



MissionCriticalPartners
Because the Mission Matters

Next Generation 911 Readiness Assessment

Final Report

PREPARED APRIL 2021 FOR
THE STATE OF NEW MEXICO

[MissionCriticalPartners.com](https://www.MissionCriticalPartners.com)

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Executive Summary

The New Mexico E-911 Bureau (NM911) of the Department of Finance and Administration (DFA) Local Government Division (LGD) was reestablished in 2019. Its charge is to provide state leadership, financial support, and coordination in supporting optimal 911 services across New Mexico.

NM911 is embarking on a transition to Next Generation 911 (NG911) and in 2020 enlisted the assistance of Mission Critical Partners, LLC (MCP) to conduct an NG911 readiness assessment.

At the heart of the assessment were stakeholder interviews conducted using MCP's proprietary Model for Advancing Public SafetySM (MAPSSM) tool. The MAPS assessment tool helped provide insight into where the organization is today and where it needs to be for a successful transition to NG911. Using criteria based on industry benchmarks, national standards, and best practices, NM911's answers were translated into easy-to-understand scores, which can be used to build an NG911 strategic roadmap specific to New Mexico.

To help move toward NG911 readiness, NM911 established the following vision:

New Mexico 911 Vision

To provide a best in-class 911 system, utilizing emerging technology to facilitate efficient reliable public safety response to best serve the communities of New Mexico.

If one imagines NG911 readiness as a continuum from 1 to 10, where a rating of "1" represents "foundational," "5" represents "transitional," and 10 represents "NG911 ready," the MAPS assessment assigned NM911 an overall score of 4.09. This indicates that NM911 is in a foundational stage and has taken the beginning steps to plan for the transition to NG911. This level of readiness is very common in the early stages of preparation and reflects strongly on an organization that is forward-focused and keen to identify gaps and areas of improvement to be made prior to jumping headlong into the technical and operational waters of NG911.

The graphic below illustrates where NM911 is on the continuum in the following categories: Governance, Next Generation 911 Core Services (NGCS), Emergency Services Internet Protocol (IP) network (ESInet), Call-Handling Equipment (CHE), Security, Geographic Information System (GIS), and Operations.

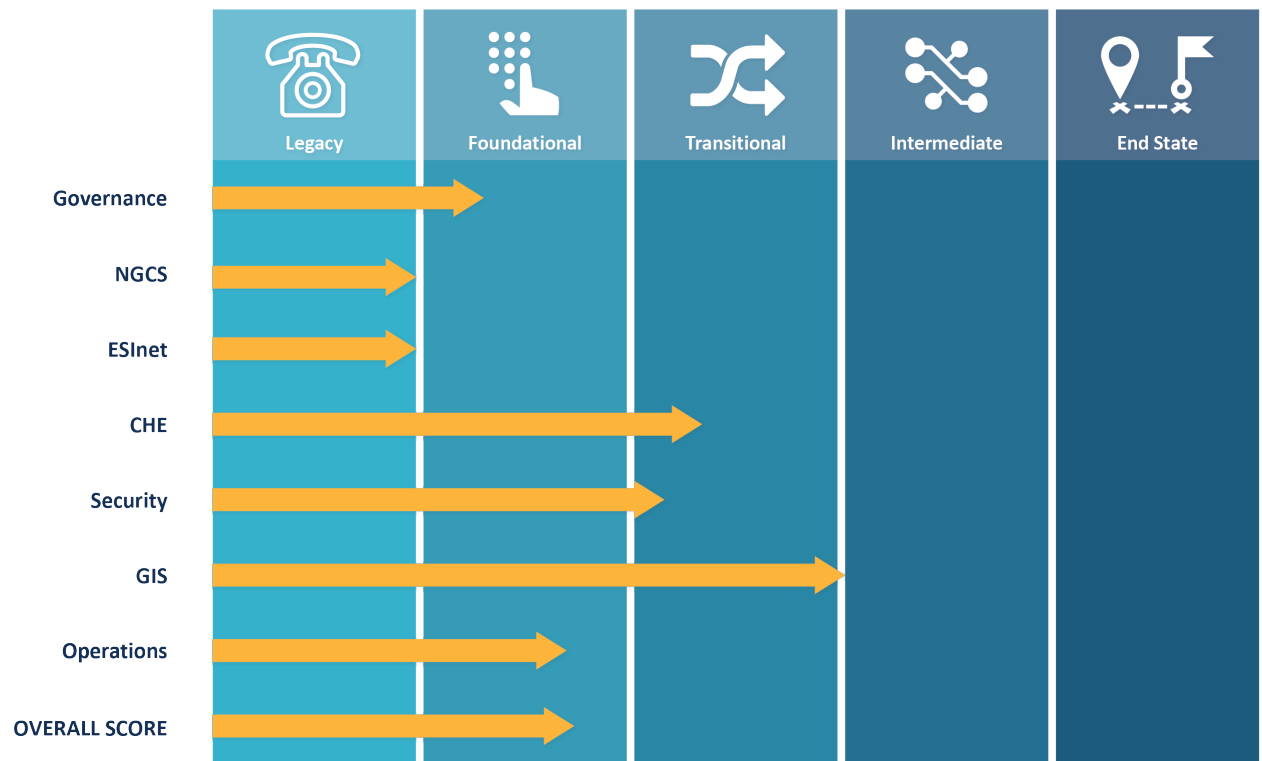


Figure 1: NM911 NG911 Continuum Stages

1 Introduction

1.1 Background

The New Mexico E-911 Bureau (NM911) of the Department of Finance and Administration (DFA) Local Government Division (LGD) provides essential programmatic and financial support to 41 public safety answering points (PSAPs) throughout the state. Through one-year grant agreements, PSAPs receive critical funding which covers recurring operating costs such as network expenses, call system maintenance, geographic information system (GIS) mapping, and training, as well as capital equipment upgrades.¹

911 in New Mexico (state) is funded from revenue generated by a \$0.51 “911 emergency surcharge” uniformly assessed on each access line in the state. In 2018, the surcharge was extended to include voice over internet protocol (VoIP) and prepaid wireless subscribers by the enactment of Senate Bill 46 (Laws 2017, Chapter 122).

The 911 emergency surcharge is deposited into the New Mexico State Treasury in an Enhanced 911 Fund (Fund). The money deposited into the Fund is appropriated and dedicated for expenditures as defined in the Enhanced 911 Act.² The NM911 Program is funded with up to 5% of the surcharge deposited annually.

1.2 History

DFA and the New Mexico Department of Information Technology (DoIT) entered into a joint powers agreement (JPA) in May 2018 which transferred the NM911 Program, including personnel and resources from DFA to DoIT. Through the JPA, DFA maintained financial responsibility of the program and DoIT became responsible for the overall management of the NM911 Program. In 2019, Legislation was introduced during the 54th Legislative session to move the NM911 Program to DoIT. The bill, SB 472, was pocket vetoed ...

