



Report to the Chairman, Committee on
Commerce, Science and Transportation,
U.S. Senate

April 2015

PUBLIC-SAFETY BROADBAND NETWORK

FirstNet Should Strengthen Internal Controls and Evaluate Lessons Learned

GAO Highlights

Highlights of [GAO-15-407](#), a report to the Chairman, Committee on Commerce, Science and Transportation, U.S. Senate

Why GAO Did This Study

For communications during emergencies, public safety officials rely on thousands of separate systems, which often lack interoperability, or the ability to communicate across agencies and jurisdictions. The 2012 act created FirstNet within the Department of Commerce to establish, for public safety use, a nationwide, interoperable, wireless broadband network, which will initially support data transmissions. The 2012 act established numerous responsibilities for FirstNet, provided \$7 billion for network construction, and required FirstNet to be self-funding beyond this initial allocation. As part of the effort, FirstNet is working with five “early builder projects” that are building local and regional public-safety broadband networks.

GAO was asked to examine FirstNet’s progress in establishing the network. GAO assessed (1) FirstNet’s progress carrying out its responsibilities and establishing internal controls, (2) how much the network is estimated to cost and how FirstNet plans to become self-funding, and (3) what lessons can be learned from the early builder projects. GAO reviewed FirstNet documentation and public-safety network cost estimates, surveyed all state-designated FirstNet contacts, and interviewed FirstNet officials and public safety stakeholders selected for their telecommunications and public safety experience.

What GAO Recommends

FirstNet should complete its risk assessment, develop standards of conduct, and develop an evaluation plan for early builder projects. FirstNet concurred with the recommendations.

View [GAO-15-407](#). For more information, contact Mark L. Goldstein at (202) 512-2834 or goldsteinm@gao.gov.

April 2015

PUBLIC-SAFETY BROADBAND NETWORK

FirstNet Should Strengthen Internal Controls and Evaluate Lessons Learned

What GAO Found

The First Responder Network Authority (FirstNet) has made progress carrying out its responsibilities established in the Middle Class Tax Relief and Job Creation Act of 2012 (the 2012 act) but lacks certain elements of effective internal controls. FirstNet is charged with the complex and challenging task of establishing a new, nationwide, wireless broadband network for public safety entities, in consultation with federal, state, local, and tribal stakeholders. The network will initially support interoperable data communications, and later integrate mission-critical voice capabilities as public safety standards for voice communications are developed. FirstNet has made progress establishing an organizational structure, planning for the network, and consulting with stakeholders. FirstNet has also begun establishing policies and practices consistent with federal internal control standards. Officials told GAO that they plan to continue to do so. However, FirstNet has not fully assessed its risks or established standards of conduct—which is an important form of ethical guidance for its personnel. Given that FirstNet faces numerous risks to achieve its complex objectives, fully assessing risks could help FirstNet achieve its objectives and maximize use of its resources. Developing standards of conduct could also help FirstNet address any performance issues in a timely manner.

A nationwide public-safety broadband network has been estimated by various entities to cost billions of dollars, and FirstNet faces difficult decisions determining how to fund the network’s construction and ongoing operations. These estimates indicate the cost to construct and operate such a network could be from \$12 to \$47 billion over the first 10 years. The actual cost of FirstNet’s network will be influenced by FirstNet’s (1) business model, especially the extent of commercial partnerships; (2) use of existing infrastructure; (3) efforts to ensure network reliability; and (4) network coverage. For example, the cost of the network may be higher if FirstNet does not utilize partnerships and some existing infrastructure. To become self-funding, FirstNet is authorized to generate revenue through user fees and commercial partnerships. However, FirstNet faces difficult decisions in determining how to best utilize these revenue sources. For instance, widespread network coverage can attract more users and revenue, but is expensive to construct and maintain, especially in rural areas.

FirstNet has taken steps to collect and evaluate information and lessons from the five “early builder projects” that are developing local and regional public-safety networks, but could do more to ensure that the lessons are properly evaluated. For example, FirstNet has asked the projects to report on the experiences of their networks’ users and has assigned contractors to collect and log lessons. However, FirstNet does not have a plan that clearly articulates how it will evaluate those experiences and lessons. Although FirstNet told GAO that it remains in close contact with early builder projects, GAO has previously found that a well-developed evaluation plan for projects like these can help ensure that agencies obtain the information necessary to make effective program and policy decisions. Given that the early builder projects are doing on a local and regional level what FirstNet must eventually do nationally, an evaluation plan can play a key role in FirstNet’s strategic planning and program management, providing feedback on both program design and execution and ensuring FirstNet has not missed opportunities to incorporate lessons the projects have identified.

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Abbreviations

2012 act	Middle Class Tax Relief and Job Creation Act of 2012
APA	Administrative Procedure Act
BTOP	Broadband Technology Opportunities Program
DHS	Department of Homeland Security
ECPC	Emergency Communications Preparedness Center
FAR	Federal Acquisition Regulation
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FirstNet	First Responder Network Authority
LMR	land mobile radio
LTE	Long Term Evolution
NPSTC	National Public Safety Telecommunications Council
MHz	megahertz
NIST	National Institute of Standards and Technology
NOI	Notice of Inquiry
NTIA	National Telecommunications and Information Administration
OIG	Office of Inspector General
PSAC	Public Safety Advisory Committee
PSCR	Public Safety Communications Research
RAN	radio access network
RFI	Request for Information
RFP	Request for Proposals
SLIGP	State and Local Implementation Grant Program
SMLA	Spectrum Manager Lease Agreement
SPOC	Single Point of Contact

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April 28, 2015

The Honorable John Thune
Chairman
Committee on Commerce, Science
and Transportation
United States Senate

Dear Mr. Chairman:

Communication systems are essential for public safety officials—especially first responders such as police, firefighters, and paramedics—to gather and share information during emergencies. First responders rely on thousands of separate, incompatible, and often proprietary land-mobile radio (LMR) systems for their mission-critical voice communications. Oftentimes these LMR systems lack “interoperability”—the capabilities that allow first responders to communicate with their counterparts in other agencies and jurisdictions with differing systems—which has been a long-standing concern. For example, during the terrorist attacks of September 11, 2001, and also during Hurricane Katrina in 2005, the lack of interoperable public-safety communications hampered rescue efforts and the overall effectiveness of public safety operations.

The Middle Class Tax Relief and Job Creation Act of 2012 provides resources, including both spectrum and billions of dollars, for the establishment of a nationwide, interoperable wireless broadband network specifically for first responders.¹ In particular, the 2012 act created the First Responder Network Authority (FirstNet) as an independent authority within the Department of Commerce’s National Telecommunications and Information Administration (NTIA) to establish a nationwide public-safety broadband network,² allocated billions for its construction, and set aside

¹Pub. L. No. 112-96, 126 Stat. 156 (2012).

²Pub. L. No. 112-96, § 6204(a), 126 Stat. 156, 208.

radio frequency spectrum on which the network can operate.³ The network is expected to support important data transmission (such as the vital signs of critically injured people and security-camera video feeds) and foster greater interoperability among public safety entities. Unlike current LMR systems, the devices operating on the public-safety broadband network are expected to be interoperable among first responders using the network, since they are using the same radio frequency band nationwide and will be required to be built to the same open, non-proprietary, commercially available standards.⁴ The network will initially support data transmissions and non-mission critical voice, with mission-critical voice communications expected to be integrated in the coming years.

In developing the public-safety broadband network, FirstNet is faced with a complex and challenging mission. We previously reported on the challenges to implementing a public-safety broadband network, including ensuring the network's reliability and security and obtaining adequate funds to build and maintain it.⁵ To inform its work, FirstNet is required to consult with numerous federal, state, local, and tribal jurisdictions.⁶ FirstNet is also working with five "early builder projects" that received federal funding to deploy local and regional public-safety broadband networks similar to what FirstNet is required to establish on a national scale. FirstNet also has to develop a business plan that supports the upfront and ongoing costs of the public-safety broadband network.

You asked us to examine FirstNet's progress in establishing the nationwide public-safety broadband network. This report assesses (1) the extent to which FirstNet is carrying out its responsibilities and establishing internal controls for developing the public safety network, (2) how much the public safety network is estimated to cost to construct and operate

³The radio frequency spectrum is the part of the natural spectrum of electromagnetic radiation lying between the frequency limits of 3 kilohertz (kHz) and 300 gigahertz (GHz). Radio frequencies are grouped into bands. Radio signals travel through space in the form of waves. These waves vary in length, and each wavelength is associated with a particular radio frequency.

⁴Pub. L. No. 112-96, § 6206(b)(2)(B), 126 Stat. 156, 212.

⁵GAO, *Emergency Communications: Various Challenges Likely to Slow Implementation of a Public Safety Broadband Network*, [GAO-12-343](#) (Washington, D.C.: Feb. 22, 2012).

⁶Pub. L. No. 112-96, § 6206(c)(2)(A), 126 Stat. 156, 213.

and how FirstNet plans to become a self-funding entity, and (3) what lessons can be learned from local and regional public-safety network early builder projects.

To address these objectives, we reviewed FirstNet’s documentation, such as Requests for Information (RFI), annual reports to Congress, board-meeting materials and resolutions, and presentations to stakeholders. We compared FirstNet’s efforts and progress to carry out its responsibilities with requirements established in the Middle Class Tax Relief and Job Creation Act of 2012⁷ and compared FirstNet’s efforts to establish internal controls with criteria established in the federal *Standards for Internal Control*.⁸ We reviewed cost estimates for a nationwide public-safety broadband network from a variety of entities, including the Congressional Budget Office, the Federal Communications Commission (FCC), and academics.⁹ We also reviewed FirstNet’s cost estimate and conducted interviews with FirstNet officials to learn more about how the estimate was prepared, the assumptions underlying it, and the documentation supporting it. We assessed FirstNet’s cost estimate against the criteria established in our *Cost Guide*.¹⁰ We also interviewed early builder project officials from—and involved in—the five current projects (Los Angeles, CA; Adams County, CO; New Jersey; New Mexico; and Harris County, TX), three projects that were canceled (Charlotte, NC; Mississippi; and San Francisco, CA), and state and local public-safety entities in the project jurisdictions. We reviewed the Spectrum Manager Lease

⁷Pub. L. No. 112-96, 126 Stat. 156.

⁸GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: Nov. 1999). The most recent version of these standards was issued in September 2014. GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: Sept. 10, 2014). These new standards become effective October 1, 2015, but an entity’s management may elect early adoption. According to FirstNet officials, as the Department of Commerce proceeds with the rollout of these revisions, NTIA and FirstNet will also adopt these new standards. Although these new standards are not yet effective and FirstNet is not required to abide by them, given that they will be effective soon and that FirstNet is still in the process of developing its internal control system, doing so according to these new standards would prevent FirstNet from having to re-design any elements of its system later this year.

⁹We did not perform a full data reliability assessment of the numbers in these estimates because the purpose of the estimates within the scope of our review was to provide illustrative examples.

¹⁰GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, [GAO-09-3SP](#) (Washington, D.C.: Mar. 2, 2009).

Agreements (SMLA) that each of the five current projects established with FirstNet, and documentation related to how FirstNet plans to collect lessons learned from the projects. We assessed FirstNet's plans to evaluate and utilize lessons from the projects against key features of a well-developed evaluation plan for pilot projects identified by our previous reports.¹¹

To obtain stakeholder views, we surveyed all 50 states, the District of Columbia, and 5 U.S. territories. We administered the survey from October 2014 through November 2014 and received 55 responses, for a 98 percent response rate.¹² We interviewed FirstNet and NTIA officials and a variety of other stakeholders, such as state and local public-safety entities, commercial wireless carriers, subject matter experts, public safety associations, and federal agencies including FCC and the Department of Homeland Security (DHS). We also spoke with government officials in Sweden responsible for establishing a public-safety communications network in their country. We selected stakeholders by considering their involvement in the early builder project jurisdictions, experience with operating and using wireless communications systems and public-safety communications systems and devices in particular, familiarity with FirstNet and its mission, and—to obtain a cross-section of public safety disciplines—their public safety role.¹³ More details about our scope and methodology can be found in appendix I and a copy of our survey in appendix II.

We conducted this performance audit from April 2014 to April 2015 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

¹¹See, for example, GAO, *Tax Administration: IRS Needs to Strengthen Its Approach for Evaluating the SRFMI Data-Sharing Pilot Program*, [GAO-09-45](#) (Washington, D.C.: Nov. 7, 2008).

¹²Puerto Rico did not respond to our survey.

¹³We conducted semi-structured interviews with all of these stakeholders and throughout this report we refer to “a few” of the stakeholders if officials from 3-5 entities, “some” if 6-9, “many” if 10-14, and “numerous” if 15 or more expressed the view.

Background

The Middle Class Tax Relief and Job Creation Act of 2012 (2012 act) established numerous responsibilities for FirstNet, most of which relate directly to developing the nationwide public-safety broadband network (hereafter, public safety network). It is intended that this network will be a new, nationwide, broadband telecommunications network. Public safety users, and potentially other “secondary” users,¹⁴ may be assessed fees to use the network, much as they may currently pay for the use of commercial wireless networks. In establishing this network, FirstNet must

- issue open, transparent, and competitive Requests for Proposals (RFP) to private sector entities for the purpose of building, operating, and maintaining the public safety network;
- develop RFPs that include appropriate timetables for construction, and network coverage areas and service levels, among other things;
- enter into agreements to use, to the maximum extent economically desirable, existing commercial, federal, state, local, and tribal infrastructure;
- promote competition in the public-safety equipment marketplace by requiring that equipment for the public safety network be built to open, non-proprietary standards;
- promote integration of the public safety network with public-safety answering points;
- address special considerations for areas with unique homeland or national security needs;
- require deployment phases that include substantial rural coverage milestones; and

¹⁴Pub. L. No. 112-96, § 6208(a)(1). Also, under Section 6208(a)(2) of the act, FirstNet is allowed to establish agreements that allow access to the public safety network through entities involved in the construction, management, or operation of the public safety network, on a secondary basis for services other than public safety, such as individual commercial customers using the network much as they currently use existing commercial networks.

-
- develop the technical and operational requirements for the public safety network, as well as the practices and procedures for managing and operating it.

