



January 2018

# NEXT GENERATION 911

## National 911 Program Could Strengthen Efforts to Assist States

Accessible Version

# GAO Highlights

Highlights of [GAO-18-252](#), a report to congressional requesters

## Why GAO Did This Study

Each year, millions of Americans call 911 for help during emergencies. However, the nation's legacy 911 system relies on aging infrastructure that is not designed to accommodate modern communications technologies. As a result, states and localities are upgrading to NG911, which offers improved capabilities, such as the ability to process images, audio files, and video. While deploying NG911 is the responsibility of state and local entities, federal agencies also support implementation, led by NHTSA's National 911 Program, which facilitates collaboration among federal, state, and local 911 stakeholders.

GAO was asked to review NG911 implementation nationwide. This report examines: (1) state and local progress and challenges in implementing NG911 and (2) federal actions to address challenges and planned next steps. GAO reviewed relevant statutes, regulations, and federal agency reports and plans. GAO also analyzed NHTSA's survey data on state 911 implementation for calendar year 2015, the most recent year for which data were available, and interviewed federal officials, state and local officials from nine states (selected to represent different regions and various phases of NG911 implementation), and officials from industry and advocacy groups.

## What GAO Recommends

GAO recommends that NHTSA's National 911 Program develop performance goals and measures and, for the National NG911 Roadmap, determine agencies' roles and responsibilities and develop an implementation plan. NHTSA agreed with GAO's recommendations.

View [GAO-18-252](#). For more information, contact Mark Goldstein at (202) 512-2834 or [goldsteinm@gao.gov](mailto:goldsteinm@gao.gov).

January 2018

## NEXT GENERATION 911

### National 911 Program Could Strengthen Efforts to Assist States

## What GAO Found

The National Highway Traffic Safety Administration's (NHTSA) National 911 Program's most recent national survey on Next Generation 911 (NG911) implementation indicated that about half of states were in some phase of transition to NG911 in 2015, but that state and local progress varied. Specifically, 10 states reported that all 911 authorities in their state processed calls using NG911 systems; however, 18 states reported having no state or local NG911 transition plans in place—which may indicate these states were in the early phases of planning for the transition to NG911 or had not yet begun. GAO spoke with state and local 911 officials in 9 states, which were in various phases of implementing NG911, and found that none of the 9 selected states were accepting images, audio files, or video. State and local 911 officials identified a number of challenges to implementing NG911. Such challenges are related to funding, evolving technology and operations, and governance. For example, officials in 3 states said that the current funding they collect from telephone service subscribers may not be sufficient to support NG911's transition costs while simultaneously funding the operation of existing 911 systems.

Federal agencies—including NHTSA, the National Telecommunications and Information Administration, the Federal Communications Commission, and the U.S. Department of Homeland Security—have responsibilities to support NG911 implementation, such as through coordinating activities and administering grants, and are taking actions to assist state and local entities in addressing challenges to NG911's implementation. Such actions include developing resources, offering technical assistance, and convening stakeholders to explore emerging NG911 issues. For example, as the lead entity for coordinating federal NG911 efforts, NHTSA's National 911 Program is developing resources on NG911 topics, such as federal funding and governance structures. While the National 911 Program is taking steps to facilitate the state and local transition to NG911, the program lacks specific performance goals and measures to assess its progress. Without such goals and measures, it is not clear to what extent the program is effectively achieving its mission.

In 2018, the National 911 Program plans to establish an interagency initiative tasked with creating a National NG911 Roadmap. This roadmap is intended to identify next steps for the federal government in supporting the creation of a national, interconnected NG911 system. While the National 911 Program is taking steps to develop a list of national-level tasks as part of its roadmap initiative, the program does not have a plan to identify: (1) roles or responsibilities for federal entities to carry out these tasks or (2) how the program plans to achieve the roadmap's objectives. Collaborating with the appropriate federal agencies to determine federal roles and responsibilities to carry out the roadmap's national-level tasks could reduce barriers to agencies effectively working together to achieve those tasks. Furthermore, developing an implementation plan that details how the roadmap's tasks will be achieved would place the National 911 Program in a better position to effectively lead interagency efforts to implement NG911 nationwide.

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### Abbreviations

2012 Act	Next Generation 911 Advancement Act of 2012
DHS	Department of Homeland Security
FCC	Federal Communications Commission
FirstNet	First Responder Network Authority
IP	Internet Protocol
NG911	Next Generation 911
NHTSA	National Highway Traffic Safety Administration
NTIA	National Telecommunications and Information Administration
Office of EMS	Office of Emergency Medical Services
RFP	request for proposal
VoIP	Voice over Internet Protocol

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January 31, 2018

The Honorable Mike Doyle  
Ranking Member  
Subcommittee on Communications and Technology  
Committee on Energy and Commerce  
House of Representatives

The Honorable Anna G. Eshoo  
House of Representatives

The Honorable Norma Torres  
House of Representatives

Each year, millions of Americans call 911 for help during emergencies. According to the National Emergency Number Association, approximately 240 million calls are made to 911 in the United States each year, with over 80 percent of these calls made from wireless devices.<sup>1</sup> However, the nation's legacy 911 systems rely on aging infrastructure that is not designed to accommodate modern communications technologies. As a result, states and localities—the primary providers of 911 services through approximately 6,000 call centers nationwide—are working to upgrade their 911 systems to the next generation of services, commonly known as Next Generation 911 (NG911). Benefits of NG911 systems include improved capabilities to communicate with callers, increased resiliency of 911 operations, and enhanced information sharing among 911 call centers and first responders. Call centers using NG911 will be able to receive voice calls and accept various forms of data, such as text messages, images, video, and vehicle crash data. Such information can help to facilitate quick and accurate dispatch of emergency responders (such as police, firefighters, and ambulance crews) and can be beneficial in situations where a 911 caller is unable to speak.<sup>2</sup>

The transition to NG911 includes replacing the existing legacy 911 networks—which carry voice calls and limited data—with NG911 systems

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<sup>1</sup>The National Emergency Number Association is a nonprofit organization focused on 911 policy, standards development, technology, operations, and education.

<sup>2</sup>According to consumer groups, other benefits of NG911 are enhanced communications options and accessibility to emergency services for individuals in the deaf and hard-of-hearing community who may use alternatives to traditional telephones for communication.

that use Internet Protocol (IP)-based technology. As we have previously reported, modernizing communications networks can improve customers' access and services.<sup>3</sup> The Federal Communications Commission (FCC) notes that as legacy infrastructure is retired, the transition period in which multiple technologies may be used simultaneously raises potential challenges for 911 services. To assist states and localities in this transition, the Next Generation 911 Advancement Act of 2012 (2012 Act) outlined federal agencies' roles and responsibilities related to NG911.<sup>4</sup> The 2012 Act required the National Highway Traffic Safety Administration (NHTSA) within the U.S. Department of Transportation and the National Telecommunications and Information Administration (NTIA) within the U.S. Department of Commerce to create a national program to improve coordination and communication among federal, state, and local stakeholders. This initiative is known as the National 911 Program, which serves as the federal point of coordination for activities among 911 stakeholders and leads the national effort to eventually connect approximately 6,000 independently operated 911 call centers into an interconnected, nationwide NG911 system. The 2012 Act also required FCC—which has regulatory authority over telecommunications carriers—to issue specific recommendations to support the NG911 transition, among other responsibilities. In addition, the 2012 Act required the U.S. Department of Homeland Security (DHS)—which has responsibilities related to ensuring the security and interoperability of emergency communications nationwide—to work with FCC, NHTSA, and NTIA on specific NG911 activities.

You asked us to review the status of implementation of NG911 nationwide. This report examines: (1) progress states and localities are making to implement NG911 and the challenges they have faced and (2)

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<sup>3</sup>More specifically, we reported that according to the Federal Communications Commission, modernizing communications networks can dramatically reduce network costs and broaden access to new technologies, allowing telecommunications carriers to serve customers with increased efficiencies that can lead to improved and innovative product offerings and lower prices. The IP transition, however, is a gradual shift; thus, it will take many years to complete and has no specific end date. See GAO, *Internet Protocol Transition: FCC Should Strengthen Its Data Collection Efforts to Assess the Transition's Effects*, [GAO-16-167](#) (Washington, D.C.: Dec. 16, 2015).

<sup>4</sup>While the 2012 Act outlines federal agencies' roles and responsibilities related to NG911 implementation, there is no federal requirement that states transition to NG911 services. See Next Generation 9-1-1 Advancement Act of 2012, Pub. L. No. 112-96, 126 Stat. 237 (2012) (codified at 47 U.S.C. 942 §§ 1471-1473).

how federal agencies have addressed state and local implementation challenges and planned next steps.<sup>5</sup>

To address these objectives, we analyzed survey data provided by NHTSA's National 911 Program on the status of statewide 911 systems for calendar year 2015, the most recent year for which data were available.<sup>6</sup> We also reviewed FCC's data on state collection and distribution of 911 fees and charges for calendar year 2015.<sup>7</sup> According to our review of the survey data, relevant documentation, and conversations with staff responsible for the data, we determined that the data were sufficiently reliable to generally describe states' progress in implementing NG911 and to provide background on 911 fee collection and costs.

