The National 911 Program

Next Generation 911 (NG911) Roadmap Progress Report

911.gov

DOCUMENT CHANGE HISTORY

The table below details the change history of this NG911 Roadmap Progress Report document.

Version	Publication Date	Description
1.0	June 2020	Initial Release

Table of Contents

Background

Definition of Next Generation 911 (NG911)

On January 12, 2018, the National 911 Program and the NG911[1] NOW Coalition—whose membership was comprised of the National Emergency Number Association (NENA), the National Association of State 911 Administrators (NASNA), and the Industry Council for Emergency Response Technologies (iCERT)—mutually agreed that "NG911 services" is defined as a secure, Internet Protocol (IP)-based, open-standards system comprised of hardware, software, data, and operational policies and procedures that:

- Provides standardized interfaces from emergency call and message services to support emergency communications.
- Processes all types of emergency calls, including voice, text, data, and multimedia information.
- Acquires and integrates additional emergency call data useful to call routing and handling.
- Delivers the emergency calls, messages, and data to the appropriate public safety answering point (PSAP) and other appropriate emergency entities based on the location of the caller.
- Supports data, video, and other communications needs for coordinated incident response and management.
- Interoperates with services and networks used by first responders (and other 911 systems) to facilitate emergency response.

In addition to the technical factors described above, the implementation of NG911 functions involves many governance and operational issues. These elements are described in the FCC Task Force on Optimal PSAP Architecture (TFOPA)'s *Adopted Final Report*, released on January 29, 2016.

---

[1] Next Generation 911

Related NG911 Activities

In December 2016, TFOPA Working Group 2 published a report titled, *Phase II Supplemental Report: NG9-1-1 Readiness Scorecard*, that identified the barriers that impede nationwide progress toward NG911 capabilities; these barriers include lack of understanding, funding, standards, outreach, and bandwidth for planning. In January of 2018, the U.S. Government Accountability Office (GAO) reviewed NG911 implementation nationwide, and published a report recommending that "NHTSA's National 911 Program develop performance goals and measures and, determine agencies' roles and responsibilities and develop an implementation plan.[2]

NG911 Roadmap

Throughout 2018 and the first half of 2019, a team of 911 experts met and in June 2019 published the *NG911 Roadmap: Pathways Toward Nationwide Interconnection of 911 Services*. This document identified tasks and ideas that could be used as a blueprint to address these barriers and ensure end-to-end interoperability of NG911 systems across the country. The NG911 Roadmap was developed to determine the activities (technical and non-technical), at a national level, that must be completed in order to achieve a nationwide, fully integrated NG911 system of systems. This initial document provided the framework for subsequent efforts to assess progress toward completion of national NG911 tasks.

The following pages provide a short review of the Roadmap, which described the current status of NG911 deployment at the time of publication, and what needs to be accomplished in the future to achieve a fully functional, national NG911 end state.

---

[2] Next Generation 911 National 911 Program Could Strengthen Efforts to Assist States.
https://www.gao.gov/products/GAO-18-252

Where We are Now ... and Where We are Headed[3]

Today, we operate in a siloed environment
Coordinating across jurisdictions is a challenge. There are approximately 6,000 PSAPs in operation, each with varying governance structures and operational environments.

We do not know how ready we are for NG911
Assessing levels of NG911 functionality is a challenge. PSAPs that are operating through an ESInet or that have installed and tested other NG911 functions and/or components may or may not be using these elements to their full potential.

Not every jurisdiction has an NG911 champion or planner
Getting buy-in at local, regional, state, tribal, and federal levels is crucial for moving forward. Without a jurisdictional champion, motivating transition is a steep uphill climb.

We all will be on the same page!
All jurisdictions will have "bought in" and will have access to the tools needed to garner support and commit time and resources to moving forward.

We will know more so we can do more!
With all jurisdictions on board, we truly can assess our current technical and operational capabilities and connect the dots between gap areas and end-state capabilities.

No more silos!
Ultimately, as jurisdictions reach full NG911 functionality and NG911 interconnection components are in place nationwide, 911 systems will be interconnected, interoperable, and able to provide optimal services to anyone at any location.

What Is the NG911 Roadmap?

The *NG911 Roadmap* (Roadmap) is a collaborative effort between the National 911 Program and 911 stakeholders from both the public and private sectors. It focuses on what needs to be done at the national level—by all members of the 911 community—to achieve a nationwide NG911

---

[3] 911.gov. *NG911 Roadmap: Pathways toward nationwide interconnection of 911 services,* Version 1, 2019. https://www.911.gov/pdf/NG911_Roadmap_Final.pdf.

system of systems. This concept entails the existence of NG911 capabilities at the jurisdictional level across the U.S., as well as interconnectivity and interoperability amongst those systems using common standards nationwide. *Why?* Among the benefits of nationwide interoperability is the ability to respond to 911 requests faster, with greater accuracy, greater situational awareness, greater resilience, and with more-consistent quality. First responders, emergency management, and other public safety entities would be able to provide optimal service not only to their own communities, but also to neighboring communities in need of additional resources or assistance. Furthermore, interconnectivity and interoperability among 911 systems poises the nation to obtain better awareness of community needs, identify trends, and evaluate how effectively U.S. residents and visitors are served.

The Roadmap identifies potential tasks to support the following goals:

1. ***Business/Governance Goal:*** Identify strategies and resources to address policy, regulatory, governance, and funding issues or obstacles faced by jurisdictions, both independently (along their transition to NG911 capabilities) and collectively (as they relate to achieving nationwide interconnectivity).

2. ***Technology (Tech) Goal:*** Stimulate adoption and enable implementation of NG911 technology by promulgating NG911 open standards and establishing means by which emerging technologies can be validated for compliance and security.

3. ***Data Goal:*** Support the enhancement of 911 services by establishing technical and operational data solutions that support cross-jurisdictional and nationwide situational awareness, interoperability, information sharing, and predictive data analysis.

4. ***Operations (Ops) Goal:*** Distinguish, enhance, and promote operating procedures, performance evaluation, and professional-development strategies that support complete and streamlined implementation of NG911 capabilities.

5. ***Cross-Cutting Goal:*** Facilitate education and knowledge transfer on an ongoing basis.

Each goal is further defined by issues that are important to complete to accomplish the goal, and each issue is further defined by a series of tasks. For detailed information on these issues and tasks see *NG911 Roadmap: Pathways toward nationwide interconnection of 911 services*.

A Call to Action!

The Roadmap is relevant to everyone. Any entity or individual that influences, contributes to, or benefits from 911 services has a potential role in bringing the Roadmap to life. While the National 911 Program intends to be the "keeper of the list" and monitor progress in completing the tasks identified in this document, responsibilities for specific tasks will not be assigned. It is assumed that individuals, agencies, organizations, and the 911 community at large will address, inform, or

champion specific issues once they are identified and publicized. Simply put, the "call to action" is to act in a manner that aligns best with your expertise, interests, and priorities.

