

911 DATA & INFORMATION SHARING

A Strategic Plan

Version 1.0 | 2019

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Executive Summary

Management and delivery of 911 service has always been a local issue, which has resulted in a national landscape of siloed 911 systems that face difficulty when trying to interact or interoperate across multiple jurisdictions. Part of that landscape includes 911 data that varies widely from one jurisdiction to another. Why should *you* care? This challenge inhibits the 911 community's ability to collect, use, analyze, and share data and information, and can result in call transferring issues, inadequate resources, lag times in incident response, and other consequences. Everyone stands to benefit from more effective 911 data management and information sharing—callers, 911 agencies, and emergency responders. Achievement of goals presented in this plan poses value for all stakeholders involved in 911 service, from legislators who influence 911 policy to the various vendors that equip 911 systems. Every U.S. resident and visitor stands to gain from these advances. With the ability to base administrative, operational, and technical decision-making on evidence-based factors, 911 systems across the U.S. will be able to respond to 911 requests more efficiently and effectively, and can achieve greater accuracy, situational awareness, resilience, and consistent quality.

Why This Plan was Developed

Various stakeholder groups have examined 911 data issues over recent years. In 2016, the Federal Communications Commission's (FCC) Task Force on Optimal PSAP [Public Safety Answering Point] Architecture (TFOPA) issued a report in which it recommended the establishment of a national system that would enable the collection and analysis of standardized 911 administrative, operational, cost and computer-aided dispatch (CAD) data. The National 911 Program (the "Program") is housed within the U.S. Department of Transportation (DOT) National Highway Traffic Safety Administration (NHTSA), and part of its mission is to provide federal leadership and coordination in supporting and promoting 911 services. In this role, the Program engaged the 911 community to find out more about its 911 data management and information sharing needs. Input from the 911 community confirmed that the 911 community seeks a data and information sharing environment that would provide useful data standards, requirements, and guidance to support day-to-day 911 service delivery and Next Generation 911 (NG911) transition efforts. The 911 community identified the following capabilities as key:

- Continuous visibility of the national 911 landscape (e.g., PSAPs, 911 authorities, service providers, NG911 functional components in use);
- Enhanced capability for multi-jurisdictional collaboration among PSAPs, 911 authorities, and other 911 stakeholder groups;

- Data-driven, evidence-based decision-making for all stakeholders involved in 911 service (e.g., legislators, 911 authorities, PSAPs, public safety agencies that respond to requests for assistance);
- Increased efficiency of 911 system operations; and
- Constant improvement of all aspects of 911 service delivery.

This strategic plan is intended to establish a framework for bringing those capabilities to bear. It revolves around five goals (Figure 1) that support a vision of routine sharing of 911 data and enhanced data-driven decision making as it relates to administrative, operational, and technical factors of 911 planning, management, and delivery.

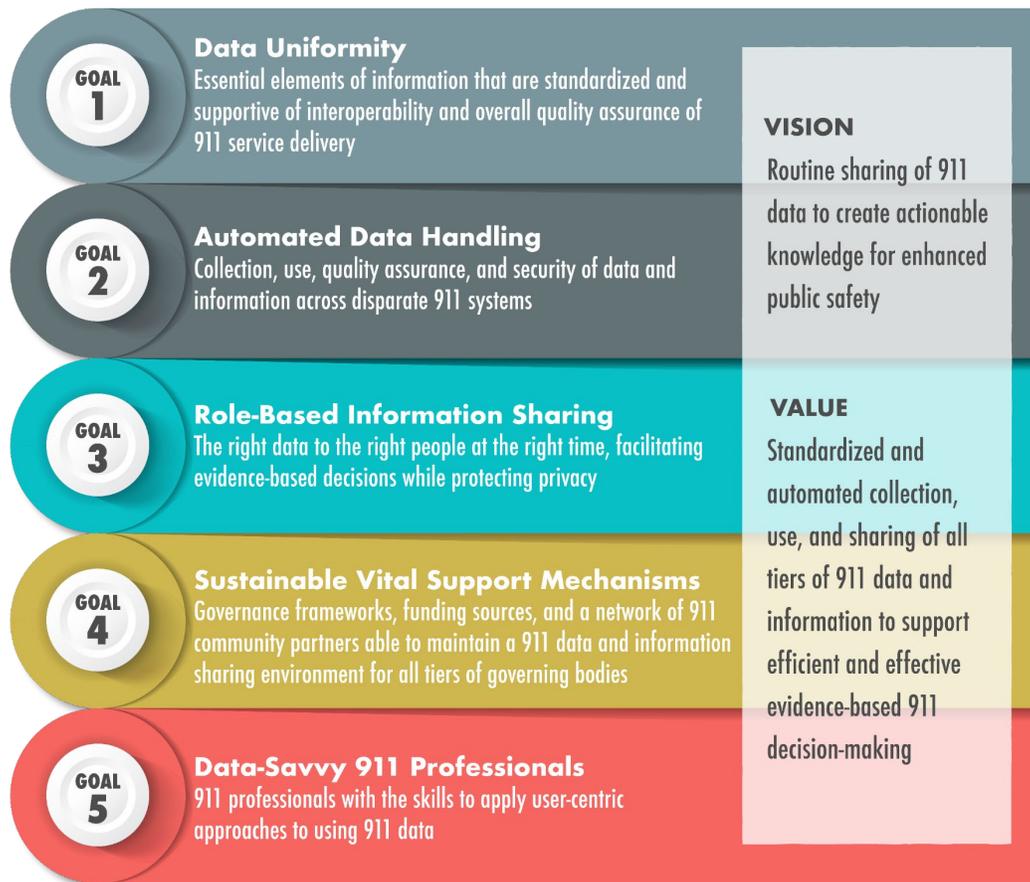


Figure 1. 911 Data and Information Sharing—A Vision, Its Value, and Five Strategic Goals for Getting There

As the first iteration of strategy designed to help the 911 community explore the art of the possible, this plan is aimed at generating dialogue about the following considerations:

1. What resources, components, and tools would compose an ideal 911 data management and information sharing environment?
2. What would need to occur to achieve the vision and goals described in this document?

3. How should the 911 community consider known (and unknown) dynamics involved in NG911 transition and implementation (e.g., transitional data)?
4. Who among 911 stakeholders should be involved as the plan for a nationally-accessible 911 data management and information sharing environment is developed and executed?
5. Are there any specific objectives and implementation considerations that should be executed first to ensure the buy-in of the 911 community?

Call to Action

As a coordinating entity responsible for convening the 911 community on service delivery issues, NHTSA's National 911 Program intends to be the "keeper" of this strategic plan and will monitor progress toward implementation. However, it is assumed that individuals, agencies, organizations, and the 911 community at large will address, inform, or champion specific goals, objectives or activities identified in the plan. Many members of the 911 community have already achieved much in some areas and needs are evolving at a rapid pace. The National 911 Program hopes that this plan provides a framework upon which the 911 community can map future directions and establish necessary partnerships to meet short- and long-term goals.

About this Plan

Background

In January 2016, the FCC’s TFOPA—a federal advisory committee chartered under the Federal Advisory Committee Act (FACA)—issued a report that provided findings and recommendations that PSAPs can take to “optimize their security, operations, and funding as they migrate to Next Generation 9-1-1 (NG9-1-1).” Three TFOPA working groups set out to address specific issue areas:

1. Working Group 1 focused on PSAP cybersecurity;
2. Working Group 2 focused on NG911 architecture implementation; and,
3. Working Group 3 focused on resource allocation.

Working Group 2 provided a recommendation that “a National system enabling the collection and analysis of standardized administrative data, operational data, cost data and CAD data should be developed and made available to PSAPs and 911 Authorities to provide essential information to substantiate planning decisions and improvements to assist in the migration towards NG911.” In response to this recommendation and those that have been made by other 911 stakeholder groups, NHTSA¹ released a Request for Information (RFI), *Nationally Uniform 911 Data System*. By doing so, NHTSA sought feedback from the 911 community on how the implementation of such a “system” would be most useful if this task were undertaken. Comments received by NHTSA supported the establishment of a data and information sharing environment that would enhance interoperability initiatives and provide stakeholders with useful data standards, requirements, and guidance to support administrative, operational, and technical decision-making for all tiers of 911 governing bodies—not only in support of NG911 transition but also as it relates to overall 911 service delivery. While the TFOPA recommended the establishment of a data system “to assist in the migration towards NG911,” such a system is likely to produce benefits beyond the TFOPA’s recommendation. Therefore, as an initial step, NHTSA convened a group of 911 stakeholders from both public and private sectors and set forth to develop this Strategic Plan.

Purpose of the Plan

What the Plan Intends to Achieve

This plan is intended to motivate the 911 community to come together and explore the art of the possible. It presents the strategic vision and goals of an environment that will be able

¹ The U.S. Department of Transportation National Highway Traffic Safety Administration, in partnership with the U.S. Department of Commerce National Telecommunication and Information Administration, administers The National 911 Program which was created by Congress in 2004 as the 911 Implementation and Coordination Office. <https://www.911.gov>.

to grow and change as various types of data are identified now and into the future. It articulates strategic goals and objectives that can serve as a framework for the process of defining the 911 community's data and information needs, requirements, priorities, and potential means to address these needs.

Information sharing of both administrative and post-event data as well as real-time situational awareness was considered while developing this plan. Additionally, the 911 community stakeholders who assisted in the development of this plan understand that data that is gathered and compiled retrospectively requires different steps, rules, and governance than data that is generated in "real time." This plan discusses the strategy to accomplish both types of data collection methods, but also is built with the knowledge that new data and new data collection and analysis methods are likely to become available over time. Finally, it is important to note that this plan focuses on the strategy of data sharing and not the operationalization of that strategy.

What the Plan is Not

This plan is not intended to define exact parameters, components, or technical architectures of a 911 data and information system, or to define specific data elements that should or would be collected. This is not a technical document, nor are we at the stage where enough is known to articulate conceptual schema or designs. Additionally, while the plan contains references to other similar initiatives and relevant tools (e.g., technical and operational standards), it does not intend to identify any particular effort or resource as "the model" for the 911 community. However, deep exploration of such initiatives and tools is an integral part of this strategy.

This plan also is not intended to replace or conflict with ongoing activities of organizations active in 911, such as the Association of Public-Safety Communications Officials (APCO), the National Emergency Number Association (NENA), the National Association of State 911 Administrators (NASNA), and others. Rather, the plan has been designed, in part, to catalyze discussion about how to connect the dots between their vital efforts. Additionally, the plan is intended to support the needs of public safety while observing nationally-applicable, consensus-driven best practices and principles set forth by federal initiatives such as the Federal Data Strategy and efforts put forth by the Office of the Program Manager for the Information Sharing Environment (PM-ISE).

How the Plan is Organized

The strategic plan begins by describing functional capabilities required by the 911 community and the challenges it currently faces regarding data collection, use, analysis, and sharing. From there, it discusses the value of enhanced data and information sharing. The plan then discusses five strategic goals, specific objectives and implementation considerations for defining exactly what is necessary for achieving each goal. Examples of existing resources are then introduced as potentially useful case studies. The plan concludes

with priority activities as ranked by contributing stakeholders. Also included is a glossary of widely used terms relevant to 911 (*Appendix 1: 911 Terms & Definitions*), a list of key 911 stakeholder entities (*Appendix 2: Associations, Organizations & Other Stakeholder Entities Relevant to 911*), and a list of resources that address various 911 and NG911 topics (*Appendix 3: Useful Resources*).

Terminology Used in the Plan

How specific stakeholders throughout the 911 community interpret 911-, NG911-, and data- and information-related terminology varies to significant degrees. As this plan addresses how such variation impacts progress in certain areas, it does not attempt to homogenize 911 data and information lexicon (although it does identify this as an objective under Goal 1: *Data Uniformity*). However, it is important to understand how terms are used specifically for the purpose of this plan. While *Appendix 1: 911 Terms & Definitions* provides a glossary of widely used terms across the entire 911 spectrum, Table 1 below lists terms used frequently throughout this plan and the meanings and context they are intended to convey.

TERM	MEANING
911 administrator	Individual responsible for overseeing the overall health of 911 environments, systems, and funding for a specific jurisdiction.
911 authority	Entity that is ultimately responsible for the geographic planning, coordination, and funding of 911 environments. Authorities could be state agencies, regional entities, federal entities, or even individual PSAPs (particularly in states that operate under a single statewide system and PSAP ²).
911 environment	All elements involved in 911 service delivery for a specific community (e.g., policy and legislation, governance, operational functions, workforce).
911 system	Technology infrastructure that supports a 911 environment (e.g., Next Generation Core Services [NGCS], CAD, call-taking equipment, logging and reporting systems, map displays, radio networks, Geographic Information Systems [GIS], databases)
Administrative, Operational, and Technical	Emphasizes that 911 data management and information sharing should be viewed as supportive of all aspects of 911 service delivery: <i>Administrative</i> —911 system oversight and management (e.g., policymaking, NG911 planning, fiscal management, reporting); <i>Operational</i> —Day-to-day 911 service delivery (e.g., processes and standard operating procedures, workforce training and development, quality assurance, performance evaluation); and <i>Technical</i> —911 system technology infrastructure (e.g., NGCS, CAD).
Best practices	Consensus-driven practices, approaches, and methodologies that have national applicability and support consistency in 911 data management and information sharing across jurisdictions.

