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Strategies for States to Achieve Public Safety Wireless Interoperability¹

Summary

Popular television shows that feature computers in patrol cars, life-saving technologies in rescue vehicles, and the latest state-of-the-art dispatch centers may lead citizens to believe that first responders can and do effortlessly communicate with each other on a regular basis. But the truth is many public safety radio communication systems across this country lack interoperability, or the ability to share voice and data, between and among agencies and jurisdictions.

The lack of interoperability is a serious, pressing public safety problem that severely undermines the capacities of law enforcement, firefighters, and other first responders to respond to and manage emergency situations. The tragic events of September 11, 2001, focused attention on the urgent need for public safety and other agencies to communicate reliably and effectively with each other when called upon in a crisis.

There are five challenges public officials must address to achieve interoperability:

1. incompatible and aging communications equipment,
2. limited and fragmented funding,
3. limited and fragmented planning,
4. lack of coordination and cooperation, and
5. limited and fragmented radio spectrum.

Governors are critical in meeting these challenges. They can provide the leadership to create statewide and regional interoperability capacity for more effective public safety. To do this, governors can employ the following strategies:

- institutionalize a governance structure that fosters collaborative planning among local, state, and federal government agencies;
- encourage the development of flexible and open architecture and standards;

- support funding for public safety agencies that work to achieve interoperability and reject agency budgets that do not include interoperable solutions; and
- support the efforts of the public safety community to work with the Federal Communications Commission (FCC) to allocate ample spectrum for public safety and create contiguous bands for public safety spectrum.

This *Issue Brief* will provide a definition of interoperability, a discussion of the challenges facing interoperable communications, and strategies governors can employ to achieve interoperability in their states.

What is Interoperability?

Interoperability means that public safety agencies—including law enforcement, firefighters, and emergency medical services—can talk to one another via radio communication systems exchanging voice and/or data on demand, in real time, during an event. The current state of interoperability varies from state to state. According to a federal study of state emergency communications capabilities, only 14 states have implemented “shared, interoperable systems and have formalized sharing agreements with public safety agencies at multiple levels of government.”² The majority of states are in the development stages of interoperability; that is, “crafting strategic plans for system design, engineering, and implementation.”³ However, most states are still operating under a system of temporary, patchwork solutions that

often does not accommodate all responders and may require the cumbersome use of more than one radio during an incident.

Lessons from the Field

On Sept. 11, hundreds of firefighters did not receive the same warning to evacuate the World Trade Center that the police officers did. Why? Firefighters and police departments were using different radio systems that could not talk to each other. (Source: “*Why Can't We Talk*,” pp. 4.)

At the same time, a different picture emerged from the Pentagon. Federal, state, and local emergency responders in the Washington, D.C., area were able to communicate because they had a mutual-aid interoperability plan. This plan was developed in response to the 1982 Air Florida plane crash in Washington, D.C. At that time agencies could not communicate with each other, hampering rescue efforts. Regional planning produced successful procedures for mutual-aid interoperability on 9/11. (Source: *Answering the Call: Communications Lessons Learned from the Pentagon Attack*, Public Safety Wireless Network, February 1, 2003.)

Challenges to Interoperability⁴

There are five key issues underlying the current status of interoperability among public safety agencies in this country: incompatible and aging communications equipment, limited and fragmented funding, limited and fragmented planning, a lack of coordination and cooperation, and inadequate and fragmented radio spectrum. This section of the Issue Brief is largely paraphrased and quoted from an excellent publication, “*Why Can’t We Talk? Working Together to Bridge the Communications Gap to Save Lives,*” produced by the National Task Force on Interoperability. The NGA Center for Best Practices, along with 17 other national associations, served on this task force to produce this guide for public officials on interoperability.

Incompatible and aging communications equipment

In many jurisdictions across the country, radio communication system infrastructure and equipment—towers, control and dispatch stations, handheld and mobile radios—are 20 years to 40 years old. Antiquated systems and aging equipment have escalated maintenance costs and reduced reliability for public safety agencies.

Public safety field personnel rely on their radios for assistance or backup in emergencies. Many radio systems are obsolete or will become obsolete as manufacturer support discontinues for older equipment. When systems deterioration results in an inability to exchange voice and data communications, field personnel are in danger and citizens are at risk, both in day-to-day and emergency operations.