NG911 stakeholders are members of a broad and diverse community of users who generally can be categorized as follows:

- 911 and public safety agencies and authorities
- Vendor community (including hardware and software) and related industries
- Technology, services, and consulting industries
- Standards-development organizations (SDOs) and standards-setting organizations (SSOs)
- Consumer, research, academic, and consortia communities
- Telematics, third-party call centers, internet, infrastructure, wireline, and wireless service providers
- Transportation agencies
- Local, state, and federal governments
- Regulatory agencies and public utility commissions
- Professional and trade associations
- The public at large

The Roadmap included the values of the stakeholders listed below in Table 1 and the following description:

The value of nationwide interconnection and interoperability of 911 networks and systems is multifaceted and unique to each stakeholder group that contributes to, operates within, and benefits from effective 911 services. Table 1 on the following page identifies a few distinct value areas for 911 service providers, public safety professionals, organizations that provide support for populations in crisis, private industry, and the public.

Table 1: Value of a Nationwide NG911 System of Systems

	INCLUDES, BUT IS NOT LIMITED TO	VALUE PROPOSITIONS
911 Services	• PSAP managers and telecommunicators • 911 administrators • 911 legislators • Governmental offices and national organizations that provide services in support of 911, e.g., information technology (IT), geographic information system (GIS), and SDOs/SSOs	• More-efficient handling of 911 requests at every phase of a call's entire lifecycle. • Heightened (and more purposeful) access to richer, more accurate data, enabling more-effective response and more-purposeful decision-making at the policy level. • Access to richer data and information on requestor location and level of need at all times and from any PSAP. • Continuity of operations and avoidance of any lapse in service availability due to disruptions experienced by a given PSAP. • Opportunities for increased standardization of 911 operations and establishment of baseline skillsets for 911 professionals across the country. • Ability to support translation capabilities for persons with limited English proficiency (e.g., text sessions).
Public Safety	Agencies and professional organizations that represent: • Emergency medical services • Fire/rescue services • Law enforcement • Emergency management • Search and rescue • Poison control	• Heightened awareness of a caller's needs, location, and conditions. • Ability to accurately transfer information to the most-appropriate responders who can provide the most expedient services. • Ability to arrive at the right scene faster. • Ability to more rapidly procure augmentative support from other public safety services within or outside of jurisdictional boundaries. • Access to richer, more-comprehensive data that enables the ability to establish and meet purposeful performance metrics, justify funding requests, and heighten efforts to keep responders safe and healthy.
Support Services	Centers/hotlines providing specialized response and support services, such as: • Suicide prevention • Abuse and crisis intervention • Missing persons intervention	• Easier, more expeditious access to 911 systems, enabling rapid response to specialized needs. • Ability to send richer, more contextual data to 911 systems.
Industry	• Telecommunications carriers • Network service providers • Computer-aided dispatch (CAD) vendors • Call handling equipment (CHE) vendors • Telematics providers	• Mechanisms by which to certify services and technology as compliant with NG911 open standards. • Parity regarding legal liability protection. • Reduction in interconnection points. • Heightened ability to route 911 calls to the most appropriate PSAP.
The Public	All U.S. residents and visitors; includes specialized support for groups with specific needs, such as: • Users of mobile health devices • Persons with disabilities • Persons with limited English proficiency	• Faster connection to telecommunicators (thus emergency services that can respond in the most immediate manner). • Ability to use existing technology. • Able to provide better data and information (e.g., multimedia). • In some cases, negation of need to physically initiate the emergency call.

Overview of this NG911 Roadmap Progress Report

The purpose of this Roadmap Progress Report is to provide a baseline status of activites related to the completion of the tasks identified for each of the five Roadmap goals; which can be used to track progress in accomplishing the tasks that were identified in the NG911 Roadmap. The status of the tasks and goals in the Roadmap will not remain static over time. New needs and goals will likely be identified during the implementation of NG911 nationwide. The purpose of this document is to provide a baseline for tracking changes to goals, issues and tasks during the implementation process.

How the Activities are Tracked

This Roadmap Progress Report uses the original Roadmap as a framework. It assesses progress and identifies activities that are taking place toward accomplishing the goals and objectives identified in the Roadmap. To determine the status of Roadmap tasks, a group of subject-matter experts (SMEs) used knowledge gleaned from working within SDOs/SSOs as well as information gathered from a variety of 911 agencies, organizations and resources to identify any work that has been done toward completing these tasks.

All tasks are organized in sections, using the same structure as the original Roadmap document, into the following goals/categories:
1. Business/Governance
2. Technology
3. Data
4. Operations
5. Cross-Cutting

Each task within these categories was rated using the following scale:
- Not Started – Tasks that have no nationally organized wor very limited formally recognized activity completed toward completion of the task.
- In Progress – Tasks that have been started but are not yet completed.
- Complete – Tasks that have been completed.

Document Format

Each of the five sections of this Roadmap Progress Report contains four segments that identify the information source, what's new, the status of each task, and the details of the activity. These four segments will be used in every subsequent Progress Report, to provide a consistent reporting structure. The four segments are:
- Background – This describes the history and purpose of the NG911 Roadmap and outlines the format and processes used to manage this report.
- What's New in the Roadmap – This will describe the changes from the last report in subsequent Progress reports.

- Status of the Roadmap – This identifies each task, reports its current status, and provides a task status summary.
- Summary of Task Activities – This identifies information reporting specific activities for each task, for those interested in more detail.

How the 911 Community can Contribute Information and Activities

The National 911 Program has witnessed how the 911 community continues to come together toward advancing NG911 capabilities across the U.S. To keep this document updated, the National 911 Program will share this report's contents, assess progress on an ongoing basis, and encourage all 911 stakeholders to undertake and share activities toward fully implementing NG911. All contributions and updates can be sent to the National 911 Program at NHTSA.National911@dot.gov. The National 911 Program looks forward to working with the 911 community to continue the progress achieved toward accomplishing the goals within the Roadmap.

What's New in the Roadmap?

This is the first version of the NG911 Roadmap Progress Report. Moving forward, the baseline information in this report will be updated to track progress and changes in the status of work being done to complete individual tasks. The following information will be important additions to subsequent versions of this report:

Added Tasks

This section will list tasks that have been added to the Roadmap since the last publication of this document.

Changed Tasks

This section will track how tasks may have changed since the last publication of this document. This could happen for a variety of reasons, including evolution of technology and changing organizational and/or governance circumstances.

Completed Tasks

This section will list those tasks that have been completed since the last publication of this document.

Status of Roadmap

Business/Governance Goal

Identify strategies and resources to address policy, regulatory, governance, and funding issues or obstacles faced by jurisdictions, both independently (along their transition to NG911 capabilities) and collectively as they relate to achieving nationwide interconnectivity.

Business/Governance Goal Status

The Business/Governance Goal has 14 tasks with the following status:

- Complete – 1
- In Progress – 7
- Not Started – 6

Table 2: Business/Governance Goal Status

Issue	Business / Governance Tasks	Status	Notes
Integrity of 911 Funds	Business 1. Concretely define what constitutes eligible spending of 911 funds.	Not Started **Task Gap:** A nationally accepted definition has not been drafted. **Ownership Gap:** Ownership of the task has not been assumed.	Some background work that can inform this task has been completed. The FCC annual fee report and state filings, such as Virginia and Pennsylvania, contain language that could contribute toward completion.
Integrity of 911 Funds	Business 2. Identify financial inefficiencies and other issues regarding current spending approaches.	In Progress Topic has been well-documented in numerous reports. **Ownership Gap:** Ownership of the task has not been assumed.	The FCC and the National 911 Program have facilitated the completion of documents that provide examples of background information.