Table 1. Meanings of Terms Frequently Used Throughout this Plan

² More information about 911 authority structures is available in the document, [State & Territory 911 Authority Structures](#), developed by NASNA in collaboration with the National 911 Program.

TERM	MEANING
Call	A generic term used to include any type of Request for Emergency Assistance (RFEA); and is not limited to voice. This may include a session established by signaling with two-way, real-time media and involves a human making a request for help. We sometimes use ‘voice call’, ‘video call’, or ‘text call’ when specific media is of primary importance. The term ‘non-human-initiated call’ refers to a one-time notification or series of data exchanges established by signaling with at most one-way media, and typically does not involve a human at the ‘calling’ end. The term ‘call’ can also be used to refer to either a ‘Voice Call’, ‘Video Call’, ‘Text Call’ or ‘Data-only call,’ since they are handled the same way through most of NG911. ³
Jurisdiction	Localities, regions, towns, rural communities, states, and tribal organizations
National	Of importance, relevance, or impact to the Nation as a whole (the term, as used throughout this plan, is not intended to refer to national/federal government).
Nationally-accessible 911 data and information sharing environment	Any potential combination of products, tools, resources, or capabilities that may be needed to establish an environment through which the 911 community can collect, use, analyze, and share data. This may include databases, standards, scripts and algorithms, and standard operating procedures. The term is not intended to indicate a singular technological, proprietary product.
State	U.S. states, commonwealths, territories, or tribal communities
Transitional data	Data that supports decisions and efforts related to the transition from legacy to NG911 functions, or new data that can be expected once NG911 functions are implemented.

Table 1. Meanings of Terms Frequently Used Throughout this Plan (cont.)

Contributors

The National 911 Program would like to thank the following individuals who, on behalf of their organizations, worked tirelessly to develop this document.

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³ Definition extracted from NENA’s [Master Glossary of 9-1-1 Terminology](#).

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Without the generous contribution of their experience and expertise, the completion of this document would not have been possible.

Today Versus the Future

What the 911 Community Faces—911 Data & NG911

As jurisdictions transition from legacy 911 environments to NG911 capabilities, reliance on the ability to efficiently collect, use, and share authoritative data and information continues to intensify. These needs are elevated even more as the 911 community collectively strives to shift from a landscape of multiple independent systems (the legacy 911 environment) to a nationally interconnected NG911 system of systems. This transition requires 911 agencies to adopt a more consistent and collaborative approach to using data and information—administratively, operationally, and technically.

What does this mean and why go through the growing pains? The transformation to NG911 offers emergency responders additional information and the ability to share that information with each other for faster and more efficient response to requests for help. At an environmental view, NG911 consists of the following three major components:

1. A public safety grade Internet Protocol (IP) transport capability (e.g., Emergency Services IP Network [ESInet]) that allows agencies to exchange data;
2. NG911 Core Services (NGCS) which compose the “brains” of NG911, enabling an NG911 environment to determine what to do with specific data (i.e., where requests for emergency assistance are received and processed for delivery to appropriate response agencies); and
3. The data (primarily GIS data) that enables NG911 systems determine how calls are routed.

NG911 will replace the current decades-old systems used by the public to request emergency assistance. It enables 911 systems to share more datasets and offers capabilities to exchange that data more seamlessly than the current siloed environment. Where legacy 911 systems are voice-operable only, analog, and limited in their abilities to transfer emergency assistance requests and receive, process, and share multimedia formats, IP-based NG911 systems can receive and process any type of communication that is digital (e.g., photos, video). Table 2 below and on the next page provides a brief comparison of other factors that differ between legacy 911 and NG911 systems.

LEGACY 911 SYSTEMS	NG911 SYSTEMS
Virtually all calls are voice callers via telephones using analog lines to access PSAP assistance.	Voice, text, or video information from many types of communications devices can be sent over IP networks.
Most information is transferred via voice and there is very limited data capability.	Advanced data sharing can be performed automatically.

Table 2. Legacy 911 Versus NG911 Systems

LEGACY 911 SYSTEMS	NG911 SYSTEMS
Callers are routed through legacy selective routers that offer limited forwarding and backup ability.	The physical location of a PSAP becomes immaterial—callers can be routed automatically based on geographic location. Enhanced backup capabilities and increased system resiliency are enabled.
A PSAP’s only backup capability might lie with the PSAP “next door,” and these cases may be rare. There is no ability to maintain connection with other PSAPs.	Multiple avenues for backup capabilities are available, and PSAP-to-PSAP connection is possible.
There is limited ability to handle overflow situations. In some cases, callers could receive a busy signal if a PSAP is experiencing call overload or is not functioning.	PSAPs are able to control call congestion treatment, including dynamic rerouting of callers.

Table 2. Legacy 911 Versus NG911 Systems (cont.)

The data-related benefits offered by NG911 systems don’t just benefit PSAPs and 911 authorities, but also benefit public safety agencies. This is especially true now that public safety communications channels are improving. For example, the advent of FirstNet—the nationwide wireless broadband network dedicated to public safety use—will enable transmission of 911 caller data to first responders in the field. Additional data about incidents and other crucial related information will help resolve the emergency more efficiently.

In summary, NG911 systems help bring to bear the availability and transfer of more data, faster transmission of such data, broader distribution of such data, and improved capabilities for validating and protecting data. NG911 systems will enable the 911 community to use meaningful data with increased purpose.⁴

What the 911 Community Wants

Based on feedback received by the National 911 Program in response to the RFI, [Nationally Uniform 911 Data System](#), and discussions with public and private sector stakeholders who contributed to the development of this plan, the functional capabilities a 911 data and information sharing system should include those identified on the next page in Figure 2.

⁴ Information about NG911 can be found at https://www.nena.org/page/NG911_Project. Information on how NG911 and FirstNet can work together can be found at https://www.911.gov/issue_911andfirstnet.html.

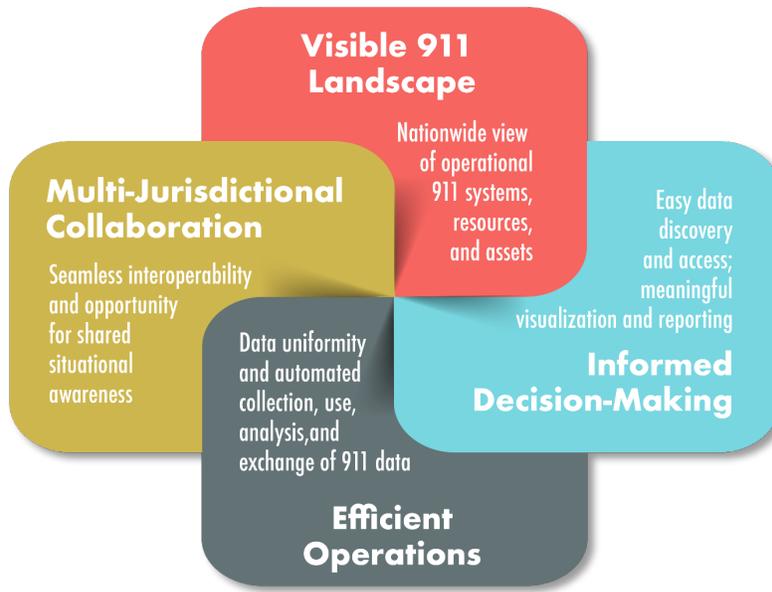


Figure 2. 911 Data and Information Sharing Environment Capabilities

Where We Are & Where We are Going

How close are we to meeting the data needs of the 911 community? The question is complex and best summed up at a high level. As Figure 3 depicts, the bottom line is that we must move from a siloed 911 environment to one that is interoperable.

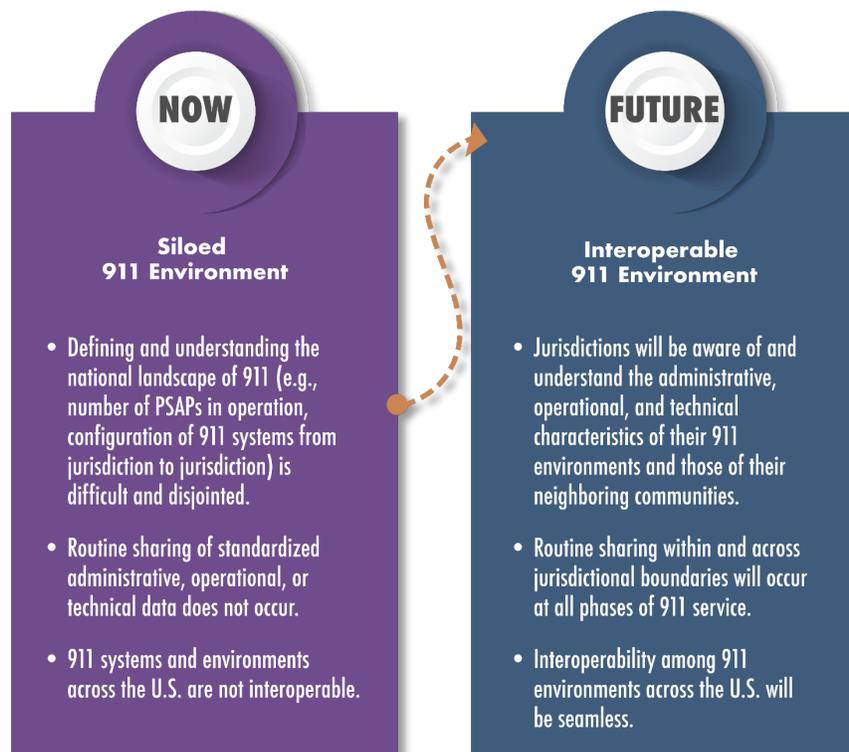


Figure 3. The 911 Data and Information Sharing Environment—Today Versus the Future

What challenges does the 911 community face as it looks toward the future? There are a variety of hurdles the community will need to overcome, many of which are unique to each jurisdictional environment. However, there are pervasive challenges that can be considered universal throughout the 911 community. Figure 4 below lists those challenges that are most prevalent and identifies this plan’s five strategic goals as key enablers for maneuvering toward the future state .

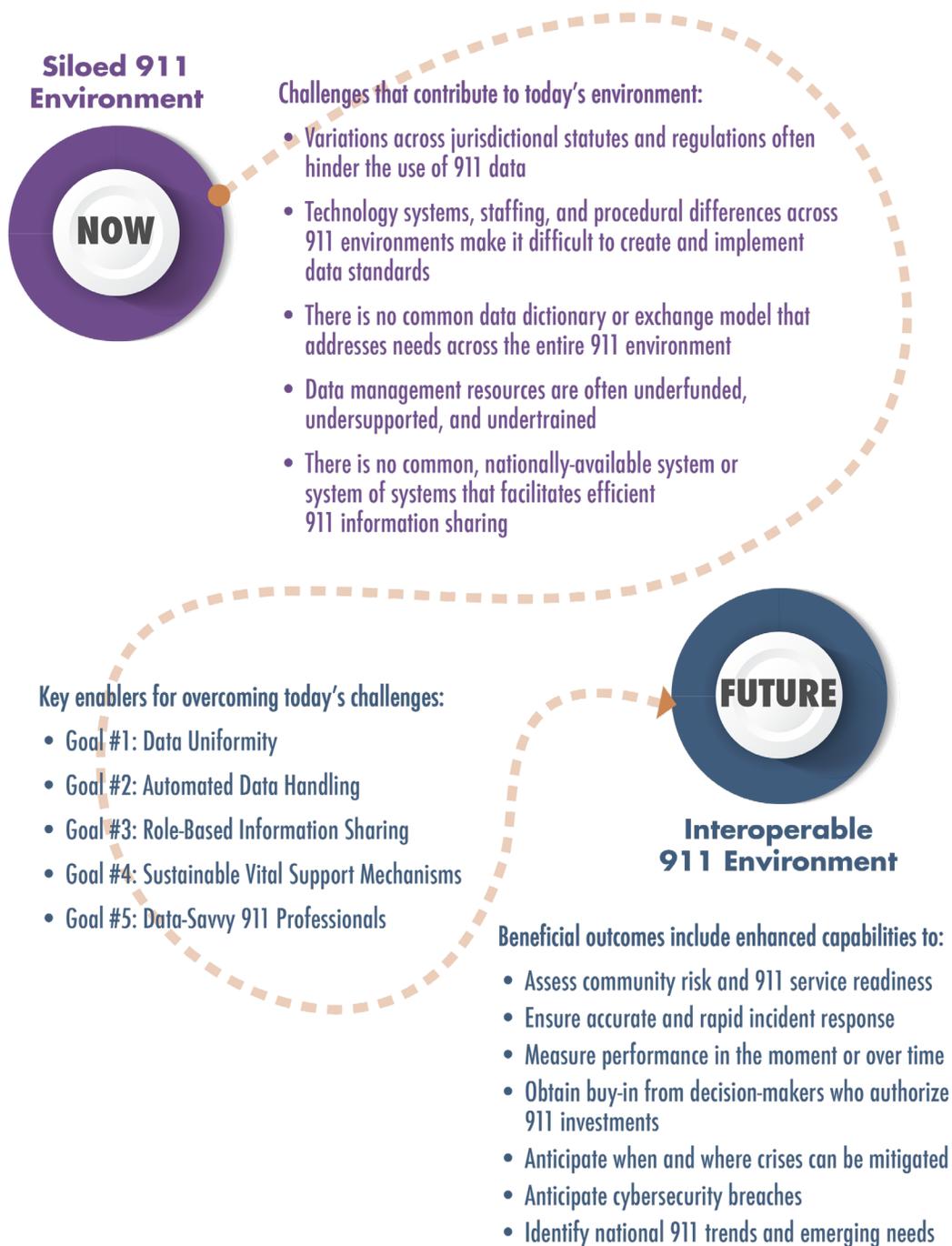


Figure 4. Today's Challenges and Goals for Overcoming Them

Emphasis on Relevance to the Entire 911 Environment

The 911 community has established the need for resources that can enable enhanced use of 911 data and information among PSAPs, 911 authorities, and other agencies, vendors, or organizations that play a role in every aspect of 911 services. These resources would address data needs that are relevant to the entire 911 environment over the course of the complete lifecycle of an emergency assistance request. Figure 5 below depicts this concept.

