Funding and Sustainment Resources

September 2016

SAFECOM

NCSWIC

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About SAFECOM and NCSWIC

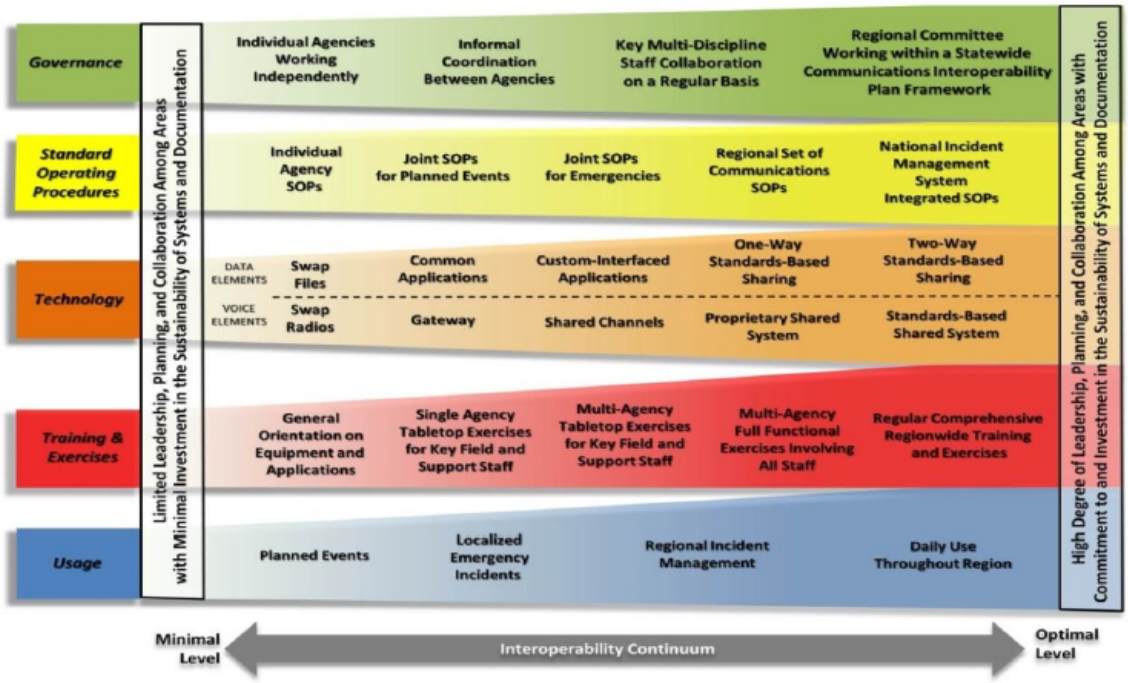
DHS OEC and the Joint SAFECOM and NCSWIC Funding and Sustainment Committee developed this document. SAFECOM's membership includes more than 60 members representing federal, state, local, and tribal emergency responders, elected and appointed officials, and major intergovernmental and national public safety associations, who provide input on the challenges, needs, and best practices of emergency communications. The NCSWIC is comprised of Statewide Interoperability Coordinators (SWIC) and their staff from 56 states and territories; SWICs promote the critical importance of interoperable communications. This document reflects the expertise of SAFECOM and NCSWIC members, and DHS OEC coordination efforts to share innovative methods, best practices, and lessons learned in funding and sustaining public safety communications systems. The Joint SAFECOM and NCSWIC Funding and Sustainment Committee will continue to seek best practices for emergency communications grantees and share updates as they become available.

SAFECOM: http://www.dhs.gov/SAFECOM **NCSWIC:** www.dhs.gov/SAFECOM/NCSWIC

SAFECOM INTEROPERABILITY CONTINUUM

Developed with practitioner input from the Department of Homeland Security's (DHS) SAFECOM program, the Interoperability Continuum is designed to assist emergency response agencies and policy makers to plan and implement interoperability solutions for data and voice communications. This tool identifies the five critical success elements that must be addressed to achieve a sophisticated interoperability solution: governance, standard operating procedures, technology, training and exercises, and usage of interoperable communications. The Interoperability Continuum can be used by jurisdictions to track progress in strengthening interoperable communications. In addition, the DHS Office of Emergency Communications has used the Interoperability Continuum to develop the priorities and measure the goals of the National Emergency Communications Plan.

Exhibit A5-1. SAFECOM Interoperability Continuum



Interoperability is a multi-dimensional challenge. To gain a true picture of a region's interoperability, progress in each of the five interdependent elements must be considered. For example, when a region procures new equipment, that region should plan and conduct training and exercises to maximize the use of that equipment. Optimal level interoperability is contingent upon individual agency and jurisdictional needs. The Continuum is designed as a guide for jurisdictions that are pursuing a new interoperability solution, based on changing needs or additional resources; it is an evolving tool that supports national preparedness doctrine including, but not limited to, the *National Incident Management System*, the *National Response Framework*, and the National Emergency Communications Plan. To maximize the Interoperability Continuum's value to the emergency response community, SAFECOM will regularly update the tool through a consensus process involving practitioners, technical experts, and representatives from Federal, State, local, and tribal agencies.

Summary of Funding and Sustainment Resources

The following materials were developed by SAFECOM and the National Council of Statewide Interoperability Coordinators (NCSWIC) to help state and local stakeholders educate decision-makers and elected officials on public safety communications systems and funding. These documents can be used as read-ahead materials or handouts. All of the products listed below are available on the Funding Page of the SAFECOM website (https://www.dhs.gov/safecom/funding), under the section titled, '*Sustaining Public Safety Communications Systems*.'

1. **Land Mobile Radio Documents**
   - Land Mobile Radio Trio
     - *LMR 101, Part I: Educating Decision Makers on LMR Technologies* includes basic information for use in educating decision-makers about the importance of LMR technologies. The paper includes simple diagrams, terminology, history, and current usage of LMR technologies by public safety agencies.
     - *LMR for Decision Makers, Part II: Educating Decision Makers on LMR Technology Issues* provides information about emerging technologies, and the impact such technologies will have on LMR systems as they evolve. Information includes discussion of the LMR-to-LTE transition, and the need to sustain mission critical voice through such transition.
     - *LMR for Project Managers, Part III: A P25 Primer for Project Managers and Acquisition Managers* delivers an introduction about standards-based (i.e., Project 25 [P25]) purchasing, and an overview of the P25 standard explaining its importance to public safety interoperability.

   - Land Mobile Radio Brochure
     The LMR Brochure was developed to educate state and local decision-makers and elected officials on LMR issues, and to explain why it is important to fund and sustain LMR. We have provided a web version, that can be transmitted and read electronically, or a print version that enables members to print, as needed.
     - *Land Mobile Radio Brochure (Web Version)*
       This version of the LMR Brochure is only available in an online format.
     - *Land Mobile Radio Brochure (Print Version)*
       This version of the LMR Brochure is available to copy and print.

   - Land Mobile Radio (LMR) Action Memorandum
     The LMR Action Memorandum provides public safety stakeholders with basic information they can give to state and local decision-makers and elected officials on why it is important to fund and sustain public safety radio systems.

2. **Funding Mechanisms Document: Examples of How State and Local Entities are Funding Public Safety Communications Systems**
    - Funding Mechanisms for Public Safety Communications Systems
      This document provides an overview of various methods of funding emergency communications systems (e.g., bonds, special tax, surcharges), and specific examples of where these methods have been used to fund state and local systems.

    - Funding Mechanisms for Public Safety Communications Systems Table
      This document presents additional funding mechanisms for states and localities funding emergency communications systems.

3. **Grants Information and Resources for Grantees**
    - Fiscal Year 2016 Emergency Communications Financial Assistance Program
      This document provides a list detailing Federal financial assistance opportunities that support emergency communications.

    - Improving Grant Management: Recommendations for Public Safety Agencies
      This document provides SAFECOM grants best practices from the DHS Inspector General report on grants management.

    - Guidance for Public Safety Entities Interested in Broadband Purchasing Equipment
      This document provides grantees with federal guidance on broadband purchasing (i.e., when it is allowed). The language is pulled from the FY 2015 SAFECOM Grant Guidance

SAFECOM and NCSWIC encourage you to share these documents with public safety agencies in your region. Several states have already leveraged these documents to help inform officials of public safety needs, and to help garner funding and support for public safety communications projects. If you have any questions or feedback on these materials, please contact SAFECOM at SAFECOMGovernance@HQ.DHS.GOV or NCSWIC at NCSWICgovernance@HQ.DHS.GOV.

Land Mobile Radio (LMR) 101

Part 1: Educating Decision-Makers on LMR Technologies

INTRODUCTION

Every day, dedicated men and women risk their lives to make our communities safe and secure. The job of emergency responders at every level of government—federal, state, local, tribal, and territorial—is to respond to and manage incidents of varying size and scope, and assist communities with recovery efforts. This mission requires timely decision-making and coordination among law enforcement and fire personnel, emergency medical services, 911 staff, emergency managers, and health care professionals. As Figure 1 represents, multiple response agencies are involved in a single incident. Communications is a critical part of that response; a breakdown of communication at any one of these junctures could negatively affect response, risking life and property.

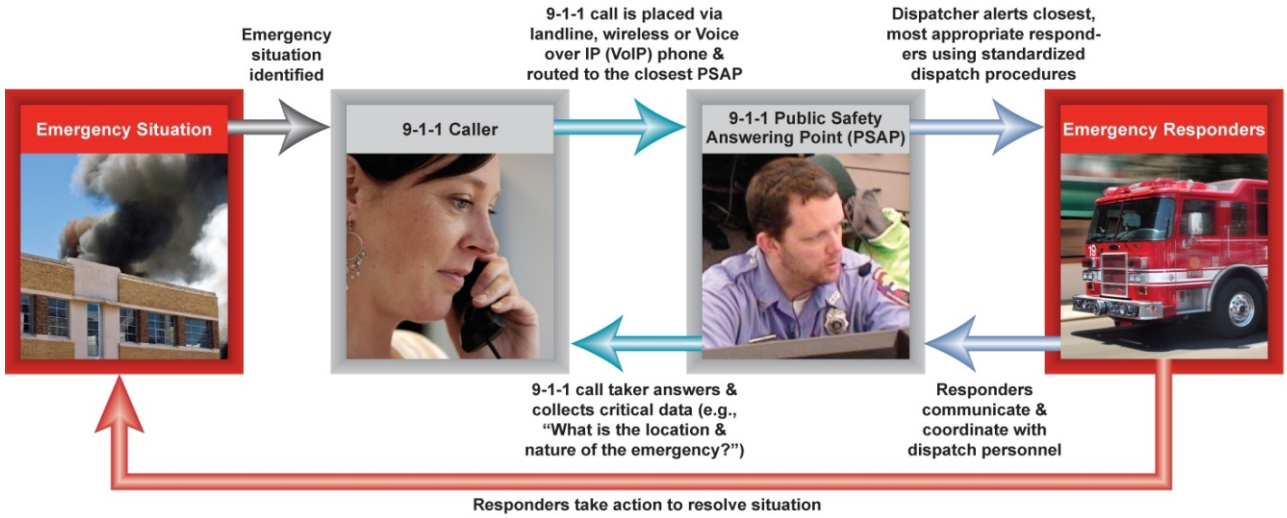


Figure 1. Mission-Critical Communications during Emergency Response

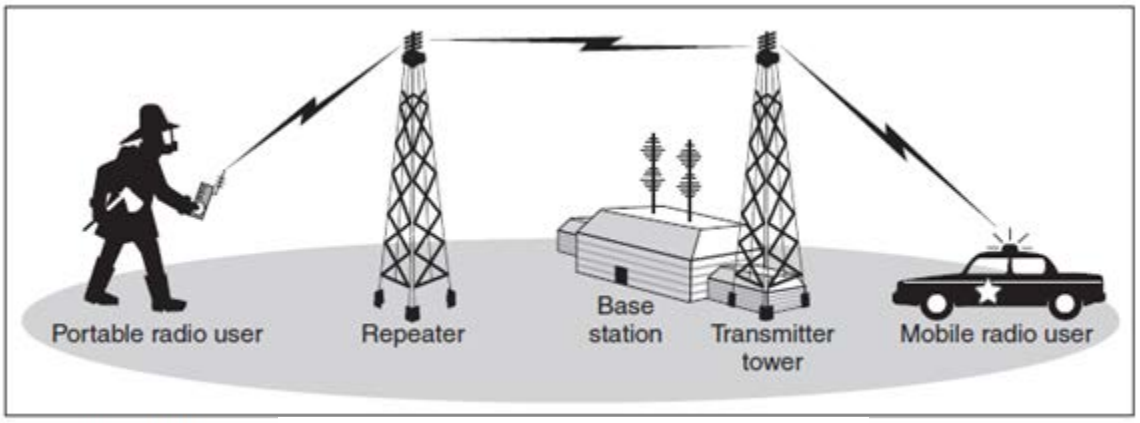
Public safety agencies rely on land mobile radio (LMR) systems as the primary means for transmitting mission-critical voice communications between emergency responders.

WHAT ARE LMR SYSTEMS?

LMR systems are terrestrially-based, wireless communications systems commonly used by federal, state, local, tribal, and territorial emergency responders, public works companies, and even the military to support voice and low-speed data communications. LMR systems typically consist of handheld portable radios, mobile radios, base stations, a network, and repeaters.

- **Handheld portable radios** are carried by public safety personnel and tend to have a limited transmission range.
- **Mobile radios** are often located in vehicles and use the vehicle's power supply and a larger antenna, providing a greater transmission range than handheld portable radios.
- **Base station radios** are located in fixed positions, such as public safety answering points or dispatch centers, and tend to have the most powerful transmitters.
- **A network** is required to connect the different base stations to the same communications system.
- **Repeaters** are used to increase the effective communications range of handheld portable radios, mobile radios, and base station radios by retransmitting received radio signals.

Figure 2 depicts a basic LMR system that shows the flow of communication between emergency responders using portable or mobile radios, which are connected to a network of base stations, towers, and repeaters.[1]



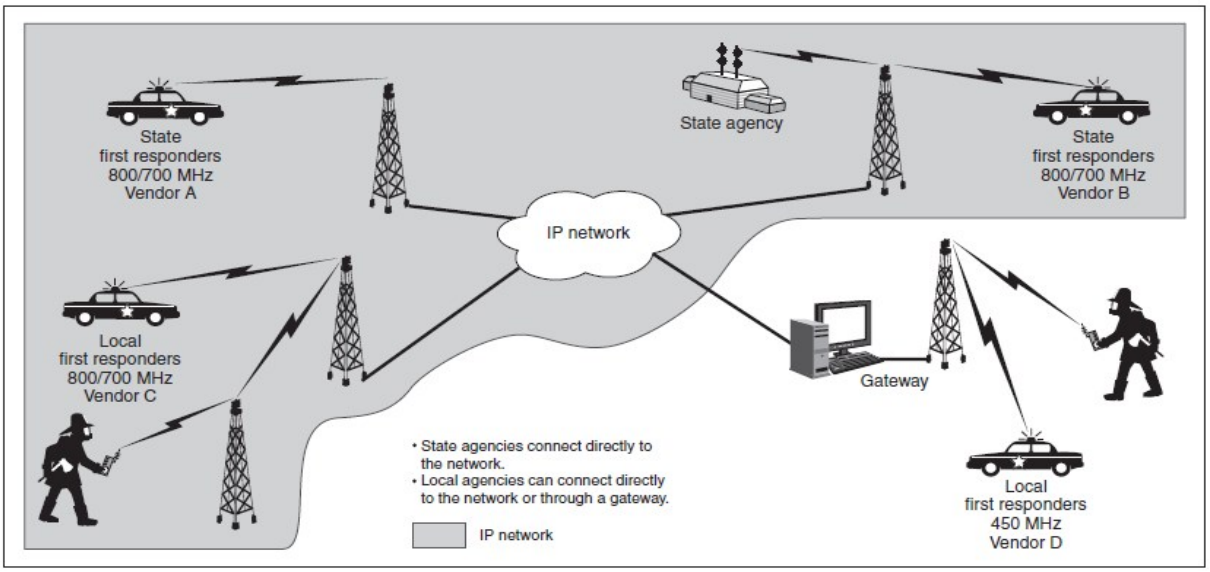
Sources: GAO and DHS.

Figure 2. Basic Components of an LMR System

LMR systems have been deployed since the 1930s to support mission-critical voice communications. Over time, many public safety agencies have migrated from basic LMR systems to more advanced communications systems.

Many agencies have moved from basic, **conventional** systems to more complex **trunked** systems. Conventional radio systems have dedicated frequencies and channels assigned to individual groups of users. When a user makes a call, and selects a channel, other members of the group cannot use the channel until the call is over.[2] Trunked systems are computer-controlled, and assign a pool of channels for use by multiple individuals. When a call is made by a user on a trunked system, an available channel is automatically selected by the system from the pool of channels, leaving the remaining channels available for others. While trunked systems are more complex and require more infrastructure than conventional systems, they allow for the sharing of channels among a large group of users, increase capacity and interoperability, reduce congestion, and enable the more efficient use of communication channels.[3]

Some states, regions, and large urban areas have migrated from basic systems to computer-based, or Internet Protocol (IP)-based systems, which has allowed agencies to increase capacity (i.e., the number of users on a system), enhance capabilities, and improve interoperability. Figure 3 provides an example of a regional or statewide IP network.



Source: GAO-07-301

Figure 3. Example of a Regional or Statewide IP Network

[1] "First Responders: Much Work Remains to Improve Communications Interoperability." GAO-07-301: Published: Apr 2, 2007.
[2] Ibid.
[3] Ibid.

WHY ARE LMR SYSTEMS IMPORTANT?

LMR systems are the primary means of voice communications among public safety personnel. LMR systems are designed to meet the unique needs of public safety, and deliver secure, reliable, mission-critical voice communications in a variety of environments, scenarios, and emergencies. LMR technologies have been used by public safety personnel for many years, and provide the most reliable means of voice communications for public safety at this time.

LMR technologies have been enhanced to provide mission-critical features. LMR technology has progressed over time from conventional, analog voice service (e.g., two-way communications) to complex systems incorporating digital and trunking features that enable such features as rapid voice call-setup, group calling capabilities, high-quality audio, and guaranteed priority access to the end-user. These enhancements have improved the interoperability, spectral efficiency, security, reliability, and functionality of voice and low-speed data communications for public safety personnel.

Public safety agencies are trained and skilled in the use of LMR technologies. LMR technologies and features have been integrated into response protocols and training curriculum, and tested through planned exercises and real-world events. While new technologies are entering the market every day, emergency responders are most familiar with how LMR technologies work. Responders have been trained in their use, and have used LMR technologies in a variety of settings over many years. This familiarity has helped public safety agencies plan for various scenarios and execute effective response operations.

Federal, state, and local agencies have invested billions of dollars in LMR infrastructure. The federal government has provided billions of dollars in grant funding for state, local, tribal, and territorial governments to install, expand, and enhance LMR systems. Individual states, localities, and regions have also devoted public funding to communication systems. Agencies and jurisdictions have worked together to leverage existing infrastructure, connect LMR systems, and create networks of communications systems. State, local, tribal, and territorial governments are continually upgrading these systems to improve interoperability, capabilities, coverage, and capacity. These systems are in place and working.

CURRENT CHALLENGES TO CONSIDER WHEN UPGRADING LMR SYSTEMS

As LMR systems and technologies evolved over many decades, agencies have a variety of communications systems in place today. Some agencies have basic LMR systems in place. Some agencies have more advanced systems in place. Not all of these systems are compatible with each other, inhibiting the ability of public safety responders and officials to talk to each other during emergencies. Below are challenges facing agencies and jurisdictions interested in upgrading public safety communications systems:

- **Agency-specific systems.** Many systems have been designed to meet specific agency missions. Vendors offer customized LMR systems and equipment, designed to serve specific agency missions; vendors build systems to proprietary standards, and offer vendor-specific features that served single agency missions, but may not be compatible with surrounding systems.
- **Spectrum issues.** Agencies and jurisdictions must secure licenses to operate their communication systems on the radio spectrum. The Federal Communications Commission (FCC) assigns spectrum to public safety agencies, according to their needs and use. Public safety communication systems operate on different spectrum frequencies (e.g., very high frequency [VHF], ultra high frequency [UHF], 700 megahertz [MHz], 800 MHz). Systems that operate on different frequencies are not always interoperable. Agencies often invest in bridging devices, and other equipment that connect disparate systems to enable interoperability between systems and responders.[4]
- **Non-standards-based systems** that are vendor-specific or customized, and therefore are not compatible with neighboring public safety LMR systems.
- **Advanced technologies that are not backward compatible** with current systems, including advanced LMR features, Internet Protocol (IP, or computer-based) systems, and broadband technologies that cannot interoperate with older LMR systems.
- **Backup communications solutions** that include commercial cellular voice and data networks as the primary or only source of back-up; these networks may be overwhelmed by congestion and capacity issues during emergencies.
- **Encrypted communications** that are proprietary, or not standardized, prohibiting interoperability with radios that are not encrypted in the same way; if encryption is used, it should be standards-based, and implemented inclusively to ensure existing interoperability is maintained.

[4] "First Responders: Much Work Remains to Improve Communications Interoperability." GAO-07-301: Published: Apr 2, 2007.

GUIDANCE FOR AGENCIES INTERESTED IN UPGRADING LMR SYSTEMS

To overcome these challenges, the federal government provides grant funding and guidance to states and localities. The Department of Homeland Security (DHS), Office of Emergency Communications collaborates with SAFECOM and the National Council of Statewide Interoperability Coordinators (NCSWIC) to develop the annual *SAFECOM Guidance on Emergency Communications Grants (SAFECOM Guidance)*. The *SAFECOM Guidance* provides recommendations, best practices, and resources to public safety agencies investing federal funds in emergency communications. **DHS encourages grantees to:**

- **Review the National Emergency Communications Plan (NECP) and Statewide Communication Interoperability Plans (SCIP),** to ensure that grant proposals support broader plans to improve communications across all systems and users.
- **Coordinate with Statewide Interoperability Coordinators (SWICs),** to serve as a single point of contact to implement statewide plans and coordinate regional projects.
- **Develop Standard Operating Procedures (SOPs)** that provide mutually-approved processes to coordinate public safety agencies' resources during response operations.
- **Invest in training, exercises, and activities that enhance operational coordination** that prepare emergency responders to communicate across agencies.
- **Purchase standards-based equipment** (e.g., Project 25 for LMR, Long-Term Evolution [LTE] for broadband technologies) to ensure public safety systems can interoperate.

State, local, tribal, and territorial governments are encouraged to reference the *SAFECOM Guidance* when developing emergency communications projects and target federal funding toward the priorities above.

CONCLUSION

LMR technologies provide mission-critical voice communications that are tailored to public safety needs. While the community considers new and emerging technologies to supplement communications, current LMR capabilities must be sustained until other technologies provide the reliability that LMR offers. Decision-makers should consider the impact of funding decisions on their agencies' ability to communicate during day-to-day incidents, emergencies, and natural and man-made disasters. The federal government and public safety agencies have spent billions building a vast LMR infrastructure and training users. Without continued investment to operate and maintain LMR systems, emergency communications could be compromised.

ABOUT SAFECOM/NCSWIC

SAFECOM is comprised of more than 70 members representing federal, state, local, and tribal emergency responders, and major intergovernmental and national public safety associations, who aim to improve multi-jurisdictional and intergovernmental communications interoperability through collaboration with emergency responders and policymakers across Federal, State, local, tribal, territorial, and international partners. SAFECOM members bring years of experience with emergency communications during day-to-day operations, and natural and man-made disasters. SAFECOM members offer insight and lessons learned on governance, planning, training, exercises, and technologies, including knowledge of equipment standards, requirements, and use. SAFECOM members also provide input on the challenges, needs, and best practices of emergency communications, and work in coordination with OEC to share best practices and lessons learned with others.

The National Council of Statewide Interoperability Coordinators (NCSWIC) is comprised of Statewide Interoperability Coordinators (SWIC) and their staff from the 56 states and territories. NCSWIC assists states and territories with promoting the critical importance of interoperable communications and sharing best practices to ensure the highest level of interoperable communications across the Nation.

This document was developed by the SAFECOM/NCSWIC Funding and Sustainment Committee, with support from the Department of Homeland Security (DHS) Office of Emergency Communications (OEC). This document reflects the expertise and knowledge of SAFECOM and NCSWIC members, and coordination efforts of OEC in bringing stakeholders together to share technical information, best practices, and lessons learned in funding and deploying public safety communications systems.

For more information on SAFECOM, see: http://www.dhs.gov/SAFECOM
For more information on NCSWIC, see: http://www.dhs.gov/SAFECOM/NCSWIC

Resources for Public Safety Agencies Investing in LMR

SAFECOM Guidance on Emergency Communications Grants
The SAFECOM Guidance provides information for grantees developing emergency communications projects for federal funding. Decision makers and grantees should read the SAFECOM Guidance, coordinate proposals with the Statewide Interoperability Coordinator, and encourage compliance with the recommendations contained therein. For Department of Homeland Security (DHS) grants, grantees must comply with the SAFECOM Guidance as a condition of funding.

P25 Technology Interest Group (PTIG)
The PTIG website provides information on all topics concerning P25 standards. Free registration is required to view content.

P25 Suite of Standards
The Telecommunications Industry Association's website contains P25 standards development activities that address all technical matters for private radio communications systems and services, including definitions, interoperability, compatibility, and compliance requirements. P25 standards documents are available for purchase. Qualified government entities may obtain copies of P25 standards via the PTIG website.

P25 Compliance Assessment Program (CAP)
The P25 CAP establishes a process for ensuring that equipment complies with P25 standards and is capable of interoperating across manufacturers. P25 CAP is helping emergency response officials make informed purchasing decisions by providing manufacturers with a method for testing their equipment for compliance with P25 standards.

Land Mobile Radio (LMR) for Decision Makers

Part 2: Educating Decision-Makers on LMR Technology Issues

INTRODUCTION

Emergency responders must have consistent, resilient, and interoperable mission-critical voice communications systems to respond to citizen calls for services and to enhance personnel safety. LMR systems have been deployed since the 1930's to meet this critical need, and LMR continues to be public safety's primary means of voice communications. As communications technologies have evolved, LMR has kept pace with the introduction of new features, functionalities, and low-speed data capabilities. Additionally, adopted Project 25 (P25) standards help ensure LMR systems and equipment are compatible and interoperable with other P25 systems. In recent years, wireless data communication systems using different technologies and standards have been deployed to supplement traditional LMR capabilities. These systems enhance response by improving the capacity and speed at which critical data (e.g., medical assessments, maps, building plans) can be shared.

The federal government recognizes the value of advanced technologies and has committed over $7 billion to develop and deploy a nationwide public safety broadband data network (NPSBN), using Long-Term Evolution (LTE) standards and technology. The future NPSBN will offer a platform for public safety responders and government officials from all jurisdictions, disciplines, and levels of government to communicate, and will initially provide advanced data capabilities for all responders. While the NPSBN offers great potential to improve interoperability and data capabilities, mission-critical voice capabilities will not be immediately available through the NPSBN. As a result, public safety agencies need to maintain and sustain LMR systems to ensure access to mission-critical voice capabilities, and to support the development and deployment of the NPSBN in their state or region, which will be challenging. For more information on this topic, see FirstNet's statements on the need to sustain LMR systems for mission-critical voice at: http://www.firstnet.gov/network/lmr.

PROGRESSION OF LMR TECHNOLOGY

LMR systems have progressed over time from conventional analog systems that provide a basic platform for reliable two-way radio communications (e.g., push-to-talk, one-to-many communications), to the current digital trunked systems that offer more advanced features to emergency responders, including greater calling capacity (e.g., talk groups), enhanced voice clarity, higher quality coverage, longer battery life, and the availability of customized software applications. The adoption of P25 standards for digital systems has helped to standardize equipment requirements and ensure that systems are compatible and interoperable, regardless of vendor. Furthermore, digital LMR can support the use of IP communication protocols, functions, features and capabilities, which enable a "standardized" network interface protocol, and removes proprietary and/or legacy network elements from the infrastructure – elements that could hinder interoperability. The adoption and use of IP-based systems is emerging at a rapid rate. Investing in systems that could support the use of IP-based systems will enable agencies to connect more easily, promoting greater interoperability across disciplines, jurisdictions, and all levels of government.

Over the past 50 years, the public safety community has invested heavily in LMR infrastructure and equipment. As a result, responders are highly skilled in LMR use. LMR is an accessible, affordable, and reliable means of communications; it provides mission-critical voice capabilities, low-speed data capabilities, and functionalities that have been tried and tested in various response operations and environments. Today, there are an assortment of public safety agencies that operate on analog LMR systems and digital LMR systems, and some that have adopted advanced technologies to supplement LMR. Each technology offers different capabilities that can enhance emergency response.

LMR'S PROVISION OF MISSION-CRITICAL VOICE COMMUNICATIONS

Public safety LMR systems provide public safety responders with mission-critical voice communications and the best possible radio frequency coverage within a given geographical area of responsibility. These systems are designed to meet public safety's unique mission-critical requirements and support time-sensitive, lifesaving tasks, including rapid voice call-setup, group calling capabilities, high-quality audio, and guaranteed priority access to the end-user. Furthermore, the infrastructure equipment, user devices and methods of deployment are hardened, allowing for prolonged operation in rigorous and harsh environments with a higher level of user familiarity, availability, and accessibility. LMR system capabilities may include:

- Emergency alerting
- Encryption
- Audio noise reduction technologies
- Dedicated channels or talkgroups
- Priority access
- Highly reliable and redundant networks

While voice capabilities are offered through other technologies (e.g., Voice over Internet Protocol [VoIP], Voice over LTE [VoLTE], commercial voice push-to-talk (PTT) services), none of these voice offerings guarantee the level of reliability, expedience, and control needed for the demands of mission-critical voice exchanges. At present, there is no other more reliable choice to achieve the same level of mission-critical voice capabilities as that provided by public safety LMR systems. LMR provides the critical combination of quality, reliability, and assurance of access to priority communications that public safety officials need when responding to emergencies.