Upon termination of the JPA, the E-911 Bureau transitioned back to DFA.³

The NM911 Program, under a new organizational structure, is authorized for five full-time equivalent (FTE) positions, which include a new bureau chief, two new program managers, and a financial coordinator. A GIS program manager is expected to be added to the team in 2021.

¹ *Next Gen 911*. Department of Finance & Administration State of New Mexico's E-911 Bureau.

<https://www.nmdfa.state.nm.us/wp-content/uploads/2021/01/NG911-Strategic-Doc.pdf>

² Enhanced 911 Act. <https://www.nm911.org/wp-content/uploads/2019/05/New-Mexico-E-911-Law.pdf>

³ *Next Gen 911*. Department of Finance & Administration State of New Mexico's E-911 Bureau.

<https://www.nmdfa.state.nm.us/wp-content/uploads/2021/01/NG911-Strategic-Doc.pdf>

New Mexico 911 Mission

The New Mexico 911 (NM911) Program provides fiscal and technical program support to Public Safety Answering Points (PSAPs) and Local Governments through communication, collaboration and customer service to enable an effective and quality 911 system.

New Mexico 911 Vision

The vision of New Mexico 911 is to provide a best in-class 911 system, utilizing emerging technology to facilitate efficient reliable public safety response to best serve the communities of New Mexico.

2 Approach and Methods

To holistically understand NM911's readiness for Next Generation 911 (NG911), Mission Critical Partners (MCP) reviewed data collected by NM911 to better understand the 911 landscape across all jurisdictions.

MCP conducted interviews with key staff members using its proprietary Model for Advancing Public Safety (MAPS) tool to assess NM911's readiness for an NG911 environment. Recognizing that the transition from legacy 911 is significant and goes beyond the technology replacement, MCP's MAPS process focuses on understanding the current operational processes, staffing, governance (policies, procedures, and bylaws), funding models, and technical networking and architecture.

The MAPS tool includes customized questions that are grouped into topic-specific categories based on best practices and industry standards developed by organizations and workgroups such as the Federal Communications Commission's (FCC) Task Force on Optimal Public Safety Answering Point (PSAP) Architecture (TFOPA), the National Institute of Standards and Technology (NIST), the National Emergency Number Association (NENA), and the Association of Public-Safety Communications Officials (APCO) International.

NM911 staff members were asked more than 80 conversational questions regarding seven NG911 readiness categories.

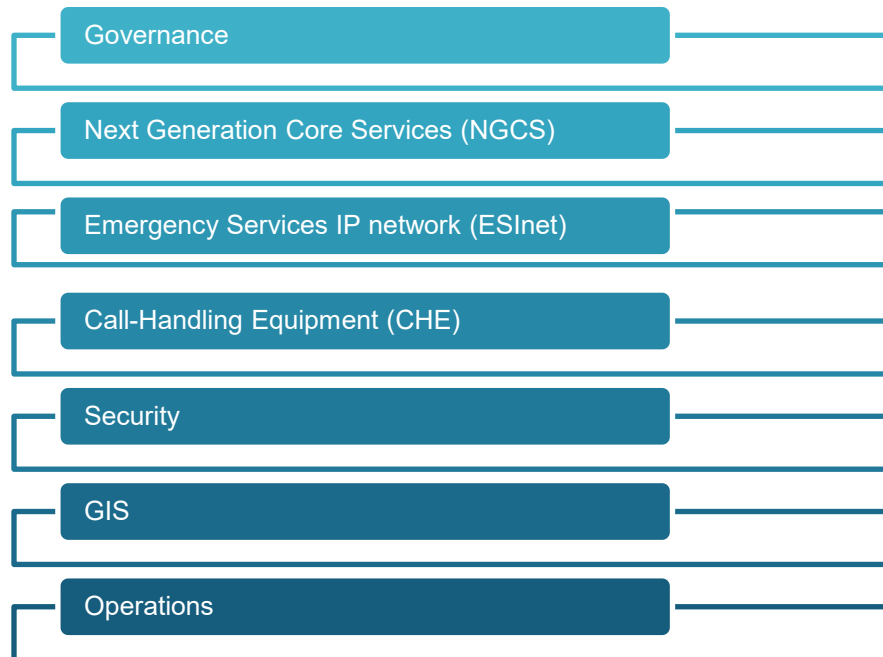


Figure 2: NG911 Readiness Categories

The staff's responses to these questions were scored and the resulting chart (refer to Section 3) provides a high-level view of the areas where prioritized focus is warranted. Findings from the comprehensive MAPS assessment will be included in the updated NM911 NG911 Strategic Plan.

3 Current State

If one imagines NG911 readiness as a continuum from 1 to 10, where a rating of “1” represents “foundational,” “5” represents “transitional” and “10” represents “NG911 ready,” the MAPS assessment assigned NM911 an overall score of **4.09**, as shown in Table 1. This indicates that NM911 is in the foundational level of readiness for NG911 as the agency has taken the beginning steps to plan for the transition to NG911. This level of readiness is very common in the early stages of preparation and reflects strongly on an organization that is forward-focused and keen to identify gaps and areas of improvement to be made prior to jumping headlong into the technical and operational waters of NG911. Notably, there were some areas in which NM911 is closer to being NG911-ready than in others. In those areas, the goal would be to continue and maintain the good work and progress to date.

MAPS NG911 Readiness Assessment

New Mexico 911

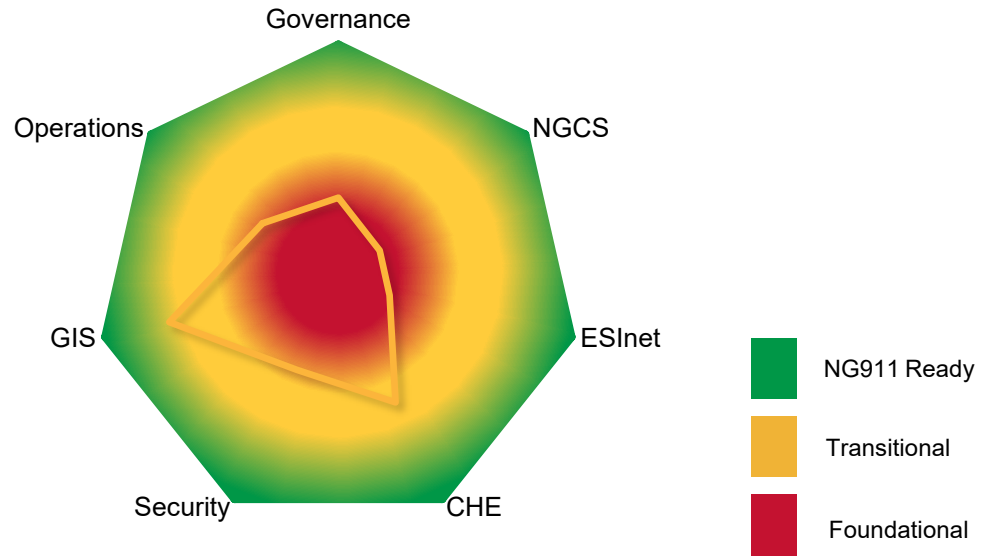


Figure 3: MAPS Readiness Assessment

Table 1: NG911 Readiness Scores

Lever	Overall Score
Governance	3.60
NGCS ⁴	2.22
ESInet ⁵	2.20
CHE ⁶	5.52
Security	5.00
GIS	7.26
Operations	4.06
Overall Score	4.09