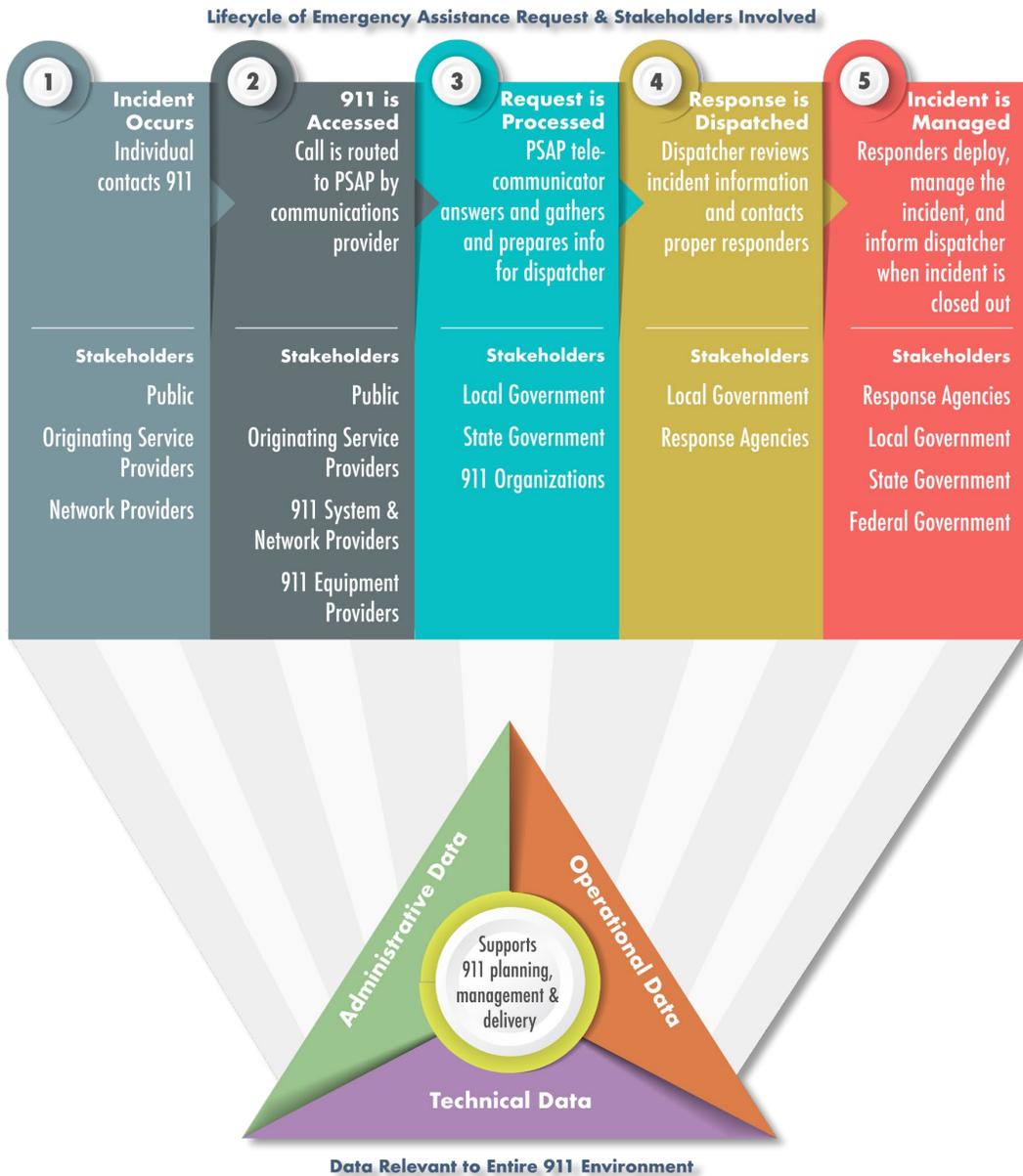


Figure 5. Framework for Considering Strategic Goals

Examining 911 data management and information sharing through this lens offers a high-level, common conceptual framework by which we can explore variations of needs across 911 environments and stakeholders. For example, the way 911 systems are structured varies greatly from jurisdiction to jurisdiction—a 911 environment that operates with a centralized dispatching function may define the lifecycle of an emergency assistance request differently than one that operates with satellite dispatch centers. Similarly, interpretations of lifecycle phases and 911 environment functions differ depending on perspective of the stakeholder—a communications provider and a PSAP manager are likely to have different views. Additionally, when exploring the goals and objectives in this plan through this framework, it is important to consider not only data and information that supports current day-to-day needs, but also *transitional data*—data that either supports NG911 transition efforts or will become available upon implementation of NG911 functions.

Value for All

Quicker access to more data and the ability to easily share it poses benefits that vary depending on the user. While a single data point might serve a primarily operational purpose for one stakeholder, it might carry more administrative value for another. Or, a different user could apply it to both functions. Regardless, the right data in the right hands poses the greatest value when it can be harnessed in a manner that provides optimal context for a given user. This may be achieved through enhanced abilities to aggregate, visualize, and convey data through analytical lenses. Table 3 shows just a few examples of how enhanced data capabilities benefits specific types of users.

STAKEHOLDER	EXAMPLE BENEFITS
<p>911 Administrators <i>Individuals (assigned by 911 authorities) responsible for ensuring the overall health of 911 systems and funding for a specific jurisdiction</i></p>	<ul style="list-style-type: none"> ▪ Qualitative information about 911 system performance and emergency assistance request handling can help administrators provide evidence of statutory compliance, identify necessary technical investments, determine the number of PSAPs needed, and ensure most effective use of tax payer resources. ▪ The ability to share and receive call volume and incident status data enables administrators to ensure PSAPs are staffed and resourced adequately.
<p>PSAP Management <i>Entities responsible for oversight of PSAP administration, operations, and quality assurance (e.g., public safety and response agencies, governmental agencies, jurisdictional governmental agencies, federal governmental agencies)</i></p>	<ul style="list-style-type: none"> ▪ Data that provides information about call times can help PSAP management evaluate workforce needs and effectively manage resources and 911 systems (e.g., positions needed, circuit utilization, equipment). ▪ Improved data on 911 systems in use facilitates awareness of how new technologies are being deployed in other 911 environments.
<p>Public Safety & Response Agencies <i>Entities responsible for management, implementation, and close-out of responses to 911 emergency assistance requests (e.g., fire response, law enforcement, emergency medical services [EMS])</i></p>	<ul style="list-style-type: none"> ▪ Streamlined access to essential 911 request and incident data improves situational awareness (particularly when an incident occurs in another jurisdiction) and enables responders to reach those in need more quickly. ▪ Access to data beyond just response-related data enables agencies to make decisions about how to better support communities (e.g., increasing patrols). ▪ The ability to review and analyze historical data can help agencies adjust mutual aid agreements for future incidents.
<p>Local Government <i>Entities responsible for oversight of community infrastructure and public safety measures (e.g., transportation agencies, public safety and health departments, community planning offices)</i></p>	<ul style="list-style-type: none"> • Call and incident information can help local government identify potential needs for systemic or infrastructure improvements that may increase community safety (e.g., traffic light patterns).

Table 3. Value of Enhanced 911 Information Sharing for Stakeholders Involved in Direct 911 Service Delivery

STAKEHOLDER	EXAMPLE BENEFITS
<p>State Government <i>Entities responsible for oversight of statewide infrastructure and public safety policies, regulations, and initiatives (e.g., departments of public safety and emergency management, departments of public health, critical infrastructure agencies)</i></p>	<ul style="list-style-type: none"> • Access to comprehensive 911 data can help state government officials make decisions about the allocation of 911 funds with increased precision.
<p>Federal Government <i>Entities responsible for development of nationwide infrastructure and public safety policies, regulations, and initiatives (e.g., DOT, DHS, U.S. Department of Health and Human Services [HHS])</i></p>	<ul style="list-style-type: none"> • Accurate data about network health, cybersecurity threats and incidents, system outages, and other factors can help federal authorities make informed decisions about federally-funded public safety initiatives and programs and enact regulations and rules to ensure 911 services meet baseline standards.
<p>911 Organizations <i>Entities focused on enhancing various aspects of how 911 environments are funded, governed, administered, equipped, operated, and evaluated (e.g., NASNA, NENA, APCO,)</i></p>	<ul style="list-style-type: none"> • Data that informs an analytical national view of the 911 landscape (e.g., number of PSAPs, 911 systems in use, NG911 functions implemented) can help organizations support their memberships through lobbying, advocacy, and education.
<p>Originating Service Providers (OSPs) <i>Entities responsible for providing telecommunications services and capabilities to 911 environments and the public (e.g., wireline service providers, wireless carriers, Voice over Internet Protocol [VoIP] providers)</i></p>	<ul style="list-style-type: none"> • Quick access to data related to 911 service outages and causes could provide OSPs with valuable evidence when needing to remediate regulatory action.
<p>911 System, Equipment & Network Providers <i>Entities responsible for development, distribution, implementation, and maintenance of 911 technologies and networks (e.g., CAD vendors, NGCS providers)</i></p>	<ul style="list-style-type: none"> • Enhanced 911 data enables providers to anticipate the 911 community’s needs as they continue to transition to NG911 capabilities, and helps providers fortify networks, systems, and equipment against cyber-threats and incidents.
<p>911 Research Community <i>Entities that analyze 911 data for the purpose of improving administrative and operational methodologies and 911 technology innovation (e.g., academia, non-academic research institutes, governmental organizations, industry)</i></p>	<ul style="list-style-type: none"> • Purposeful, focused sets of 911 data enables researchers to assess 911 service delivery impacts, identify issues as they relate to specific types of 911 environments, and empirically identify consensus-driven best practices that have nationwide applicability.

Table 3. Value of Enhanced 911 Information Sharing for Stakeholders Involved in Direct 911 Service Delivery (cont.)

Goals & Objectives

In this section, each of the strategic goals depicted below in Figure 6 is described and supported by a variety of objectives and implementation considerations. Examination of these and other considerations will help determine how to best approach next steps toward conceptualizing and coordinating a nationally-accessible 911 data and information sharing environment. Additionally, it is important to note that while objectives under each goal have been serially numbered for organizational purposes, assigned numbers are not intended to suggest the order by which objectives should be achieved. In many cases, activities in support of this plan’s objectives will likely occur simultaneously.

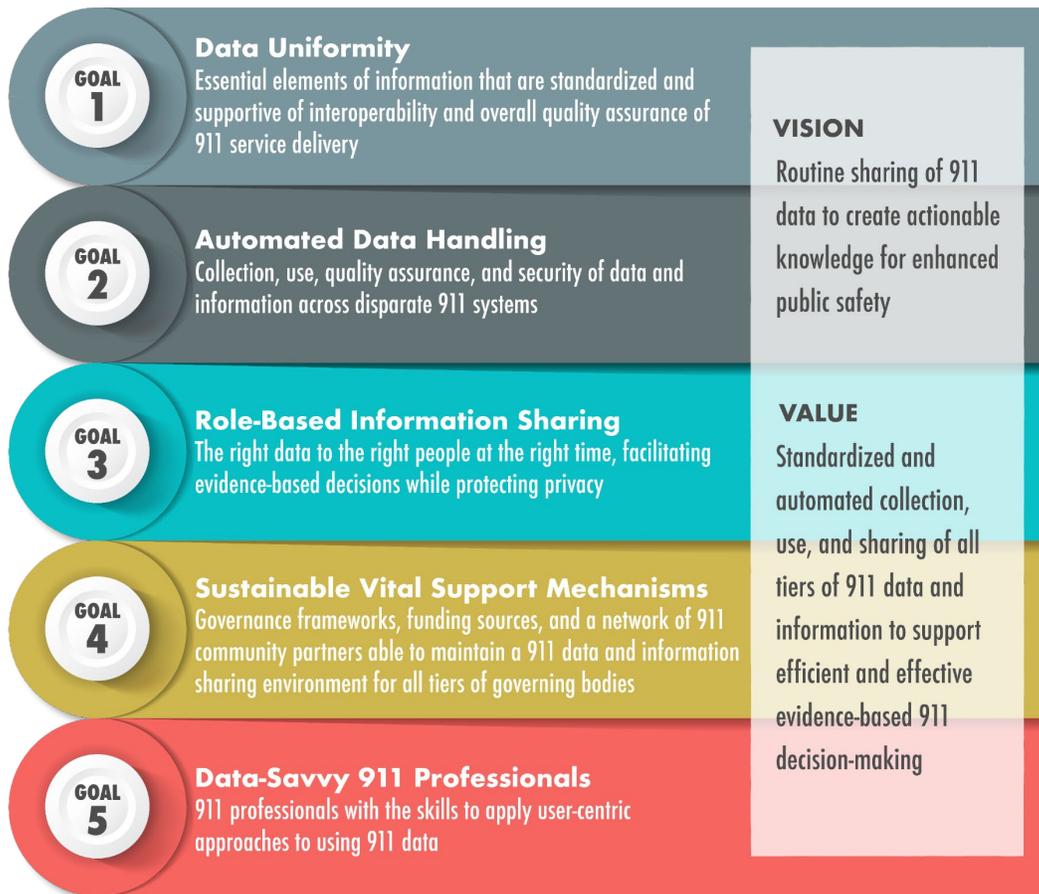


Figure 6. 911 Data and Information Sharing—A Vision, Its Value, and Five Strategic Goals for Getting There



Data Uniformity

Essential elements of information that are standardized and supportive of interoperability and overall quality assurance of 911 service delivery

Objectives & Implementation Considerations

1.1 Identify and define essential elements of information that span the entire lifecycle of a 911 emergency assistance request (i.e., call origination to incident close-out).