With the development of the NPSBN, there has been a great focus on defining public safety grade requirements, including the availability and reliability needed for mission-critical voice communications using LTE technologies. LTE voice protocols and standards remain under development. Furthermore, there is no date certain or firm commitment of when or if mission-critical voice services will be offered through the NPSBN. As a result, even as public safety agencies have integrated new technologies, they have stressed the need to maintain and enhance LMR systems to ensure access to mission-critical voice communications during day-to-day operations, emergencies, and disasters.

ADOPTION OF ADVANCED TECHNOLOGIES TO SUPPLEMENT LMR

In addition to using LMR systems, many public safety agencies are using commercial cellular data services or wireless broadband services to augment LMR capabilities. However, there are many drawbacks to using commercial services that are not designed and dedicated for public safety operations. The following table compares publicly-owned, dedicated LMR systems and offerings to privately-owned, commercial cellular networks.

Publicly owned, Dedicated LMR Systems	Privately owned, Commercial Cellular Networks
Intended to provide highest reliability at reasonable cost	Designed as "best effort" and offer no assurance of call completion or coverage; can become overwhelmed during major incidents
Designed to provide maximum coverage per base station site, and to service as many areas and people as possible	Designed to maximize the number of paying users on the system and to ensure the generation of revenue and highest profitability of infrastructure investments
Allows simultaneous communications with multiple users, across multiple jurisdictions and levels of government	Conversations are typically between two users
Based on dispatch operations from a centralized control center	Communications are typically linear, and between individual subscribers
Designed to be robust and resilient	Designed to support the generation of revenue
Developed by a state or local government or a single agency, which may or may not be a public safety agency; the system may be dedicated solely to public safety or shared with other agencies, utilities, or regional entities	Equally accessible to all. Intended to maximize system capacity and profit by allowing more users wireless access. Does not provide public safety priority over other users

Emergency communications are often accomplished through many technologies, each with varying capabilities, standards, and requirements. None is expected to replace the other; rather, they supplement capabilities already in place and to provide back-up or secondary means of communications in the event that the primary means of communications fails. The public safety community recognizes this reality and continues to reiterate that LMR remains the primary tool for emergency responders. As such, local, state, federal and tribal public safety agencies are planning for the NPSBN, while also sustaining LMR systems as the primary and only means of proven and effective mission-critical voice communications.

Most public safety agencies see a future in which LMR systems and wireless broadband services will converge to supplement one another. Other public safety agencies believe there will a convergence of technology, but it will take many years. In either case, the public safety community will need to support a multi-path approach to emergency communications, maintaining LMR systems' operability and interoperability while also planning for the deployment of new technologies. Figure 1 from the *Public Safety Communications Evolution Brochure* illustrates this multi-path approach and the eventual convergence of mission-critical voice and data.

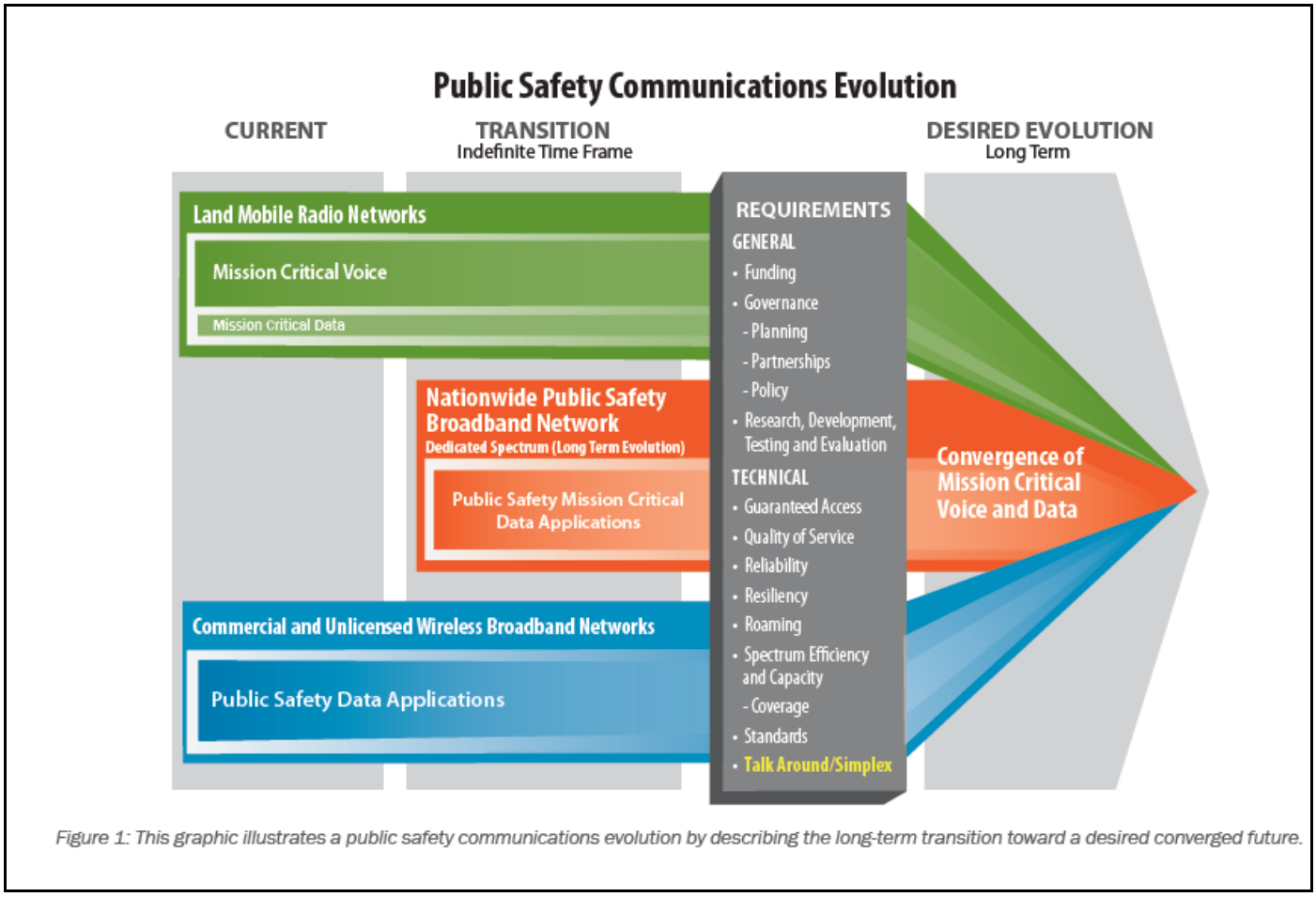


Figure 1: This graphic illustrates a public safety communications evolution by describing the long-term transition toward a desired converged future.

As these technologies continue to converge, interoperability becomes increasingly important. While the federal government has developed minimum interoperability standards for the NPSBN, technical requirements and protocols that ensure the integration and interoperability between systems in the network are still under development. For LMR systems, there are clear and established technical standards that ensure interoperability between systems. Therefore, public safety agencies that are recommending sustained investment in LMR systems, are also recommending the purchase of standards-based equipment to ensure interoperability between existing digital LMR systems and their thousands of users.

TO ENSURE INTEROPERABILITY AMONG RESPONDERS, PURCHASE P25 EQUIPMENT

P25 standards are developed and published by the Telecommunications Industry Association, a recognized American National Standards Institute standards development organization. P25 standards provide technical specifications for manufacturers building and providing digital LMR systems and equipment. The standards have helped to ensure that equipment is compatible and interoperable with other P25 systems. Before the advent of P25, various vendors were producing equipment built with proprietary features and functionalities. Public safety agencies owned and operated these vendor-specific systems. Often one vendor's equipment would not work with another's equipment, which greatly inhibited interoperability across agencies.

In order to promote interoperability, the federal government strongly encourages public safety agencies to purchase digital LMR systems and equipment that are compliant with the P25 suite of standards. While the federal government does not require investment in P25-only equipment, many federal grant administrating agencies will not approve requests for non-standards-based equipment unless there is a compelling reason for such a purchase.

The SAFECOM Guidance on Emergency Communications Grants provides recommendations, best practices, and resources for purchasing LMR equipment, including detailed information on P25 requirements. The *SAFECOM Guidance* recommends that grantees:

- Read the P25 technical standards for LMR
- Include P25 in Statement of Requirements and vendor inquiries
- Select P25 eligible equipment
- Obtain documented evidence of P25 compliance
- Ensure additional features purchased are P25-compliant
- Provide written justification required for non-P25 purchases

Purchase of P25 equipment ensures that digital LMR systems will be compatible with other, most importantly contiguous, P25 systems. Additionally, standards-based systems enable interoperable communications between emergency responders from various agencies, jurisdictions, and levels of government in the event they need to communicate during day-to-day incidents, large-scale emergencies, and disaster responses.

CONCLUSION

With the NPSBN development and initial early builder deployments underway, many local, state, federal and tribal public officials may wrongly believe the NPSBN will replace current LMR systems, and that LMR systems and funding can be phased out. Public safety agencies recognize that LMR systems provide a key capability during response operations—mission-critical voice communications—that will not be immediately available through the NPSBN. Additionally, completion of the NPSBN is remains years away. Therefore, public safety agencies must continue to seek funding for LMR systems, equipment, and enhancements in order to sustain and improve mission-critical voice communications among public safety responders. Decision-makers must consider the needs of public safety agencies and the impact of funding decisions on the ability of public safety responders to effectively communicate during day-to-day incidents, emergencies, and natural and man-made disasters. Without continued investment in LMR systems to sustain mission-critical voice communications, capabilities could be compromised during response operations.

The following list of resources is for public officials and public safety agencies investing in LMR. The *SAFECOM Guidance on Emergency Communications Grants* provides state and local project managers with recommendations, technical requirements, and best practices for planning, procuring, and sustaining an LMR system. To learn more on the current emergency communications ecosystem and the need to sustain two communications systems, decision-makers should read the *Public Safety Communications Evolution Brochure* and the *FirstNet LMR Fact Sheet*. Additional resources on P25 standards are available for LMR system planners.

ABOUT SAFECOM/NCSWIC

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The National Council of Statewide Interoperability Coordinators (NCSWIC) is comprised of Statewide Interoperability Coordinators (SWIC) and their staff from the 56 states and territories. NCSWIC assists states and territories with promoting the critical importance of interoperable communications and sharing best practices to ensure the highest level of interoperable communications across the Nation.

This document was developed by the SAFECOM/NCSWIC Funding and Sustainment Committee, with the support of the Department of Homeland Security (DHS) Office of Emergency Communications. This document reflects the expertise and knowledge of SAFECOM and NCSWIC members, and the coordination efforts of OEC in bringing stakeholders together to share technical information, best practices, and lessons learned in funding and deploying public safety communications systems.

For more information on SAFECOM, see: http://www.dhs.gov/SAFECOM
For more information on NCSWIC, see: http://www.dhs.gov/SAFECOM/NCSWIC

Resources for Public Safety Agencies Investing in LMR

2015 SAFECOM Guidance on Emergency Communications Grants
The SAFECOM Guidance provides information for grantees developing emergency communications projects for federal funding. Decision makers and grantees should read the SAFECOM Guidance, coordinate proposals with the Statewide Interoperability Coordinator, and encourage compliance with the recommendations contained therein. For Department of Homeland Security (DHS) grants, grantees must comply with the SAFECOM Guidance as a condition of funding.

Public Safety Communications Evolution Brochure
The DHS Office of Emergency Communications developed this brochure in collaboration with SAFECOM and the National Council of Statewide Interoperability Coordinators, with the support and input of public safety officials at multiple levels of government across the country. This brochure: (1) Helps educate the public safety community and elected and appointed officials about the future of emergency communications; (2) Describes the evolution of emergency communications and how traditional LMR communications used today may converge with wireless broadband in the future, if specific requirements are met; and (3) Discusses important requirements to achieve the desired long term state of convergence with LMR networks. Decision makers should review the brochure to understand the complexities of the FirstNet program and how it affects current and future investment in LMR.

FirstNet LMR Fact Sheet
This fact sheet discusses how FirstNet's Nationwide Public Safety Broadband Network will work with current LMR systems, and the need for continued investment in legacy LMR systems to preserve voice capabilities while the network is being developed.

P25 Technology Interest Group (PTIG)
The PTIG website provides information on all topics concerning P25 standards. Free registration is required to view content.

P25 Suite of Standards
The Telecommunications Industry Association's website contains P25 standards development activities that address all technical matters for private radio communications systems and services, including definitions, interoperability, compatibility, and compliance requirements. P25 standards documents are available for purchase. Government entities may obtain copies of P25 standards via the PTIG website.

P25 Compliance Assessment Program (CAP)
The CAP establishes a process for ensuring that equipment complies with P25 standards and is capable of interoperating across manufacturers. P25 CAP is helping emergency response officials make informed purchasing decisions by providing manufacturers with a method for testing their equipment for compliance with P25 standards.

Questions on this paper can be directed to the DHS Office of Emergency Communications at oec@hq.dhs.gov.

Land Mobile Radio (LMR) for Project Managers

Part 3: A P25 Primer for Project Managers and Acquisition Managers

Public safety agencies use land mobile radio (LMR) systems as the primary means for transmitting mission-critical voice communications and low-speed data between public safety responders. As LMR systems and technologies have evolved over many decades, there are a variety of communications systems in use today. Traditionally, systems are designed to meet specific agency missions and operate on assigned frequencies/channels within appropriate spectrum bands (e.g., very high frequency [VHF], ultra high frequency [UHF], 700 megahertz [MHz], 800 MHz). Vendors built LMR systems and equipment that were non-standard, and offered vendor-specific features, that could inhibit interoperability with surrounding systems and equipment. As a result, disparate LMR systems emerged, and were not always compatible with each other, making it difficult for public safety agencies to communicate across jurisdictions and disciplines. Public safety recognized a need to standardize systems and equipment, to ensure that, regardless of system or vendor, responders could communicate.

As digital and trunking technologies were introduced in the late 1980s and early 1990s, the public safety community and federal government agencies recognized the need for standards to enhance communications interoperability, and to provide a competitive marketplace for public safety agencies.

DEVELOPING STANDARDS

The Federal government, in partnership with the Association of Public Safety Communications Officials (APCO) and the National Association of State Telecommunications Directors (NASTD), signed a Memorandum of Understanding (MOU) with the Telecommunications Industry Association (TIA) to develop digital LMR standards to develop public safety requirements (1992, amended in 1993).

Federal, state, and local public safety representatives worked with the Telecommunications Industry Association (TIA) to develop standards for LMR systems, known as P25. As a result of this public-private collaboration, the P25 standards have gained worldwide acceptance for public safety, security, public service, and commercial applications. Moreover, P25 standards development is continuous, and ongoing as new features, interfaces, and testing procedures are continuously developed, updated, and released.

ADOPTING STANDARDS

Following the tragic events from 9/11, legislation was passed to improve the interoperability of public safety communications systems and equipment. Congress mandated that new or upgraded equipment must be interoperable and meet certain interoperability standards. As a result, the federal government supported the purchase of P25-compliant LMR equipment through grants and policy, to ensure public safety systems can interoperate, regardless of manufacturer.

It’s worth noting that while the purchase of P25 equipment provides the technical ability to connect, there is an equally pressing need to establish standard operating procedures that define roles, responsibilities and appropriate usage of dedicated interoperability resources during response operations. Interoperability requires not only the technical ability to connect, but also the agreement between people, agencies, and other players to communicate and cooperatively respond to emergencies and disaster events. Recognizing the great value of standards-based equipment investments, the federal government supports the purchase of P25 equipment to improve interoperability among public safety agencies.

GUIDANCE FOR PURCHASING P25 EQUIPMENT

The Department of Homeland Security (DHS) collaborates with SAFECOM and the National Council of Statewide Interoperability Coordinators (NCSWIC) to provide annual guidance to grantees investing in emergency communications. The *SAFECOM Guidance on Emergency Communications Grants* provides recommendations, best practices, and resources for grantees purchasing LMR equipment, including detailed information on P25 standards. Specifically, the *SAFECOM Guidance* recommends that grantees:

- **Read the P25 technical standards for LMR.** The published standards approved by the P25 Steering Committee are available to employees of qualified government agencies at no cost by completing the TIA online request form at: http://www.tiaonline.org/all-standards/p25-downloads-application. To date, TIA has published over 90 documents detailing the specifications, messages, procedures, and tests applicable to the 13 interfaces, multiple feature sets, and functions offered by P25. The test documents include performance, conformance, and interoperability test procedures to ensure baseline compliance with the applicable standards. It's not realistic for grantees to read all of these documents; however, project and acquisition managers should read any P25 technical standards documents that are applicable to their system planning or to educate themselves before speaking with P25 vendors.

- **Include P25 in Statement of Requirements (SoR) and vendor inquiries.** There are several resources for grantees to reference when developing SoRs and vendor inquiries. These resources help project and acquisition managers to determine which standards are applicable and ensure proposed projects are compliant with the P25 standards. Resources include:

    - The P25 Technology Interest Group's (PTIG) *Capabilities Guide* provides example project requirements and Requests for Proposals (RFP). This document and other P25 resources are available on the PTIG website following free registration at: http://www.project25.org/.

    - The P25 Steering Committee, in coordination with the P25 User Needs Subcommittee, publishes the *P25 Statement of Requirements* that addresses user needs on an annual basis. Although the SoR reflects the user needs for LMR specifications and standards, it is not a part of the TIA-P25 standards and may contain requirements that are not addressed in the standards and are not applicable to available products. It should be noted that the SoR should not be a replacement for detailed engineering specifications. Updates to this document are available on the PTIG website at: http://www.project25.org/.

- **Select P25 eligible equipment.** To improve interoperability across LMR systems, project and acquisition managers should ensure that digital voice LMR systems and equipment purchased are compliant with the P25 standards. The P25 Compliance Assessment Program (CAP) is a formal, independent process, created by DHS and operated in collaboration with the National Institute of Standards and Technology, for ensuring that communications equipment that is declared by the supplier to be P25-compliant, in fact, is tested against the standards with publicly available results. As a voluntary program, P25 CAP allows suppliers to publicly attest to their products' compliance with a selected group of requirements through Summary Test Report (STR) and Supplier's Declaration of Compliance (SDOC) documents based on the Detailed Test Report from the DHS-recognized laboratory that performed the product testing. In turn, P25 CAP makes these documents available, along with a list of grant-eligible equipment, to the public safety community to inform their purchasing decisions at: http://www.FirstResponder.gov/P25CAP.

- **Obtain documented evidence of P25 compliance.** Grantees, project managers, and acquisition managers can obtain evidence in one of two ways:

    - Through documented evidence that the equipment has been tested and passed all the applicable, published, and normative P25 compliance assessment test procedures for performance, conformance, and interoperability as defined in the latest P25 CAP's *Compliance Assessment Bulletins* for testing requirements. Before purchasing equipment, managers should confirm whether the vendor has participated in equipment testing consistent with the P25 CAP.

    - If documentation for applicable equipment is not yet available through the P25 CAP, managers should obtain documented evidence from the manufacturer, as part of the RFP/RFQ Response, stating that the applicable tests were conducted in accordance with the published test procedures in the P25 suite of standards. It is suggested the manager review the published tests procedures/standards provided by TIA to specifically identify the appropriate tests and results.

- **Ensure additional features purchased are P25-compliant.** Grantees should ensure that added equipment, features, or capabilities are P25-compliant. Vendor-specific features may not be P25-compliant and as a result, may hinder interoperability with other equipment and devices that do not share those features. Managers should request the vendor provide a list of non-standard features/functionality and ascertain there is no comparable standard and the use of the feature/function will not impede interoperability with P25 compliant equipment systems. In addition, when federal grant funds are used to purchase P25 LMR equipment and systems that contain non-standard features or capabilities, where there is a comparable P25 feature or capability available, grantees must ensure the standards-based feature or capability is included as well.

- **If encryption is required, ensure compliance with the P25 standard for the Advanced Encryption Standard (AES), when applicable.** To ensure interoperability of encrypted communications between public safety agencies, devices used by responders must share a common encryption key and algorithm. The following provides additional guidance on encryption:

    - Grantees using federal funds to purchase encryption options for new or existing communications equipment should ensure that encrypted capabilities are compliant with the current publication of ANSI/TIA-102.AAAD *P25 Block Encryption Protocol* standard.

    - Grantees investing in encryption are strongly encouraged to implement the AES 256-bit Encryption Algorithm as specified in the *P25 Block Encryption Protocol*. The P25 suite of standards references the use of AES as the primary encryption algorithm, but continues to allow Data Encryption Standard-Output Feedback (DES-OFB) for backwards compatibility and interoperability with existing systems. The current version of the *P25 Block Encryption Protocol*, referenced above should be identified in all procurement actions when encryption is required.

    - Grantees seeking to use federal grant funds to purchase non-standard encryption features or capabilities for new or existing equipment must ensure 256-bit AES is also included to ensure their devices have the capability to interoperate in an encrypted mode.

    - Grantees currently using DES-OFB should no longer invest in this encryption method unless the AES (256 bit) encryption is also provided. . The continued use of DES-OFB or other non-standard encryption algorithms is strongly discouraged. Grantees should include the anticipated timeline to complete the migration to AES. The federal government recognizes AES as a more robust encryption algorithm and strongly recommends entities migrate to AES as it will enhance interoperability with federal entities, as well as state and local public safety agencies implementing encryption in the future.

- **Provide written justification required for non-P25 purchases.** In the event a grantee is using federal funds to purchase equipment that is not compliant with P25 standards, written justification should be provided to the grantor. Authorizing language for most emergency communications grants strongly encourages investment in standards-based equipment. Many granting agencies will not approve non-standards-based equipment unless there are compelling reasons for using other solutions.

    - Funding requests by public safety agencies to replace or add radio equipment to an existing non-P25 system (e.g., procuring new portable radios for an existing analog system) will be considered if there is a compelling reason why such equipment should be purchased and written justification of how the equipment will advance interoperability and support eventual migration to interoperable systems. Written justification should also explain how that purchase will serve the needs of the applicant better than equipment or systems that meet or exceed such standards. **Absent compelling reasons for using other solutions, public safety agencies should invest in standards-based equipment.**

CONCLUSION

Standards-based systems enable interoperable communications between responders from various disciplines, jurisdictions, and levels of government in the event they need to communicate during day-to-day incidents, emergencies, and disaster responses. In order to promote interoperability, the federal government strongly encourages public safety agencies to purchase P25-compliant LMR equipment. The *SAFECOM Guidance* and other resources are available to assist grantees in planning emergency communications projects.

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For more information on SAFECOM, see: http://www.dhs.gov/SAFECOM
For more information on NCSWIC, see: http://www.dhs.gov/SAFECOM/NCSWIC

Resources for Public Safety Agencies Investing in P25 Equipment

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Questions on this paper can be directed to the DHS Office of Emergency Communications at oec@hq.dhs.gov.

Funding and Maintaining Public Safety Radio Systems

SAFECOM

NCSWIC

Public Safety Radios Provide Reliable Communications During Emergency Response Operations

Since the 1930s, public safety agencies (e.g., police, fire, and emergency medical services) have purchased and deployed Land Mobile Radio (LMR) systems to enable responders to talk to one another, dispatch centers, and Incident Command during emergency response operations. The technology proved to be the most reliable in the challenging public safety environment.

State and local agencies invested millions of dollars in LMR systems (e.g., communication towers, radio equipment, devices). As a result, there is significant infrastructure in place to support LMR and mission critical communications. First responders are trained and experienced in LMR technologies and protocols. Its constant use has enabled responders to adapt the technology to a variety of scenarios, which has proved invaluable at keeping responders and the public safe.

Over the years, public safety users have shared guidance, best practices, and lessons learned from using LMR technologies with the public safety community, increasing the reliability and resiliency of this technology in all situations.

LMR technologies are a daily lifeline for police, fire, and EMS personnel. LMR is essential to response and needs continual care and maintenance to ensure it is operating effectively. For more information about LMR systems, see the Land Mobile Radio 101 document.

New Technologies Can Enhance, But Cannot Replace Current Communications Capabilities

In 2012, the federal government passed legislation that allocated funding for the First Responder Network Authority (FirstNet) - an independent authority established to develop and deploy a nationwide public safety broadband network (NPSBN). FirstNet will provide a single platform for public safety responders and officials at all levels of government, to communicate, using commercial broadband standards (i.e., Long-Term Evolution [LTE]) and technologies.

Public safety agencies are excited about the capabilities FirstNet will offer (e.g., faster data transmission, increased interoperability, enhanced video), but recognize that not all capabilities will be available at once.

Initially, FirstNet will provide advanced data capabilities for all users, at all levels of government, **but will NOT offer everyday mission critical voice capabilities for users**.

> "FirstNet can't predict the arrival of mission critical voice in part because the standards are still under development."

As a result, FirstNet has advised public safety agencies to continue to fund and maintain LMR systems, until mission-critical voice capabilities are functional under FirstNet.

For more information on this topic, see the Land Mobile Radio for Decision Makers document. Also, see FirstNet's statements on the need to sustain LMR systems for mission critical voice.

"Need to Know" When Funding Public Safety Radio Systems

When funding LMR systems, State, local, Tribal, and Territorial officials should consult with their SWIC to ensure the project supports the statewide plan to improve interoperability. To find the SWIC for your state, visit the NCSWIC Contact Information page.

LMR systems must adhere to certain technical standards. The LMR for Project Managers document provides additional information about technical standards for LMR investments. This paper provides an overview of the Project 25 (P25) suite of standards used to ensure that equipment purchased is standards-based and interoperable, regardless of vendor.

All public safety communications projects funded through federal grants must adhere to the SAFECOM Guidance on Emergency Communications Grants. The SAFECOM Grant Guidance provides guidance on planning and coordinating public safety communications projects, grants best practices, and technical standards that help ensure projects are compatible and interoperable.

Lastly, grants managers should review Improving Grant Management: SAFECOM Recommendations for Public Safety Agencies, which encourages grantees to tie grants' objectives to risk assessments, develop strong measures of success, and strengthen internal controls on use of grant funds. This guidance helps ensure grants are effective and impactful.

How to Support Public Safety

1. Inform decision-makers and elected officials about LMR systems and capabilities.

Leverage the LMR Trio documents to educate state and local officials about LMR technologies and issues. Officials should know LMR systems are like other technologies—they need to be updated and/or replaced often.

2. Provide funding and resources for technology refresh and/or replacement of radio systems.

LMR systems require resources for ongoing maintenance, operations, and life cycle upgrades. In 2015, SAFECOM and NCSWIC collected examples of how state and local governments are funding improvements to LMR systems. Stakeholders can leverage the Funding Mechanisms for Public Safety Communications Systems document which provides specific examples of funding methods used by states, territories, and localities to support public safety communications projects, and upgrades to LMR systems. Stakeholders can also leverage the Emergency Communications Financial Assistance Programs—the annual list of grants funding emergency communications, produced by DHS each year.

3. Support the people managing LMR systems.

Fully fund the Statewide Interoperability Coordinator (SWIC) in your state, and agencies managing LMR systems.

Resources

This document was developed by the SAFECOM/NCSWIC Funding and Sustainment Committee, with support from the Department of Homeland Security (DHS) Office of Emergency Communications (OEC). It reflects the expertise and knowledge of SAFECOM and NCSWIC public safety members, and OEC's continual engagement with public safety stakeholders to collect and share lessons learned in funding and sustaining public safety communications systems.

For more information on LMR and the other documents presented in this brochure, please see: http://www.dhs.gov/safecom/funding

SAFECOM and the NCSWIC are public safety advisory groups, supported by the Department of Homeland Security (DHS) Office of Emergency Communications (OEC), dedicated to improving emergency communications and interoperability.

SAFECOM

www.dhs.gov/SAFECOM

NCSWIC

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ACTION MEMO

TO: State and Local Decision-Makers/Elected and Appointed Officials
FROM: SAFECOM and the National Council of Statewide Interoperability Coordinators (NCSWIC)
SUBJECT: **Sustaining Land Mobile Radio (LMR) Systems for First Responders and Public Safety Agencies**

Purpose: To provide state and local decision-makers with an overview of the importance of sustaining public safety radio systems.

Background: Public safety agencies (e.g., police, fire, EMS) use radio systems as the primary means of communication for day-to-day operations and during emergency response. Land Mobile Radio (LMR) systems provide the most reliable means of voice communications during response operations. While new technologies (e.g., cell phones) are being used to supplement emergency communications, they do not yet offer the consistency and reliability of services provided by LMR; therefore, it is critical for state and local officials to support and sustain LMR capabilities until the new technologies can ensure the reliability LMR provides and responders need.

Timeliness: The First Responder Network Authority (FirstNet), established in 2012, is tasked with deploying a new nationwide public safety broadband network (NPSBN) dedicated to first responder communications. Once completed, this network will provide a single system that public safety stakeholders at all levels of government can leverage during response operations. As FirstNet moves forward, leaders should know:

(a) Mission critical voice capabilities will not be part of the initial offering of FirstNet. FirstNet is focused on providing data capabilities at first launch. "FirstNet can't predict the arrival of mission critical voice in part because the standards are still under development."[1]
(b) FirstNet has advised public safety agencies to sustain current LMR communications systems throughout the planning and deployment of the NPSBN to ensure responders have communication capabilities

SAFECOM and NCSWIC recommend that public safety agencies and their decision-makers:

- Continue to fund and maintain current public safety radio systems to ensure mission critical voice capabilities are available for responders. Reducing or eliminating LMR funding could put lives at risk.
- Maintain awareness of FirstNet progress. Jurisdictions are being approached by vendors promoting broadband solutions and devices that promise voice capabilities and seamless integration to the NPSBN. Government leaders are encouraged to exercise caution when considering such purchases, as these devices have not been thoroughly tested or vetted by FirstNet. FirstNet will announce publicly when such capabilities have been vetted.
- Develop a strategy and plan for managing vendors to carefully evaluate purchases. State and local leaders should consult the FirstNet State Single Point of Contact (SPOC), Statewide Interoperability Coordinator (SWIC), Statewide Interoperability Governing Body (SIGB), and/or Statewide Interoperability Executive Committee (SIEC), and the Statewide Communication Interoperability Plan (SCIP), before purchasing broadband equipment.
- Share the strategy and plan among their public safety agencies. Such collaboration should help ensure purchases support the overall plan to improve emergency communications in their respective states, as well as well as support the state's integration into the NPSBN (if applicable).