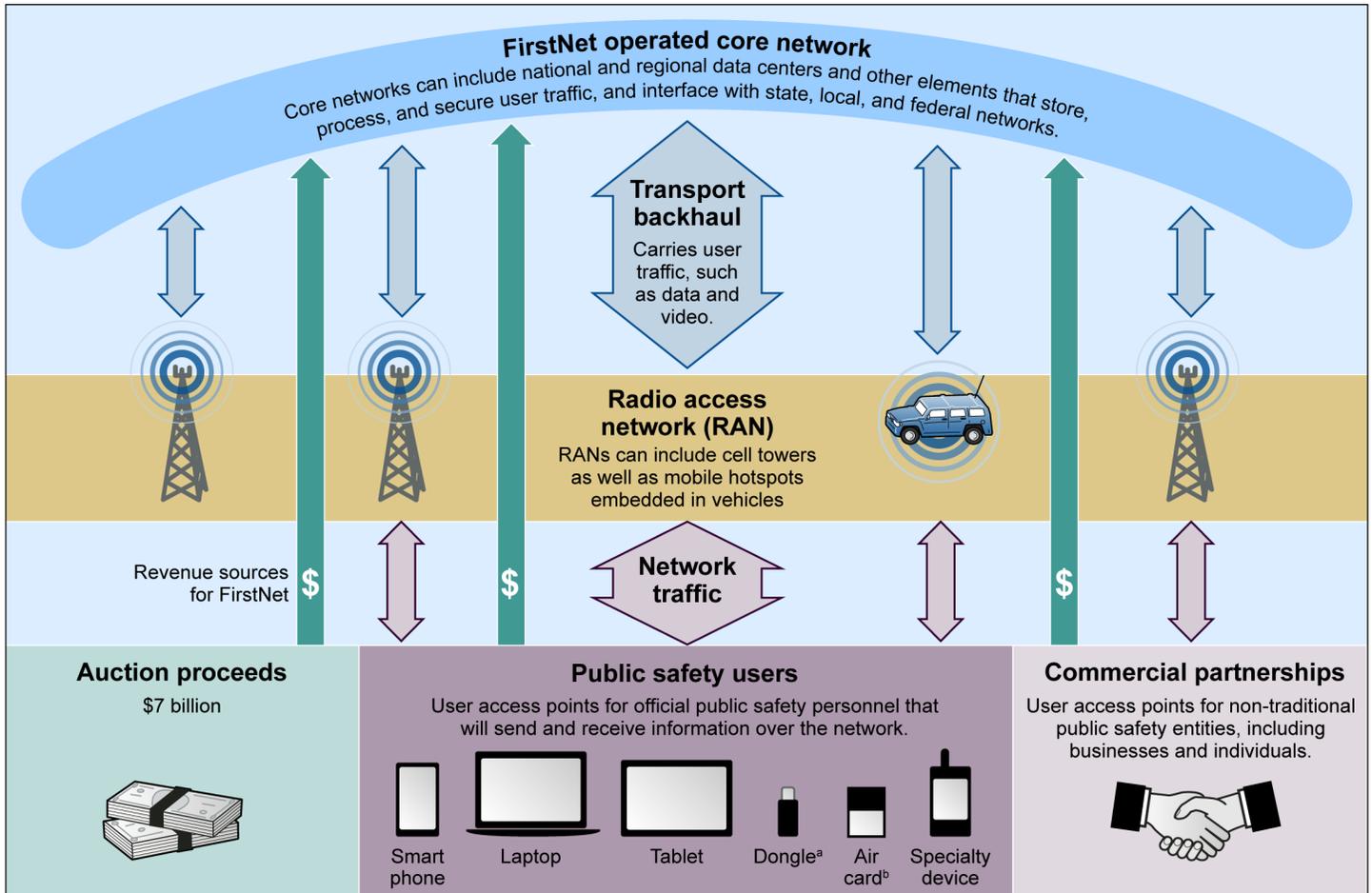
In establishing the infrastructure for the public safety network, the 2012 act requires FirstNet to include the following network components, as shown in figure 1:¹⁵

- core network of data centers and other elements, all based on commercial standards;
- connectivity between the radio access network (RAN) and the public Internet or the Public Switched Telephone Network, or both; and
- network cell-site equipment, antennas, and “backhaul” equipment, based on commercial standards, to support wireless devices operating on frequencies designated for public safety broadband.¹⁶

¹⁵Pub. L. No. 112-96, § 6202(b), 126 Stat, 156, 206.

¹⁶“Backhaul” is the telecommunications industry term that refers to connections between a central telecommunications network and other nodes outside the central network, such as a cell phone tower.

Figure 1: Key Elements of First Responder Network Authority's (FirstNet) Public Safety Network



Source: GAO. | GAO-15-407

^aGenerally, “dongles” are small devices that plug into computers and serve as an adapter or as a security measure to enable the use of certain software.

^bGenerally, “air cards” are wireless adapters for sending and receiving data in a cellular network.

In developing the public safety network, FirstNet must work with a variety of stakeholders. The 2012 act required FirstNet to be headed by a 15-member board with 3 permanent members (the Secretary of Homeland Security, the Attorney General, and the Director of the Office of Management and Budget) and 12 individuals appointed by the Secretary of Commerce. The appointed members are required to have public safety

experience or technical, network, or financial expertise.¹⁷ The 2012 act also required FirstNet to establish a standing public-safety advisory committee to assist it in carrying out its responsibilities and consult with federal, regional, state, local, and tribal jurisdictions on developing the network.¹⁸ For state, local, and tribal planning consultations, FirstNet is required to work with the state Single Points of Contact (SPOC) who have been designated by each state, territory, and the District of Columbia (hereafter, states).¹⁹

The 2012 act requires FirstNet to notify the states when it has completed its RFP process for building, operating, and maintaining the public safety network.²⁰ Once a state receives the details of FirstNet's plans, it has 90 days either to agree to allow FirstNet to construct a RAN in that state or notify FirstNet, NTIA, and FCC of its intent to deploy its own RAN. A state that "opts out" of FirstNet's plan to build that state's RAN has an additional 180 days from that notification to develop and complete RFPs for the construction, maintenance, and operation of the RAN within the state; the state must send FCC an alternative plan for constructing, operating, and maintaining its RAN. The plan must demonstrate that the state's proposed RAN would comply with certain minimum technical requirements and be interoperable with FirstNet's network. FCC shall either approve or disapprove the plan. In addition, a state that opts out is required to apply to NTIA for an agreement to use FirstNet's spectrum capacity.

Various federal agencies will provide assistance and support to FirstNet. For example,

- The National Institute of Standards and Technology (NIST) within the Department of Commerce, in consultation with FCC, DHS, and the Department of Justice's National Institute of Justice, is required to conduct research and assist with the development of standards,

¹⁷Pub. L. No. 112-96, § 6204(b)(2)(B), 126 Stat. 156, 209.

¹⁸Pub. L. No. 112-96, § 6205, 126 Stat. 156, 211.

¹⁹Pub. L. No. 112-96, § 6206(c)(2)(B), 126 Stat. 156, 214.

²⁰Pub. L. No. 112-96, § 6302(e)(1), 126 Stat. 156, 219.

technologies, and applications to advance wireless public-safety communications.²¹

- The Public Safety Communications Research (PSCR) program, a joint NTIA and NIST effort, performs research on behalf of FirstNet to advance public-safety communications interoperability.²²
- DHS, through both the Office of Emergency Communications and the Office for Interoperability and Compatibility, supports the establishment of the public safety network and collaborates with public safety and government officials at the federal, state, local, and tribal levels to help ensure the network meets the needs and technical requirements of users in the public safety community.

The 2012 act also required FCC, the entity responsible for managing and licensing commercial and non-federal spectrum use—including spectrum allocated to public safety—to take certain steps to support FirstNet. It also authorized FCC to provide FirstNet with technical assistance and to take any action necessary to assist FirstNet in effectuating its statutory duties and responsibilities. Radio frequency spectrum is an essential resource for wireless communications, including the planned public-safety network. The energy in electronic telecommunications transmissions converts airwaves into signals to deliver voice, text, and images. These signal frequencies are allocated for specific purposes, such as television broadcasting or Wi-Fi, and assigned to specific users through licenses.

Allocating sufficient spectrum for wireless emergency communications has long been a concern for Congress. The 2012 act required FCC to reallocate the “D Block,” a previously commercial spectrum block located in the upper 700 megahertz (MHz) band, to public safety²³ and to grant a license to FirstNet for the use of both the existing public-safety broadband spectrum in the upper 700 MHz band and the D Block.²⁴ FirstNet now has a license to operate the nationwide public-safety broadband network on

²¹Pub. L. No. 112-96, § 6303(a), 126 Stat. 156, 221.

²²The PSCR program also conducts research on behalf of the DHS Office for Interoperability and Compatibility in support of the development of public safety broadband.

²³Pub. L. No. 112-96, § 6101, 126 Stat. 156, 205.

²⁴Pub. L. No. 112-96, § 6201, 126 Stat. 156, 206.

spectrum in the upper 700 MHz band, specifically 758-769 MHz and 788-799 MHz (see fig. 2 below). In October 2013, FCC adopted consolidated technical service rules governing the 700 MHz band of spectrum licensed to FirstNet and was prepared to accept and process applications for equipment certification in that spectrum band consistent with the newly consolidated rules.²⁵ FCC has conducted specified spectrum auctions, as required by the 2012 act, so that auction proceeds could be used to fund FirstNet.²⁶ The 2012 act provides \$7 billion from the spectrum auction proceeds to FirstNet for “buildout” of the public safety network, reduced by the amount needed to establish FirstNet.²⁷ The 2012 act requires FirstNet to be self-funding beyond this initial \$7 billion.²⁸

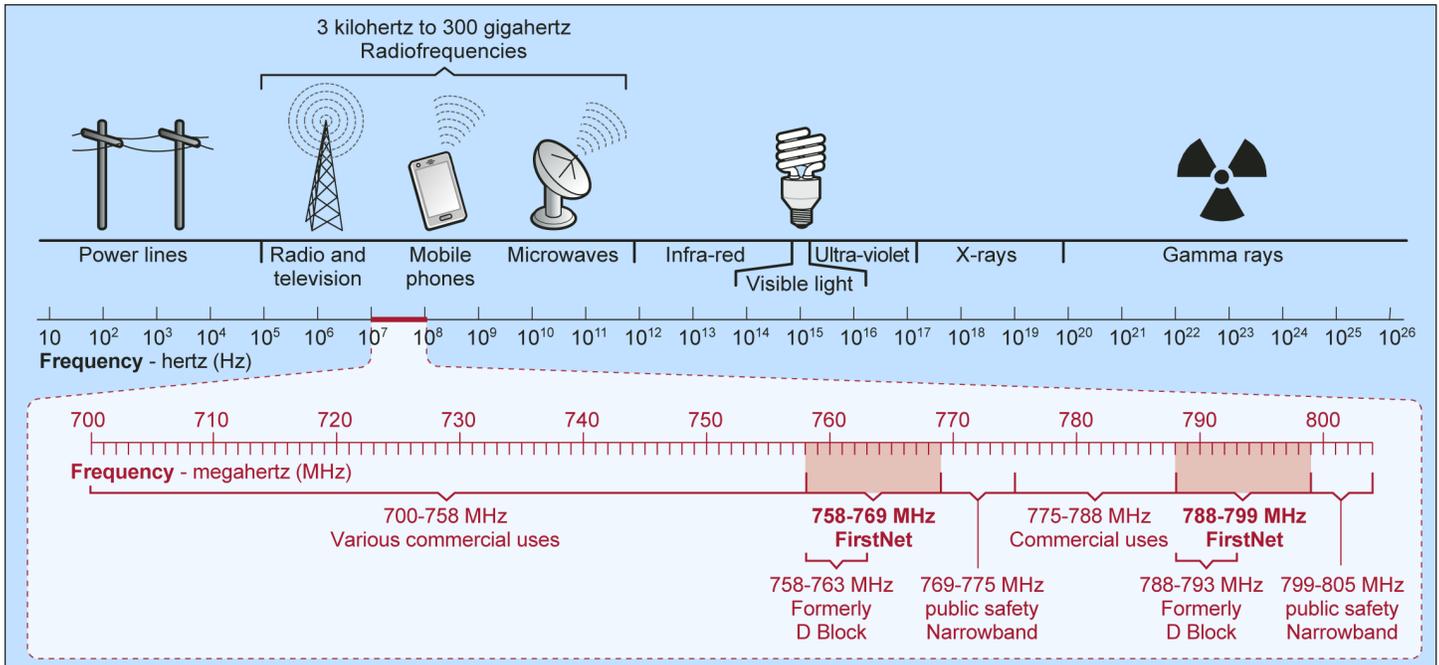
²⁵*In the Matter of Implementing Public Safety Broadband Provisions of the Middle Class Tax Relief and Job Creation Act of 2012; Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band; Service Rules for the 698-746, 747-762 and 777-792 MHz Bands*, Second Report and Order, 28 FCC Rcd. 15174 (2013).

²⁶Pub. L. No. 112-96, § 6402, 126 Stat. 156, 224.

²⁷Pub. L. No. 112-96, § 6413(b)(3), 126 Stat. 156, 236. NTIA was allowed to borrow \$2 billion from the U.S. Treasury to support FirstNet’s work prior to the deposit of auction proceeds into the newly created Public Safety Trust Fund. NTIA must reimburse the Treasury from funds deposited into the Public Safety Trust Fund once the spectrum auctions are complete. Pub. L. No. 112-96, §§ 6207 and 6413(b), 126 Stat. 156, 215.

²⁸Pub. L. No. 112-96, § 6208, 126 Stat. 156, 215.

Figure 2: First Responder Network Authority's (FirstNet) Spectrum



Sources: Federal Communications Commission and GAO. | GAO-15-407

Efforts to establish local and regional public-safety networks are also ongoing, and predate the 2012 act. In 2009, public safety entities began requesting waivers from FCC's rules to allow early deployment of interoperable public-safety wireless broadband networks in the upper 700 MHz spectrum band authorized for public safety use. Through 2011, FCC granted waivers to 22 jurisdictions for early deployment of such networks.²⁹ However, FCC recognized that the 2012 act "fundamentally altered the regulatory landscape for the 700 MHz band" and sought

²⁹In the Matter of Requests for Waiver of Various Petitioners to Allow the Establishment of 700 MHz Interoperable Public Safety Wireless Broadband Networks, Order, 25 FCC Rcd 5145 (2010); In the Matter of Requests for Waiver of Various Petitioners to Allow the Establishment of 700 MHz Interoperable Public Safety Wireless Broadband Networks, Order, 26 FCC Rcd 6783 (2011).

comment on the disposition of waiver jurisdiction deployments.³⁰ In May 2012, NTIA partially suspended seven grant projects for the waiver jurisdictions that received funding from the Broadband Technology Opportunities Program (BTOP), a federal grant program to promote the expansion of broadband infrastructure.³¹ NTIA suspended the projects in part to ensure the projects supported the development of FirstNet's public safety network. In July 2012, FCC decided to hold all waiver authorizations ineffective as of September 2, 2012, and said it would allow such jurisdictions to continue to deploy public-safety broadband services in the existing public-safety broadband spectrum (later extended to include the D Block) under certain limited circumstances consistent with FirstNet's future use of the spectrum.³² FCC granted FirstNet the 700 MHz public-safety broadband-spectrum license in November 2012,³³ and in February 2013, FirstNet announced it would begin negotiations with the original waiver jurisdictions on SMLAs. With FirstNet in control of the 700 MHz public-safety broadband-spectrum license pursuant to its FCC license, the jurisdictions had to secure an SMLA with FirstNet to lift their partial funding suspension and resume work. By August 2014, FirstNet secured SMLAs with five original waiver jurisdictions; in this report, we refer to these jurisdictions as early builder projects. Figure 3 shows timelines for the early builder projects and the amount of federal funding they received to deploy their networks. As part of their SMLAs with FirstNet, the early builder projects agreed to report to FirstNet on their use of the spectrum, their progress, and on key-learning conditions,

³⁰*Public Safety and Homeland Security Bureau Seeks Comment on Transition Process for 700 MHz Public Safety Broadband Waiver Recipients*, Public Notice, 27 FCC Rcd. 3310 (PSHSB 2012); *In the Matter of Implementing Public Safety Broadband Provisions of the Middle Class Tax Relief and Job Creation Act of 2012; Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band*, Order, 27 FCC Rcd. 9652 (2012).

³¹NTIA was authorized to award BTOP grants through the American Recovery and Reinvestment Act of 2009, Pub. L. No. 111-5, 123 Stat. 115 (2009). Harris County, Texas, obtained a grant for its public-safety network project from the Federal Emergency Management Agency (FEMA), not BTOP.