Key data elements relevant to operations must be identified, and a common definition for each element must be defined. This will be an ongoing objective as data elements are developed, identified, and added to the 911 data and information sharing environment.

- What are the data points that exist throughout the entire lifecycle of a 911 emergency assistance request?
- If the data is available, where is it located, collected, and stored?
- To whom are data points most relevant?
- How should data elements be prioritized?
- What data elements require aggregation (e.g. call volume for specific timeframes)?

1.2 Identify and define essential elements of information that span the management of a 911 environment.

Key data elements relevant to administrative concerns must be identified, and a common definition for each element must be defined. This will be an ongoing objective as data elements are developed, identified, and added to the 911 data and information sharing system.

- What key decision data points exist in relation to 911 environment administration, operations, and technology?
- Where is that data located?
- To whom are data points most relevant?
- How should data elements be prioritized?
- How should transitional data be categorized?
- What data elements require aggregation (e.g., technology costs)?

1.3 Create a 911 essential elements of information dictionary.

The dictionary must be referenced for use of the 911 data and information sharing environment and will be updated as data elements are developed, identified, and added.

- What is currently in use?
 - What current data standards exist and who developed them?
 - How do you deal with duplicates and gaps?
 - What is the best approach for creating consensus for data definitions?
-



Data Uniformity

Essential elements of information that are standardized and supportive of interoperability and overall quality assurance of 911 service delivery

Objectives & Implementation Considerations (cont.)

1.4 Create standard data models for 911 essential elements of information.

Data models must include all necessary structural, formatting, and programming attributes to enable efficient data and information use and exchange.

- What is the best approach for identifying priority elements that require models?
- What level of research and curation of existing models must occur?
- How can necessary models best be created and who should create them?

1.5 Categorize data by source, collector, and user by level.

Data sets available must be relevant to stakeholders that compose the 911 community.

- Where does that data exist?
- Who can access the data?
- Are there restrictions on the use of the data?

1.6 Create a process for validating and verifying data.

Users must be assured that data collected is accurate, provided by an authoritative source, and used for appropriate purposes.

- What are the data formatting requirements?
 - What is valid for each data element?
 - Who is the authority of the data?
-



Automated Data Handling

Collection, use, quality assurance, and security of data and information across disparate 911 systems

Objectives & Implementation Considerations

2.1 Reduce data and information silos by facilitating adoption of Goal 1 products and use of interoperable systems.

Use of standardized models, and uniform validation and verification processes are necessary for enabling automated data and information services.

- What are the most appropriate adoption strategies and implementation activities relevant to each stakeholder group within the 911 community and the various levels of functionality under which they are operating?

2.2 Establish recommended approaches for how uniform data can be used across various databases, etc.

Disparate information systems must be interconnected so they are complementary and are able to functionally serve each other. In other words, the data and information they provide substantively supplement or augment data and information provided by others, and any necessary cross-system population/storage of data is automated.

- What interconnection is possible through the use of data exchange models or other scripted approaches that could minimize needs to modify systems?
- What interconnection approaches are already being used for functional elements used by 911 systems?
- Can existing successful approaches be feasibly replicated? Can existing systems be leveraged?
- What is needed (e.g., expertise, resources, funding) to develop interconnection mechanisms?
- How can disparate PSAPs best coordinate their efforts to provide data?

2.3 Ensure adoption of nationally-applicable, consensus-driven best practices for 911 service system protection and safe storage and exchange of data and information.

Technical elements that interact with a nationally-accessible 911 data and information sharing environment must be cyber-secure and able to detect any unauthorized use.

- Which identity, credential, and access management (ICAM) requirements should be promulgated?
 - What monitoring requirements (e.g., security, the Emergency Communications Cybersecurity Center [EC3] should be promulgated)?
 - What encryption requirements should be promulgated?
 - What contractual issues should be addressed between 911 administrators and vendors?
-



Automated Data Handling

Collection, use, quality assurance, and security of data and information across disparate 911 systems

Objectives & Implementation Considerations (cont.)

2.4 Ensure adoption of common practices for chain of custody/evidence or anonymization.

Systems that interact with the 911 data and information sharing environment must be able to track data usage by variables including the type of data, the user accessing the data, etc.

- What are the nationally-applicable, consensus-driven best practices for logging requirements by data classification?
-



Role-Based Information Sharing

The right data to the right people at the right time, facilitating evidence-based decisions while protecting privacy

Objectives & Implementation Considerations

3.1 Create and define a common list of roles and responsibilities as they apply to those who handle data (e.g., data owners, data custodians, data coordinators).

Standardization of roles and responsibilities will contribute to the ability to sustain management and optimal use of the system on a long-term basis.

- What roles are currently identified and defined among the 911 community?
- What roles are identified and defined by other public safety disciplines/domains and is it feasible to replicate them for 911 purposes?

3.2 Establish parameters for role-based sharing.

Role-based sharing will be necessary for ensuring that the right data is used by the right people for the purpose of operations, analysis, or administration.

- Which user roles are relevant to each stakeholder group within the 911 community (and throughout extended public safety systems) that may share information with 911 systems?
- How feasible would it be to create a baseline for usage rights per role?
- What privacy issues should be addressed?

3.3 Support promotion of nationally-applicable, consensus-driven best practices for creating dashboards, visualization tools, and other platforms and tools that support jurisdictional data analysis and shared situational awareness.

Dashboards must provide users with the ability to make purposeful use of the data quickly and efficiently by presenting only the data needed and in formats that are easy to digest, share, and manipulate.

- What are the analytical, aggregation, and visualization needs at jurisdictional, multi-jurisdictional, and national levels?
- Which existing tools and mechanisms have already been successfully implemented by agencies either within the 911 community or the broader public safety community?
- What is the level of effort and cost burden involved in introducing existing tools into the 911 environment?

3.4 Permit ad-hoc/on-demand data sharing and discovery processes.

As needs rapidly change throughout the processing of a 911 call and engaging response, user-friendly mechanisms must be in place to enable users to generate and share customized/tailored reports with appropriate partners and stakeholders.

- What requirements does the 911 community have for ad hoc reporting tools?
-



Sustainable Vital Support Mechanisms

Governance frameworks, funding sources, and a network of 911 community partners able to maintain a 911 data and information sharing environment for all tiers of governing bodies

Objectives & Implementation Considerations

4.1 Develop a user-focused governance and advisory framework.

Establishing and sustaining relevance for the entire 911 community will be an essential ingredient for success. The environment will require a governance approach that will ensure that relevance, functionality, and accessibility is maintained.

- Which 911-stakeholders should be involved in developing and implementing governance?

4.2 Identify funding needs, funding models, and funding sources for long-term sustainability of the 911 data and information system.

Long-term sustainability of a nationally-accessible 911 data and information sharing environment will be contingent upon a diverse portfolio of funding sources and flexible business models that can scale as the system expands and matures.

- What exactly would it take to manage a nationally-accessible 911 data and information sharing environment?
- What qualifications should owners of the environment possess?
- What private-public partnerships will be needed?
- What funding/business models for similar efforts have been successful and how can aspects of such be adapted for 911 purposes?

4.3 Develop model legislation language that would set the stage for enhanced data and information collection, use, analysis, and sharing.

Optimal use of the system is possible only if policies are supportive of expanded usage of data and information. Policies must match data and information management to NG911 capabilities that jurisdictions are expected to achieve.

- What are current statutory and regulatory factors that either promote or inhibit enhanced data use?
- What is the best approach for revising prohibitive language or creating new recommended language?

4.4 Develop model contractual language that requires service providers to share data.

Service providers must provide data to their clients in order to achieve “whole of 911 environment” visibility and optimal operational capabilities.

- What are the commercial sources of data elements?
 - How can we best define the differences between “use” and “ownership” of the data?
 - What are the legal references that support access and use of data from commercial sources/systems?
-



Sustainable Vital Support Mechanisms

Governance frameworks, funding sources, and a network of 911 community partners able to maintain a 911 data and information sharing environment for all tiers of governing bodies

Objectives & Implementation Considerations (cont.)

4.5 Develop model jurisdictional agreements/memoranda of understanding (MOUs) that would facilitate authoritative data and information sharing.

Streamlining agreements and sharing parameters from jurisdiction to jurisdiction (while maintaining respect to specific requirements or limitations a given jurisdiction may face) is critical for ensuring system adoption and optimal use.

- What existing agreements are already in use among the 911 community or other public safety disciplines/domains, and can aspects be adapted for 911 purposes?
- What gap areas exist that are specific to how 911 systems collect, use, and share information?

4.6 Measure impacts of data sharing (return on investment).

Identifying and tracking the concrete value delivered by the 911 data and information sharing environment will be critical to ensuring ongoing enhancement and sustainable funding.

- What are the key performance indicators needed for meaningful evaluation?
 - What reporting processes should be considered?
 - How can lessons learned from early adopters be used for evaluation purposes?
-



Data-Savvy 911 Professionals

911 professionals with the skills to apply user-centric approaches to using 911 data

Objectives & Implementation Considerations

5.1 Identify role-based skillsets and qualifications for each staff position involved in data management (e.g., data entry, system administrator, data analyst).

Establishing a uniform baseline of skills and qualification criteria for data management staff ensures continuity during multi-jurisdictional operations or when 911 data professionals transition from one agency to another.

- What data-related job descriptions currently exist and how can they best be leveraged for 911 purposes?
- What are the skillsets and qualifications needed to fulfill 911 data positions?

5.2 Develop staff training to support the development of skillsets needed for data-related positions.

Thorough training that can be used universally across the nation is necessary for ensuring workforce quality at the jurisdictional level and an expansion of parallel skillsets across the workforce nationwide.

- What specific training is needed (e.g., data collection, aggregation, analysis, sharing, privacy, security)?
- What existing training programs or materials are being used either within the 911 community or the broader public safety community and how can they best be leveraged?
- What are the best approaches for developing sustainable, multimodal training?

5.3 Define how data skills impact 911 service funding needs and models.

Justification of 911 service funding, design and implementation of 911 service funding models, and preservation of the fidelity of 911 funds requires solid supporting data and evidence-based analysis.

- What data is needed and through what lenses should data be viewed to optimize its relevance to funding-related decision-making?
- How might variations in how 911 environments are governed and funded impact the establishment of a baseline of necessary capabilities and skillsets?

5.4 Identify staffing models that support various levels of data management capabilities (e.g., minimum, intermediate, optimal).

Establishing various, flexible staffing models will enable 911 systems to invest resources for only what they need at their given level of functionality.

- What staffing models currently exist related specifically to data management and sharing?
 - How can staffing needs best be minimized by improving technology and systems automation?
-

Implementation Considerations

What Might a Nationally-Accessible 911 Data & Information Sharing Environment Look Like?

At this stage, it is difficult to specify the exact components (technical or operational) that would compose a nationally-accessible 911 data and information sharing environment. The environment is envisioned to be a set of applications, services, systems, and connections that will permit the automatic sharing of all types of data from various sources such as PSAP equipment, NG911 systems, and systems that support administration and operations. This may include data transfer to other systems as well as “read-only” access (as appropriate).

Components could include any combination of hardware, software, standards, exchange models, data scripts or algorithms that facilitate automated data, nationally-applicable best practices, etc. Considerable research must be conducted on similar initiatives both within and outside of the 911 field. Much work has been accomplished by public and private sectors related to public safety and other critical functions of national concern. These efforts vary in scope and purpose and may or may not reflect the exact characteristics of the 911 community’s ideal system; however, much can be learned from these projects as they share similar concerns. Any effort to streamline data and information use or sharing across multiple systems (within or outside of a specific domain or discipline) grapples with the key priorities identified below in Figure 7.

