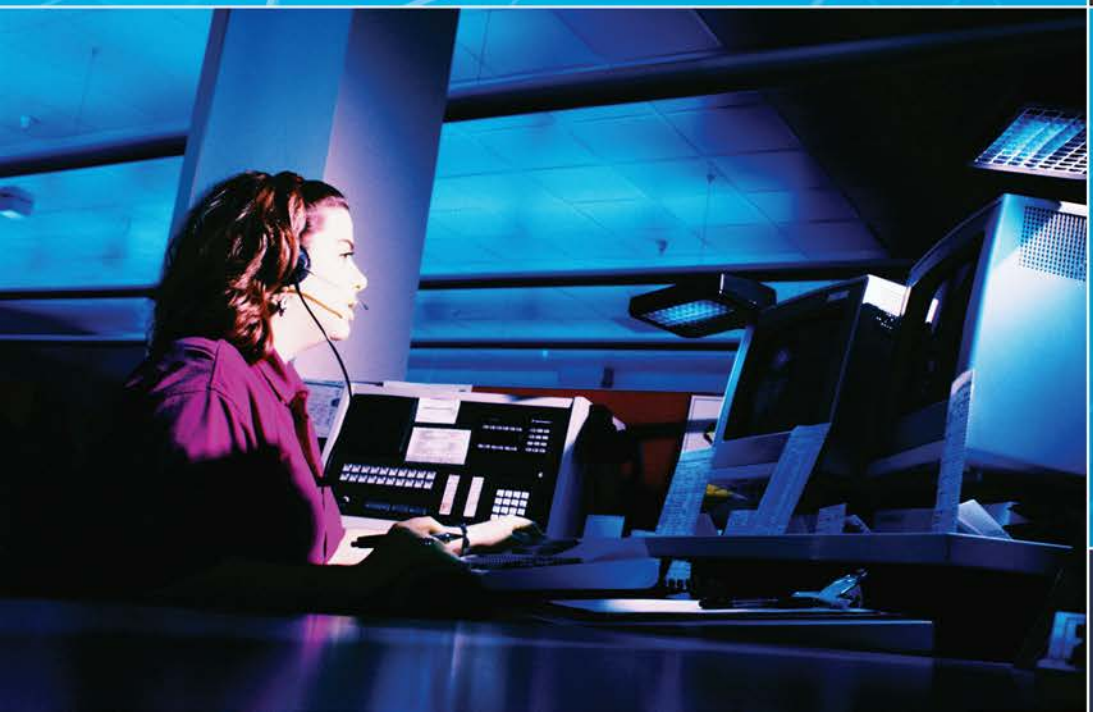
Review of Nationwide 911 Data Collection

National 911 Program

May 2016



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ABOUT THE NATIONAL 911 PROGRAM

The mission of the National 911 Program is to provide federal leadership in supporting and promoting optimal 911 services. It was created as a point of coordination for activities among 911 stakeholders and to provide information that can be used to improve the 911 system. The National 911 Program develops a variety of tools and resources for planning and implementing Next Generation 911 (NG911).

The National 911 Program is housed within the Office of Emergency Medical Services at the National Highway Traffic Safety Administration – part of the U.S. Department of Transportation (USDOT).

INTRODUCTION

The importance of data in decision-making is well documented. In recent years, many State and Federal agencies have been focusing efforts on how to collect larger sets of data and how to use this data for planning and day-to-day operational purposes. The federal government's DATA.gov website lists over 132,000 datasets provided by over 229 organizations in 21 topic areas, in support of the "Open Government Initiative." These datasets and others that are collected and reported by various agencies are being used to understand the impacts of various projects. Large and regularly collected datasets can help agencies in many ways, such as:

- Understanding if initiatives and programs have the intended impacts and outcomes (performance management)
- Comparing data from different periods of time to track progress (for example, year-to-year comparisons)
- Planning new or updated programs to achieve intended results
- Integrating findings from data collection and analysis efforts in communications and program implementations

The National 911 Program began collecting State 911 data in 2011 for the 2010 calendar year. In that first year, the National 911 Program developed a comprehensive data dictionary in collaboration with State 911 offices and the National Association of State 911 Administrators (NASNA) to ensure that data collected was representative and consistent among States. States were asked to respond to a survey and the requested information was used to build a National 911 Profile Database. Not all States responded, but this initial effort to compile State information provided an excellent foundation for future years. By 2015, the data dictionary was revised to improve the quality of data collected. The number of reporting States and the interpretive value of the data had both increased substantially.