⁴ Next Generation 911 Core Services

⁵ Emergency Services Internet Protocol (IP) network

⁶ Call-handling equipment

3.1 Governance

Today's emergency communications environment is complex and as new emergency communications technology is deployed, it will require even more planning and discussion between NM911 staff, PSAPs, technology and service providers, and emergency responders. A robust governance structure fosters stakeholder-engaged decision-making. It provides an opportunity for cross-jurisdictional and cross-functional discussions to take place—discussions that are essential for interoperable, functional, and operational success.

A strong governance structure is critical in the transition from legacy 911 to NG911 because the transition impacts every aspect of 911—from network technology changes outside the walls of the PSAP to the hardware and software used within the PSAP, including PSAP operations. It is critical that goals, objectives, tasks, and timelines, as well as impacts to the PSAP, are carefully communicated throughout the process. Every stakeholder must be aware of, and involved in, the transition process. Communication among NM911 staff and stakeholders is key to this transition.

[TFOPA](#) was created to provide a framework for readiness and maturation of the NG911 transition model from foundational to end-state NENA i3 (i.e., NG911). The MAPS assessment overlays the TFOPA framework, as well as industry standards and best practices, to develop a baseline from which to plan and coordinate transition strategies and procure technologies to improve NG911 readiness.

The MAPS tool examines ten key areas associated with or requiring governance to help assess NG911 readiness:

- Documentation
- Strategic planning
- Communication
- Coordination
- Technology
- Budgeting
- Funding
- Staffing
- Procurement
- Standards and best practices

Based on the MAPS assessment, a review of the documentation provided, and interviews with NM911 staff, NM911 achieved an overall score of **3.60** for governance—a foundational state on the NG911 readiness continuum.

MAPS NG911 Readiness Assessment

New Mexico 911

Governance

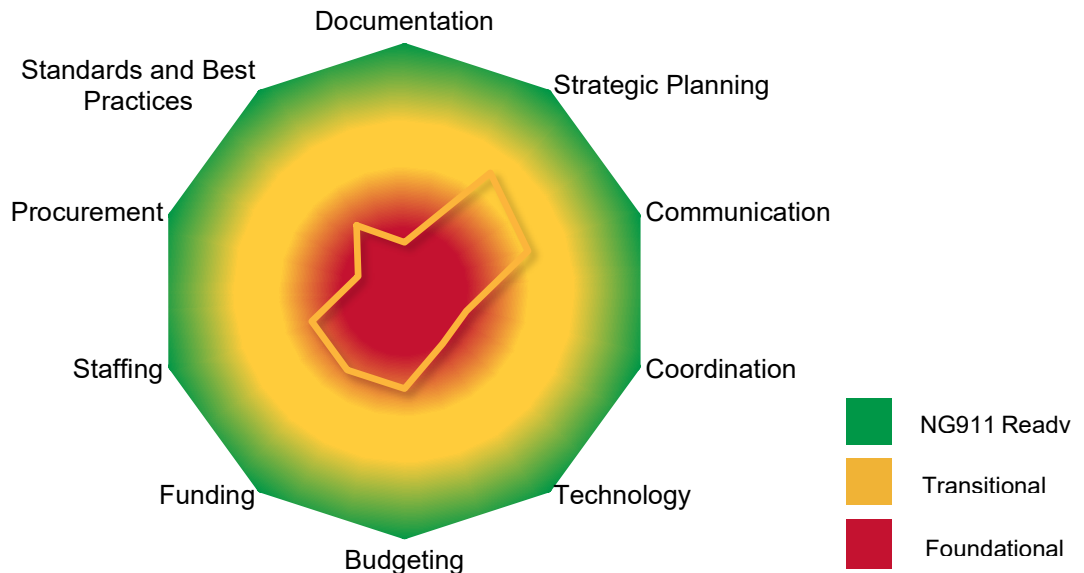


Figure 4: Governance MAPS

Table 2: Governance Readiness Scores

Lever	Overall Score	Documentation	Strategic Planning	Communication	Coordination	Technology	Budgeting	Funding	Staffing	Procurement	Standards and Best Practices
Governance	3.60	2.00	6.00	5.33	2.67	2.67	4.00	4.00	4.00	2.00	3.33

3.1.1 Documentation

Rating: 2.00

MCP compared the New Mexico legislation against the National 911 Program's [Guidelines for State NG911, Legislative Language, Examples and options for legislative language that facilitates the deployment of NG911](#). The legislation was updated in 2017 to broaden the definition of “enhanced 911 system” to include NG911 and ESInet; overall, the changes are very comprehensive and broad enough to

allow for future changes in technology to be interpreted as part of the enhanced 911 system both at the originating service provider side of the NG911 network as well as the PSAP side. The legislation does provide for the LGD of the DFA to carry out the provisions of the statute and allows for rulemaking authority limited to the statutory requirements.

MCP offers a few suggestions for consideration. The statute does not specifically call out the role of NM911 to facilitate state-level coordination of 911 service networks statewide. The NM911 Program should have the authority to ensure coordinated intrastate interoperability of 911 communications providing consistent 911 service across New Mexico. The NM911 Program also would benefit from the statute specifically stating it has the responsibility to coordinate and oversee the state NG911 plan. This will give the NM911 Program the ability to create technical and operational standards or recommendations that benefit the smooth implementation of a statewide NG911 system.

Additionally, MCP recommends that some legacy terminology is removed at a future date to make the legislation more technology neutral and to avoid legacy and NG911 providers from a narrow interpretation of the legislation and require legacy components in the NG911 solution. For example, in Article 9D – Enhanced 911 Section 63-9D-3 – Definitions, the enhanced 911 system “...includes the capability to: (1) selectively route incoming 911 calls to the appropriate public safety answering point operating in a 911 service area...”⁷ By keeping the term “selectively,” the legacy 911 service provider could interpret they must keep the selective router part of the NG911 system.