We also selected a non-generalizable sample of 10 states for case studies, based upon a variety of factors, including variation in geographic location, reported progress in implementing NG911, number of annual

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<sup>5</sup>Federal departments may also operate 911 call centers, such as on military bases and in national parks, according to federal agency officials. DHS officials reported that they are working to determine the number of federally-funded 911 call centers and that, in some cases, federal call centers may provide 911 services for surrounding communities. Call centers owned and operated by the federal government are not included in the scope of this review.

<sup>6</sup>More specifically, we analyzed the most recent state-provided data from calendar year 2015 related to planning and implementation of NG911 at the state and local levels. NHTSA's National 911 Program collects these data annually by surveying states during a given calendar year on activities from the previous year. Thus the data we obtained from NHTSA were released in 2016 and represent progress from 2015. According to the National 911 Program, these data can be used to characterize the status of statewide 911 systems and measure progress in implementing advanced 911 systems. See NHTSA, *2016 National 911 Progress Report, National 911 Program* (Washington, D.C.: December 2016).

<sup>7</sup>FCC surveys states annually on states' collection and use of 911 fees. FCC is required to report to Congress on the identity of states, territories, or political subdivisions (such as counties or localities) that collect taxes, fees, or other charges for emergency communications. This reporting includes the amount of those revenues used for purposes other than the ones specified in the state's method of funding 911—also known as 911 fee diversion. See FCC, *Eighth Annual Report to Congress on State Collection and Distribution of 911 and Enhanced 911 Fees and Charges for the Period January 1, 2015 to December 31, 2015* (Washington, D.C.: Dec. 30, 2016).

911 calls, and whether states diverted 911 fees to other uses.<sup>8</sup> We requested interviews with and documentation from state and local 911 officials from the 10 selected states about NG911 implementation progress, challenges, federal actions, and any additional assistance needed. We obtained documentation from and interviewed officials from nine states; one of the selected states did not respond to our requests.<sup>9</sup> While not generalizable to all states, the information obtained from our case studies provides examples of broader issues faced by states and localities in managing the transition to NG911.

In addition to our case study work, we reviewed relevant statutes, regulations, our prior reports, and documentation of federal agency actions and plans. We also interviewed officials from federal agencies, including NHTSA, NTIA, FCC, and DHS, and officials from national associations representing emergency-response-technology companies, wireless and wireline phone carriers, emergency-communications entities, and consumer groups. We identified guidance on leading practices for performance management,<sup>10</sup> and reviewed interagency collaboration practices from our prior work.<sup>11</sup> We also applied relevant federal standards for internal control that are key to helping agencies better achieve their missions and desired program results.<sup>12</sup> We assessed NHTSA's efforts to set goals and achieve desired results for the National 911 Program using these standards, this guidance, and selected

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<sup>8</sup>We have previously reported that when states collect funds for 911 purposes and then use those revenues for other purposes, there is a risk of confusing stakeholders and members of the public who pay these fees and undermining the credibility of 911 fees. See GAO, *911 Services: Most States Used 911 Funds for Intended Purposes, but FCC Could Improve Its Reporting on States' Use of Funds*, [GAO-13-376](#) (Washington, D.C.: Apr. 18, 2013).

<sup>9</sup>We interviewed officials from California, Maine, Maryland, Minnesota, New Hampshire, North Dakota, South Dakota, Vermont, and Virginia. We contacted 911 officials in Nevada but did not receive responses.

<sup>10</sup>GAO, *Agencies' Strategic Plans Under GPRA: Key Questions to Facilitate Congressional Review*, [GAO/IGD-10.1.16](#) (Washington, D.C.: May 1997) and GAO, *Managing for Results: Critical Issues for Improving Federal Agencies' Strategic Plans*, [GAO/IGD-97-180](#) (Washington, D.C.: Sept. 16, 1997).

<sup>11</sup>GAO, *Managing for Results: Key Considerations for Implementing Interagency Collaborative Mechanisms*, [GAO-12-1022](#) (Washington, D.C.: Sept. 27, 2012).

<sup>12</sup>GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: September 2014).



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collaboration practices from our prior work.<sup>13</sup> A more detailed summary of our scope and methodology appears in appendix I.

We conducted our work from January 2017 to January 2018 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.

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## Background

As we have previously reported, 911 services have evolved from basic 911—which provided Americans with a universally recognized emergency number—to Enhanced 911 which also routes calls to the appropriate call center and provides information about the caller’s location and a call back number.<sup>14</sup> NG911 represents the next evolution in 911 services by using IP-based technology to deliver and process 911 traffic. Under NG911, call centers will continue to receive voice calls and location information, but will also be able to accommodate emergency communications from the range of technologies in use today. In addition, NG911 systems provide call centers with enhanced capabilities to route and transfer calls and data, which could improve call centers’ abilities to handle overflow calls and increase information sharing with first responders.

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## 911 Communications Process

Generally speaking, 911 communications begin when a caller dials 911 using a landline, wireless, or Voice over Internet Protocol (VoIP)<sup>15</sup>

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<sup>13</sup>We considered key collaboration practices identified in [GAO-12-1022](#) and selected practices that were most relevant to NHTSA’s planned collaboration activities.

<sup>14</sup>GAO, *911 Services: Most States Used 911 Funds for Intended Purposes, but FCC Could Improve Its Reporting on States’ Use of Funds*, [GAO-13-376](#) (Washington, D.C.: Apr. 18, 2013). For previous related reports, see GAO, *Telecommunications: States’ Collection and Use of Funds for Wireless Enhanced 911 Services*, [GAO-06-338](#) (Washington, D.C.: Mar. 10, 2006) and *Telecommunications: Uneven Implementation of Wireless Enhanced 911 Raises Prospect of Piecemeal Availability for Years to Come*, [GAO-04-55](#) (Washington, D.C.: Nov. 7, 2003).

<sup>15</sup>VoIP is the routing of voice conversations over the Internet or any other IP-network.

system.<sup>16</sup> Once a 911 caller places an emergency call, a communications provider receives and routes the call to the appropriate call center, along with the caller's phone number and location (i.e., street address for a landline caller, approximate geographic location for a wireless caller, and the subscriber's address for VoIP).<sup>17</sup> Calls and data may be routed to 911 call centers using legacy methods (i.e., routing calls across traditional telephone networks) or NG911 methods (i.e., routing calls and other data through IP-networks). Once the call reaches a call center, trained call takers and dispatchers determine the nature of the emergency and dispatch first responders, typically using a variety of equipment and systems, including call handling systems, mapping programs, and computer aided dispatch.<sup>18</sup> Figure 1 illustrates the 911 communications and dispatch process.

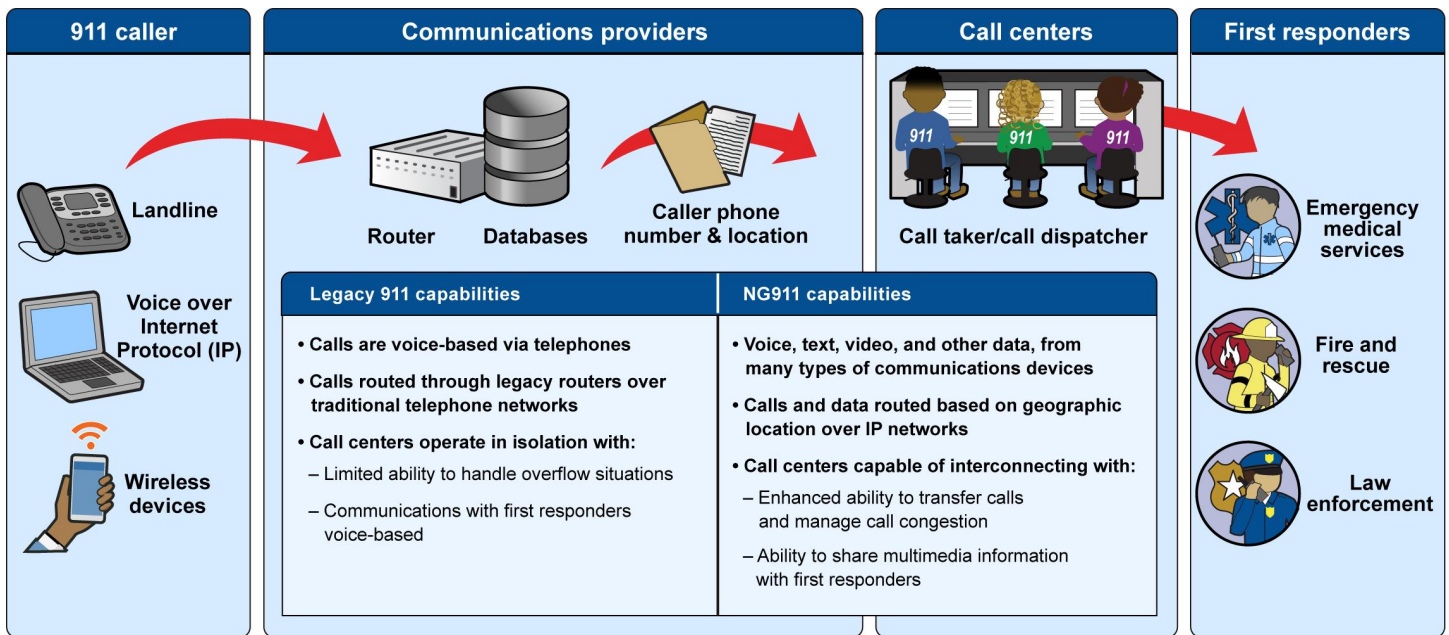
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<sup>16</sup>More specifically, according to FCC, 911 communications generally originate on an originating service provider's network where the caller is located, such as a landline telephone network, a wireless network, or an over-the-top communications service operating over another network.