Issue	Business / Governance Tasks	Status	Notes
Integrity of 911 Funds	Business 3. Develop a nationally accepted definition of the term, "fee diversion."	Not Started **Task Gap:** A nationally accepted definition has not been drafted. **Ownership Gap:** Ownership of the task has not been assumed.	Some background work that informs this task has been completed. The implementing statute for the 911 Grant Program includes a statutory provision prohibiting fee diversion. In addition, the FCC annual fee report and State filings such as from Virginia and Pennsylvania contain language that could be used toward completeing a more formalized definition. This could be completed in conjunction with Business Task 1 above.
Integrity of 911 Funds	Business 4. Develop an adequate and sustainable jurisdictional financial model that includes clear funding and spending guidelines.	In Progress Topic has been well-documented in numerous reports. **Ownership Gap:** Ownership of the task has not been assumed.	Model language from States such as Virginia, Pennsylvania, and Minnesota provide the background content for this task. May require prior completion of Business Tasks 1 and 3.
Funding of Nationwide Resources	Business 5. Develop a comprehensive cost analysis for nationwide products in need of development, testing, implementation, adoption, operations, and maintenance.	Complete	The NG911 Cost Estimate Report to Congress, was published October, 2018. (This report does not include the cost of upgrading federally operated 911 systems.)

Issue	Business / Governance Tasks	Status	Notes
Funding of Nationwide Resources	Business 6. Develop a strategy for developing public policies that support implementation and proper use of nationwide products.	In Progress Topic has been well-documented in numerous reports. This may become s a long-term task that will continue to evolve, as technologies evolve. **Ownership Gap:** Ownership of the task has not been assumed.	Examples of policies exist in current state legislative language and FirstNet[4] policies. The National Emergency Communications Plan (NECP) includes policy information and tasks the CISA[5] with ongoing monitoring of implementation of its goals. The results are to be gathered as part of the expected CISA 2023 Nationwide Communications Survey.
Funding of Nationwide Resources	Business 7. Develop an outreach and stakeholder engagement plan to explore feasible ownership and sustainable funding models.	In Progress Topic has been well-documented in numerous reports. **Ownership Gap:** Ownership of the task has not been assumed.	The FirstNet stakeholder engagement model and the NECP stakeholder engagement processes provide possible examples for completing this task.

[4] First Responder Network Authority
[5] Cybersecurity and Infrastructure Security Agency

Issue	Business / Governance Tasks	Status	Notes
Funding of Nationwide Resources	Business 8. Identify sources of funding for the development, implementation, operation, and support of required nationwide components.	Not Started Need to determine what will be required and any governance necessary to oversee. **Ownership Gap:** Ownership of the task has not been assumed.	Current funding models utilized in states are well-documented by the National Association of State 911 Administrators. The gap is in funding national or regional portions of the NG911 system.
Funding for Jurisdictional NG911 Planning and Implementation	Business 9. Maintain a funding stream for the NG911 grant program.	Not Started Periodic federal funding has been approrpiated, but no funding sources have been identified to provide the amount funding to match the amount reported to Congress for national NG911 implementation. **Ownership Gap:** Ownership of the task has not been assumed.	Task is not started.
Funding for Jurisdictional NG911 Planning and Implementation	Business 10. Identify long-term jurisdictional funding streams, including traditional and non-traditional sources (e.g., public-private partnerships).	In Progress Numerous reports and jurisdictions have identified funding streams. **Ownership Gap:** Ownership of the task has not been assumed.	Topic has been well-documented in numerous reports. This is a long-term task that will continue to evolve as governance models and funding sources evolve.

Issue	Business / Governance Tasks	Status	Notes
NG911 Knowledge Transfer and Planning Guidance	Business 11. Develop an inventory of jurisdictional NG911 roadmaps/plans.	Not Started Many state and regional roadmaps/plans have been published, but not consolidated. **Ownership Gap:** Ownership of the task has not been assumed.	Task is not started; however, some background work that informs this task has been completed. The data required for this task is currently gathered as part of several overlapping initiatives within federal and state agencies.
NG911 Knowledge Transfer and Planning Guidance	Business 12. Develop an analysis report on jurisdictional accomplishments regarding cross-boundary interconnectivity, and identify how approaches can be scaled nationwide.	In Progress Some regional analyses have been completed but lack approaches as to how to scale them nationwide. **Ownership Gap:** Ownership of the task has not been assumed.	The NG911 Interstate Playbook could serve as background information for this analysis. The 911 Data & Information Sharing Plan provides an example of a regional approach that could be transitioned to a national-level strategy.
Policy Conflicts	Business 13. Continue to develop case studies regarding how issues identified have been resolved at jurisdictional and federal levels.	In Progress Analyses have been completed but lack approaches as to how to scale them nationwide. **Ownership Gap:** Ownership of the task has not been assumed.	The NG911 Interstate Playbook could serve as the background information for this analysis. The 911 Data & Information Sharing Plan provides an example of a regional approach that could then be transitioned to a national level strategy.

Issue	Business / Governance Tasks	Status	Notes
Policy Conflicts	Business 14. Develop NG911 policies that address parameters for nationwide interconnectivity of jurisdictional 911 systems.	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	Task is not started; however, some background work that informs this task has been completed. Interdependent on the progress of Business Task 12, which will serve as the precursor/model for this task.

Technology Goal

Stimulate adoption and enable implementation of NG911 technology by promulgating NG911 open standards and establishing means by which emerging technologies can be validated for compliance and security.

Technology Goal Status

The Technology Goal has 15 tasks with the following status:

- Complete – 3
- In Progress – 3
- Not Started – 9

Table 3: Technology Goal Status

Issue	Technology Tasks	Status	Notes
NG911 Interconnection Components	Tech 1. Design, implement, and operate nationwide interconnected ESInets.	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	
NG911 Interconnection Components	Tech 2. Design, implement, and operate a national forest guide.	In Progress NENA has announced that it is releasing a contract for a vendor to implement and operate a national forest guide.	NENA has developed standards for the Forest Guide, and an award was made in April of 2020 to tech companies Eonti and DigiCert, to establish the Forest Guide.
NG911 Interconnection Components	Tech 3. Design, implement, and operate a nationwide PSAP registry.	Complete	NENA Enhanced PSAP Registry Beta Version was launched in October 2019.

Issue	Technology Tasks	Status	Notes
NG911 Interconnection Components	Tech 4. Design, implement, and operate a nationwide GIS data store.	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	Task is not started; however, some background work that informs this task has been completed by multiple organizations and agencies.
NG911 Interconnection Components	Tech 5. Design, implement, and operate a nationwide ICAM[6] capability.	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	Task is not started; however, some background work that informs this task has been completed. The Federal Identity, Credential, and Access Management (FICAM) Architecture provides an enterprise design. There are no initiatives to date for a national-level implementation.
NG911 Interconnection Components	Tech 6. Design, implement, and operate a nationwide cybersecurity capability, such as Emergency Communications Cybersecurity Center (EC3).	Not Started Standards developed, but technology needs testing. **Ownership Gap:** Ownership of the task has not been assumed.	Task is not started; however, some background work that informs this task has been completed. The National Institute of Standards and Technology (NIST) Cybersecurity framework provides the basis for an architectural design. There are no initiatives to date for a national-level implementation.