It would be helpful to the NM911 Program and the PSAPs to specify in statute that NM911 is an “essential government service” and its employees are essential personnel during a disaster declaration. This provides the team the ability to continue working during a disaster declaration and provide support services to the PSAPs when they are needed most.

As mentioned above, the LGD can set rules and policies. The current E911 rule is outdated and needs to be updated to align the changes from the 2019 statute, removing reference to legacy technology to be more vendor neutral and including NG911 and ESInet references. Consideration should be given to including references to basic security and cybersecurity measures that each PSAP should consider when on a shared statewide system.

NM911 has a comprehensive PSAP Manager’s Guide that provides information on program policies and the process for requesting funding. However, this document was last updated in 2014 and is focused solely on E911. Updating the document to align with the 2019 statute and anticipated rule updates would be prudent to avoid any confusion.

New Mexico does not have a formal Board comprised of public safety stakeholders. However, the use of committees and working groups to provide feedback and insight from the PSAP community will assist in garnering the support NM911 needs to implement the changes necessary to bring NG911 to fruition across the state.

⁷ [NM Stat § 63-9D-3 \(2019\)](#)

3.1.2 Strategic Planning

Rating: 6.00

NM911 has a strategic plan, created in 2013, that has guided its efforts for the past eight years. While the 2013 strategic plan is focused entirely on E911, NM911 is in the process of updating the plan to focus on NG911.

NM911 has created a stakeholder group to provide input to the strategic planning process and plans to hold stakeholder engagement sessions to allow all stakeholders a voice.

3.1.3 Communication

Rating: 5.33

NM911 does not have a formal communications plan in place, outside of the communications plan provided by MCP for the current project. Staff expressed a desire to have a more formal communications plan and process.

NM911 meets monthly with the 911 Director's Affiliate group. While this group does not include every PSAP in the state, it is a good way to have a dialogue with PSAP stakeholders.

Additionally, NM911 hosts quarterly WebEx meetings with PSAP directors. The meetings cover a range of topics and training to include budget updates, fund status, program information, and training. NM911 uses PSAP interactions as one of its metrics to ensure it is meeting PSAP expectations.

NM911 is in the process of updating its website and is working with the Public Information Officer for the DFA to create educational materials for stakeholders. Due to the pandemic, NM911 has not conducted in-person PSAP site visits over the past year; however, between November 2019 and March 2020, 90% of the PSAPs were visited. NM911 has conducted virtual PSAP visits during the pandemic and will resume in-person site visits as soon as it is safe.

Currently, most stakeholder communication is one-on-one and is related to funding requests.

A robust formal communications plan that clearly defines all stakeholders will be needed as NM911 plans for the transition to NG911.

3.1.4 Coordination

Rating: 2.67

NM911 is in the early stages of creating an NG911 strategic plan; therefore, coordination with neighboring states has not begun. There is some interaction at the local level between New Mexico PSAPs in the southeast and Texas PSAPs.

As NM911 implements NG911, coordination with non-911 stakeholders and neighboring states will be needed.

3.1.5 Technology

Rating: 2.67

NM911 does not have 911 committees or working groups; however, there was a wireless committee in the past to help with Phase I and Phase II wireless deployment. NM911 has the authority to create committees and working groups, and this would be a beneficial way to engage stakeholders in the decision-making processes associated with transitioning from a legacy to an NG911 environment. Working groups could be continual or ad hoc. NM911 might benefit from having operations, financial, and technical working groups.

3.1.6 Budgeting

Rating: 4.00

NM911 does not have adequate budget to fund the current legislatively allowable costs of 911. In 2018, due to limited funding, the capital equipment replacement schedule was changed to a six-year replacement cycle. Previously, a five-year replacement cycle based upon industry best practices was employed.

During the transition to NG911, it will be necessary for NM911 to pay for both the current E911 costs while also paying for new costs for a period. The amount of time that both costs will be required can be controlled by a well-defined and closely managed transition plan. However, it will require NM911 to have accrued significant fund reserves for those costs.

3.1.7 Funding

Rating: 4.00

The NM911 Program is funded from revenue generated by a \$0.51 911 emergency surcharge uniformly assessed on each access line in the state for wireline and wireless subscribers. In 2018, the surcharge was extended to include VoIP and prepaid wireless subscribers by the enactment of Senate Bill 46. The total revenue generated averages \$12 million annually.

Table 3: 911 Surcharges

Device	Surcharge
Wireline	\$0.51 per line per month
Wireless	\$0.51 per line per month
Prepaid Wireless	1.38% of the retail transaction

Device	Surcharge
VoIP	\$0.51 per line per month

Through one-year grant agreements, PSAPs receive critical funding that covers recurring operating costs such as network expenses, call system maintenance, GIS mapping, training, and capital equipment upgrades.⁸

3.1.8 Staffing

Rating: 4.00

NM911 has five FTE positions. The team, led by a new bureau chief, includes two new program managers, and a financial coordinator. A GIS program manager is anticipated to join the team. This staffing is suitable for program management in the legacy environment. However, as NM911 progresses towards NG911, it may need to expand staffing to include an additional program manager to assist with policy creation, workgroup facilitation, and stakeholder communications.

3.1.9 Procurement

Rating: 2.00

While not clearly defined in legislation, NM911 does have procurement authority related to the implementation of the Enhance 911 Act. NM911 has issued a procurement vehicle to place CHE on a state contract. PSAPs can select their desired CHE from the state contract.

The stringent State purchasing requirements may impede the ability to procure NG911 at the State level. Currently, procurement is required every four years; there is not an allowance to extend the length of a contract beyond four years. It is possible that the implementation of NG911 statewide might take two or more years and be required to go back out for procurement immediately after implementation would be detrimental to the stability of the 911 system.

3.1.10 Standards and Best Practices

Rating: 3.33

Through the authority provided in the Enhance 911 Act and the E911 Rule⁹, NM911 has defined the national standards and best practices PSAPs must meet to qualify for grant funding. However, NM911 has

⁸ *Next Gen 911*. Department of Finance & Administration State of New Mexico's E-911 Bureau.
<https://www.nmdfa.state.nm.us/wp-content/uploads/2021/01/NG911-Stategic-Doc.pdf>

⁹ New Mexico Administrative Code, CHAPTER 6, 10.6.2 NMAC - ENHANCED 911 REQUIREMENTS.
<http://164.64.110.134/nmac/T10C006>

limited authority to enforce adherence to the rule especially in those PSAPs that do not qualify for grant funding.

NM911 has a comprehensive PSAP Manager's Guide, last updated in November 2014, to explain what is required to qualify for funding, and to provide consistency and clarification of existing E911 program policies. It is recommended that NM911 update the guide with program policy statements in alignment with industry standards and best practices related to NG911 and remove any legacy policies that no longer apply.