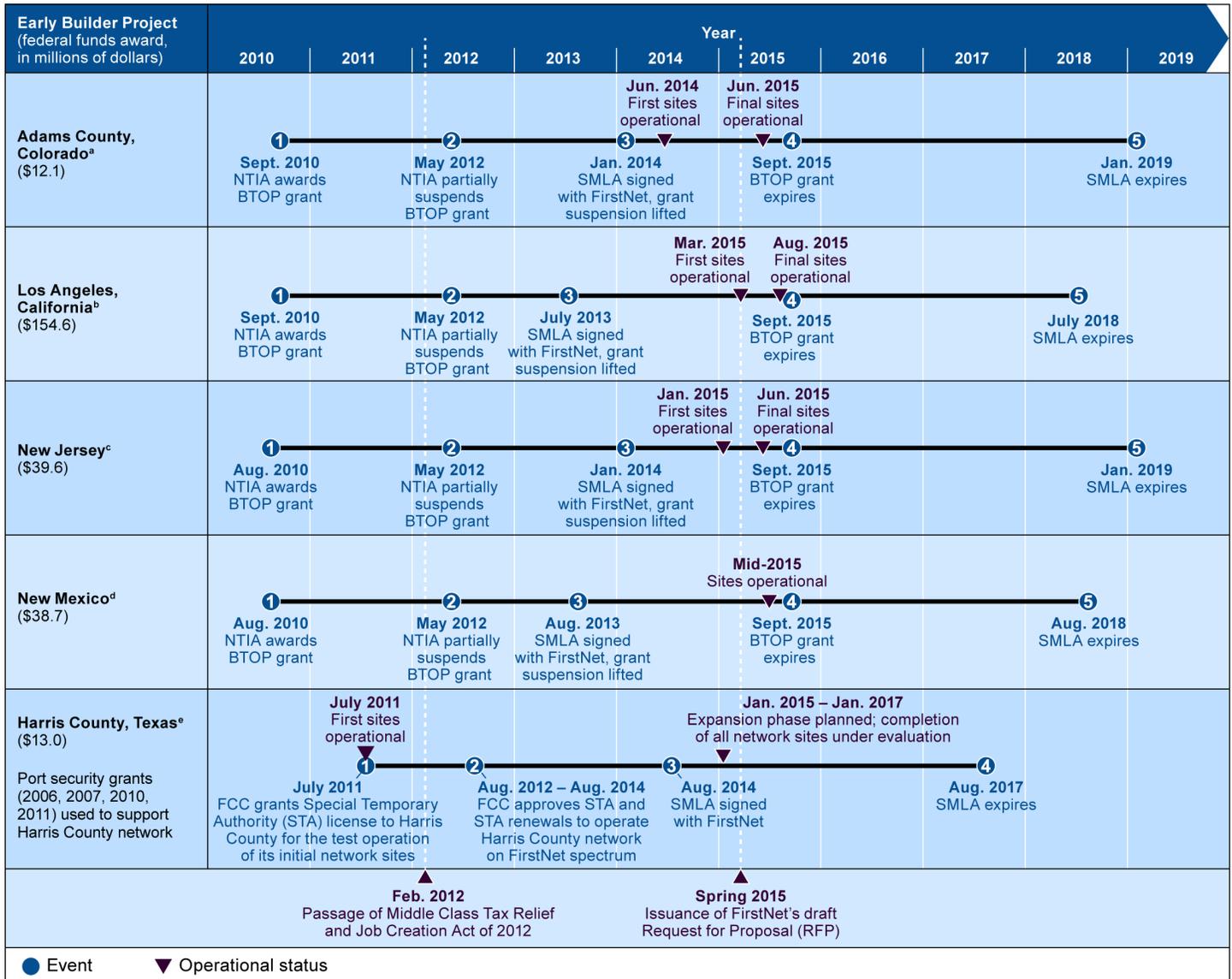
³²*In the Matter of Implementing Public Safety Broadband Provisions of the Middle Class Tax Relief and Job Creation Act of 2012; Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band*, Order, 27 FCC Rcd. 9652 (2012).

³³Universal Licensing System, License Call Sign WQQE234 (Nov. 15, 2012).

among other things. FirstNet has not yet determined if or how the early builder project networks will be incorporated into its nationwide network.³⁴

³⁴According to FirstNet officials, various factors could affect whether the early builder networks are integrated into FirstNet's public safety network including whether a state "opts out" and builds its own RAN to connect to the FirstNet core, the desire of the state to retain the network and/or equipment, the individually negotiated infrastructure and maintenance agreements executed by the early builders with their vendors, if it is economically desirable or practical for FirstNet to utilize the network or equipment, and the ability to reach a timely and cost-effective agreement regarding the transfer or lease of network facilities.

Figure 3: Early Builder Project Timelines, as of January 2015



Source: GAO based on information from Spectrum Manager Lease Agreements (SMLAs), Early Builder Projects, National Telecommunications and Information Administration (NTIA), Broadband Technology Opportunities Program (BTOP) documentation, Federal Communications Commission (FCC) documentation, and the First Responder Network Authority (FirstNet). First and final sites operational information provided by project officials. | GAO-15-407

^aFirstNet entered into an SMLA with the Adams County Communications Center, Inc., which plans to provide broadband network coverage for Adams County, Colorado.

^bFirstNet entered into an SMLA with the Los Angeles Regional Interoperable Communications System Authority, which plans to provide broadband network coverage to over 4,000 square miles of geographic boundaries around Los Angeles, California.

^cFirstNet entered into an SMLA with the State of New Jersey by and through the Office of Information Technology. While the Office of Information Technology will continue to be the primary recipient of the BTOP grant, project activities have been transitioned to the New Jersey Office of Homeland Security and Preparedness, which will implement deployable public-safety broadband networks in three service regions including Atlantic City, Camden, and the “Route 21 Corridor” or state highway in north central New Jersey.

^dFirstNet entered into an SMLA with the State of New Mexico, which plans to focus its public-safety broadband network on the southwest border area.

^eFirstNet entered into an SMLA with the State of Texas, which plans to provide broadband network coverage for Harris County, Texas.

Three other original waiver jurisdictions were awarded BTOP funds to deploy local and regional public-safety broadband networks, including the State of Mississippi,³⁵ the San Francisco Bay Area in California,³⁶ and the City of Charlotte in North Carolina.³⁷ However, for various reasons, these jurisdictions were unable to reach SMLAs with FirstNet and the projects were canceled.

Even with the establishment of the public safety network, first responders will continue to rely on their current LMR systems for mission-critical voice communications. We previously reported that a major limitation of a public-safety broadband network is that it will not provide first responders with “mission-critical” voice capabilities—that is, voice capabilities that meet a high standard for reliability, redundancy, capacity, and flexibility necessary during emergencies—for several years.³⁸ Long Term Evolution (LTE), the technical standard for the public-safety broadband network, is a wireless broadband standard that is not currently designed to support

³⁵The Executive Office of the State of Mississippi was awarded a BTOP grant totaling \$70.1 million to build its public-safety broadband network. The state used \$32.1 million in BTOP funds, according to its last BTOP report submitted to NTIA. Negotiations for an SMLA failed due to disagreements between FirstNet and the state on a number of issues. Consequently, the Mississippi award expired. State officials told us that they were seeking information from NTIA on decommissioning the network, donating unused equipment to FirstNet, and continuing to use the microwave systems it deployed.

³⁶A BTOP grant totaling \$50.6 million was awarded to Motorola Solutions, Inc., the vendor selected to partner with the Bay Area Regional Interoperable Communications Systems, to build and operate a public safety network in the Bay Area. Motorola, Inc. reported in its last BTOP report to NTIA that it received \$5.9 million in BTOP funds. Motorola, Inc. terminated the grant when it was unable to reach an SMLA with FirstNet.

³⁷The City of Charlotte was awarded \$16.7 million in BTOP funds to deploy a public-safety broadband network. Charlotte officials told us they repurposed the grant and planned to use the remaining \$8.8 million of BTOP funds to improve the city’s public-safety mobile technology and infrastructure.

³⁸[GAO-12-343](#).

mission-critical voice communications.³⁹ Commercial wireless providers are currently providing voice over LTE capabilities, but these capabilities do not currently meet public safety's mission-critical voice requirements because key elements needed for mission-critical voice—such as group calls—are not part of the LTE standard. Therefore, public safety agencies will continue to rely on their LMR systems for mission-critical voice for the foreseeable future, and the public safety network will supplement, rather than replace, current LMR systems.

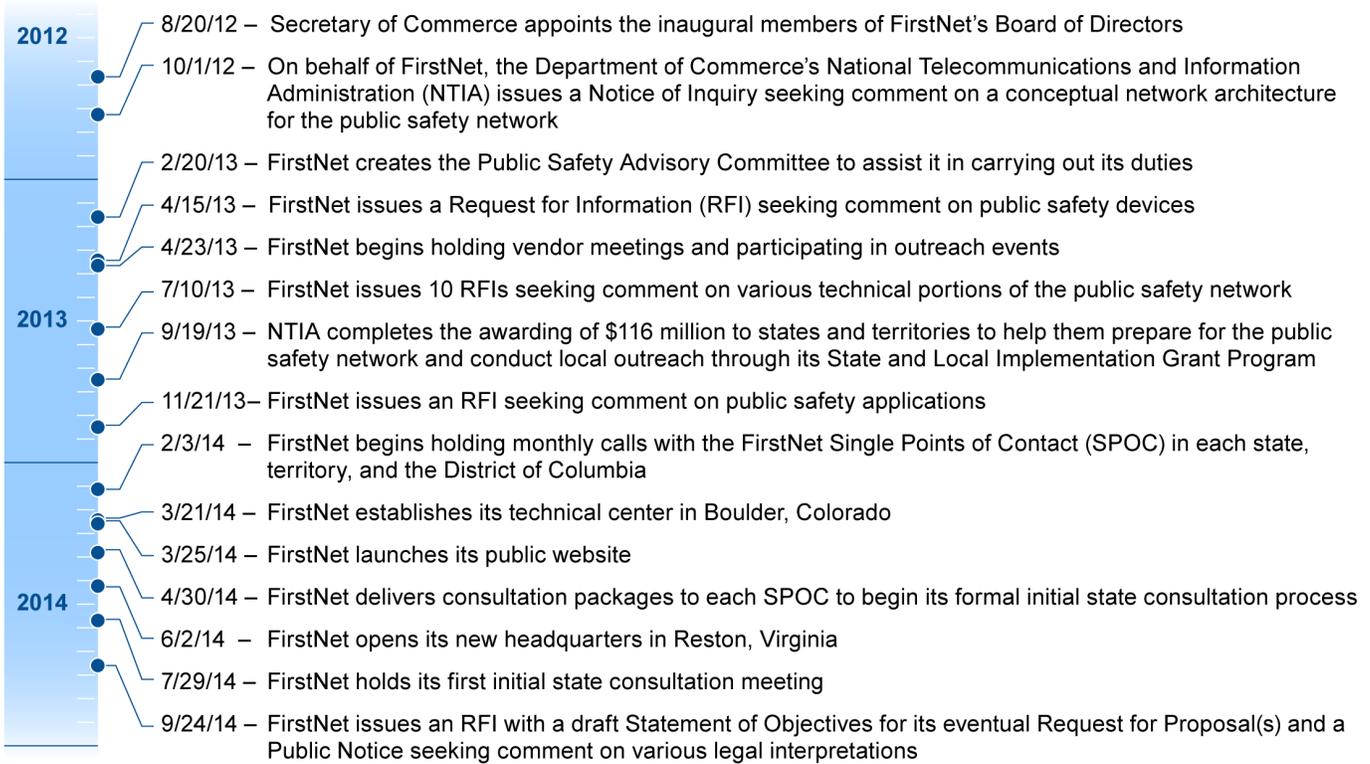
FirstNet Is Making Progress Meeting Responsibilities but Lacks Certain Elements of Effective Internal Controls

FirstNet Is Making Progress Carrying Out Statutory Responsibilities

FirstNet has made progress carrying out its statutory responsibilities in three areas—(1) establishing its organizational structure, (2) planning the public safety network, and (3) consulting with stakeholders—but could face challenges in each of these areas. Figure 4 provides a timeline of select events in FirstNet's progress meeting its statutory responsibilities since the 2012 act's passage.

³⁹LTE has been accepted and adopted by national and international communities as the foundation for future mobile telecommunications.

Figure 4: Select Events in the First Responder Network Authority’s (FirstNet) Efforts since Establishment in February 2012



Source: GAO based on FirstNet and NTIA information. | GAO-15-407

Establishing Its Organizational Structure

As a newly created entity within the federal government, FirstNet has taken a number of steps to establish its organizational structure and hire staff. As required by the 2012 act, the Secretary of Commerce appointed FirstNet’s inaugural board members in August 2012.⁴⁰ FirstNet’s Board established Governance and Personnel, Finance, Technology, and Outreach Committees to review, approve, and oversee FirstNet’s activities. As required by the 2012 act, FirstNet’s Board also established the Public Safety Advisory Committee (PSAC) in February 2013—one year after the 2012 act’s passage—and adopted the PSAC’s charter in June 2014.⁴¹ The PSAC’s membership represents a broad cross section

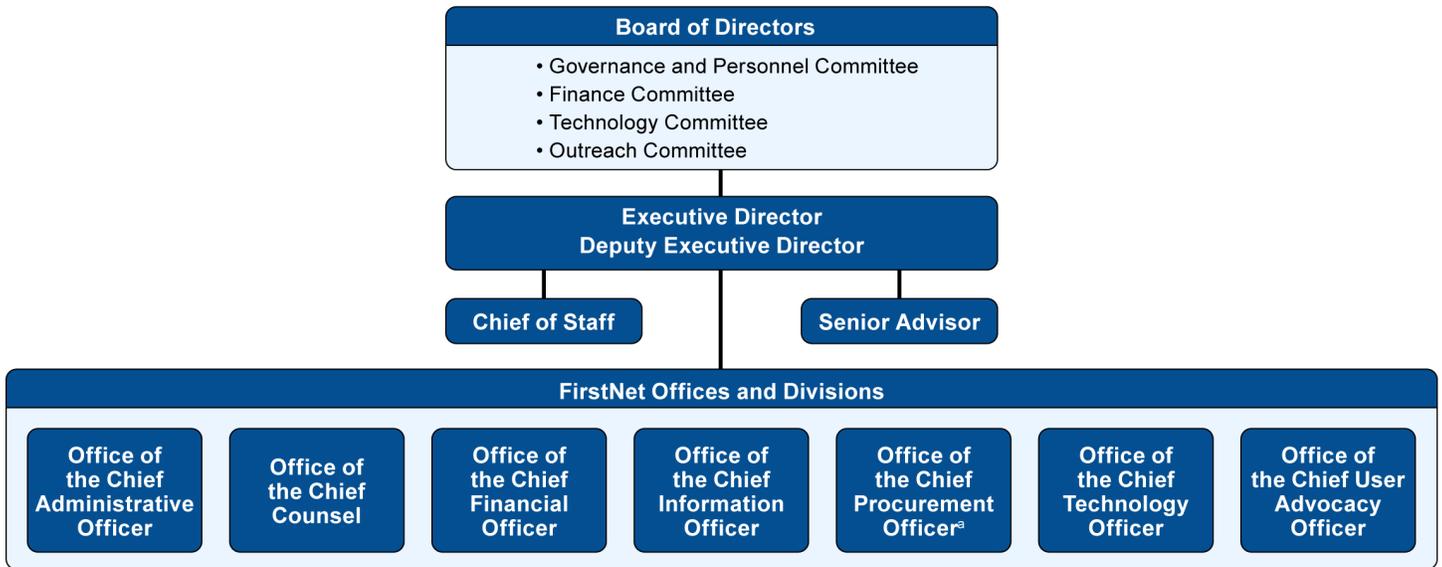
⁴⁰Pub. L. No. 112-96, § 6204(b), 126 Stat. 156, 209.

⁴¹Pub. L. No. 112-96, § 6205(a)(1), 126 Stat. 156, 211.

of public safety disciplines and state, local, and tribal governments. In addition to the board and the PSAC, FirstNet has established organizational units and hired key personnel to lead and perform its work. In April 2013—over a year after the 2012 act’s passage—the FirstNet Board selected an Executive Director to lead its day-to-day operations.⁴² Since then, FirstNet has hired, and continues to hire, other senior management personnel to lead its organizational units (such as a Chief Counsel and Chief Administrative, Financial, and Information Officers), and Directors and organizational chiefs to further lead and perform its work. FirstNet has also hired, and continues to hire, general staff. As of February 2015, FirstNet had over 120 employees, including full-time equivalent federal employees, contractors, and personnel on detail from other agencies. FirstNet confirmed in February 2015 that it may hire up to 42 additional full-time equivalent federal employees in fiscal year 2015 and that it will evaluate and adjust needed staffing levels on an ongoing basis. See figure 5 for an overview of FirstNet’s organizational structure. Additionally, in June 2014, FirstNet opened its “corporate” headquarters in Reston, Virginia, and, in March 2014, a technical center to serve as its technical, engineering, and network design headquarters in Boulder, Colorado.

⁴²FirstNet originally called this position “General Manager” but has since changed the position to “Executive Director.” FirstNet’s first Executive Director resigned in April 2014. As of February 2015, the position was still vacant and FirstNet’s Deputy Executive Director is serving as Acting Executive Director.

Figure 5: First Responder Network Authority (FirstNet) Organizational Structure, as of February 2015



Source: GAO based on FirstNet information. | GAO-15-407

^aThis position is a planned future position. New officer positions may be created at the discretion of the Board of Directors.