The public safety community has also begun using data in innovative ways. For example, the National Highway Traffic Safety Administration's (NHTSA) Office of Emergency Medical Service (EMS) developed and manages the National EMS Information System (NEMSIS), which provides the framework for collecting, storing, and sharing standardized EMS data to accurately assess EMS needs and performance. The U.S. Fire Administration's National Fire Incident Reporting System (NFIRS) collects data from fire departments in all 50 States and the District of Columbia on all types of fire-related incidents. Within DATA.gov, a Safety Community (safety.data.gov) has been established to focus on public safety data, furthering the discussion around crime, roadway safety, and safety in the workplace. These examples show how the public safety community is embracing "big data," or data analytics. Collecting reliable and accurate information about 911 is consistent with, and supports, other public safety efforts to develop metrics of performance.

WHY WE NEED 911 DATA

Numerous 911-related white papers, reports, and fact sheets are now complemented by a collection of uniform 911 data representing the national status of 911 system technology or operations. At the national level, a number of fundamental questions about 911 are being answered, including:

- How many public safety answering points (PSAPs) exist nationwide?[1]
- How many 911 calls occur every year? Month? Day?
- What types of calls are made to 911?
- How many jurisdictions use Basic 911, Enhanced 911 (E911), or Next Generation 911 (NG911)?

Until several years ago, there were no evidence-based answers to questions like these on a national level. Consequently, it was difficult for State and Federal governments to allocate the proper amount of funding to 911 agencies or develop appropriate governance models and oversight policies. Now that we have a far greater understanding of the current status of 911, it is possible to know where to focus resources to improve service. Public safety officials can use these baseline or measurement tools to measure progress or identify effective, data-driven improvement strategies. State and local 911 agencies can justify effective and cost-efficient investments to assist with the ongoing transition to NG911.

Data collection is extremely valuable in describing the national status of 911 service, as well as the quality of that service and the nation's progress in migrating to NG911. Continued collection of 911 data is essential in describing the current status of 911 and also in helping PSAPs measure performance, such as metrics to ensure 911 calls are routed properly and assessing the time taken to process calls. The 911 data that has been and continues to be collected can be examined and analyzed to aid in multiple decision-making processes.

"This report provides State-by-State data, thus providing a wealth of information and allowing States to utilize the data for collaborative purposes."

- 2015 National 911 Progress Report [2]

NATIONWIDE 911 DATA COLLECTION

During recent years, the National 911 Program and the National Emergency Number Association (NENA) have come together to combine their 911 data to better understand the status of 911 service across the country. The private sector also collects PSAP call data for selected States. PSAPs and States use these data to assess key parameters related to 911 service. Please note, for the purposes of this report, States, territories, and the District of Columbia are all referred to as "States."

The National 911 Program's 911 Resource Center maintains a **National 911 Profile Database**,[3] containing State-specific data to benchmark and show progress in an annual National 911 Progress Report. The most recent report, published in 2016, represents data collected in 2015, included data describing the status of statewide 911 systems and the progress each State is making toward implementing NG911. A total of 42 States and territories provided data for this report. The data collected included information on planning, procurement, installation, testing, transition, and operation of NG911.

[1] A public safety answering point (PSAP) is a call center responsible for accepting emergency calls and communicating with appropriate public safety responders.
[2] The 2015 National 911 Progress Report can be found at: http://www.911.gov/pdf/National-911-Program-2015-ProfileDatabaseProgressReport-021716.pdf
[3] This annual data collection effort and associated process complies with the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). In accordance with that Act, the National Highway Traffic Safety Administration (NHTSA), under the U.S. Department of Transportation (USDOT), as the host federal agency for the National 911 Program, received authorization from the Office of Management and Budget (OMB) for the related information solicitation.