A unified strategy established in advance will guarantee public safety communications purchases support the statewide plan to improve interoperability; avoid costly investments in solutions and devices that may not provide comparable voice services; ensure funds are maintained for LMR systems; and ensure mission critical voice capabilities are available for first responders. For more information on this issue, see the additional resources provided below:

- LMR Trio – three papers on LMR technologies, at: https://www.dhs.gov/safecom/funding
- For more information on FirstNet, see: http://www.firstnet.gov/
- To find the SWIC for your state, see: https://www.dhs.gov/safecom/contact-information

Douglas M. Aiken	Mark Grubb	Robert Symons
SAFECOM Co-Chair	SAFECOM Co-Chair	NCSWIC Chair, Wyoming SWIC, Wyoming
National Public Safety Telecommunications Council	National Council of Statewide Interoperability Coordinators	Office of Homeland Security, Wyoming Public Safety Communications Commission

[1] http://www.firstnet.gov/content/firstnet-will-enhance-public-safety-communications-delivering-mission-critical-data-and

Funding Public Safety Communications Systems

HOW STATES AND LOCALITIES ARE FUNDING COMMUNICATIONS SYSTEMS

State and local governments and their public safety agencies are leveraging a variety of funding mechanisms to build, improve, expand, and support ongoing costs of public safety communications systems. Government and public safety officials must work together to develop strong project proposals, educate elected officials on the need for such improvements, and work together to identify and secure viable funding sources to maintain public safety communications systems, and sustain core communications capabilities, in order to ensure operability[1] and interoperability[2] between public safety agencies.[3]

The following is a list of funding mechanisms that have been used by states, territories, and localities to support initial capital investments in public safety communications projects, as well as ongoing operational costs. In addition, there are links to specific examples of each type of funding mechanism, and how it was used in select states and localities. These examples are intended to help public safety and government officials learn how other states and localities are funding their public safety communications systems. This document can be used to serve as a starting point for discussions on how improvements could be funded. The document will be updated, over time, with new and innovative methods and examples, as they emerge.

FUNDING MECHANISMS

BONDS State and local governments use bonds as a funding source to support public safety communications projects. Bonds are debt obligations, repaid through taxes or fees, over time, with interest. Bonds are often used by state and local governments for capital costs, typically construction and large procurement purposes. In some scenarios, if the tax or fee revenue exceeds the costs of paying down the debt, state and local governments have made the funds available as grants; put the money into a public safety communications contingency fund; or, designated funding to other options, as determined by the state. The amount of bonds can be limited if the state has a mandated debt ceiling, if the state has sub-standard credit, or if the bond depends on the successful passage of a referendum by citizens. As an example, Minnesota funded their public safety communications system using State-issued 911 Revenue Bonds. For more information, click here.

PUBLIC-PRIVATE PARTNERSHIP Many states have utilized partnerships with private companies to build and sustain public safety communications systems. Partnerships are mutually beneficial. One example of a state's partnership with a private company includes the sharing of state-owned communications infrastructure with a private partner in exchange for the ability to use the private companies' radios and radio accessories. Partnerships usually include signed contracts with expiration dates, and include terms and conditions for use and maintenance of the equipment. South Carolina has utilized a public-private approach to support its communications system. For more information, click here.

USER FEES Some state and local entities charge end-users directly for the use of emergency communications products or systems. Fees can be used toward operations, maintenance, and capital equipment costs for public safety communications-related investments. A best practice for instituting user fees is to conduct an analysis to determine the cost of building a communications system, and then use this analysis to determine an appropriate user fee structure based on state and local needs and the number of applicable users. Fees can be charged for data[4] or voice service, but may not cover the full cost of operations. Michigan charges user fees for its public safety communications system. For more information, click here.

9-1-1 SURCHARGE FEES States can bring in substantial funding in support of statewide public safety communications by attaching a minor fee to each phone line able to use 911 services.[5] States can attach fees to wireline,[6] wireless,[7] and Voice-over-Internet Protocol,[8] commonly referred to as VoIP, phone numbers. Most states utilize this funding mechanism for a variety of purposes, including paying bond debts, expanding/improving dispatch services and technology, and augmenting state governing body staff.

As the general public continues to decrease the use of wireline/landline phones, states are taking action to levy similar fees against other types of communication devices (e.g., cell phones) to cover 911 costs. Establishing a surcharge on other communication devices may require state and local legislative approval, and public vetting[9] and approval of regulatory language governing the use of such funds. Many state and local governments have passed legislation levying charges against landline phones, and added cell phones and other devices to cover increasing 911 costs. Many states have specific language in legislation related to surcharges, ensuring that fees levied against users for a specific purpose (e.g., 911) may not be diverted to other purposes. Recently, Pennsylvania changed its law to raise funds to cover costs of 911 Centers. For more information, click here.

TRAFFIC TICKET AND VEHICLE SURCHARGE Similar to 911 surcharges, state and local governments may increase fees for traffic tickets and vehicle registration to support emergency communications. While these fees are an excellent way to supplement other funding sources, they are not enough by themselves to support network operations and construction due to the fluctuation of revenue that is generated. Traffic and vehicle surcharges also provide an ongoing source of income that can be utilized for staff costs, operational costs, enhancements to the system, or other costs that require an ongoing supplemental income stream. Florida is one state that uses traffic fines to operate and maintain its statewide communication system. For more information, click here.

LEASING EQUIPMENT Occasionally, state and local governments will lease communications equipment from companies to help spread the cost over several years, and to be eligible for upgrades, as they occur. One option is for a state to sign a "lease-to-own" contract; these contracts stipulate that at the end of the contract term, the state will gain ownership of the property. A different option is for a state to utilize leasing for a set period of time, where the state returns the equipment at the end of the lease, or signs a new lease for more updated equipment. Either option allows states to spread costs out over the term length, instead of purchasing equipment for a substantial up-front fee. State and local governments should ensure that the leasing and eventual purchase of equipment complies with applicable procurement regulations (e.g., competitive bidding). For more information on lease-to-own options, click here.

LEASING TOWERS AND OTHER INFRASTRUCTURE TO PUBLIC AND PRIVATE ENTITIES States that have built networks with statewide coverage may have the ability to lease infrastructure[10] and excess tower capacity to public and private entities to pay for payment on debt service bonds, or for ongoing operational, maintenance, and upgrade costs. The leasing of state-owned towers and infrastructure can help to extend service to underserved areas. Prior to leasing infrastructure, states should conduct an assessment to analyze fair market value, and future tower space needs. The ownership and leasing of tower space may be regulated by the state. Interested entities should ensure that leasing agreements are compliant with state, local, and environmental laws governing the use of towers. For examples of states and localities that have leased towers and other infrastructure, click here.

SPECIAL TAXES Some public safety agencies have been successful in lobbying their state and local government for special taxes[11] specifically designed to pay for improvements to public safety systems. This method has several advantages, in that it establishes a specific stream of funding set aside for public safety improvements, enables public safety agencies to provide elected officials with specific costs and a set budget for the project, and allows elected officials to control the rate and duration of the tax or tax increase to cover those costs. Most of these taxes require a special vote from the citizenry, and public education and outreach on the purpose and terms of the proposed increase, but may be an effective means to raise awareness of public safety needs, and initial capital costs for improvements, if the public is adequately educated and engaged in the referendum. For examples of Special Tax initiatives, click here.

UNIQUE FUNDING STREAMS Some states have identified unique funding streams that they have leveraged to support emergency communications systems. For example, Kansas City, Missouri has dedicated $10.5 million in gaming money,[12] revenue that comes from an area casino, to support the deployment of a new broadband network. Stakeholders should identify unique funding streams in their states, and determine if a portion of the funding can be used to support public safety communication systems, especially if public safety is needed to support the industry, event, or landmark where revenues are collected. For information on Kansas City, click here.

GRANTS Grants are often used to pay for capital cost related to emergency communications systems, upgrades, and equipment. Each year, OEC produces a list of federal grants funding emergency communications. State and local public safety agencies should work with state-level grant officials (e.g., State Administrative Agency) to identify grants and other sources of funding, and opportunities for joint procurement with entities interested in investing in emergency communications projects. DHS grantees should be aware that recipients (including sub-recipients) who receive federal funding for communication projects and related activities must comply with the SAFECOM Guidance for Emergency Communication Grants (*SAFECOM Grant Guidance*).[13] *The SAFECOM Grant Guidance* provides information on national policies, eligible activities, best practices, and technical standards that are common to most federal emergency communications grants.

BREAKDOWN OF FUNDING METHODS

Table 1 (below) provides a breakdown of the various funding methods by category, showing how the funding methods are typically used – toward initial capital costs, ongoing maintenance and sustainment costs, and/or as a method of cost savings. Stakeholders can use this chart to discuss the need for initial costs and ongoing costs, and to provide examples of how other states and localities are using various funding methods to support emergency communications systems.

Table 1. Breakdown of Funding Methods by Category

Capital Costs	Ongoing Costs	Cost-Savings
Bonds	User Fees	Public-Private Partnerships
Grants	9-1-1 Surcharges	Leasing Equipment
State and local funds	Traffic Ticket Fees	Leasing Towers/Infrastructure
Unique Funding Streams	Vehicle Surcharges/Fees	

PLANNING AND COORDINATION NEEDED TO MAINTAIN COMMUNICATIONS

Emergency communications stakeholders need to work closely with state and local legislators and officials, and technical experts and financial experts, to develop and gain support for emergency communications projects. Stakeholders should clearly define and prioritize emergency communications needs, and help identify potential methods of funding – not only for initial capital costs, but also for ongoing maintenance costs, and upgrades. Additionally, stakeholders should seek out cost-saving methods, and ways to reduce duplication in spending, and highlight these methods in project proposals for decision-makers and their constituents.

State leaders are aware of the importance of emergency communications for public safety; however, they are charged with creating a budget that addresses a variety of state and local needs beyond emergency communications. Therefore, it is important that emergency communications officials prepare clear and concise budget options that identify multiple revenue streams (e.g., federal, state, local, in-kind) and potential matching sources, that lessen the burden on taxpayers, and are valued by legislators and state executives during budget discussions. Each state and territory has a unique fiscal environment based on varying laws, traditions, priorities, and existing programs and it is important that emergency communications officials tailor their funding mechanisms for their specific location and need.

Additionally, stakeholders should participate in the development of grant applications, and be prepared to demonstrate funding methods for initial capital costs, and for ongoing costs. Stakeholders should highlight contributions to a project by the state, public-private partnerships, cost-saving methods, any contribution of in-kind services or state-owned assets, and methods of providing a sustainable funding stream for maintenance and operations. To maximize the use of federal grant funding, it is essential that emergency communications stakeholders and state officials work together closely to:

- Work with the Statewide Interoperability Coordinator (SWIC) to define and prioritize communications needs in the Statewide Communication Interoperability Plan (SCIP)[14]
- Share the SCIP and critical emergency communications needs with statewide leaders
- Engage in the Threat and Hazard Identification and Risk Assessment (THIRA) process[15] to understand threats and hazards of the state to establish informed and defensible capability targets
- Work to incorporate emergency communications needs in the State Preparedness Report[16] based on current capability against capability targets established via the THIRA process
- Seek out potential federal funding sources for both capital and operational needs
- Participate in the State Senior Advisory Council (or equivalent) to prioritize projects for funding
- Identify and apply for multiple sources of funding to support public safety communications improvements

Stakeholders are encouraged to leverage this document, which was developed by, and with the input from public safety stakeholders, and members of SAFECOM and the National Council of Statewide Interoperability Coordinators (NCSWIC). This document provides examples and ideas for funding emergency communications projects, and can be used to demonstrate how other entities have funded improvements.

ABOUT SAFECOM/NCSWIC

SAFECOM is comprised of more than 70 members representing federal, state, local, and tribal emergency responders, and major intergovernmental and national public safety associations, who aim to improve multi-jurisdictional and intergovernmental communications interoperability through collaboration with emergency responders and policymakers across Federal, State, local, tribal, territorial, and international partners. SAFECOM members bring years of experience with emergency communications during day-to-day operations, and natural and man-made disasters. SAFECOM members offer insight and lessons learned on governance, planning, training, exercises, and technologies, including knowledge of equipment standards, requirements, and use. SAFECOM members also provide input on the challenges, needs, and best practices of emergency communications, and work in coordination with OEC to share best practices and lessons learned with others.

The National Council of Statewide Interoperability Coordinators (NCSWIC) is comprised of Statewide Interoperability Coordinators (SWIC) and their staff from the 56 states and territories. NCSWIC assists states and territories with promoting the critical importance of interoperable communications and sharing best practices to ensure the highest level of interoperable communications across the Nation.

This document was developed by the SAFECOM/NCSWIC Funding and Sustainment Committee, with the support of the Department of Homeland Security (DHS) Office of Emergency Communications. This document reflects the expertise and knowledge of SAFECOM and NCSWIC members, and the coordination efforts of OEC in bringing stakeholders together to share innovative methods, best practices, and lessons learned in funding and sustaining public safety communications systems. The Funding and Sustainment Committee will continue to monitor state and local methods for sustaining communications systems, and publish updates as needed.

For more information on SAFECOM, see: http://www.dhs.gov/SAFECOM

For more information on NCSWIC, see: http://www.dhs.gov/SAFECOM/NCSWIC

For more information on available funding mechanisms, please contact **SAFECOMGovernance@hq.dhs.gov** or **NCSWICGovernance@hq.dhs.gov**.

STATE AND LOCAL FUNDING EXAMPLES

Funding Public Safety Communications Systems with Bonds

Minnesota Funding Improvements with 911 Revenue Bonds. As an example, the State of Minnesota issues bonds for the purpose of financing all or a portion of the cost of certain programs and capital projects, including public safety projects. Specifically, the State issued 911 Revenue Bonds to finance portions of their public safety communications system. "The pledged revenues are derived from fees imposed by the State on each customer of a telephone service provider that furnishes service capable of originating a 9-1-1 emergency call. The system will enable emergency response organizations to utilize a single, integrated, and highly structured digital radio communications system, known as the Allied Radio Matrix for Emergency Response System (ARMER System). Phases 1 and 2 provided nine counties in the Minneapolis-Saint Paul metropolitan area with the radio system infrastructure for the ARMER System. Phase 3 extended the ARMER System to the St. Cloud and Rochester State Patrol districts which encompass twenty-three (23) counties. Phases 4, 5 and 6 extend the ARMER System to the remaining counties of the State."[17]

Using Public Private Partnerships to Build Public Safety Communications Systems

South Carolina Leveraged Public-Private Partnerships to Improve Communications. In 1989, Hurricane Hugo ravaged parts of South Carolina. As first responders from other areas arrived, incompatible radio systems made it difficult to communicate or coordinate public safety efforts. State and local response agencies recognized a need for a reliable, statewide, interoperable system, but struggled with the projected $100 million cost.[18] At the same time, Spartanburg County and SCANA, a local power company that owns electrical utilities in South Carolina, North Carolina and Georgia, joined forces to build a system they could both use, and leveraged SCANA's existing 800 megahertz (MHz) trunked radio network.[19] Spartanburg County would provide the towers and generators for new antenna sites, and SCANA would provide the radio frequency equipment and manage the network. User fees would finance operations. Over time, more state and local agencies joined the network, and still more were interested in joining, when and if infrastructure could be expanded into those areas.[20]

In operation since 1992, the network continues to expand and evolve to meet public safety needs. The South Carolina Division of Technology administers the system with the support of an elected advisory committee created in 1994 to ensure the system is administered with the input of its users. In 2001, with approval from the State, SCANA agreed to sell the network infrastructure to its vendor, which would operate the system and fund its expansion (South Carolina also contributed some capital), under a contract with the State Division of Technology. The South Carolina Statewide 800 MHz Radio and Mobile Data System (commonly referred to as the "Palmetto 800," or "PAL 800") has continued to grow and today is one of the largest shared statewide public safety radio systems in the nation.[21]

The goal of the shared network is to provide statewide coverage, enhance statewide and regional interoperability, coordinate the State's response to emergencies, and to provide an economical solution for stand-alone public safety radio systems.

Additionally,

- The Palmetto 800 Network serves South Carolina and Augusta-Richmond County, Georgia
- The system serves over 40,000 voice users from over 750 different agencies representing State government, federal government, local government, law enforcement agencies, fire services, emergency medical services (EMS) and power utilities in South Carolina, North Carolina and Georgia participate in the shared statewide 800 MHz radio system.
- Over 94 percent of the State's population is serviced by sheriff's departments with access to the statewide 800 MHz radio system. And, 100% of county emergency management agencies and 9-1-1 Centers have access to the system for interoperability and disaster coordination.
- The State continues to receive top rankings for its interoperability efforts with the statewide shared public safety system.[22]
- Through the use of public-private partnerships, South Carolina has been able to reduce costs and improve interoperability for all system users.

Leveraging User Fees to Build and Update Public Safety Communications Systems

Michigan Charging User Fees to Sustain Public Safety Communications System. The implementation of the Michigan Public Safety Communications System (MPSCS) began in 1984 when the State police were seeking to replace its 1940s two-way radio system. Officials decided the new network should be large and flexible enough to support all State and local public safety agencies. In 1992, after several years of system design planning and cost studies, specifications for a request for proposal were finalized and sent to potential vendors. In June 1994, the Michigan Legislature approved the funding for the system, and a contract was awarded to build the MPSCS.[23]

Today, MPSCS provides a stable, secure framework for interoperable communications among local, State, federal, tribal and private first responders. MPSCS handles the second-largest trunked communication system in the world, including administration of a statewide 800/700 MHz digital trunked radio communication network spanning 59,415 square miles and including more than 244 radio towers and 66,000 radios.[24] To sustain this large system, Michigan charges fees to members and non-members:

- **User Fees.** Fees are levied twice a year on members, for voice and for data communications (per device). MPSCS may credit a portion of local infrastructure costs, against local voice subscriber fees.
- **Collocation[25] Fees – Members.** In addition, members (i.e., public safety agencies that use MPSCS as a primary means of mobile radio communications) are charged a fee if they want to collocate a service (e.g., a VHF radio system) that MPSCS does offer. Members are currently not charged a fee to collocate on a MPSCS tower if they are requesting a service that MPSCS does not offer (e.g., paging).
- **Collocation Fees – Non-members.** Non-members that do not use MPSCS as a primary means of mobile radio communications are charged a fee for collocating equipment on a MPSCS tower.[26]

This system and approach provides rapid response and facilitates cooperation of emergency personnel through statewide coverage and advanced technology. It is a reliable, easy-to-use system and adheres to national standards. Additionally, system operation is monitored 24 hours a day to ensure its readiness to assist Michigan's first responders. As important, this system and approach promotes asset sharing and cost sharing, which reduces costs to individual agencies and to the State.[27]

Ohio Charges User Fees to Support its Multi-Agency Radio Communication System (MARCS). "MARCS is a 700/800 MHz radio and data network that utilizes state-of-the-art trunked technology to provide statewide interoperability in digital clarity to its subscribers throughout Ohio and a 10 mile radius outside of Ohio. The MARCS development contract required 97.5% mobile voice and data in-street coverage.[28] 99.71% aggregate voice coverage was realized and 98.13% aggregate data coverage was achieved. This allows maximum statewide interoperability and enhanced safety and protection for public safety service providers through secure digital transmissions. The MARCS network operates on three system components:

- Mobile Voice – operating on the 700/800 MHZ digital trunked technology
- Mobile Data – allowing data transmissions, Law Enforcement Agencies Data System (LEADS)[29] inquiries, reformatting of data from Mobile Data Terminals (MDT)[30]
- Computer Aided Dispatch[31] - providing GPS [Global Positioning System]-based auto vehicle location, resource recommendation and GGM[32] display…"[33]

The system is supported exclusively by user fees, which are divided between different agencies and are designated for specific purpose, as established in Ohio Revised Code, more specifically:

- Section 4501.16 provides for a MARCS maintenance fund, which "shall consist of moneys received by the State highway patrol from users of MARCS. The fund shall be used to provide maintenance for MARCS-related equipment located at both the MARCS facilities and tower sites."
- Section 4501.28 provides for a MARCS operations fund, which "shall consist of moneys received by the emergency management agency established under section 5502.22 of the Revised Code from users of the multi-agency radio communications system (MARCS)."
- Section 4501.29 provides an administration fund directing the Department of Administrative Services to "collect user fees from participants in the multi-agency radio communications system (MARCS)" for administrative purposes.[34]

There are currently over 47,500 voice units[35] and over 1,800 mobile data units[36] on the MARCS system with over 1200 public safety/public service agencies statewide. This includes local, State and federal agencies. In a 2010 Report, the MARCS Task Force reported that there was a need to upgrade to Project 25 (P25) standards,[37] yet there was no funding to meet recurring needs to upgrade, extend or expand the system.[38] Most recently, one county – Montgomery County – approved spending $13.4 million to switch to a digital P25 radio system from the current 800 MHz analog technology.[39]

The State of Ohio will reimburse the county for half of the cost of the new equipment via credits from user fees, which will take more than five years to repay. The agreement, which was approved in July, 2015 spells out the relationship between the county and MARCS, and how the State will own, operate and maintain the new radio system.[40]

Using 9-1-1 Surcharges to Support and Sustain Public Safety Communications Systems

Pennsylvania Funds Improvements by Raising Rates on 9-1-1 Surcharges. Recently, Pennsylvania lawmakers enacted changes to its law – the 911 Emergency Telephone Act – and voted to raise the monthly per device fee to $1.65 per device per month to cover increasing costs of State and local 911 centers. Under the law, the Pennsylvania Emergency Management Agency (PEMA) will collect the wireless fees from service providers and then distribute that revenue to the counties.

As part of the new legislation, 80 percent of the funds will be distributed to counties through a formula yet to be finalized; up to 15 percent will be used for competitive incentive grants for system improvements, consolidation and system efficiencies; a flat 3 percent will be divided uniformly among the counties and the two city-based systems; and, PEMA will keep 2 percent for administration and support. PEMA has up to 18 months to develop the formula with the advice of a State 911 advisory board; once decided, funds will be distributed quarterly.[41] Previously, fees were based on population, where 5 counties paid $1 per device per month; 30 counties paid $1.25 per device per month; and 34 counties paid $1.50 per device per month.[42]

According to the County Commissioners Association of Pennsylvania, the communication centers throughout the State require about $292 million a year to operate but the previous fees only generated about $190 million. It was up to individual counties to come up with the rest of the funding. In 2014, the county had to draw about $350,000 from a reserve account to pay operational costs for the second half of the fiscal year after State funding fell short of projections.[43] The new bill is expected to generate $314 million for State communication centers. Revenue from the increased fees will cover maintenance and improvements to emergency call centers, and create an infrastructure that would support text-messaging, video calls, and nonhuman calls (e.g., OnStar).[44]

Using Traffic Fines to Supplement Costs for Public Safety Communications Systems

Florida Covers Costs of Public Safety System with Vehicle Registration Fees and Traffic Fines. Florida is one of many States utilizing this funding mechanism. "The Department of Management Services (DMS) entered into a public/private partnership with [its vendor] to implement the Statewide Law Enforcement Radio System (SLERS). DMS conveyed selected State-owned communications tower and tower assets to [the vendor], and received $26.4 million in credits for radio equipment and accessories. [The vendor] also provided additional credits to replace 6,000 State mobile and portable radios…and was paid a $40 million advance payment per the service contract."[45]

"To operate and maintain the SLERS network, [the vendor] is paid $15 - $18 million annually based on motor vehicle and vessel registration surcharge.[46] To enhance the SLERS network, DMS receives $3 per criminal offense and moving traffic violation under section 318.18(17) of the Florida Statutes. The revenue stream brings in about $1.5 million annually to enhance SLERS such as radio coverage, capacity, and operation of the radio system. In addition, DMS receives from [the vendor] 15 percent credit of all net revenues received from SLERS Partners on communications towers and 5 percent credit for each SLERS Partner radio on the SLERS network."[47] While revenues generated from traffic tickets and fees for criminal offense are not sufficient to support network operations on their own, they can reduce operational costs, the savings of which can be passed on to public safety agencies.

Using Lease-to-Own Options to Purchase Equipment

City of Concord, California. In 2010, the City of Concord was facing a situation in which their legacy UHF radio system for public safety communications was nearing the end of its useful life. In 2010, the City Council adopted Resolution No. 10-77 authorizing participation in the East Bay Radio Communications System Authority (EBRCSA) issued bond, and participation in the regional interoperable radio system for all responders in Alameda and Contra Costa Counties. This would require the City to purchase digital P25 radios that would operate in the 700-800MHz frequency range.[48]

The cost of replacing the 84 subscriber units was approximately $381,000. City staff proposed a "lease-to-own" option whereby the City would enter into an agreement with the vendor to receive the units immediately, spread the payments (with nominal interest) out over time, and, own the units at the end of the lease. "The proposed lease agreement includes seven years of manufacturer provided maintenance and support at an annual charge of $75,768.35 [approximately $60,000 for equipment and $15,000 for maintenance], and the City will own the units at the end of the lease."[49] This option allowed the City to budget for the costs,[50] spread costs out over time, and avoid having to pay a substantial fee up-front. The City was also able to combine its purchasing power with a neighboring jurisdiction and receive a bulk discount on each subscriber unit from the vendor.

Leasing Towers and Other Infrastructure to Raise Revenue

Leasing Tower Space in Michigan. The Michigan legislature passed a law allowing public and non-public users to collocate equipment on the Michigan Public Safety Communication System (MPSCS) towers. The legislation stipulated that all costs associated with planning, installing, and maintaining colocation equipment are the responsibility of the agency or entity wishing to collocate on the MPSCS towers. Government agencies could collocate on the MPSCS towers immediately; nonpublic safety government entities were required to wait three years after the law went into effect to collocate on the MPSCS towers for any "commercial or business purposes." Legislation further required that costs associated with collocating on MPSCS paid by a public safety agency or a legal entity be comparable to the costs charged to other public safety agencies or entities. Fees for members (i.e., governmental agencies) are waived if the entity is requesting a radio service that MPSCS does not offer.[51]

Revenue collected from leasing the MPSCS tower space is to be used for the payment of debt service for bonds that financed the construction of the MPSCS towers. Further, the State reserved the right to deny requests to co-locate if the installation, attachment, or collocation will interfere with the "optimum operation" of the MPSCS.[52]

Missouri Leasing Dark Fiber to Raise Revenue. In another example, several cities have engaged in deployment of municipal broadband. As these cities continue to build out infrastructure, a few have been able to work with private industry to secure long-term lease agreements, allowing commercial providers to leverage dark (i.e., unused) fiber in order to expand their services to unserved areas, for a fee. The private entity gains access to needed infrastructure and the City gains a steady stream of revenue to support the network.

As an example, Kansas City, Missouri developed LiNKCity, which offered high-speed internet access for residents. North Kansas City spent $10.5 million in gaming money,[53] the revenue that comes from Harrah's Casino, to build the network. It was supposed to be an attractive amenity to residents and a lure to outside businesses to move to North Kansas City. It was also set up as an enterprise fund, a segment of the city's budget that's supposed to operate as a business and generate its own profit. But with the rapid advancement of high-speed internet, and the introduction of even-faster fiber, projections for LiNKCity use were over-estimated. Facing revenue shortfalls, the City decided to enter into a 20-year lease agreement with [a major Internet provider] to use city-owned dark fiber. [The private Internet provider] would be able to use the dark fiber as a pass-through to surrounding areas, and Kansas City would receive approximately $3.2 million in leasing fees. The steady stream of funding would help to stabilize the finances for this municipal network, and expand access to high-speed internet in surrounding areas.[54]

This example demonstrates the complex nature of building and funding communications systems. Here, Kansas City leveraged a unique revenue stream – gaming revenue – to build the municipal broadband network, counted on a wide variety of users to support the network through user fees, expected the user fees to generate a profit, adjusted the approach to accommodate unexpected short-falls, forged a public-private partnership with the [private Internet provider], which leased a segment of the infrastructure, providing a steady stream of funding for the municipality, and enabling [the private Internet provider] to expand access to surrounding areas. It is critical that any network development or expansion project include a wide array of experts including public safety users, technical experts, and financial experts to ensure the long-term viability of communication systems.

Using Special Taxes to Fund Emergency Communications Improvements

Whitfield County, Georgia. Whitfield County, Georgia proposed a Special Purpose Local Option Sales Tax (SPLOST) to pay for infrastructure improvements, including a $12 million P25 700/800 MHz radio system for county first responders. The county is currently on an analog VHF radio system. The SPLOST was approved, and the county is in the process of planning the transition and implementation of its P25 radio system, which includes upgrades that will link its public safety communications system to a regional P25 system in Tennessee.

