NSGIC

National States Geographic Information Council

Best Practices for State Geospatial Maturity

Next Generation 9-1-1

Growing from the 2019 Geospatial Maturity Assessment, this document is the third in a series of best practices collected from "honor roll" states based on individual GMA report cards. In addition to addresses, coordination, and Next Generation 9-1-1, the series will cover transportation, cadastre data, hydrography data, elevation data, and orthoimagery data in 2021.

Next Generation 9-1-1 (NG9-1-1) is a gamechanger for the 9-1-1 community because it will utilize GIS technology to deliver every 9-1-1 call -- mobile, VOIP, and landline alike -- to 9-1-1 public safety answering point (PSAP) centers with precise geographic coordinates.

Each PSAP, state, or large region, implementing NG9-1-1 will need, at a minimum, complete, seamless, and standardized GIS data for its road and addressing systems and response jurisdictional boundaries - fire, law, medical, and the 9-1-1 centers themselves. Additional optional GIS data layers include landmarks, campus buildings, highway mile-posting, cell towers, railroads, lakes, streams, and parks, just to name a few.

With the implementation of NG9-1-1, it will be possible for the 9-1-1 network to process text messages, photos, and videos in addition to voice through a faster and more resilient system. NG9-1-1 will also support PSAPs in cases of call overload and natural disasters, as well as jurisdictional issues.

Currently, a number of states are using NG9-1-1 for emergency number calls, while the rest of the country is in varying stages of preparedness to make the transition. State Geographic Information Officers (GIOs) and statewide GIS coordinators serve as important partners to their 9-1-1 communities in this complex undertaking.

In the 2019 NSGIC Geospatial Maturity Assessment, NG9-1-1, due to its relative newness, was not a graded theme. In this report, nine of those states share insights into the drivers of success for NG9-1-1.

Minnesot*a* | *Dan Ross, Chief Geospatial Information Officer*

Strong relationships top the list for establishing a successful NG9-1-1 program in Minnesota. There must be trust and regular communication, including some face time with local 9-1-1 authorities, to achieve that success. Identifying a focal point contact for both GIS and 9-1-1 at

The National States Geographic Information Council (NSGIC) launched the Geospatial Maturity Assessment (GMA) in 2009 as a national effort to document each state's current geospatial development practices and uses. In the decade since, the GMA provided a biennial snapshot of the state of each state's geospatial maturity. Inspired by the National Spatial Data Infrastructure theme grading undertaken by the Coalition of Geospatial Organizations (of which NSGIC is a founding member), an entirely new process was developed for the 2019 GMA. Nine-grade "report cards" were produced for individual state spatial data infrastructures and state geospatial coordination, in addition to overall theme and topical analysis. Explore the full GMA with interactive maps and dashboards.

the regional, local, and state levels, while also having appropriate GIS workgroups, consisting of all needed stakeholders to coordinate and collaborate on the work, is imperative.

Having good organizational support has also contributed to the program's success, including executive support, with identified leaders and good relationships between GIS and 9-1-1 offices. Legislative statute can make all of the difference and is important in identifying roles and solidifying authority.

Adequate resources for both GIS and 9-1-1 offices are a must. This includes individuals with the appropriate skills, PSAP staff that understand GIS, and GIS staff that understand 9-1-1. It also means having the funding to make it happen, including pursuing any available grant funding and ensuring that the 9-1-1 fee can be used for GIS work.

Finally, if possible, leverage state GIS expertise to plan both the budget and timelines as GIS-capable resources will be required, including hardware, software, and people.

Last and certainly not least, recognize the role that the private sector may play in supporting local and state 9-1-1 offices. There may be a large one for them to play.

North Dakota | *Bob Nutsch, GIS Manager*

North Dakota's program success primarily oscillates around its structure and how it is funded. In the state, GIS is a part of the cabinet agencies. The North Dakota 9-1-1 Association governs the majority of 9-1-1, and state GIS leadership is included on the state board and leadership body. All NG9-1-1 authority begins with the 9-1-1 Association, and local 9-1-1 coordinators choose program direction through legislation. 9-1-1 fees are collected at the local county government landline and cellular device level at the value of $1.00 to $1.50 depending on the locality's statute. If this fee needs to be increased, a measure is placed on the ballot to do this. The money is used for services needed for 9-1-1 and soon NG9-1-1.