In addition to the National 911 Profile Database, NENA has been monitoring the deployment of 911 across the country since 2006. Their **911 Deployment Profile** has collected data at the county level to determine the status of 911, including Wireless Phase I[4] and Phase II[5] deployment. This data collection benefits 911 stakeholders at all levels of government by helping to form a more complete nationwide picture of progress to assist in identifying gaps and barriers, especially with the transition to NG911. Additionally, NENA updates a **State NG911 Progress Map,** identifying progress made nationwide at the State and sub-state levels.

The purpose of this report is to combine these data sets. While none of these data sets are complete, combining the data from the National 911 Program and NENA provides a more complete picture of the status of 911 services than either data set provides alone.

NATIONAL 911 PROGRAM: NATIONAL PROFILE DATABASE

The collection of uniform data is necessary to track the status of NG911 implementation and to provide baseline information (e.g., operational and fiscal data) to answer basic questions such as the number of PSAPs and 911 calls nationwide. To collect these data, the National 911 Program established the National 911 Profile Database. The National 911 Program's National 911 Resource Center has worked closely with NASNA to develop a uniform set of data elements and definitions as the basis for data collection from States. Data based on these data elements and definitions are provided by 911 authorities at the State level and focus on 911 and NG911 planning and transition.

The National 911 Profile Database baseline data elements include:

- 911 Operational Data
    - 911 authorities and levels of service at the State and sub-state level
    - Number of primary / secondary PSAPs
    - Call volume statistics (e.g., wireline, cellular, Voice over Internet Protocol [VoIP], multi-line telephone system [MLTS], texts-to-911, other)
    - Percentage of population served by levels of service
    - Percentage of geographic area served by levels of service
- 911 Fiscal Data
    - Annual revenue
    - Annual costs
    - Revenue sources

The National 911 Profile Database also includes information that can be used to measure and report on 911 authorities' progress toward implementing NG911 technology and operations. As part of the data collection process, progress benchmarks are reported to reflect the status of State efforts to implement NG911 systems and capabilities. These benchmark elements were categorized into several categories:

- **Planning** – defined as a State that has decided on an NG911 architecture or concept of operations

[4] The FCC's Phase I E911 rules require wireless service providers to provide the PSAP with the telephone number of the originator of a wireless 911 call and the location of the cell site or base station transmitting the call

[5] The FCC's Phase II E911 rules require wireless service providers to provide more precise location information to PSAPs; specifically, the latitude and longitude of the caller. This information must be accurate to within 50 to 300 meters, depending upon the type of location determination technology used (i.e., handset or network).

- **Procurement** – defined as a State that has released a request for proposal (RFP), procured NG911 components, or awarded a contract
- **Installation and Testing** – defined as a State that has either tested or completed the installation and testing of NG911 components or have agreements with service providers
- **Operations** – defined as the percentage of planned NG911 systems that are operational in coordination with external organizations
- **Transition** – defined as the percentage of population served by 911 call taking using NG911 components and/or infrastructure

NENA: 911 DEPLOYMENT PROFILE AND STATUS OF NG911 STATE ACTIVITY

NENA collects State data on 911 deployment and readiness across the nation to monitor and advance the deployment of 911 technologies. These data have been compiled into a 911 Deployment Profile and capabilities are categorized into one of the following groups:

- No 911 (calls are remote call forwarded to an answering point)
- Basic 911
- 911 Phase I
- 911 Phase II

These data elements capture the technological status of States and are depicted in county-by-county deployment maps. The deployment maps are accessible[6] and provide tabular data for each county. Information in the 911 Deployment Profile is updated by NENA on an ongoing basis and can be accessed online at NENA.org, then by clicking on "PSAP Survey Results."

In addition to the tracking of 911 deployment, NENA also tracks the status of NG911 State activity to identify States that are conducting or planning NG911 related trials, as well as where NG911 components are currently being implemented. This information helps identify "early adopter" States that have begun the transition to NG911. Indicators of early adoption include State and sub-state initiatives to establish and implement Emergency Services IP networks (ESInets) supporting future NG911 capabilities, and deployment of NG911. These data are presented on a color-coded map, which summarizes the status of these activities by State. Activities are broken down by depictions of:

- IP network available at State level
- IP network available at sub-state level
- NG911 planning started
- NG911 preparation activity at State level
- NG911 preparation activity at sub-state level
- NG911 implementation in progress at State level
- NG911 implementation in progress at sub-state level

[6] Deployment maps can be found at: http://nena.ddti.net/.