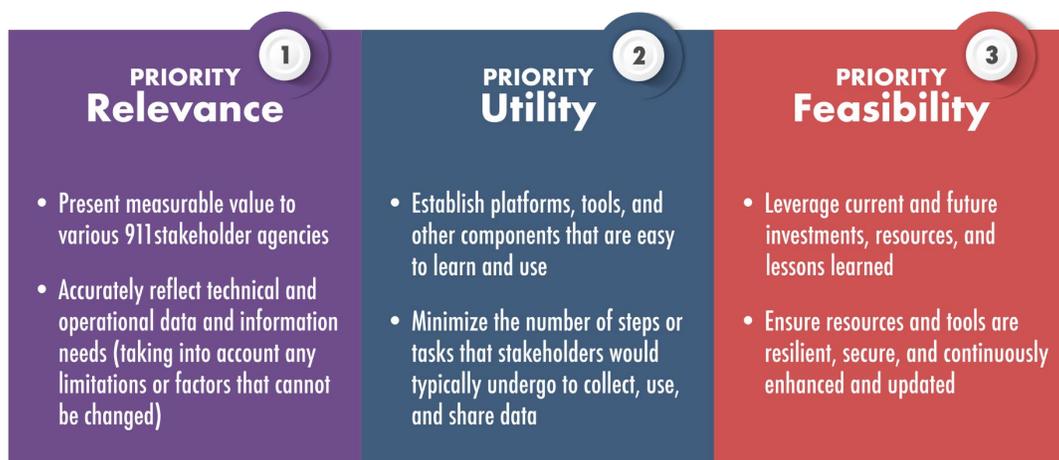


Figure 7. Priorities for Creation of a Nationally-Accessible 911 Data and Information Sharing Environment

Models Worth Exploring

When thinking about what a 911 information sharing environment may look like, components and functionalities it should contain, and capabilities it could leverage, it may be useful to examine efforts that are comparable or relevant in scope or purpose. Described below are but a few initiatives—information sharing environments and information exchange models—worthy of exploration.

The [National Fire Operations Reporting System](#) (NFORS) and [Fire-Community Assessment Response Evaluation System](#) (FireCARES)—These systems are funded by the DHS Federal Emergency Management Agency (FEMA) Assistance to Firefighters Grant (AFG) Program, and in the case of NFORS, FEMA’s Fire Prevention and Safety Grant (FP&S). In support of local fire departments across the Nation, NFORS strives to help improve firefighter and civilian safety while FireCARES is designed to provide local fire department and community risk information to fire service and community leaders. NFORS, which is in the process of a phased roll-out, enables local fire departments to analyze their CAD data, track response diaries for individual firefighters, and assess incident data. CAD data is populated into NFORS through automated extraction capabilities that tap directly into local CAD systems. FireCARES leverages national data sets plus manual data manipulation to enable users to assess risk based on community and infrastructure data, analyze fire department performance, and measure levels to which local fire departments are equipped to meet the risk environment in which they provide services. Furthermore, interoperability between the two data systems is planned, which will facilitate automated data population for enhanced analytical purposes. Automated transfer will also help maintain the integrity of data, avoiding errors that may occur from duplicative manual entries. Years of nationally-relevant, consensus-driven best practices and lessons learned can be culled from over 20 fire industry governmental and professional organizations that have partnered to plan, design, coordinate, implement, and promote these systems.

[The Emergency Incident Data Document \(EIDD\)](#)—APCO and NENA’s EIDD (APCO/NENA 2.105.1-2017), is an American National Standards Institute (ANSI)-approved standard for exchanging emergency incident information to agencies and regions that implement NG911 and IP-based emergency communications systems. The EIDD is Extensible Markup Language (XML)-based and conforms to the National Information Exchange Model (NIEM) vocabulary to define specific incident elements, their attributes, allowable values, and data structures. It provides a vendor-neutral method for sharing information among disparate systems within a public safety agency or across different agencies.

NHTSA’s [National EMS Information System \(NEMSIS\)](#)—NEMSIS is a national database that stores and provides state EMS data and standardizes how information related to patient care resulting from 911 services is collected. NEMSIS offers a publicly available research data set; various reports that are relevant to the public, EMS data managers and agencies, software vendors, and federal officials; and, technical assistance in regard to

implementing the NEMESIS standard, maintaining and managing data, and public education. Another DOT example includes the Federal Transit Administration’s (FTA) [National Transit Database](#) (NTD) which provides data and trends analyses to help local, state, and regional transit providers make data-informed decisions about their budgets, operations, and benchmarks for improving asset conditions.

The [Law Enforcement Enterprise Portal](#) (LEEP) and the [National Data Exchange](#) (N-DEx) System—The U.S. Department of Justice (DOJ) Federal Bureau of Investigation (FBI) maintains LEEP, a multi-portal information sharing environment described by the FBI as “an electronic gateway that provides law enforcement agencies, intelligence partners, and criminal justice entities with centralized access to many different resources and services via a single sign-on.” Users can form special interest groups and collaborate via a “Virtual Command Center” that facilitates shared situational awareness and collaborative incident management. The FBI also maintains the N-DEx System which provides criminal justice agencies a platform for sharing, searching, linking, and analyzing information across jurisdictional boundaries.

Implementation Milestones & Priorities

An initiative of this nature can take years, will require the input of the entire 911 community, and must be approached in digestible pieces. Visions of what the environment should look and feel like will change iteratively as this plan is constantly socialized and refined accordingly. Therefore, a solid foundation for this process must be laid—sufficient time and effort must be spent on identifying and articulating what the system should accomplish. Additionally, concerted effort must be made to identify, understand, and leverage the many efforts and achievements that already have occurred throughout the 911 community. Significant strides in 911 service delivery research, standards development, multijurisdictional operations, and NG911 planning have been made in recent years. These efforts offer successes, resources, and tools upon which to build, and a variety of lessons that can help the 911 community avoid certain landmines.

To bring this plan as close as possible to an actionable format, the 911 community stakeholders who contributed to its development discussed high-level implementation milestones that would need to occur. In doing so, they categorized activities across the following three timeframes:

1. **Near-Term Milestones**—activities that can feasibly be started and/or completed between now and the next two years;
2. **Intermediate-Term Milestones**—activities that can feasibly be started and/or completed within approximately two to five years from now; and
3. **Long-Term Milestones**—activities that can feasibly be started once Intermediate-Term tasks are completed and tasks that are likely to be ongoing on an indefinite basis.

Activities in support of milestones may occur simultaneously across various goals and objectives (objectives are serially numbered for organizational purposes—assigned numbers are not intended to suggest the order by which objectives should be achieved).

Contributors acknowledged that regardless of the milestone or timeframe anticipated, all tasks will require the input and involvement of all 911 perspectives to ensure forward momentum and success for the 911 community as a whole. They also agreed that this plan must remain fluid and be continuously adjusted as outcomes shed light on the 911 community’s requirements and needs. Additionally, as highlighted elsewhere in the plan, activities have not been attributed to any specific organization or stakeholder group. How responsibilities play out will depend largely on findings that result from each activity, particularly the Near-Term Milestones. As visibility of exactly what needs to be done increases, the 911 community will be better positioned to organize strategic and tactical teams and approaches that can bring the plan closer to its stated vision. Milestones relating to each goal and objectives are identified in the following tables.

**GOAL
1**

Data Uniformity

Essential elements of information that are standardized and supportive of interoperability and overall quality assurance of 911 service delivery

GOAL 1 OBJECTIVES	NEAR-TERM MILESTONES	INTERMEDIATE-TERM MILESTONES	LONG-TERM MILESTONES
OBJECTIVE 1.1: Identify and define essential elements of information that span the entire lifecycle of a 911 emergency assistance request	<ul style="list-style-type: none"> Identify data elements already collected Identify other desired elements Determine sources of each element Determine relevance and priority of each element Define each element for standardization 		
OBJECTIVE 1.2: Identify and define essential elements of information that span the management of a 911 environment	<ul style="list-style-type: none"> Identify data elements already collected Identify other desired elements Determine sources of each element Determine relevance and priority of each element Define each element for standardization 		
OBJECTIVE 1.3: Create a 911 essential elements of information dictionary	<ul style="list-style-type: none"> Create a data document of all elements 	<ul style="list-style-type: none"> Publish data document through a standards body 	<ul style="list-style-type: none"> Maintain document through the standards process
OBJECTIVE 1.4: Create standard data models for 911 essential elements of information	<ul style="list-style-type: none"> Group data elements into logical data categories Identify methods to collect, store, and analyze data categories 	<ul style="list-style-type: none"> Develop data exchange models for each category 	
OBJECTIVE 1.5: Categorize data by source, collector, and user level	<ul style="list-style-type: none"> Identify source, collectors, users, and usage restrictions for each data element 		
OBJECTIVE 1.6: Create a process for validating and verifying data	<ul style="list-style-type: none"> Identify the valid data, valid sources, and appropriate validation method for each data element 		

**GOAL
2**

Automated Data Handling

Collection, use, quality assurance, and security of data and information across disparate 911 systems

GOAL 2 OBJECTIVES	NEAR-TERM MILESTONES	INTERMEDIATE-TERM MILESTONES	LONG-TERM MILESTONES
OBJECTIVE 2.1: Reduce data and information silos by facilitating adoption of Goal 1 products and use of interoperable systems		<ul style="list-style-type: none"> Identify data systems from which data elements can be acquired Develop standards for automated data exchange Develop data repository standards Implement data repositories at regional, state, and national levels 	<ul style="list-style-type: none"> Implement data repositories at regional, state, and national levels
OBJECTIVE 2.2: Establish recommended approaches for how uniform data can be used across various dashboards, etc.		<ul style="list-style-type: none"> Research exchange models Identify existing methods that may be appropriate for the 911 community Develop specific governance parameters 	
OBJECTIVE 2.3: Ensure adoption of nationally-applicable, consensus-driven best practices for 911 service system protection and safe storage and exchange of data and information	<ul style="list-style-type: none"> Develop security needs and requirements Review existing solutions that may meet needs and requirements 	<ul style="list-style-type: none"> Define security standards for data in transit Define security standards for data stored by users Define security standards for identity, credential, and access management (ICAM) for all parties and agencies involved Provide education and best practices on standards Develop processes that make use of other existing systems (e.g., NG911 and related ESInets) Develop governance standards and model contractual language 	<ul style="list-style-type: none"> Implement governance standards and model contractual language
OBJECTIVE 2.4: Ensure adoption of common practices for chain of custody/evidence or anonymization		<ul style="list-style-type: none"> Define nationally-applicable, consensus-driven best practices for: <ul style="list-style-type: none"> using data without impacting chain of custody logging, accessing, and using data anonymization Define specific data elements that need anonymization 	

**GOAL
3**

Role-Based Information Sharing

The right data to the right people at the right time, facilitating evidence-based decisions while protecting privacy

GOAL 3 OBJECTIVES	NEAR-TERM MILESTONES	INTERMEDIATE-TERM MILESTONES	LONG-TERM MILESTONES
OBJECTIVE 3.1: Create and define a common list of roles and responsibilities as they apply to those who handle data	<ul style="list-style-type: none"> • Research data roles and responsibilities from other public safety domains • Define a list of data creators, users, and handlers • Identify circumstances that define whether a person is a data handler, user, owner, or coordinator • Define roles and responsibilities specific to each circumstance 		
OBJECTIVE 3.2: Establish parameters for role-based sharing	<ul style="list-style-type: none"> • Define usage rights for which data is available to each role and circumstance • Define privacy issues for each data element (i.e., under what circumstances it may be shared and with whom) 		
OBJECTIVE 3.3: Support promotion of nationally-acceptable, consensus-driven best practices for creating dashboards, visualization tools, and other platforms and tools that support jurisdictional data analysis and shared situational awareness		<ul style="list-style-type: none"> • Define reports needed for each defined role at jurisdictional, multijurisdictional, and national levels • Research other reporting dashboards and visualization tools used for data analysis and shared situational awareness • Define requirement for tool(s) • Interview providers of similar tools that support similar requirements • Research costs to provide tool(s) at the local level • Identify any other national data sharing tool(s) needs that could be incorporated into the process (e.g., national GIS data) 	
OBJECTIVE 3.4: Permit ad-hoc/on-demand data sharing and discovery processes		<ul style="list-style-type: none"> • Identify tools that can create ad hoc reports • Identify information sharing tools that permit ad hoc data exchange • Define policies and procedures for ad hoc data sharing and analysis 	

**GOAL
4**

Sustainable Vital Support Mechanisms

Governance frameworks, funding sources, and a network of 911 community partners able to maintain a 911 data and information sharing environment for all tiers of governing bodies

GOAL 4 OBJECTIVES	NEAR-TERM MILESTONES	INTERMEDIATE-TERM MILESTONES	LONG-TERM MILESTONES
OBJECTIVE 4.1: Develop user-focused governance and advisory framework		<ul style="list-style-type: none"> Identify the composition and framework for a solid governance structure Determine guiding principles for the data sharing environment 	
OBJECTIVE 4.2: Identify funding needs, funding models, and funding sources for long-term sustainability of the 911 data and information system	<ul style="list-style-type: none"> Research other nationally accessible data sharing environments (e.g., NEMSIS) to understand their data sharing applications Understand their lessons learned, best practices, and funding/business models Identify public and private providers of data Outline data owner requirements 	<ul style="list-style-type: none"> Create funding/business model options for stakeholder consideration Understand their lessons learned, best practices, and funding/business models Identify synergies between public and private providers to determine possible partnerships 	
OBJECTIVE 4.3: Develop model legislation language that would set the stage for enhanced data and information collection, use, analysis, and sharing	<ul style="list-style-type: none"> Review federal law regarding public safety data for any inhibitive legal issues Review state laws referencing public safety data to identify states that would inhibit enhanced data use 	<ul style="list-style-type: none"> Design sample language for states to use if legislative changes are needed at the state level 	
OBJECTIVE 4.4: Develop model contractual language that requires service providers to share data	<ul style="list-style-type: none"> Identify the various commercial data sources In collaboration with service provider stakeholders, define "use" and "ownership" of data 	<ul style="list-style-type: none"> Work with service provider stakeholders to find examples of current data sharing agreements between companies Research and categorize legal references that support access and use of data in commercial systems Create sample contractual language 	