<sup>17</sup>According to FCC, the architecture of 911 networks, both legacy and NG911, can include multiple entities, each providing one or more links in a chain of connectivity. These entities include several distinct types of communications providers, including originating service providers (as previously mentioned), incumbent local exchange carriers, system service providers, subcontractors and vendors that provide additional technical capabilities, and 911 call centers and emergency authorities themselves to the extent that they provide 911 network components. See *In the Matters of 911 Governance and Accountability and Improving 911 Reliability*, Policy Statement and Notice of Proposed Rulemaking, 29 FCC Rcd 14208 (2014).

<sup>18</sup>We have previously reported that first responders often have difficulty communicating among agencies because existing emergency communications systems lack interoperability. The Middle Class Tax Relief and Job Creation Act of 2012 created the First Responder Network Authority (FirstNet) within NTIA, and required the agency to establish a nationwide, interoperable public-safety broadband network, which is expected to foster greater interoperability between NG911-enabled call centers and first responders using FirstNet's network. In June 2017 we reported that FirstNet was working to establish the network, but faced various challenges to ensure the network's reliability, security, and interoperability. See GAO, *Public Safety Broadband Network: FirstNet Has Made Progress Establishing the Network, but Should Address Stakeholder Concerns and Workforce Planning*, [GAO-17-569](#) (Washington, D.C.: June 20, 2017).

Figure 1: Overview of 911 Communications and Dispatch Process



Source: Based on GAO analysis of public safety industry documents. | GAO-18-252

As illustrated in figure 1, NG911 systems use IP-networks capable of carrying voice plus large amounts of data.<sup>19</sup> These emergency-services networks are typically deployed at the state or regional level with multiple call centers connecting to the network.<sup>20</sup> However, the existence of an IP-network alone does not constitute an NG911 system. As defined by standards developed by the emergency communications community, an NG911 system should have the capability to, among other things:

- provide a secure environment for emergency communications;
- acquire and integrate additional data for routing and answering calls;
- process all types of emergency calls, including multimedia messages; and

<sup>19</sup>An NG911 system is comprised of hardware, software, data, and operating policies, according to the National Emergency Number Association.

<sup>20</sup>Emergency services IP-networks—also known as ESInets—are managed, multipurpose networks that support public-safety communications services and use broadband technology capable of carrying voice plus large amounts of data using Internet Protocols and standards. These networks are typically deployed at the state or regional level and operate under contracts with call centers or through state or local government agencies.

- transfer calls with added data to other call centers or first responders.<sup>21</sup>

While NG911 systems must possess certain capabilities, it is important to note that states and localities may make decisions about which capabilities they intend to use to best meet their needs. In addition, states and localities have the authority to make decisions about what NG911 equipment, systems, and vendors to use; thus, the configurations of these systems vary.

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## NG911 Implementation

According to a panel of experts convened by the National 911 Program, the transition to NG911 may require a variety of technical and operational changes to current 911 systems and processes.<sup>22</sup> For example, technical changes can include upgrades to networks or installing new hardware or software in 911 call centers. Operational changes can include the need for additional training or the development of new policies and procedures (e.g., new procedures for processing or storing multimedia). These technical and operational changes may also have effects on 911 funding and state and local governance structures, which we will discuss in more detail later in this report.

According to an FCC advisory body that examined NG911 systems architecture in 2016, while NG911 systems are implemented in a variety of ways at the state or local level, NG911 implementation can occur gradually and in phases.<sup>23</sup> According to this model, NG911 implementation occurs on a continuum that begins with legacy 911 systems and ends with a fully deployed NG911 national end-state where all individual 911 call centers nationwide would be connected. The NG911

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<sup>21</sup>Emergency communications associations play an important role in developing standards and operational procedures for NG911 architecture and implementation. The National Emergency Number Association, for example, aims to improve 911 through research, standards development, training, education, outreach, and advocacy. This association has developed a widely accepted standard for NG911 requirements and architecture, according to FCC.

<sup>22</sup>See NHTSA, *Blue Ribbon Panel on 911 Funding: Report to the National 911 Program* (Washington, D.C.: December 2013).

<sup>23</sup>FCC, Task Force on Optimal Public Safety Answering Point Architecture, *Working Group 2, Phase II Supplemental Report: NG9-1-1 Readiness Scorecard* (Dec. 2, 2016).

implementation model identifies activities that take place as part of the NG911 transition, many of which occur concurrently, such as:

- planning (e.g., conducting feasibility studies, preparing databases, establishing governance models);
- acquiring, testing, and implementing NG911 system elements (e.g., establishing an emergency-services IP-network, location-based call routing, processing multimedia);
- connecting call centers within a jurisdiction (i.e., jurisdictional end-state in which all call centers are fully NG911 operational, supported by agreements, policies, and procedures); and
- connecting NG911 systems nationwide (i.e., national end-state in which all call centers in the nation are fully NG911 operational, supported by agreements, policies, and procedures).

In addition, because 911 services provide an essential function, the implementation of NG911 generally involves using both the legacy system and the NG911 system simultaneously for a period of time, according to the FCC advisory body, to ensure 911 services are not disrupted as new system elements are tested and implemented.

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## State and Local Roles

Deploying and operating 911 is the responsibility of 911 authorities at the state and local level. As we have previously reported, all 50 states and the District of Columbia collect—or have authorized local entities to collect—funding for 911 from telephone service subscribers, and methods within each state for collecting funds vary.<sup>24</sup> FCC, as required by statute, reports to Congress annually on the states' collection and distribution of 911 fees and charges.<sup>25</sup> There are approximately 6,000 call centers nationwide that process 911 calls, often at the county or city level, and

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<sup>24</sup>[GAO-13-376](#).

<sup>25</sup>FCC has been publishing an annual report on state collection and distribution of 911 fees and charges since 2009, as required by the New and Emerging Technologies 911 Improvement Act of 2008. As part of that report, FCC also includes collection and distribution of 911 fees and charges of United States territories. Pub. L. No. 110-238, § 101(2)(f)(2), 122 Stat. 2620 (2008). For more information, see FCC, *Eighth Annual Report to Congress on State Collection and Distribution of 911 and Enhanced 911 Fees and Charges for the Period January 1, 2015 to December 31, 2015* (Washington, D.C.: Dec. 30, 2016).

these centers can vary greatly in size and technical sophistication.<sup>26</sup> The state and local governance structures that oversee 911 operations also vary by location. For example, we previously reported that some states collect fees or charges for 911 and administer a statewide 911 program.<sup>27</sup> Other states authorize local entities to collect fees or charges for 911 and administer 911 programs at the local level. Still other states use a combination of these approaches. According to a panel of experts convened by the National 911 Program, historically, 911 authority has been coordinated and maintained locally with no requirement to coordinate with other jurisdictions.<sup>28</sup> However, the transition to NG911 enables connection of 911 systems. Thus, as previously mentioned, the NG911 transition may require technological and operational changes, as well as changes to 911 policies and governance responsibilities for states and localities.

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## Federal Roles

While deploying and operating 911 is the responsibility of entities at the state and local level, federal agencies—including NHTSA, NTIA, FCC, and DHS—have responsibilities to support state and local implementation, including through facilitating coordination of activities among 911 stakeholders and administering federal grants,<sup>29</sup> for example:

- NHTSA houses the National 911 Program as part of its Office of Emergency Medical Services (Office of EMS) to provide national leadership and coordination for the NG911 transition throughout the United States, as previously mentioned. According to NHTSA, the fiscal year 2017 budget for the National 911 Program was \$2.74

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<sup>26</sup>As we have previously reported, call centers within a state vary in size and technical sophistication. For example, some large urban call centers may have dozens of call takers and split functions of call taking and dispatching emergency responders, such as police, firefighters, and ambulance crews. Smaller call centers may be staffed by only two or three call takers who also handle dispatch. In some rural areas, the call centers may be the sheriff's office. [GAO-13-376](#).

<sup>27</sup>[GAO-13-376](#).

<sup>28</sup>NHTSA, *Blue Ribbon Panel on 911 Funding: Report to the National 911 Program* (Washington, D.C.: December 2013).