NATIONWIDE 911 PROGRESS REPORT

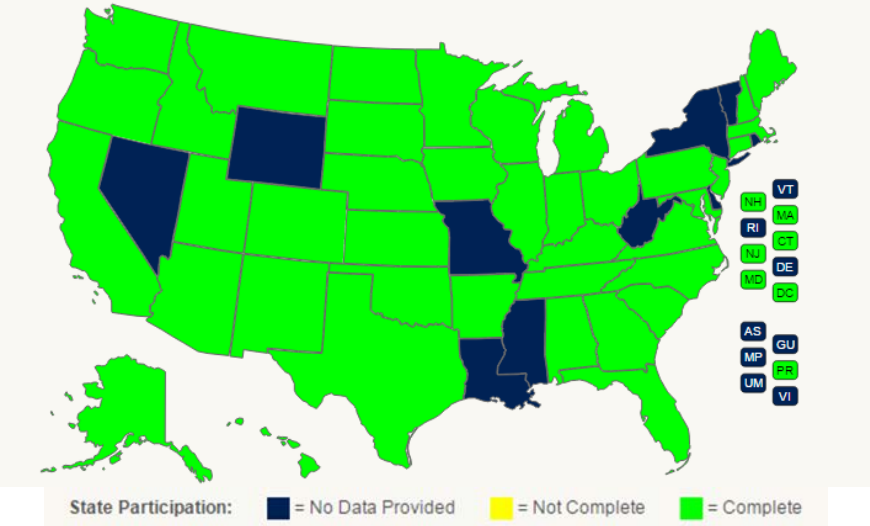
This Nationwide 911 Progress Report uses data collected from 42 participating States and territories to create a snapshot of 911 service and the NG911 transition. By combining the NG911 data from the National 911 Progress Report with NENA's 911 Deployment Profile and National Progress on IP network, ESInet, and NG911 map, a more complete picture of the overall status of nationwide 911 service can be represented.

For the 2015 National 911 Progress Report, 42 States responded to the data call to report their 2014 data. The remainder of the States and territories were categorized into one of the following four categories:

- Unable to submit data due to lack of statutory authority to collect data from local 911 authorities
- Unable to submit data due to lack of resources to collect and/or aggregate data
- Contacted State point of contact, however no response was received
- No State point of contact is available

States that reported data for the 2015 National 911 Progress Report are depicted in green in Figure 1 below.