3.2 Next Generation Core Services

NGCS are the functional elements responsible for NG911 call-routing capabilities. The NENA i3 standard for these functional elements is defined in [NENA-STA-010.2](#), *NENA Detailed Functional and Interface Standards for the NENA i3 Solution* (as well as its successor and related documents). Given the often-transitional nature of NG911 routing solution implementations, it is common for agencies to have some or all routing technologies in place for the transition to NG911 while still integrated with legacy call-routing elements. The result is a broad spectrum of readiness ranging from foundational to end-state NG911.

The MAPS tool examines nine key areas associated with NGCS to help assess NG911 readiness:

- Technology Procurement
- Functional Elements
- Routing Solutions
- Automatic Location Identification (ALI)
- Database Management System (DBMS) and Location Information Services (LIS)
- Service Level Agreements (SLAs)
- Reporting and Management Information Systems (MIS)
- Interoperability
- Call Transfer
- Additional Data Repositories (ADR)

Based on the MAPS assessment, a review of the documentation provided, and interviews with NM911 staff, NM911 achieved an overall score of **2.22** for NGCS—a foundational state on the NG911 readiness continuum.

The foundational rating for this portion of the assessment highlights an opportunity to acquire a statewide, standards-based solution that supports the long-term operational needs of the State and its PSAPs. By defining a statewide set of baseline requirements and capabilities for this critical infrastructure, NM911 has a tremendous opportunity to raise the bar and level the playing field for all PSAPs and all users across New Mexico.

MAPS NG911 Readiness Assessment

New Mexico 911

NGCS

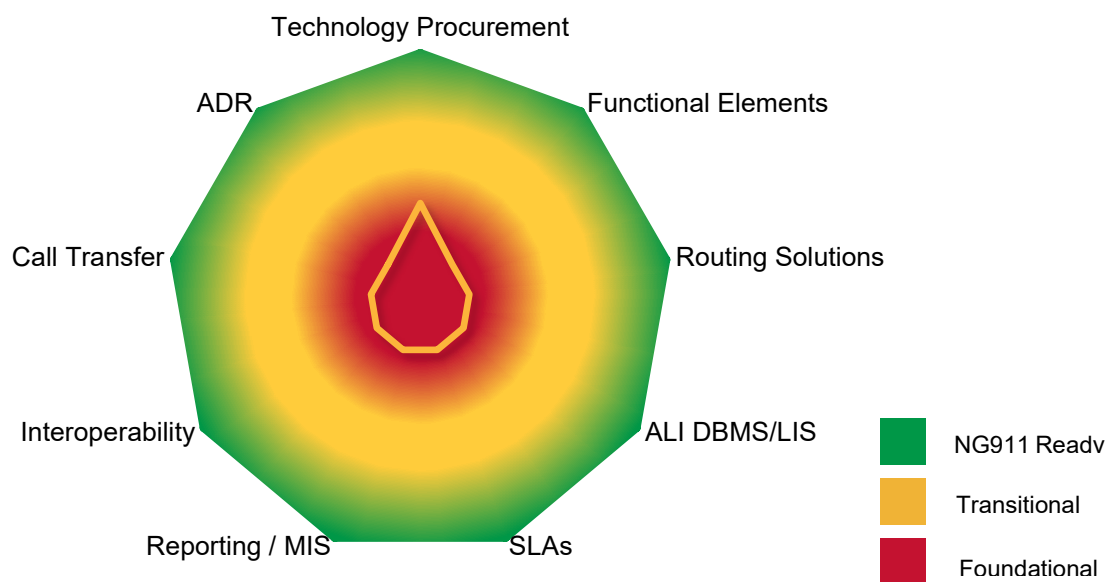


Table 4: NGCS Readiness Scores

Lever	Overall Score	Technology Procurement	Functional Elements	Routing Solutions	ALI DBMS/LIS	SLAs	Reporting / MIS	Interoperability	Call Transfer	ADR
NGCS	2.00	4.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00

3.2.1 Technology Procurement

Rating: 4.00

NM911, on behalf of the State, is in the beginning stages of procurement planning. MCP has been contracted to assist with creating technical and operational requirements for a request for proposal (RFP)

to procure an NG911 solution. NM911, prior to procurement, has several decisions to make and, as noted in Section 3.1.9, state procurement rules may pose a challenge.

Procurement is expected to occur in the next 12 to 18 months. NM911 is taking the appropriate actions to collect information from stakeholders to undertake a procurement for NGCS functional elements to deliver an i3 routing solution to the state's PSAPs.

3.2.2 Functional Elements

Rating: 2.00

The absence of a coordinated deployment of NGCS across the state may result in an uneven playing field for PSAPs attempting to migrate to NG911, especially smaller and more rural PSAPs. It is recommended that the RFP is aligned with industry best practices and standards, ensuring, regardless of PSAP size or budget, the full potential of the NG911 vision, allowing PSAPs to interoperate more seamlessly and effectively while serving their constituents and supporting each other.

3.2.3 Routing Solutions

Rating: 2.00

Based on [NENA 03-002](#), *NENA Standard for the Implementation of Enhanced MF Signaling, E9-1-1 Tandem to PSAP*; [NENA 03-005](#), *NENA Standard Generic Requirements for an Enhanced 9-1-1 Selective Routing Switch* (archived); and [NENA-STA-010.2 2016](#), the current routing technologies used by PSAPs in New Mexico are rated as foundational. PSAPs within the state are currently supported by legacy selective routers (LSRs) provided by a patchwork of local exchange carriers (LECs) and 911 system service providers.

Geospatial routing is the goal of NG911 call routing, using highly accurate GIS data to route calls based on their actual location, as opposed to a static call-routing database. Geospatial routing has the potential to minimize misroutes due to inaccurate or outdated call-routing tables as well as to decrease the time needed for a call to be delivered to the PSAP best suited to service their request for help. The GIS section of this document (Section 3.6) describes, in more detail, the current state and opportunities that NM911 has to develop a coordinated, statewide GIS program to support its NG911 objectives, as well as other state uses of GIS.

3.2.4 ALI DBMS and LIS

Rating: 2.00

All PSAPs within the state are currently supported by legacy 911 location solutions. The functional elements required for NG911 include a Location Validation Function (LVF) and LIS in the end-state i3 solution. NM911 will likely need to implement a transitional solution for a period before these functional

elements are in production usage. A transitional solution should support both legacy and i3 data needs and is commonly referred to as a Location Database (LDB).

Since the ALI and master street address guide (MSAG) legacy processes still are in service, New Mexico is in a foundational state. For more information on the milestones for achieving geospatial call routing as a step towards full NG911 capabilities, refer to [NENA 02-011](#), *NENA Data Standards for Local Exchange Carriers, ALI Service Providers & 9-1-1 Jurisdictions*.