The SPLOST raised the sales tax by one percent (1%) each year for four years, beginning July 1, 2015 and ending June 30, 2019. The proposal had to be approved by the voters. Public safety representatives held a series of educational town hall meetings on the need for improvements to the public safety communications systems. In April 2015, the proposal passed (67% in favor). As a result, the County is expected to collect $63.6 million. Thirty-eight percent (38%) of that will go toward public safety, including the new P25 emergency radio system for first responders, new trucks for the Whitfield County and Dalton fire departments, a new fire station in the northwest part of the county and new vehicles for the Cohutta and Varnell police departments and the Whitfield County sheriff's office. Forty-one percent (41%) of the revenues will go toward improvements to roads and other infrastructure.[55]

In an effort to save costs and maximize impact, the County decided to join the Tennessee Valley Regional Communications System (TVRCS) and leverage their infrastructure and systems, and join other Georgia counties operating on this regional system. In this scenario, the County was able to gain approval for a designated stream of funding for its public safety communications system by educating the public on system needs, and maximized opportunities for cost-saving by linking to a near-by regional system.[56]

Funding Improvements through Special Tax Districts. Some localities have special districts which levy taxes to fund infrastructure costs, such as water, sewer, and fire services. In the State of Connecticut, there are Fire Districts which have authority to tax to support public safety needs. "The City of Norwich has a career fire department in a *city* district which levies a tax to pay for the career fire department. Norwich also has five volunteer fire departments in a *town* district which levies a tax to pay for the volunteer fire departments. Each department operates cooperatively, but independently. The *city* owns the career fire station and two of the volunteer fire stations. While three stations are owned by the volunteer fire departments, the *town* funds the operational and maintenance of these stations. The *city* owns all functional fire apparatus of all the fire departments."[57] Already-existing special tax districts could be a means to seek constant funding for emergency communications costs (e.g., maintenance, operations, upgrades, user fees, Internet services).

Stakeholders are invited to send additional examples to OEC at **oec@hq.dhs.gov**.

End Notes

[1] The 2014 National Emergency Communications Plan (NECP) defines operability as, "The ability of emergency responders to establish and sustain communications in support of mission operations." For more information, see: http://www.dhs.gov/national-emergency-communications-plan.

[2] The 2014 NECP defines interoperability as, "The ability of emergency responders to communicate among jurisdictions, disciplines, frequency bands, and levels of government as needed and as authorized. System operability is required for system interoperability." For more information, see: http://www.dhs.gov/national-emergency-communications-plan.

[3] The 2014 NECP describes public safety entities as "An entity that provides public safety services that include services provided by emergency response providers." For more information, see: http://www.dhs.gov/national-emergency-communications-plan.

[4] Data can include texts, images, and sounds.

[5] The Federal Communications Commission (FCC) developed a 9-1-1 Fees Congressional Report providing information on State collected 9-1-1 and E9-1-1 surcharges from across the Nation.

[6] Wireline refers to telephone and data service that is provided on cables – both copper and fiber. For more information, see: Newton, Harry. *Newton's Telecom Dictionary: Telecommunications Networking, Information Technologies, the Internet, Wired, Wireless, Satellites, and Fiber.* (New York: Flatiron Publishing 2013).

[7] Any system transmitting and receiving information without wires. *Newton's Telecom Dictionary*.

[8] Voice over Internet Protocol (VoIP) is the transmission of voice using Internet Protocol (i.e., computer-based exchanges). Traditionally, voice services make use of circuit switching to transmit voice signals. This means that a channel is set up and maintained between the calling party and the called party for the duration of the call. In VoIP, the voice signal is encoded and divided into packets of data. Each packet is sent separately through the network. Packetizing of the voice signal means that nothing will be sent when the caller is not speaking. This allows for a reduction of the total bandwidth required. Another benefit of VoIP is the ability to route voice traffic over the Internet. (*Telecom ABC:* http://www.telecomabc.com/v/voip.html).

[9] Public vetting may include referendum, public hearings, and other voting requirements, depending on state/local laws.

[10] Infrastructure can include towers, equipment, and other assets.

[11] Special taxes can be increases to existing tax rates, or a separate tax to pay for certain improvements. Many times, these special taxes have a limited term, and are levied for only a certain number of years (long enough to pay for improvements).

[12] Some states have unique revenue streams that are used to support public safety, such as gaming (i.e., casino) revenue. In Kansas City, officials used gaming revenue for the initial capital investment in municipal broadband; in Indiana, a portion of entry fees to Riverboat Casinos are used to support county services, including public safety.

[13] All other federal grantees investing in emergency communications are strongly encouraged to comply with the requirements in the *SAFECOM Grant Guidance* to ensure investments are compatible and interoperable, but should consult the specific grant guidance, as well as the federal granting agency to understand grant requirements.

[14] For more information on the SCIP or to find the SWIC for your state, please contact OEC at oec@hq.dhs.gov

[15] For more information on the THIRA, and the THIRA process, see: http://www.fema.gov/threat-and-hazard-identification-and-risk-assessment.

[16] For more information on the State Preparedness Report, see: https://www.fema.gov/state-preparedness-report.

[17] State of Minnesota. Department of Management and Budget. *State of Minnesota 9-1-1 Revenue Bonds (Public Safety Communications System Project) Series 201:* 16 Aug. 2011. http://www.beta.mmb.state.mn.us/doc/bonds/statement-revenue/8-16-11.pdf.

[18] Douglas, Merrill. "South Carolina's Public-Private Partnership Brings Interoperability to State Public Safety Communications." *Government Technology* (2010): 17 Mar. 2010. http://www.govtech.com/public-safety/South-Carolinas-Public-Private-Partnership-Brings-Interoperability.html?page=2.

[19] An 800MHz trunked radio system is a communications system that is managed by a computer. These systems are really a blend of two-way communications technology and computer-controlled technologies. The system is computer controlled, and the radios are computer controlled. In conventional radio systems, users must wait in the "que" for a free channel before they can transmit. A trunked radio system offers users a "pool" of channels that users can access, so they do not have to wait to transmit, and offers the capability to develop talk groups, that can share channels. All of these features can be controlled and managed through the Central Controller, allowing for great flexibility in communications, providing access when and where it is most needed. For basic information, see: http://www.mctx.org/departments_d-k/departments_q-z/radio_shop/docs/Trunking_101_7_11_07_CM_RAC.ppt. Trunked systems can only operate in certain segments of the radio spectrum. The network in South Carolina operates in the 800 MHz frequency band, and state and local agencies must be licensed by the FCC to operate on this band.

[20] "Palmetto 800 Radio System | Department of Administration - State of South Carolina." *Palmetto 800 Radio System.*

http://www.admin.sc.gov/technology/technology-operations/palmetto-800.

[21] *Palmetto 800 Radio System.* http://www.admin.sc.gov/technology/technology-operations/palmetto-800.

[22] *Palmetto 800 Radio System.* http://www.admin.sc.gov/technology/technology-operations/palmetto-800.

[23] "About MPSCS." *MPSCS.* http://michigan.gov/mpscs/0,4640,7-184-58837-71405--,00.html.

[24] "About MPSCS." *MPSCS.* http://michigan.gov/mpscs/0,4640,7-184-58837-71405--,00.html.

[25] This refers primarily to colocation of antennas on state-owned towers.

[26] "About MPSCS." *MPSCS Fee Structure:* 4 Nov. 2011. http://www.michigan.gov/documents/mpscs/1.1.1_MPSCS_Fee_Structure-w-DATA_FINAL_396499_7.pdf.

[27] "About MPSCS." *MPSCS.* http://michigan.gov/mpscs/0,4640,7-184-58837-71405--,00.html.

[28] In-street coverage is typically defined as coverage outside, around, or between buildings. For more information, see: Desourdis, Robert. *Emerging Public Safety Wireless Communications Systems.* (Artech House: Norwood 2002).

[29] LEADS is a shared computer system that allows authorized law enforcement agencies to share records with each other.

[30] Mobile data terminals are typically computerized devices (e.g., laptops) in vehicles (e.g., police and fire vehicles) which are used to communicate with dispatch centers and to access data from central computer systems (e.g., mapping, records search). For more information on mobile terminals and computers, see: http://www.cops.usdoj.gov/default.asp?Item=632.

[31] Computer Aided Dispatch typically consists of a suite of software packages used to initiate public safety response, dispatch, and to maintain the status of responding resources in the field. It is generally used by emergency communications dispatchers, call-takers, and 911 operators in centralized, public-safety call centers, as well as by field personnel. For more information on CAD, see: http://www.cops.usdoj.gov/default.asp?Item=632.

[32] Gigamedia (GGM) Display refers to a commercial offering of a display screen, designed for security purposes, that is said to provide high resolution, crisp, clear display, for use with CAD and GPS systems in this example.

[33] "MARCS News and Information." *Department of Administrative Services Divisions Information Technology MARCS Services*. http://das.ohio.gov/Divisions/InformationTechnology/MARCSServices/tabid/124/Default.aspx#33220-home.

[34] MARCS Task Force. *http://www.das.ohio.gov/LinkClick.aspx?fileticket=JIQ6gnAbyJY%3d&tabid=538*. 1 Apr. 2010.

[35] Typically hand-held devices.

[36] Typically in-vehicle computers.

[37] Project 25 (P25) is the standard for the design and manufacture of interoperable digital two-way wireless communications products. Developed in North America with state, local and federal representatives and Telecommunications Industry Association (TIA) governance, P25 has gained worldwide acceptance for public safety, security, public service, and commercial applications. P25 is applicable to LMR equipment authorized or licensed, in the U.S., under the National Telecommunications and Information Administration (NTIA) or FCC rules and regulations. (*Project 25 Technology Interest Group*: http://www.project25.org/).

[38] MARCS Task Force. *http://www.das.ohio.gov/LinkClick.aspx?fileticket=JIQ6gnAbyJY%3d&tabid=538*. 1 Apr. 2010.

[39] Analog systems have one way of transmitting voice, data, and signals, while digital systems offer a different way of transmitting and receiving voice, data, and other information. Traditionally, public safety agencies utilized analog systems which enabled two-way communications. With more advanced technologies, public safety agencies are moving toward digital systems, which offer more features (e.g., computer-controlled radios, talk groups), greater coverage, capacity, and clarity.

[40] "Montgomery County to Upgrade Emergency Radio System." *PSC E-news: The Official Magazine of APCO International.* 17 July 2015. http://psc.apcointl.org/2015/07/17/montgomery-county-ohio-to-upgrade-emergency-radio-system/.

[41] Gilger, Mark, Jr. "Gov. Wolf Raises Charge for 911 Calls." *Republican Herald* (n.d.): 2 July 2015. http://republicanherald.com/news/gov-wolf-raises-charge-for-911-calls-1.1906862.

[42] Scala, Kristina. "State: 911 Emergency Telephone Act Overhaul Discussed."*MainlineMediaNews*. 18 Feb. 2015. http://www.mainlinemedianews.com/articles/2015/02/18/region/doc54e35c7990797025992493.txt?viewmode=2.

[43] Scala, Kristina. "State: 911 Emergency Telephone Act Overhaul Discussed." *MainlineMediaNews.* 18 Feb. 2015. http://www.mainlinemedianews.com/articles/2015/02/18/region/doc54e35c7990797025992493.txt?viewmode=2.

[44] Gilger, Mark, Jr. "Gov. Wolf Raises Charge for 911 Calls." *Republican Herald*. 2 July 2015.

[45] "Department of Management Services." *SLERS Funding.* http://www.dms.myflorida.com/business_operations/telecommunications/radio_communications_services/statewide_law_enforcement_radio_system_slers/slers_funding.

[46] See Florida Statute 318.21(9) at: http://www.flsenate.gov/Laws/Statutes/2012/318.21

[47] "Department of Management Services." *SLERS Funding.* http://www.dms.myflorida.com/business_operations/telecommunications/radio_communications_services/statewide_law_enforcement_radio_system_slers/slers_funding.

[48] City Council of City of Concord, CA. *Agenda Item 3j - Resolution to Adopt a Seven Year Lease for Emergency Communications Equipment*. 24 July 2012. http://www.cityofconcord.org/pdf/citygov/agendas/council/2012/0724/3J.pdf.

[49] City Council of City of Concord, CA. *Agenda Item 3j - Resolution to Adopt a Seven Year Lease for Emergency Communications Equipment*. 24 July 2012. http://www.cityofconcord.org/pdf/citygov/agendas/council/2012/0724/3J.pdf.

[50] The lease included a non-appropriation clause which allows the City to terminate the lease without financial penalty in the event Council does not appropriate funding; if the lease is terminated, the City is required to return the leased equipment to the lessor at the City's expense.

[51] "About MPSCS." *MPSCS*. http://michigan.gov/mpscs/0,4640,7-184-58837-71405--,00.html.

[52] "About MPSCS." *MPSCS*. http://michigan.gov/mpscs/0,4640,7-184-58837-71405--,00.html.

[53] Some states have unique revenue streams that are used to support public safety, such as gaming revenue. In Kansas City, officials used gaming revenue for the initial capital investment in municipal broadband; in Indiana, a portion of entry fees to Riverboat Casinos are used to support county services, including public safety.

[54] Vockrodt, Steve. "Google Fiber Bails out North Kansas City's Fiber-optic Misfire." *The Pitch News*. 7 May 2013. http://www.pitch.com/kansascity/linkcity-google-fiber-dark-fiber/Content?oid=3220559.

[55] Oliver, Charles. "Commissioners Say New Radio System Will Improve Safety." *The Daily Citizen*. 9 Mar. 2015. http://www.daltondailycitizen.com/news/commissioners-say-new-radio-system-will-improve-safety/article_4da40b8a-c6d0-11e4-a62a-3fb256bc2773.html.

[56] Oliver, Charles. "SPLOST Passes Convincingly." *The Daily Citizen*. 17 Mar. 2015. http://www.daltondailycitizen.com/news/commissioners-say-new-radio-system-will-improve-safety/article_4da40b8a-c6d0-11e4-a62a-3fb256bc2773.html.

[57] Kling, Bruce. "Fire Departments and Emergency Medical Services in Connecticut." http://klingreport.com/wp-content/uploads/2014/11/CTFireDepartment.pdf, p. 11.

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State	Category	Method	Intended Impact
PA	LMR Devices	Montgomery County, PA is offering municipalities and public safety agencies an interest-free financing package to purchase new radios as part of its larger emergency radio system upgrade. The county is paying for infrastructure upgrades, and has secured low-interest financing through the Delaware Valley Regional Finance Authority (DVRFA) to provide financing for local governments. Municipalities will be able to borrow funds to cover the costs of new radios and repay the principal of those loans over a five-year period to the DVRFA, which will administer the loan, and the county will pay the interest and administrative costs. The financing program will only be offered one time. Repayment is expected to start in 2016.	County is paying for infrastructure upgrades through low-interest loans from a local Finance Authority. The funds will help municipalities in the county purchase radios that will operate on a new county communications system.
WA	LMR System Replacement	King County, WA voting on a proposal to lift the lid on the property tax above the state limitation, to replace the county's emergency radio system. The system is owned in equal shares by King County, the city of Seattle, Valley Communications Center and the East Side Public Safety Communications Agency. A release from the council stated the levy lid lift rate would be .07 cents per $1,000 of assessed value. Based on the 2015 median home value in King County, the cost to the median homeowner would be $26.46 per year. It is estimated the levy would raise $273M. The vote is April 28, 2015. King County voters OK emergency network. King County voters Tuesday approved a $246 million levy to upgrade and expand King County's emergency-radio network used daily by police, fire, emergency-medical staff and 911 dispatchers from jurisdictions across the county. In Tuesday's vote count, 65 percent were supporting the property-tax levy known as Proposition 1. County officials have said the network, originally built in 1997, doesn't reach all areas of the county and the current signal is sometimes blocked by high-rise buildings within cities. That's made it hard for first responders to talk with each other at incidents or relay information to dispatchers, levy backers said. The network contractor, Motorola, has also said it won't support the current system after 2018. The nine-year levy, which required a simple majority to pass, will cost $0.07 per $1,000 of assessed valuation beginning in 2016. That was the only countywide measure in King County in the vote-by-mail special election.	To replace the county's aging communications systems and improve coverage, the County Council proposed to raise the rate on property taxes. The proposal was sent to voters in April 2015, in a vote-by-mail special election. This is a nine-year levy, which will cost homeowners $0.07 per $1,000 assessed valuation beginning 2016. Voters approved the levy – 65% were in support of the increase, which is expected to raise approximately $250 million for the communications system

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State	Category	Method	Intended Impact
GA	LMR System Replacement	Whitfield County, GA is proposing a Special Purpose Local Option Sales Tax (SPLOST) to pay for infrastructure improvements, including a $12 million digital radio system for county first responders. If the SPLOST is approved, Whitfield County would join the Tennessee Valley Regional Communications System (TVRCS), which includes 10 counties in Tennessee and Catoosa, Dade and Walker counties in Georgia. The referendum is on the March 17 ballot. The 1 percent sales tax would last four years, beginning July 1 and ending June 30, 2019. It would collect $63.6 million during that period, according to the latest estimates. SPLOST Passes Convincingly. The Special Purpose Local Option Sales Tax (SPLOST) passed easily with 2,624 yes votes (67.26 percent) to 1,277 no votes (32.74 percent). Only 10.26 percent of registered voters turned out (3,914 of the 38,157 total voters). The 1 percent sales tax lasts four years, beginning July 1 and ending June 30, 2019. It will collect $63.6 million during that time, according to the latest estimates. Thirty-eight percent of that goes toward public safety, including a digital emergency radio system for first responders, new trucks for the Whitfield County and Dalton fire departments, a new fire station in the northwest part of the county and new vehicles for the Cohutta and Varnell police departments and the Whitfield County sheriff's office. Another 41 percent goes to roads and infrastructure.	To build a digital radio system, Whitfield County, GA proposed a Special Purpose Local Option Sales Tax (SPLOST) to fund the system and other infrastructure improvements. The SPLOST went to a vote and 67% of the citizens approved the tax. The funding will allow the local communications system to connect to a regional radio system that allows communications between counties in Tennessee and Georgia.
ME	LMR System Upgrade	Maine completes statewide P25 system. Maine recently completed an upgrade of its P25 system with $57.4 million from its state legislature. State of Maine, Harris announce completion of statewide P25 system Officials for the state of Maine recently announced that more than 2,000 users are communicating on the new statewide digital P25 Maine State Communications Network (MSCommNet) system built by Harris, which has replaced disparate aging analog systems that were unable to provide coverage throughout the state. Users have been operating on the VHF P25 system for more than a month and have given the network rousing reviews—particularly when compared to the previous radio systems that state personnel used, according to Greg McNeal, chief technology officer (CTO) for the state of Maine's office of information technology (OIT).	This is a project that was primarily funded by the State, with State funds. This project involved multiple state agencies, CTO, communications officials. Project now has 2,000 users.
FL	LMR System	Palm Beach County to provide dispatch services for Delray Fire Rescue. Delray Beach Fire Rescue will receive dispatch services from Palm Beach County Fire Rescue starting 5/6/15. Currently, Delray's Police Department Communications Division provides dispatch services for fire rescue. Now, the city will be on the county's system. City officials say the switch will help provide the best service, help track department resources and provide automatic aid by the county if resources are strained. The move will also save the city money because the county will now provide radio equipment. Delray will save $750,000 by switching fire rescue dispatch to Palm Beach County.	The City of Delray Beach will use County dispatch services. The City will be on the county's systems for fire rescue, which will not only improve service but also help the city save money, as the county will provide the radios.

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State	Category	Method	Intended Impact
CO	LMR System Upgrade	Pitkin County assessing radio system overhaul. Pitkin County is mulling an overhaul to its radio system from the current VHF analog multicast network, to an 800 megahertz system used by neighboring counties and the state. The LMR isn't compatible with the 800 MHz system used by Colorado State Patrol. The state then offered its support for an 800 MHz system, as well as funding to help cut the cost for each site down to around $215,000 for equipment. The sites would be turned over to the state, which would cover future maintenance and replacement costs, but the county would still control the towers, and would be responsible for upkeep.	The State offered funding to help the county migrate from a VHF analog network to a statewide 800MHz system. County sites would be turned over to the state, which would cover future maintenance and replacement costs; the county would control the towers and manage upkeep.
AZ	LMR System Upgrade	Police chief tells council upgrade of communications needed. The Bullhead City Police Chief reported that its communications equipment is obsolete — with some of it dating back to 1985 when the department was established. The system was updated in 1998 and 2006, but is now "past its life," new parts are no longer available, and the PD must search for used parts. The system could cost $4 million to replace. The City settled on the more reasonable price of $1.5 million, "with no bells and whistles."	The price includes new computer software, communications towers, six 911 operator dispatch consoles, a voice logging system and radios.
LA	LMR System Upgrade	St Tammany Parish is spending $16 million to build the best hurricane communications system in the state. It's part of a state-wide communications system that's currently under construction. The parish is building-out the system to include virtually all major emergency responders. The various agencies that are joining the system are pitching in to pay for the $16 million price tag.	Complete collaboration amongst all agencies will allow seamless interoperability and cost savings.
CT	LMR Dispatch Consolidation	State police dispatch consolidations to be reversed Connecticut's public safety commissioner announced on Monday that she intends to reverse all the state police dispatching consolidations put in place by her predecessor, who was criticized by some troopers and state lawmakers who said the consolidations were increasing police response time. Dora Schriro, commissioner of the Department of Emergency Services and Public Protection, said she completed a review of the consolidations and plans to reinstate dispatching and call-taking services at all state police barracks.	State had instituted consolidation of dispatch services as cost-saving measure; successor reversed decision to consolidate
MN	LMR Upgrade (Multi-Agency)	Minnesota County Launches 'First of its Kind' Integrated Public Safety System. First responders in Anoka County, Minn., may feel a little safer responding to emergency calls these days, thanks to a new public safety data system initiative integrating data from 26 county agencies. The new system, which was designed to improve the safety of responders and citizens by enabling fire and law enforcement agencies to share critical data during a response, was born out of the fire department's need to replace their antiquated dispatch system. "The fire department's system was pushing 40 years old and didn't include computer aided dispatch (CAD)," said Harlan Lundstrom, deputy chief of the Spring Lake Park/Blaine/Mounds View Fire Department. "Then law enforcement jumped in and wanted to upgrade too. So we started looking at redoing the whole public safety system for the county…"	County fire department was replacing their dispatch system. Law enforcement joined in on the project. Project promotes interoperability and information-sharing across agencies, reduces duplication, and leads to more accurate record-keeping.

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State	Category	Method	Intended Impact
OH	LMR Upgrade	Sheriff's Office requests $1M radio communication system upgrade Medina County commissioners are considering a contract with Cleveland Communications Inc., of Parma, to upgrade the radio communication system at the Sheriff's Office. The cost would depend on several variables, but could exceed $1 million. "The main upgrade is to give us complete inter-operability with other counties," Meredith said. That capability especially will be important during the 2016 Republican National Convention to be held in Cleveland, she said. "Cuyahoga County has asked every county in Northeast Ohio to offer support and additional manpower," Meredith said. "If they should come our way, we would be able to have those communications with them."	Local sheriff seeking funding for LMR upgrade to digital P25, in preparation of RNC in Cleveland. Upgrades 400 MHz to 700/800 MHz, with backward compatibility to 400 MHz so local/volunteer fire companies, who may not be able to afford upgrades.
KY	LMR Upgrade (Multi-Agency)	Local agencies make move to new $7M radio system The Richardsville Volunteer Fire Department was the first public safety agency in Warren County to be moved to a long-planned emergency radio system that will bring better radio coverage to the county. Some non-emergency agencies, such as the county road department and parks and recreation department, were recently moved to the system. More fire departments are expected to be moved to the Bowling Green/Warren County Emergency Services Radio System this summer. The city and county combined financial resources to pay for the new $7 million system. Both governments approved the project in 2013. There is a device in place that will allow the old and new systems to be tied together while the cutover process to the new system is being completed.	The new system will give agencies better coverage and allow all nine fire departments to be able to communicate with one another. OEC will look into any agreement that may be in place with non-public safety users, and will inquire about the "transition technology."
NJ	LMR Upgrade (Multi-Agency)	Monroe poised to upgrade radio system with help from East Brunswick Monroe set aside $3 million in capital funds to upgrade its decades-old radio system, and link to East Brunswick's master core and radio system. The Council is now poised to vote on a shared service agreement with East Brunswick to support the new system. Under the agreement, Monroe would pay Brunswick $25,000 a year to access East Brunswick's master core and radio system. Brunswick has similar agreements with two other towns. This combined annual funding helps Brunswick maintain the system, and saves money for the participating towns, in that they do not need to establish their own master core. For Monroe, this could result in as much as $700,000 in savings. The system will service almost 600 town employees, including public safety and non-public safety users. The $25,000 is slated to come from the police budget. The Council vote on the shared service agreement is September 9.	Being able to enter into shared service agreements reduces costs for the system owners and for the system users.
FL	LMR Upgrade	Brevard upgrades towers to improve law enforcement communication. The County is installing three new 200-foot communication towers to upgrade its 25-year old system, improve coverage, address gaps in communication, and enable police, fire and emergency personnel access to a 'countywide' radio channel. The towers are specially designed to collapse on themselves in hurricane-force winds. The county is looking at leasing tower space to cell phone companies. The money would go to offsetting the $15 million price tag to upgrade the communications system.	This is an example of how leasing tower space can help offset the costs to upgrading.

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State	Category	Method	Intended Impact
CA	LMR Upgrade (Multi-Agency)	PUBLIC SAFETY: Police departments joining Riverside County's radio network. Several cities are expected to join Riverside County's public safety radio network by July 1, 2016, bringing the $172 million system closer to its goal of unifying in-the-field communication between police and firefighters. Last month, the Murrieta Police Department became the first local department to join the Public Safety Enterprise Communication network. Murrieta officials expect to spend $2.1 million to join the network, and another $120,000 a year on radios for officers. The new network also costs more to operate -- about $15 million a year compared to $6.7 million annually for the old system. The higher costs have been blamed for budget shortfalls in the sheriff's and county fire departments. Outside agencies have been reluctant to join the network until they know how much it will cost them. Loftus, the Riverside police lieutenant, said his agency initially had concerns about the network's reliability and whether it could afford to join. The network's startup glitches have been fixed, and the price to subscribe is now more affordable.	The new system will allow police to quickly communicate over the radio. Additionally, Systems often cost more than expected, and the uncertainty in ongoing costs can affect subscribership. Cost drives subscribership, and subscribership drives costs as the cost for each agency using the network should drop as more agencies join.
GA	LMR Upgrade	Columbia County Fire department to get new radios, move dispatchers into 911 center. Columbia County leaders are expected to approve a bid to (1) provide new digital radios for county fire personnel and (2) consolidate 911 and fire dispatchers. Commissioners discussed a $1.324 million bid to purchase the 800 MHz Phase II Trunked Radios for Columbia County Fire Rescue. The funds will come from the 2017-22 one-cent sales tax.	The new digital radios and consolidation of 911 and dispatchers will streamline the communication process during emergencies and disasters.
NY	LMR Systems, Interoperability and Regional Partnerships	New York State Division of Homeland Security and Emergency Services' Statewide Interoperable Communications Grant (SICG) Program is a State-funded competitive grant which supports the growth of regional communications partnerships throughout the State. The partnerships, which are inclusive of local and state public safety agencies, will create interoperable emergency communications systems for first responders. The funding will be used to expand radio coverage by installing new equipment at towers and antenna sites; set up common interoperability and mutual-aid channels among public safety radio systems, consolidate emergency services dispatch facilities, and deploy technology so that counties can link systems together. To date $215 million has been awarded to 52 counties (including the City of New York) though this program. Governance protocols, standard operating procedures and training and exercises are being implemented through these entities.	Through the incentive of the SICG, 10 regional partnerships or consortiums have been formed inclusive all 57 counties and NYC. This represents an increase in participation of over 50% since the grant program was launched in 2011. Continuing the accomplishments of this program, an additional $50 million in fourth round awards will be announced in coming months.

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State	Category	Method	Intended Impact
SC*	LMR Systems, Interoperability, and Public-Private Partnerships	South Carolina Leveraged Public-Private Partnerships to Improve Communications. In 1989, Hurricane Hugo ravaged South Carolina. As first responders from other areas arrived, incompatible radio systems made it difficult to communicate or coordinate public safety efforts. State and local response agencies recognized a need for a reliable, statewide, interoperable system, but struggled with the projected $100 million cost. At the same time Spartanburg County and SCANA, a local power company, joined forces to build a system they could both use and leveraged SCANA's existing 800 MHz trunked radio network. Over time, more state and local agencies joined the network, and still more were interested in joining, when and if infrastructure could be expanded into those areas. The network continues to expand and evolve to meet public safety needs. In 2001, with approval from the State, SCANA agreed to sell the network infrastructure to its vendor to operate the system and fund its expansion, under a contract with the State Division of Technology. The South Carolina Statewide 800 MHz Radio and Mobile Data System has continued to grow and today is one of the largest shared statewide public safety radio systems in the nation.	The goal of the shared network is to provide statewide coverage, enhance statewide and regional interoperability, coordinate the State's response to emergencies, and to provide an economical solution for stand-alone public safety radio systems.
MI*	LMR Upgrade	Michigan Charging User Fees to Sustain Public Safety Communications System. The implementation of the Michigan Public Safety Communications System (MPSCS) began in 1984 when the State police were seeking to replace its 1940s two-way radio system. They decided the new network should be large and flexible enough to support all State and local public safety agencies. In June 1994, the Michigan Legislature approved the funding for the new system and a contract was awarded to build the MPSCS. MPSCS provides a stable, secure framework for interoperable communications among local, State, federal, tribal and private first responders. MPSCS handles the second-largest trunked communication system in the world. To sustain this large system, Michigan charges fees to members and non-members including user fees, collocation fees - members, and collocation fees – non-members.	This system and approach promotes asset sharing and cost sharing, which reduces costs to individual agencies and to the State.
OH*	LMR Upgrade	Ohio Charges User Fees to Support its Multi-Agency Radio Communication System (MARCS). "MARCS is a 700/800 MHz radio and data network that utilizes state-of-the-art trunked technology to provide statewide interoperability in digital clarity to its subscribers throughout Ohio and a 10 mile radius outside of Ohio." The system is supported exclusively by user fees, which are divided between different agencies and are designated for specific purpose, as established in Ohio Revised Code.	Fees can cover the operations and maintenance costs for public safety communications related investments.