**GOAL
4**

Sustainable Vital Support Mechanisms

Governance frameworks, funding sources, and a network of 911 community partners able to maintain a 911 data and information sharing environment for all tiers of governing bodies

GOAL 4 OBJECTIVES

OBJECTIVE 4.5: Develop model jurisdictional agreements/memoranda of understanding (MOUs) that would facilitate authoritative data and information sharing

OBJECTIVE 4.6: Measure impacts of data sharing (return on investment)

NEAR-TERM MILESTONES

INTERMEDIATE-TERM MILESTONES

LONG-TERM MILESTONES

- Review existing MOUs within the 911 community and between public data owners and PSAPs to identify how they address data sharing
- Identify best practices and gaps in how 911 systems currently collect, use, and share information

- Identify data users

- Define performance measurements pertaining to each data user
- Define reporting processes
- Create evaluation criteria for early adopters

**GOAL
5**

Data-Savvy 911 Professionals

911 professionals with the skills to apply user-centric approaches to using 911 data

GOAL 5 OBJECTIVES	NEAR-TERM MILESTONES	INTERMEDIATE-TERM MILESTONES	LONG-TERM MILESTONES
OBJECTIVE 5.1: Identify role-based skillsets and qualifications for each staff position involved in data management		<ul style="list-style-type: none"> • Identify needed skillsets for each position • Review, write, or create job description/positions for data management • Review and enhance/change organizational models to include data management positions 	
OBJECTIVE 5.2: Develop staff training to support the development of skillsets needed for data-related positions		<ul style="list-style-type: none"> • Identify data training needs • Identify existing training being offered by 911 and standards organizations • Define specific training related to 911 data collection, aggregation, and analysis • Define training for PSAP personnel to ensure they are maintaining the chain of custody • Define cybersecurity training needed by PSAP personnel as it relates to each position • Identify best approaches for developing sustainable, multimodal training for data sharing 	
OBJECTIVE 5.3: Define how data skills impact 911 service funding needs and models	<ul style="list-style-type: none"> • Identify what data is needed to support funding-related decision-making 	<ul style="list-style-type: none"> • Identify how variations in 911 environment governance and funding models impact establishing a baseline of necessary capabilities and skillsets • Define how data skills impact 911 service funding needs and models 	
OBJECTIVE 5.4: Identify staffing models that support various levels of data management capabilities		<ul style="list-style-type: none"> • Identify how various data sharing models impact staffing models 	<ul style="list-style-type: none"> • Define how staffing needs may be minimized by improving technology and systems automation

Foundational First Steps—Near-Term Milestones

When considering where to start, it is helpful to look at the Near-Term Milestones. The majority of these activities involve research and thorough examination of what the 911 community currently faces. Figure 8 below reflects Near-Term Milestones across all goals and objectives. As progress is made, milestones (near- and intermediate-term) can be refined, expanded upon, and planned. Continuous socialization of this plan with the 911 community also will affect future steps—keeping the plan front-and-center with the community will be the most crucial step.

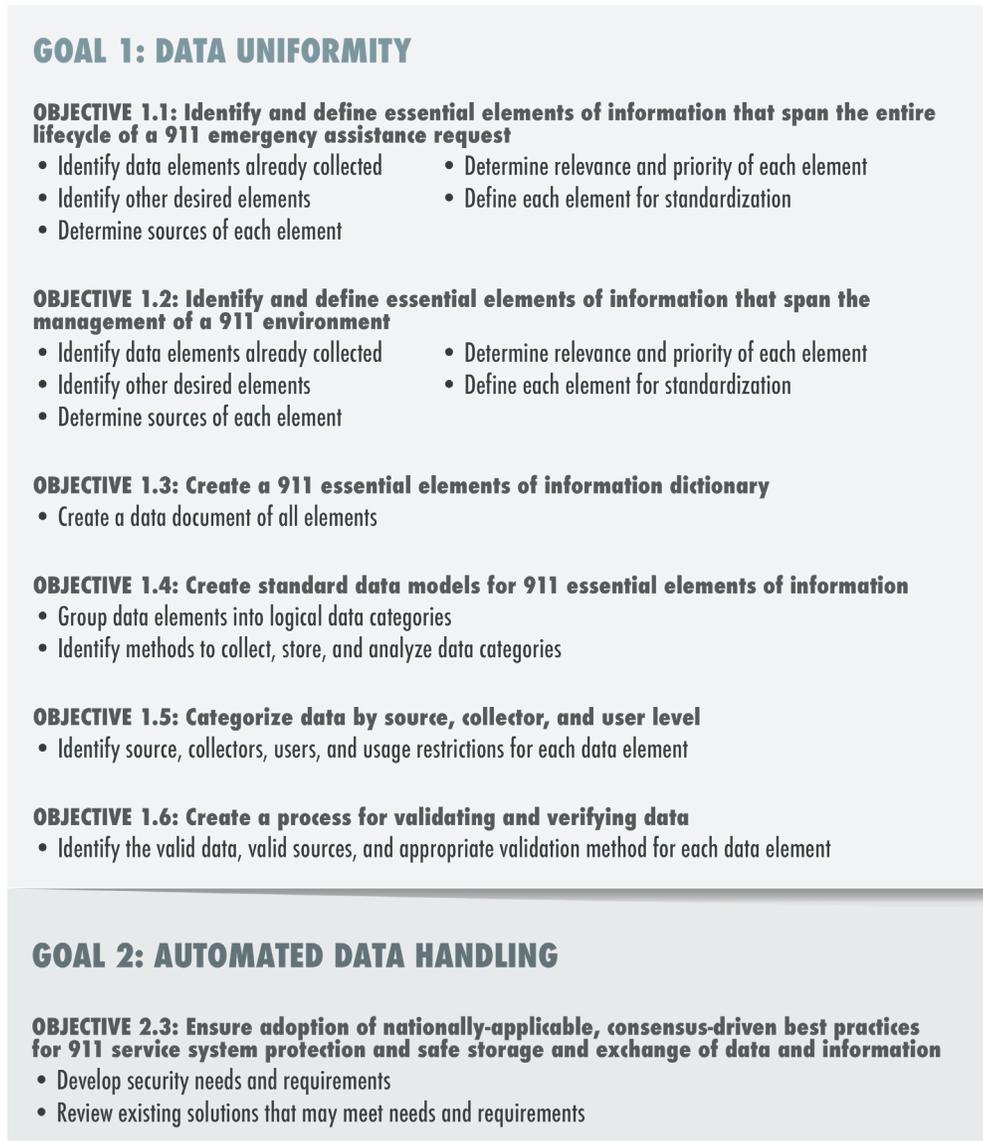


Figure 8. Near-Term Milestones

GOAL 3: ROLE-BASED INFORMATION SHARING

OBJECTIVE 3.1: Create and define a common list of roles and responsibilities as they apply to those who handle data

- Research data roles and responsibilities from other public safety domains
- Define a list of data creators, users, and handlers
- Identify circumstances that define whether a person is a data handler, user, owner, or coordinator
- Define roles and responsibilities specific to each circumstance

OBJECTIVE 3.2: Establish parameters for role-based sharing

- Define usage rights for which data is available to each role and circumstance
- Define privacy issues for each data element (i.e., under what circumstances it may be shared and with whom)

GOAL 4: SUSTAINABLE VITAL SUPPORT MECHANISMS

OBJECTIVE 4.2: Identify funding needs, funding models, and funding sources for long-term sustainability of the 911 data and information system

- Research other nationally accessible data sharing environments (e.g., NEMSIS) to understand their data sharing applications
- Understand their lessons learned, best practices, and funding/business models
- Identify public and private providers of data
- Outline data owner requirements

OBJECTIVE 4.3: Develop model legislation language that would set the stage for enhanced data and information collection, use, analysis, and sharing

- Review federal law regarding public safety data for any inhibitive legal issues
- Review state laws referencing public safety data to identify states that would inhibit enhanced data use

OBJECTIVE 4.4: Develop model contractual language that requires service providers to share data

- Identify the various commercial data sources
- In collaboration with service provider stakeholders, define “use” and “ownership” of data

OBJECTIVE 4.6: Measure impacts of data sharing (return on investment)

- Identify data users

GOAL 5: DATA-SAVVY 911 PROFESSIONALS

OBJECTIVE 5.3: Define how data skills impact 911 service funding needs and models

- Identify what data is needed to support funding-related decision-making

Figure 8. Near-Term Milestones (cont.)

What First Steps Can You Take Toward Pushing this Plan Forward?

An abundance of collective thought must occur to determine how to best configure the implementation activities described in this plan into an actionable timeline that ensures each are able to inform and build upon the other. As you consider your potential role, remember that there are a multitude of ways you can contribute. Below are just a few suggestions on how to become involved.

- Become more informed about 911 data management and information sharing issues.
- Engage with your community, networks, and elected officials about the importance of 911 data collection, use, analysis, and evaluation.
- Help articulate:
 - administrative, operational, and technical 911 data needs, requirements, and challenges;
 - challenges that occur during day-to-day operations and with continuous process improvement due to hindered access to 911 data; and
 - issues experienced by industry that hinder production and implementation of enhanced 911 data management and sharing technologies.
- Help develop use cases to inform standards, garner buy-in, influence technological advances, and establish nationally-applicable best practices and methodologies.
- Document and promulgate 911 data and information sharing consensus-driven best practices and successful policies and procedures that have national applicability.
- Join a 911 data management and information sharing standards development organization or working group.
- Submit changes, recommendations, and additions to this plan to NHTSA.
- Submit your thoughts on what the ideal 911 data management and information sharing environment might look like to NHTSA.

NHTSA's National 911 Program will be the "keeper" of this strategic plan and will monitor its progress. You are encouraged to send any recommendations, considerations, and updates to the Program's attention: NHTSA.national911@dot.gov. Keeping in touch and sharing information and knowledge of how the 911 community is coming together on data issues will help contribute to this plan's success.

In Conclusion

While we may not yet be able to list specific components or develop a technical architecture for a nationally uniform 911 data and information system, we know that the “system,” if produced as intended, will be multifaceted and flexible. While it will strive to standardize and streamline a great deal of the 911 system information landscape, it must also be flexible and thoughtful about leveraging significant work that has already been accomplished (or is currently underway). The system should not “reinvent the wheel” or conflict with consensus-driven best practices and approaches already in use throughout the 911 community.

This plan is an early step toward determining the most beneficial suite of services, tools, and mechanisms to reach a common data sharing and safeguarding environment. Through this environment, data will become actionable information and be available for use to make data-driven decisions. Interoperability will become the “norm,” data management resources will be available and optimally utilized, and the now siloed environment will become history. Ultimately, a nationally uniform 911 data and information environment will improve 911 for the caller, PSAPs, 911 system managers, and public safety responders. As this strategy is implemented, the National 911 Program will document outcomes, coordinate updates, and facilitate defining iterative paths forward.

APPENDIX 1: 911 Terms & Definitions

TERM	DEFINITION
911 (or 9-1-1)	A three-digit telephone number to facilitate the reporting of an emergency requiring a response by a public safety agency.
911 authority	A state, county, regional, or other governmental entity responsible for 911 service operations. For example, this could be a county/parish or city government, a special 911 or Emergency Communications District, a Council of Governments or other similar body.
911 “call”	A generic term used to include any type of Request For Emergency Assistance (RFEA); a 911 call is not limited to voice. This may include a session established by signaling with two-way, real-time media and involves a human making a request for help. We sometimes use “voice call,” “video call” or “text call” when specific media is of primary importance. The term “non-human-initiated call” refers to a one-time notification or series of data exchanges established by signaling with at most one-way media, and typically does not involve a human at the “calling” end. The term “call” also can be used to refer to either a “voice call,” “video call,” “text call” or “data-only call”, because they are handled the same way through most of NG911.
911 fund	The fund established by state statute that is specifically used to fund 911 activities and/or infrastructure.
911 service area	The geographic area that has been granted authority by a state or local governmental body to provide 911 services.
911 state plan	A document prepared, maintained, implemented, and updated by a state that provides a comprehensive plan for operating a statewide 911 system that communicates 911 call information across networks and among PSAPs, addresses all aspects of the statewide 911 system, and describes the allowable uses of revenue in the 911 fund.
911 system	A coordinated system of technologies used by a collaborative group of people to operate an efficient and effective network for accepting, processing, and delivering emergency information to facilitate an emergency response. A set of networks, services, software applications, databases, customer premises equipment (CPE) components, and operations and management procedures required to provide 911 service. This may include commercial, governmental, and human resources.
Access provider	An access provider is any organization that arranges for an individual or an organization to have access to the internet.
Additional data	Data that further describes the nature of how a call was placed, the person(s) associated with the device placing the call, or the location the call was placed from. There are three types of additional data: for the call, for the caller, and for the location.
Agency	In NG911, an organization that is connected directly or indirectly to the ESInet. Public safety agencies are examples. An entity such as a company that provides a service in the ESInet also can be an agency. Agencies have identifiers and credentials that allow them access to services and data.
Agent	In NG911, an agent is an authorized person—an employee, contractor or volunteer, who has one or more roles in an agency. An agent also can be an automaton in some circumstances (e.g., an interactive media response [IMR] answering a call).