3.2.5 SLAs

Rating: 2.00

SLAs are a vital tool in holding solution and service providers accountable to their contractual commitments. Currently, such performance criteria are largely developed at the local level and are dependent on the solution a PSAP has in place. 911 in New Mexico is operated by legacy solution providers and supported through legacy agreements for services through incumbent LECs. These disparities can lead to different service levels in each jurisdiction. However, procuring a state-wide NG911 system with a common set of service-level requirements could substantially improve a PSAP's individual ability to dictate and enforce the terms of any SLA.

3.2.6 Reporting/MIS

Rating: 2.00

Annually, PSAPs are required to self-report call volume to NM911. However, these reports do not provide any insight into the performance and activity within the call-routing infrastructure that delivers those calls. For example, there is no data to show if a 911 call was delivered to a PSAP or if there were any issues affecting how long call delivery takes. Additionally, a once-yearly report provides no insight into the day-to-day performance, behavior, or operational status of the call-routing infrastructure throughout New Mexico. Automating the collection, collating, and analysis of real- and near-real-time data across a statewide ESInet will significantly enhance a PSAP's and the State's ability to monitor day-to-day operations and proactively address issues before they result in major problems or outages.

3.2.7 Interoperability

Rating: 2.00

Inter-tandem transfer capabilities in legacy 911 solutions are often limited to local access and transport area (LATA) boundaries and/or interoperating agreements with LECs. In some cases, these LECs might not employ systems that can support the full functionality of E911 in a transfer scenario.

Developing standard guidelines, requirements, and recommendations that align all procured NGCS solutions with NENA's i3 specification and other industry best practices will help ensure the greatest level of interoperability between all New Mexico's PSAPs and their i3-compliant neighbors, both within and outside New Mexico's borders. It also assures compliance with grant requirements.

3.2.8 Call Transfer

Rating: 2.00

New Mexico PSAP requirements state that PSAPs shall have the ability to transfer 911 calls. Some PSAPs must transfer to seven-digit administrative phone lines, while others transfer directly via 911 trunks.¹⁰ Local PSAPs have the ability to transfer through the legacy selective router within the limitations of their local exchange provider and 911 system service provider coverage area. This is the minimum expected service level in the legacy 911 environment. This legacy infrastructure does not support the sharing or transfer of any information beyond the telephone number of the original caller, significantly limiting a PSAP's ability to respond to calls on behalf of its neighbor agencies and slowing emergency response by requiring each recipient of a transferred call to gather the needed data (e.g., ALI) repeatedly.

And although PSAP consolidation is a high priority in New Mexico, which would minimize the need for such inter-PSAP transfers, deploying a standards-based ESInet will open up almost-limitless opportunities for cooperating PSAPs to exchange extremely rich multimedia and data, enhancing telecommunicator and first responder situational awareness, allowing quicker and more appropriate targeted responses to emergency situations.

3.2.9 ADR

Rating: 2.00

In the current 911 environment, there is no functionality for integrated ADR. Access to these solutions is through third-party connectivity and/or out-of-band network connections at the local PSAP CHE level; however, very few PSAPs leverage solutions like this.

Establishing requirements for a statewide ESInet and NGCS that can support a rich assortment of sources of additional information (e.g., location hazards, personal medical information, call history, etc.) will allow all PSAPs to operate from a common set of operational knowledge, enhancing situational awareness and potentially improving emergency response outcomes.

3.3 Emergency Services IP Network

Per [NENA-INF-016.2-2018](#), *Emergency Services IP Network Design (ESIND) Information Document*, an "ESInet is a specialized IP network designed and implemented ... to allow connectivity between public safety agencies. ESInets lay the groundwork for NG9-1-1 configurations by providing the common routed infrastructure to deliver critical information. ESInets provide transport, interoperability, security, and related services."¹¹

¹⁰ [Ibid.](#)

¹¹ *Emergency Services IP Network Design (ESIND) Information Document*, NENA-INF-016.2-2018. National Emergency Number Association, April 5, 2018, section 2.1.

Given the transitional nature of some ESInet implementations, it is common for agencies to have ESInet facilities in place to support NG911-ready CHE and other IP-based mission-critical network services. The level of redundancy in ESInet implementations across the country varies widely, representing the full range of categories from foundational (single point-to-point connections between sites) to fully redundant, resilient, and highly secure rings and mesh networks (end state).

NM911 recognizes the ESInet of the future is meant to be a wholly separate network solution, designed and implemented for the purpose of supporting NGCS, and may be implemented in tandem with i3-compliant call-handling solutions, i3-compliant radio networks, or other IP-based and data-driven public safety network projects. These design decisions will be addressed at a future date and incorporated into the NG911 procurement requirements.

The MAPS tool examines ten key areas associated with the current state of networking infrastructure among public safety agencies in the state to help assess NG911 readiness:

- Carrier ingress
- Interconnectivity
- Survivability
- Monitoring
- Change management
- Reporting/MIS
- Bandwidth
- Nclock¹²
- Quality of Service (QoS)
- Documentation

Based on the MAPS assessment, a review of the documentation provided by the PSAPs, and interviews with NM911 staff, NM911 achieved an overall score of **2.00** for the ESInet—a foundational state on the NG911 readiness continuum. This was anticipated given the lack of ESInet deployments across the state.

¹² Network clock

MAPS NG911 Readiness Assessment

New Mexico 911

ESInet

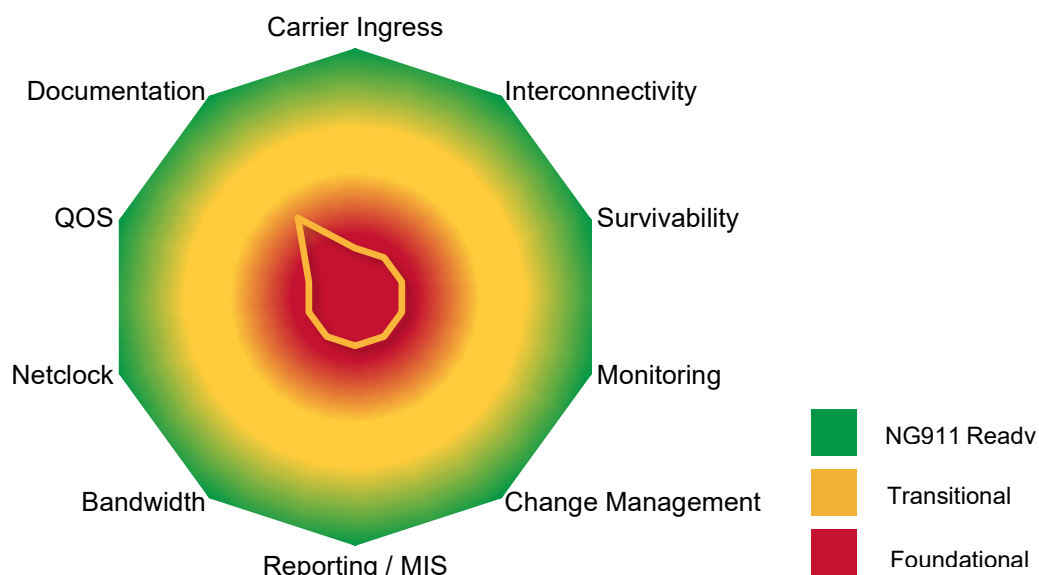


Table 5: ESInet Readiness Scores

Lever	Overall Score	Carrier Ingress	Interconnectivity	Survivability	Monitoring	Change Management	Reporting/MIS	Bandwidth	Netclock	QoS	Documentation
ESInet	2.20	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	4.00