Just as different computer operating systems will not work together or an AM receiver will not accept an FM signal, radio systems operating on different equipment and frequencies cannot communicate with one another. Moreover, some newer digital radio systems operate on unique proprietary software that prevents the exchange of voice or data communications even on the same radio frequency.

Limited and fragmented funding

In most cases, public safety agencies developed radio communication systems based on individual needs and spending decisions were based on strategies that did not consider the need for interoperability.

Today, local, state, and federal governments face budget shortfalls, and competition is stiff among public agencies for scarce resources. Efforts to secure funding for initiatives that cut across agencies and jurisdictions are undermined by the typical practice of financing government functions on an agency-by-agency, jurisdiction-by-jurisdiction basis. Short-term strategies to incrementally improve existing radio communication systems with limited resources should be explored and developed. In addition, the cost of deploying the entire needed infrastructure in rural areas can be perceived as too high and without political support these areas may not receive the necessary funding.

Limited and fragmented planning

Interoperability planning is underfinanced and fragmented. Yet, without adequate planning, resources are wasted and the outcome is inadequate. The lack of coordination among funding streams for updating or replacing radio communications equipment also hampers overall interoperability. Different agency and community funding priorities and budget cycles exacerbate the problem. Without strategic planning, investments often are made in systems and equipment that are not interoperable. Agencies and jurisdictions also compete for limited federal funds, which can undermine the partnerships necessary for interoperability.

Lack of coordination and cooperation

The need for a coordinating body is clear. However, the reality is that many public safety agencies are reluctant to cede management and control of their communications systems due to disparate agency missions and jurisdictional responsibilities. Interoperability requires shared management, control, policies, and procedures. While it may appear to be a technical issue, interoperability has more to do with establishing trust and buy-in among stakeholders.

Limited and fragmented radio spectrum

The FCC oversees spectrum management, and it has allocated certain frequencies for public safety. Spectrum is the amount of bandwidth available for all over-the-air communications, and it is a finite resource. An extremely limited amount of radio spectrum is reserved for public safety and it is inadequate to accommodate the increasing number of electronic devices that require more and more spectrum to operate. In response, FCC has assigned additional frequency bands for public safety, which now operates

in 10 separate bands. However, these allocated frequencies are scattered across the spectrum, making “ad hoc” technical solutions more difficult for different agencies and jurisdictions.

As technology has advanced and improved, transmission at higher frequencies has become possible.⁵ There are two major spectrum management issues concerning the high-end frequencies. The 700 MHz radio spectrum allocated for public safety is blocked by ongoing television broadcast operations. The ability of public safety agencies to utilize the 700 MHz radio spectrum will depend on how quickly the public replaces its analog televisions with digital televisions.⁶ Current law permits television stations to remain on the air until December 31, 2006, or until 85 percent of households in the relevant market have access to digital television signals, whichever is later.

While the 800 MHz band is being used by many state and local governments for interoperable radio communications systems, the band also faces growing interference problems from commercial radio. In addition to the interference problem, designated public safety channels have already been assigned to users in most major metropolitan areas, leaving little or no room for new system development or expansion of existing systems.⁷

Strategies for Achieving Interoperability: The Role of the Governor

Governors can provide leadership and vision for creating statewide interoperable public safety wireless communications. As leaders, they can build support at the federal, state, and local levels for the necessary investment and coordination to achieve interoperability. This is an investment the public seems more willing to make after September 11.

Governors can use the following strategies and best practices to achieve statewide interoperability:

- institutionalize a governance structure that fosters collaborative planning among local, state, and federal government agencies;
- encourage the development of flexible and open architecture and standards;
- support funding for public safety agencies that work to achieve interoperability and reject agency budgets that do not include interoperable solutions; and

- support the efforts of the public safety community in working with the FCC to allocate ample spectrum for public safety and create contiguous bands for public safety spectrum.

Institutionalize a governance structure that fosters collaborative planning among local, state, and federal government agencies

A governance structure is instrumental in expanding an interoperable communications system. Not only does it solidify relationships and bring various stakeholders to the table, but a governance structure provides a vehicle to explore innovative technologies and potential funding sources to achieve a given jurisdiction’s vision of interoperability.

Local representation on the governance body and in interoperability planning is a 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 decisionmaking early.