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State	Category	Method	Intended Impact
MI*	LMR Upgrade	Leasing Tower Space in Michigan. The Michigan legislature passed a law allowing public and non-public users to collocate equipment on the Michigan Public Safety Communication System (MPSCS) towers. The legislation stipulated that all costs associated with planning, installing, and maintaining colocation equipment are the responsibility of the agency or entity wishing to collocate on the MPSCS towers. Government agencies could collocate on the MPSCS towers immediately; nonpublic safety government entities were required to wait three years after the law went into effect to collocate on the MPSCS towers for any "commercial or business purposes." Legislation further required that costs associated with collocating on MPSCS paid by a public safety agency or a legal entity be comparable to the costs charged to other public safety agencies or entities. Fees for members (i.e., governmental agencies) are waived if the entity is requesting a radio service that MPSCS does not offer. Revenue collected from leasing the MPSCS tower space is to be used for the payment of debt service for bonds that financed the construction of the MPSCS towers. Further, the State reserved the right to deny requests to co-locate if the installation, attachment, or colocation will interfere with the "optimum operation" of the MPSCS.	States that have built networks with statewide coverage may have the ability to lease infrastructure and excess tower capacity to public and private entities to generate additional revenue. The leasing of state-owned towers and infrastructure can help to extend commercial service to underserved areas.
MO*	LMR Upgrade	Missouri Leasing Dark Fiber to Raise Revenue. Kansas City, Missouri developed LiNKCity, which offered high-speed internet access for residents. North Kansas City spent $10.5 million in gaming money, the revenue that comes from Harrah's Casino, to build the network. It was supposed to be an attractive amenity to residents and a lure to outside businesses to move to North Kansas City. It was also set up as an enterprise fund, a segment of the city's budget that's supposed to operate as a business and generate its own profit. But with the rapid advancement of high-speed internet, and the introduction of even-faster fiber, projections for LiNKCity use were over-estimated. Facing revenue shortfalls, the City decided to enter into a 20-year lease agreement with [a major Internet provider] to use city-owned dark fiber. [The private Internet provider] would be able to use the dark fiber as a pass-through to surrounding areas, and Kansas City would receive approximately $3.2 million in leasing fees. The steady stream of funding would help to stabilize the finances for this municipal network, and expand access to high-speed internet in surrounding areas.	This example demonstrates the complex nature of building and funding communications systems.

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State	Category	Method	Intended Impact
FL*	LMR Upgrade & Public – Private Partnerships	Florida Covers Costs of Public Safety System with Vehicle Registration Fees and Traffic Fines. "The Department of Management Services (DMS) entered into a public/private partnership with [its vendor] to implement the Statewide Law Enforcement Radio System (SLERS). DMS conveyed selected State-owned communications tower and tower assets to [the vendor], and received $26.4 million in credits for radio equipment and accessories. [The vendor] also provided additional credits to replace 6,000 State mobile and portable radios…and was paid a $40 million advance payment per the service contract." "To operate and maintain the SLERS network, [the vendor] is paid $15 - $18 million annually based on motor vehicle and vessel registration surcharge. To enhance the SLERS network, DMS receives $3 per criminal offense and moving traffic violation under section 318.18(17) of the Florida Statutes. The revenue stream brings in about $1.5 million annually to enhance SLERS such as radio coverage, capacity, and operation of the radio system. In addition, DMS receives from [the vendor] 15 percent credit of all net revenues received from SLERS Partners on communications towers and 5 percent credit for each SLERS Partner radio on the SLERS network."	While revenues generated from traffic tickets and fees for criminal offense are not sufficient to support network operations on their own, they can reduce operational costs, the savings of which can be passed on to public safety agencies.
CA*	LMR Upgrade: Leasing	City of Concord, California. In 2010, the City of Concord, California was facing a situation in which their legacy UHF radio system for public safety radio communications was nearing the end of its useful life. In 2010, the City Council adopted Resolution No. 10-77 authorizing participation in the East Bay Radio Communications System Authority (EBRCSA) issued bond, and participation in the regional interoperable radio system for all emergency responders in Alameda and Contra Costa Counties. Participation in EBRCSA would require the City to purchase digital P25 radios that would operate in the 700-800MHz frequency range. The cost of replacing the 84 subscriber units was approximately $381,000. City staff proposed a "lease-to-own" option whereby the City would enter into an agreement with the vendor to receive the units immediately, spread the payments (with nominal interest) out over time, and, own the units at the end of the lease.	This option allowed the City to budget for the costs, spread costs out over time, and avoid having to pay a substantial fee up-front. In addition, the City was able to combine its purchasing power with a neighboring jurisdiction and receive a bulk discount on each subscriber unit from the vendor.

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State	Category	Method	Intended Impact
GA*	LMR Upgrade	Whitfield County, Georgia proposed a Special Purpose Local Option Sales Tax (SPLOST) to pay for infrastructure improvements, including a $12 million P25 700/800 MHz radio system for county first responders. The county is currently on an analog VHF radio system. The SPLOST was approved, and the county is in the process of planning the transition and implementation of its P25 radio system, which includes upgrades that will link its public safety communications system to a regional P25 system in Tennessee. The SPLOST raised the sales tax by one percent (1%) each year for four years, beginning July 1, 2015 and ending June 30, 2019. The proposal had to be approved by the voters. Public safety representatives held a series of educational town hall meetings on the need for improvements to the public safety communications systems. In April 2015, the proposal passed (67% in favor). As a result, the County is expected to collect $63.6 million. Thirty-eight percent (38%) of that will go toward public safety, including the new P25 emergency radio system for first responders, new trucks for the Whitfield County and Dalton fire departments, a new fire station in the northwest part of the county and new vehicles for the Cohutta and Varnell police departments and the Whitfield County sheriff's office. Forty-one percent (41%) of the revenues will go toward improvements to roads and other infrastructure.	This method has several advantages, in that it establishes a specific stream of funding set aside for public safety improvements, enables public safety agencies to provide elected officials with specific costs and a set budget for the project, and allows elected officials to control the rate and duration of the tax or tax increase to cover those costs.
CT*	LMR Improvements & Operations	Funding Improvements through Special Tax Districts. Some localities have special districts which levy taxes to fund infrastructure costs, such as water, sewer, and fire services. In the State of Connecticut, there are Fire Districts which have authority to tax to support public safety needs. "The City of Norwich has a career fire department in a city district which levies a tax to pay for the career fire department. Norwich also has five volunteer fire departments in a town district which levies a tax to pay for the volunteer fire departments. Each department operates cooperatively, but independently. The city owns the career fire station and two of the volunteer fire stations. While three stations are owned by the volunteer fire departments, the town funds the operational and maintenance of these stations. The city owns all functional fire apparatus of all the fire departments." Already-existing special tax districts could be a means to seek constant funding for emergency communications costs (e.g., maintenance, operations, upgrades, user fees, Internet services).	This method has several advantages, in that it establishes a specific stream of funding set aside for public safety improvements, enables public safety agencies to provide elected officials with specific costs and a set budget for the project, and allows elected officials to control the rate and duration of the tax or tax increase to cover those costs.

2015 Funding and Sustainment Methods

State	Category	Method	Intended Impact
AL	LMR Improvements & Operations	Dale County takes $694,500 'leap of faith' Dale County has reached a point where it must upgrade its emergency communication system for first responders. The Dale County Commission unanimously agreed to sign a $694,000 contract to upgrade the system. The project will be financed over eight years at an interest rate of 2.29 percent from Commercial Bank of Ozark. The upgrades will be paid for largely from the new process serving fees that are expected to be collected under new legislation. The process serving fee will be $25 for each document served by the sheriff's department for "matters pending or to be commenced in a court inside of Dale County. The process-serving fee will be $50 for each document served by the sheriff's department for "matters pending or to be commenced outside of Dale County. The funds generated by the process-serving fee would be earmarked for sheriff's office law enforcement vehicles, communication equipment and other technology for the sheriff's department. Additionally, Dale County partnered with Troy University to put equipment on the university's towers.	The new process serving fees will help offset the costs of the upgraded emergency communication system.
MO	LMR Improvements & Operations	St. Louis County opens new emergency operations center St. Louis County is unveiling its new radio system for first responders this week. Tax dollars from a special sales tax will pay for $66.4 million dollars of equipment. It will connect police, fire and emergency medical crews on special radio channels when multiple agencies are needed for a natural or manmade emergency. St. Louis County Public Safety Supervisor Daniel Davis said surrounding counties are in the process of joining the communication effort.	The county's implementation of a special sales tax will allow for a unified system that should reduce the time it takes for commanders on the scene to reach first responders when additional help is needed.
LA	LMR Improvements & Operations	Gonzales agrees to pay monthly fees for use of radio equipment to help fund parish's struggling 911 District The Ascension Parish Communications District approved the collection of a user fee of $5 per month for each of 238 radios used by government agencies (e.g. police officers, firefighters, and public works personnel) to help fund the 911 center operated by the Ascension Parish Sheriff's Office. The user fee, generating $14,280 a year, will be collected by the Ascension Parish Communications District, which has a board of representatives from municipal and parish entities and handles all radio communications. The district is in charge of disbursing funds for the maintenance of the 911 center that are collected as a monthly tariff of approximately $1 on every phone bill, whether landline or wireless, in the parish.	The new user fee and monthly tariff on phone bills allows the district to maintain equipment during a time when maintenance costs are rising.

2015 Funding and Sustainment Methods

State	Category	Method	Intended Impact
IN	P25 Radio System	Indiana's Howard County to Move into Future with P25 Radio System Currently, there is a lack of interoperability throughout the state of Indiana. State officials have decided to implement a Project 25, or P25, digital system to increase communications between local and state agencies. The statewide system, composed of six implementation phases, is expected to be completed sometime in mid-to-late 2016. For Howard County, the total price tag will run somewhere from $6 million to $7 million. The County hopes the cost can be split into multiple payments. The basis behind splitting the payments would be to first begin implementation of the local P25 system before later spending money to tie the system into the statewide program following the fifth phase. Financing the project will largely depend on the final price tag. The County has yet to receive any grant funding for the project. If the final price tag is lower than projected, the County will look at financing the project through cash-on-hand or short-term financing. If the final price tag is higher than projected, the County will look at a public safety tax or some kind of a bond issue to cover the cost. However, a tax increase is currently the least attractive funding option. If a tax were to be implemented, it would include a sunset clause taking the tax out of effect after the necessary amount of funding was received. Ultimately, the final size of the project will determine how the project is financed. As for the financial responsibility among differing government agencies, each group will pay for its own radio upgrades and replacements, with the county being solely responsible for the program's infrastructure.	Statewide implementation of a P25 radio system will connect first responders to any P25 compatible radio system throughout Indiana. More importantly, the switch to Indiana's P25 system will allow for simplicity of conversation in the most dangerous of times.
TX	Business Model for Public Safety LTE Sustainability	Harris County Tackles Business Model for Public Safety LTE Sustainability Harris County, Texas has worked out a business model for financial sustainability of its public safety Long Term Evolution (LTE) network. In its first phase, the agency needs 7,500 subscribers paying $35 a month for unlimited data within three years of offering paid user fees. A few obstacles stand in the early builder network's way to achieving that goal, however. The first is the high price of the devices that users need to operate on the network. The second is the nascent market for voice over LTE (VoLTE), which is likely to be required before public-safety users will give up their commercial LTE service for the private network. Buildout of the Harris County public safety LTE network, called Broadband Interoperable Gateway Network (BIGNet) is currently on track.	This example showcases the benefits of using a business model to support public safety initiatives.
IL	9-1-1 Operations & Improvements	Galesburg/Knox County 911 system goes digital On July 1, Galesburg County began collecting a quarter-percent sales tax to help pay for a $1 million 9-1-1 overhaul. The tax amounts to an additional 25 cents for every $100 spent in the county. The tax was approved by voters in a referendum. The new digital equipment replaces an analog system and will include in the near future the ability to receive texts and photos from cellphones. The digital switchboard equipment came in under its $500,000 budget.	The passage of the quarter-percent sales tax showcases the importance of educating the public on the purpose of the increased sales tax.

2015 Funding and Sustainment Methods

State	Category	Method	Intended Impact
PA	911 Operations & Improvements	Pennsylvania lawmakers plan to overhaul the state's 911 Emergency Telephone Act to adapt to changing technology (cell phones) and create a fee structure for system upkeep. Lawmakers have proposed a raise in the monthly per device fee from $1 to $2 Currently, fees are based on population, where five counties pay $1 per device per month. Thirty counties pay $1.25 and 34 pay $1.50. Counter proposals have been made to raise fees from $1 to $1.60, to consolidate call centers to achieve savings, and to push to receive reimbursement funds out of the state 911 call center funds on a quarterly basis versus the end of the fiscal year. Wireless fee increase coming to PA to upgrade 911 call centers. Lawmakers are working on updating the state's 911 Public Safety Emergency Telephone Act of 1990. House Bill 911, which passed 134-59, increases wireless fees on users for operational and technological upgrades. The wireless fee currently is $1 per consumer and can reach up to $1.50 per consumer depending on residence. 3 things to know about raising Pennsylvania's 911 surcharge State lawmakers are chugging toward an overhaul of Pennsylvania's emergency communications law, including raising the surcharge that funds counties' 911 call centers. Lawmakers have been studying the issue for more than two years. The surcharges for wireless services expires June 30, leaving the General Assembly with a shrinking window to act. Gov. Wolf raises charge for 911 calls Gov. Tom Wolf signed a bill Monday that would raise millions for emergency call centers throughout the state by increasing the monthly fees paid by phone customers to $1.65.	The fees would cover costs connected to maintaining emergency call centers, and also to create an infrastructure that would support text-message capabilities, video calls, and nonhuman calls (e.g., OnStar, iPads). The Bill, increasing wireless fees, was passed in the PA House. Opponents feel the fee is already very high, that the fee would go toward current shortfalls, and that sunset provisions in the proposed legislation leaves the door open for the government to re-open fees.
NY	911 Operations & Improvements	New York State sets aside $10M for a PSAP Operations Grants, to offer grants to counties to sustain ongoing operations and improvements of PSAPs in NY State. The law seeks an equitable distribution of funding among counties based on quantifiable elements, relevant metrics (e.g., population, call volume), and current status (efforts toward consolidation, NG911); therefore the distribution is formula-based.	This formula grant reimburses counties for PSAP costs based on prescribed metrics.

2015 Funding and Sustainment Methods

State	Category	Method	Intended Impact
VT	911 Consolidation	Firefighters Oppose PSAP Vermont Consolidation. State plans to consolidate four state-operated 911 call centers into two. VT Public Safety Commissioner Keith Flynn has proposed closing the dispatch centers in Derby and Rutland and transferring the phone calls and radio communications to the dispatch centers in Williston and Rockingham. The plan is slated to save $1.7 million, by request of Gov. Peter Shumlin. 911 technology upgrades wasted in Vermont call center closing. In January 2015, Gov. Shumlin proposed closing 911 Public Safety Answering Points in Derby and Rutland Town to help narrow the state's budget gap. However, notification of the PSAP consolidation came after FairPoint, Vermont's new 911 service provider as of November, had already begun making upgrades. The only piece of upgraded technology that could not be redeployed elsewhere in the system was the fiber installed to Derby prior to the suspension of work. The wasted cost for the fiber was estimated to be $108,000. In addition, due to consolidation, the Rockingham PSAP now requires additional bandwidth from the Vermont Telephone Co. to accommodate call-taking positions transferred from Rutland. Finally, additional operational costs may be needed. Opponents to the consolidation have pointed out that the consolidation will not save anywhere near the projected $.6 million in savings that was expected.	Governor consolidating state-operated call centers from four to two. The consolidation is expected to save $1.7 million. This example showcases the importance of information sharing with all partners and stakeholders, management of existing projects as upgrades are being planned and made, and the importance of oversight and accountability for funds already spent.
CA	Withdrawal from County 911	City of Seaside joins Salinas, Pacific Grove in possibly bailing on Monterey County (CA) 911 system. Monterey County spokesperson Maia Carroll said each partner pays based on a formula that includes population, property value and workload, all of which are equally weighted. In fiscal year 2013-14, Salinas paid 30 percent, Pacific Grove 4 percent and Seaside 6.5 percent. In all, the cities paid 65.5 percent, fire districts paid 17 percent and the county paid 17.5 percent. They feel the county has more say in how the emergency services center is run, and how the money is spent, even though fiscal documents show the cities pay two-thirds of the costs.	Cities bailing from a county 911 system because they do not feel they have enough say in its operations.
IN	Riverboat Revenue	Changes in law affect riverboat revenue. Riverboat gamblers in Indiana pay $3 each time they board a riverboat casino. From the $3 admission fee, $1 goes to the city; $1 to the county; 10-cents goes to the local tourism entity; and the other 90-cents goes to the state to help fund a variety of programs. Changes in state law would lift the requirement for gamblers to re-board (and re-pay) every two hours, lowering the revenue to counties.	Demonstrates another source of revenue (outside the per-device fee), and how changes in laws affects formulas that fund programs

2015 Funding and Sustainment Methods

State	Category	Method	Intended Impact
IL	911 Operations & Improvements	911 fee change heads to governor A proposal to alter the fees people pay for 911 emergency phone service is headed to Gov. Bruce Rauner's desk. In action Sunday, the Illinois Senate unanimously approved a rewrite of the state's 911 laws as part of a goal to create a statewide system by 2020. A key piece of the package is a uniform monthly fee of 87-cents per month for 911 services for both cell phones and land line phones. The fee may mean a slight increase for some cell phone users, but also could represent a decrease in the cost for land line users. Illinois legislators pass bill to consolidate 911 services An Illinois bill overhauling the state's 911 emergency response system has been approved in the state house and senate and sent to Governor Bruce Rauner's office to be signed. The changes would shorten emergency response times and cover more counties. Governor signs 911 revamp The fees Illinoisans pay for 911 emergency telephone service are changing under a law signed by Gov. Bruce Rauner. Without comment, the governor approved a rewrite of the state's 911 laws as part of an initiative to create a statewide system by 2020. A key piece of the package is a uniform monthly fee of 87 cents per month for 911 services for both mobile phones and land line phones.	Along with helping to finance the cost of 911 services, the fees will go toward pushing for consolidation of local emergency phone service providers. It also will bring 911 to nine counties that don't currently have the service.
AK	Extension on Text to 9-1-1 Capability	Alaska Carrier Requests 1-Year Extension on Text to 9-1-1 Capability. In December, Alaska Wireless Network (AWN) filed a petition requesting a one-year waiver of Section 20.18(n) of the commission's rules requiring all covered text providers to be "text-capable" by Dec. 31, 2014, to support text-to-9-1-1 service for any requesting public-safety answering point (PSAP). In its petition, AWN said that as a Tier 3 carrier serving Alaska, it faces unique financial and technical constraints in meeting the text-capable requirement by the deadline, and that technical issues associated with its deployment of a Long Term Evolution (LTE) network render it unable to route 9-1-1 texts to the appropriate PSAP.	States are struggling to keep current systems up and running, while trying to migrate to advanced technologies whose requirements are evolving (Text-to-911)
MD	9-1-1 Operations & Improvements	Baltimore County Implements Next-Generation 9-1-1 Infrastructure from Unify. Unify, a leading communications software and services firm, today announced Baltimore County, Maryland, is an early adopter of Unify's OpenScape platform for the county's transformation to a Next Generation 9-1-1 (NG9-1-1) operation. Located just outside of Washington, DC, and home to two major universities, Baltimore County's highly trained public safety staff serves a population of more than 800,000 residents and more than 20 million visitors each year. Baltimore County 9-1-1 manages and coordinates emergency response and disaster preparedness activities with some of the most advanced public safety processes and solutions available. Coordinating dispatch with over 55 individual fire stations, 10 police precincts, three helicopter units and over 2,000 sworn personnel, Baltimore County 9-1-1 serves as the central command center for this large metro area.	An example of how current infrastructure is being leveraged and integrated into a more advanced application, Baltimore County is bringing their internal call management operations to an integrated application layer, to equip their PSAP with the most advanced solution in the U.S.

2015 Funding and Sustainment Methods

State	Category	Method	Intended Impact
OH	9-1-1 Operations & Improvements	Chagrin Valley Dispatch Center recognized nationally as a leader in emergency communications Touting some of the most advanced equipment in the region, the Chagrin Valley Dispatch Center has now been named as a leader in public safety communications by The Association of Public-Safety Communications Officials. "These municipalities were looking for cost savings associated with the merger of dispatching services. They were obviously not willing to downgrade emergency dispatching services or to lose their voice in important decisions." Many of the advancements were funded through a $780,000 Assistance To Firefighters Grant through FEMA.	Chagrin Valley is an example of successful collaboration between leaders and member agencies.
TX	9-1-1 Dispatcher Training	New training will allow Sherman 911 dispatchers to give medical directions over the phone Sherman's 911 dispatchers are getting new medical training to help callers in an emergency while first responders are on the way. By the end of July, instead of just routing calls, dispatchers will be able to give instructions on how to perform CPR and deal with a diabetic emergency or a stroke while first responders are enroute. The Sherman Police and Fire Departments have worked together to implement the program and it won't cost the taxpayer any extra dollars. The $6,800 dollars needed to cover training costs is coming out of the drug enforcement budget.	The reallocation of funding to train 911 dispatchers will help treat patients, citizens, or those passing through Sherman faster and better in the long run.
OH	9-1-1 Operations & Improvement	Zanesville to digitize 911 system People calling 911 may soon be able to send dispatchers photos, video and text messages as officials look to phase out the analog system for a digital system. City officials hope the new system, which should be up and running within two months, will eventually allow emergency personnel to respond to calls more quickly and efficiently. The city set aside $114,450 for the new 911 system. Of that, $100,000 comes from the 911 Wireless Committee; the remainder will be paid out of the police fund. The wireless committee, made up of city and county officials, oversees funds for the 911 dispatching centers, and is funded from residents' cellphone bills. From each bill, 28 cents goes to the committee. The committee raises about $100,000 a year.	An example of collaboration and ways to use of funds from a variety of sources.
IL	NG911 Operations & Improvement	Counties of Southern Illinois (CSI) begin operations on next-gen 911 system provided by NG-911 Inc. A next-generation 911 system is now operational for a group of 13 counties in southern Illinois in what many emergency-calling experts believe may be a blueprint for next-gen services in rural location. The last of the 17 public-safety answering points (PSAPs) went live on the next-gen 911 system on June 25, marking the end of an eight-year journey to make CSI's next-gen 911 vision a reality. "We recognized about eight years ago that next-gen 911 was coming, and we knew—being a bunch of poor, rural counties—that we could never afford to do it ourselves [on an individual basis]," Smith said. "The only way would be to get out in front of it, get some federal grant money, and cooperate on a regional basis, so we could share one set of equipment, because there was no way each of us could do it on our own."	An example of how counties are working together to consolidate resources and assets and work together.

2015 Funding and Sustainment Methods

State	Category	Method	Intended Impact
IN	Text to 9-1-1 Capability	"Indiana is leading the way" Text-to-911 feature doing well in the Hoosier state The "Text-to-911" system continues to prove effective in the state of Indiana. The system is used by 90 of the 92 counties. Vigo County, Indiana has had the texting system for a little more than a year now and it continues to reign successful. The text-to-911 service comes at no additional charge to the county. The funding is part of the state's 911 surcharges.	This example showcases the benefit of a state 911 surcharge.
ME	NG911 Operations & Improvement	Emergency communications a serious problem in Franklin County Franklin County Communications Director spoke at a Rotary event, noting that despite a new dispatch center, much work remains to be done as far as improving communications with emergency agencies in Franklin County. The challenge in Franklin County is terrain. There are still places where agencies and personnel cannot hear or talk to one another. Communications Director Stan Wheeler and Franklin County Commissioners have been working with a consultant to come up with a solution. A basic communication system without the bells and whistles is estimated to cost $488,000. The cost will need to be paid over several years and the project done in different phases. In the first phase of the project, $73,200 will need to be raised from Franklin County taxpayers. Some of the project funds will come from Department of Homeland Security grant funds, and funds from the county's Tax Increment Financing deal with the Kibby wind project. They are also investigating a lease agreement for a new radio console, estimated to cost $100,000 - $120,000, that can be refinanced.	This is an example of how one county is using various revenue streams to fund different phases of its emergency communication upgrades and improvements, and socializing the idea to community organizations to gain buy-in and support.
AR	9-1-1 Operations & Improvement	Arkansas County Quorum Court hears 9-1-1 update Arkansas amended legislation, changing the collection of revenue for 9-1-1. Act 919 has increased training requirements for 9-1-1 dispatchers and supervisors, and reporting requirements for counties operating PSAPs. The documentation is required for counties to receive their 9-1-1 funding. The 9-1-1 budget receives no funding from the County General fund, so the paperwork is critical to sustaining their system. The funding comes from the AETSB (Arkansas Electronic Telecommunication Service Board), ACT 442 (an Act to provide broadband and 9-1-1 funding and services to rural areas), and landline revenue. The County 9-1-1 Coordinator has been working with the Arkansas Geographic Information Systems (GIS) office on an address point layer since February. The first layer was submitted June 23. Using an ArcMap program, the Arkansas County 9-1-1 address points are physically matched to the assessor's parcel point layer. All counties will be required to have this layer completed in order to receive AETSB funding. Davenport expects this to be completed by the end of the year and installed on 9-1-1 consoles for a more accurate "dispatchable location." Act 919 also provides funding for the statewide Smart911 (a pre-registration site) for 9-1-1 location-based services.	This is an example of how legislation is being used to ensure and enhance 9-1-1 services, through control of the purse strings. The law also increases training requirements for dispatchers and supervisors, and sets aside additional funding to provide that training. The Act also designates funding to specific programs (e.g., smart911). Arkansas provides an example of a state leveraging multiple sources of funding to support initiatives it enacted through legislation.

2015 Funding and Sustainment Methods

State	Category	Method	Intended Impact
KS	9-1-1 Operations & Improvement	New alternative for next-gen 911 funding suggested As Harvey County continues preparation to move to Next Generation 911 call processing, a new opportunity to help pay for the high costs of the transition is being explored. An initial increase of the 911 fee from 53 cents per device — anything such as a phone or cell phone that can access 911 call centers — to 60 cents is well in the works. The state 911 liaison, Scott Ekberg, suggested commissioners start pushing legislators to increase the fee to a flat $1 per device with a revenue breakdown that would allow call centers across the state to be more fully funded.	The fee increase will help finance the cost of 911 services and prepare for the move to NG911. This is interesting in that it shows how some jurisdictions see a need for additional increases in the future even as current increases are being discussed.
NJ	9-1-1 Operations & Improvements	N.J. county moves one step closer to full regionalization of 911 dispatch In the latest effort to regionalize services and reduce the cost on individual municipalities, Carneys Point and Salem County have signed a five-year contract to have the county take over emergency dispatching for Carneys Point, which has been providing the service for Pennsville. Currently Carneys Point Township pays $300,000 annually for the dispatcher's salaries and benefits. The cost to Carneys Point Township is expected to significantly decrease over the course of the five-year contract from $105,771 in 2016 to $43,325 in 2020. All four of the dispatchers who were previously working for Carneys Point have been offered positions at the county's 911 center in Mannington Township.	Regionalization can help to relieve the pressure on municipalities to provide first-class public safety.
NC	9-1-1 Operations & Improvement	Johnston residents can text emergencies to 911. Following a technology upgrade, Johnston County residents can text 911 for help instead of calling. Rather than buying all new equipment the county decided to lease the next-generation system from Century Link for $50,000 per month. Under this contract, Century Link services the equipment and makes sure Johnston has the latest hardware and software.	This example showcases the benefits of leasing.
MN*	9-1-1 Operations & Improvements	Minnesota Funding Improvements with 911 Revenue Bonds. The State of Minnesota issues bonds for the purpose of financing all or a portion of the cost of certain programs and capital projects, including public safety projects. Specifically, the State issued 911 Revenue Bonds to finance portions of their public safety communications system. "The pledged revenues are derived from fees imposed by the State on each customer of a telephone service provider that furnishes service capable of originating a 9-1-1 emergency call. The system will enable emergency response organizations to utilize a single, integrated, and highly structured digital radio communications system, known as the Allied Radio Matrix for Emergency Response System (ARMER System). Phases 1 and 2 provided nine counties in the Minneapolis-Saint Paul metropolitan area with the radio system infrastructure for the ARMER System. Phase 3 extended the ARMER System to the St. Cloud and Rochester State Patrol districts which encompass twenty-three (23) counties. Phases 4, 5 and 6 extend the ARMER System to the remaining counties of the State."	Bonds are debt obligations, repaid through taxes or fees, over time, with interest. Bonds are often used by state and local governments for capital costs.

2015 Funding and Sustainment Methods

State	Category	Method	Intended Impact
MO	9-1-1 Operations & Improvements	Boone County cuts ribbon for delayed 911 center Boone County is building a new emergency communications center to accommodate the county's significant increase in population size. The disaster-proof building will provide more room for 911 dispatchers and house all new technology. The construction costs are within the original $12.8 million budgeted for the project, including an additional cost of $136,000 in change orders. In 2013, county voters passed a three-eights-cent sales tax to pay back bonds needed to finish building the facility.	The passage of the three-eights-cent sales tax showcases the importance of educating the public on the purpose of the increased sales tax.
CA	Broadband Pilot Project (LA-RICS)	Feds lift LA-RICS suspension, OK construction on 82-site public-safety LTE project Los Angeles Regional Interoperable Communications System (LA-RICS) officials will restart work Monday on its revised, 82-site public-safety LTE system after the federal government lifted its suspension on the project and waived a clause that would have required LA-RICS to meet a 20% matching requirement. Three weeks ago, LA-RICS submitted a revised design for its proposed LTE network—known as a corrective action plan (CAP). NTIA, in close consultation with FirstNet, determined the revised LA-RICS project plan would deliver substantial benefits to the Los Angeles public safety community. Most of the funding for the project is coming from a $154.6 million federal BTOP grant; however, under the CAP budget proposed on April 13, LA-RICS would spend $90 million in BTOP grants on the revised project.	NTIA determined that the revised LA-RICS project plan would deliver substantial benefits to the Los Angeles public safety community and to FirstNet, and could be completed by the statutory deadline. The agency waived the 20% matching requirement.
MN	Broadband Pilot Project	Minnesota Pilot to Demo Public-Private Collaboration for FirstNet. Key players in the wireless industry partnered with government entities in the state of Minnesota to encourage private-public partnerships that establish a national public-safety broadband system. The pilot project in central Minnesota is a public-private collaboration among the state of Minnesota, Great River Energy (GRE), the City of Elk River, [and several vendors]. All private-sector partners donated equipment, tower space, technical services and carrier services at no cost to the government for the project.	This network will provide the ideal platform for testing some of the latest technology and equipment that could enhance public and first responder safety.
FL	Purchasing New Equipment	Police Body Cameras Offer Sense of Trust, Study Shows The use of body cameras by law enforcement is still in its infancy, but a University of South Florida study says the technology is building confidence between at least one Florida police department and the community it serves. The body cameras, Jennings said, initially cost about $600 each. But additional costs for data storage and equipment maintenance increased the price tag to about $1,000 per camera. In January, the Tampa City Council unanimously approved spending $83,000 to purchase 60 Taser Axon Flex cameras and video storage system. Over the next five years, the cost of storing video footage, software licenses and other expenses is expected to total about $287,000. The money comes from the police forfeiture fund, which includes cash and property seized in criminal investigations.	This example showcases some of the unique ways in which police departments are starting to pay for upgraded and new equipment.