TERM	DEFINITION
Alternate routing	The capability of routing 911 calls to a designated alternate location(s) if all 911 trunks are busy or out of service. May be activated upon request or automatically, if detectable, when 911 equipment fails or the PSAP itself is disabled.
Automatic location identification (ALI)	The automatic display at the PSAP of the caller’s address/location of the telephone and supplementary emergency services information of the location from which a call originates.
Automatic number identification (ANI)	The automatic display at the PSAP of the caller’s telephone number associated with the access line from which a call originates.
Basic 911	An emergency telephone system that automatically connects 911 callers to a designated answering point. Call routing is determined by the originating telephone central office only. Basic 911 may or may not support ANI and/or ALI.
Call handling	Functional element concerned with the details of the management of calls. It handles all communication from the caller. It includes the interfaces, devices and applications utilized by the agents to handle the call.
Call routing	The capability to selectively route the 911 call to the appropriate PSAP.
Call-taker	An agent of a PSAP who answers and processes emergency calls. Synonymous with the term, “telecommunicator.”
Call taking	The act of processing a call for emergency assistance up to the point that the call is ready for dispatch, including the use of equipment, call classification, location of a caller, and determination of the appropriate response level for emergency responders.
Carrier	The business entity providing service to a customer base, typically for a fee. Examples of carriers and associated services are public switched telephone network (PSTN) service by a local exchange carrier (LEC), voice over Internet Protocol (VoIP) service by a VoIP provider; email service provided by an internet service provider (ISP).
Commercial call center	A privately operated call center, which answers emergency and/or nonemergency calls.
Commercial mobile radio service (CMRS)	An FCC designation for any carrier or licensee whose wireless network is connected to the PSTN.
CMRS connection	Each mobile handset telephone number assigned to a CMRS subscriber with a place of primary use in-state.
CMRS provider	An entity, whether facilities-based or non-facilities-based, that is licensed by the FCC to provide CMRS or that resells CMRS within a state.
Computer-aided dispatch (CAD)	A computer-based system that aids PSAP telecommunicators by automating selected dispatching and record-keeping activities.
Continuity of operations (COOP)	The ability to continue operations during and after a service-impacting event through a specific set of procedures designed to reduce the damaging consequences of unexpected events resulting in the loss of 911 capabilities.
Customer premises equipment (CPE)	Communications or terminal equipment located in the customer’s facilities—terminal equipment at a PSAP.
Database	An organized collection of information, typically stored in computer systems, comprised of fields, records (data), and indexes. In 911, such databases include the Master Street Address Guide (MSAG), telephone number/emergency service number (ESN), and telephone customer records.
Data exchange	The process of exchanging 911 data between service providers and the database management system provider.

TERM	DEFINITION
Dispatch system	Functional element used to assign appropriate resources (emergency responders) to an incident, monitor the response and relay relevant information. Tracks and logs all transactions associated with the emergency response.
Enhanced 911 (E911)	A telephone system that includes network switching, database and PSAP premises elements capable of providing ALI data, selective routing, selective transfer, fixed transfer, and a callback number. The term also includes any enhanced 911 service so designated by the FCC in its Report and Order in WC Docket Nos. 04-26 and 05-196, or any successor proceeding.
Emergency medical services (EMS)	A service providing out-of-hospital acute care and transport to definitive care, for patients with illnesses and injuries that the patient believes constitute a medical emergency.
Emergency services IP network (ESInet)	An ESInet is a managed IP network that is used for emergency services communications, and which can be shared by all public safety agencies. It provides the IP transport infrastructure upon which independent application platforms and core services can be deployed, including, but not restricted to, those necessary for providing NG911 services. ESInets may be constructed from a mix of dedicated and shared facilities. ESInets may be interconnected at local, regional, state, federal, national and international levels to form an IP-based inter-network (network of networks). The term ESInet designates the network, not the services that ride on the network.
First Responder Network Authority (FirstNet)	Signed into law on February 22, 2012, the Middle Class Tax Relief and Job Creation Act created the First Responder Network Authority (FirstNet). The law gives FirstNet the mission to build, operate and maintain the first high-speed, nationwide wireless broadband network dedicated to public safety. FirstNet will provide a single interoperable platform for emergency and daily public safety communications. http://www.firstnet.gov/
Geographic information system (GIS)	A system for capturing, storing, displaying, analyzing and managing data and associated attributes that are spatially referenced.
i3 solution	NENA i3 is a term for the NENA NG911 system architecture that standardizes the structure and design of functional elements which make up the set of software services, databases, network elements, and interfaces needed to process multi-media emergency calls and data for NG911.
Interconnectivity	The capability of disparate systems to be joined by connections between parts and elements.
Interlocal services agreement	An agreement among governmental jurisdictions or privately-owned systems, or both, within a specified area to share 911 system costs, maintenance responsibilities, and other considerations.
Internet of Things (IoT)	A network of physical internet-connected devices embedded with electronics, sensors, and software able to collect and exchange data with other linked devices.
Internet Protocol (IP)	The method by which digital data is sent from one computer to another on the internet or other networks.
Interoperability	The capability of disparate communications systems to seamlessly interconnect and work together as a collective system.
Landline	Colloquial term for PSTN access via an actual copper or fiber-optic transmission line that travels underground or on telephone poles. Used to differentiate the “wireless” connectivity of a cellular or Personal Communication System (PCS).
Legacy network gateway (LNG)	An NG911 functional element that provides an interface between a non-IP originating network and a NGCS-enabled network.

TERM	DEFINITION
Legacy PSAP gateway (LPG)	The Legacy PSAP Gateway (LPG) is a signaling and media interconnection point between an ESInet and a legacy PSAP. It plays a role in the delivery of emergency calls that traverse an i3-compliant ESInet to get to a legacy PSAP, as well as in the transfer and alternate routing of emergency calls between legacy PSAPs and NG911 PSAPs. The LPG supports an IP (i.e., Session Initiation Protocol [SIP]) interface toward the ESInet on one side, and a traditional multi-frequency (MF) or enhanced MF interface (comparable to the interface between a traditional selective router and a legacy PSAP) on the other.
Local exchange carrier	A telecommunications carrier under the state/local Public Utilities Act that provides local exchange telecommunications services. Also known as incumbent local exchange carriers, alternate local exchange carriers, competitive local exchange carriers, competitive access providers, certified local exchange carriers, and local service providers.
Location information server (LIS)	A functional element in an IP-capable originating network that provides locations of endpoints (i.e., calling devices). A LIS can provide location by reference, or location by value, and, if the latter, in geo or civic forms. A LIS can be queried by an endpoint for its own location, or by another entity for the location of an endpoint. In either case, the LIS receives a unique identifier that represents the endpoint, for example an IP address, circuit-ID or Media Access Control (MAC) address and returns the location (value or reference) associated with that identifier. The LIS is also the entity that provides the dereferencing service, exchanging a location reference for a location value.
Master Street Address Guide (MSAG)	A database of street names and house number ranges within their associated communities defining emergency service zones (ESZs) and their associated ESNs to enable proper routing of 911 calls.
Memorandum of agreement (MOA)	A memorandum of agreement (MOA) or cooperative agreement is a document written between parties to cooperatively work together on an agreed-upon project or meet an agreed-upon objective.
Memorandum of understanding (MOU)	A memorandum of understanding (MOU) is a document that expresses mutual accord on an issue between two or more parties.
Mutual-aid agreement	Written agreement between agencies and/or jurisdictions by which they agree to assist one another upon request, by furnishing personnel and equipment.
National Incident Management System (NIMS)	A standardized approach to incident management developed by DHS. It is intended to facilitate coordination between all responders (including all levels of government with public, private, and non-governmental organizations). https://www.fema.gov/national-incident-management-system
National Information Exchange Model (NIEM)	A community-driven, standards-based, national model for structured information sharing. www.niem.gov
Next Generation 911 (NG911) services	<p>“Next Generation 9-1-1 services” means an IP-based system comprised of hardware, software, data, and operational policies and procedures that:</p> <ol style="list-style-type: none"> a) provides standardized interfaces from emergency call and message services to support emergency communications; b) processes all types of emergency calls, including voice, data, and multimedia information; c) acquires and integrates additional emergency call data useful to call routing and handling; d) delivers the emergency calls, messages, and data to the appropriate public safety answering point and other appropriate emergency entities; e) supports data or video communications needs for coordinated incident response and management; and f) provides broadband service to public safety answering points or other first responder entities. <p>REF: Middle Class Tax Relief and Job Creation Act of 2012</p>

TERM	DEFINITION
Order of authority	A formal order by the state or local authority that authorizes public agencies or public safety agencies to provide 911 service in a geographical area.
Prepaid wireless telephone service	Telephone service authorized by the purchase of CMRS, either exclusively or in conjunction with other services. This service must be paid for in advance and is sold in units or dollars whose number or dollar value declines with use and is known on a continuous basis.
Private 911 emergency answering point	An answering point operated by non-public safety entities with functional alternative and adequate means of signaling and directing response to emergencies. Includes training to individuals intercepting calls for assistance that is in accordance with applicable local emergency telecommunications requirements. Private 911 emergency answering points are an adjunct to public safety response and as such must provide incident reporting to the public safety emergency response centers per local requirements.
Proprietary information	Subscriber lists, technology descriptions, technical information, or trade secrets that are developed, produced, or received internally by a voice communications service provider or by a voice communications service provider’s employees, directors, officers, or agents.
Public safety agency	A functional division of a public agency that provides firefighting, law enforcement, medical or other services to respond to and manage emergency incidents.
Public safety answering point (PSAP)	<p>An entity responsible for receiving 911 calls and processing those calls according to a specific operational policy.</p> <ul style="list-style-type: none"> • Primary PSAP: A PSAP to which 911 calls are routed directly from the 911 Control Office. • Secondary PSAP: A PSAP to which 911 calls are transferred from a primary PSAP. • Alternate PSAP: A PSAP designated to receive calls when the primary PSAP is unable to do so. • Consolidated PSAP: A facility where multiple public safety agencies choose to operate as a single 911 entity. • Legacy PSAP: A PSAP that cannot process calls received via i3-defined call interfaces (IP-based calls) and still requires the use of centralized automatic message accounting (CAMA) or integrated services digital network (ISDN) trunk technology for delivery of 911 emergency calls. • Serving PSAP: The PSAP to which a call normally would be routed. • NG911 PSAP: This term is used to denote a PSAP capable of processing calls and accessing data services as defined in NENA’s i3 specification, NENA NENA-STA-010, and referred to therein as an “i3 PSAP.”
Service provider	An entity providing one or more of the following 911 elements: network, CPE, or database service.
Standards development organization (SDO)	An entity whose primary activities are developing, coordinating, promulgating, revising, amending, reissuing, interpreting, or otherwise maintaining standards that address the interests of a wide base of users outside the standards development organization.
Subscriber	A person who purchases a communications service and is able to receive it or use it periodically over time.
Telecommunication	The transmission, between and among points specified by the user, or information of the user’s choosing, without change in the form of content of the information sent and received, regardless of the facilities, equipment or technology used.

TERM	DEFINITION
Virtual PSAP	An operational model directly enabled through NG911 features and/or network-hosted PSAP equipment in which telecommunicators are geographically dispersed, rather than working from the same physical location. Remote access to the PSAP applications by the dispersed telecommunicators requires the appropriate network connections, security, and workstation equipment at the remote location. Unified communications applications supporting voice, data, instant messaging, and video communications between telecommunicators may be used to enable the telecommunicators to work cooperatively from diverse locations. The virtual workplace may be a logical combination of physical PSAPs, or an alternate work environment such as a satellite facility, or any combination of the above. Workers interoperate via IP connectivity.
Voice communications service	The transmission, conveyance, or routing of real-time, two-way voice communications to a point, or between or among points, or through any electronic, radio, satellite, cable, optical, microwave, wireline, wireless, or other medium or method, regardless of the protocol used, including interconnected VoIP service.
Voice over Internet Protocol (VoIP)	Technology that permits delivery of voice calls and other real-time multimedia sessions over IP networks.