Stakeholders we spoke with and surveyed expressed concern that organizational issues have slowed FirstNet’s progress and could continue to do so. In particular, in response to our survey, numerous SPOCs noted either that FirstNet’s placement within NTIA could create “bureaucratic” obstacles or that FirstNet should be more independent from NTIA. One survey respondent and another subject matter expert we interviewed also noted that this placement creates conflicting expectations—that is, stakeholders expect FirstNet to behave like both a commercial wireless carrier and a government entity, and these expectations can sometimes be in conflict. However, FirstNet officials told us that while FirstNet has leveraged its relationship with NTIA in administrative and legal matters, it exercises strong independence in decisions that are directly program-related.

Numerous stakeholders we surveyed and interviewed were also concerned about the pace of FirstNet’s hiring, noting that the federal hiring process is too slow, has not allowed FirstNet to hire staff quickly enough, and has delayed FirstNet’s progress. For example, FirstNet hired its management team for state plans, consultation, and outreach in late 2013 to early 2014, then hired State and Local, Tribal, and Federal

Outreach Leads in June and August 2014, almost 2 years after FirstNet's board members were appointed. Additionally, FirstNet is still in the process of hiring staff for key positions. For example, as of February 2015 FirstNet was re-filling the Chief User Advocacy Officer and Director of Communications positions, was planning for the hiring of a Chief Procurement Officer, and was in the process of hiring staff to lead regional consultation teams that it plans to establish, among other positions.⁴³ As of February 2015, it was also still hiring key technical positions—including Director of Devices, Director of Standards, and Director of Core Network—and re-filling the Chief Technology Officer position. According to FirstNet officials, FirstNet faces challenges hiring as quickly as it would like, in part due to government hiring procedures, but is seeking direct hire authority from the Office of Personnel Management and is exploring other authorities it could use to expedite hiring.⁴⁴

Planning the Public Safety Network

To plan the public safety network and help ensure that its approach is open and transparent and meets the 2012 act's requirements and that interested parties have a formal way to comment on FirstNet's strategy and decisions, FirstNet intends to follow the Federal Acquisition Regulation (FAR) process for its comprehensive network-services procurement.⁴⁵ This process will culminate in one or multiple RFPs for "network solution(s)"—that is, proposals for the building, deployment, operation, and maintenance of the public safety network. To help draft the RFP(s), FirstNet has sought comments through a Notice of Inquiry (NOI), RFIs, and Public Notices. Specifically, in October 2012, NTIA, on behalf of FirstNet, issued an NOI to seek input on the network's potential architecture.⁴⁶ From April to November 2013, FirstNet issued 12 detailed RFIs on specific technical aspects of the network and on devices and

⁴³FirstNet's planned regional teams will mirror the 10 FEMA regions.

⁴⁴For example, FirstNet is exploring whether it can use Temporary Appointments and Intergovernmental Personnel Act appointments, which allow for the temporary assignment of personnel between the federal government and state, local, and tribal governments; colleges and universities; federally funded research and development centers; and other organizations.

⁴⁵The FAR is the comprehensive set of rules governing the process by which executive branch agencies purchase goods and services. Its purpose is to ensure purchasing procedures are standard and consistent, and conducted in a fair and impartial manner.

⁴⁶77 Fed. Reg. 60680 (Oct. 4, 2012).

applications for public safety. NTIA and FirstNet received over 400 comments to the NOI and RFIs, and FirstNet has used these as a source of market research in assessing industry capabilities and developing the technical design of the network. Building off these efforts, in September 2014 FirstNet issued an RFI that sought further comment on a number of issues, such as network coverage, pricing, deployment strategies, security, prioritization among network users, and customer service, among other things. According to this RFI, FirstNet's current approach is to follow a performance-based procurement strategy, whereby FirstNet does not dictate the specific network solution that bidders responding to the RFP(s) must provide, but, rather, outlines objectives and encourages bidders to develop proposals that will meet those objectives.⁴⁷

Additionally, although the 2012 act exempts FirstNet from portions of the Administrative Procedure Act (APA), FirstNet has chosen to follow an APA-like process in order to provide more opportunities for interested parties to comment on its interpretations of the 2012 act's requirements.⁴⁸

Therefore, in September 2014, FirstNet also issued a Public Notice seeking comment on a number of its preliminary interpretations, such as how to define its rural coverage milestones and eligible network users.⁴⁹

FirstNet received 185 responses to the September 2014 RFI and Public Notice from a broad range of respondents, such as states, public safety entities, private companies, and associations. FirstNet issued a second Public Notice in March 2015 and expects to issue a draft RFP in spring 2015.

In addition to its efforts seeking public comment, FirstNet has also received technical input from a variety of stakeholders, such as FCC, the PSAC, the National Public Safety Telecommunications Council (NPSTC), and the PSCR program.⁵⁰ As required by the 2012 act, the FCC's

⁴⁷As such, this RFI also included a draft Statement of Objectives that interested parties were invited to comment on.

⁴⁸Pub. L. No. 112-96, § 6206(d)(2), 126 Stat. 156, 215. The APA provides the basic framework of administrative law governing agency actions, including the procedural steps that must precede the effective promulgation, amendment, or repeal of a rule by a federal agency. Solicitation of comments on proposed legal interpretations and related items is typically performed through a Public Notice and comment process.

⁴⁹79 Fed. Reg. 57058 (Sept. 24, 2014).

⁵⁰NPSTC is a federation of organizations whose mission is to improve public safety communications and interoperability through collaborative leadership.

Technical Advisory Board for First Responder Interoperability issued minimum technical requirements for the public safety network in May 2012.⁵¹ The report provided recommendations on LTE standards; network user equipment, device management, and evolution; and quality of service, among other things. FirstNet has also asked the PSAC to provide recommendations on various topics, including a framework for establishing the priority of public safety entities on the network.⁵² In May 2014, NPSTC provided FirstNet with guidance on what makes communication systems “public-safety grade.”⁵³ Additionally, FirstNet has provided the PSCR—which is based in Boulder, Colorado, where FirstNet’s technical center is also located—with funding to research interoperability standards, test and evaluate potential network features, and model and simulate network data traffic.

Notwithstanding this progress, stakeholders maintained that developing a nationwide public-safety network will pose challenges. Numerous stakeholders we interviewed—such as SPOCs; federal, state, and local public-safety entities; public safety associations; commercial wireless carriers; and individual experts—cited upcoming difficulties. For example, they noted that deciding the level of network coverage and security, working out agreements for use of existing infrastructure, resolving questions about user priority, and navigating state regulations will be difficult to address. In response to our survey, the SPOCs most frequently responded that they were “neither satisfied nor dissatisfied” with FirstNet’s progress on various responsibilities related to developing the network.⁵⁴ SPOCs were most satisfied with FirstNet’s progress carrying out a transparent RFI process and most dissatisfied with FirstNet’s progress developing the technical and operational requirements of the

⁵¹Pub. L. No. 112-96, § 6203(c)(1)(A), 126 Stat.156, 208. FCC Technical Advisory Board for First Responder Interoperability, *Recommended Minimum Technical Requirements to Ensure Nationwide Interoperability for the Nationwide Public Safety Broadband Network* (Washington, D.C.: May 22, 2012).

⁵²“Priority” transmission of calls and data is provided through special enhancements embedded in telecommunications networks to identify transmissions made by authorized users as higher priority than those made by other users. These enhancements automatically place the transmission higher in the queue over those made by other users.

⁵³NPSTC, *Defining Public Safety Grade Systems and Facilities* (Littleton, CO: May 22, 2014).

⁵⁴Specifically, SPOCs responded this 33 percent of the time. For question wording, see appendix II question 5 (b-g).

network, and the practices, procedures, and standards for managing and operating the network. Still, even in these instances, SPOCs' level of satisfaction or dissatisfaction was mostly "moderate."⁵⁵ While many stakeholders we surveyed and interviewed noted that FirstNet's progress has been too slow, some also noted that they were satisfied with FirstNet's progress given the complex nature of FirstNet's tasks and that it is a government entity subject to federal rules and regulations. Some also said that FirstNet's progress has improved recently, especially as FirstNet has hired more staff.

Consulting Stakeholders

FirstNet has initiated a process to consult with the public safety community in each state through the SPOC. FirstNet first worked to establish informal mechanisms for coordinating with the SPOCs. For example, FirstNet began holding regional workshops in May 2013, quarterly SPOC webinars in January 2014, and monthly calls with SPOCs in February 2014. FirstNet began its formal state consultation process by delivering an initial consultation package to each SPOC in April 2014; the package contained a checklist for the SPOCs to complete in preparation for an initial consultation meeting. FirstNet is using these meetings to gather information on each state's unique challenges, needs, and processes to inform its development of the public safety network and, in particular, state RAN plans. Initial state consultation meetings began in July 2014—when FirstNet conducted its first consultation with Maryland—and FirstNet expects these initial meetings to continue through 2015, with additional rounds to follow. As of April 16, 2015, FirstNet had conducted initial consultation meetings with 18 states, Puerto Rico, and the District of Columbia.

In addition to its consultation with SPOCs, FirstNet officials have conducted outreach to other stakeholders. For example, from October 2013 to February 2015, FirstNet officials visited 39 states and territories while participating in 187 events, such as state town halls and public safety, industry, and government (including federal, state, local, and tribal) conferences. To engage with tribal entities, FirstNet staff visited

⁵⁵Specifically, 31 percent of SPOCs responded that they were "moderately satisfied" with FirstNet's progress carrying out a transparent RFI process; 31 percent responded that they were "moderately dissatisfied" with FirstNet's progress developing the technical and operational requirements of the network; and 27 percent responded that they were "moderately dissatisfied" with FirstNet's progress developing practices, procedures, and standards for managing and operating the network. For question wording, see appendix II question 5 (b-g).

eight tribal nations in 2014, and sought the advice of the PSAC on tribal outreach, education, and inclusive consultation strategies.⁵⁶ To engage with federal entities, FirstNet has hired a director of federal outreach, designated DHS's Emergency Communications Preparedness Center (ECPC) as the primary body to FirstNet for federal consultation, and participated in meetings with ECPC and other agencies. To engage with vendors interested in doing business with FirstNet, FirstNet has held vendor meetings and appointed an industry liaison to coordinate vendor outreach. In addition to this targeted outreach, FirstNet also launched a public website in March 2014, where it regularly posts updates, presentations, board-meeting minutes, a list of upcoming speaking engagements, and other information. The 2012 act also created a State and Local Implementation Grant Program (SLIGP), administered by NTIA, to provide states with funds to plan for the public safety network and to consult with FirstNet.⁵⁷ Starting in July 2013, NTIA awarded \$116 million in SLIGP grants.⁵⁸

We believe FirstNet's consultation and outreach activities generally align with core principles for effective stakeholder participation that we have developed and used in previous reports.⁵⁹ For example, we found during the course of our review that FirstNet is using an open and clearly defined decision-making process, actively conducting outreach, involving stakeholders throughout the process, using formal and informal participation methods, and including all stakeholders.

⁵⁶The PSAC established its Tribal Working Group in January 2015.

⁵⁷Pub. L. No. 112-96, § 6302, 126 Stat. 156, 219.

⁵⁸NTIA awarded these funds as part of SLIGP Phase I. SLIGP will have two phases; as of March 2015, Phase II has not commenced. NTIA, in consultation with FirstNet, will determine the timing of Phase II.

⁵⁹For discussion of those core principles, see GAO, *Fisheries Management: Core Principles and a Strategic Approach Would Enhance Stakeholder Participation in Developing Quota-Based Programs*, [GAO-06-289](#) (Washington, D.C.: Feb. 23, 2006). [GAO-06-289](#) identified core principles for effective stakeholder participation by interviewing participation experts and reviewing academic literature on public participation theory and practice, policies from leading federal agencies in stakeholder participation, and prior GAO work. See also, for example, GAO, *Aviation and the Environment: Systematically Addressing Environmental Impacts and Community Concerns Can Help Airports Reduce Project Delays*, [GAO-10-50](#) (Washington, D.C.: Sept. 13, 2010).

The majority of stakeholders we surveyed were generally satisfied with the level of FirstNet's consultation and outreach, but others were dissatisfied and said that they would like more new information. In response to our survey, 54 percent of SPOCs said they were either "moderately" or "very" satisfied with FirstNet's overall level of consultation, coordination, and communication, while 22 percent said they were either "moderately" or "very" dissatisfied.⁶⁰ However, numerous stakeholders we surveyed and interviewed said that they would like more new and detailed information and that they would like FirstNet to focus more on certain aspects of the public safety network during outreach. For example, in response to our survey, SPOCs most frequently indicated that there should be a "large increase" in how much FirstNet focuses on various technical aspects of developing the network in its state outreach.⁶¹ Some SPOCs also said that the lack of new information from FirstNet, such as details about the network's design, hampers their ability to conduct local outreach. However, in response to our survey many SPOCs also acknowledged that the level of new and detailed information exchanged will likely increase once they hold their initial state consultation meeting with FirstNet. Additionally, officials from one federal agency with public safety responsibilities said they would have liked to see more in-depth outreach to federal entities, given that federal agencies will have a large pool of potential network users. In January 2015, FirstNet formally initiated its federal consultation process. As part of this process, FirstNet will conduct meetings with federal entities in 2015 similar to the initial consultation meetings it is conducting with states.

FirstNet Has Not Assessed Risk or Established a Complete Control Environment

Internal controls are the plans, methods, policies, and procedures that an entity uses to fulfill its mission, strategic plan, goals, and objectives. An effective internal control system increases the likelihood that an entity will achieve its objectives. We assessed FirstNet's policies and practices against two components of an effective federal internal control system:

⁶⁰Twenty-two percent were "neither satisfied nor dissatisfied." These percentages do not equal 100 due to rounding and because one SPOC responded "do not know." For question wording, see appendix II question 15.

⁶¹Specifically, 54 percent of the time SPOCs responded "large increase" when asked how much more, if at all, FirstNet should focus on various items in its outreach to their states (such as design and construction of the core and radio access network, coverage areas, security requirements, training needs of users, and user fee pricing). For question wording, see appendix II question 13.

risk assessment and control environment.⁶² We chose to assess these two components because risk assessment provides the basis for developing appropriate risk responses and control activities and the control environment is the foundation for an internal control system. For those two components, we found that—although FirstNet has begun establishing policies and practices that are consistent with federal standards—FirstNet lacked certain elements that contribute to the proper implementation of effective internal control systems. While FirstNet has stated that it is relying on the Department of Commerce’s and NTIA’s internal controls where it has not developed its own, it is also important for FirstNet to implement its own controls, as the Commerce Office of Inspector General (OIG) noted as early as February 2014 in a memo on the management challenges facing FirstNet.

Risk Assessment

In an internal control system, according to federal internal control standards, management should assess risks facing the entity as it seeks to achieve its objectives. Specifically, entities should first clearly define their objectives then identify and analyze risks from both internal and external sources. Analyzing risks generally includes estimating the risk’s significance, assessing the likelihood of its occurrence, and deciding how to respond to it. Risk assessments inform an entity’s policies, planning, and priorities, and help entities develop responses to the risks they face, so that they can achieve their objectives. Control activities respond to these risks.

FirstNet has set objectives and taken some steps to assess risks. Specifically, FirstNet has set three key objectives:

1. Provide FirstNet services that are critical to public safety users and differentiate FirstNet services from commercial broadband services, such as through reliability, resiliency, coverage, functionality, interoperability, quality of service, priority access, pre-emption, and applications.
2. Reduce costs for public safety entities by leveraging the value of excess network capacity with partners.
3. Provide mechanisms for public safety entities (directly or indirectly through the states) to benefit from the economies of scale created by FirstNet in terms of purchasing, partnering, and information/data.

⁶²GAO/AIMD-00-21.3.1; also see [GAO-14-704G](#) (effective Oct. 1, 2015).