FIGURE 1: STATES REPORTING DATA FOR THE NATIONAL 911 PROGRESS REPORT

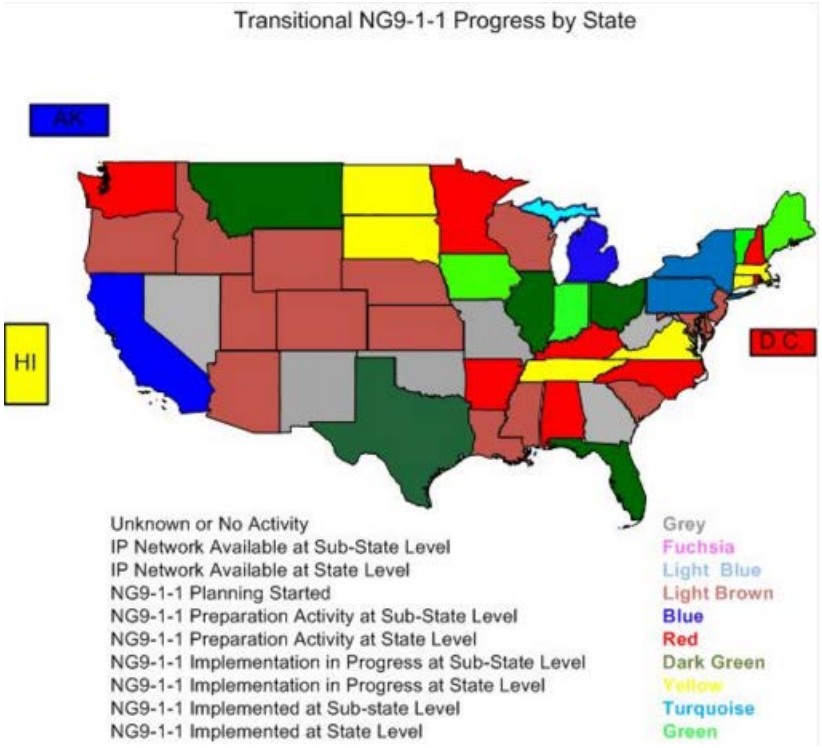


By analyzing the data provided by these States, it is possible to begin to understand 911 operations across the country. Some of the key pieces of information from the report include:[7]

- The majority of 911 calls are received from cellular phones
    - Approximately 73% of 911 calls received were from cellular phones, while 21% were from wireline phones (the other 6% were from either VoIP, MLTS, or text-to-911)
- Progress is being made towards implementation of NG911
    - 18 of the 42 (43%) reporting States indicated that they have released an RFP for defined statewide NG911 components

[7] Additional information from the 2015 National 911 Progress Report can be found in Appendix A.