---

[6] Identity, Credential, and Access Management

Issue	Technology Tasks	Status	Notes
Nationwide Cybersecurity	Tech 7. Develop a research report on the need for, and feasibility of, a nationwide cybersecurity and cyberthreat response framework.	Complete	NIST completed the Framework for Improving Critical Infrastructure Cybersecurity, Version 1.1 in 2018.
Nationwide Cybersecurity	Tech 8. Develop minimum standards and requirements for network interconnection and impacts on facility and personnel security.	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	Task is not started; however, some background work that informs this task has been completed. There are multiple efforts spread across several stakeholder groups. Needs owner to oversee ongoing progress of these diverse efforts.
Nationwide Cybersecurity	Tech 9. Develop a strategy for expanding the connection between national Information Sharing Analysis Centers (ISACs) and PSAPs to augment nationwide NG911 security.	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	This task has not had tangible progress. Interdependent on Technology Task 8.
Carrier Migration and Delivery Standards	Tech 10. Define technical requirements and successes for carrier migration and interconnection using industry standards.	In Progress **Ownership Gap:** Ownership of the task has not been assumed.	There are multiple efforts spread across several stakeholder groups. Needs owner to oversee ongoing progress of these diverse efforts.

Issue	Technology Tasks	Status	Notes
Carrier Migration and Delivery Standards	Tech 11. Develop policies that promote accelerated migration to NG911 by carriers and PSAPs.	In Progress **Ownership Gap:** Ownership of the task has not been assumed.	Updates to the ATIS/TIA J-STD-036 offer information on differentiation of calling devices and location codes. TIA/ATIS[7] led this particular effort.
Validation, Verification, Testing and Evaluation of NG911-Relevant Functions and Systems	Tech 12. Develop minimum requirements that technologies must meet to verify overall legitimacy of 911 service delivery and impact to the 911 ecosystem (e.g., workforce needs, cybersecurity risks).	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	This task has not had tangible progress.
Validation, Verification, Testing and Evaluation of NG911-Relevant Functions and Systems	Tech 13. Develop standards and requirements for NG911 system testing and evaluation, including external systems that interact with NG911 functions (e.g., FirstNet, alarm systems, telematics devices).	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	Task is not started; however, some background work that informs this task has been completed. Disparate efforts exist. NENA ICE[8], vendor labs and FirstNet's test lab offer information on lessons learned.

---

[7] Telecommunications Industry Association/Alliance for Telecommunications Industry Solutions
[8] Industry Collaboration Events

Issue	Technology Tasks	Status	Notes
Validation, Verification, Testing and Evaluation of NG911-Relevant Functions and Systems	Tech 14. Research the feasibility—including cost implications and funding considerations—of establishing sanctioned testing facilities to enable focused, safe evaluation of NG911 products and emerging technologies.	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	Task is not started; however, some background work that informs this task has been completed. Two examples are Texas A&M's testing, performed in conjunction with the Texas Commission on State Emergency Communications (CSEC).and NENA Industry Collaboration Events. However, up-to-date cost projections and funding initiatives have not been established.
Validation, Verification, Testing and Evaluation of NG911-Relevant Functions and Systems	Tech 15. Research the feasibility—including cost implications and funding considerations—of establishing a credentialing authority for NG911 compliance.	Complete	NENA issued the PSAP Credentialing Agency Request for Proposals (RFP) an Enhanced PSAP Registry and Census (EPRC) which will contain a national map that can be accessed by all PSAPs.

Data Goal

Support the enhancement of 911 services by establishing technical and operational data solutions that support cross-jurisdictional and nationwide situational awareness, information sharing, and predictive data analysis.

Data Goal Status

The Data Goal has 7 tasks with the following status:

- Complete – 0
- In Progress – 4
- Not Started – 3

Table 4: Data Goal Tasks Status

Issue	Data Related Tasks	Status	Notes
NG911 Data System	Data 1. Address recommendations that surface as a result of the National 911 Program's Strategic Planning for Collection and Use of Nationwide 911 Data Project.	In Progress **Ownership Gap:** Ownership of the task has not been assumed.	Topic has been well-documented in numerous reports and state-level plans; however, no national-level ownership of this task has been assumed.

Issue	Data Related Tasks	Status	Notes
NG911 Data System	Data 2. Develop NG911-related data models, requirements, and standards relevant to the entire lifecycle of 911 call handling and response (as sanctioned by the 911 community).	In Progress **Ownership Gap:** Ownership of the task has not been assumed.	Numerous and continually evolving national-level standards and best practices exist and are updated. As local and regional NG911 systems are brought online, these standards will continue to evolve and mature from "lessons learned."
Multimedia Data Collection and Management	Data 3. Assess successful national and international efforts, and develop pilot projects to test the integration, use, and aggregation of additional data and multimedia (e.g., images, real-time text, social media, videos).	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	Task is not started; however, some background work that informs this task has been completed. The European Telecommunications Standards Institute (ETSI) conducts regular events regarding system integration, aggregation and testing that could provide background information. The last NENA Industry Colloaboration Event for NG911 systems and components testing took place in November 2013.

Issue	Data Related Tasks	Status	Notes
Multimedia Data Collection and Management	Data 4. Assess successful national and international integration with other governmental agencies (OGAs), and develop pilot projects to test NG911 integration with Smart City initiatives and Internet of Things (IoT) systems.	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	This task has not progressed due to the immaturity of NG911. Interdependent on forward movement of Data Tasks 1-3.
Use of GIS Data	Data 5. Develop an inventory of existing policies relevant to geospatial routing of 911 calls (regardless of technology used).	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	Task is not started; however, some background work that informs this task has been completed. Basics of routing policies are well-documented and basic policy routing rules have been developed, but only rudimentary routing policies are in place due to lack of mature implementations.
Use of GIS Data	Data 6. Develop needed standards, requirements, and best practices for NG911 consumption and handling of GIS data.	In Progress **Ownership Gap:** Ownership of the task has not been assumed.	Information exists throughout multiple documents that are being updated and refined as technology and implementations are brought online.

Issue	Data Related Tasks	Status	Notes
Use of GIS data	Data 7. Research the feasibility—including cost implications and funding considerations—of establishing a national map that can be accessed by all PSAPs.	In progress	In Spring of 2020, NENA announced its formal project to complete an Enhanced PSAP Registry and Census (EPRC), which will contain a national map that can be accessed by all PSAPs.

Operations Goal

Distinguish, enhance, and promote operating procedures, performance evaluation, and professional development strategies that support complete and streamlined implementation of NG911 capabilities.

Operations Goal Status

The Operations Goal has 10 tasks with the following status:

- Complete – 0
- In Progress – 3
- Not Started – 7

Table 5: Operations Goal Task Status

Issue	Operations Tasks	Status	Notes
Cross-Jurisdictional Call Handling	Ops 1. Develop best practices based on how states have overcome cross-jurisdictional issues (e.g., call routing, liability).	In Progress **Ownership Gap:** Ownership of the task has not been assumed.	Language has been drafted for many relevant best practices in projects such as the Interstate Playbook; however, they have not been coalesced into a single document.
Cross-Jurisdictional Call Handling	Ops 2. Develop best practices and/or national standards for operations within the NG911 environment.	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	Task is not started; however, some background work that informs this task has been completed. For example, multiple best practice documents have been developed and reviewed. This task needs to be broken into operational subcategories before a detailed synopsis of its progress can be assessed.