FirstNet has further delineated how it will accomplish these objectives in a “roadmap” that identifies additional long-term and short-term objectives and milestones.⁶³ FirstNet has established a Program Management Office to, according to FirstNet officials, help set internal timelines and monitor the completion of tasks needed to achieve these objectives and reach these milestones. Additionally, the Department of Commerce and FirstNet have performed some risk assessment activities. In February 2014, the Commerce OIG issued a memorandum outlining the top management challenges facing FirstNet. To support development of the roadmap, FirstNet created a “risk register” that identifies some risks related to its financial sustainability as well as possible counter-measures.⁶⁴

However, FirstNet has not yet fully assessed risks it may face in accomplishing its objectives. FirstNet officials told us in November 2014 that they have not yet done so because they are in the process of defining risk factors and, again in December 2014, because they are in the process of conducting a legal compliance risk assessment of certain key risk areas. In December 2014, FirstNet officials also said that they intend to perform periodic risk assessments in various areas to manage and mitigate risks on an iterative basis.⁶⁵ However, as of February 2015, FirstNet has not yet completed these risk assessment activities. As a result, we were unable to evaluate the extent to which these activities align with the elements of risk assessment detailed in the federal internal control standards, and therefore, it remains unclear how effective FirstNet’s efforts will be in helping it to identify and respond to obstacles to fulfilling its responsibilities.

As FirstNet completes these assessments, we believe that it is important that it incorporate all of the elements of risk assessment detailed in the federal internal control standards. Lacking complete risk assessments (that is, assessments that incorporate these elements), FirstNet’s control

⁶³Due to the sensitive information about FirstNet’s procurement activities contained in this roadmap, FirstNet has not publicly released the full version. The executive summary is available on FirstNet’s website at <http://www.firstnet.gov/content/march-board-directors-meeting>.

⁶⁴Due to the sensitive information about FirstNet’s procurement and cost-estimating activities contained in this risk register, FirstNet has not publicly released it.

⁶⁵In addition to these formal periodic risk assessments, FirstNet officials also said in February 2015 that informal risk assessment is ongoing based on issues as identified and are handled as appropriate on a real-time basis.

activities may not be designed to respond to the appropriate risks. In previous work, we found that when an agency worked quickly to establish a new program, it resulted in the agency's hastily designing an internal control system that was not based on complete risk assessments and that the agency responded to risks in a reactive, rather than a proactive, manner. Thus, it was unclear whether the controls appropriately responded to risk or were the best use of the agency's resources.⁶⁶ Additionally, we are concerned that the complexity of FirstNet's responsibilities and objectives, makeup of FirstNet's Board of Directors, and challenges that FirstNet will face attracting users to its network and becoming self-funding illustrate the multitude of potential risks FirstNet faces in achieving its objectives. For example, as we point out later in this report, various factors could hinder whether public safety entities adopt the public safety network—and thus how much user fee revenue FirstNet can collect—which could pose risks to FirstNet's ability to become self-funding. Given this, complete risk assessments could help FirstNet appropriately design its full internal control system and achieve its objectives while maximizing use of its available resources.

Control Environment

The control environment is the foundation for an internal control system and provides the basic structure that helps an entity achieve its objectives. To help set this environment, according to federal internal control standards, an entity should

- establish an organizational structure and delegate authority throughout the entity;
- establish appropriate human-capital practices for hiring, developing, evaluating, retaining, supervising, and disciplining personnel;
- demonstrate a commitment to competence, such as by establishing expectations of competence and holding personnel accountable by evaluating their performance;
- demonstrate a commitment to integrity and ethical values, such as by setting a positive "tone at the top," providing and evaluating adherence to ethical and behavioral guidance, and removing temptations for unethical behavior; and

⁶⁶GAO, *Telecommunications: FCC Should Assess the Design of the E-rate Program's Internal Control Structure*, [GAO-10-908](#) (Washington, D.C.: Sept. 29, 2010).

-
- have an oversight body that oversees the entity's internal control system.

FirstNet has taken a number of steps to begin establishing an effective control environment. As described above, FirstNet has established an organizational structure with clearly designated responsibilities and has explored hiring options that would allow it to recruit individuals more quickly. According to FirstNet officials, to develop staff, FirstNet has also leveraged its relationship with the Department of Commerce by using the Department's training facilities as it works to create FirstNet-specific training. Per Department of Commerce policy, FirstNet's Senior Executive Service employees are subject to applicable competency and evaluation plans and other employees are evaluated using a performance appraisal process. Additionally, FirstNet has taken steps to identify and manage potential conflicts of interest. For example, FirstNet has held ethics briefings, distributed ethics documents, held ethics counseling and training, and instituted a Board Member Vendor Interaction Policy to establish processes for board members interacting with vendors with a potential interest in FirstNet's procurement efforts. FirstNet has also established and disseminated a variety of guidance documents, such as policies on employee timekeeping, expenses, travel, information technology rules of behavior, and telework. Finally, FirstNet's Board Committees and FirstNet senior management's Compliance Committee oversee FirstNet's activities and the Commerce OIG and others perform additional oversight.⁶⁷

However, FirstNet has not yet finished establishing its control environment. While FirstNet has a variety of separate guidelines and policies, it does not have a uniform and cohesive standards of conduct policy. Specifically, although FirstNet officials told us that they intend to develop a code/standards of conduct policy, which is an important form of ethical and behavioral guidance for personnel, they have not yet developed this item as of February 2015. According to FirstNet officials, FirstNet has not yet done so because, as a "start-up" entity, building up the organization while making progress meeting statutory responsibilities is a balancing act affected by FirstNet's priorities and resources.

⁶⁷As required by the 2012 act, an independent auditor audited FirstNet's financial statements as of September 2013, and FirstNet has submitted annual reports to Congress in each of the fiscal years since its creation. As of February 2015, NTIA was in the process of hiring a firm that will audit FirstNet's fiscal year 2014 and 2015 financial statements. Pub. L. No. 112-96, § 6209(a)(1), 126 Stat. 156, 216.

Nonetheless, absent standards of conduct, we are concerned that FirstNet may not be able to address deviations in its personnel's conduct and performance, and take corrective actions in a timely manner. Indeed, FirstNet itself established a special committee in May 2013 to review ethical concerns raised by one of its board members. Similarly, in a December 2014 report, the Commerce OIG identified concerns with FirstNet's financial disclosure reporting and contracting practices, among other things.⁶⁸ The report highlighted that the FirstNet Board, out of necessity, includes members with significant ties to the telecommunications industry that make strategic decisions regarding FirstNet's operations and, thus, are at increased risk of encountering conflicts of interests. Although FirstNet has taken corrective actions since the Commerce OIG's investigation, we believe that establishing and evaluating adherence to standards of conduct may help FirstNet ensure that all its personnel are held accountable for their actions. By establishing this item, FirstNet could also foster stakeholder trust in its ability to meet its statutory responsibilities and be a good steward of public funds.

FirstNet Faces Difficult Decisions in Determining How to Pay for a Nationwide Public-Safety Network Estimated to Cost Billions

⁶⁸Commerce OIG, *First Responder Network Authority: FirstNet Must Strengthen Management of Financial Disclosures and Monitoring of Contracts*, Final Report No. OIG-15-013-A (Washington, D.C.: Dec. 5, 2014).

Cost of a Public Safety Network Estimated to be at least \$12 Billion over First 10 Years

Various entities have estimated the cost to construct and operate a nationwide network for public safety from a low of \$12 billion to a high of between \$34 and \$47 billion, over the first 10 years. As shown in table 1, a variety of entities have developed cost estimates for a public-safety broadband network, although they have used different assumptions about the network's scope. Key assumptions influencing these estimates include whether the network is constructed, operated, or financed in partnership with commercial entities, and the number of sites needed to provide the network's coverage. For instance, FCC's 2010 estimate assumes costs would be decreased through a high level of cooperation with commercial carriers. These estimates also vary, for instance, on how much they expect ongoing maintenance and operation to cost. However, some differences among these estimates are difficult to identify since some of the estimates do not explicitly state all their assumptions.

Table 1: Selected Cost Estimates for Constructing a Public-Safety Broadband Network

Source	Year of estimate ^a	Commercial partnership	Coverage (percent of population)	Sites	Cost per site (thousands)	Up-Front deployment costs (billions) ^b	Total costs, first 10 years (billions) ^c
Cyren Call Communications Corporation	2007	Yes	99	37,000	No estimate	\$18 ^d	No estimate
Eisenach	2007	Yes	99	33,700	\$600,000	No estimate	\$20
Federal Communications Commission	2010	Yes	99	44,800	\$140,625 ^e	\$7	\$12-16
		No	99	44,800	\$350,446 ^e	\$16	\$34-47
Hallahan and Peha	2010	Yes	99	19,400	\$500,000	\$10	\$18
		No	99	22,200	\$500,000	\$11	\$20
Congressional Budget Office	2011	Yes	95	45,000	No estimate	No estimate	\$12

Sources: Sachs, Elizabeth, on behalf of Cyren Call Communications, *In the Matter of Public Safety Network in the 700 MHz Broadband*, Ex Parte Presentation to Federal Communications Commission (June 3, 2007); Eisenach, Jeffrey, *Due Diligence: Risk Factors in the Frontline Proposal* (June 28, 2007); Federal Communications Commission (FCC), *A Broadband Network Cost Model: A Basis for Public Funding Essential to Bringing Nationwide Interoperable Communications to America's First Responders*, OBI Technical Paper No. 2 (May 2010); Hallahan, Ryan, and John M. Peha, *Quantifying the Costs of a Nationwide Public Safety Wireless Network*, Telecommunications Policy, 34 (2010); Congressional Budget Office, *Cost Estimate: S. 911 Public Safety Spectrum and Wireless Innovation Act* (July 2011). | GAO-15-407

^aThe figures are presented here as they were reported at the time of publication; that is, we did not adjust these figures for inflation.

^bEstimates vary in scope, with some estimating the total cost and some only considering costs associated with the installation and operation of cell sites and not the costs of the backbone network components, or the costs of network planning and administration.

^cThe total costs include both the up-front deployment costs plus ongoing costs, such as maintenance and operations, over the first 10 years.

^dThis estimate is described as including "cumulative capital expenditures." It is not clear whether this only includes up-front deployments costs or also some (or all) maintenance and operations over the first 10 years.

⁶⁹This is an average cost across all proposed sites. FCC estimated different costs for sites in urban, suburban, and rural areas.

The actual costs per site for early builder projects vary but are generally less than the estimates above. As discussed more below, five early builders are constructing local or regional broadband networks for public safety. Some of these projects have begun construction and provided us with cost data. The new cell towers (and associated LTE equipment) for the regional network in the Los Angeles area average \$196,000 per site. For equipment being attached to existing towers and sites, the average cost is \$102,000. For the regional project in Adams County, Colorado, the cost per site is approximately \$75,000. This cost reflects sites utilizing existing infrastructure that does not require strengthening. For budgetary purposes, the Adams County project has estimated the development of a new site at \$500,000, an estimate that includes acquisition of land, tower construction, and utilities.⁶⁹

As part of its planning and market research, FirstNet has developed a cost estimate for its public safety network that met most of the best practices against which we evaluated it. A reliable cost estimate is critical to the success of any program and is updated continually throughout its life cycle. Such an estimate provides the basis for informed investment decision making, realistic budget formulation and program resourcing, meaningful progress measurement, proactive course correction when warranted, and accountability for results. FirstNet's cost estimate, including the assumptions it is based on, are not public because of the highly sensitive nature of the information it contains. Based on our analysis of this estimate, using our *Cost Estimating and Assessment Guide*, we determined that FirstNet's cost estimate met the comprehensive, and substantially met the well-documented characteristics of a reliable cost estimate.⁷⁰ For example, we found that FirstNet's estimate completely defines the program (in this case, the public safety network), documents all cost-influencing assumptions, and documents calculations performed and estimating methodology used to derive each element's cost. We did not assess FirstNet's cost estimate against all the characteristics established in our *Cost Estimating and Assessment Guide*. Specifically, we did not assess whether FirstNet's estimate was "credible" or "accurate" because the estimate and its

⁶⁹The Harris County, Texas, project has budgeted \$500,000 per site for new sites as well.

⁷⁰[GAO-09-3SP](#).

associated documentation were deemed business sensitive.⁷¹ Therefore, we cannot say if the estimate is in line with the best practices associated with the credible and accurate characteristics of our *Cost Estimating and Assessment Guide*.⁷²

Various Factors Will Influence Cost of FirstNet's Public Safety Network

Cost estimates notwithstanding, various factors will influence the cost of constructing and operating FirstNet's public safety network, including (1) the business model used, especially the extent of commercial partnerships; (2) use of existing infrastructure; (3) efforts to ensure network reliability; and (4) network coverage.

Extent of Commercial Partnerships

FirstNet's business model, especially the extent to which it partners with commercial carriers or other private enterprises, will influence the cost to construct and operate the public safety network. The 2012 act gives FirstNet the authority to engage in a variety of commercial partnerships.⁷³ Such partnerships could involve a private-sector partner that would contribute resources to the network (e.g., infrastructure) and accept some risk in the form of profits or losses. FirstNet would then contribute other resources to the partnership (e.g., spectrum) conditioned on the network satisfying social objectives (i.e., enhancing public safety communications). In a partnership, public safety and commercial users could share the public safety network's infrastructure and spectrum, with public safety given priority to all network capacity during times of emergency. Regardless of the approach, some public safety stakeholders we spoke with maintained the need for FirstNet to work with commercial partners in building and operating the network for it to be financially sustainable. One study calculated that the value of serving both commercial and public safety users is greater than the costs of the additional capacity and signal reliability requirements placed on the

⁷¹We did not analyze the quantitative input and output of the cost model because the data included procurement sensitive information, and we would therefore be unable to report our findings in a public report.

⁷²As FirstNet develops its network and RFP, we may update our assessment of its cost estimate.

⁷³Pub. L. No. 112-96, § 6206(c)(3), 126 Stat. 156, 214.

network to serve both public safety and commercial users, demonstrating a strong business case for a public-private partnership.⁷⁴

Use of Existing Infrastructure

The use of existing infrastructure will influence the cost to construct and operate FirstNet's public safety network. Under agreements to share existing wireless network infrastructure, FirstNet may be able to make use of, for example, cell towers, antennae, cabling, radio-processing equipment, backup power facilities, and the links between towers and the nearest communications hub, to the extent economically desirable to do so. According to FCC estimates, capital costs would be 2.5 times greater without this form of sharing. Given these potential financial savings, a few public safety stakeholders we spoke with maintained that FirstNet should use at least some existing infrastructure for the network. The use of existing infrastructure can have limitations though. For instance, using existing infrastructure can limit the design and coverage of the network, since existing towers and buildings can only facilitate certain network coverage given their physical location. Negotiating access to existing infrastructure can also be a time-consuming process, especially with government-owned or controlled facilities, and where contracts must be executed with multiple owners, ultimately slowing down network deployment. For example, when we spoke with Swedish officials about the public-safety communications network in their county, they said that they sought to use existing infrastructure, to save costs, when constructing their network, but faced problems in their largest cities convincing tower owners to allow the government to rent the towers.⁷⁵ Furthermore, there is a risk when public safety entities rely on infrastructure owned by commercial operators, particularly if they have to rely on a single provider in any given location that can then charge high fees.

Efforts to Ensure Network Reliability

FirstNet's approach to ensure the public safety network is safe, secure, and resilient (that is, the overall reliability of the network) will also influence the cost to construct the network. FirstNet is required by the 2012 act to "ensure the safety, security, and resiliency of the network."⁷⁶

⁷⁴Ryan Hallahan and John M. Peha, *The Business Case of a Network that Serves both Public Safety and Commercial Subscribers*, Telecommunications Policy, 35 (2011).

⁷⁵This interoperable network in Sweden is called the "Rake" network and is primarily used for voice communications.

⁷⁶Pub. L. No. 112-96, § 6206(b)(2)(A), 126 Stat. 156, 212.

FirstNet is still determining how it will satisfy this requirement.⁷⁷ As previously described, NPSTC published a report to provide guidance for FirstNet as it constructs and implements the public safety network.⁷⁸ NPSTC concluded that a “public-safety grade” communications system should be designed to resist failures due to manmade or natural events as much as practical, and that the public safety network must be constructed to meet as many of these requirements as possible. If FirstNet implements all of NPSTC’s best practices, though, it will significantly add to the cost of building the network. For example, transmission sites, such as cell towers, should have backup power sources when used for public safety communications, according to NPSTC. Existing commercial sites, however, generally do not have such backup, primarily to reduce costs in extremely competitive markets. FCC, for instance, has reported that it could cost \$35,000 per site to harden existing commercial LTE sites.⁷⁹

Network Coverage

The public safety network’s coverage will also influence the cost to construct and operate the network. The 2012 act requires FirstNet to establish a “nationwide” network, but does not define the level of coverage that constitutes “nationwide.”⁸⁰ Generally speaking, increasing the area covered by the network, as well as the extent to which coverage penetrates buildings, increases the amount of infrastructure needed, and thus the cost of the network. It may be relatively affordable, for example, to cover large segments of the population concentrated in relatively small areas. For instance, one stakeholder we spoke with suggested that FirstNet could provide service to as much as 25 percent of all potential customers by covering just the 8 largest metropolitan areas. Providing coverage outside dense metropolitan areas can be particularly expensive. One study has shown that a nationwide public-safety broadband network would generally be profitable in urban areas and unprofitable in rural areas.⁸¹ This study demonstrated that a network built with a commercial

⁷⁷FirstNet sought input into this matter in its September 2014 RFI.