*These examples were included in the SAFECOM/NCSWIC White Paper on funding mechanisms, entitled: Funding Mechanisms for Public Safety Communications Systems

2016 Funding and Sustainment Methods

State	Category	Method	Intended Impact
TX	LMR to LTE Upgrades	City of Houston Collaboration Leads to Innovative Solution for First Responders Houston, Texas recently deployed a pilot project to demonstrate the ability of datacasting to support public safety communications in an operational environment. The pilot project included a number of agencies and organizations working in partnership with KUHT-TV to test and evaluate the use of existing broadcast television spectrum to deliver video and other proprietary data efficiently. The need to deliver data, especially video, to multiple users in the field is increasing and public safety networks are struggling to keep up. Broadcast television has an almost 80 year history of optimizing its wireless delivery network for coverage, resilience and reliability. In addition to the ability to broadcast, television stations are connectivity hubs with extensive content management expertise, vertical real estate assets and other capabilities that are valuable to public safety. New technology called datacasting bridges these two worlds allowing television broadcast signals to deliver secure encrypted and targetable video and other data to first responders.	The pilot project in Houston demonstrated both the technical capabilities of datacasting (coverage, video quality, integration, ease of use) as well as its applicability for improving day-to-day public safety information sharing. In addition, the project showcased how public-private partnerships can be leveraged to address growing content delivery needs.
FL	LMR System Replacement	County to update radio system In Pasco County, Florida commissioners heard residents loud and clear when they complained the county's 26-year-old radio system was no longer adequate. The Pasco County commissioners have approved a $14.5 million contract with Williams Communications Inc. to overhaul the county's public safety communications system. The county will borrow the $14.5 million from its general fund and pay it back using the Penny for Pasco 1 percent sales tax approved by voters in 2012.	The county is leveraging a 1 percent sales tax to pay for $14.5M in improvements to their radio system. The new system will allow the county to expand radio coverage and seamless communication among all county agencies.
MI	LMR System Upgrades	Grand Traverse County first responders prepare for communication upgrades Grand Traverse County, Michigan will soon be using the Michigan Public Safety Communication System. The statewide system helps provide better communication among first responders during emergencies and connects around 1,500 hundred state, local, tribal, federal and private public safety agencies. The change was made possible through a 2014 Grand Traverse County surcharge to 9-1-1 services, along with several state efforts aimed at keeping costs to use the system down.	The statewide system will not only allow for communication on the same channel between state, local, tribal and federal agencies in the county, but it will also let them talk with agencies on the outside.

2016 Funding and Sustainment Methods

State	Category	Method	Intended Impact
NE	LMR/9-1-1 System Sharing	City will save money on 911 radio system sharing with state Lincoln, Nebraska will save more than $570,000 through an arrangement with the state to share emergency radio system assets. The city will operate its new 911 radio system using the state computer core and will be able to use the statewide radio system for communication, which will be particularly helpful in rural parts of the county. In return, the state will be able to use the city's new radio system, which offers better communication service inside the urban area. This is a straight-across exchange. No money will change hands. The city's ability to use the state computer core will save some money now and more down the road since the city will not have to buy the core or pay for maintenance in five to 10 years. In addition, the city is also looking at locations and design for the three fire stations and a co-located police/fire station to be built with revenue from the quarter-cent sales tax. City voters approved a three-year, quarter-cent hike in the city sales tax to pay for the stations and its new radio system. The revenue has been coming in as expected, at about $1 million a month	This example showcases both the benefits of sharing systems and implementing a tax.
MD	LMR System Upgrades	Ocean City purchases new radio for $5.4M After months of negotiations, the Ocean City Council in Ocean City, Maryland has signed a $5.4 million contract to replace is decades-old radio system. According to officials, the radio upgrade languished for three years in the unfunded projects category until the manufacturer announced it would no longer be providing parts for the system by 2018. Funding for the radio system will be covered through a combination of a 10-year capital lease (for the equipment) and using revenue from radio antenna rentals. The antenna rentals will generate an estimated $819,000 by the end of the year. The antenna rentals will pay for the five percent down [payment] and the lease payments for fiscal year 2017. Each year after that, there would be about $400,000 for lease payments (because the radios were purchased in the first year).	This is an example of how some counties are leveraging multiple sources of financing and funding streams to pay for radio system upgrades. In this case, Ocean City is leasing equipment and using rental fees from antennas to help pay for its new radio system.

2016 Funding and Sustainment Methods

State	Category	Method	Intended Impact
IA	LMR System Upgrades	Iowa Legislature patches 'holes' in emergency communications network Iowa lawmakers have agreed to a $68 million patch for “holes” in a statewide communications network so law enforcement, firefighters, and other emergency responders will be able to talk to one another. The House, Senate and Gov. Terry Branstad’s office have reached an agreement on the $68 million, 10-year lease-to-own package that is expected to take three years to build out. Local agencies — fire departments and emergency medical services — will be able to use the statewide system without charge, but will have to buy their own radio equipment. The system will be financed by a $1-a-month surcharge paid by cellphone users.	The example demonstrates how states are leveraging multiple sources of funding to pay for radio systems. In this case, the Iowa legislature has agreed to a 10-year lease-to-own agreement. In addition, they are leveraging charges on cellphone users to fund public safety radio system. Further, in this case, public safety agencies would not be charged to use the system, but would have to purchase their own radios.
TX	LMR System Upgrades	Police radios get big upgrade The $1.5 million upgrade to Texarkana, Texas' public safety radio system is slated for completion August 1, 2016. The new system is part of the Texas Department of Public Safety system linking city and state communication services. The upgraded system will also connect directly to the Arkansas Wireless Information Network. The much-needed upgrade will be the first in 15 years and will make communications more reliable.	The biggest benefit from the upgrade will be the option to seamlessly switch over to Arkansas’ system should Texas’ system go down, or vice versa. This will also relieve the taxpayers of the full burden of outfitting a new radio tower.
IA	LMR System Upgrades	Western suburbs first to connect to statewide emergency radio system Des Moines, Iowa’s western suburbs are the first in Iowa to hook up their shared emergency communication center to a radio system that connects first-responders statewide. A bill approving the Statewide Interoperable Communications System was signed by Gov. Terry Branstad in early May. The $58 million system should be fully built in two years. Cities and counties can decide whether they want to connect.	First-responders in connected cities can now communicate with their dispatch centers no matter where they are in Iowa. The system is expected to create savings on equipment maintenance costs. The $58M system will be funded over a two year period.

2016 Funding and Sustainment Methods

State	Category	Method	Intended Impact
NJ	LMR System Upgrades	Millville police to replace outdated radios The city of Millville, New Jersey is working to replace its police communications system this year. The plan includes installing new equipment from headquarters down to the personal radios officers use when out of their cruiser. The City Commission introduced a bond ordinance that will raise $825,000 for the project. The $825,000 will buy a dispatching system, cruiser radios, and personal radios. The bond ordinance, which had its public hearing on July 19, 2016, will raise $950,000 with the difference applied to vehicle purchases for firefighters. The city will take $50,000 out of its capital budget as a down payment on the bond.	This examples showcases the benefits of utilizing bonds.
VA	LMR Radio Upgrade	New radios cut through background noise for first responders in Virginia Beach Firefighters arrived at a self-storage building on a recent hot morning to heavy smoke and fire. They used power saws to cut through doors. Water whooshed through the fire hoses. In the past, it would have been hard to understand firefighters when they requested more water and pressure on the hoses. Over the past several months, the Fire Department and all city first-responders began using new radios to filter out background noise. The equipment has new technological features. Most are heat-and water-resistant; they feature built-in flashlights and can switch between two frequencies, allowing communication with marine-radio users.	This is an example of a City investing $13M in radios (nothing else); the goal of this investment was to increase voice quality. The radios were $3900 each.
TN/GA	LMR Build-Out	New radio tower goes up in Whitfield County to improve emergency communications If a police officer needs help in Whitfield County, they don't always know if someone will answer. A new radio tower is trying to solve the problem of spotty-service. Thursday, crews put up a massive new radio tower at the Whitfield County 911 center, bringing Whitfield County emergency responders one step closer to communicating across county lines with their radios. The current system is more than 40 years old. The new tower will allow Whitfield County to join the Tennessee Valley Radio system for a total cost of about $12 million dollars.	Whitfield County installed a radio in July 2016, which allows them to connect to the Tennessee Valley system.
MT	LMR Radios	Gallatin Co. 911 upgrades radio system Gallatin County dispatch has been working to find a cost-efficient way to solve its communication problems. The current radio system has holes in its coverage and does not always work for police officers. Work will now begin to upgrade the radios. For dispatchers, their responsibility to keep the public and emergency responders safe can be tricky when communications cut in and out. Currently, dispatchers will wait a certain period of time after losing communication during a call. It can be stressful for dispatchers when they are unable to get back on the call with an officer. The County is upgrading its radio system and radios (800MHz).	This article talks to communication problems between 9-1-1 dispatch and officers, due to in-building coverage issues and lost calls. The County is moving toward VHF and purchasing 800 MHz radios to improve coverage and voice quality.

2016 Funding and Sustainment Methods

State	Category	Method	Intended Impact
ND	LMR Radios	Replacing radios In Stutsman County, local law enforcement agencies are facing a crisis of having to replace all of the emergency response radios in the county and city. Roughly a decade ago, Department of Homeland Security grants were used to purchase radios for numerous agencies. Those radios are now almost completely obsolete and will need to be replaced before the end of 2018. The cost to replace the radios could amount to more than $400,000 over the next two years. Cost estimates are still preliminary as the final specifications for the radios are not available.	Interesting article on life cycle – with PSIC and other homeland security grants, counties invested a lot of money in radios and radio systems. Now they are all nearing end of life cycle at the same time, and need to be replaced.
NC	New LMR Radio System	New radio system boosts town's communication efficiency Mooresville, North Carolina has finally transitioned off a 12-year-old outdated communications system through its partnership with Charlotte's Regional Radio System. The deployment of the new communications systems was staggered over the course of two years. Roughly 500 radios were replaced or upgraded. During the fall of 2015, Mooresville commissioners approved spending $1.3 million to replace the previous trunking radio system. The Mooresville fire department had previously sought to apply for grant funding to help fund the replacement; however, it was not successful. The system overhaul replaced all of the consoles for the police department and added an additional radio console to the department. Additionally, all repeaters and tower site equipment were replaced and a new microwave data hop from the police department to the tower site was put in place. Through the Urban Area Security Initiative system upgrade with Charlotte via the use of its master site and maintenance capabilities, approximately $225,000 will be paid to them to utilize the system, which includes upgrades every two years and maintenance of the equipment. Town commissioners approved the agreement on July 5, 2016; it includes maintenance, repair, and advanced replacement of infrastructure to maintain the radio system and its components for all town departments.	This is a good example of a town linking to a regional system to save money. Town of Mooresville partnered with Charlotte UASI Regional Radio System to replace their 12-year old system. Mooresville officials approved $1.3M for the new system which includes new consoles, repeaters, and tower site equipment. Mooresville will pay Charlotte $225.000 to utilize their regional system, which includes upgrade and M&O, and replacement of infrastructure to serve all town departments (Public Works, Police, Fire-Rescue).

2016 Funding and Sustainment Methods

State	Category	Method	Intended Impact
OH	LMR Spectrum Sharing with Energy Group (Utilities)	Ohio MARCS to Share 700/800 MHz Spectrum with FirstEnergy The FCC granted a waiver request from the state of Ohio through the Ohio Multi-Agency Radio Communications System (MARCS) program and three electric utilities in Ohio, all wholly owned subsidiaries of FirstEnergy, for use of MARCS' 800 MHz and 700 MHz public-safety frequencies. The waiver allows FirstEnergy's use of MARCS' 800 MHz as specified by the application. With regard to the converse question — MARCS' use of 800 MHz business/industrial land transportation (B/ILT) spectrum — the FCC said the rules permit FirstEnergy to share its 800 MHz facilities with MARCS, so that portion of the waiver request was unnecessary and dismissed as moot.	Sharing infrastructure across sectors enables greater coordination during response, and saves money.
WA	LMR Equipment Upgrades	Valley and county to get modern emergency communications Methow Valley, WA is almost finished replacing its emergency communications equipment. Once completed, the system will use microwave transmission instead of the existing system, which relies on physical wires that run underground, across bridges or in the air. The microwave network will send audio signals and data from one side of the county to the other. A second phase of the project, which won't be finished until next year, will allow the county to re-route emergency telephone circuits if needed so that 911 calls can still reach the dispatch center. The $3-million project is being paid for primarily through grants. The majority of that — $1.85 million — is from the Washington State Military Department disaster recovery account. The McClure upgrades are supported by a $400,000 grant from the Washington Department of Commerce. The remainder is from an Okanogan County Sheriff's Department reserve fund and from WSDOT.	The new technology will give emergency managers the capacity to monitor all functions.
NE	9-1-1 Operations & Improvements	Motorola Solutions updates Nebraska call system Douglas County, Nebraska, officials were faced with the same public safety communications challenges as many other communities across the country -- how to do more with fewer resources while efficiently using taxpayer dollars. When it came time to replace an old 9-1-1 computer-aided dispatch system that handles approximately 600,000 calls each year, Douglas County chose to have Schaumburg-based Motorola Solutions' PremierOne CAD deployed on a virtual platform, allowing dispatchers simple access to centrally shared resources, saving time and money.	A virtual platform centralizes the dispatch system hardware and software resources, creating virtual workstations within the dispatch center where all existing dispatch positions can use the same resources. This resulted in a 67 percent reduction in equipment costs for Douglas County.

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State	Category	Method	Intended Impact
NM	9-1-1 Operations & Improvements	New 911 Center Enters Final Stretch Construction of a new, $8.25 million 911 call center, which will serve residents throughout Doña Ana County, New Mexico has entered the final stretch. Of the $8.25 million in funds for the project, about $6 million stemmed from a general obligation bond approved by county voters. The rest came from a state legislative appropriation. But in addition to the $8.25 million, the overall project benefited from another $1.25 million — $900,000 for the 911 phone system and $350,000 for dispatch furniture — that came from a separate pool of state funding that pays for periodic upgrades to 911 equipment.	The new 9-1-1 center will improve communications between public safety personnel and agencies, law enforcement, and community residents. The system was paid for by a state bond ($8.25M) and from a state 911 funding pool ($1.25M).
MI	9-1-1 Operations & Improvements	Ingham County launches new 911 service Ingham County, Michigan announced families' names, addresses, health conditions and medications can be immediately available to 911 dispatchers through a voluntary service. Smart911 allows residents to upload their information to save time, and in some cases lives, by creating a free profile at http://www.smart911.com. The program will cost about $17,000 a year and will be paid for through existing 911 center millage dollars and 911 fees on phone bills. The program will not cause a 911 fee increase on phone bills.	The service will help to save time, and improve (medical) response. It appears that this county has some sort of tax set aside for its 9-1-1 center, AND fees on phone bills, that will cover this new service.
TN	9-1-1 Operations & Improvements	New Blount County 911 dispatch system goes live In Tennessee, Blount County's Communications Center went live with its new computer-assisted dispatch system. In November 2015, the County Commission approved a $579,064 expenditure for the Blount County Sheriff's Office to purchase a new records management system. Most of the cost, $479,064, came out of dedicated information technology reserves that are funded through court fees, plus $100,000 that had been approved by the E-911 Board. The BCSO is asking the Blount County Commission to consider approving some supplemental requests for complementary technology to the system in the 2016-2017 budget.	This TN county is moving toward CAD, which will help dispatchers respond faster. The CAD upgrade was paid from a technology reserve funded through court fees, and from their E-911 Board. This demonstrates the combined funding solution again – using multiple sources to fund upgrades.

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State	Category	Method	Intended Impact
OK	9-1-1 Operations & Improvements	Muskogee, Adair counties work on sharing 911 system Two counties in Oklahoma – Muskogee and Adair counties – are sharing a 9-1-1 system. Muskogee City/County Enhanced 911 Trust Authority approved a $1.96 million budget for the 2016-2017 fiscal year. This represents a 7.25 percent decrease from the previous year's approved budget of $2.1 million. The decrease stems from a loss of revenue due to reduced receipt of fees from landline users. To compensate, Muskogee entered into a cooperative agreement with Adair County that would allow Adair County to use Muskogee's backend equipment (i.e., their servers) for a fee. This helps Adair County, because their system is out of date (they cannot even get a maintenance contract on it), and they cannot afford the upgrade; the agreement is said to save Adair $100,000 over five years. The agreement will help Muskogee as it allows them to increase their revenue $500 per month, and close budget gaps stemming from the loss of revenues from landline phones. To further reduce annual costs, Muskogee E911 Trust Authority approved loan refinancing, which would extend the term on their current loan of $1.6 million to pay it off in 2019, rather than 2017.	This shows the cost savings from combining 9-1-1 services, the creative approach that counties use to close budget gaps caused by a reducing number of landline users, and the multiple approaches that counties take (e.g., extending term on loan to reduce costs) to sustain services. Due to budget constraints, many counties are starting to partner with nearby counties to upgrade their systems in addition to finding other ways to offset costs.
WA	9-1-1 Operations & Improvements	Skagit 911 Funding Plan Will Help Fund Infrastructure Skagit County, Washington's new funding plan, Skagit 911, will provide an increase in funding for the county's emergency dispatch center to help replace outdated equipment and infrastructure. Under the new funding plan, Skagit 911 will save 5 percent of its tax revenue for reserves and capital improvements; and, it will no longer charge local law enforcement agencies based on call volume alone, but also on the number of officers or deputies the agencies employ. Many police agencies will face fee increases of about 20 percent. Payments from fire agencies will be based on call volume, as well as the property value of the area they serve. The Skagit County Department of Emergency Management will pay for ambulance calls up front, instead of refunding agencies the way it does now.	This example showcases how some counties are increasing user fees to the cover the costs of upgrades and maintenance.
PA	9-1-1 Operations & Improvements	Somerset Co. 911 system gets upgrade Somerset County 911 installed a new $8.2M system that will allow first responders to communicate directly and across county lines with ease. The cost of the new system will be paid for by tax payers, with a portion of the funds coming from the 911 emergency surcharge applied to phone bills. The new system is an upgrade to the original system that has been in place since the 1970s.	This example showcases how some counties are using multiple sources of funding to cover the costs of upgrades.

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State	Category	Method	Intended Impact
NY	9-1-1 Operations & Improvements	Albany, Rensselaer, Saratoga counties cooperate on 911 system Albany, Rensselaer and Saratoga counties in New York will cooperate on a new, shared $5.5 million dispatch system that will reduce costs and increase information to responders. Police and EMS departments also will share a records management system, enabling police, firefighters and EMS crews to share information that includes routes to scenes and locations of fire hydrants. Once installed by late 2017, the system would not only provide more information, it will enable participating governments to reduce their costs for maintaining the system by sharing it. Albany County saves $1 million by eliminating multiple systems and the county will save another $200,000 in annual costs for maintaining the system. Rensselaer County will save $500,000 a year. Saratoga County will save $150,000 a year. By using the same system, 911 dispatchers can receive calls from each county as well as local police, fire departments and EMS crews within the counties. Dispatchers also can be cross-trained to back each other up. The new system will not reduce staffing .	The shared system will enable real-time sharing of data across municipal and county lines. The new dispatch system will also consolidate multiple systems across the three counties, resulting in significant cost savings.
OK	9-1-1 Service Delivery	House vote to reform state's 911 system cheered In Oklahoma, House Bill 3126, authored by Rep. Josh Cockroft (R-Wanette), increases the transparency and accountability for 911 fees and provides state coordination for improved 911 service delivery. The measure also replaces the funding that has been lost due to the drop in the use of landline phones with an increase to the individual 911 fee on each cellular contract. That fee would increase from 50 cents to 75 cents and is estimated to result in approximately $28 million. The measure still has to be considered by the Senate.	9-1-1 is a critical public safety service. This bill should alleviate funding issues due to the decrease in the use of landline phones and increase the accountability of the current use of revenues.
MI	9-1-1 Operations & Improvements	Allegan County 911 Will Spend up to $10 Million on New System Allegan County, Michigan's Central Dispatch is looking to spend as much as $10 million on a new radio system over the next year. The current system was installed in 2001 and is due for a replacement. A new system would replace equipment on local radio towers, in the dispatch offices and on the officers and emergency personnel all throughout the county Ten law-enforcement agencies rely on Allegan County Central Dispatch, as well as 20 fire departments and five EMS agencies. The $8-10 million price tag will be footed through the dispatch's phone bill surcharge. Allegan County residents pay $3 per device on each monthly phone bill to fund Central Dispatch's operations and capital improvement. The new system will last around 15 years. Vendors advertise 20-plus years, Ludwig said, but the technology will probably run its course quicker than that.	This county is replacing its 15 year-old central dispatch. The funds are being raised through a $3 phone bill surcharge, which appears to fund both capital and operational costs. One interesting note: the article mentions the vendors project the system to last 20+ years, but the county believes it will only last 15 years or less, due to the pace of emerging technologies.

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State	Category	Method	Intended Impact
OH	9-1-1 Operations & Improvements	Ohio Cities Resist Transition to Statewide 911 Dispatch In Warren County, Ohio communities are resisting efforts to create a statewide emergency dispatch network, despite the potential to save millions in taxpayer money. The issue has divided communities and local officials around the state. Franklin and Lebanon City are the final holdouts in the county. In March, Lebanon City Council spent $135,000 to update computer programming supporting its system, rather than sign on with Warren County, which signed a $1.8 million contract in January for software computer-aided dispatch, records keeping and records management. Warren County funds its center with sales tax, in particular on the sale of new cars and trucks from the auto mall along the county line. Lebanon, struggling to fund street repairs, has no such surplus. The county commissioners have directed the county's director of emergency services to reconvene a committee established to deal with the state changes and divvy up the cell phone funds of $433,272 last year. Currently Franklin and Lebanon each get 25 percent $108,318, leaving the rest, $216,636 for the county. However, the director of emergency services has found support on the board for cutting the shares going to Lebanon and Franklin, possibly urging the cities to join the county.	This article discusses the options state and local agencies are facing during consolidation of dispatch. The Lebanon City Council spent $135,000 to update software rather than sign on to the statewide system which cost one neighboring county $1.8M. The article points out that Warren County leverages sales tax from new cars and trucks to supplement local budgets. Warren County is using its funds from the tax to pay for this upgrade, while the cities are not (i.e., they are spending those funds on other pressing projects – roads). Interesting to note the county may cut sales tax shares to those entities not signing on to the central dispatch as an incentive for them to join.
TX	9-1-1 Operations & Improvements	New 911 Dispatch Center Opens in Cameron Co. Cell phone service fees charged for 9-1-1 use helped pay for a new center for the Cameron County, Texas Emergency Communications District. The facility is a multiuse center. It will serve as a training site for dispatchers, who are the first line of defense when a 9-1-1 call is received and a means of gathering so dispatchers can stay current on technology.	This example showcases the benefits of 9-1-1 fees.
CO	Consolidation of 9-1-1 Dispatch between County and City	El Paso County, Fountain create joint 911 dispatch center In an effort to cut down on emergency response time, the El Paso County Sheriff's Office and the city of Fountain has teamed up on a joint dispatch center for 9-1-1 calls. The service began Monday. In the past, Sheriff Bill Elder said some 9-1-1 calls bounced from one dispatch center to another before they landed with the appropriate dispatcher. Now, Fountain and Sheriff's Office dispatchers will work together in one place.	This example shows consolidation of 9-1-1 centers to improve response times; that will also likely result in cost savings as well.

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State	Category	Method	Intended Impact
OH	NG911 Operations & Improvements	911, what's your emergency?: Police, sheriff launch next generation 911 The next generation of 9-1-1 launched in Sidney and Shelby County, Ohio. The $429,327.85 cost of the system has been divided up equally between four agencies, including Sidney Police, Shelby County Sheriff, Bellefontaine Police and Logan County Sheriff. Each agency was able to save approximately $150,000 each by purchasing it as one entity. This has resulted in a huge savings to the taxpayers. Additionally, with the ability to link out in four areas, the counties now have a 20-25 mile range versus the previous 2 mile range. Furthermore, if the system goes down in one area another agency can step in as needed. Funding for Sidney's upgrade has come from the 9-1-1 surcharge, which is placed on all cell phones, and the department's "rainy day" fund. It took most of the agencies between four to five years to save up for the new system.	By joining forces to upgrade to a new 9-1-1 system both counties experienced great savings.
NY	NG911 Operations & Improvements	Rockland's new 911 system should mean quicker responses Rockland County, NY has almost completed a $1.8 million overhaul to its aging analog system installed in 1993. The Next Generation 9-1-1 systems allows the county to handle emergency calls and texts and, eventually, photos and video. The county is financing the project, mostly through a portion of the $1.2 million in 9-1-1 surcharge fees it collects annually. More money will come in the form of state grants like the $227,942 in funds Rockland received from the state Division of Homeland Security and Emergency Services.	This example showcases the benefits of 911 surcharge fees and how using multiple sources of funding to cover the costs of upgrades.
CA	NG911 Operations & Improvements	5 California Municipalities Move to Networked Next-Gen 911 System In the foothills of Northern California, five counties are coming together to complete a joint city networking project. Through an intergovernmental agency agreement (IAA) the cities of Auburn, Lincoln, Rocklin and Roseville will be linked with Placer County in a next-generation 9-1-1 system. The new networked 9-1-1 system will allow agencies in all five counties to accept streaming video, text messages, and voice calls. The state has awarded $1.76 million for the project.	Multiple counties linked with another county in a NG911 system. The new system will allow agencies in all counties to accept text, video, and voice. The new, consolidated system was funded by the state, and is expected to lead to costs savings.
AL	NG911 Operations & Improvements	Special Report: AL taking 911 to the next level Alabama has made tremendous strides in efforts to have the most up-to-date technology in its 88 9-1-1 districts. The Alabama 9-1-1 Board is currently working to roll out a statewide system. The state completed the first phase of its migration to NG911 with ANGEN, the Alabama Next Generation Emergency Network. Statewide, all wireless 9-1-1 calls are on the network. The state is now taking bids to contract with a company and move forward with implementing the rest of NG911 capability. A 9-1-1 law passed in Alabama in 2012 has provided a stable revenue stream based on the existing 9-1-1 surcharges in each of the state's 88 9-1-1 districts.	This example showcases the power of having a bill that establishes a solid revenue stream.

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State	Category	Method	Intended Impact
IL	NG911 Operations & Improvements	Southern Illinois counties receive national recognition for 911 Call system The counties of southern Illinois were presented the “Outstanding 911 Call Center/Program” award at the Next Generation 911 (NG911) awards ceremony held in February. The southern Illinois counties are now receiving national recognition for their 911 Call Center system. The NG911 system is the first advanced 911 system of its kind in the U.S. This 911 system not only accepts 911 calls, but text messages, automatic crash notifications from vehicles with systems like "On Star," pictures and streaming video. The system was paid for mainly by grants, state funding, and local taxes.	This example showcases how multiple funding sources can be utilized to advance 9-1-1 services.
IN	NG911 Operations & Improvements	Next Generation 911 More than $10M has been spent to improve 9-1-1 emergency communications in St. Joseph County, Indiana. The county is forming a county-wide department that will be housed at a new “next generation” 9-1-1 center. St. Joseph County, along with the cities of Mishawaka and South Bend, will share the responsibility of funding the center at pro-rated rates. For instance, operating expenses, the county pays about 45 percent, South Bend about 35 percent and Mishawaka about 17 percent.	The new center will not only allow everyone to be on the same system, but it will give dispatchers the ability to see what is happening in real time, and send the most appropriate and quickest responder to a scene.
NM	NG911 Operations & Improvements	Ribbon-cutting marks completion of 911 center Las Cruces, New Mexico recently celebrated the near-completion of a new $8.25 million 9-1-1 center. Voters countywide OK'd a bond issue for about $6 million toward the new 911 call center in mid-2013. State lawmakers pitched in additional funding.	The new facility will go a long way toward improved communications for responders and the public.
IL	NG911 (Text-to-911) Mandated	Winnebago County to move to Next Generation 911 system Winnebago County, Illinois residents could soon have more ways to request emergency help from first responders. The county wants to implement a new phone system network that will allow residents to send text and video messages to 911 operators. The move is part of the Next Generation 911. By state mandate, all local 911 agencies throughout Illinois must become compliant with the next generation software by July 2020. The change could allow first responders to see exactly what is happening on the scene of an accident or crime in progress. The upgraded “state of the art” system will help improve communication between residents and responders and could improve response times. Winnebago is one of 10 counties in the Northern Illinois Next Generation Alliance, which means officials will be able to get started with the new system for $108,000. The current phone network is at the end of its life and the cost for replacement hardware alone would be about $2.5 million.	The 911 Northern Illinois Next Generation Alliance — made up of Winnebago, Stephenson, Ogle, Lee, Jo Daviess, DeKalb, Carroll, Boone, Bureau and McHenry counties — will work together to determine how much the new equipment will cost and how to generate the cash.The idea is that with this many agencies working together, they may be able to share equipment, purchase materials in bulk at cheaper prices and work out any kinks in the system together.

