communications, the states will be better positioned to promote and plan for multijurisdictional interoperability at local and federal levels. Additionally, state decision makers should continue to proactively represent public safety interests in state and national planning forums and before legislative and regulatory bodies.

In facing the formidable task of replacing aging, outdated public safety radio systems, state government officials will be challenged to keep pace with rapidly evolving wireless technologies, to exploit emerging applications to meet current needs, and to ensure coordination across jurisdictional boundaries. If these challenges are not met, public safety agencies will continue to struggle to communicate with one another and operational effectiveness will be compromised.

checklist

for Ensuring Public Safety Wireless Communications Effectiveness

About the Public Safety Wireless Network Program

The PSWN Program is a jointly sponsored initiative of the United States Department of Justice and the United States Department of the Treasury. The PSWN Program is responsible for planning and fostering interoperability among public safety wireless networks so that local, state, federal, and tribal personnel can better communicate with each other while serving the Nation's public safety needs. Through a variety of activities, the program strives to achieve the vision it shares with the public safety community—seamless, coordinated, and integrated public safety communications for the safe, effective, and efficient protection of life and property. A critical feature of the PSWN Program's strategy for supporting widespread interoperability is an emphasis on a leadership role for the individual states to serve as the linchpins for achieving nationwide wireless interoperability.

During its first several years, the PSWN Program has actively supported both state and local entities in improving public safety wireless interoperability. Examples include:

- Convening the PSWN Executive Committee, which comprises prominent local and state public safety officials, to provide strategic guidance and promote the need for improved communications interoperability
- Hosting regional symposiums in 13 different states that bring together local, state, federal, and tribal public safety agencies to share information on wide-ranging issues such as regional planning, site acquisition, funding, and systems planning
- Working with agencies in southern California to pilot a transportable interoperability solution that allows crossband, interagency communications among disparate public safety entities at all levels of government
- Supporting a pilot project in south Florida that will address interoperability challenges that could arise during a mass migration incident by linking local, state, and federal agencies using various types of radio systems in different frequency bands
- Establishing a pilot project in the southwest border cities of El Paso, Texas, and Las Cruces, New Mexico, that is designed to demonstrate interoperability between public safety agencies using proprietary equipment from different vendors
- Working with the Utah Communications Agency Network (UCAN) to improve interoperability and increase flexibility for the entire Salt Lake County public safety community and to support interoperable communications for the 2002 Winter Olympic Games
- Developing a pilot project in Washington, DC, in conjunction with the Metropolitan Washington Council of Governments (COG), to design and implement a regional interoperability solution using 800 MHz interoperability channels
- Supporting efforts to improve radio communication interoperability between Vermont and New Hampshire and to implement a solution that allows users to cross into the other state and either talk on their "home" system or on the other state's system
- Working with the Montana Public Safety Communications Association (PSCA) to develop a consolidated tower site for local, state, and federal public safety agencies in the Carbon County area to be used as a model for other parts of the state
- Providing interoperability assistance to the State of Michigan by evaluating their consultant's findings on two mobile data proposals for the final phase of their statewide system implementation.

Coordination and Partnerships

- Form a State Executive Committee or Council that reports back to the Governor and the legislature on current developments and issues related to statewide and regional interoperability
- Participate in statewide, regional, and national outreach and education initiatives aimed at improving public safety wireless interoperability, such as the PSWN Program's quarterly symposiums
- Establish Memoranda of Understanding defining interoperability procedures
- Include interoperability success as an element of the Governor's State of the State address

Funding

- Establish public safety interoperability as a fiscal priority
- Develop funding strategies or incentives that encourage greater local, state, and federal participation in statewide and regional systems
- Identify current and sustained funding for developing a shared system within your state
- Research successful funding strategies used by other states

Spectrum

- Retain a professional spectrum manager to provide coordinated, high-level policy guidance and direction to all public safety spectrum users
- Implement strategies for the efficient use of radio frequency spectrum
- Ensure that the state fully participates in Federal Communications Commission rulemaking activities that impact frequency allocation for public safety use

Standards & Technology

- Ensure all new communications systems acquisitions are consistent with an accepted wireless standard
- Fully explore and test viable new technologies, such as Voice-over-Internet Protocol (VoIP), as potential options for system architecture
- Use small modernization projects to test technology that could have broader impact across a state or region and that could enhance local functional and operational requirements
- Remain keenly involved with standards development activities to ensure that state requirements are accurately reflected in emerging standards

Security

- Understand the potential security threats and risks associated with public safety communications systems
- Establish a statewide security policy that provides maximum coverage to all agencies that could participate in a statewide or regional shared system
- Ensure adequate funding is available to secure existing systems and strive to fund only those systems with security policies and plans in place
- Identify federal security requirements that would allow secure joint participation on major communications systems

Leading Interoperable Systems Development

- Lead planning efforts to identify state requirements necessary for implementing interoperable system strategies that will maximally benefit public safety agencies throughout the state
- Research what other states have done to successfully implement interoperable wireless solutions
- Develop an interoperable communications infrastructure available to all public safety agencies within your state
- Offer incentives for local and federal participation in shared or highly interoperable communications systems in your state



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