Iowa | *Jon Paoli, HSEMD GIS Manager, and Patrick Wilke-Brown, Geospatial Coordinator*

There is no centralized geospatial office in Iowa. The 9-1-1 program resides in the Iowa Department of Homeland Security and Emergency Management (HSEMD) and is adequately funded. Coordination of multiple partners, including 117 PSAPs across 99 counties, add to the management complexity. Despite many partners, coordination of the 9-1-1 program has been and continues to be successful. Local partners who have the authority to make decisions do so and understand the role delineation between them and the 9-1-1 program.

In Iowa, the wireless surcharge successfully funds the 9-1-1 program, and GIS aspects of the program are funded through State and Federal grant dollars and other evolving incentives. No statute is in place to require the 9-1-1 program and GIS to work together; however, the program is regulated through statute. As in other states, relationships are important. The HSEMD GIS coordination office does have a close relationship with the 9-1-1 office due to HSEMD GIS staff

being located in the same office as state 9-1-1 staff. HSEMD has been a champion for all things 9-1-1, committed, and working hard on the relationships.

Iowa currently works with a private sector company on the GIS component of NG9-1-1. Simultaneously, the private sector has also played an important role in working with the counties and PSAPs and handling the GIS workflows.

Utah | *Matt Peters, Director of Utah Automated Geographic Resource Center (AGRC)*

The Automated Geographic Reference Center (AGRC), structurally, is under the Department of Technology Services and is not linked to 9-1-1 through state structure; however, that is not to say we do not work closely with 9-1-1. Each group has defined and clear roles; the 9-1-1 division of the Utah Communications Authority sets best practices, distributes the funding, and supports the PSAPs. AGRC has the responsibility of aggregating the GIS data. The 9-1-1 division distributes the funding; AGRC receives one $.01 of the State's $.96 9-1-1 phone surcharge fee. This equates to approximately $350,000 annually. Initially, this value was sufficient; however, over time, we have seen a shortfall. The existing funding model will not work moving forward, and funding will need to be increased to make GIS happen for NG9-1-1. Additionally, the State has tied future funding to the PSAPs to the adoption of identified NG9-1-1 procedures. Utah has a unique circumstance where the AGRC supports smaller PSAPs in their NG9-1-1 work, while most of the larger PSAPs and counties handle their own with their staff. Bigger counties provide AGRC extra funding to prioritize their updates. Statute guides the roles, responsibilities, and resources, identifying AGRC as a data aggregator with funding amounts explicitly provided. Like New York, AGRC benefits from years of relationship building and a long history of assisting in this space; the relationships are good, and they are built on a strong foundation of trust and accountability.

Kentucky | *Kent Anness, GIS Operations Manager Kentucky Division of Geographic Information*

The Division of Geographic Information is situated in the state's Information Technology division and has executive-level support. The Kentucky Office of Homeland Security has authority over 9-1-1. The Division of Geographic Information is a stakeholder for 9-1-1 and has representation on the 9-1-1 Services Board, while the Office of Homeland Security has a seat on the Geographic Information Advisory Council. These relationships ensure the two-way flow of information, which promotes coordination. Leadership is carrying the message that GIS is important has been key to the success of the effort. Relationships are established and critical, as is just picking up the phone and calling the 9-1-1 program to discuss matters.

There are regulations in place which require minimum standards for GIS components required for 9-1-1 operations. The regulations affect the distribution of funds, incentivizing PSAPs to improve their GIS datasets and maintenance processes in order to secure 9-1-1 funding. In Kentucky, the leadership of 9-1-1 decided to develop the GIS requirements before the ESInet and other NG9-1-1 system components since GIS is the cornerstone to a successful NG9-1-1

implementation. There has been a renewed focus and priority on GIS projects, and if PSAPs meet certain requirements, they can receive state or federal funding.