⁷⁸NPSTC, *Defining Public Safety Grade Systems and Facilities*, 2014.

⁷⁹FCC, *A Broadband Network Cost Model: A Basis for Public Funding Essential to Bringing Nationwide Interoperable Communications to America’s First Responders*, OBI Technical Paper No. 2 (May 2010).

⁸⁰FirstNet sought input into this matter in its September 2014 RFI.

⁸¹Hallahan and Peha, 2011.

partnership could cover 94 percent of the U.S. population and break even because urban areas could subsidize coverage in rural areas.

FirstNet Faces Difficult Decisions about User Fees and Commercial Partnerships in Determining How to Become Self-Funding

Although FirstNet has various revenue options it is authorized to use to become self-funding, it is unclear how FirstNet will use those authorities. As the cost estimates discussed above illustrate, FirstNet's network will likely cost tens of billions of dollars to construct and initially operate. As also noted above, FirstNet is required to be self-funding. To meet the costs of building and maintaining the network, FirstNet may generate revenue through user fees and commercial partnerships, the latter of which can involve the secondary use of the network for non-public safety services. However, FirstNet faces difficult decisions determining how to best utilize these revenue sources. Additionally, regardless of the effectiveness of FirstNet's use of these revenue sources, the public safety network will likely have net negative income in the first few years of operation.⁸²

User Fees

FirstNet can generate revenue through user fees, but the extent of this revenue will be determined by demand for the public safety network and other factors. According to stakeholders we spoke with and surveyed, demand for FirstNet's public safety network is significant. Many public safety entities we spoke with said that there is demand for a public-safety broadband network. Further, numerous SPOCs responding to our survey indicated that a public-safety broadband network will be very useful for public safety entities.⁸³ SPOCs we surveyed also noted that some public safety entities already use commercial wireless data services. Indeed, 80 percent of the SPOCs responded that law enforcement first responders who use commercial wireless data services use those services "always or often."⁸⁴ According to one SPOC, "the use of data for public safety is increasing rapidly and the existing commercial networks do not provide the necessary coverage or capacity." Another SPOC maintained that "the

⁸²According to FirstNet officials, these negative income flows could be borne by one or more commercial partners, depending on the public safety network construction and operation arrangements.

⁸³More than 75 percent of survey respondents noted that the network would be "very useful" to emergency management, emergency medical services, fire services, and law enforcement. For question wording, see appendix II question 1.

⁸⁴For question wording, see appendix II question 3.

ability to have reliable access to broadband data throughout the state would improve interoperability,” as well as a first responder’s ability to deliver critical services in a timely manner.

Despite the demand for the public safety network, a variety of challenges could hinder adoption and thus user fee revenue:

- **Fee size:** If FirstNet’s user fee is too high it could hinder public safety adoption, and if it is too low it could bring in too little revenue. Numerous stakeholders we spoke with noted that FirstNet’s cost would play a role in whether they adopt the public safety network and that user fees must be competitive with existing commercial services.⁸⁵ According to a few public safety entities we spoke with and the SPOCs we surveyed, public safety entities currently pay \$20-\$100 per user or device, per month, for commercial services.⁸⁶ While low user fees would be attractive to public safety entities and therefore may increase adoption, they would also bring in a relatively smaller amount of revenue per user.⁸⁷ As a FirstNet Senior Program Manager reported in December 2014, there is a trade-off with low user fees between adoption and the network’s financial sustainability. Some stakeholders also noted that the cost of equipment and devices needed to access the public safety network could limit adoption, especially since public safety entities are continuing to invest in their LMR devices and equipment.
- **User base:** While a large user base can potentially bring in significant user fee revenue, it could be challenging to manage. The 2012 act established that FirstNet’s primary customers will be entities that provide “public safety services.”⁸⁸ How FirstNet interprets the definitions of “public safety services” established in the 2012 act will expand or contract the potential sources of revenue.⁸⁹ As one public

⁸⁵Additionally, about 84 percent of SPOCs we surveyed noted that FirstNet should largely or moderately increase its focus on user fee pricing in its outreach to their states. For question wording, see appendix II question 13.

⁸⁶For question wording, see appendix II question 4.

⁸⁷Additionally, the fees that FirstNet charges are subject to review by NTIA to ensure that they are sufficient to cover network costs.

⁸⁸Pub. L. No. 112-96, § 6001(26), 126 Stat. 156, 204.

⁸⁹FirstNet proposed some interpretations of these definitions in its September 2014 Public Notice. 79 Fed. Reg. 57058 (Sept. 24, 2014).

safety official we spoke with noted, the network has more value to public safety entities when there are more users on the network, because entities will all be able to communicate with each other. Another public safety official we spoke with suggested that certain users could be required to adopt the public safety network. Government users in Sweden, for instance, are required to pay a user fee, regardless of their use of the network, to generate revenue that is necessary to support the national network's maintenance and operations. However, a large user base can require priority and preemption rules, if certain users are to have privileged access to the network. According to some public safety officials we spoke with, such rules can be difficult to establish among public safety entities.

- **Coverage:** Widespread network coverage can attract more users, and thus user fee revenue, but is expensive to construct and maintain. As the FirstNet Senior Program Manager reported in December 2014, there is a trade-off with increased coverage between adoption and the network's financial sustainability. Further, FirstNet does not have total control over the network's coverage, since states may opt out and build their own RANs. Nevertheless, some of the public safety entities we spoke with said that the network's coverage would play a role in whether they adopt the public safety network, noting in particular that the coverage should be at least as good as existing commercial services. One public safety entity we spoke with said that existing commercial coverage is inadequate, while two other entities said that the coverage is adequate normally, but the service becomes unusable during large events because of the number of users on the network. However, as noted above, providing extensive coverage, especially in rural areas, can be very costly. Indeed, a few SPOCs noted in survey responses that providing rural coverage in their states would be challenging, with one commenting that "it is inconceivable that FirstNet will be able to deploy a terrestrial network in the vast areas that are unpopulated or sparsely populated."
- **Reliability:** Although FirstNet is required to construct a resilient network, practices to ensure this can be costly. Some public safety officials we spoke with said that the network's reliability would play a role in whether they adopt the public safety network. A few officials specifically said that if the network did not reliably work when first utilized by public safety, adoption would suffer, since public safety has a low tolerance for unreliable technology. However, as noted above, ensuring reliability requires significant capital expenses. As the FirstNet Senior Program Manager reported in December 2014, there

is also a trade-off with hardening the network between the extent of adoption and the network's financial sustainability.

Compounding these challenges are other factors that might hinder adoption. For instance, officials from some public safety entities told us that public safety tends to take a "wait and see" approach to adopting new technology. Public safety, according to an official we spoke with, can be reluctant to buy and use new technology and services because if those things do not work it can put lives in jeopardy. Furthermore, according to officials from two public safety entities we spoke with, some entities may not see a need for a nationwide public-safety network if they operate in areas with few large-scale emergencies.

Commercial Partnerships

FirstNet can also generate revenue through commercial partnerships, but the extent of commercial interest in these partnerships, and therefore the value of this authority for FirstNet, is currently unknown.⁹⁰ Under the 2012 act, FirstNet can receive payment for the use of the public safety network's capacity by non-public safety users as well as use of the network's infrastructure.⁹¹ The value of secondary access to the public safety network's capacity depends in part on the availability of the spectrum, which itself will be determined in part by the capacity available given the network's design. According to one major carrier we spoke with, no business is likely to enter into a partnership with FirstNet because its public-safety user base has not been defined, and thus the network's capacity available to secondary (commercial) users is unknown. According to this carrier, the risk would be too high for a commercial entity to enter into an agreement without knowing exactly how they will be able to use FirstNet's network. If public safety preempts all commercial traffic, then the commercial entity will struggle to generate income from this venture and may lose favor with its customers. However, another major carrier we spoke with maintained that FirstNet will have to partner with at least one commercial carrier to be financially sustainable, and given the significant investments in LTE infrastructure made by commercial carriers, FirstNet would do well to utilize some of this

⁹⁰One study showed that theoretically, the revenue to be derived from secondary use of the spectrum is much greater than fees from users of a public safety network. See Hallahan and Peha, 2011.

⁹¹Pub. L. No. 112-96, § 6208(a)(1), 126 Stat. 156, 215. FirstNet tentatively concluded in its September 2014 Public Notice that multiple commercial partners could coexist and utilize FirstNet spectrum in a given area. 79 Fed. Reg. 57058 (Sept. 24, 2014).

infrastructure through commercial partnerships. Although the historic Advanced Wireless Services spectrum auction that FCC concluded in late January 2015 could indicate demand for spectrum capacity among commercial carriers,⁹² the extent of carrier interest in partnering with FirstNet is not yet fully known. In particular, there may be some benefits to existing commercial carriers in partnering with FirstNet, but these companies may prefer to expand their businesses by directly competing with FirstNet and offering their own public safety products. Notably, when FCC presented the D Block spectrum for auction in 2008 with public safety encumbrances, it received no qualifying bids and thus the D Block was not licensed. The lack of commercial interest in the D Block was due in part to uncertainty about how the public-private partnership would work, which raises further questions about FirstNet's ability to partner with commercial carriers.⁹³

Although Early Builder Projects Are Providing Lessons, FirstNet Has Not Developed a Plan to Evaluate Them

Early Builder Projects Have Learned Lessons As They Develop Public Safety Networks

Officials from the five early builder projects, as well as the three canceled projects, told us that they have learned a number of lessons while developing their public-safety broadband networks that may be useful as FirstNet develops its public safety network. Specifically, the early builders identified lessons about (1) governance, (2) financing the network, (3) conducting outreach, and (4) planning for network deployment.

Governance

⁹²This auction, for 65 MHz of spectrum, included 341 rounds of bidding. The auction resulted in over \$40 billion in bids from over 30 bidders.

⁹³According to FirstNet officials, the public safety network FirstNet is developing is more clearly defined than the network proposed in 2008 with the D Block. Further, FirstNet has been provided significant initial capital to establish this network, including the \$7 billion from spectrum auctions and twice as much spectrum as the D Block.

Officials from the early builder projects cited governance lessons associated with developing a new network for public safety. As we reported in February 2012, governance is a key element for interoperable networks.⁹⁴ By providing a framework for collaboration and decision making with the goal of achieving a common objective, governance structures can promote interoperability and help ensure public safety networks are secure and reliable. The 2012 act established FirstNet as the governing entity for a nationwide public-safety network, and as such, early builder project officials described governance challenges that FirstNet may face. For example, officials from one project told us some public safety entities may not have a clear understanding of FirstNet’s goals and plans. The officials told us localities are willing to participate in the public safety network, but FirstNet will face difficulty in establishing timely technical decisions and effective policies that keep pace with local enthusiasm to participate. The officials said FirstNet can address this challenge by setting expectations about what the network will provide, including the specific intent, purpose, and planned capabilities. A SPOC working with one of the projects described challenges that FirstNet will face in determining how to diplomatically work with tribal nations. For example, whereas each state will have a designated SPOC, tribes are sovereign nations within a state but will not have a designated SPOC, which could pose governance challenges. The SPOC told us it is unclear whether FirstNet has planned for how the “opt in” or “opt out” process will work for tribal nations, when the 2012 act requires state governors to make the state decision. The SPOC also told us that a tribe representative in his state met with him to share concerns about how public safety entities only have broadband coverage near the edge of their reservation’s limits. The SPOC noted that the tribe has become a partner of the early builder project and that this partnership underscores how their state has developed close relationships with tribes through state-level liaison efforts, federal grant programs, and its early builder project. According to the SPOC, FirstNet should work closely with states and leverage these relationships to work with tribal nations.

Financing the Network

Officials from the early builder projects also learned lessons related to financing a new public safety network that could be applicable to FirstNet. Although the 2012 act provides FirstNet with funding sources and options, as described above, utilizing such sources could be challenging

⁹⁴[GAO-12-343](#).

according to early builder project stakeholders. Officials from a project told us they will face sustainability challenges due to the limited number of users that will be able to utilize their network. According to the officials, their project will not be able to charge their users enough to make the operations sustainable without pricing the users out of the services. The officials told us a possible way to address this challenge would be to expand the service to public safety entities in neighboring metropolitan areas and airport services areas that have established broadband infrastructure. Similarly, officials from one of the projects said their network will be in an “uneasy” financial position initially because the number of users subscribing to the network will likely be low. Further, the officials noted that a small user base could make it difficult to maintain the network because user fees are expected to pay for a significant portion of network operations and maintenance. According to a SPOC working with one of the projects, determining user fees to cover ongoing maintenance and administrative costs has been a financial challenge. To decide user fees, project officials are considering factors including the potential for public-private partnerships and how to define the scope of the user base. As we found in February 2012, obtaining adequate funds to build, operate, and maintain a public safety network could be challenging.⁹⁵

Conducting Outreach

Early builder project officials cited lessons they learned for conducting outreach while developing their public safety networks. According to project officials, effectively conducting outreach as required by the 2012 act could be challenging for FirstNet. According to officials working with one of the projects, network coverage will be a challenging outreach topic and FirstNet must be prepared to explain the coverage strategy for each state. The officials said most public safety officials in their state are aware that network coverage is typically provided through a myriad of approaches such as permanent infrastructure, mobile “deployables,” and satellites.⁹⁶ However, the officials noted, until FirstNet sets clear and valid expectations on those approaches, state stakeholders for the public safety network will face difficulty holding constructive conversations about which coverage solutions are the most feasible. Another SPOC described

⁹⁵[GAO-12-343](#).

⁹⁶Mobile “deployables” can also be referred to as “deployable networks.” A deployable network typically includes “deployable assets” such as “cells on wheels” that provide localized wireless network service to areas where coverage is minimal or compromised. These assets typically provide fully functional service via vehicles such as trailers, vans, and trucks.

challenges in their state on the topic of network coverage. According to the SPOC, their state's public safety community and tribal nations became frustrated with FirstNet's inconsistent messaging about the network's coverage and capability. The inconsistent messaging created challenges for the SPOC in convincing frustrated potential users to remain engaged in the state's FirstNet planning efforts. We also spoke with a SPOC closely involved in one of the early builder projects who described strategies that his state's project used in conducting outreach. For example, the project developed contact lists for each site deployment location and for primary and secondary stakeholders, and distributed materials in public safety locations including police stations. According to the SPOC, FirstNet will need to sustain a level of excitement in its outreach for the public safety network.

Planning for Network Deployment

Officials from the early builder projects as well as the canceled public-safety projects also described lessons they learned about planning their network's deployment that could benefit FirstNet. Officials from one project told us they learned specific lessons about site selection, permits and site access agreements, and equipment choices. The officials also told us they selected the RFP response that was the most economical in its use of existing infrastructure. Officials from another project told us how they chose to deploy in densely populated areas with high-crime rates, where public safety coordination is typically challenging and in most need of improvement. The officials also said they provided guidance to local police departments that helped them avoid procuring communications devices that would not be compatible with the project or FirstNet's public safety network. An official from one of the canceled projects said his team faced several challenges including local zoning conditions that affected project schedule and cost, a newly passed city code that required towers to withstand higher wind loads and that increased costs, and commercial competitors lowering their subscription rates to compete with the planned public-safety network. Officials from an ongoing project told us their project initially identified "buildout" sites but learned that environmental assessments would need to be completed for each site. Doing these assessments would threaten the project's ability to follow its project schedule. To address the challenge, the project narrowed its buildout site pool to exclude marshlands and other areas with obstructive tree lines and to include publicly owned sites such as police and fire stations. With the publicly owned sites identified, project officials worked with their state's legislature to pass an exemption to state environmental reviews. According to a SPOC we spoke with, the project's efforts on this issue will reduce the project's overall build time. The official from the project told us that an important lesson learned is to thoroughly understand all of the

process steps and risks prior to plan execution. According to the project official, it will be important for FirstNet to be able to navigate similar issues and challenges.