States should consider a system that provides incentives to local agencies, as they are the most familiar with the needs of their first responders. For instance, if local agencies use the statewide infrastructure, they may not have to build their own infrastructure and the state may even purchase mobile radios for local police, fire, and EMS. Creating a statewide plan that accommodates local needs and guarantees efficient use of resources is an effective strategy.

Governors as Catalysts

Delaware Governor Ruth Ann Minner became aware of the lack of interoperability when she owned a towing company. During emergency incidents, the towing company’s radio system was utilized to deliver messages to first responders because there was no interoperable communications. This first-hand knowledge of the state’s lack of shared communications provided Governor Minner with an understanding of the issues and a strong desire to correct the problem in Delaware. Now the state has an 800 MHz, digital, trunked radio system that provides statewide coverage for more than 9,000 state, local, and federal users. (Source: “*Why Can’t We Talk?*” Supplemental resources, pp. 17.)

After 9/11, **Utah** Governor Michael Leavitt was adamant about ensuring the public’s safety at the 2002 Winter Olympics in Salt Lake City. To meet the public’s high expectations, there was a significant investment in the Utah Communications Agency Network (UCAN), an 800 MHz public safety radio system. Due to the enormous efforts of the public safety community, the system supported 15,600 federal, state, county, and municipal users during the Olympics processing 8.5 million calls in 17 days. If there had been an incident, UCAN could have provided immediate coverage for first responders. (Source: “*Why Can’t We Talk?*” Supplemental resources, pp. 26.)

The governance body also must determine the appropriate level of interoperability during an incident. Obviously it is not feasible for every police officer, every firefighter, and every emergency medical responder to have interoperable communications. There would simply be too many people talking on the system at the same time. An incident management command system must be implemented with clearly defined protocols that determine who needs to talk to whom.

In [South Dakota](#), the public safety communications system had evolved with little statewide planning. After an extensive survey of local and federal agency needs, the state built a system that uses a communications infrastructure based on the most prevalent technology in the state. The system allows users from local, state, and federal levels of government to communicate with each other at any place, anytime. The 150 MHz digital trunked statewide radio communications system became operational in October 2002. To encourage local public safety agencies to use the statewide system, they were given compatible mobile radios and access to the communications infrastructure. Through these incentives, the state has bridged its vision of building a communications system that provides interoperability based on local need, and created an incentive for compatible local equipment purchases in the future.⁸

The [Capital Wireless Integrated Network](#) (CapWIN) is a multistate, multijurisdictional wireless public safety system. This partnership of communities and agencies serving Washington, D.C., **Maryland**, and **Virginia**, is working together to develop an integrated mobile wireless public safety and transportation network that will enable public safety and transportation officials from more than 40 local, state, and federal agencies to communicate with one another in real time. CapWIN will provide firefighters, police, transportation officials, and other authorized emergency personnel with wireless access to multiple government databases during critical incidents. The network will give first responders and other public safety officials pertinent information to make critical decisions.⁹

CapWIN's governance structure represents all the stakeholders. A project steering group provided project oversight. The steering group has nine members from state, local, and federal agencies representing law enforcement, emergency medical services, transportation, and public works. It has routine oversight responsibilities, but defers to the executive group on matters of policy. The project's executive group has 32 members from state, local, and federal agencies representing fire, police, emergency management,

medical services, and transportation. Additionally, some members are publicly elected officials. This group facilitates implementation of policy based on input from the steering group.

Several other states have been successful in bringing together different stakeholders in their interoperability strategies.

- [Indiana](#) created the Integrated Public Safety Commission (IPSC) in 1999, which was the key factor in winning local support. The IPSC provides structure to the local-state relationship. The state constructs the backbone of the system (i.e., the towers, controllers, and connectivity) and the localities purchase user equipment. There are no user fees, a plan favorable to local agencies.¹⁰
- [Minnesota](#) passed legislation in 1995 to create the Metropolitan Radio Board (MRB), which included representatives from local government, counties, state law enforcement, and other public safety providers. The board allowed state agencies and local governments to develop shared solutions instead of building separate systems.¹¹
- Created in 1997, the [Utah](#) Communications Agency Network (UCAN) has an executive committee composed of 10 local government and 5 state members, appointed by the governor.¹²
- The [New York State Police](#) has divided the state into 16 communication zones with local representation from each zone. This approach keeps stakeholders engaged in achieving interoperability. In addition, all state agencies meet biweekly to discuss homeland security issues, including interoperability.