Arkansas | *Shelby Johnson, Geographic Information Officer*

Relationships are essential to a successful NG9-1-1 program. In Arkansas, we prioritize regular facetime meetings with the localities, meeting these valuable stakeholders at their physical location. The program receives executive support, and state GIS leadership is regularly included in the state 9-1-1 board and leadership body.

Also of key importance, the Arkansas Public Safety Communications statute requires GIS coordination for 9-1-1 purposes. Statutes also require and enforce standards, including funding for GIS data creation and its maintenance, and the sharing of the data for 9-1-1 between the state and localities.

Strategizing and planning for the needed funds to implement the program, including adequate support for all data layers, is essential, along with establishing a schedule for potential increases, as oftentimes, going back for more funding can be difficult. It may be useful to consider and leverage existing data programs, like statewide address points or road centerline efforts. Ensure that 9-1-1 fees can be used for GIS and that the fee covers both landline and mobile phones. And whenever possible, apply for available grants to aid in this work.

Finally, recognize and leverage the role of the private sector and their work with localities. When possible, require the providers to share data with the state, and understand and leverage the fact that one provider may be able to share data for multiple PSAPs.

Ohio | *David Blackstone, Spatial Data Infrastructure Manager, Ohio Geographically Referenced Information Program*

Like many states, the Ohio Geographically Referenced Information Program is located in the state's Information Technology division. Although there is no formal relationship between 9-1-1 and the GIS coordinating office, close office proximity has been extremely beneficial for communication and discussion every day. When you make all stakeholders a part of the decision-making, they are more willing to participate. In Ohio, the state 9-1-1 council sets the direction of work and determines projects. Collaboration is extremely critical, and to this point, having the GIS coordinating office a part of the ESInet Technical Committee has ensured all appropriate requirements for GIS were in the RFP.

Because Ohio is a home rule state, 9-1-1 is a local function. Counties provide data to the state annually. Sometimes a county auditor's addresses do not match the 9-1-1 addresses. The state runs quality control checks and aggregates the data, and the counties correct the disparities. Again, most of the work is completed at the local level. The Ohio Geographically Referenced Information Program was able to bring together the counties and nurture our relationship with them through the Local Based Response System (LBRS) project. We helped them in setting up

standards and policies, putting immense effort into the collaboration to ensure the project's success. Establishing a relationship with the counties was critical.

We have obtained an adequate amount of funding, mostly from the Department of Transportation - $10 million over 10 years. Playing a large role in the LBRS project, the private sector contribution has been key, with localities selecting their own vendors and the state providing the funding.

New York | *Frank Winters, Geographic Information Officer*

The New York GIS Coordinating Program and GIS Program Office is in the state's Information Technology department, and the group supports GIS aspects of the 9-1-1 program. Clearly defining roles in this space is important. The GIS Program Office is clear about the NG9-1-1 data currently supported and the data programs yet to be defined. The main focus currently is on street and address data, and we have helped develop the language for a draft of the state 9-1-1 plan addressing all spatial data needs. Relationships are imperative. Being in the space for such a long time, the GIS Program Office is a recognized and trusted partner. We have driven the entire state and met with stakeholders to learn about their needs. Face-to-face interaction can solidify relationships. Gaps do remain between GIS and 9-1-1. We are determined to bridge those gaps through education and dialogue. It is clear that NG9-1-1 does not work without good GIS data. The GIS Program Office is working hard to position New York for success.

Massachusetts | *Neil MacGaffey, Director, MassGIS*

MassGIS is situated in the Executive Office of Technology and Security Services. Although challenged by a 40-minute commute to the State 9-1-1 Department office, MassGIS has built a strong and lasting relationship with the department. Relationships are key to the success of a NG9-1-1 program. GIS staff must know the 9-1-1 space, the technology, tools, and best practices. Conversely, GIS staff must help 9-1-1 staff understand GIS technology and concepts. Most importantly, GIS professionals understand how to develop and maintain the GIS data that are essential for a 9-1-1 system.

In Massachusetts, MassGIS performs the essential GIS tasks that 9-1-1 needs. MassGIS has built and maintains the geography and address database for the NG9-1-1 system. We also systematically documented municipal staff involved in the address assignment process or designated staff as 9-1-1 liaisons and developed relationships with them.