Issue	Operations Tasks	Status	Notes
Cross-Jurisdictional Call Handling	Ops 3. Create best practices for network operations center (NOC) and security operations center (SOC) notifications.	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	Task is not started; however, some background work that informs this task has been completed. New stakeholder working groups provide a good start for this task. Best practices for NOC/SOC entities are interdependent with training on the hybrid 911 system architectures they will encounter during the NG911 transition.
Evolving Workforce Requirements	Ops 4. Develop NG911-appropriate job descriptions (e.g., operational, systems management, GIS).	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	Task is not started; however, some background work that informs this task has been completed. Efforts to date are fragmented across multiple stakeholder organizations. Need an agreed-upon cohesive list of NG911 job descriptions.
Evolving Workforce Requirements	Ops 5. Identify necessary training (e.g., cross-jurisdictional call handling) and professional development needed to bolster the skills and growth paths of those currently in the workforce, as well as opportunities to integrate NG911 education for those who are interested in 911 as a career.	In Progress **Ownership Gap:** Ownership of the task has not been assumed.	Multiple organizations currently provide a variety of training offerings, using multiple curricula and training methods.

Issue	Operations Tasks	Status	Notes
Interconnectivity with Nontraditional Entities	Ops 6. Assess successful national and international interconnectivity with OGAs, and develop pilot projects and demonstrations to identify needs and best practices related to the various nontraditional domains, disciplines, and entities that either require interconnectivity or would benefit from a more direct level of access to 911 services.	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	
Interconnectivity with Nontraditional Entities	Ops 7. Develop guidelines and procedures for interconnecting with nontraditional entities.	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	Task is not started; however, some background work that informs this task has been completed.
Standardized Performance Evaluation	Ops 8. Evaluate the best nationwide approaches for collecting performance-related data.	In-Progress **Ownership Gap:** Ownership of the task has not been assumed.	In 2019, The National 911 Program has published the 911 Data and Information Sharing Strategic Plan, which could provide background and framework for this task.

Issue	Operations Tasks	Status	Notes
Standardized Performance Evaluation	Ops 9. Develop national models for performance analysis and evaluation.	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	Task is not started; however, some background work that informs this task has been completed. Several organizations have published criteria for performance evaluation. Dependent on results of Operations Task 8. Several organizations have published criteria for performance evaluation.
Standardized Performance Evaluation	Ops 10. Develop best practices for applying national models at the jurisdictional level.	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	

Cross-Cutting Goal

Facilitate education and knowledge transfer on an ongoing basis.

Cross-Cutting Goal Status

The Cross-Cutting Goal has 1 task with the following status:

- Complete – 0
- In Progress – 0
- Not Started – 1

Table 6: Cross-Cutting Goal Task Status

Issue	Cross-Cutting Tasks	Overall Status	Summary/Suggestions
National Knowledge Transfer	Cross-Goal 1. Conduct a feasibility study, including cost implications and funding considerations, regarding creation of a national database/repository that houses and makes accessible guidance materials, research, and other resources that are relevant to the entire NG911 spectrum.	Not Started **Ownership Gap:** Ownership of the task has not been assumed.	Task is not started; however, some background work that informs this task has been completed. Multiple organizations have data repositories, such as the FCC and National 911 Program, but these contain more data and information related to more than just NG911, and often have been limited to a specific area not "relevant to the entire NG911 spectrum."

Summary of Task Activities

Reference information regarding recent (after 2017) and past actions (prior to 2017) for each goal is provided in the following tables.

Business/Governance Goal

Table 7: Business/Governance Goal Activities Summary

Business / Governance Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Business 1. Concretely define what constitutes eligible spending of 911 funds.	• Notice of Proposed Rulemaking for 911 Grant Program • Eleventh Annual Report to Congress on State Collection and Distribution of 911 and Enhanced 911 Fees and Charges • Eleventh Annual Fee Report – State and Other Jurisdiction Filings • Pennsylvania Emergency Management Agency – 911 Program Guidance for 2019 • 911 Grant Program – 2019 Grant Recipient Information • Next Generation 911 Cost Study	• NG911 Interstate Playbook Chapter 1 • Blue Ribbon Panel 911 Funding Report to the National 911 Program • Task Force for Optimal PSAP Architecture (TFOPA) WG2 Optimal Approach to NG9-1-1 Architecture Implementation by PSAPs • TFOPA WG-3 Optimal Approach to NG911 Resource Allocation for PSAPs • TFOPA WG-3 Supplemental Report: Funding Sustainment Model • Proposed House Bill H.R. 6424 to amend the Wireless Communications and Public Safety Act of 1999, to clarify acceptable 9-1-1 obligations or expenditures, and for other purposes

Business / Governance Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Business 2. Identify financial inefficiencies and other issues regarding current spending approaches.	• Notice of Proposed Rulemaking for 911 Grant Program • Eleventh Annual Report to Congress on State Collection and Distribution of 911 and Enhanced 911 Fees and Charges • Pennsylvania Emergency Management Agency – 911 Program Guidance for 2019 • Eleventh Annual Fee Report – State and Other Jurisdiction Filings • Next Generation 911 Cost Study • SAFECOM 2018 Emergency Communications System Lifecycle Planning Guide	• NG911 Interstate Playbook Chapter 1 • Blue Ribbon Panel 911 Funding Report to the National 911 Program • TFOPA WG-3 Optimal Approach to NG911 Resource Allocation for PSAPs • TFOPA WG-3 Supplemental Report: Funding Sustainment Model • FCC Report on Legal and Regulatory Framework for NG911 Services • NASNA 911 Funding: Optimizing Revenue from the Current Surcharge Model
Business 3. Develop a nationally accepted definition of the term, "fee diversion."	• Notice of Proposed Rulemaking for 911 Grant Program • Eleventh Annual Report to Congress on State Collection and Distribution of 911 and Enhanced 911 Fees and Charges • Eleventh Annual Fee Report – State and Other Jurisdiction Filings • Pennsylvania Emergency Management Agency – 911 Program Guidance for 2019 • 911 Grant Program – 2019 Grant Recipient Information • Next Generation 911 Cost Study	• NG911 Interstate Playbook Chapter 1 • Blue Ribbon Panel 911 Funding Report to the National 911 Program • Notice of Proposed Rulemaking for 911 Grant Program • NASNA 911 Funding: Optimizing Revenue from the Current Surcharge Model

Business / Governance Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Business 4. Develop an adequate and sustainable jurisdictional financial model that includes clear funding and spending guidelines.	- Notice of Proposed Rulemaking for 911 Grant Program - Eleventh Annual Fee Report – State and Other Jurisdiction Filings - Pennsylvania Emergency Management Agency – 911 Program Guidance for 2019 - Next Generation 911 Cost Study - FirstNet Authority Roadmap - Fiscal Year 2019 SAFECOM Guidance on Emergency Communications Grants - CISA 2019 NECP - SAFECOM 2018 Emergency Communications System Lifecycle Planning Guide - NPSTC Report Best Practices for Public Safety Interoperable Communications (May 2018)	- NG911 Interstate Playbook Chapter 1 - Blue Ribbon Panel 911 Funding Report to the National 911 Program - NASNA Report on Four Potential Sustainable Funding Models for NG911 - NASNA 911 Funding: Optimizing Revenue from the Current Surcharge Model
Business 5. Develop a comprehensive cost analysis for nationwide products in need of development, testing, implementation, adoption, operations, and maintenance.	Next Generation 911 Cost Study	- NG911 Interstate Playbook Chapter 1 - Blue Ribbon Panel 911 Funding Report to the National 911 Program - NASNA Report on Four Potential Funding Models for NG911 - NASNA 911 Funding: Optimizing Revenue from the Current Surcharge Model