Encourage the development of flexible and open architecture and standards

In response to the current lack of standards, the Association of Public-Safety Communications Officials International, an association of public safety agencies and private-sector companies, is developing a digital standard for wireless communications users called “Project 25.” Although not all first responders are adopting “Project 25” due to investments they may have already made in equipment, it is a model that agencies can use when purchasing digital radios to achieve interoperable communications.¹³

Recent funding for interoperable communications available through the U.S. Department of Homeland Security (DHS) and the U.S. Department of Justice's Office of Community Oriented Policing Services (COPS) requires localities to use open-based standards when procuring equipment. For example, [Indiana](#) requires localities to use these standards before allocating funds toward their public safety needs. In this case, Indiana awarded funds to a local fire department involved with the build-out of the statewide communications infrastructure. Funds will be used to expand the fire department's ability to serve its community.

Support funding for public safety agencies that work to achieve interoperability and reject agency budgets that do not include interoperable solutions

Optimizing the use of limited funding available is important in interoperability planning and implementation. States should develop strategies for governmental units to coordinate and share funding for common infrastructure and equipment. Likewise, state and local governments should ensure that homeland security funding designated for interoperable communications is spent effectively and efficiently through the coordination of statewide and regional plans.

Several states are using financial incentives to encourage and leverage cooperation and participation in interoperability initiatives.

- [Minnesota](#) passed legislation that encourages state and local governments to share infrastructure instead of upgrading systems separately. The Minnesota Department of Transportation financed half the cost of the infrastructure, partly through general obligation bonds and partly with monies from the state's trunk highway fund. The other half of the capital costs came from the Metropolitan Radio Board through revenue bonds issues on its behalf by the Metropolitan Council. Debt service is provided by 4 cents from the 9-1-1 surtax, which is collected monthly on all of the state's wired and wireless telephone lines.¹⁴
- [Indiana](#) offered its statewide Project Hoosier SAFE-T system to localities. Johnson County estimates that it saved more than \$2 million by using the statewide system instead of building its own system.

Maintenance of the statewide system is financed through a \$1.25 surcharge on transactions at the Department of Motor Vehicle transactions, which amount to \$15 million annually.

- The [North Carolina](#) State Highway Patrol has installed a mobile data network that includes approximately 270 federal, state, and local agencies sharing the mobile data network with more than 7,100 users. By using towers owned by other agencies, the state has completed the network infrastructure, originally estimated at \$100 million, for approximately \$15 million.¹⁵
- In the post-9/11 environment, [New Jersey](#) is installing an 800 MHz radio communications system in each of the state's 85 acute care hospitals. The goal is to piggyback on the New Jersey State Police radio network to leverage scarce resources for purchasing equipment and maintaining the system.¹⁶
- The [Utah](#) Communications Agency Network shares resources cost effectively by linking existing communications systems. Systems include the University of Utah network, intelligent transportation systems, and other state and local networks. Radio service costs decrease because of the economies of scale realized through creating a "network of networks."

Support the efforts of the public safety community to work with FCC to allocate ample spectrum for public safety and create contiguous bands for public safety spectrum.

State and local governments are working with FCC to find ways to bring public safety frequencies into contiguous bands. Governors have adopted a NGA policy urging Congress to revise provisions of the Balanced Budget Act of 1997 so radio spectrum for public safety is available to state and local governments as soon as possible.¹⁷

Recently, Representatives Jane Harman (D-Calif.) and Curt Weldon (R-Pa.) have reintroduced a bill to ensure that TV broadcasters transfer a 24 MHz piece of spectrum to public safety officials by 2006. The Homeland Emergency Response Operations (HERO) Act sets a firm December 31, 2006, deadline for the transition and closes the loophole that would allow broadcasters to continue to use the channels if digital TV is not used by 85 percent of American households. It is estimated that only 1 percent of households currently have digital TV, and reaching the 85 percent saturation threshold is problematic. Under the

current legislation, TV broadcasters have until December 31, 2006, to move or until 85 percent of the households in a market have access to digital TV signals, whichever is later.¹⁸

In addition, Nextel Communications is working with FCC to create a plan whereby the 700 MHz band will be reconfigured to allow public safety channels to be contiguous. This is a long-term plan that has been submitted to the FCC for public comment, but has not been resolved.