<sup>29</sup>In addition, as previously mentioned, federal departments may also operate 911 call centers, such as on military bases and in national parks, according to federal agency officials. Call centers owned and operated by the federal government are not included in the scope of this review.

million.<sup>30</sup> Among other activities, which we will discuss later in this report, the National 911 Program surveys states on progress implementing NG911 and reports this survey data annually.<sup>31</sup>

- FCC issues orders and regulations for 911 service providers on topics relevant to NG911, such as 911 reliability, location accuracy, and text-to-911. FCC also sponsors advisory bodies comprised of government and industry experts that study relevant topics and provide recommendations related to NG911, such as the Task Force on Optimal Public Safety Answering Point Architecture and the Communications, Security, Reliability, and Interoperability Council.

While there are no federally mandated time frames for implementing NG911, the Next Generation 911 Advancement Act of 2012 requires specific actions of some federal agencies as outlined in table 1, below.

**Table 1: Selected Federal Agencies' Requirements Related to Next Generation 911 (NG911)**

Federal agency	Selected requirements
National Highway Traffic Safety Administration (NHTSA)	<ul style="list-style-type: none"> <li>• Required by the Next Generation 911 Advancement Act of 2012<sup>a</sup> (2012 Act) to work in coordination with NTIA to: (1) establish an Implementation Coordination Office to facilitate coordination and communication between federal, state, and local entities; (2) develop regulations prescribing the criteria for grant selection and provide grants to eligible entities, including states, for 911 implementation (including NG911); and (3) prepare a report for Congress that analyzes and determines detailed costs for NG911 implementation, in consultation with FCC and DHS.</li> </ul>
National Telecommunications and Information Administration (NTIA)	<ul style="list-style-type: none"> <li>• Required by the 2012 Act to work in coordination with NHTSA to: (1) establish an Implementation Coordination Office; (2) issue regulations and provide grants to states for 911 implementation (including NG911); and (3) prepare and submit a cost study for Congress, all as described in more detail above.</li> </ul>
Federal Communications Commission (FCC) <sup>b</sup>	<ul style="list-style-type: none"> <li>• Required by the 2012 Act to provide recommendations to Congress on the legal and statutory framework needed for the NG911 transition, in coordination with NHTSA, NTIA, and DHS, among other requirements.</li> </ul>
U.S. Department of Homeland Security (DHS) <sup>c</sup>	<ul style="list-style-type: none"> <li>• Required by 2012 Act to coordinate with NHTSA to prepare and submit a cost study for Congress, as described above.</li> </ul>

Source: GAO analysis of the Next Generation 911 Advancement Act of 2012. | GAO-18-252

<sup>a</sup>Pub. L. No. 112-96, 126 Stat. 237 (2012).

<sup>b</sup>FCC regulates interstate and international communications by radio, television, wire, satellite, and cable throughout the United States. Communications Act of 1934, Pub. L. No. 73-416, § 2, 48 Stat.

<sup>30</sup>More specifically, according to NHTSA's 2018 Budget Estimates, the annualized continuing resolution for the National 911 Program for fiscal year 2017 was \$2.74 million. According to program officials, the National 911 Program has one full-time staff member and leverages partnerships with other organizations and contractors to carry out some of the office's activities.

<sup>31</sup>See NHTSA, *2016 National 911 Progress Report, National 911 Program* (Washington, D.C.: December 2016).

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1064 (1934), as amended by Telecommunications Act of 1996, Pub. L. No. 104-104, 110 Stat. 56 (1996) (codified as amended at 47 U.S.C. § 151).

<sup>c</sup>DHS is responsible for leading, integrating, and coordinating the implementation of efforts to protect the nation's cyber-reliant critical infrastructures.

In addition, according to the National 911 Program, as states and localities continue to implement NG911, and begin to explore interconnection with other states' 911 systems, federal agencies may need to take steps to help ensure state NG911 networks are interoperable and connected. We will discuss actions taken by federal agencies to assist states and localities to implement NG911 later in this report.

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## States and Localities Have Reported Varied Progress in Implementing NG911 and Identified Funding, Technology, and Governance Challenges

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### Reported Progress among States Varies in Implementing Next Generation 911

According to NHTSA's most recent national survey, state and local progress implementing NG911 varies, and about half of all states reported being in some phase of transition to NG911 in 2015.<sup>32</sup> While a few states are well into statewide implementation, NHTSA officials told us that no state had completely implemented all NG911 functions. Additionally, as of the fall of 2017, none of the selected states we spoke with were processing multimedia—such as images or audio/video recordings—through their 911 systems due to concerns related to privacy, liability, and the ability to store and manage these types of data, among other things. The national survey data, based on responses from 45 states, measured the extent to which NG911 planning and acquisition of NG911 equipment and services were occurring, and the extent to

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<sup>32</sup>NHTSA, *2016 National 911 Progress Report, National 911 Program* (Washington, D.C.: December 2016). The data used in the December 2016 report are from calendar year 2015, the most recent data available during this review.



which basic NG911 functions were operational at the state and local levels in 2015.<sup>33</sup>

**Planning:** This measure includes state and local NG911 plans for governance, funding, system components, and operations. In this context, system components refer to an emergency services IP-based network, NG911 software, system and information security, and databases, among other things, according to NHTSA's survey. In total, 25 of 45 states reported having a state or at least one local NG911 plan in place; conversely, 18 states reported having no NG911 plan in place at either the state or local level—which may indicate they are in the early stages of planning for the NG911 transition or have not yet begun the transition to NG911.<sup>34</sup>

**Acquisition:** These measures identify states or local entities that have defined their NG911 needs and awarded contracts, and then installed and tested acquired NG911 components and services. Twenty-four states reported awarding at least one contract at the state or local level for NG911 components and services. Twenty-three states reported having installed and tested NG911 components and services at either the state or local level.<sup>35</sup>

**NG911 services:** This is a measure of 911 authorities that have some basic, functioning NG911 infrastructure in place.<sup>36</sup> In total, 21 states reported having some level of basic NG911 services in place at the state or local level. Of these 21 states, 10 reported that all 911 authorities within the state were using NG911 technology to process emergency calls. Another 7 of these states reported that 25 percent or less of their

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<sup>33</sup>As part of the National 911 Program's data collection effort, 50 states, the District of Columbia, and 6 U.S. territories were asked to provide 911-related data. For the purposes of reporting on these data, states, territories, and the District of Columbia are all referred to as "states." A total of 45 states provided data for calendar year 2015.

<sup>34</sup>Two states reported not knowing the status of state and local planning.

<sup>35</sup>Two states reported awarding contracts but did not report having installed and tested NG911 systems yet. In addition, one state reported having installed and tested a system, but reported "unknown" to the extent contracts were awarded.

<sup>36</sup>This does not necessarily mean that all NG911 core services are in place. For example, NHTSA's survey did not measure: (1) a 911 authority's ability to route calls based on a specific geographic location, (2) a system's ability to process multimedia, or (3) establishment of interoperability with neighboring authorities' systems.

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state's 911 authorities were using NG911 technology to process emergency calls.

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## Officials Identified State and Local Funding, Technology, and Governance Challenges to Implementing NG911

Federal officials, industry stakeholders, and state and local 911 officials we interviewed from nine states identified a number of challenges to implementing NG911, including challenges related to funding, evolving technology and operations, and governance.<sup>37</sup>

**Funding:** State and local officials in four of nine selected states identified insufficient funding as one of the challenges they face in implementing NG911.<sup>38</sup> Additionally, FCC, NHTSA, and industry reports noted that state and local financing strategies are generally insufficient to fully implement NG911.<sup>39</sup> Specifically, these reports note that the need to provide new capital for NG911 implementation while simultaneously funding legacy operational costs during the transition can strain state and local funding.

- *Limited funding:* Officials in three states told us that their current funding may not be able to support the upfront costs of infrastructure and equipment acquisitions associated with the transition to NG911. Further, officials said they will need to simultaneously fund both the new NG911 and legacy 911 systems currently in operation until the NG911 systems are fully operational. To address these challenges, a Minnesota official told us about how the state leveraged economies of scale to reduce overall costs through cost sharing between multiple call centers and of call centers consolidating operations from 114 to

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<sup>37</sup>It is important to note that while each local and state 911 authority may have discussed challenges unique to its respective situations, the challenges identified in this report are in part limited to those that were mentioned by more than one authority. Therefore, not every one of the selected states experienced these challenges, nor are these challenges meant to be generalizable to all of the states.

<sup>38</sup>As previously mentioned, we interviewed officials from California, Maine, Maryland, Minnesota, New Hampshire, North Dakota, South Dakota, Vermont, and Virginia. We attempted to contact 911 officials in Nevada but did not receive responses.

<sup>39</sup>FCC, Task Force on Optimal Public Safety Answering Point Architecture, *Adopted Final Report* (January 2016); NHTSA, *Blue Ribbon Panel on 911 Funding: Report to the National 911 Program* (Washington, D.C.: December 2013); and Industry Council for Emergency Response Technologies, *The Status of NG911 Deployment in the United States* (January 2015).

104 call centers. Additionally, a Virginia official told us that to cover the upfront costs of transitioning to NG911, the state plans to borrow from the state treasury and then repay the treasury with future-year fee collections.