2016 Funding and Sustainment Methods

State	Category	Method	Intended Impact
CT	Upgrade of 9-1-1 to Statewide NG911	Connecticut Is Replacing Its Outdated 911 Technology Connecticut is one of several states in the process of upgrading its emergency system. It will replace the outdated operation, which was built to respond to landline calls and bring the system into the 21st century using new technology known as Next Generation 911. The new system is already being implemented in Connecticut. The upgrade will allow dispatchers to accept text and video messages and eventually be able to pinpoint the exact location of a cell phone caller.	This is a statewide deployment of NG911.
CT KS	Deploying NG911	Two States Two Approaches (How Connecticut and Kansas are Managing NG911 Build-out) – This article details the deployment approach (pilot projects) and funding approach Connecticut and Kansas are using to deploy NG911.	
WY	Emergency Services Operations & Improvements	Public Safety Center Near Completion The Laramie County Public Safety Center in Cheyenne, Wyoming is now 80% complete. The nearly 27 million dollar project will connect a number of emergency services, including the Cheyenne Police Department, Cheyenne Fire and Rescue, Administrative Office, Laramie County Communications Center and Laramie County Emergency Management. The Laramie County Public Safety Center is funded by the 5th Penny Sales and Use Tax. This tax has been around since 1978 and must be renewed every four years by voters.	The 5th Penny Sales and Use Tax provides an important tool for funding community initiatives, in addition to providing leverage to receive additional funds through grants.
CA	Emergency Services Operations & Improvements	Access to radio tower to improve emergency communications, save money Access to a radio tower in Marina, California will help improve emergency communications in Monterey County at a lower cost. Monterey County reached an agreement with Marina Coast Water District to use the Sprint telecommunications tower on their site. Emergency services in the county will now be able to utilize a high-tech communication system through the Next Generation Radio Project. The agreement also saves the county $90,000, waiving a previous Sprint sublease fee for space on the tower.	To save money, this California county partnered with a local water district to share infrastructure. The agreement will save the county $90,000 and waives a sublease fee from Sprint for using the tower.
PA	Emergency Services Operations & Improvements	County Dedicates New Public Safety Building Lawrence County, Pennsylvania opened a new state of the art public safety building. The building cost $6.5 million. The new building is the largest capital undertaking the county has commissioned in a quarter of a century. The commissioners in 2014 floated a bond issue to pay for the building. Upgraded communications cost another $1 million, which is being paid for largely with 9-1-1 funding.	Lawrence County shows how some counties are using multiple sources of funding to complete big projects that will ensure front-line workers — police officers, firefighters, EMS workers and volunteer EMA coordinators — will have reliable countywide communications.

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State	Category	Method	Intended Impact
CT	Emergency Services Operations & Improvements	Madison Moves Forward with EMS Communications Upgrade Efforts to improve Madison, Connecticut's Emergency Medical Services (EMS) Communication system are now underway. In June 2016, the board voted to move forward and sign a lease with Motorola Solutions, Inc., for the purchase of new radio equipment. The initial engineering cost of the project was somewhere in the area of $3.6 million, but the town found ways to reduce costs to bring the project estimate to $1.8 million.	This example how a phased approach to replacing communications systems can result in a long-term financial planning tool for installing upgrades.
GA	9-1-1 Center Upgrade and LMR Encryption	County Police Radio Will Open Communications Glynn County's basic police communications will soon become public again. Police communications went silent on June 8, 2016 when the Brunswick-Glynn 911 Center completed a $4.5 million upgrade from the old analog radio system to a more technically sophisticated digital system. In the process, county police and Brunswick Police went to encrypted channels, which blocked radio traffic to those with private emergency radio scanners.	This shows how an update to a 9-1-1 digital system also included a move to encrypt police channels which blocked radio traffic for those with private scanners.
PA	Disbanding local EMS saves costs	Disbanding EMS Service in Line With National Trend The Bath, Pennsylvania firefighting department is a volunteer organization made up of about 35 members. Of those members, only seven were trained emergency medical technicians. The department only had the capabilities to provide basic life support services and was so small a half-dozen staffers were working five days a week from 6 p.m. to midnight to cover calls. Facing mounting financial losses and a burned-out volunteer staff, Bath, Pa., is prepared to end its EMS service for good. The borough's roughly 2,700 residents will be served by the Bethlehem Township EMS. A resolution to make the transfer official is still in the works, but the plan is to switch to Bethlehem Township services starting in October. The township EMS will work out a leasing agreement with the borough to operate out of the Bath Firefighters and Ambulance Corps' facility on Center Street.	This highlights the value in seeking and achieving economies of scale in firefighting and EMS services.
UT	Single 9-1-1 Dispatch System	Salt Lake County to finally have just one 911 dispatch system Salt Lake County in Utah is upgrading to a single computer-aided dispatch system. The $13 million dispatch system will be able to handle 1 million 9-1-1 calls a year. Over the next year and a half, new hardware will be installed in every machine used by dispatchers, firefighters, police officers and paramedics. Training also will be provided to those responders. Much of the funding for the $13 million system will come from the Legislature. Salt Lake County is paying $1.4 million, federal Homeland Security officials are pitching in $177,000 and another $5 million has been rounded up through contributions and discounts.	This example shows how multiple funding sources were used to pay for a single, statewide dispatch center for 9-1-1.

2016 Funding and Sustainment Methods

State	Category	Method	Intended Impact
SC	Upgrades to 911 System	Chesterfield County, South Carolina Upgrades 911 System Chesterfield County, South Carolina has strengthened its E911 system. The county tapped Connecticut-based PowerPhone for its call handling solution. The new system includes upgraded software, operations, and training for emergency dispatch staff. Total Response utilizes integrated call handling protocols covering police, fire, and emergency medical subject matters. The new system is compatible with Chesterfield County E911's current computer-aided dispatch system (Southern Software CAD). An interface allows for the seamless communication between 911 call handlers and dispatched emergency responders, meaning responders arrive on scene more prepared and with a clearer picture of the emergency ahead of time.	The article notes that several states are working through updates to their 911 calling systems in an effort to replace legacy solutions and get ready for the voice and data transfer capabilities included in FirstNet. NENA has recommended nationwide upgrades to improve call handling and deal with calls coming in from cell phones and other devices, but implementation has been spotty at best.
MD	Upgrades to 911 Equipment	$4 Million in State Grants to Help Baltimore County, Md., with 911 Upgrades Baltimore County will receive $4 million from the state to upgrade its 911 equipment. The Baltimore County Council formally approved acceptance of the state grant Tuesday. The money comes from the state's Emergency Number Systems Board, which collects a fee from phone users. The phone system upgrades are funded by the state's 911 Trust Fund, administered by the Emergency Systems Numbers Board. For people with monthly phone bills, $1 is collected on each bill for the fund. Users of prepaid phones pay 60 cents into the fund when they buy their phones. Seventy-five percent of the money in the 911 Trust Fund goes to local governments to support operating costs of 911 centers, and 25 percent is for upgrades such as the new phones.	The upgrade will allow operators to receive texts, photos and videos and to provide better locational data that can improve emergency responses by ensuring that callers are directed to the right dispatchers.
NY	PSAP Operations	GLOW counties split $680,000 for E-911 costs More than $680,000 was awarded by the New York State Division of Homeland Security and Emergency Services to the GLOW counties in support of emergency response operations. Public Safety Answering Points (PSAPs) operations grants reimburse counties for public safety call-taking and dispatching expenses. Livingston County had the area's largest grant, at $205,512; followed by Genesee, $187,497; Wyoming, $153,848; and Orleans, $134,049. Monies were distributed among participating counties based on statistics reflective of a county's operational scope, demographics and emergency services call metrics.	These types of grants not only help county operators offset their day-to-day expenses, but can also foster upgrades in call-taking and dispatching technology and investing in new services such as text messaging, data communication and improved geo-location for emergency response.

2016 Funding and Sustainment Methods

State	Category	Method	Intended Impact
AZ	Wireless Broadband/ SmartCity	Phoenix Convention Center's Public Safety System Gets Final Approval Smart City Networks has received final approval for a public-safety distributed antenna system (DAS) it installed last year at the Phoenix Convention Center. Smart City Networks partnered with system integration firm Connectivity Wireless Solutions (CWS) to design, install, manage and commission the customized, turnkey system that ensures first responders can maintain communication with each other in case of an emergency.	This shows how a Convention Center is improving public safety communications through advanced technologies (DAS). DAS helps to boost signal strength, eliminate dead zones and remove interference from phone/radio frequency signals
NJ	Broadband	New Jersey Police Department Deploys Cradlepoint System The Ewing (New Jersey) Police Department is leveraging Cradlepoint's software-defined Long Term Evolution (LTE) solutions to provide in-vehicle connectivity for its officers in the field. The system allows the Ewing Police Department to create a secure end-to-end private network in the cloud over wired and wireless broadband Internet leveraging Cradlepoint's technology. Officers have instant, resilient and secure network connectivity while accessing critical online systems no matter where they are.	The solutions enable the police department to streamline network and fleet management with the ability to efficiently configure, monitor and manage all of its devices from one central location.
FL	Broadband	Motorola Solutions announces new mobile radio, enhancements to its P25 platform Motorola Solutions unveiled a new P25 mobile radio that operates on its ASTRO 25 systems. One of the key features of the APX 8500 all-band mobile radio is its ability to leverage LTE connectivity from a VML750 modem installed in the public-safety vehicle. During a major incident, voice communications can continue over the ASTRO network, while data communications, if the ASTRO network is too busy due to the major incident, can be carried on by an LTE network from the same public-safety vehicle.	The ASTRO 25 software will provide system users and operators with improved reliability and usability of the P25 network.

*This document is available online at https://www.dhs.gov/safecom/funding.

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D/A	Office	Program	Program Amount	SAFECOM Reference	Program Description	Application Deadline	Website
DOJ	COPS	Community Oriented Policing Services Coordinated Tribal Assistance Solicitation (COPS/CTAS)	Tribes with a sworn force of 1-9 officers are eligible for **$300,000**; 10-20 officers are eligible for **$600,000**; 20+ officers are eligible for **$1,000,000**	Yes	CTAS seeks to improve public safety and victim services in Tribal communities. The program provides Federally-recognized Tribes and Tribal consortia an opportunity to develop a comprehensive and coordinated approach to public safety and victimization issues and to apply for funding.	2/23/2016	http://www.cops.usdoj.gov/Default.asp?Item=2489
DOJ	COPS	Community Oriented Policing Services Community Policing Development (COPS/CPD)	Awards scaled between **$100,000** and **$1,000,000**	Yes	CPD funds are used to advance the practice of community policing in law enforcement agencies through training and technical assistance, the development of innovative community policing strategies, applied research, guidebooks, and best practices that are national in scope.	6/1/2016	http://www.cops.usdoj.gov/default.asp?Item=2450
DOJ	OJP	Edward Byrne Memorial Justice Assistance Grant Program (JAG)	Awards of at least **$25,000** are 4 years in length; Awards less than **$25,000** are 2 years in length	Yes	JAG funds support all components of the criminal justice system, from multi-jurisdictional drug and gang task forces to crime prevention and domestic violence programs, courts, corrections, treatment, and justice information sharing initiatives. JAG funds may be used for State and local initiatives, technical assistance, training, personnel, equipment, supplies, contractual support, information systems for criminal justice, and criminal justice-related research and evaluation activities.	6/26/2015	https://www.bja.gov/ProgramDetails.aspx?Program_ID=59
DOJ	OJP/NIJ	National Institute of Justice (NIJ) Research Grants (Law Enforcement, Geospatial, Criminal Justice IT)	Varies	No	NIJ awards grants and agreements for physical and social science research, development and evaluation projects about criminal justice through competitive solicitations, as well as two fellowships through annual solicitations. The focus of the solicitations varies from year to year based on research priorities and available funding. Additionally, NIJ funding supports efforts to improve the quality and timeliness of forensic science and medical examiner services.	12/23/14 - 3/23/15	http://www.nij.gov/funding/current.htm
HHS	ASPR	Hospital Preparedness Program (HPP)	$228,500,000	Yes	The mission of HPP is to ready hospitals and other healthcare systems through enhanced surge capacity, capability, and in collaboration with other partners, to deliver coordinated and effective care to victims of terrorism and other public health emergencies, and improve community preparedness and resiliency. This cooperative agreement supports interoperable communications equipment, systems, training, and exercises. This is an extension of a previously-issued cooperative agreement; eligible applicants are limited to those currently funded under the HPP Cooperative Agreement and the Public Health Emergency Preparedness (PHEP) Cooperative Agreement.	6/1/2014 - 6/30/2015	http://www.phe.gov/Preparedness/planning/hpp/Pages/funding.aspx

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D/A	Office	Program	Program Amount	SAFECOM Reference	Program Description	Application Deadline	Website
HHS	CDC	Public Health Emergency Preparedness (PHEP)	$611,750,000	Yes	The purpose of the PHER grant is to support and enhance the State and local public health infrastructure that is critical to public health preparedness and response. This grant supports interoperable communications equipment, systems, training, and exercises. This is an extension of a previously-issued grant; eligible applicants are limited to those currently funded under the HPP Cooperative Agreement and the PHEP Cooperative Agreement.	6/1/2014 - 6/30/2015	http://www.cdc.gov/phpr/coopagreement.htm
USDA	RUS	Community Connect	$13,000,000	No	The Community Connect program serves rural communities where broadband service is least likely to be available, but where it can make a tremendous difference in the quality of life for citizens. The projects funded by these grants will help rural residents tap into the enormous potential of the Internet.	2/15/2015	http://www.rd.usda.gov/programs-services/community-connect-grants
USDA	RUS	Community Facilities	Graduated Scale	No	Community Facilities Programs provide loans, grant and loan guarantees for essential community facilities in rural areas. Priority is given to health care, education and public safety projects. Typical projects are hospitals, health clinics, schools, fire houses, community centers and many other community based initiatives. Community Facilities Programs can make and guarantee loans to develop essential community facilities in rural areas and towns of up to 20,000 in population. Loans and guarantees are available to public entities such as municipalities, counties, parishes, boroughs, and special-purpose districts, as well as to non-profit corporations and tribal governments.	Applications for this program are accepted year round. Contact local office to discuss a specific project	http://www.rd.usda.gov/programs-services/community-facilities-direct-loan-grant-program
USDA	RUS	Telecommunications Infrastructure Loan	Graduated Scale	No	Through the Expansion of 911 Loan, USDA will leverage public and private resources to speed the rural deployment of dual-use public safety/commercial wireless networks, address homeland security communications needs along America's rural international borders, and finance enhanced 911 capabilities for carriers and communities. Advantages include the ability to precisely locate rural wireless 911 calls, contact 911 via text message, or send emergency responders photos or videos of crime scenes or accidents. The new regulation would also give RUS ability to finance wireless upgrades for public safety and security.	Applications for this program are accepted through the General Field Representative year round	http://www.rd.usda.gov/programs-services/telecommunications-infrastructure-loans-loan-guarantees

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D/A	Office	Program	Program Amount	SAFECOM Reference	Program Description	Application Deadline	Website
DHS	S&T	Small Business Innovation Research (SBIR)	S&T SBIR Phase 1: **$100,000** Phase 2: **$750,000** DNDO SBIR Phase 1: **$150,000** Phase 2: **$1,000,000**	Yes	The SBIR Program is a congressionally mandated small business set-aside designed to stimulate technological innovation and foster small business and private sector commercialization of innovations derived from Federal Research and Development. The annual solicitations consist of topics that are relevant to the Borders and Maritime Security, Chemical/Biological Defense, Cyber Security, Explosives, Human Factors/Behavioral Sciences, and Infrastructure Protection and Disaster Management Divisions.	1/21/2015	https://www.fbo.gov/?s=opportunity&mode=form&id=a591b70cee17b77ebda2c70e67b144ce&tab=core&_cview=0
DHS	FEMA	Assistance to Firefighters Grant (AFG)	$306,000,000	Yes	The primary goal of the AFG Program is to meet the firefighting and emergency response needs of fire departments and non-affiliated emergency medical service organizations. AFG funds have helped firefighters and other first responders to obtain critically needed equipment, protective gear, emergency vehicles, training, and other resources needed to protect the public and emergency personnel from fire and related hazards.	3/31/2016	http://www.fema.gov/assistance-firefighters-grant
DHS	FEMA	Assistance to Firefighters Grant Fire Prevention and Safety (AFG/FP&S)	$34,000,000	Yes	FP&S grants support projects that enhance the safety of the public and firefighters from fire and related hazards. The primary goal is to reduce injury and prevent death among high-risk populations.	5/6/2016	http://www.fema.gov/fire-prevention-safety-grants
DHS	FEMA	Emergency Management Performance Grant (EMPG)	$350,100,000	Yes	The EMPG assists State, local and tribal governments in preparing for all hazards. The intent of the Program is to provide granting funding to assist state emergency management agencies in obtaining the resources required to support the National Preparedness Goal's (the Goal) associated with Mission Areas and Core Capabilities. The Federal government, through the program, provides necessary direction, coordination, guidance, and assistance so that a comprehensive emergency preparedness system exists for all hazards.	3/18/2016	http://www.fema.gov/fiscal-year-2016-emergency-management-performance-grant-program
DHS	FEMA	Homeland Security Grant Program State Homeland Security Program (HSGP/SHSP)	$402,000,000	Yes	SHSP supports the implementation of risk driven, capabilities-based State Homeland Security Strategies to address capability targets set in Urban Area, State, and regional THIRAs. The capability targets are established during the THIRA process, and assessed in the State Preparedness Report (SPR), which inform planning, organization, equipment, training, and exercise needs to prevent, protect against, mitigate, respond to, and recover from acts of terrorism and other catastrophic events.	4/25/2016	http://www.fema.gov/fiscal-year-2016-homeland-security-grant-program

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D/A	Office	Program	Program Amount	SAFECOM Reference	Program Description	Application Deadline	Website
DHS	FEMA	Homeland Security Grant Program Urban Area Strategic Initiative (HSGP/UASI)	$580,000,000	Yes	The UASI program addresses the unique risk driven and capabilities-based planning, organization, equipment, training, exercise needs, of high-threat, high-density Urban Areas based on the capability targets identified during the THIRA process and associated assessment efforts, and assists them in building an enhanced and sustainable capacity to prevent, protect against, mitigate, respond to, and recover from acts of terrorism.	4/25/2016	http://www.fema.gov/fiscal-year-2016-homeland-security-grant-program
DHS	FEMA	Homeland Security Grant Program Operation Stonegarden (HSGP/OPSG)	$55,000,000	Yes	OPSG supports enhanced cooperation and coordination among local, Tribal, territorial, State, and Federal law enforcement agencies in a joint mission to secure the United States' borders along routes of ingress from international borders. This includes travel corridors in States bordering Mexico and Canada, as well as States and territories with international water borders.	4/25/2016	http://www.fema.gov/fiscal-year-2016-homeland-security-grant-program
DHS	FEMA	Tribal Homeland Security Grant Program (THSGP)	$10,000,000	Yes	THSGP supports the building, sustainment and delivery of core capabilities to enable Tribes to strengthen their capacity to prevent, protect against, mitigate, respond to, and recover from potential terrorist attacks and other hazards.	4/25/2016	http://www.fema.gov/fiscal-year-2016-tribal-homeland-security-grant-program
DHS	FEMA	Non-Profit Security Grant Program (NSGP)	$20,000,000	Yes	The NSGP provides funding support for hardening and other physical security enhancements to non-profit organizations that are at high risk of a terrorist attack and located within one of the specific UASIs. The program seeks to integrate the preparedness activities of non-profit organizations that are at high risk of a terrorist attack with broader state and local preparedness efforts. The NSGP also serves to promote coordination and collaboration in emergency preparedness activities among public and private community representatives as well as State and local government agencies.	4/25/2016	http://www.fema.gov/fiscal-year-2016-nonprofit-security-grant-program
DHS	FEMA	Port Security Grant Program (PSGP)	$100,000,000	Yes	The FY 2015 PSGP directly supports maritime transportation infrastructure security activities. PSGP is one tool to strengthen the Nation's critical infrastructure against risks associated with potential terrorist attacks.	4/25/2016	http://www.fema.gov/fiscal-year-2016-port-security-grant-program
DHS	FEMA	Transit Security Grant Program (TSGP)	$87,000,000	Yes	TSGP directly supports transportation infrastructure security activities, and is one tool in the comprehensive set of measures to strengthen the Nation's critical infrastructure against risks associated with potential terrorist attacks. TSGP provides funds to eligible publicly owned operators of public transportation to protect critical surface transportation infrastructure and the traveling public from acts of terrorism and to increase the resilience of transit infrastructure.	4/25/2016	http://www.fema.gov/fiscal-year-2016-transit-security-grant-program

The following list details Federal financial assistance opportunities that support emergency communications. Please note that other Federal financial assistance opportunities may exist. It is recommended that any entity seeking emergency communications related funding can also refer to www.grants.gov to determine if other opportunities are available.

D/A	Office	Program	Program Amount	SAFECOM Reference	Program Description	Application Deadline	Website
DHS	FEMA	Intercity Bus Security Grant Program (IBSGP)	$3,000,000	Yes	The 2015 IBSGP provides funding to create a sustainable program for the protection of intercity bus systems and the traveling public from terrorism. The program seeks to assist operators of fixed-route intercity and charter bus services in obtaining the resources required to support security measures such as enhanced planning, facility security upgrades and vehicle and driver protection.	4/25/2016	http://www.fema.gov/fiscal-year-2016-intercity-bus-security-grant-program
DOC	NTIA-FirstNet	Band 14 Incumbent Spectrum Relocation Grant Program	$40,000,000	Yes	This grant program is intended to assist public safety entities that are currently operating on Band 14 to relocate their communications operations to other frequencies allocated by the Federal Communications Commission, and provide the unencumbered spectrum that is necessary for the National Public Safety Broadband Network (NPSBN).	5/16/2016	http://www.firstnet.gov/sites/default/files/Band%2014%20Incumbent%20Spectrum%20Relocation%20Grant%20Program.pdf

IMPROVING GRANT MANAGEMENT: SAFECOM Recommendations for Public Safety Agencies

Based on Guidance from the U.S. DHS Inspector General

INTRODUCTION

Each year, the U.S. Department of Homeland Security (DHS) Office of Inspector General (OIG) audits grantees to monitor compliance with laws, federal regulations, and program guidance. In 2014, the DHS OIG audited grant recipients in 13 states and five territories which received State Homeland Security Program (SHSP) and Urban Area Security Initiative (UASI) funds.[1] The OIG report found, in most instances, states and urban areas administered grant programs effectively, efficiently, and in accordance with federal regulations and program guidance; however, in its findings, the DHS OIG identified two major areas for improvement—strategic planning before grants are awarded, and oversight of grant activities.

This document provides an overview of the Department of Homeland Security (DHS) Office of the Inspector General (OIG) recommendations for grantees, and recommendations from SAFECOM for public safety grantees. The intent is to establish best practices and methods that enable grantees to effectively report on the impact of the grant and their progress toward targeted communication goals. Grantees should use the information to develop strong proposals and effectively manage grant-funded projects.

AUDIT FINDINGS

The DHS OIG identified two major areas for improvement -- strategic planning before grants are awarded, and oversight of grant activities. To improve these areas, the DHS OIG recommended grantees perform the following:

- **Strategic Planning,** which should contain broad, long-term goals and corresponding short-term objectives addressing areas of prevention, protection, mitigation, response, and recovery enhancements within the state or urban area. Specifically, the DHS OIG recommended that grantees strengthen or improve upon:

[1] DHS OIG-14-22: https://www.oig.dhs.gov/assets/Mgmt/2014/OIG_14-22_Dec13.pdf.

- **Risk Assessments** that provide a process for identifying potential hazards and analyzing what could happen if an incident occurs. Done correctly, risk assessments give states a clear view of the variables to which they may be exposed, whether internal or external, retrospective or forward-looking. Once variables are identified, states must monitor and measure threats in relation to the objectives established in the risk assessment.
- **Performance Management** which defines a tangible and measurable target level of performance, over time, against which actual achievement can be compared, including goals expressed as a quantitative standard, value, or rate. Once a risk assessment is completed and target capabilities set, grant applicants should work to specify proposed activities; identify outcomes, impacts, and performance measures for the proposed activities; tie outcomes, impacts, and measures to long-term goals; obtain appropriate evaluation expertise and determine evaluation methods; and develop a data collection plan, including the procedures for implementing the evaluation.

- **Oversight of Grant Activities,** which is the full responsibility of grantees. The grantee assumes accountability for conduct of project activities and is held responsible for meeting federal and state standards in the areas of allocating, obligating, and expending grant funds; monitoring sub-grantee activity; financial management, internal controls, audit, and timely and accurate reporting; and complying with procurement and property management requirements.

SAFECOM RECOMMENDATIONS FOR PUBLIC SAFETY GRANTEES

DHS OIG's findings and recommendations provide beneficial guidance for all federal grantees. SAFECOM and the National Council of Statewide Interoperability Coordinators (NCSWIC) worked closely with the DHS Office of Emergency Communications (OEC) to analyze the DHS OIG recommendations and apply them to public safety stakeholders. The intent of this paper is to inform public safety grantees of lessons learned and best practices in grants management, in order to strengthen grant applications, and increase the impact of federal funding on improving emergency communications nationwide. Below are four recommendations for improving grant management, customized for public safety stakeholders.

Recommendation 1: Align Projects to Strategic Plans

The public safety community has engaged in strategic planning for many years. Since 2008, all 56 states and territories have developed Statewide Communications Interoperability Plans (SCIP) – stakeholder-driven strategic plans aimed at improving emergency communications.[2] The DHS OIG reported that strategic planning is critical; states can improve strategic planning by developing fully measurable goals and objectives, as well as by conducting capabilities and risk assessments. These recommendations are consistent with the *SAFECOM Guidance on Emergency Communications Grants (SAFECOM Guidance)*, in which grantees are encouraged to align proposed projects to strategic plans and target funding where there is the greatest risk or need. Best practices for grantees planning emergency communications projects include:

> ***Statewide Communication Interoperability Plans***
>
> Stakeholder-driven, multi-jurisdictional, and multi-disciplinary statewide plans that outline and define the current and future vision for communications interoperability within the state or territory. It is a critical strategic planning tool to help states prioritize resources, establish and strengthen governance, identify future technology investments, and address interoperability gaps.

[2] To find your SCIP, contact OEC at oec@hq.dhs.gov or your SWIC at: http://www.dhs.gov/safecom/contact-information.

- Review national and statewide strategic plans for emergency communications (e.g., *National Emergency Communications Plan*, SCIPs)
- Coordinate with statewide governance bodies and Statewide Interoperability Coordinators (SWIC)[3] to document needs, align proposed projects to national and statewide strategic plans, identify funding options, discuss asset sharing, and set strategic goals and measures
- Review requirements in the federal program guidance and consult with the federal granting agency, spectrum authorities, and *SAFECOM Guidance* when developing projects
- Reference alignment to the SCIP in grant applications

Recommendation 2: Participate in Risk Assessments

DHS OIG wrote that for risk assessments to yield meaningful results, grantees must consider the *Presidential Policy Directive 8 (PPD-8): National Preparedness*, which is the Nation's approach to preparing for threats and hazards that pose the greatest risk to the security of the United States. Risks include such events as natural disasters, disease pandemics, chemical spills, and other man-made hazards, terrorist attacks, and cyber-attacks. A risk assessment should begin by identifying community-specific threats, and setting targets for each core capability identified in the *National Preparedness Goal*, as set forth by PPD-8.

Operational Communications is a core capability and should be considered in the risk assessment process. DHS requires that states and territories complete a Threat and Hazard Identification and Risk Assessment (THIRA) as a condition of grant funding. Developing and updating the THIRA requires active involvement from the whole community to ensure assessments and planning efforts are representative of all needs.

Threat and Hazard Identification and Risk Assessment

Required by several DHS grants, the THIRA process helps communities understand their threats and hazards and how the impacts may vary according to time of occurrence, season, location, and numerous other community factors. The THIRA process results in whole community-informed capability targets and resource requirements necessary to address anticipated and unanticipated risks.

Thus, public safety stakeholders should be actively engaged in the THIRA process to convey the impact of various threats and hazards on emergency communications, and the needs of emergency communications users during all hazards. Participation in the THIRA process will ensure that emergency communications needs are known and considered for funding in future years.[4] Best practices for grantees participating in risk assessments include:

- Perform regular analysis, with participation from the whole community, of the state's strategy in identifying communications gaps, excesses, and deficiencies and preparedness to meet such challenges
- Use the THIRA process to identify communications-specific threats and hazards and set capability targets for each core capability identified in the *National Preparedness Goal* as required in PPD-8
- Ensure updates to THIRA include desired outcomes as required by program guidance
- Participate in the development of their State's State Preparedness Report

[3] SWICs provide leadership on interoperability issues in states and territories. For information, see: NCSWICGovernance@hq.dhs.gov.

[4] The THIRA is submitted by the State Administrative Agency (SAA). For your SAA, see: http://www.fema.gov/media-library-data/1426254849515-5f5df4ed92d2e90af450afa2d43a5312/SAA_Contact_List_March_2015.pdf.