Business / Governance Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Business 6. Develop a strategy for developing public policies that support implementation and proper use of nationwide products.	- NCSL State 911 Bill Tracking Database - APCO Project 43: Broadband Implications for the PSAP - FirstNet Authority Roadmap - Fiscal Year 2019 SAFECOM Guidance on Emergency Communications Grants - CISA 2019 NECP - SAFECOM 2018 Emergency Communications System Lifecycle Planning Guide - NPSTC Report Best Practices for Public Safety Interoperable Communications (May 2018)	
Business 7. Develop an outreach and stakeholder engagement plan to explore feasible ownership and sustainable funding models.	- Next Generation 911 Cost Study - FirstNet Authority Roadmap - Fiscal Year 2019 SAFECOM Guidance on Emergency Communications Grants - CISA 2019 NECP - SAFECOM 2018 Emergency Communications System Lifecycle Planning Guide	

Business / Governance Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Business 8. Identify sources of funding for the development, implementation, operation, and support of required nationwide components.	• Next Generation 911 Cost Study • FirstNet Authority Roadmap • 911 Data & Information Sharing: A Strategic Plan • Fiscal Year 2019 SAFECOM Guidance on Emergency Communications Grants	• NG911 Interstate Playbook Chapter 1 • Blue Ribbon Panel 911 Funding Report to the National 911 Program • NASNA Report on Four Potential Funding Models for NG911 • NASNA 911 Funding: Optimizing Revenue from the Current Surcharge Model • SAFECOM Funding Public Safety Communications System
Business 9. Maintain a funding stream for the NG911 grant program.	• Next Generation 911 Cost Study • Management Plan for the Next Generation 9-1-1 Grant Program Submitted by NHTSA and NTIA • Fiscal Year 2019 SAFECOM Guidance on Emergency Communications Grants	• NG911 Interstate Playbook Chapter 1 • Blue Ribbon Panel 911 Funding Report to the National 911 Program • NASNA Report on Four Potential Funding Models for NG911 • NASNA 911 Funding: Optimizing Revenue from the Current Surcharge Model
Business 10. Identify long-term jurisdictional funding streams, including traditional and non-traditional sources (e.g., public-private partnerships).	• FirstNet Authority Roadmap • Fiscal Year 2019 SAFECOM Guidance on Emergency Communications Grants • CISA 2019 NECP • SAFECOM 2018 Emergency Communications System Lifecycle Planning Guide • NPSTC Report Best Practices for Public Safety Interoperable Communications (May 2018)	• NG911 Interstate Playbook Chapter 1 • Blue Ribbon Panel 911 Funding Report to the National 911 Program • NASNA Report on Four Potential Funding Models for NG911 • NASNA 911 Funding: Optimizing Revenue from the Current Surcharge Model

Business / Governance Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Business 11. Develop an inventory of jurisdictional NG911 roadmaps/plans.	- Notice of Proposed Rulemaking for 911 Grant Program - Eleventh Annual Fee Report – State and Other Jurisdiction Filings - Pennsylvania Emergency Management Agency – 911 Program Guidance for 2019 - Next Generation 911 Cost Study - FirstNet Authority Roadmap - Fiscal Year 2019 SAFECOM Guidance on Emergency Communications Grants - CISA 2019 NECP - SAFECOM 2018 Emergency Communications System Lifecycle Planning Guide - NPSTC Report Best Practices for Public Safety Interoperable Communications (May 2018) - Guidelines for Developing a State NG911 Plan - North Carolina 2018 State 911 Plan - Idaho Enhanced/Next Generation 911 Plan - Arkansas Statewide NG9-1-1 Plan	- NHTSA Model State Plan v1.0 - Commonwealth of Pennsylvania Statewide 911 Plan – March 2019 - State of Maine Plan for NG9-1-1

Business / Governance Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Business 12. Develop an analysis report on jurisdictional accomplishments regarding cross-boundary interconnectivity, and identify how approaches can be scaled nationwide.	• 911 Data & Information Sharing: A Strategic Plan • FirstNet Authority Roadmap • CISA 2019 NECP • SAFECOM 2018 Emergency Communications System Lifecycle Planning Guide	• NG911 Interstate Playbook Chapter 1
Business 13. Continue to develop case studies about how issues identified have been resolved at jurisdictional and federal levels.	• 911 Data & Information Sharing: A Strategic Plan • FirstNet Authority Roadmap • CISA 2019 NECP • SAFECOM 2018 Emergency Communications System Lifecycle Planning Guide	• NG911 Interstate Playbook Chapter 2
Business 14. Develop NG911 policies that address parameters for nationwide interconnectivity of jurisdictional 911 systems.	• 911 Data & Information Sharing: A Strategic Plan • FirstNet Authority Roadmap • CISA 2019 NECP • SAFECOM 2018 Emergency Communications System Lifecycle Planning Guide	

Technology Goal

Table 8: Technology Goal Activities Summary

Technology Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Tech 1. Design, implement, and operate nationwide interconnected ESInets.	• NENA i3 Standard for Next Generation 9-1-1, NENA-STA-010.3-2019 (draft in progress)	• Detailed Functional and Interface Standards for the NENA i3 Solution • APCO Project 43: Broadband Implications for the PSAP • FirstNet
Tech 2. Design, implement, and operate a nationwide Forest Guide.	• NENA i3 Standard for Next Generation 9-1-1, NENA-STA-010.3-2019 (draft in progress)	• NENA Requirements for a National Forest Guide • NENA Next Generation 9-1-1 Data Management Requirements • Detailed Functional and Interface Standards for the NENA i3 Solution
Tech 3. Design, implement, and operate a nationwide PSAP registry.	• NENA Enhanced PSAP Registry	• FCC 911 Master PSAP Registry
Tech 4. Design, implement, and operate a nationwide GIS data store.	• ATIS Emergency Location Task Force (ELOC TF) • NEAD LLC • NENA Standards for the Provisioning and Maintenance of GIS Data to ECRFs[9] and LVFs[10]	• Detailed Functional and Interface Standards for the NENA i3 Solution