Conclusion

Governors are well positioned to provide the leadership to facilitate a process for improving statewide and regional public safety communications interoperability. Without a statewide plan that incorporates an intergovernmental approach with specific action and support, new investments in equipment and infrastructure can hinder interoperability.

While events like September 11th are unconscionable, they have brought attention to a serious public safety problem and provided an opportunity to bring stakeholders together to focus on the need for different and more effective emergency responses. Though tools are available to achieve interoperability, it will take leadership and political will to provide the impetus to work through jurisdictional battles and facilitate innovative policy and technical solutions.

Additional Resources

Federal Sources¹⁹

- SAFECOM is the overarching umbrella program within the federal government that oversees all initiatives and projects pertaining to public safety communications and interoperability. The program is managed by the Department of Homeland Security, and is housed within the Science and Technology Directorate.
- The Web site for the Office of Justice Programs (OJP) Information Technology Initiatives offers guidance on both federal and private funding sources.
- The CommTech program from the National Institute of Justice (NIJ) which will work to inform SAFECOM's policy, coordination, and technology development activities.
- Local Law Enforcement Block Grants (LLEBGs) from the Bureau of Justice Assistance (BJA) can be used to procure equipment, technology, and other material directly related to basic law enforcement functions.
- The Office for Domestic Preparedness (ODP) Equipment Grant Program can be utilized to enhance the capacity of state jurisdictions to respond to, and mitigate the consequences of incidents of domestic terrorism involving the use of weapons of mass destruction (WMD). Communications equipment is part of the authorized equipment purchase list for these grants.

Funding Opportunities

The Homeland Security Act of 2003 appropriates \$3.5 billion for first responders. This allocation includes funding for interoperable communications equipment, which is spread across several existing programs.

- Police departments can tap the \$900 million U.S. Department of Justice (DOJ) Law Enforcement Block Grant and the Byrne Grant program to buy communications equipment and other law enforcement technologies.

- The spending bill allocates \$750 million for fire department grant programs run by the Federal Emergency Management Agency, including \$25 million for interoperable communications equipment.
- DOJ will receive \$2.4 billion for first responder programs, including \$20 million for interoperable radio equipment within the Community Oriented Police Services (COPS) program.²⁰

Endnotes

¹ “Why Can’t We Talk? Working Together to Bridge the Communications Gap to Save Lives,” National Task Force on Interoperability, February 2003, Executive Summary, available at: <http://www.agileprogram.org/ntfi>. NGA served on the task force throughout 2002 and was involved in the preparation of this planning guide for public officials. Much of the text, ideas, and examples for this *Issue Brief* are drawn from the planning guide.

² *The State of Interoperability*, Public Safety WINS (Wireless Interoperability National Strategy), <http://www.publicsafetywins.gov/>, April 14, 2003.

³ Ibid.

⁴ “Why Can’t We Talk?,” 15-21.

⁵ Ibid., 21.

⁶ Ibid., 53.

⁷ Ibid., 54.

⁸ “Why Can’t We Talk?” Supplemental Resources, pp. 5-11.

⁹ “Answering the Call: Communications Lessons Learned from the Pentagon Attack,” Public Safety Wireless Network, February 1, 2003.

¹⁰ “Why Can’t We Talk?,” Supplemental Resources, 14.

¹¹ Ibid., 17.

¹² Ibid., 25.

¹³ APCO International and Project 25, <http://www.apco911.org/> and <http://www.project25.org/pages/archive.htm>.

¹⁴ “Why Can’t We Talk?,” 18-19.

¹⁵ Ibid, Supplemental Resources, 23.

¹⁶ “New Jersey Enhances Disaster Preparedness,” *Government Technology*, August 2002, available at: www.govtech.net/news/news.phtml?docid=2002.08.28-3030000000020202.

¹⁷ NGA Policy Position EDC-8.3, adopted July 2002.

¹⁸ Dibya Sarkar, “Bill would close spectrum loophole,” March 26, 2003, available at: <http://www.fcw.com/geb/articles/2003/0324/web-spectrum-03-26-03.asp>

¹⁹ Volume Two: Homeland Security: A Governor’s Guide to Emergency Management, p. 39.

²⁰ David Clarke, “Surprises May Lurk for Local Officials Anticipating Windfall for Emergency Units,” *CQ HOMELAND SECURITY*, February 13, 2003.