FIGURE 2: NENA NG911 PROGRESS BY STATE

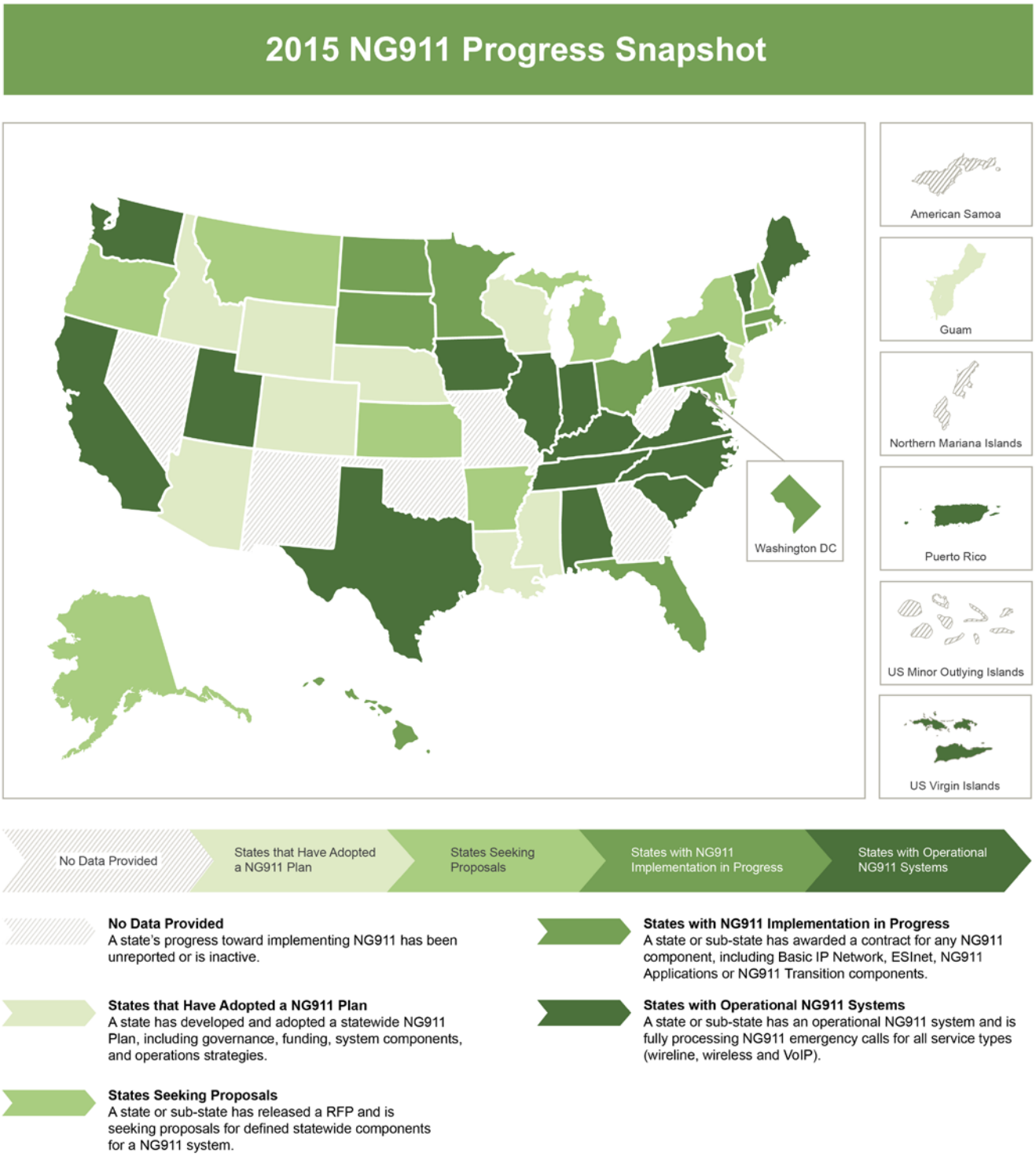


As shown in Figure 2, a majority of the country has made progress toward NG911 implementation, but some counties (sub-state level) only have Basic 911 service available. For full definitions of these benchmarks, as defined by NENA, please see Appendix B.

THE COMPREHENSIVE PICTURE OF NG911 PROGRESS

By combining the data collected by the National 911 Program and NENA, a more complete picture of nationwide deployment of NG911 is provided. By combining the data of the 42 States that submitted data to the National 911 Program's data call in 2015 and the 44 States included in NENA's National Progress on IP Network, ESInet, and NG911 data call, a more complete picture of nationwide progress toward NG911 deployment is displayed. One main advantage of combining the data is that out of the 57 States, only 11 States (Georgia, Missouri, New Mexico, Nevada, Oklahoma, West Virginia, American Samoa, Guam, Northern Mariana Islands, U.S. Virgin Islands, and United States Minor Outlying Islands) were not able to provide data. The combined National 911 Program and NENA data are shown in Figure 3.

FIGURE 3: COMBINED NENA AND NATIONAL 911 PROGRAM NG911 STATUS DATA



On the combined 2015 NG911 progress map:

- Both U.S. States and territories are designated as "States"
- Data for sub-state activity and State activity were combined to show States in which a particular activity had been started, even if the entire State had not completed the activity
- If discrepancies occurred between NENA data and data collected as part of the National 911 Profile Database, data from the National 911 Profile Database was utilized, as it was reported by the State 911 authority.

As of 2015 (*opposed to data as of 2014*), the NG911 progress map shows:

- 15 States were using NG911 infrastructure to process voice calls (*opposed to 13 States in 2014*)
- 10 States had begun NG911 Implementation of some component of NG911 (*opposed to 11 States in 2014*)
- 9 States had posted request for proposals to begin NG911 projects (*opposed to 8 States in 2014*)
- 12 States adopted an NG911 plan (*opposed to 16 States in 2014*)
- 11 States were depicted as having unknown data or no activity (*opposed to 9 States in 2014*)

PRIVATE SECTOR DATA

There are a number of private sector companies currently collecting millions of 911 call records from local jurisdictions and PSAPs that are important to stakeholders. These data could provide PSAPs with a baseline for their current operations and allow them to identify areas for improvement. The data is not available for public analysis. Making these data available could result in identifying metrics and conclusions about 911 service. Standardization of the data could also allow for comparison of technical, operational, and cost factors among jurisdictions.

As PSAPs transition to NG911, there is an opportunity to receive and process data and information from additional sources outside of traditional 911 or public safety entities, such as vehicle texts-to-911 service providers, alarm systems, and other data-rich sensor information. These data, when combined with data from other sources, will provide an even more enhanced picture of 911 service.

CHALLENGES & LIMITATIONS

While these datasets have already shown benefits in understanding the current status of 911, there are ongoing data challenges to presenting a complete and accurate picture. In developing the National 911 Profile Database, the National 911 Program was able to solicit input from 42 States. While this data collection was considered successful overall, future data calls could yield additional participation from States and territories. The ability of a State to submit data depends upon multiple factors, including funding, resources, and the nature of the State 911 agency's responsibility and authority, which varies widely from State to State. For many reasons, the State's ability to collect local data may be limited.