FirstNet Has Processes in Place to Identify Early Builder Project Lessons but Has Not Developed a Written Evaluation Plan

While FirstNet has taken steps to collect and evaluate lessons learned from the early builder projects, it could do more to ensure that the lessons are properly evaluated. We have previously found that a well-developed evaluation plan for projects like the early builder projects can help ensure that agencies obtain the information necessary to make effective program and policy decisions.⁹⁷ A well-developed evaluation plan should include, at a minimum, several key features including the following:

- well-defined, clear, and measurable objectives;
- criteria or standards for determining project performance;
- a clear plan that details the type and source of data necessary to evaluate the project, methods for data collection, and timing and frequency of data collection; and
- a detailed data-analysis plan to track performance and evaluate the projects' final results.

FirstNet has taken steps to identify objectives and standards for early builder project performance, as well as the data and information it will collect from the early builder projects. As noted above, FirstNet entered into SMLAs with the early builder projects that permit their use of FirstNet's spectrum. Under the SMLAs, the early builders agreed to conduct specific activities on their networks, also known as key-learning conditions, and develop a Key Learning Conditions Plan with FirstNet in exchange for spectrum use.⁹⁸ Under the plans, early builder projects will submit various deliverables to FirstNet, such as project plans and schedules, as well as documentation describing the project's specific

⁹⁷ [GAO-09-45](#). [GAO-09-45](#) identified key features of an evaluation plan through the consultation of social science and evaluation literature, along with published GAO guidance.

⁹⁸ The plans identify the key-learning condition activities, including roles and responsibilities and the information, lessons, reports, and other deliverables expected under the SMLA.

procedures and experiences.⁹⁹ According to a SPOC involved in one of the projects, FirstNet's key-learning conditions cover a comprehensive set of issues and should provide valuable data for FirstNet. Under the SMLAs, the projects also agree to provide FirstNet with quarterly reporting on their project's use of FirstNet's spectrum, progress achieving project milestones, and in some cases, the experiences of their network users. In October 2014, FirstNet provided the projects with quarterly report templates, instructions, and timing for completing the reports. Additionally, FirstNet intends to gain knowledge from the projects through contractors who have been assigned to each project to provide information and collect formal and informal lessons.¹⁰⁰ FirstNet told us the contractors are using an informal lessons log to track observed lessons and whether they have been incorporated into the technical documents used to guide FirstNet's acquisition of a comprehensive network solution. FirstNet officials also told us that they hold weekly meetings to review early builder project status, progress on SMLA key-learning conditions, and informal key lessons. Finally, in April 2014 FirstNet authorized the PSAC to establish an Early Builder Working Group to provide advice on the strategies and lessons learned related to the early builder network development, outreach, and consultation. As of January 2015, the PSAC planned to submit the Early Builder Working Group's first series of recommendations to FirstNet.

Although FirstNet has taken these steps, we are concerned that it lacks a detailed data-analysis plan to track the performance and results of the early builder projects. For the early builder projects, their performance and results are captured in the observations and lessons learned reported to FirstNet and identified by consultants. Tracking the early builder projects' observations and lessons against FirstNet technical documentation is necessary to ensure that the lessons have been addressed and also facilitates transparency and accountability for

⁹⁹As one plan notes, the document "provides the requisite details on the required activities and each party's obligations, so that the learning conditions are effectively collected, documented, and applied to the nationwide public-safety network roll-out."

¹⁰⁰FirstNet told us the consultants will be in position to obtain informal and formal "learnings." In this report, we will refer to these "learnings" as informal and formal lessons. An example of an informal lesson could come from the challenges experienced during a network build on various issues including the placement of antennas or the permit process, whereas a formal lesson could come from a key-learning condition specified in the SMLA.

FirstNet's decision-making. Even though FirstNet staff and contractors remain in close contact with the early builder projects, without a data-analysis plan to track those projects it is unclear how FirstNet intends to evaluate the projects' observations and lessons and determine whether or how the lessons are addressed. As a result, we believe that FirstNet could miss opportunities to leverage key lessons related to governance, finance, outreach, and network deployment. Given that the early builder projects are doing, in part, on a regional and local level what FirstNet must eventually do on a national level, a complete evaluation plan that includes a detailed data-analysis plan could play a key role in FirstNet's strategic planning and program management, providing feedback on both program design and execution. Furthermore, such a plan could provide FirstNet officials the opportunity to make informed midcourse changes as they plan for the public safety network, and help ensure that lessons from these projects are evaluated in ways that generate reliable information to inform future program-development decisions.

Conclusions

The lack of interoperability in public safety communications has been a long-standing concern given the essential role these communications play in protecting lives, health, and property. The 2012 act provided FirstNet with the basic resources necessary—such as spectrum and initial capital—to establish an interoperable broadband network for all public safety entities. However, there is no guarantee that FirstNet will be able to successfully develop and operate this nationwide network. FirstNet is tasked with a complex and challenging mission to establish the network, which researchers have estimated could cost as much as \$47 billion to construct and operate over its first 10 years. Furthermore, FirstNet faces a multitude of risks, significant challenges, and difficult decisions in meeting its statutory responsibilities, including determining how to become a self-funding entity. If FirstNet fails to generate enough revenue to operate the network over the long-term, for example, it could jeopardize the existence of this new public safety network. At this time, the extent to which FirstNet can generate revenue through partnerships with commercial carriers remains unknown, especially given that some commercial carriers could choose to compete with FirstNet. However, FirstNet is taking certain actions to help ensure that its public safety network is successful. For instance, to date it has effectively consulted with stakeholders and maintained a rigorous cost estimate.

Although FirstNet has started to establish an internal control system to help it meet its statutory responsibilities, we found FirstNet could strengthen its internal controls. In particular, while FirstNet has begun

taking some steps to assess risks, it has not fully assessed the risks it faces. Complete risk assessments would help FirstNet respond to risks in a proactive manner and make the best use of its resources by appropriately responding to the most pressing risks. FirstNet could also strengthen its internal controls by fully establishing its control environment, which is the foundation for an effective internal control system. Currently, FirstNet has not established a cohesive standards of conduct policy, which means FirstNet may not be able to address deviations in conduct and performance and take corrective actions in a timely manner. Establishing and evaluating adherence to standards of conduct would help FirstNet ensure that all its personnel are held accountable for their actions and foster stakeholder trust in FirstNet's ability to meet its statutory responsibilities.

Early builder projects have learned important lessons related to governance, finance, outreach, and network deployment that could be useful to FirstNet as it develops its plans to establish a nationwide network. However, FirstNet lacks a detailed data-analysis plan to track the projects' observations and lessons learned. Without such a plan, it is unclear how FirstNet intends to evaluate the early builder projects and ensure that the lessons have been addressed and incorporated, if applicable, into FirstNet's planning. As a result, FirstNet could miss opportunities to leverage the key lessons the projects learned. A complete evaluation plan for the early builder projects that includes a detailed data-analysis plan would increase transparency and help FirstNet's strategic planning and program management, which are important given the complexity of FirstNet's mission. Furthermore, such a plan would provide FirstNet officials the opportunity to make informed midcourse changes as they plan the nationwide network and help ensure that lessons from these projects are evaluated in ways that generate reliable information to inform future network-deployment decisions.

Recommendations for Executive Action

To improve the accountability and transparency of FirstNet's operations, and ensure that FirstNet is gaining as much knowledge from the early builder projects as possible, we recommend that FirstNet take the following two actions:

- strengthen FirstNet's internal control system by fully assessing risks, developing standards of conduct, and evaluating performance against these standards, and

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- develop an evaluation plan that includes a detailed data-analysis plan for the early builder projects' performance and results, including how the observations and lessons learned reported to FirstNet and identified by consultants will be evaluated.

Agency Comments

We provided a draft of this report to the Departments of Commerce and Homeland Security, FCC, and FirstNet for their review and comment. The Department of Commerce and FirstNet provided written comments, reprinted in app. III and IV, respectively. DHS, FCC, FirstNet, and NTIA (within the Department of Commerce), provided technical comments that we incorporated as appropriate.

In its written comments, the Department of Commerce stressed that it takes its oversight responsibilities with respect to FirstNet seriously, is committed to the success of the public-safety broadband network, and supports the response provided to us from FirstNet. In its written comments, FirstNet stated that it agreed with all of our recommendations and noted activities that it will undertake to implement them. Regarding strengthening internal controls, FirstNet stated that it is cognizant that, as a newly formed government entity, it must continue its efforts to establish comprehensive internal control policies and procedures. FirstNet reiterated that it has initiated a legal compliance risk assessment focusing on key legal risk areas and stated that it will also undertake a full risk assessment. FirstNet also stated that it plans to establish supplemental standards of conduct, which will operate in conjunction with applicable regulations and existing FirstNet and Department of Commerce policies. Regarding an evaluation plan for lessons learned from the early builder projects, FirstNet stated that it will develop an appropriate evaluation plan consistent with the principles we specified. FirstNet noted that it has already enacted a standard operating procedure that ensures information and lessons from the projects are appropriately distributed within FirstNet, and it will use this process to disseminate the findings gathered under the evaluation plan.

We will send copies of this report to FirstNet as well as the Secretary of Commerce, Secretary of Homeland Security, Chairman of the Federal Communications Commission, and appropriate congressional committees. In addition, the report will be available at no charge on GAO's website at <http://www.gao.gov>.

If you or members of your staff have any questions about this report, please contact me at (202) 512-2834 or goldsteinm@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Major contributors to this report are listed in appendix V.

Sincerely yours,

A handwritten signature in black ink, appearing to read 'Mark L. Goldstein', with a long horizontal flourish extending to the right.

Mark L. Goldstein
Director, Physical Infrastructure

Appendix I: Objectives, Scope, and Methodology

This report examines the First Responder Network Authority (FirstNet) and its progress towards establishing a nationwide public-safety broadband network (hereafter, the public safety network). Specifically, we reviewed (1) the extent to which FirstNet is carrying out its responsibilities and establishing internal controls for developing the public safety network, (2) how much the public safety network is estimated to cost to construct and operate and how FirstNet plans to become a self-funding entity, and (3) what lessons can be learned from local and regional public-safety network projects.

To determine the extent to which FirstNet is carrying out its responsibilities and establishing internal controls, we reviewed FirstNet documentation and conducted interviews. We reviewed all of FirstNet's Requests for Information, Notices, and annual reports to Congress. We also reviewed relevant board-meeting materials and resolutions, presentations to stakeholders, press releases and blog posts, and other documentation. We interviewed and received written responses from FirstNet, the National Telecommunications and Information Administration, and Department of Commerce officials to obtain further information on their efforts. We compared FirstNet's efforts and progress carrying out its responsibilities against requirements established in the Middle Class Tax Relief and Job Creation Act of 2012 (2012 act).¹ However, we did not review FirstNet's progress against every responsibility established for it in the 2012 act, because it is not possible for FirstNet to have made progress on some responsibilities. For instance, FirstNet cannot develop terms of service for the use of the public safety network without first developing the network, the design of which is itself dependent on consultation with a wide variety of stakeholders. We did compare FirstNet's efforts establishing internal controls against criteria established in the federal *Standards for Internal Control*.² For the scope of this review, we chose to evaluate FirstNet's policies and practices against the first two components of internal control: control environment and risk assessment. We chose these two components because the control environment is the foundation for an

¹Pub. L. No 112-96, 126 Stat. 156.

²GAO, *Standards for Internal Control in the Federal Government*, [GAO/AIMD-00-21.3.1](#) (Washington, D.C.: Nov. 1999). The most recent version of these standards was issued in September 2014. GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: Sept. 10, 2014).

internal control system and risk assessment provides the basis for developing appropriate risk responses and control activities. We also assessed FirstNet's outreach efforts against core principles for effective stakeholder participation identified by our previous reports.³ Further, as described below, we interviewed a variety of public safety officials about their perspectives on FirstNet's progress to date.

To learn how much the public safety network is estimated to cost and how FirstNet plans to become self-funding, we reviewed cost estimates from FirstNet and others, and conducted interviews. Specifically, we reviewed cost estimates for nationwide public-safety broadband networks from a variety of entities, including the Congressional Budget Office, the Federal Communications Commission (FCC), and academics. We identified these cost estimates through interviews with agency officials and subject matter experts. We did not perform a full data reliability assessment of the numbers in these estimates because the purpose of the estimates within the scope of our review was to provide illustrative examples. We also reviewed FirstNet's cost estimate. We used our *Cost Estimating and Assessment Guide*, which is based on research of best practices, to estimate program schedules and costs.⁴ Due to the procurement sensitivity of the estimate, we assessed FirstNet's cost estimate against two of the characteristics of reliable cost estimates: comprehensive and well-documented.⁵ Our *Cost Guide* considers an estimate to be comprehensive if its level of detail ensures that all pertinent costs are included and that no costs are double-counted, and that costs are well documented in order that the estimate can be easily repeated or updated and can be traced to original sources through auditing. We also interviewed members of FirstNet's cost-estimating team to obtain a

³For discussion of those core principles, see GAO, *Fisheries Management: Core Principles and a Strategic Approach Would Enhance Stakeholder Participation in Developing Quota-Based Programs*, [GAO-06-289](#) (Washington, D.C.: Feb. 23, 2006). [GAO-06-289](#) identified core principles for effective stakeholder participation by interviewing participation experts and reviewing academic literature on public participation theory and practice, policies from leading federal agencies in stakeholder participation, and prior GAO work.

⁴GAO, *GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs*, [GAO-09-3SP](#) (Washington, D.C.: Mar. 2, 2009).

⁵We did not analyze the quantitative input and output of the cost model because the data included procurement sensitive information and we would therefore be unable to report our findings in a public report.

detailed understanding of the cost model, such as how it was prepared, the assumptions underlying it, and the documentation supporting it. We also interviewed FirstNet officials about how it plans to become self-funding.

To assess the factors that will influence the cost of the public safety network and challenges FirstNet may face in becoming self-funding, we conducted a variety of interviews and reviewed documents. As described below, we interviewed officials involved in early builder projects, as well as state and local public-safety entities. We also interviewed subject matter experts who were interviewed for our previous report on emergency communications. Additionally, we interviewed two major commercial wireless carriers for their perspectives on building and operating a public safety network. We also reviewed FirstNet documentation, academic literature suggested to us by subject matter experts, and reports published by FCC and the National Public Safety Telecommunications Council (NPSTC).⁶

To identify lessons that can be learned from local and regional public-safety broadband network early builder projects, we interviewed project officials and reviewed documentation from FirstNet and the projects. Specifically, we conducted site visits and phone interviews with officials from—and involved in—the five current projects (Los Angeles, CA; Adams County, CO; New Jersey; New Mexico; and Harris County, TX), the three projects that were canceled (Charlotte, NC; Mississippi; and San Francisco, CA), and state and local public-safety entities in the project jurisdictions. We also reviewed the Spectrum Manager Lease Agreements that each of the five current projects established with FirstNet, and documentation related to how FirstNet plans to collect lessons learned from the projects, such as Key Learning Condition Plans, project quarterly reporting requirements, and other documentation provided by project officials. We also interviewed and obtained written responses from FirstNet officials to obtain more information about their plans to evaluate and utilize lessons from the projects. We assessed FirstNet's plans to evaluate and utilize lessons from the projects against

⁶FCC, *Technical Advisory Board for First Responder Interoperability, Recommended Minimum Technical Requirements to Ensure Nationwide Interoperability for the Nationwide Public Safety Broadband Network* (Washington, D.C.: May 22, 2012). NPSTC, *Defining Public Safety Grade Systems and Facilities* (Littleton, CO: May 22, 2014).

key features of a well-developed evaluation plan for pilot projects identified by our previous reports.⁷

Finally, to obtain stakeholder views on all our objectives, we surveyed all 50 states, the District of Columbia, and 5 U.S. territories and conducted interviews.⁸ We emailed the survey to the Single Point of Contact (SPOC); we obtained the list of SPOCs from FirstNet’s website. The survey included questions about demand for the public safety network and SPOCs’ satisfaction with FirstNet’s progress and consultation efforts, among other things. To ensure that our survey questions and skip pattern were clear and logical and that respondents could answer the questions without undue burden, we pretested our survey with four states: Maryland, Mississippi, Montana, and New Jersey. We selected the pretest states in order to provide for variation in level of engagement and experience with public-safety broadband networks and FirstNet, and geographic location. We administered the survey from October 2014 through November 2014; therefore, responses reflect information and views as of that time. We received 55 responses, for a 98 percent response rate. Puerto Rico did not respond to our survey. We also interviewed a variety of stakeholders, such as state and local public-safety entities, commercial wireless carriers, subject matter experts, public safety associations, and other federal agencies, such as FCC and the Department of Homeland Security. We also spoke with government officials in Sweden responsible for establishing a public-safety communications network in their country. We selected stakeholders by considering their involvement in early builder jurisdictions, experience with operating and using wireless communications systems and public safety-communications systems and devices in particular, familiarity with FirstNet and its mission, and—to obtain a cross-section of public safety disciplines—their public safety role.⁹ Among public safety entities, we interviewed seven law enforcement, four fire, three emergency medical

⁷GAO, *Tax Administration: IRS Needs to Strengthen Its Approach for Evaluating the SRFMI Data-Sharing Pilot Program*, [GAO-09-45](#) (Washington, D.C.: Nov. 7, 2008). [GAO-09-45](#) identified key features of an evaluation plan through the consultation of social science and evaluation literature, along with published GAO guidance.