3.3.1 Carrier Ingress

Rating: 2.00

Currently, all PSAPs are supported by legacy centralized automatic message accounting (CAMA) circuits for 911 call delivery. By contrast, an end-state NG911 solution delivers calls through a dedicated, managed, and resilient ESInet. The flexibility of a data-network-based infrastructure is absent in the legacy world of CAMA and other voice-grade circuits, significantly reducing the New Mexico PSAPs' ability to

adapt and respond to large-scale incidents or to support each other in high call-volume periods, as it is impossible to quickly or easily redistribute calls during a crisis. NM911 clearly appreciates the advantages of doing so and is actively taking steps to identify and procure an optimal ESInet and NGCS infrastructure, which includes IP-based carrier ingress capabilities, for the PSAPs.

3.3.2 Interconnectivity with Neighboring ESInets

Rating: 2.00

As New Mexico does not have an ESInet, there is no interconnectivity with neighboring ESInets. Nonetheless, NM911 would be best served by being prepared to connect to neighboring ESInets as soon as they become operational. In that spirit, NM911 is pursuing procurement of its own statewide ESInet with a focus on interoperability with other ESInets, even those that do not exist yet. It is recommended that NM911 require the ESInet provider to comply with industry standards and best practices, with the expectation that New Mexico's neighbors will do the same.

3.3.3 Survivability

Rating: 2.00

New Mexico does not have redundancy in the existing call-delivery infrastructure from the telephone companies to the PSAPs. The pricing structure for IP connectivity is significantly more flexible and adaptable to short-term increases in demand (bursty traffic) as well as providing multiple paths between any two endpoints. It is recommended that NM911 include requirements for redundancy as well as carrier- and path-diversity in the ESInet procurement requirements to ensure the emergency call-delivery infrastructure in the state is well designed and robust.

3.3.4 Monitoring

Rating: 2.00

There is an absence of a singular, statewide call-routing monitoring center or solution. Lack of visibility (at the state or even region level) into the health and performance of the current call-delivery infrastructure makes it hard to coordinate responses and provide a consistent level of support to all PSAPs. The data-based nature of an ESInet naturally lends itself to more transparency and visibility.

3.3.5 Change Management

Rating: 2.00

NM911 does not have a formal change management process; this is locally established by the PSAPs. There is no common framework or way to consolidate, aggregate, and coordinate change across the state.

As NM911 plans for procurement and deployment of a statewide ESInet, it is recommended that a formal change management process is established. A formal change management framework can help to assure

that changes are made more uniformly across the infrastructure, maintaining a shared and consistent level of functionality across the state while minimizing unexpected outages due to version-incompatibility between parts of the network.

3.3.6 Reporting and MIS

Rating: 2.00

Although there is no requirement or formal agreement for 911 system service providers and LECs to provide health and performance reports to NM911, these reports are generally provided upon request. As NM911 develops its requirements for the ESInet, MIS requirements should be included as part of RFP development.

3.3.7 Bandwidth

Rating: 2.00

The current multiprotocol label switching (MPLS) network is used exclusively to transport GIS data. In the data-rich world of NG911, an IP-based ESInet provides infinitely more flexibility, both in terms of the *quality* of data it can support as well as the *quantity*. It is recommended that NM911 include specifications in the ESInet procurement document that require flexibility in the network architecture to support future increases in data (both quality and quantity). This will help assure that the ESInet procured is able to adapt and grow, throughout its life, to accommodate the changes (both predicted and unforeseen) to the public safety data landscape.

3.3.8 Netclock

Rating: 2.00

To reconcile timestamped log data from disparate elements in a network-based infrastructure, it is critical that all elements reference a common timing source. Taking time signals from the global positioning system (GPS) satellite constellation is an easy and cost-effective way to synchronize systems separated by vast distances. Furthermore, a GPS time reference is widely considered to be legally defensible if records are to be used in court.

GPS satellites are considered Stratum 0 (essentially the original source). As devices receive GPS signals and forward them to other devices, each hop in that chain increases the stratum number, indicating a potential loss in traceability, reliability, and accuracy. In public safety, it is considered best practice to have every physical facility where system elements are housed have its own Stratum 1 time source, meaning an onsite netclock that receives signals directly from the GPS network via a GPS antenna connected directly to the netclock.

Current requirements in New Mexico do not specify that PSAPs shall have a netclock. Netclock installation is a decision made at the local level. NM911 is reliant on the timestamps provided by the LECs, system

service providers, and CHE vendors. It is recommended that a local netclock is a requirement for all PSAPs as well as data centers housing ESInet or NGCS elements and/or hosted CHE.

3.3.9 QoS

Rating: 2.00

QoS is a mechanism for defining and enforcing relative priorities between different types of data traversing the same network. In an ESInet QoS scheme, the packetized voice traffic for 911 “calls” is generally considered to be of the highest priority for delivery, as compared to the exchange of inter-agency emails or even computer-aided dispatch (CAD) and updated GIS data, for example.

QoS rules not only mark different packets based on their priority, but also enforce those priorities by delaying or even dropping lower-priority data, when and if necessary, to ensure the timely delivery of higher-priority data. A QoS scheme based on industry best practices can greatly improve the perceived quality of the voice (also known as the Mean Opinion Score [MOS] for VoIP), leading to clearer communication and understanding between all parties on the call. QoS only applies to data prioritization and signal quality over data networks, which the PSAPs do not employ today. It is recommended that NM911 provide clear requirements in this area for any NG911 procurement.

3.3.10 Documentation

Rating: 4.00

NM911 maintains some records on its infrastructure but does not have any network diagrams.

Moving to an i3 ESInet (and preferably a single-vendor solution) will make it easier to develop a common operating picture of the 911 environment. Furthermore, the requirements for the procurement of such a solution may be written to include the delivery and regular updates of such documentation.