---

[9] Emergency Call Routing Functions
[10] Location Validation Functions

Technology Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Tech 5. Design, implement, and operate a nationwide ICAM capability.	• National Strategy for Trusted Identities in Cyberspace (NSTIC) • FICAM Testing Program • Federal ICAM Enterprise Architecture	• TFOPA WG1 Optimal Cybersecurity Approach for PSAPs Supplemental Report • APCO Project 43: Broadband Implications for the PSAP
Tech 6. Design, implement, and operate a nationwide cybersecurity capability such as EC3.	• NIST Digital Identity Guidelines • NIST Cybersecurity Framework (version 1.1)	• TFOPA WG1 Optimal Cybersecurity Approach for PSAPs Supplemental Report • APCO Project 43: Broadband Implications for the PSAP
Tech 7. Develop a research report on the need for, and feasibility of, a nationwide cybersecurity and cyberthreat response framework.	• NIST Digital Identity Guidelines • NIST Cybersecurity Framework (version 1.1)	
Tech 8. Develop minimum standards and requirements for network interconnection and impacts on facility and personnel security.	• NIST Digital Identity Guidelines • NIST Cybersecurity Framework (version 1.1) • ATIS-0300116, Interoperability Standards between Next Generation Networks (NGN) for Signature-Based Handling of Asserted information Using Tokens (SHAKEN) • NENA i3 Standard for Next Generation 9-1-1, NENA-STA-010.3-2019 (draft in progress)	• ATIS Request for Assistance Interface (RFAI) Specification • Detailed Functional and Interface Standards for the NENA i3 Solution • APCO Project 43: Broadband Implications for the PSAP

Technology Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Tech 9. Develop a strategy for expanding the connection between national Information Sharing Analysis Centers (ISACs) and PSAPs to augment nationwide NG911 security.	• NIST Digital Identity Guidelines • NIST Cybersecurity Framework (version 1.1) • ATIS IP-NNI Task Force	
Tech 10. Define technical requirements and successes for carrier migration and interconnection using industry standards.	• NIST Digital Identity Guidelines • NIST Cybersecurity Framework (version 1.1) • ISO/IEC JTC 1/SC 27 – multiple standards/work groups • ATIS IP-NNI Task Force • ATIS-0300116, Interoperability Standards between Next Generation Networks (NGN) for Signature-Based Handling of Asserted information Using Tokens (SHAKEN) • ATIS 0300117 (2019-10) Operational Standard for the Signature-based Handling of Asserted information using toKENs (SHAKEN) Governance Model and Certificate Management • ATIS 0500036 Standard for IMS-based Next Generation Emergency Services Network Interconnection • ATIS 0500037 Overview of how an IMS Originating Network interfaces to an E9-1-1 or NG9-1-1 System	• ATIS-0500032, ATIS Standard for Implementation of an IMS-based NG9-1-1 Service Architecture • ATIS-0500023, Applying Common IMS to NG9-1-1 Networks

Technology Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Tech 11. Develop policies that promote accelerated migration to NG911 by carriers and PSAPs.	• TIA J-STD-036-C-2 Enhanced Wireless 9-1-1 Phase II • ATIS 0500036 Standard for IMS-based Next Generation Emergency Services Network Interconnection	• APCO Project 43
Tech 12. Develop minimum requirements that technologies must meet to verify overall legitimacy of 911 service delivery and impact to the 911 ecosystem (e.g., workforce needs, cybersecurity risks).	• ATIS 0500034.V002 Comparison of Enhanced 9-1-1 (E9-1-1) and Next Generation 9-1-1 (NG9-1-1) Focused on Reportable Outage Data Points	• APCO ANS 1.110.1-2015, Multi-Functional Multi-Discipline Computer Aided Dispatch (CAD) Minimum Functional Requirements
Tech 13. Develop standards and requirements for NG911 system testing and evaluation, including external systems that interact with NG911 functions (e.g., FirstNet, alarm systems, telematics devices).	• NENA NG9-1-1 Emergency Services IP Networks & Public Safety Broadband Networks Interconnection Working Group • FirstNet Test Lab • FICAM Testing Program • FICAM Playbooks • NENA i3 Standard for Next Generation 9-1-1, NENA-STA-010.3-2019 (Draft in progress)	• NENA ICE Events • Texas CSEC and TX A&M pilot test bed project • APCO ASAP to PSAP

Technology Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Tech 14. Research the feasibility—including cost implications and funding considerations—of establishing sanctioned testing facilities to enable focused, safe evaluation of NG911 products and emerging technologies.	• Various commercial entities offer services that could be vetted for this task. • FirstNet Test Lab	• NENA ICE Events • Texas CSEC and TX A&M pilot test bed project
Tech 15. Research the feasibility—including cost implications and funding considerations—of establishing a credentialing authority for NG911 compliance.	• NENA i3 Standard for Next Generation 9-1-1, NENA-STA-010.3-2019 (draft in progress)	• Detailed Functional and Interface Standards for the NENA i3 Solution

Data Goal

Table 9: Data Goal Activities Summary

Data Related Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Data 1. Address recommendations that surface as a result of the National 911 Program's Strategic Planning for Collection and Use of Nationwide 911 Data project.	• The National 911 Program Next Generation 911 (NG911) Standards Identification and Review • Guidelines for State NG911 Legislative Language: Examples and Options for Legislative Language to Facilitate Deployment of NG911 • Recommended Best Practices for Supplemental 9-1-1 Location Data • Minnesota NG9-1-1 Strategic Plan • California Governor's Office NG911 Transition / Implementation Plan • Commonwealth of Pennsylvania Statewide NG911 GIS Strategic Plan	• State of Maine Plan for Next Generation 9-1-1
Data 2. Develop NG911 related data models, requirements, and standards relevant to the entire lifecycle of 911 call handling and response (as sanctioned by the 911 community).	• The National 911 Program Next Generation 911 (NG911) Standards Identification and Review • 911 Data & Information Sharing: A Strategic Plan • Recommended Best Practices for Supplemental 9-1-1 Location Data • Illinois NG9-1 -1 Geographic Information System Governance Policy • Core Competencies, Operational Factors, and Training for Next Generation Technologies in Public Safety Communications • Standards for the Provisioning and Maintenance of GIS data to ECRFs and LVFs	• Core Competencies and Minimum Training Standards for Public Safety Communications Supervisor • Standard for the Establishment of a Quality Assurance and Quality Improvement Program for Public Safety Answering Points • Next Generation 9-1-1 Data Management Requirements • NENA Detailed Functional and Interface Standards for the NENA i3 Solution • Security for Next-Generation 9-1-1 Standard (NG-SEC)

Data Related Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
	• NG9-1-1 GIS Data Model • Standard for NG9-1-1 Additional Data • NENA/APCO NG9-1-1 Emergency Incident Data Document • APCO Public Safety Communications Incident Handling Process	• The Information Sharing and Safeguarding (IS&S) Playbook • Best Practices for the Use of Social Media in Public Safety Communications
Data 3. Assess successful national and international efforts, and develop pilot projects to test the integration, use, and aggregation of additional data and multimedia (e.g., images, real-time text, social media, videos).	• Emergency Communications and the EU Legislative Framework • ETSI Smart cities and communities – Standardization to meet citizen and consumer requirements • ETSI Plugtests (Interoperability) Report • Progress Report on a National Public Safety Broadband Network – Working towards the next generation of public safety communications in Canada • Deploying Next Generation 911 • North Carolina Next Generation 911 • NG911 Progress Snapshot Across the U.S. Now	• Next Generation Networks Task Force Report 2006 • National Conference of State Legislatures Next Generation 911 (2015)
Data 4. Assess successful national and international integration with other governmental agencies (OGAs) and develop pilot projects to test NG911 integration with Smart City	• NG911 Institute – Intersection of IoT, Smart Cities and NG911 • Department of Homeland Security to test smart cities technology in St. Louis to improve public safety	