Funding is key to the program's success, and MassGIS has had a stable source of funding from the State 9-1-1 Department (they are funded by a surcharge on each phone number) and from capital funds. This funding has enabled MassGIS to complete a statewide build-out of property parcels, building roof prints, and address points. The private sector does play a large role in 9-1-1 as the 9-1-1 system's operation is outsourced. Outreach on deployment of the new system has primarily been a joint effort of the 9-1-1 contractor and the State 9-1-1 Department.

MassGIS has been heavily involved in seeking property parcel and address updates from municipalities as part of maintaining the data for 9-1-1. The detail required in the GIS data, especially addresses, means that challenges exist in the process of receiving updates and their quality; it takes years to upgrade people's understanding of the data update requirements.

Bilateral, steady relationships (MassGIS and State 9-1-1 Department, MassGIS and municipalities) and trust are the foundation for a long-lasting support network.

BEST PRACTICES

- Establish and nurture strong relationships with local 9-1-1 and GIS professionals
    - Prioritize outreach - meet local 9-1-1 and local GIS professionals on their turf, regularly
    - If possible, have face-to-face regular communication and engagement
    - Establish a foundation of trust
    - Institute a close working relationship between GIS and 9-1-1 leadership at all levels
    - Communicate! Communicate! Communicate!
- Through education and sharing the importance of GIS in the process, obtain high-level, executive support
- Identify strong champions, including from the private sector, as local governments and PSAPs may have close working relationships with vendors in support of their 9-1-1 activities
  coordinating office
- Advocate for statutes with some "teeth" that promote open data sharing and coordination and identify state GIS as having an authoritative role
- Ensure GIS is part of the conversation and there is proper representation for GIS at all levels
    - Ensure GIS representation on state 9-1-1 governing body
    - Ensure adequate and skilled GIS resources are available to each PSAP
    - Encourage GIS resource sharing between counties
    - Ensure that the state gives back - standardized data, other data resources, staff help, etc.

CHALLENGES & SOLUTIONS

These states noted several challenges in building a successful NG9-1-1 program:

- Obtaining adequate funding or receiving statute support to appropriately fund NG9-1-1 and GIS for 9-1-1
- Building and maintaining relationships at the state and local level
- Understanding the jargon and technical nature of NG9-1-1 can be challenging and problematic for both the public safety community and GIS professionals
    - This lack of understanding can lead to a disconnect between GIS and 9-1-1 at the local level
- Obtaining and keeping local GIS resources
- Stewarding, maintaining, and managing the data, including:
    - A general reluctance to share data due to concerns about data quality
    - Lack of local current data, timely data updates, or updates altogether
    - 9-1-1 offices doing their own thing with different schemas, non-standardized data
- Large number of different players and partners to know and interact with in the 9-1-1 space
- Lack of understanding of what needs to happen and be done by partners and stakeholders doing the work
- Change management issues to address the notion that the current system “works,” so why change?

Lessons learned by states in building a successful NG9-1-1 program:

- Plan for future, needed, and adequate funding
    - Strategizing and planning for the needed funds to implement the program, including adequate support for all data layers, is essential, along with establishing a schedule for potential increases, as oftentimes, going back for more funding can be difficult.
- Leverage existing programs like statewide address points and road centerline efforts
- Clear statutes can make all of the difference in roles and authority
    - It is vital to advocate for statute that promotes and identifies state GIS as an authoritative role, while promoting open data sharing.
- Leadership changes are a normalcy in all levels of state government. As key leadership positions change, it is important for GIOs, state GIS coordinators, or equivalents to meet with new partners and stakeholders and advocate for GIS.

ABOUT NSGIC

NSGIC advances state-led geospatial coordination for the nation. Founded in 1991 by state Geographic Information Officers and statewide GIS coordinators, NSGIC serves as a national forum to develop future-oriented geospatial leadership and advance sound policies and practices for geospatial activities. Learn more at www.NSGIC.org. NSGIC invites further input from the GIS community by contact with NSGIC Director of Programs Jamie Chesser at jamie.chesser@nsgic.org.