Recommendation 3: Develop Strong Performance Measures

The DHS OIG found that many states and urban areas did not have strong performance measures which, as a result, affected their ability to demonstrate the impact of grant funding. To strengthen performance measures for emergency communications grants, DHS recommends that the public safety community consult the *Communications Interoperability Performance Guide*. *SAFECOM Guidance* also encourages grantees to use existing documentation and data (e.g., strategic plans, risk assessments) to measure performance and demonstrate how gaps in capabilities will be addressed through the use of grant funding. Best practices for grantees developing performance measures include:

- Develop project and budget milestones to ensure timely completion
- Consider potential impacts of federal or program requirements (e.g., Environmental and Historic Preservation [EHP] for construction projects) on implementation timeline and plan accordingly
- Identify performance measures that demonstrate the impact of funding, including measures at the start of the grant and benchmark measures to gauge progress throughout the project
- Track performance regularly and report the impact of the funds on the improvement of emergency communications

Recommendation 4: Provide Oversight of Grant Activities

Policies, procedures, and guidelines governing federal and state grants are in place to ensure sound accounting and oversight practices and provide consistency in grant administration. Acceptance of a grant establishes a legal obligation on the grantee to use grant funds in accordance with the grant terms and conditions. Best practices for grantees overseeing grant activities include:

- Establish policies and procedures for monitoring project milestones and financial performance
- Identify and train staff to manage financial reporting and programmatic compliance requirements (e.g., fair and competitive procurement process, EHP, and relevant technology standards)
- Ensure proper mechanisms are in place to avoid commingling and supplanting of funds
- Evaluate clearly the ability of sub-grantees to manage federal funding

CONCLUSION

The DHS OIG's recommendations are consistent with best practices in the *SAFECOM Guidance* which is developed by DHS OEC, SAFECOM, and NCSWIC members. The *SAFECOM Guidance* is updated annually to provide current information on emergency communications policies, eligible costs, best practices, and technical standards for state, local, tribal, and territorial grantees investing federal funds in emergency communications projects. Emergency communications leaders and grantees are encouraged to consult *SAFECOM Guidance* when developing grant proposals.

By following DHS OIG and *SAFECOM Guidance* recommendations, grantees will strengthen their applications and increase their chances of receiving federal funding for emergency communications projects. More importantly, these recommendations will ensure that federal funds are targeted where they are most needed and have the greatest impact on response operations.

ABOUT SAFECOM AND NCSWIC

SAFECOM was formed in 2001 after the terrorist attacks of September 11, 2001 as part of the Presidential E-Government Initiative to improve public safety interoperability, allowing emergency responders to communicate effectively before, during, and after emergencies and disasters. SAFECOM's mission is to improve designated emergency response providers' inter-jurisdictional and inter-disciplinary emergency communications interoperability through collaboration with emergency responders across Federal, State, local, tribal, and territorial governments, and international borders.is a public safety stakeholders. SAFECOM's membership includes 70 members representing federal, state, local, and tribal emergency responders, elected and appointed officials, and major intergovernmental and national public safety associations, who provide input on the challenges, needs, and best practices of emergency communications.

The National Council of Statewide Interoperability Coordinators (NCSWIC) was established in July 2010. The NCSWIC is comprised of Statewide Interoperability Coordinators (SWIC) and their staff from 56 states and territories. NCSWIC assists State and territory interoperability coordinators with promoting the critical importance of interoperable communications and the sharing of best practices to ensure the highest level of interoperable communications across the nation.

This document was developed by the SAFECOM/NCSWIC Funding and Sustainment Committee. This document reflects the expertise of SAFECOM and NCSWIC members, and DHS OEC coordination efforts to share innovative methods, best practices, and lessons learned in funding and sustaining public safety communications systems. The SAFECOM/NCSWIC Funding and Sustainment Committee will continue to seek best practices for emergency communications grantees and share updates as they become available.

For questions on this document, please contact SAFECOM or NCSWIC:

SAFECOM: SAFECOMGovernance@hq.dhs.gov

NCSWIC: NCSWICGovernance@hq.dhs.gov

Resources

SAFECOM Guidance on Emergency Communications Grants

The SAFECOM Guidance provides information for grantees developing emergency communications projects for federal funding. Decision makers and grantees should read the SAFECOM Guidance, coordinate proposals with the Statewide Interoperability Coordinator, and encourage compliance with the recommendations contained therein. For DHS grants, grantees must comply with the SAFECOM Guidance as a condition of funding.

National Emergency Communications Plan (NECP)

The 2014 NECP provides information and guidance to those that plan for, coordinate, invest in, and use operable and interoperable communications for response and recovery operations. The Plan sets forth five strategic goals based on the SAFECOM Interoperability Continuum. Collectively, the NECP goals aim to enhance emergency communications capabilities at all levels of government and across disciplines in coordination with the private sector, non-governmental organizations, and communities across the Nation.

Communications Interoperability Performance Measurement Guide

This guide is designed to help those in public safety planning. Interoperable capabilities have improved in recent years through a multi-dimensional view of the issue, statewide strategic plans across the nation, and a national plan presenting a practical vision. National goals today target practical outcomes and impacts rather than mere means to these ends. This guide addresses current performance measurement efforts and presents a step-by-step process to build a performance management framework, apply it, and use results to refine strategy.

DHS OIG Annual Report to Congress on States' and Urban Areas' Management of Homeland Security Grant Programs Fiscal Year 2014 This report provides detailed audit findings and recommendations as summarized in this paper.

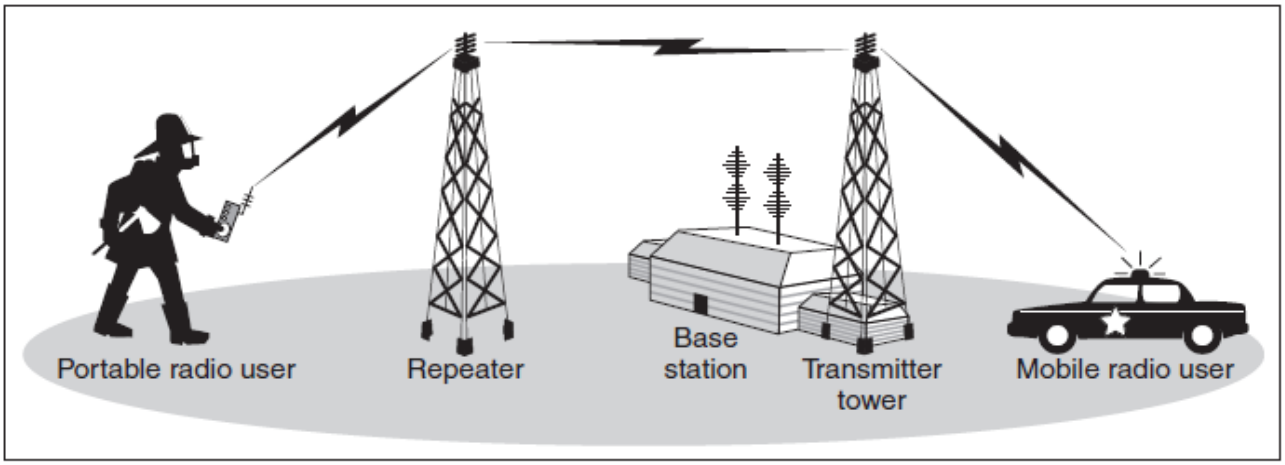
SAFECOM Guidance for Public Safety Entities Interested in Purchasing Broadband Equipment

BACKGROUND

For many years, public safety agencies have relied on traditional land mobile radio (LMR) systems to communicate during day-to-day response, large-scale emergencies, and natural and man-made disasters. LMR systems are "the primary means of voice communications among public safety personnel. These systems typically consist of handheld portable radios, mobile radios, base stations, and repeaters. Figure 1 below illustrates the basic components of a land mobile radio system."[1]

- **Handheld portable radios** are typically carried by public safety personnel and tend to have a limited transmission range
- **Mobile radios** are often located in vehicles and use the vehicle's power supply and a larger antenna, providing a greater transmission range than handheld portable radios
- **Base station radios** are located in fixed positions, such as public service access points or dispatch centers, and tend to have the most powerful transmitters.
- **A network** is required to connect the different base stations to the same communications system.
- **Repeaters** are used to increase the effective communications range of handheld portable radios, mobile radios, and base station radios by retransmitting received radio signals. Figure 1 below illustrates the basic components of a land mobile radio system.[2]

Figure 1. Basic Components of a Land Mobile Radio System

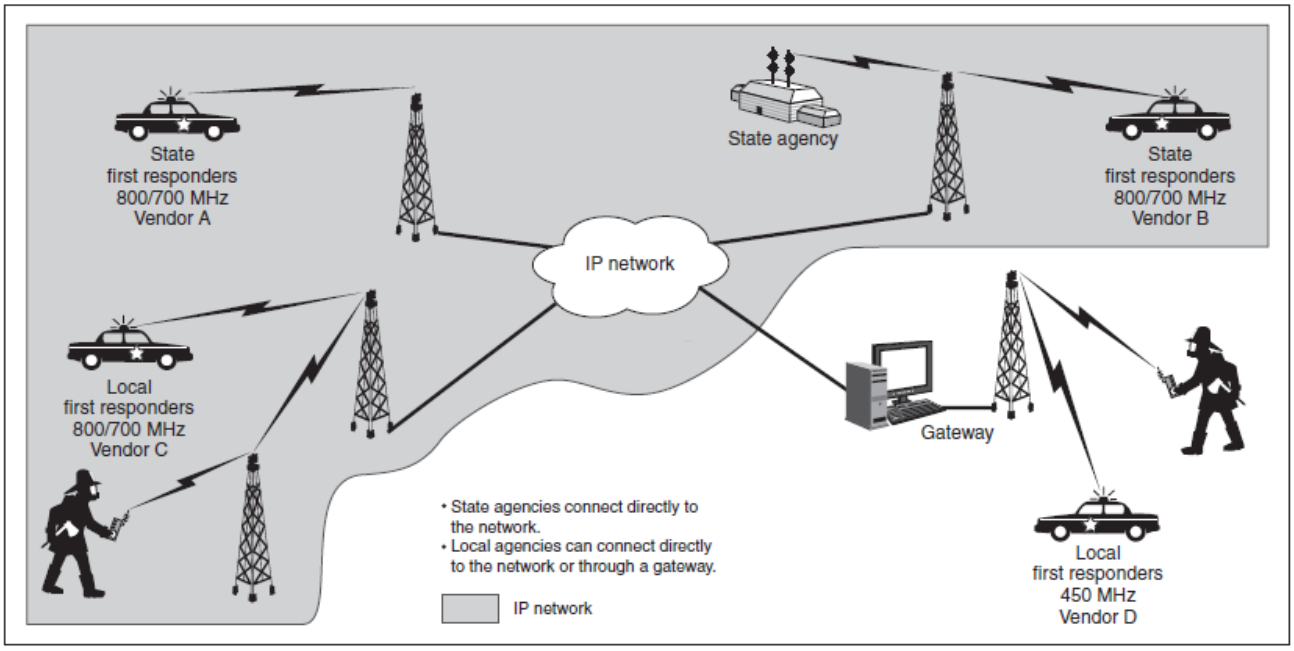


Source: GAO-07-301

Radio systems are classified as either **conventional** or **trunked**. Conventional radio systems have dedicated frequencies—also referred to as channels—assigned to individual groups of users. When a user makes a call, and selects a channel, other members of the group cannot use the channel until the call is over.[3] In contrast, trunked systems are computer-controlled, and assign a pool of channels for use by multiple individuals. When a call is made by a user on a trunked system, an available channel is automatically selected by the system from the pool of channels, leaving the remaining channels available for others. While trunked systems are more complex and require more infrastructure than conventional systems, they allow for the sharing of channels among a large group of users, increase capacity and interoperability, reduce congestion, and enable the more efficient use of communication channels.[4]

Over time, many public safety agencies have migrated towards more advanced communications systems – first, from conventional to trunked systems, and now toward Internet Protocol (IP)-based systems. IP-based networks are computer-based networks that allow states to connect radio sites across the state or across the region. Figure 2 provides an example of a regional or statewide IP network.

Figure 2. Example of a Regional or Statewide IP Network



Source: GAO-07-301 to

These statewide networks or regional networks provide a means for multiple agencies, disciplines, and responders to communicate during day-to-day operations, as well as during large-scale disasters. These systems have allowed agencies to increase capacity (i.e., the number of users on a system), enhance capabilities, and improve interoperability.

Public safety agencies are also leveraging broadband networks to improve communications. Public safety agencies are leveraging commercial wireless broadband services,[5] and some have developed and deployed their own local or municipal broadband networks[6] for mission critical data communications. The use of broadband networks will transform how public safety stakeholders communicate. Such networks will provide unparalleled connectivity and bandwidth,[7] allowing agencies to access and share more information (e.g. data, text, photos, and video), greatly enhancing situational awareness.

LOOKING AHEAD: UNDERSTANDING THE PUBLIC SAFETY BROADBAND NETWORK

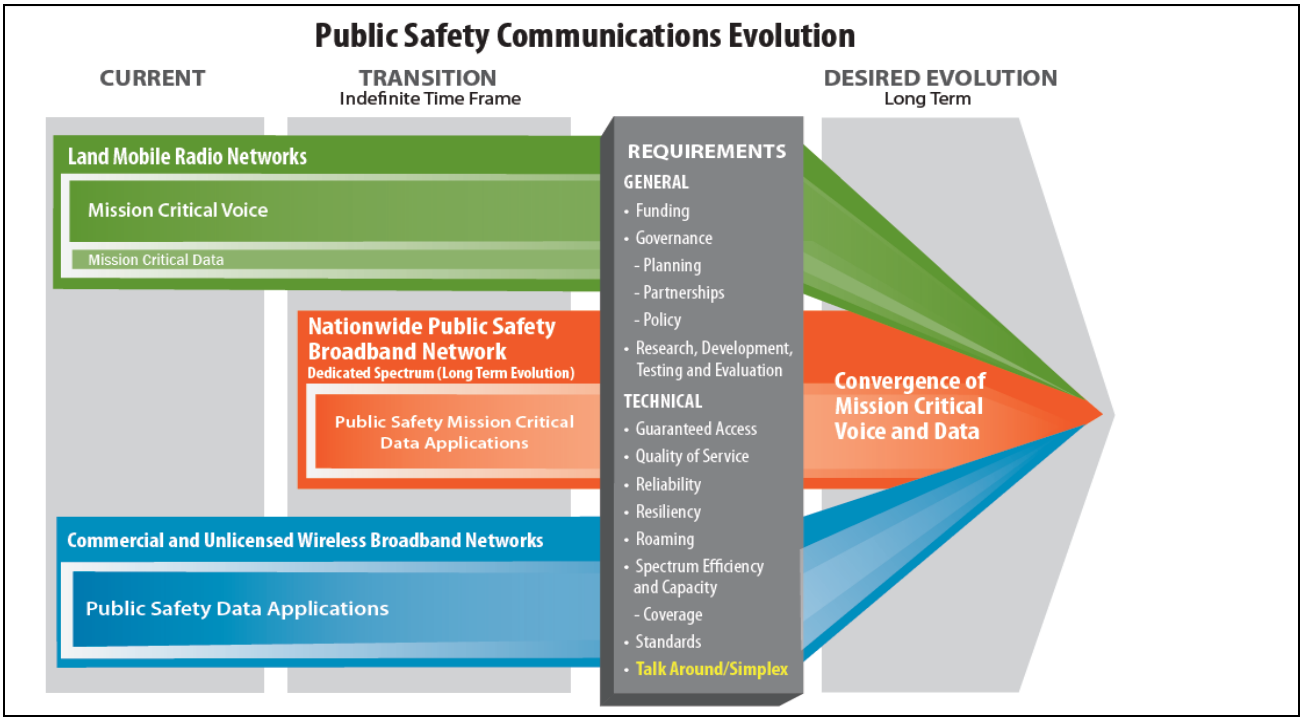
In 2012, the Middle Class Tax Relief and Job Creation Act was enacted, which established the First Responder Network Authority (FirstNet), authorizing it to establish a single, nationwide public safety broadband network for public safety. The Act set aside spectrum in the 700 megahertz (MHz) band[8] to deploy the network,[9] and designated funding to build and deploy the network nationwide. The goal of this project is to ensure that first responders, at all levels of government, across all disciplines, and jurisdictions can communicate as needed during emergencies.[10] While public safety agencies are looking forward to, the deployment of a single, nationwide network, dedicated to public safety, there are several issues that state and local officials must be aware of when making funding decisions.

First, the development and deployment of the nationwide public safety broadband network (NPSBN) is expected to take several years. Therefore, it is necessary for state and local governments to continue to sustain LMR systems throughout the development and deployment of the NPSBN, to ensure first responders can continue to communicate during emergencies and natural and man-made disasters.

Secondly, while the NPSBN is expected to offer advanced data capabilities and data features, such as messaging, image sharing, video streaming, data storage, and applications, it will not offer mission critical voice capabilities from the outset. Therefore, it is necessary for state and local governments to continue to support current systems and solutions that support mission critical voice, until reliable and secure voice capabilities can be offered through the NPSBN.

Figure 3 below depicts the eventual convergence of LMR networks with broadband technologies at some point in the future, but acknowledges that the timeline for the transition is undetermined and indefinite. Public safety agencies argue that current systems providing mission critical voice and communication capabilities (i.e., LMR systems) must be maintained and sustained until similar capabilities can be offered through broadband networks (e.g., commercial wireless networks, or the NPSBN). State and local officials should be aware that while regular voice capabilities are available through commercial broadband networks, technologies that ensure more reliable, robust, and secure mission critical voice capabilities needed by public safety are not yet available, and will not be available initially on the NPSBN.

Figure 3. Public Safety Communications Evolution



Source: DHS Public Safety Evolution Brochure

GUIDANCE FOR ENTITIES INTERESTED IN INVESTING FEDERAL FUNDS IN BROADBAND

With the recent commencement of the NPSBN planning, many public safety agencies have expressed interest in investing federal funds in broadband-related projects. However, there are many aspects of the NPSBN that are still under development, including network architecture, coverage requirements, technical requirements, deployment and operations plans, and funding strategy.[11] Therefore, many federal granting agencies are advising grantees to avoid acquisition of broadband equipment (i.e., Long Term Evolution [LTE] equipment),[12] until there is further guidance from FirstNet on network architecture and requirements. Following this guidance will help to ensure that any investment of funds in broadband technology will complement the deployment of the NPSBN and will support state broadband plans currently being developed by states in consultation with FirstNet.[13]

Entities are encouraged to target grant funding toward planning and outreach activities (e.g., community outreach, documenting user needs), and to work with the State Single Point of Contact (SPOC)[14] and other state officials (e.g., State Administrative Agency, Statewide Interoperability Coordinator [SWIC])[15] in planning for broadband and other advanced technologies. Such planning activities may include, but not be limited to:

- Attending statewide or regional broadband planning meetings
- Establishing a governance structure, or expanding existing structures, to consult with FirstNet
- Preparing a comprehensive plan as part of the existing Statewide Communication Interoperability Plan (SCIP), or similar plan, describing the public safety needs that the State/territory expects FirstNet to address in its design of the NPSBN[16]
- Developing procedures to ensure regional, local, tribal representation and participation in the FirstNet consultation process
- Ensuring that all necessary planning and tribal consultation for Federal environmental, historic preservation and cultural resources statutory compliance will occur
- Creating and implementing a process for education and outreach among regional, local, and tribal officials, public safety users, and other stakeholders about the NPSBN

EXCEPTIONS TO THE RULE: ENTITIES HOLDING SPECTRUM LEASE AGREEMENTS

There are certain entities that have approval from FirstNet to proceed with broadband acquisition and deployment. These entities have been granted spectrum access and permission to proceed with planned broadband projects funded under the Broadband Technology Opportunities Program (BTOP) and/or the Department of Homeland Security (DHS), awarded prior to the Middle Class Tax Relief and Job Creation Act. They have been granted spectrum management lease agreements, and have been asked by FirstNet to fulfill specific Key Learning Conditions (KLC) that will inform the future deployment of the NPSBN.

FirstNet made a determination that these “early builders” of broadband projects could offer valuable lessons learned that could help inform the development and deployment of the NPSBN. Entities with lease agreements include:

- Los Angeles Regional Interoperable Communications System (LA-RICS)
- State of New Mexico
- Adams County, Colorado
- State of New Jersey
- State of Texas

Because these entities had projects underway, and have authority to operate in the FirstNet spectrum, these entities may use federal funding to support their broadband deployment. These investments continue to be reviewed carefully to ensure they support the statewide plan to deploy broadband and the federal goals for these pilot projects.

All other entities without authority to operate in the spectrum (i.e., those without a lease agreement with FirstNet), should not be requesting federal funds for broadband LTE) infrastructure equipment. Entities should be targeting funding toward broadband planning, governance, outreach, and education. Once the state plans are complete, and once FirstNet has more formal plans for the network, federal funds may be able to be used for broadband projects.

GUIDANCE TO ENTITIES INTERESTED IN INVESTING IN OTHER-THAN-LTE EQUIPMENT[17]

In the past, some public safety agencies have leveraged non-LTE wireless broadband technologies (e.g., Wi-Fi, [18] WiMAX,[19] mesh networks[20]) and other commercial broadband services to supplement their current communications. These solutions, which are either agency-owned or provided by a commercial carrier, allow agencies to access non mission critical voice, as well as data, video, and other applications.

However, given ongoing advancements in the NPSBN deployment, public safety entities should consider the overall impact of leveraging other-than-LTE broadband technologies at this time. First, LTE has been identified as the chosen standard for public safety broadband communications. The Middle Class Tax Relief and Job Creation Act established LTE as the standard for the NPSBN. LTE was endorsed by public safety organizations for economies of scale, radio frequency use, and spectral efficiency reasons. Moreover, major wireless service providers chose LTE for their broadband data services and in 2010, the FCC designated LTE as the required technology for the NPSBN.[21] Secondly, it is important to note that other wireless broadband technologies do not interoperate with LTE.

With these cautions, public safety entities should consider the impact of other-than-LTE investments in broadband and focus on activities and solutions that will help agencies plan and prepare for the deployment of the NPSBN. Entities are strongly encouraged to work with their state's SWIC, the FirstNet SPOC for the state,[22] federal granting agencies, and commercial providers to ensure grant-funded systems are compatible and interoperable with current and future solutions.

CONCLUSION

Planning for the NPSBN is underway. Public safety agencies interested in investing in broadband technologies should engage in planning for broadband, but understand five important points regarding acquisition and deployment of broadband equipment:

The NPSBN is in the early stages of development; public safety agencies should engage in planning efforts. The federal government is in the planning stages for the NPSBN; public safety agencies should coordinate with state broadband planners, participate in planning sessions, and discuss whether the proposed project supports the state's plan for public safety broadband use.

Agencies with lease agreements with FirstNet may be able to use grant funds for acquisition and deployment. Some public safety agencies have permission (i.e., a lease agreement) to deploy a public safety broadband project. These projects are expected to inform the future deployment of the NPSBN, and may be able to use grant funds to support their project.

Many federal agencies will not support acquisition and deployment if the grantee does not have a lease agreement in place. Many federal agencies will not support acquisition and deployment of broadband equipment and systems unless agencies have access to the 700 MHz public safety spectrum (i.e., a lease with FirstNet) or until there is further guidance from FirstNet.

Public safety agencies leveraging commercial networks to supplement public safety communications should exercise caution on major acquisitions, as they may not integrate with the NPSBN. Many public safety agencies are using commercial broadband services, and investing in other broadband technologies to support public safety communications. Agencies should exercise caution in investing in non-LTE equipment that may not integrate into the NPSBN.

Public safety agencies should continue to sustain LMR systems. Public safety agencies should continue to sustain LMR systems to ensure first responders can access mission critical voice communications, as these capabilities may not be immediately available on the NPSBN.

ABOUT SAFECOM AND NCSWIC

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NCSWIC: NCSWICGovernance@hq.dhs.gov

Resources for Entities Interested in Investing in Broadband Technologies

2015 SAFECOM Guidance for Emergency Communications Grants
The SAFECOM Guidance provides information on the current state of broadband, federal guidance for grantees interested in investing in broadband, and broadband activities that grantees can pursue in the near-term. Decision makers and grantees should read the SAFECOM Guidance carefully, encourage compliance with the recommendations contained therein, and should encourage coordination with the SWIC and the FirstNet SPOC for any projects proposing investment in broadband. Decision makers should ensure that grant applicants comply with the recommendations in the SAFECOM Guidance, as it is a condition of grant funding for grants, and represents best practices in emergency communications.

Information Bulletin #386
This is formal guidance to DHS grantees regarding the use of DHS funds for broadband investments.

Public Safety Communications Evolution Brochure
The DHS Office of Emergency Communications (OEC) developed this brochure in collaboration with SAFECOM and the National Council of Statewide Interoperability Coordinators, with the support and input of public safety officials at multiple levels of government across the country. This brochure: (1) helps educate the public safety community and elected and appointed officials about the future of emergency communications; (2) Describes the evolution of emergency communications and how traditional LMR communications used today may converge with wireless broadband in the future, if specific requirements are met; (3) discusses some of the most important requirements to achieve the desired long term state of convergence with LMR networks.

FirstNet Elected Officials Fact Sheet
This fact sheet prepared by FirstNet provides an overview of FirstNet, the nationwide public safety broadband network, and roles and responsibilities.

April 2015 FirstNet Stakeholder Presentation
This presentation provides an update on FirstNet activities to date, including updates on state consultations, progress toward milestones, and development of Request for Proposal for acquisition and deployment of the NPSBN.

Interoperability Planning for Wireless Broadband
Technical Guide for public safety practitioners planning for broadband.

Application of Emerging Wireless Broadband Technology for Public Safety Communications
FCC Tech Topic #22 on broadband applications to public safety, and recent trends.

Standards for Other Broadband Technologies: FCC Tech Topic #11: WiMAX Applications for Public Safety

Broadband Technology Opportunities Program (BTOP)
Department of Commerce grant program, that was funded under the American Reinvestment and Recovery Act (ARRA), and which funded seven public safety broadband projects, four of which are serving as pilot projects for FirstNet.

FirstNet LMR Fact Sheet
This Fact Sheet discusses how the FirstNet Network will work with current LMR systems, and the need for continued investment in legacy LMR systems to preserve voice capabilities while the network is being developed.

End Notes

[1] GAO-07-301: First Responders Much Work Remains to Improve Communications Interoperability.p.6.

[2] GAO-07-301: First Responders Much Work Remains to Improve Communications Interoperability.p.6.

[3] GAO-07-301: First Responders Much Work Remains to Improve Communications Interoperability, p.7.

[4] GAO-07-301: First Responders Much Work Remains to Improve Communications Interoperability, p.8.

[5] Broadband refers to high-speed data transmission in which a single connection can carry a large amount of data at once. Broadband allows users to access information via the Internet through one of several high-speed transmission technologies (e.g., cable provided by a cable TV provider, DSL provided by a local telephone company, fiber provided by an Internet Service Provider). The Federal government was charged in 2012 with building a nationwide public safety broadband network (NPSBN).

[6] These are networks that are typically owned and operated by a municipality, public utility, or by a council of governments in a region.

[7] Bandwidth is the width of a communications channel, and determines the information-capacity of a telecommunications channel.

[8] The 700 MHz band is a segment of the radio spectrum that has been designated for public safety use, as stated in the Middle Class Tax Relief and Job Creation Act.

[9] The 9/11 Commission Report made a recommendation that Congress should support pending legislation which provides for the expedited and increased assignment of radio spectrum for public safety purposes (p. 397). See: http://www.9-11commission.gov/report/911Report.pdf.

[10] The nationwide network was established by law, through the enactment of the Middle Class Tax Relief and Job Creation Act which authorized the creation of FirstNet, and the establishment of a single, nationwide network for public safety. For more information see: http://www.gpo.gov/fdsys/pkg/PLAW-112publ96/content-detail.html.

[1111] FirstNet is in the process of developing formal documents for the procurement of the NPSBN. See: https://www.fbo.gov/index?s=opportunity&mode=form&id=0a78db17dc3ade1848a16f168fa697dd&tab=core&_cview=1.

[12] Long Term Evolution (LTE) is a standard for wireless communication that supports high-speed data and roaming for mobile phones and handheld devices. LTE was established by the 3rd Generation Partnership Project (3GPP), and was adopted as the standard for which the nationwide public safety broadband network will be built.

[13] For more information on the state consultation process, see: http://www.firstnet.gov/consultation.

[14] States that received Department of Commerce State and Local Implementation Grant Program (SLIGP) funds have a SPOC in place. To find your SPOC, see: http://www.firstnet.gov/consultation#State Single Points of Contact (SPOC).

[15] To find the SWIC for your state, contact OEC at oec@hq.dhs.gov.

[16] For more information on the SCIP, see: http://www.dhs.gov/statewide-communication-interoperability-plans

[17] This guidance is included in the 2015 SAFECOM Guidance on Emergency Communications Grants, Appendix B-8.

[18] Wi-Fi stands for "wireless fidelity." Wi-Fi allows for the deployment of local area networks (LANs) without wires for connecting devices, typically reducing the costs of network deployment and expansion. Wi-Fi is a low power wireless system that uses unlicensed radio frequency that is attached to a LAN, which is then attached to the Internet through a cable modem, DLS router or phone line. These are often the systems used in coffee shops, hotels, airports.

[19] WiMAX operates similar to Wi-Fi but at higher speeds and over greater distances and for a greater number of users. For WiMAX, users can access the Internet from farther away, without a phone line or other wired line, using a card inserted in their laptop, or can access the Internet through a modem that is attached to, for example, an antenna on the roof of a house. WiMAX has the ability to provide service in hard-to-reach areas. WiMAX can enable two hotspots to be created and linked, creating a mesh network.

[20] Mesh networks are like ad-hoc networks, where individual nodes (hotspots) are deployed and linked, providing an ad-hoc network for users, who may not have service.

[21] FCC, 700 MHz Public Safety Spectrum: http://www.fcc.gov/encyclopedia/700-mhz-spectrum.

[22] For the FirstNet SPOC list, see: http://www.firstnet.gov/consultation#State Single Points of Contact (SPOC).