Data Related Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
initiatives and Internet of Things (IoT) systems.		
Data 5. Develop an inventory of existing policies relevant to geospatial routing of 911 calls (regardless of technology used).	• NG9-1-1 GIS Data Model • Guidelines for Developing a State NG911 Plan • Commonwealth of Pennsylvania Statewide NG911 GIS Strategic Plan • Guidelines for Emergency Call Location Selection and Reporting by Originating Networks	• NG9-1-1 Policy Routing Rules • NENA NG9-1-1 Policy Routing Rules Operations Guide • Recommended Best Practices for PSAPs when Processing Vehicle Telematics Calls from Telematic Service Providers
Data 6. Develop needed standards, requirements, and best practices for NG911 consumption and handling of GIS data.	• Standards for the Provisioning and Maintenance of GIS data to ECRFs and LVFs • Guidelines for Developing a State NG911 Plan • NG9-1-1 GIS Data Model	• NENA Information Document for Development of Site/Structure Address Point GIS Data for 9-1-1 • GIS Data Collection and Maintenance • Information Document for Synchronizing GIS Databases with MSAG & ALI
Data 7. Research the feasibility—including cost implications and funding considerations—of establishing a national map that can be accessed by all PSAPs.	• Standards for the Provisioning and Maintenance of GIS data to ECRFs and LVFs • Guidelines for Developing a State NG911 Plan • NG9-1-1 GIS Data Model • NENA Enhanced PSAP Registry and Census (ERPC)	• NG9-1-1 Policy Routing Rules • NENA NG9-1-1 Policy Routing Rules Operations Guide • GIS Data Collection and Maintenance

Operations Goal

Table 10: Operations Goal Activities Summary

Operations Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Ops 1. Develop best practices based on how states have overcome cross-jurisdictional issues (e.g., call routing, liability).	• NENA WG: DoD/USCG/Pipeline Notifications • CSRIC VII Working Group 4: 911 Security Vulnerabilities during the IP Transition *Actions from Business Task 12 also apply	• NENA Inter-Agency Agreements Model Recommendations Information Document • CSRIC V WG1 Evolving 911 Services • NENA STA 009.2 Mutual Aid Standard/Model Recommendation

Operations Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Ops 2. Develop best practices and/or national standards for operations within the NG911 environment.	• NENA NG911 Go To Handbook • APCO Candidate ANS: Cybersecurity Training for Public Safety Communications Personnel • APCO ANS: Core Competencies, Operational Factors, and Training for Next Generation Technologies in Public Safety Communications • CSRIC VI Working Group 1: Recommendations for 9-1-1 System Reliability and Resiliency during the NG9-1-1 Transition • NENA WG: Social Media Emergency Requests for Service • NENA WG: Monitoring & Managing NG911, NENA WG: NG911 Impacts on the PSAP • CSRIC VII Working Group 1: Alert Originator Standard Operating Procedures • NFPA[11] 1225: Proposed Standard for Emergency Communications Services	• TFOPA WG2 NG9-1-1 Readiness Scorecard • Virginia Information Technologies Agency (VITA) – Public Safety Call Processing Best Practice

[11] National Fire Protection Association

Operations Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Ops 3. Create best practices for network operations center (NOC) and security operations center (SOC) notifications.	• [CSRIC VII Working Group 4: 911 Security Vulnerabilities during the IP Transition](#) • [CSRIC VII Working Group 6: SIP Security Vulnerabilities](#) • [CSRIC VI Working Group 1: Recommendations for 9-1-1 System Reliability and Resiliency during the NG9-1-1 Transition](#) • [NENA WG: Security for NG9-1-1 (NG-SEC)](#)	
Ops 4. Develop NG911-appropriate job descriptions (e.g., operational, systems management, GIS).	• [CSRIC VI Working Group 1 Recommendations for 9-1-1 System Reliability and Resiliency during the NG9-1-1 Transition](#) • [APCO ANS: Core Competencies, Operational Factors, and Training for Next Generation Technologies in Public Safety Communications](#) • [National Initiative for Cybersecurity Education (NICE) Cybersecurity Workforce Framework](#) • [NFPA 1225 Proposed Standard for Emergency Communications Services](#)	• [APCO Core Competency Standards](#) • [APCO RPL program](#) • [NENA ENP program](#) • [NENA CMCP program](#) • [IAED, Power Phone, NENA, APCO](#) and other private-sector leadership certifications (various sources depending on specialty)

Operations Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Ops 5. Identify necessary training (e.g., cross-jurisdictional call handling) and professional development needed to bolster the skills and growth paths of those currently in the workforce, as well as opportunities to integrate NG911 education for those who are interested in 911 as a career.	- APCO Candidate ANS: Cybersecurity Training for Public Safety Communications Personnel - NENA WG: Changing Role of the Telecommunicator in the NG9-1-1 Environment - NENA WG: 911 Professional Education - CSRIC VII Working Group 1: Alert Originator Standard Operating Procedures - APCO ANS: Core Competencies, Operational Factors, and Training for Next Generation Technologies in Public Safety Communications - APCO Public Safety Communications Incident Handling Process	
Ops 6. Assess successful national and international interconnectivity with OGAs, and develop pilot projects and demonstrations to identify needs and best practices related to the various nontraditional domains, disciplines, and entities that either require interconnectivity or would benefit from a more direct level of access to 911 services.	- NENA WG: DoD/USCG/Pipeline Notifications - NENA Standard for NORAD/FAA Notification: Airborne Events - CSRIC VII Working Group 4: 911 Security Vulnerabilities During the IP Transition	

Operations Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Ops 7. Develop guidelines and procedures for interconnecting with nontraditional entities.	• NENA Standard For NORAD/FAA Notification: Airborne Events • CSRIC VII Working Group 1: Alert Originator Standard Operating Procedures • NENA WG: DoD/USCG/Pipeline Notifications	• NENA Pipeline Emergency Operations Standard/Model Recommendation • NENA PSAP & Railroad Interaction Standard
Ops 8. Evaluate the best nationwide approaches for collecting performance-related data.	• NENA NG9-1-1 Call Processing Metrics Standard • APCO ANS: Communications Center Key Performance Indicators • NENA WG: Delivery of Next Generation Services via the Cloud • CTIA 911 Location Accuracy Test Bed • Strategic Planning for Collection and Use of Nationwide 911 Data	• NENA ICE • National EMS Information System (NEMSIS) • National Fire Incident Reporting System (NFIRS) • National Information Exchange Model (NIEM) • Emergency Data Exchange Language (EDXL)
Ops 9. Develop national models for performance analysis and evaluation.	• ISCRAM Information Systems for Crisis Response and Management • Strategic Planning for Collection and Use of Nationwide 911 Data	• NENA ICE • NEMSIS • NFIRS • NIEM • EDXL
Ops 10. Develop best practices for applying national models at the jurisdictional level.	*All actions from Tasks 8 & 9 are applicable	

Cross-Cutting Goal

Table 11: Cross-Cutting Goal Activities Summary

Cross-Cutting Tasks	Recent Actions (After 2017)	Past Actions (Prior to 2017)
Cross-Goal 1. Conduct a feasibility study, including cost implications and funding considerations, regarding creation of a national database/repository that houses and makes accessible guidance materials, research, and other resources that are relevant to the entire NG911 spectrum.		• FCC Resource Center (discontinued) • National 911 Resource Center (currently "Documents and Tools" on 911.gov