- *Fee diversion:* Diversion of fees intended for 911 costs to non-911 activities may affect a state's or locality's ability to cover NG911 transition costs and necessitate identifying alternative funding sources. The FCC's 2016 annual report on 911 fees indicates that for calendar year 2015, all but two of the states that responded to FCC's 911 fee survey affirmed that their state or jurisdiction collects fees from phone users to support or implement 911 services.<sup>40</sup> State and local authorities also determine how these 911 fees can be used.<sup>41</sup> FCC's report also indicated that eight states and Puerto Rico reported diverting a total of more than \$220 million (or approximately 8.4 percent) of 911 fees collected to non-911 purposes. Some of these diverted funds were directed to other public safety programs, and others were diverted to either non-public safety or unspecified purposes. According to one state official, had it not been for 911 fees being diverted to non-911 purposes, funding would have been sufficient to cover the NG911 transition without having to go to the state legislature for additional funding. However, officials in the other eight selected states told us that either fee diversion was not an issue in their state or that the diversion of funds had not affected their state's ability to implement NG911.

**Evolving technology and operations:** Officials in eight states told us that the retirement of legacy infrastructure and the transition to IP-based systems introduces new technical and operational challenges for call centers and states, as well as for equipment and service providers.

- *Interoperability:* Officials in three selected states mentioned that connecting to neighboring networks—whether within or between

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<sup>40</sup>FCC's 911 fee survey is separate from NHTSA's NG911 implementation survey. As previously mentioned, FCC collects data and reports to Congress annually on state collection and use of 911 fees. Forty-seven states, the District of Columbia, American Samoa, Puerto Rico, and the U.S. Virgin Islands provided responses to this particular question from FCC's survey. Three states—Missouri, Nevada, and Wyoming—did not respond to this question. For additional information, see FCC, *Eighth Annual Report to Congress on State Collection and Distribution of 911 and Enhanced 911 Fees and Charges for the Period January 1, 2015 to December 31, 2015* (Washington, D.C.: Dec. 30, 2016).

<sup>41</sup>Although FCC collects data from states on the collection and use of 911 data, it has no authority to determine how state and local 911 fees are spent.

states—could pose challenges. For example, officials mentioned that states and localities may have obtained different equipment, software applications, or service providers – all of which can make interconnections difficult. Officials in Maine and New Hampshire told us that differences in service providers can also be a challenge to seamlessly connecting to neighboring systems. In an instance where two states (Minnesota and North Dakota) have worked to connect their 911 systems, both states used the same service provider, which officials said allowed for fewer barriers to connection.

- *Cyber risks:* Officials in three states told us that the transition from a traditional system that only transmits voice traffic to an IP-based system that transmits voice and data traffic has significantly increased the risk of a cyber-attack. This can be a challenge because managing cyber risks is a new and evolving role for state and local 911 authorities. Approaching the transition to NG911 without managing these risks could result in disrupted or disabled call center operations and ultimately a delayed response to an emergency situation.
- *Multimedia:* Officials in three states mentioned potential implementation challenges related to accepting and processing multimedia such as audio recordings, images, and videos. More specifically, one official said they did not have procedures to manage or store these multimedia files once received. In addition, another official raised privacy and liability concerns.
- *Call routing:* One of the core services of an NG911 system is the ability to have calls routed to the appropriate call center based on a wireless caller's physical location, instead of the location of the cellular tower that receives and transmits the call. An FCC-sponsored working group reported that there are several options for achieving this and each option has unique positive and negative aspects.<sup>42</sup> One challenge officials in two states noted was that rather than a single, nationwide approach to routing these calls, state and local 911 authorities would need to work individually with the wireless carriers to determine how to best implement location-based call routing.

**Governance:** FCC has noted that transitioning to NG911 will likely result in new roles and levels of coordination between state 911 authorities, local 911 authorities, 911 call centers, and 911 service providers. Further, relationships among authorities at the state and local level may change

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<sup>42</sup>FCC, Communications Security, Reliability and Interoperability Council V, Working Group 1, Evolving 911 Services, *Final Report – Task 2: 911 Location-Based Routing* (September 2016).

as states work to interconnect NG911 systems. State and local officials noted that these types of governance challenges can apply in a variety of situations, including within or between states.

- *Evolving roles:* As previously mentioned, 911 governance structures vary among states. These varying governance structures may pose different challenges. For example, some states have a centralized structure in which a single government agency is responsible for statewide 911 system's administration and policy. Officials in two states told us that although they faced challenges transitioning to NG911, their states' centralized 911 structure eased the transition in their states because there was uniformity in policy and technology, among other things, coming from a single statewide authority. In other states, 911 systems are primarily a local responsibility and organized with decentralized authorities and resources. In these instances, there may be specific challenges related to transitioning to an interconnected NG911 system. Such challenges may include the need for increased levels of coordination among numerous jurisdictions with potentially disparate organizational structures, levels of funding, and priorities. An official also noted that there are governance challenges related to connecting states and evolving relationships between 911 authorities and service providers.
- *Informing decision makers:* One of the challenges identified by officials in two states is differing levels of experience and understanding by state and local officials as to what NG911 priorities should be for timely implementation. To help with this understanding, the federal government is making efforts to educate state and local authorities on how to facilitate policymaker understanding as well as provide regular updates to stakeholders on recent NG911 developments. We discuss some of these efforts later in this report.

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## Federal Agencies Are Addressing NG911 Implementation Challenges, but the National 911 Program Lacks Measurable Goals and Next Steps for the NG911 Roadmap Initiative

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### Federal Agencies Are Taking Actions to Address NG911 Implementation Challenges

While state and local entities have the primary responsibility for implementing NG911 technology and services, federal agencies are taking actions to assist state and local 911 entities to address NG911 implementation challenges. Actions taken include developing resources, offering technical assistance, and convening stakeholders. More specifically, we identified selected activities that were taken by NHTSA, NTIA, FCC, and DHS that address some of the funding, technology, and governance challenges raised by state and local 911 stakeholders, for example:

- **Cost study:** NHTSA's National 911 Program and NTIA, in consultation with FCC and DHS, plan to issue a study of the range of costs for 911 call centers and service providers to implement NG911 systems.<sup>43</sup> According to NHTSA officials, the cost study will present a nationwide view, rather than a state-by-state view, on the progress of NG911 implementation and its associated costs.
- **Grant program:** NHTSA and NTIA are preparing to jointly administer a \$115 million grant program to improve 911 services, including the adoption and operation of NG911 services.<sup>44</sup> In September 2017, NHTSA and NTIA issued a notice of proposed rulemaking outlining

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<sup>43</sup>As previously mentioned, the 2012 Act required NHTSA and NTIA, in consultation with FCC and DHS, to submit a report to Congress that determines detailed costs for specific NG911 service requirements and specifications. The 2012 Act specifies the purpose of the report as serving as a resource for Congress as it considers creating a coordinated, long-term funding mechanism for the deployment and operation, accessibility, application development, equipment procurement, and training of personnel for NG911 services. NHTSA officials said they received the study from their selected contractors in September 2017, which was under review as of the time of our analysis.

<sup>44</sup>47 U.S.C. § 942(b)(1).

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implementing regulations for the grant program.<sup>45</sup> NHTSA and NTIA expect to award the grants in 2018.

- **Technology standards:** The National 911 Program issued an annual guide in 2017 that stressed the importance of using open technology standards for NG911 services. The guide provides a list of standards that have been recently updated and an analysis that identifies whether existing standards fully address NG911 processes and protocols.<sup>46</sup>
- **Cybersecurity guides:** DHS issued a guide in 2016 that identified cybersecurity risks for NG911 and risk mitigation strategies.<sup>47</sup> According to DHS officials, the National 911 Program provided input on this guide. In addition, an advisory body tasked by FCC to examine 911 call-centers' architecture issued a report in 2016 that provided a cybersecurity self-assessment tool for call centers and guidance on cybersecurity strategies.<sup>48</sup>
- **Governance plans:** To address challenges related to the evolving roles for state and local 911 authorities, the National 911 Program issued a guide in 2016 that provided practices for states to consider when interconnecting NG911 networks, and DHS issued a guide in 2015 for emergency communications officials for establishing, assessing, and updating their governance structures.<sup>49</sup> In addition, an FCC advisory body issued a report in 2016 that identified NG911 governance approaches, issues, and recommendations for states,

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<sup>45</sup>The notice of proposed rulemaking included a request for comments due November 6, 2017. As previously mentioned, the 2012 Act required NHTSA and NTIA to administer this grant program. In 2016, approximately \$115 million from spectrum auction proceeds were deposited into the Public Safety Trust Fund and made available to NTIA and NHTSA for the grant program.

<sup>46</sup>NHTSA, National 911 Program, *Next Generation 911 (NG911) Standards Identification and Review* (Washington, D.C.: March 2017).

<sup>47</sup>DHS, Office of Emergency Communications, *Cyber Risks to Next Generation 911* (2016).

<sup>48</sup>FCC, Task Force on Optimal Public Safety Answering Point Architecture, *Adopted Final Report* (January 2016). Additional information on cybersecurity planning for NG911 can be found in FCC, Task Force on Optimal Public Safety Answering Point Architecture, *Working Group 1, Optimal Cybersecurity Approach for PSAPs, Supplemental Report* (December 2016).