Some States have struggled with reporting data within the requested timeframe. It should also be noted that not all States maintain the same reporting periods – some operate on a fiscal year while some operate on a calendar year. Further, data normally collected by the State may not be consistent with data elements requested, and even with training and support some misinterpretations of data element definitions can occur.

Harmonizing data from the different States and thousands of local jurisdictions is another challenge. The nature of the decentralized 911 governance structure makes the use of common definitions for data points such as "number of 911 call per year" difficult. The definition of a "call" may vary from jurisdiction to jurisdiction. How does a State categorize a text message? How is data collected on non-emergency or administrative calls? A common data dictionary that is uniform and consistent would

be beneficial in implementing a national approach to data collection. This would help improve the accuracy of the data and would enable a meaningful comparison of State data.

MOVING FORWARD

As jurisdictions continue to make the transition to NG911, data has become increasingly valuable and useful to both public and private organizations. There is an ongoing and critical need to collect, analyze, and use 911 data to understand trends and to improve the delivery of the nation's 911 services. Working together, the National 911 Program, NENA, NASNA, the States, and other public and private 911 data collectors, can offer a complete picture of the national "state of 911" by sharing their 911 data.

It is important to not only collect the data, but also to share the data with 911 professionals and policy makers so they have the opportunity to utilize the data to improve planning and decision-making.

Individuals and organizations throughout the 911 community can continue to help improve the state of 911 data collection in a variety of ways:

- Identify the current degree of data collection within individual PSAPs, States, or organizations
- Raise awareness of the benefits to collecting, analyzing, and sharing data
- Work towards standardization of data elements

Both the National 911 Program and NENA continue to strive to assist 911 stakeholders to understand the importance of these data elements being collected on a yearly basis. With continued support from multiple organizations, the value of the data becomes realized, which results in a more accurate picture of the progress of the 911 system nationwide.

APPENDIX A: NATIONAL 911 PROGRESS REPORT

The full 2015 National 911 Progress Report is available online at the following link: www.911.gov.

To access the full report directly, access the resource center here: https://resourcecenter.911.gov/code/9-11ProfileDatabase.aspx.

In addition to the NG911 statistics referenced above, this report provides statistics regarding the operations, administrative, and financial pieces of our nation's 911 systems.

APPENDIX B: NG911 DATA BENCHMARKS

Benchmarks as Defined by the National Emergency Number Association (NENA)	Benchmarks as Defined by the National 911 Profile Database
IP network available at State level – IP network(s) in place statewide upon which the ESInet, and then NG911, can be established	N/A
IP network available at sub-state level – IP network(s) in place at sub-state level upon which an intended regional ESInet can be established	N/A
NG911 planning started – activity within the State to understand and plan for a proposed NG911 service system, whether State or sub-state level	**Statewide NG911 Plan Adopted (3.2.1.1)** – Identifies a State that has developed and adopted a statewide NG911 Plan **Sub-state 911 Authority NG911 Plan Adopted (3.2.1.2)** – Identifies the number of regional or local 911 authorities within a State who have developed and adopted NG911 Plans.
NG911 preparation activity at State level – statewide actions to establish governance and prepare and issue RFPs for NG911	**Statewide Request for Proposal Released (3.2.2.1)** – Identifies whether a State has released an RFP for defined statewide components,
NG911 preparation activity at sub-state level – sub-state, regional actions to establish governance and prepare and issue RFPs for NG911	**911 Authority RFP Released (3.2.2.2)** – Identifies the number of regional or local 911 authorities within a State who have released an RFP for NG911 components
NG911 implementation in progress at State level – decisions made on vendors and activity in progress to implement a coordinated NG911 service for the State	**State Contract for NG911 Has Been Awarded (3.2.2.5)** – Captures whether a State has awarded contracts for the procured components and/or functions defined in 3.2.2.3
NG911 implementation in progress at sub-state level – decisions made on vendors and regional activity in progress to implement a coordinated NG911 service	**Number of 911 Authorities Statewide that Have Awarded a Contract (3.2.2.6) –** Identifies the number of 911 authorities within your State that have awarded a contract of the system components and/or functions procured in 3.2.2.3