⁸The 5 U.S. territories we surveyed were American Samoa, Guam, the Northern Mariana Islands, Puerto Rico, and the U.S. Virgin Islands.

⁹We conducted semi-structured interviews with all of these stakeholders and throughout this report we refer to “a few” of the stakeholders if officials from 3-5 entities, “some” if 6-9, “many” if 10-14, and “numerous” if 15 or more expressed the view.

service, three emergency management or communications, and two general public safety entities.

Appendix II: Copy of Survey to FirstNet Single Points of Contact



United States Government Accountability Office

FirstNet State Survey

Introduction

The U.S. Government Accountability Office (GAO) is an agency that gathers and analyzes information for the Congress. The Ranking Member of the Committee on Commerce, Science, and Transportation, U.S. Senate, has asked GAO to examine the First Responder Network Authority (FirstNet), including how it is carrying out its responsibilities related to the establishment of a nationwide public safety broadband network. As part of our review, we are, among other things, surveying all FirstNet State Single Points of Contact (SPOC). Results from this survey will help inform Congress about FirstNet's progress to date, challenges it may face, and the efforts of states to help establish the nationwide public safety broadband network. We plan to issue a report to the Congress in the spring of 2015.

In our report to Congress, we will generally use only the aggregated results of this survey. While we may use individual responses, we will not attribute them to individual respondents in our report or otherwise disclose them to the public. GAO will not disclose such information, unless required by law or requested by Congress.

Please answer the questions in this survey from your perspective as a SPOC and to the best of your knowledge. In this survey, references to a nationwide public safety broadband network refer to a fully operational network established by FirstNet. Additionally, in this survey, by "state" we mean any state or territory and the District of Columbia. If you are not able to answer all the questions in this survey yourself, please forward this survey or coordinate your responses with the appropriate people to the extent possible. At the end of the survey, you will have an opportunity to expand upon any of your responses and provide any additional comments you may have.

Please complete this survey within 2 weeks of receiving it. In testing this survey, we found that it took approximately 45 minutes to complete. We may contact you to clarify responses as needed.

Thank you in advance for your time and participation.

GAO Contacts

If you have any questions about this GAO survey, please contact:

Sally Moino at (214) 777-5610 (moinos@gao.gov)

Or

Nalylee Padilla at (202) 512-6797 (padillan@gao.gov)

Demand for a Nationwide Public Safety Broadband Network

1. Generally, how useful will a public safety broadband network be for the following public safety entities in your state?

	Very useful ▼	Moderately useful ▼	Not useful ▼	Don't know ▼	Not applicable ▼	No response ▼
a. Emergency Management	<input type="checkbox"/>					
b. Emergency Medical Services	<input type="checkbox"/>					
c. Federal Public Safety Entities	<input type="checkbox"/>					
d. Fire Services						
e. Law Enforcement	<input type="checkbox"/>					
f. Public Works	<input type="checkbox"/>					
g. Tribal Public Safety Entities	<input type="checkbox"/>					
h. Other Potential Users (specify): _____	<input type="checkbox"/>					

1a. Please provide any additional comments or explanations you have on the usefulness of a public safety broadband network to public safety entities in your state.

2. About how many first responders from the following public safety entities in your state are using commercial wireless data services?

	Most ▼	Some ▼	Few ▼	None ▼	Don't know ▼	Not applicable ▼	No response ▼
a. Emergency Management	<input type="checkbox"/>						
b. Emergency Medical Services	<input type="checkbox"/>						
c. Federal Public Safety Entities	<input type="checkbox"/>						
d. Fire Services							
e. Law Enforcement	<input type="checkbox"/>						
f. Public Works	<input type="checkbox"/>						
g. Tribal Public Safety Entities	<input type="checkbox"/>						
h. Other Potential Users (specify): _____	<input type="checkbox"/>						

3. Among first responders who use commercial wireless data services in your state, how frequently do they use those services?

	Always or Often ▼	Sometimes ▼	Rarely or Never ▼	Don't know ▼	Not applicable ▼	No response ▼
a. Emergency Management	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Emergency Medical Services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Federal Public Safety Entities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Fire Services	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Law Enforcement	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Public Works	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Tribal Public Safety Entities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Other Potential Users (specify): _____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

4. What is the typical cost per month, per subscriber, for commercial wireless data services used by first responders in your state?

FirstNet Responsibilities

The questions in this section ask about your satisfaction with FirstNet's progress carrying out its responsibilities (as established in Title VI of the Middle Class Tax Relief and Job Creation Act of 2012). Specifically, the questions ask about your satisfaction with FirstNet's progress on developing and designing a secure and reliable nationwide public safety broadband network.

5. How satisfied or dissatisfied are you with FirstNet's progress to date on each of the following responsibilities?

	Very satisfied ▼	Moderately satisfied ▼	Neither satisfied nor dissatisfied ▼	Moderately dissatisfied ▼	Very dissatisfied ▼	Don't know enough about FirstNet's progress ▼	No response ▼
a. Hire FirstNet staff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Develop the technical and operational requirements of the network	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Develop the practices, procedures, and standards for managing and operating the network	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Develop service-level agreements for use of the network	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Carry out a transparent Request for Information process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Issue open, transparent, and competitive Requests for Proposals	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Promote integration of the network with Next Generation 911 (NG911)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Consult with state public safety entities on the development of the network	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. Consult with local public safety entities on the development of the network	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Consult with tribal public safety entities on the development of the network	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. Please provide any additional comments you have on FirstNet's progress carrying out its responsibilities and your level of satisfaction with that progress.

7. What obstacles, if any, has FirstNet faced, or may it face, due to its placement within the National Telecommunications and Information Administration (which is a component of the U.S. Department of Commerce)?

State Governance and Outreach

8. Does your state have a governance structure established to work with FirstNet?

- Yes.....
- No
- Don't know.....
- No response.....

8a. If you responded No, please explain in the box below.

9. Does your state have an outreach plan to educate your state's public safety entities about FirstNet and the nationwide public safety broadband network?

- Yes.....
- No
- Don't know.....
- No response.....

9a. If you responded No, please explain in the box below.

10. What special or unique circumstances may create challenges for deploying, operating, or maintaining the nationwide public safety broadband network in your state?

FirstNet Consultation with States

11. Has your state had its consultation meeting with FirstNet?

- Yes.....
- No.....
- Don't know.....
- No response.....

11a. If your state has not yet had its consultation meeting with FirstNet, but one is scheduled, please indicate the meeting date in the box below.

12. To what extent has FirstNet sought input from your state on the following aspects of the nationwide public safety broadband network?

	Not at all ▼	To a small extent ▼	To a moderate extent ▼	To a large extent ▼	Don't know ▼	No response ▼
a. Design and construction of the core network	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Design and construction of the radio access network	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Coverage area(s)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Hardening, reliability, and resiliency requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
e. Security requirements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Eligible users	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
g. Priority access amongst public safety entities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
h. Training needs of users	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
i. User fee pricing	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
j. Mission critical voice communications capabilities	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
k. Community resistance to network infrastructure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Appendix II: Copy of Survey to FirstNet Single Points of Contact

13. How much more, if at all, should FirstNet focus on the following aspects of the nationwide public safety broadband network in its outreach to your state?

	Stay the same ▼	Slight increase ▼	Moderate increase ▼	Large increase ▼	Don't know ▼	No response ▼
a. Design and construction of the core network	<input type="checkbox"/>					
b. Design and construction of the radio access network	<input type="checkbox"/>					
c. Coverage area(s)	<input type="checkbox"/>					
d. Hardening, reliability, and resiliency requirements	<input type="checkbox"/>					
e. Security requirements	<input type="checkbox"/>					
f. Eligible users	<input type="checkbox"/>					
g. Priority access amongst public safety entities	<input type="checkbox"/>					
h. Training needs of users	<input type="checkbox"/>					
i. User fee pricing	<input type="checkbox"/>					
j. Mission critical voice communications capabilities	<input type="checkbox"/>					
k. Community resistance to network infrastructure	<input type="checkbox"/>					

14. Please provide any comments you have on the above aspects of the nationwide public safety broadband network.

15. How satisfied or dissatisfied are you with FirstNet's overall level of consultation, coordination, and communication with your state, including the level of input FirstNet has sought from your state?

- Very satisfied.....
- Moderately satisfied.....
- Neither satisfied nor dissatisfied...
- Moderately dissatisfied.....
- Very dissatisfied.....
- Don't know.....
- No response.....

16. Has FirstNet provided your state with information or guidance related to its nationwide public safety broadband network to make decisions in your state?

Yes, just enough information.....

Yes, but would like more information.....

No, need more information.....

Don't know.....

No response.....

17. Please provide any additional comments you have on FirstNet's consultation and outreach in your state.

18. What factors, if any, would influence your state's decision to opt-out of the nationwide public safety broadband network?

19. If you would like to expand upon any of your responses to the questions above, or have any other comments about FirstNet and the nationwide public safety broadband network, please write them in the box below.

Appendix III: Comments from the U.S. Department of Commerce



THE DEPUTY SECRETARY OF COMMERCE
Washington, D.C. 20230

April 13, 2015

Mark Goldstein
Director
U.S. Government Accountability Office
441 G Street NW
Washington, DC 20548

Dear Mr. Goldstein:

Thank you for the opportunity to review and comment on the Government Accountability Office's draft report entitled *Public Safety Broadband Network: FirstNet Should Strengthen Internal Controls and Evaluate Lessons Learned* (GAO-15-407). The Department has no comments on the draft report, but will defer to and support the response provided to you directly by the First Responder Network Authority (FirstNet).

I do, however, want to stress how seriously the Department takes its oversight responsibilities with respect to the FirstNet as well as our commitment to the success of the public safety broadband network. I note that the draft report does not make recommendations specific to the Department of Commerce beyond those made to FirstNet directly. As a result, I will defer to and support the response provided to you directly from FirstNet.

If you have any questions, please contact Lawrence E. Strickling, Assistant Secretary for Communications and Information, at (202) 482-1840.

Sincerely,

A handwritten signature in blue ink, appearing to read "B. Andrews".

Bruce Andrews

Appendix IV: Comments from the First Responder Network Authority



12201 Sunrise Valley Drive • Reston, Virginia 20192

April 13, 2015

Mr. Mark Goldstein
Director, Physical Infrastructure
U.S. Government Accountability Office
441 G Street, NW
Washington, DC 20548

Dear Mr. Goldstein:

Thank you for providing the First Responder Network Authority (“FirstNet”) with the opportunity to comment on the Government Accountability Office (“GAO”) draft report: *FirstNet Should Strengthen Internal Controls and Evaluate Lessons Learned*. FirstNet is pleased that the report acknowledges the substantial progress that FirstNet has made towards establishing a nationwide public safety broadband network, while providing useful recommendations to improve FirstNet operations. FirstNet has reviewed the report and agrees with all of GAO’s recommendations.

We believe that the report appropriately focuses on FirstNet’s development of the nationwide public safety broadband network, finding that FirstNet has made progress establishing an organizational structure, planning the network, and consulting with stakeholders, including:

- FirstNet has begun establishing policies and practices consistent with federal internal control standards;
- FirstNet’s consultation and outreach activities generally align with core principles for effective stakeholder participation in that FirstNet is (i) using an open and clearly defined decision-make process, (ii) actively conducting outreach, (iii) involving stakeholders throughout the process, (iv) using formal and informal participation methods, and (v) including all stakeholders;
- FirstNet has taken a number of steps to begin establishing an effective control environment, including establishing an organizational structure with clearly designated responsibilities and exploring hiring options that will allow FirstNet to recruit individuals more quickly; and

Appendix IV: Comments from the First Responder Network Authority

Mr. Mark Goldstein
Director, Physical Infrastructure
Page 2

- FirstNet has developed, as part of its planning and market research, a cost estimate for the network that meets or exceeds most of the best practices against which it was evaluated.

These findings represent the hard work and commitment of the FirstNet team. However, we are cognizant that they are tempered by the additional work that must be done and, as a newly formed governmental entity, FirstNet must and shall continue its efforts in establishing comprehensive and fully compliant internal control policies and practices.

The report recommends that FirstNet strengthen its internal control system by fully assessing risks and developing standards of conduct and evaluating performance against such standards. FirstNet agrees with this recommendation and has already undertaken efforts in this regard. In addition to the risk analyses that have been performed to date both by the Department of Commerce and FirstNet, FirstNet has initiated a legal compliance risk assessment focusing on key legal risks, and FirstNet reviews significant enterprise-wide risks with management on a bi-weekly basis. FirstNet will also undertake a full risk assessment and plans to establish supplemental standards of conduct, which will operate in conjunction with applicable regulations and existing FirstNet and Department of Commerce policies, including existing FirstNet policies related to, for example, vendor communications, financial disclosure, training, travel, telework, administrative expenses, access control, vulnerability management, web/news media, and IT rules of behavior, among others.

The report further recommends that FirstNet develop an evaluation plan for lessons from the early builder projects. FirstNet agrees with this recommendation and will develop an appropriate evaluation plan consistent with the principles specified in the report. The early builder projects are not funded or operated by FirstNet, but they present an important opportunity to obtain lessons and information that will aid in the build-out of the future nationwide public safety broadband network. FirstNet has already enacted a standard operating procedure that ensures that information and lessons learned from these projects are appropriately distributed within the FirstNet organization, and we will use this process to disseminate the findings gathered under the evaluation plan.

Thank you again for the opportunity to comment and provide further information with respect to the report. If you have any questions regarding our comments to the report, please do not hesitate to contact me.

Sincerely,



PJ Kennedy
Executive Director (Acting),
First Responder Network Authority

Appendix V: GAO Contact and Staff Acknowledgments

GAO Contact

Mark L. Goldstein, (202) 512-2834 or goldsteinm@gao.gov

Staff Acknowledgments

In addition to the individual named above, Sally Moino (Assistant Director), Susan Baker, Kyle Browning, David Hooper, Kristen Kociolek, Abishek Krupanand, Jason Lee, Josh Ormond, Nalylee Padilla, Amy Rosewarne, Kelly Rubin, Grant Simmons, Andrew Stavisky, and Michael Sweet made key contributions to this report.

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E-mail: fraudnet@gao.gov

Automated answering system: (800) 424-5454 or (202) 512-7470

Congressional Relations

Katherine Siggerud, Managing Director, siggerudk@gao.gov, (202) 512-4400, U.S. Government Accountability Office, 441 G Street NW, Room 7125, Washington, DC 20548

Public Affairs

Chuck Young, Managing Director, youngc1@gao.gov, (202) 512-4800 U.S. Government Accountability Office, 441 G Street NW, Room 7149 Washington, DC 20548