<sup>49</sup>NHTSA, National 911 Program, *Next Generation 911 (NG9-1-1) Interstate Playbook: Implementing State-to-State 9-1-1 Connectivity* (Washington, D.C.: October 2016) and DHS, *Emergency Communications Governance Guide for State, Local, Tribal, and Territorial Officials* (September 2015).

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localities, and call centers to consider when planning for the deployment of NG911.<sup>50</sup>

In addition to federal agency efforts to assist the state and local 911 community, the National 911 Program is in the early stages of establishing an interagency initiative to create a National NG911 Roadmap. As part of this initiative, the National 911 Program plans to convene the 911 stakeholder community to identify tasks that need to be completed at the national level by the federal government and other public and private-sector organizations to support the creation of a national, interconnected NG911 system. Additional details regarding this planned activity are described in further detail later in this report. For additional information on federal actions to address state and local NG911 challenges, see appendix II.

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## National 911 Program Lacks Goals and Performance Measures

As the lead entity for coordinating federal NG911 activities, the National 911 Program has taken a variety of actions to assist the state and local 911 community, in collaboration with other federal agencies. However, the program lacks goals and performance measures to assess whether these activities are achieving desired results. National 911 Program officials stated that they initiate program activities based on feedback received from the 911 community. In addition, officials said the program's activities fall within the tasks established in the Next Generation 911 Advancement Act of 2012. However, the National 911 Program does not have a means to assess its progress toward meeting its responsibilities established in the 2012 Act. National 911 Program officials said the Office of EMS—the office within NHTSA in which the program is housed—has a strategic plan, but it is outdated and does not contain specific goals or performance measures related to 911 or NG911 implementation. Officials said the Office of EMS has held preliminary discussions to begin updating its strategic plan by January 2019 and plans to include goals and performance measures related to 911 and NG911 services. Office of EMS officials told us the Office of EMS strategic plan will be jointly

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<sup>50</sup>FCC, Task Force on Optimal Public Safety Answering Point Architecture, *Adopted Final Report* (January 2016). Additional information on governance planning for NG911 can be found in FCC, Task Force on Optimal Public Safety Answering Point Architecture, *Working Group 2, Phase II Supplemental Report: NG9-1-1 Readiness Scorecard* (December 2016).



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developed with the National 911 Program. However the Office of EMS had not yet developed a draft strategic plan during the time of our review.

Federal internal control standards call for management to clearly define objectives in order to achieve desired results. According to these standards, an entity determines its mission, establishes specific measurable objectives, and formulates plans to achieve its objectives. These standards state that management sets objectives in order to meet the entity's mission, strategic plan, and goals and requirements of applicable laws and regulations.<sup>51</sup> In addition, our work on leading practices for managing for results indicated that an agency's strategic goals should also explain what results are expected from the agency and when to expect those results.<sup>52</sup> Further, these goals form a basis for an entity to identify strategies to fulfill its mission and improve its operations to support the achievement of that mission.<sup>53</sup>

As the lead entity for coordinating federal NG911 efforts, the National 911 Program faces a complex and challenging task of assisting the 911 community while the nation's 911 systems undergo a major transformation. However, without specific goals and related performance measures, the National 911 Program is unable to assess how well its activities are achieving results in relation to its responsibilities identified in the 2012 Act. As the National 911 Program and the Office of EMS consider creating a strategic plan, ensuring that the plan includes specific goals and related measures for the National 911 Program would help officials better understand whether the program's activities are effectively assisting states and localities in transitioning to a fully integrated national NG911 system, and help identify any programmatic changes that might be needed.

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### National 911 Program Lacks Plans to Identify Roles and Responsibilities for the NG911 Roadmap Initiative and an Implementation Plan to Achieve Objectives

As previously mentioned, the National 911 Program is in the early stages of establishing an interagency initiative to create a National NG911

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<sup>51</sup>[GAO-14-704G](#).

<sup>52</sup>[GAO/GGD-10.1.16](#).

<sup>53</sup>[GAO/GGD-97-180](#).

Roadmap. This initiative will convene the 911 stakeholder community to identify national-level tasks that need to be completed by federal agencies and other organizations to realize a national, interconnected NG911 system. According to the National 911 Program, a list of the national-level tasks needed to advance NG911 implementation nationwide has not been created to date. In addition, state officials we spoke with said there are certain issues related to interoperability and cybersecurity that federal agencies need to address before states can connect their respective state NG911 systems. To address these issues, NHTSA's National 911 Program issued a request for proposal (RFP) in August 2017 for managing the roadmap development process and awarded a contract in September 2017.<sup>54</sup> While the National 911 Program is taking steps to develop a National NG911 Roadmap, the program does not have a plan to identify: (1) roles or responsibilities for federal entities to carry out national-level tasks or (2) how the program plans to achieve the roadmap's objectives.

### Clarifying Roles and Responsibilities

NHTSA's NG911 roadmap RFP specifies that by identifying a list of national-level tasks that are developed and adopted by the 911 stakeholder community, the roadmap could serve as a blueprint to carry out these tasks and thereby ensure the interoperability of the nation's NG911 system. However, the National 911 Program does not have plans for the entities participating in the development of the roadmap to be assigned roles and responsibilities for executing the roadmap's national-level tasks. National 911 Program officials told us the National 911 Program does not plan to assign roles and responsibilities because NHTSA does not have the authority to require or assign tasks for other entities. Additionally, program officials view the simultaneous identification of tasks and assignments of responsibility for those tasks as a risk to facilitating a candid and productive discussion with entities participating in the roadmap initiative. However, officials stated it may be appropriate for agencies participating in the roadmap initiative to perform specific tasks after the roadmap is finalized. We have previously examined interagency

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<sup>54</sup>According to the roadmap's RFP, as states begin to explore interconnection with other states' 911 systems, certain tasks should be completed in order to achieve a nationwide system where all states' NG911 networks are interoperable and connected. The RFP specifies that the contractor will be required to conduct a public comment process, convene a steering group of 911 experts, and gather input from federal and private sector entities on the content of the roadmap, and deliver a final roadmap to NHTSA.

collaborative mechanisms and identified certain key issues for federal agencies to consider when using these mechanisms to achieve results.<sup>55</sup> Our prior work has found that following leading collaboration practices, such as clarifying roles and responsibilities of agencies engaged in collaboration, can enhance and sustain collaboration among agencies and provide an understanding of who will do what in support of meeting the aims of the collaborative group.<sup>56</sup>

As stated above, the RFP specifies that a roadmap developed by and adopted by 911 stakeholders could serve as a blueprint to carry out the roadmap's tasks. Securing the commitment of agencies to assigned roles could help organize the collaborative group's joint and individual efforts and thereby better facilitate decision making. As we have previously found, a lack of clarity on the roles and responsibilities of agencies participating in an interagency effort—such as the execution of the roadmap's tasks—may limit agencies' abilities to effectively achieve shared objectives.<sup>57</sup> Given the complexity of the task and the number of agencies that could be involved, following selected leading collaboration practices for the roadmap initiative—particularly with regard to collaborating with roadmap stakeholders to clarify their roles and responsibilities (whether during the creation of the task list or afterwards)—could reduce barriers to agencies effectively working together to achieve the national-level tasks.

### Developing an Implementation Plan to Achieve Objectives

While clarifying the roles and responsibilities of roadmap stakeholders for the execution of the roadmap's tasks is an important collaborative step, the National 911 Program has additional responsibilities as the lead entity for the initiative. However, National 911 Program officials are unable to clearly articulate how the program will proceed following the completion of the roadmap. National 911 Program officials said without knowing the contents of the roadmap, it would be premature to specify how the roadmap's national-level tasks would be completed. Officials stated that

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<sup>55</sup> [GAO-12-1022](#).

<sup>56</sup> For example, other key practices include defining and articulating short and long-term outcomes and ensuring relevant participants are included in the process. For more information on examples, see [GAO-12-1022](#).

<sup>57</sup> GAO, *Emergency Communications: Effectiveness of the Post-Katrina Interagency Coordination Group Could be Enhanced*, [GAO-16-681](#) (Washington, D.C.: July 14, 2016).

once the roadmap is completed, possible next steps may include identification of timelines, deadlines, and a mechanism for tracking progress, among other things, but officials stated that these steps are not required in the roadmap RFP. As stated above, federal internal control standards call for management to clearly define objectives in specific terms. According to these standards, management defines what is to be achieved, who is to achieve it, how it will be achieved, and the time frames for achievement.<sup>58</sup>

Without a clear plan for how the National 911 Program would take next steps to support the implementation of the roadmap's objectives and tasks, the National 911 Program may not be prepared to take effective action once the roadmap is completed. We have previously found that having an implementation plan can assist agencies to better focus and prioritize goals and objectives, and align planned activities.<sup>59</sup> Once the roadmap is completed, developing an implementation plan that details what is to be achieved and how it will be accomplished will place the National 911 Program in a better position moving forward to support the completion of the national-level tasks.