APPENDIX 2: Associations, Organizations & Other Stakeholder Entities Relevant to 911

NAME/ACRONYM	DESCRIPTION	WEBSITE
Alliance for Telecommunications Industry Solutions (ATIS)	A U.S.-based organization that is committed to rapidly developing and promoting technical and operations standards for the communications and related information technologies industry worldwide using a pragmatic, flexible and open approach.	https://www.atis.org/
American National Standards Institute (ANSI)	Entity that coordinates the development and use of voluntary consensus standards in the United States and represents the needs and views of U.S. stakeholders in standardization forums around the globe.	www.ansi.org
American Registry for Internet Numbers (ARIN)	An organization that provides services related to the technical coordination and management of internet number resources.	https://www.arin.net/
Association of Public-Safety Communications Officials (APCO)	APCO is the world’s oldest and largest not-for-profit professional organization dedicated to the enhancement of public safety communications.	http://www.apcointl.org/
Commission on Accreditation for Law Enforcement Agencies (CALEA)	<p>Created in 1979 as a credentialing authority through the joint efforts of law enforcement's major executive associations:</p> <ul style="list-style-type: none"> • International Association of Chiefs of Police (IACP) • National Organization of Black Law Enforcement Executives (NOBLE) • National Sheriffs' Association (NSA) • Police Executive Research Forum (PERF). <p>The purpose of CALEA’s accreditation programs is to improve the delivery of public safety services, primarily by: maintaining a body of standards, developed by public safety practitioners, covering a wide range of up-to-date public safety initiatives; establishing and administering an accreditation process; and recognizing professional excellence.</p>	http://www.calea.org/

NAME/ACRONYM	DESCRIPTION	WEBSITE
Communications Security, Reliability, and Interoperability Council (CSRIC) (formerly known as the Network Reliability and Interoperability Council [NRIC])	An advisory body of the FCC that provides recommendations to the FCC to ensure, among other things, optimal security and reliability of communications systems, including telecommunications, media, and public safety.	https://www.fcc.gov/about-fcc/advisory-committees/communications-security-reliability-and-interoperability-council-0
CTIA—The Wireless Association	CTIA represents the U.S. wireless communications industry. From carriers and equipment manufacturers to mobile app developers and content creators, CTIA brings together a dynamic group of companies that enable consumers to lead a 21st Century connected life.	https://www.ctia.org/
Emergency Services Interconnection Forum (ESIF)	An open, technical/operational forum, under the auspices of ATIS, with the voluntary participation of interested parties to identify and resolve recognized 911 interconnection issues.	https://www.atis.org/01_committ_forums/ESIF/about.asp
Federal Communications Commission (FCC)	An independent U.S. government agency overseen by Congress, the FCC regulates interstate and international communications by radio, television, wire, satellite and cable in all 50 states, the District of Columbia and U.S. territories.	https://www.fcc.gov/
Federal Geographic Data Committee (FGDC)	An interagency committee that promotes the coordinated development, use, sharing, and dissemination of geospatial data on a national basis.	https://www.fgdc.gov/
First Responder Network Authority (FirstNet)	Signed into law on February 22, 2012, the <i>Middle Class Tax Relief and Job Creation Act</i> created FirstNet. The law gives FirstNet the mission to build, operate and maintain the first high-speed, nationwide wireless broadband network dedicated to public safety. FirstNet will provide a single interoperable platform for emergency and daily public safety communications.	http://www.firstnet.gov/
Industry Council for Emergency Response Technologies (iCERT)	iCERT’s mission is to serve as the voice of the commercial sector in the emergency response technologies field. iCERT members assist public policymakers and government emergency communications professionals as they address complex choices regarding advanced communications technology alternatives in the years ahead. Through advocacy, research, and in coordination with the public sector, iCERT plays a vital role in the development and deployment of emergency response technologies.	https://www.theindustrycouncil.org/
Institute of Electrical and Electronic Engineers (IEEE)	A publishing and standards-making body responsible for many telecom and computing standards.	https://www.ieee.org/

NAME/ACRONYM	DESCRIPTION	WEBSITE
Integrated Justice Information Systems Institute (IJIS)	The IJIS Institute, a 501(c)(3) nonprofit corporation, represents industry’s leading companies that collaborate with local, state, tribal, and federal agencies to provide technical assistance, training, and support services for information exchange and technology initiatives. The mission of the IJIS Institute is to unite the private and public sectors to improve critical information sharing for those who provide public safety and administer justice in our communities.	www.ijis.org
International Academies of Emergency Dispatch (IAED)	A non-profit, standards-setting organization, formerly known as the National Academies of Emergency Dispatch (NAED), promoting safe and effective emergency dispatch services worldwide.	http://www.emergencydispatch.org/
International Committee for Information Technology Standards (INCITS)	A U.S.-based standards development organization dedicated to the creation of information technology standards.	www.incits.org
International Organization for Standardization (ISO)	An independent, non-governmental international organization with a membership of 161 national standards bodies.	www.iso.org
International Telecommunication Union (ITU)	The telecommunications agency of the United Nations established to provide worldwide standard communications practices and procedures. Formerly the Consultative Committee for International Telephony and Telegraphy (CCITT).	https://www.itu.int/en/Pages/default.aspx
Internet Architecture Board (IAB)	The IAB is the committee charged with oversight of the technical and engineering development of the internet by the Internet Society (ISOC). It oversees numerous task forces, of which the most important are the Internet Engineering Task Force (IETF) and the Internet Research Task Force (IRTF). The body that eventually became the IAB originally was formed by the DOD’s Defense Advanced Research Projects Agency (DARPA), under the name Internet Configuration Control Board, in 1979; it eventually became the Internet Advisory Board in September 1984, and then the Internet Activities Board in May 1986 (the name was changed, while keeping the same acronym). It finally became the Internet Architecture Board, under ISOC, in January 1992, as part of the internet’s transition from a U.S. government entity to an international public entity.	https://www.iab.org/
Internet Assigned Numbers Authority (IANA)	IANA is the entity that oversees global IP address allocation; Domain Name System (DNS) root zone management, and other IP assignments.	www.iana.org
Internet Corporate for Assigned Names and Numbers (ICANN)	Authority for public domain addresses and uniform resource locators (URLs), including related policies and databases.	https://www.icann.org/
Internet Engineering Steering Group (IESG)	The IESG is a body composed of the IETF chair and area directors.	https://www.ietf.org/about/groups/iesg/
Internet Engineering Task Force (IETF)	Lead standards-setting authority for internet-related protocols.	https://www.ietf.org/

NAME/ACRONYM	DESCRIPTION	WEBSITE
National 911 Program	The National 911 Program's mission is to provide federal leadership and coordination in supporting and promoting optimal 911 services. This federal "home" for 911 plays a critical role by coordinating federal efforts that support 911 services across the nation.	https://www.911.gov/
National Association of Search and Rescue (NASAR)	Non-profit association dedicated to advancement of professional, literary and scientific knowledge and training in the search-and-rescue field.	http://www.nasar.org/
National Association of State 911 Administrators (NASNA)	An association that represents state 911 programs in the field of emergency communications.	www.nasna911.org
National Center for Missing and Exploited Children (NCMEC)	The National Center for Missing and Exploited Children® opened in 1984 to serve as the nation's clearinghouse on issues related to missing and sexually exploited children.	www.missingkids.com
National Emergency Number Association (NENA)	NENA is a not-for-profit corporation established in 1982 to further the goal of "One Nation—One Number." NENA is a networking source and promotes research, planning and training. NENA strives to educate, set standards, and provide certification programs, legislative representation and technical assistance for implementing and managing 911 systems.	www.nena.org
National Exchange Carrier Association (NECA)	A membership association of U.S. local telecommunications companies dedicated to keeping customers connected on state-of-the-art communications networks.	www.neca.org
National Fire Protection Association (NFPA)	A global nonprofit organization, established in 1896, devoted to eliminating death, injury, property and economic loss due to fire, electrical and related hazards.	www.nfpa.org
National Highway Traffic Safety Administration (NHTSA)	NHTSA is a U.S. executive branch agency that is part of the Department of Transportation. It describes its mission as "Save lives, prevent injuries, reduce vehicle-related crashes." The National 911 Program is housed under NHTSA.	www.nhtsa.gov
National Information Standards Organization (NISO)	NISO is a non-profit association accredited by the American National Standards Institute (ANSI); it identifies, develops, maintains, and publishes technical standards to manage information in our changing and evermore digital environment. NISO standards apply both traditional and new technologies to the full range of information-related needs, including retrieval, re-purposing, storage, metadata, and preservation.	http://www.niso.org
National Institute of Standards and Technology (NIST)	A part of the U.S. Department of Commerce (DOC) that oversees the operation of the U.S. National Bureau of Standards. NIST works with industry and government to advance measurement science and to develop standards in support of industry, commerce, scientific institutions, and all branches of government. Its mission is to promote innovation and industrial competitiveness.	www.nist.gov

NAME/ACRONYM	DESCRIPTION	WEBSITE
National Integration Center (NIC)	DHS's National Integration Center (NIC) is responsible for managing the implementation and administration of the National Incident Management System (NIMS).	https://www.fema.gov/fema-technical-assistance-program
National Joint Telecommunicator Emergency Response Taskforce (TERT) Initiative (NJTI)	A partnership between APCO and NENA that has worked to develop the many facets of a TERT program and to help states lacking an active TERT program to develop one. TERT involves a comprehensive program that includes assistance to individual states in developing programs that would lead to the establishment of predetermined and selected trained teams of individuals who can be mobilized quickly and deployed to assist communications centers during disasters.	www.njti-tert.org
National Suicide Prevention Lifeline	The National Suicide Prevention Lifeline is a national network of local crisis centers that provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.	https://suicidepreventionlifeline.org/
National Telecommunications and Information Administration (NTIA)	NTIA is the executive branch agency that is principally responsible for advising the president on telecommunications and information policy issues. NTIA's programs and policymaking focus largely on expanding broadband internet access and adoption in America, expanding the use of spectrum by all users, and ensuring that the internet remains an engine for continued innovation and economic growth.	https://www.ntia.doc.gov/
North American Network Operators Group (NANOG)	A governing body that provides guidance and instructions for the design of an IP network. NANOG typically is involved in the best current operational practices for IPv6 planning.	https://www.nanog.org/about/home
North American Numbering Plan Administration (NANPA)	The organization that has overall administrative responsibility of the North American Numbering Plan (NANP), an integrated telephone numbering plan serving 20 North American countries that share its resources.	www.nationalnanpa.com
Open Geospatial Consortium (OGC)	A standards development organization that promulgates standards for the global geospatial community.	http://www.opengeospatial.org/
Open Mobile Alliance (OMA)	A standards development organization that develops standards for the mobile phone industry.	www.openmobilealliance.org
Organization for Advancement of Structured Information Standards (OASIS)	A standards development organization that promulgates standards for data interchange.	www.oasis-open.org
Packet Technologies and Services Committee (PTSC)	PTSC is an ATIS standards committee that develops standards related to services, architectures, signaling, network interfaces, next generation carrier interconnect, cybersecurity, and government emergency telecommunications service within next-generation networks.	https://www.atis.org/01_committ_forums/ptsc/
Urban and Regional Information Systems Association (URISA)	A non-profit association of professionals using GIS and other information technologies to solve challenges in U.S. state and local government agencies.	http://www.urisa.org/

APPENDIX 3: Useful Resources

Federal Rules, Regulations & Laws

- [Wireless Communications and Public Safety Act of 1999 \(PL 106-81\)](#)
- [Enhance 911 Service Act of 2004 \(PL 108-494\)](#)
- [New and Emerging Technologies 911 Improvement Act of 2008](#)
- [Food, Conservation and Energy Act of 2008 \(“Farm Bill”\) \(PL 110-246\)](#)
- [Implementing Recommendations of the 9/11 Commission Act of 2007 \(PL 110-53\)](#)

Reports

- FCC TFOPA [Adopted Final Report](#)
- TFOPA Working Group 1 Supplemental Report—[Optimal Cybersecurity Approach for PSAPs](#)
- TFOPA Working Group 2 Supplemental Report—[Phase II Supplemental Report: NG9-1-1 Readiness Scorecard](#)
- TFOPA Working Group 3 Supplemental Report—[Funding Sustainment Model](#)
- APCO Report—[Project 43: Broadband Implications for the PSAP](#)
- Government Accountability Office (GAO) Report to Congressional Committees: [911 Services Most States Used 911 Funds for Intended Purposes, but FCC Could Improve Its Reporting on States’ Use of Funds](#)
- FCC Emergency Access Advisory Committee (EACC) Working Group 7 Report—[Recommendations on Timeline Alignment](#)
- Canadian Radio-television and Telecommunications Commission, [A Report on Matters Related to Emergency 911](#)

Guidance & Research Documents

- National 911 Program [Guidelines for State NG911 Legislative Language](#)
- National 911 Program [Guidelines for Developing a State NG911 Plan](#)
- National 911 Program [State Assessment Handbook: A Guide for States Participating in the Statewide 911 System Assessment Process](#)
- National 911 Program [State Assessment Guidelines Synopsis Chart](#)
- National 911 Program [Next Generation 911 \(NG911\) Standards Identification and Review](#)
- [NG911 & FirstNet: Together Building the Future of Public Safety Communications \(A Guide for State & Local Authorities\)](#)
- [Guidelines for Minimum Training](#)
- National 911 Program [Next Generation 911 \(NG9-1-1\) Interstate Playbook](#)
- National 911 Program [Next Generation 911 \(NG9-1-1\) Interstate Playbook, Chapter 2](#)

Databases & Resource Repositories

- APCO [Standards to Download](#)
- NASNA [How to Start a State 911 Program](#)
- NASNA [State 911 Contacts](#)
- NASNA 911 [Regionalization—Tools and Information](#)
- National 911 [Program Documents & Tools](#)
- [National 911 Profile Database](#)
- NCSL [Key Enacted 911 Legislation Database](#)
- NENA [Company Identifier Program](#)
- NENA [Standards & Other Documents](#)