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## Conclusions

The current 911 system is undergoing a historic transition. With no federal requirement that states transition to NG911 services, federal leadership is critical to addressing interoperability challenges and promoting the goal of an interconnected national system. As the lead federal entity for fostering coordination and collaboration among federal, state, and local 911 authorities, the National 911 Program plays a critical role in coordinating NG911 implementation efforts to improve the nation's 911 services. However, this program—in collaboration with other federal agencies—faces a complex and challenging task to help move approximately 6,000 independent 911 call centers toward an interconnected national NG911 system. In addition, given that the NG911 transition is still in its early stages and is an ongoing effort, it is difficult to assess the effectiveness of various federal actions to assist states and localities in the transition. In

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<sup>58</sup>[GAO-14-704G](#).

<sup>59</sup>GAO, *DOD Biometrics and Forensics: Progress Made in Establishing Long-term Deployable Capabilities, but Further Actions Are Needed*, [GAO-17-580](#) (Washington, D.C.: Aug. 7, 2017).

light of these challenges, without specific goals and related measures to assess effectiveness, the National 911 Program may be hindered in determining whether it is making progress towards its stated mission. Through the roadmap initiative, the National 911 Program has taken important first steps in identifying the need for actions at the national level, in order to fully realize the desired end-state of a national, interconnected NG911 system. However, while identifying needed next steps is essential, equally important to the collaborative effort's success is (1) defining and agreeing on the roles and responsibilities of the entities best suited to undertake these actions, and (2) developing plans for how the National 911 Program will support implementation to achieve the roadmap's objectives. If taken, these actions could help further NG911 implementation nationwide and help the National 911 Program and federal agencies in assisting states and localities to improve these lifesaving services.

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## Recommendations for Executive Action

We are making the following three recommendations to the Administrator of NHTSA regarding the National 911 Program:

- develop specific program goals and performance measures related to NG911 implementation. (Recommendation 1)
- in collaboration with the appropriate federal agencies, determine roles and responsibilities of federal agencies participating in the National NG911 Roadmap initiative in order to carry out the national-level tasks over which each agency has jurisdiction. (Recommendation 2)
- develop an implementation plan to support the completion of the National NG911 Roadmap's national-level tasks. (Recommendation 3)

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## Agency Comments

We provided a draft of this report to the Departments of Transportation, Commerce, and Homeland Security and FCC for their review and comment. In its comments, reproduced in appendix III, the Department of Transportation agreed with the recommendations. The Departments of Transportation and Homeland Security also provided technical comments, which we incorporated as appropriate. The Department of Commerce and FCC had no comments.

As agreed with your office, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies of this report to the appropriate congressional committees, the Secretary of the Department of Transportation, the Secretary of the Department of Commerce, the Secretary of the Department of Homeland Security, the Managing Director of the FCC, and other interested parties. In addition, the report will be available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions about this report, please contact me at (202) 512-2834 or [goldsteinm@gao.gov](mailto:goldsteinm@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. Staff who made key contributions to this report are listed in appendix IV.



Mark L. Goldstein  
Director, Physical Infrastructure Issues

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## Appendix I: Objectives, Scope, and Methodology

Our objectives were to examine (1) progress states and localities are making to implement Next Generation 911 (NG911) and the challenges they have faced and (2) how federal agencies have addressed state and local implementation challenges and planned next steps.

To describe state and local progress in implementing NG911 and background information on fee collection and costs, we analyzed select survey data elements from the *2016 National 911 Progress Report*<sup>1</sup> and the *Eighth Annual Report to Congress on State Collection and Distribution of 911 and Enhanced 911 Fees and Charges*,<sup>2</sup> maintained by the National Highway Traffic Safety Administration (NHTSA) and the Federal Communications Commission (FCC) respectively. More specifically, we analyzed the most recent state-provided data (from calendar year 2015) related to the planning and implementation of NG911 at the state and local levels, as well as NG911 cost and 911-related revenue data. We assessed the reliability of these data by reviewing relevant documents and discussing data elements with staff responsible for collecting and analyzing the data. We also conducted our own testing to check the consistency of the data. We found the data from both sources to be sufficiently reliable for our purposes to describe states' progress in implementing NG911 and provide background on 911 fee collection and costs. While these data provide the best nationwide picture of NG911 implementation and fee collection, and are reliable for our purposes, there are some limitations on how the data can be used. Since we did not validate the state-reported responses, our findings based on

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<sup>1</sup>These data consist of survey data collected annually by NHTSA's National 911 Program. According to the National 911 Program, these data can be used to characterize the status of statewide 911 systems and measure progress in implementing advanced 911 systems. See NHTSA, *2016 National 911 Progress Report, National 911 Program* (Washington, D.C.: December 2016).

<sup>2</sup>These data consist of survey data collected annually by FCC on state collection and use of 911 fees. FCC is required to report to Congress on the identity of states, territories, or political subdivisions (such as counties or localities) that collect taxes, fees, or other charges for emergency communications. This reporting includes the amount of those revenues used for purposes other than the ones specified in the state's method of funding 911—also known as 911 fee diversion. See FCC, *Eighth Annual Report to Congress on State Collection and Distribution of 911 and Enhanced 911 Fees and Charges for the Period January 1, 2015 to December 31, 2015* (Washington, D.C.: Dec. 30, 2016).

these data are limited to what states reported. Additionally, regarding the *2016 National 911 Progress Report* data, there are limitations to (1) making comparisons between states because states have different approaches to implementing NG911 and (2) ascertaining year-over-year progress because reporting is voluntary and states' response rates can vary year to year.

To describe implementation challenges that states and local authorities may be encountering, we selected a non-generalizable sample of 10 states as case studies, based upon a variety of factors, including reported progress in implementing NG911, statewide planning and coordination, reported number of annual 911 calls, whether states diverted 911 fees to other uses, and variation in geographic location. We selected these states, in part, based on their responses to the two aforementioned surveys. Based on the aforementioned criteria, we selected the following states to include as case studies: California, Maine, Maryland, Minnesota, Nevada, New Hampshire, North Dakota, South Dakota, Vermont, and Virginia. We reviewed documents and interviewed state officials from all of these states except Nevada about NG911 implementation progress, challenges, federal actions, and any additional assistance needed. We contacted 911 officials in Nevada but did not receive responses. We also interviewed local officials in four of the selected states. While not generalizable to all states, the information obtained from our case studies provides examples of broader issues faced by states and localities in managing the NG911 transition.

To determine how federal agencies have addressed state and local implementation challenges and planned next steps, we reviewed relevant statutes, regulations, and documentation of federal agency actions and plans, and our prior reports. We also interviewed officials from federal agencies, including NHTSA, the National Telecommunications and Information Administration (NTIA), FCC, and the U.S. Department of Homeland Security (DHS), about federal actions taken and plans for next steps. To understand planning activities undertaken by NHTSA's National 911 Program, and its planned project to develop a National NG911 Roadmap, we reviewed the National 911 Program's internal planning documents, the program's request for proposal to develop a national roadmap, the program's written responses to our questions, and interviewed National 911 Program officials. In addition, we interviewed officials from national associations representing emergency-response-technology companies, wireless and wireline phone carriers, emergency-communications entities, and groups representing deaf and hard-of-hearing consumers to gain their perspectives on federal actions taken



and next steps. We assessed the National 911 Program's strategic-planning activities against leading practices for performance management found in our prior work on strategic planning and goal setting and federal internal control standards.<sup>3</sup> We assessed the National 911 Program's planned activities for the national roadmap project against federal internal control standards and selected key practices to enhance interagency collaboration identified in our prior work.<sup>4</sup>

We conducted our work from January 2017 to January 2018 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.

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<sup>3</sup>GAO, *Standards for Internal Control in the Federal Government*, [GAO-14-704G](#) (Washington, D.C.: September 2014); *Agencies' Strategic Plans Under GPRA: Key Questions to Facilitate Congressional Review*, [GAO/GGD-10.1.16](#) (Washington, D.C.: May 1997); and *Managing for Results: Critical Issues for Improving Federal Agencies' Strategic Plans*, [GAO/GGD-97-180](#) (Washington, D.C.: Sept. 16, 1997).

<sup>4</sup>GAO, *Managing for Results: Key Considerations for Implementing Interagency Collaborative Mechanisms*, [GAO-12-1022](#) (Washington, D.C.: Sept. 27, 2012).

## Appendix II: Selected Federal Actions since 2013 to Address State and Local Challenges in Implementing Next Generation 911 (NG911), as of October 2017

Challenges	Description of challenge	Federal actions
Funding	State and local funding may not be sufficient to support costs associated with transitioning to NG911 equipment and infrastructure.	<p><b>Grant resources:</b> The National Highway Traffic Safety Administration's (NHTSA) National 911 Program issued on its website a list clarifying which of the fiscal year 2016 emergency-communications grants may be used for NG911 services. Program officials said they developed this list in collaboration with the Department of Homeland Security (DHS).</p> <p><b>Cost study:</b> NHTSA's National 911 Program and the National Telecommunications and Information Administration (NTIA), in consultation with the Federal Communications Commission (FCC) and DHS, plan to issue a study of the range of costs for 911 call centers and service providers to implement NG911 systems and on the nationwide progress of implementing NG911 services.</p> <p><b>Grant program:</b> NHTSA and NTIA are preparing to jointly administer a \$115 million grant program to improve 911 services, including the adoption and operation of NG911 services. NHTSA and NTIA expect to award the grants in 2018.</p> <p><b>Funding mechanisms:</b> An advisory body tasked by FCC issued a report<sup>a</sup> in 2016 that identified common costs and funding mechanisms for 911 officials to consider. The report also introduced a 911 funding sustainment model designed for use by 911 officials to calculate their financial needs to support a transition to NG911 implementation.</p>

**Appendix II: Selected Federal Actions since 2013 to Address State and Local Challenges in Implementing Next Generation 911 (NG911), as of October 2017**

<b>Challenges</b>	<b>Description of challenge</b>	<b>Federal actions</b>
Evolving technology and operations	Transitioning from legacy infrastructure to Internet Protocol-based systems presents technical and operational challenges such as interoperability and cybersecurity risks.	<p><b>Guides on technology standards and procurement practices:</b> In 2017, NHTSA’s National 911 Program issued an annual guide<sup>b</sup> on emergency-communications technology standards that stressed the importance of using open technology standards for NG911 services. The National 911 Program issued another guide<sup>c</sup> in 2016 that provides information on procuring goods and services related to NG911 such as practices for call centers to consider when developing their request for proposals and contracts.</p> <p><b>Examining emerging technology issues:</b> In 2017, FCC tasked a public-private advisory council to recommend how FCC can promote the NG911 transition, enhance the reliability of NG911, and mitigate the threat of 911 outages. Prior to that tasking, the FCC advisory council issued a report<sup>d</sup> in 2016 that explored location-based routing issues and discussed transition considerations from legacy 911 to NG911.</p> <p><b>NG911 cybersecurity guide and technical assistance:</b> DHS, with input from NHTSA’s National 911 Program according to DHS officials, issued a guide<sup>e</sup> in 2016 that identifies cybersecurity risks for NG911 and risk mitigation strategies. In addition, DHS provides NG911 technical assistance for states seeking assistance with strategic planning and technology integration. In a separate effort, an advisory body tasked by FCC to examine 911 call center architecture issued a report<sup>f</sup> in 2016 that provides a cybersecurity self-assessment tool for call centers and guidance on cybersecurity strategies.</p>
Governance	States may face a range of challenges related to evolving roles for state and local 911 authorities that could hinder NG911 implementation.	<p><b>Guides on state and legislative planning:</b> NHTSA’s National 911 Program issued guides on state 911 planning<sup>g</sup> and legislative issues to consider for NG911<sup>h</sup> and awarded a contract in September 2017 to update those guides. In 2016, the National 911 Program issued a guide<sup>i</sup> based on the experiences of Iowa, Minnesota, North Dakota, and South Dakota that identifies practices to consider for states interconnecting NG911 networks across state lines.</p> <p><b>Exploring NG911 governance implementation issues:</b> In 2016, an advisory body tasked by FCC issued a report<sup>j</sup> that identifies NG911 governance approaches, issues, and recommendations for states, localities, and call centers to consider when planning for the deployment of NG911. In 2013, FCC also issued a report<sup>k</sup> that details recommendations to Congress for transitioning from legacy 911 to NG911 networks.</p> <p><b>Guide on emergency communications governance structures:</b> In 2015, DHS and the National Council of Statewide Interoperability Coordinators issued a guide<sup>l</sup> that provides characteristics of effective governance approaches and best practices for officials to establish, assess, and update their governance structures.</p>

Source: GAO analysis of NHTSA, NTIA, FCC, and DHS information. | GAO-18-252

<sup>a</sup>FCC, Task Force on Optimal Public Safety Answering Point Architecture, *Working Group 3 Report: Funding Sustainment Model* (December 2016).

<sup>b</sup>Department of Transportation, NHTSA, National 911 Program, *Next Generation 911 (NG911) Standards Identification and Review* (Washington, D.C.: March 2017).

<sup>c</sup>Department of Transportation, NHTSA, National 911 Program, *Next Generation 911 Procurement Guidance* (Washington, D.C.: October 2016).

<sup>d</sup>FCC, Communications Security, Reliability and Interoperability Council V, Working Group 1, *Evolving 911 Services, Final Report – Task 2: 911 Location-Based Routing* (September 2016).

<sup>e</sup>DHS, Office of Emergency Communications, *Cyber Risks to Next Generation 911* (2016).

<sup>f</sup>FCC, Task Force on Optimal Public Safety Answering Point Architecture, *Adopted Final Report* (January 2016). Additional information on cybersecurity planning for NG911 can be found in FCC,

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**Appendix II: Selected Federal Actions since 2013 to Address State and Local Challenges in Implementing Next Generation 911 (NG911), as of October 2017**

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Task Force on Optimal Public Safety Answering Point Architecture, *Working Group 1, Optimal Cybersecurity Approach for PSAPs, Supplemental Report* (December 2016).

<sup>9</sup>Department of Transportation, NHTSA, *Model State 911 Plan* (February 2013).

<sup>h</sup>Department of Transportation, NHTSA, *Guidelines for State NG9-1-1 Legislative Language* (November 2012).

<sup>i</sup>Department of Transportation, NHTSA, National 911 Program, *Next Generation 911 (NG9-1-1) Interstate Playbook: Implementing State-to-State 9-1-1 Connectivity* (Washington, D.C.: October 2016).

<sup>j</sup>FCC, Task Force on Optimal Public Safety Answering Point Architecture, *Adopted Final Report* (January 2016). Additional information on governance planning for NG911 can be found in FCC, Task Force on Optimal Public Safety Answering Point Architecture, *Working Group 2, Phase II Supplemental Report: NG9-1-1 Readiness Scorecard* (December 2016).

<sup>k</sup>FCC, *Legal and Regulatory Framework for Next Generation 911 Services, Report to Congress and Recommendations* (February 2013).

<sup>l</sup>DHS, *Emergency Communications Governance Guide for State, Local, Tribal, and Territorial Officials* (September 2015).

## Appendix III: Comments from the U.S. Department of Transportation



U.S. Department of  
Transportation  
Office of the Secretary  
of Transportation

Assistant Secretary for Administration

1200 New Jersey Avenue SE  
Washington, DC 20590

JAN 11 2018

Mark L. Goldstein  
Director, Physical Infrastructure Issues  
U.S. Government Accountability Office (GAO)  
441 G Street NW  
Washington, DC 20548

Dear Mr. Goldstein:

The National Highway Traffic Safety Administration's (NHTSA) mission is to save lives, prevent injuries, and reduce traffic-related deaths and economic losses resulting from motor vehicle crashes. The National 911 Program (Program) furthers this mission by supporting and promoting an optimal emergency response system if crashes occur. The Program's role is to convene and coordinate public and private sector efforts to support the improvement of the nation's 911 system; collect and create resources for local and state 911 Authorities who operate the 911 system; and administer a grant program specifically for the benefit of 911 Public Safety Answering Points (PSAPs).

NHTSA has several efforts underway or completed to enhance the Program, including the following:

- convened the 911 community and solicited ideas for a National Next Generation 911 (NG911) Roadmap—a project to identify tasks that must be completed at the national level, for a seamless, nationwide NG911 system;
- maintained the National 911 Profile Database, containing uniform data voluntarily submitted by state 911 agencies on their progress in deploying NG911; and
- partnered with the National Telecommunications and Information Administration in the U.S. Department of Commerce to finalize implementing regulations for the 911 Grant Program, which will provide \$115 million in funding to states and tribal organizations for NG911 implementation.

Upon review of the GAO's draft report, we concur with the three recommendations. With respect to recommendation 2, to determine roles and responsibilities of federal agencies in the National NG911 Roadmap initiative to carry out the roadmap's national-level tasks, NHTSA will work with the appropriate federal agencies to determine roles and responsibilities for the tasks over which each agency has jurisdiction. We will provide a detailed response to each recommendation within 60 days of the final report's issuance.

We appreciate the opportunity to respond to the GAO draft report. Please contact Madeline M. Chulumovich, Director, Audit Relations and Program Improvement at (202) 366-6512 with any questions.

Sincerely,

Keith Nelson  
Assistant Secretary for Administration

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## Appendix IV: GAO Contact and Staff Acknowledgments

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### GAO Contact

Mark L. Goldstein, (202) 512-2834 or [GoldsteinM@gao.gov](mailto:GoldsteinM@gao.gov)

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### Staff Acknowledgments

In addition to the contact named above, Andrew Huddleston (Assistant Director), Jean Cook (Analyst in Charge), Camilo Flores, Steven Rabinowitz, Malika Rice, Kelly L. Rubin, Michael Sweet, Hai Tran, Marika Van Laan, and Michelle Weathers made key contributions to this report.

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## Appendix V: Accessible Dat

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### Agency Comment Letter

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#### Text of Appendix III: Comments from the U.S. Department of Transportation

U.S. Government Accountability Office (GAO) 441 G Street NW

Washington, DC 20548

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Keith Nelson

Assistant Secretary for Administration



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