3.4 Call-Handling Equipment

CHE is a key component in the NG911 environment. Analog technologies rapidly are becoming a thing of the past as the nation’s major telephone carriers migrate away from copper-line networks. This key component of 911 call delivery can be a stumbling block for many jurisdictions financially, technologically, and/or operationally when implementing NG911. Older analog technology may not be capable of processing the available features of an NG911 call, thus eliminating much of the information that may be available to a telecommunicator.

Given the cyclic nature of hardware refreshes, it is common for states to have a mix of call-handling capabilities in place, ranging from foundational to regional end-state NG911.

The MAPS tool examines six key areas associated with call-handling to help assess NG911 readiness:

- i3-capable Call Handling
- Text-to-911
- Logging and Recording
- Mapping
- MIS
- Multimedia
- ADR

Based on the MAPS assessment, a review of the documentation provided, and interviews with NM911 staff, NM911 achieved an overall score of **5.52** for the CHE—a transitional state on the NG911 readiness continuum.

MAPS NG911 Readiness Assessment

New Mexico 911

Call-Handling Equipment

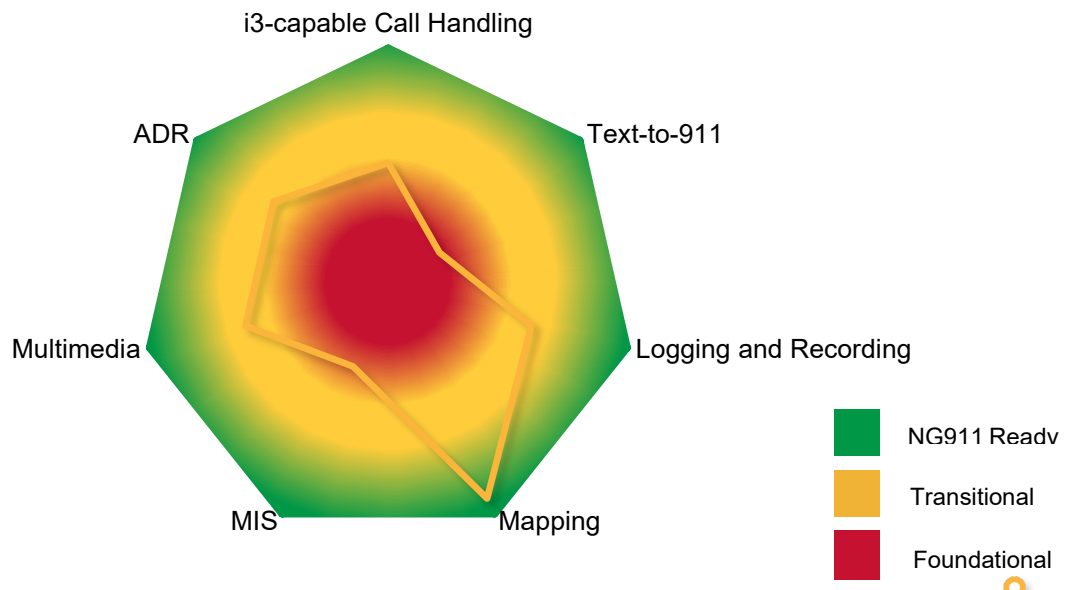


Figure 7: CHE MAPS

Table 6: CHE Readiness Scores

Lever	Overall Score	i3-capable Call-Handling	Text-to-911	Logging and Recording	Mapping	MIS	Multimedia	ADR
CHE	5.52	5.33	2.67	6.00	9.33	3.33	6.00	6.00

3.4.1 i3-capable Call Handling

Rating: 5.33

Based on data gathered through PSAP surveys and outreach, NM911 is monitoring the deployment of call-handling solutions to ensure adequate funding. The data provided indicates that 14 PSAPs have newly upgraded CHE that is i3-capable. Fifteen PSAPs are scheduled for new equipment in 2021 and ten are scheduled in 2022. This will leave two PSAPs that will either need a software upgrade or equipment replacement in 2023.

It is recommended that NM911 closely monitor CHE upgrades to ensure all PSAPs are capable at the time of NG911 implementation.

3.4.2 Text-to-911

Rating: 2.67

Currently, there is no statewide plan or any requirements outlining how PSAPs should deploy text functionality and no PSAPs within the state have deployed text-to-911. However, NM911 has indicated a desire to include text-to-911 as an integrated function of the NG911 system. A statewide alignment with industry best practices and standards (with regard to receipt and processing of text-to-911 calls) can dramatically improve the speed of processing and the ease of sharing text messages and even entire text sessions between agencies and jurisdictions through common text sharing protocols.

3.4.3 Logging and Recording

Rating: 6.00

PSAPs reported a variety of recording solutions in use. NM911 PSAP equipment requirements specify that PSAPs shall have “the capacity to record both sides of a conversation on each incoming 911 call and all radio communications while dispatching the 911 call.”¹³ However, there are no specific policies on the logging or recording of NG911 additional data (e.g., digital media, location information, etc.).

The State does have a Statewide Price Agreement for PSAP logging recorders. Language included in the price agreement stipulates that logging recorders must have some i3 capabilities including:

1. *Be able to record analog, digital time division multiplexing (TDM), Voice over Internet Protocol (VoIP), Radio over Internet Protocol (RoIP), text messaging, still images, and video ...*

¹³ New Mexico Administrative Code, CHAPTER 6, 10.6.2 NMAC - ENHANCED 911 REQUIREMENTS. 10.6.2.11 C.(14)(a). <http://164.64.110.134/nmac/T10C006>

18. Be expandable to Next Generation 911 features and capabilities to include but not limited to recording text messages, still images, and videos delivered via a telephonic device. Text messages, still images, and videos must be stored on a secure server. ¹⁴

PSAPs are not required to purchase from the statewide price agreement or purchase equipment that is NG911-capable.

3.4.4 Mapping

Rating: 9.33

New Mexico has made good progress in preparing GIS data for an NG911 environment. As such, every PSAP has an integrated mapping solution as part of its CHE.

3.4.5 MIS

Rating: 3.33

Various platforms are in use. All call volume is self-reported to NM911 as part of the PSAP annual reporting requirements. Localities must break out call metrics to measure the number of wireless, VoIP, and landline 911 calls received. Procurement guidelines mention that equipment be able to follow recorded calls as they are forwarded and retain accurate call transfer information.

Perhaps more importantly, there is no state-level repository, process, or policy in place regarding the aggregation of 911 system performance and activity data for the purposes of monitoring, reporting, and advocating for the PSAPs with their equipment vendors. MIS is generally accepted as a vital management tool in the NG911 ecosystem, providing both visibility and transparency needed to hold providers accountable to State requirements.

Call metrics are needed to complete surveys for the FCC and the National 911 Program. Having a statewide MIS allows the State to collect accurate information for use in State and Federal reporting.

3.4.6 Multimedia

Rating: 6.00

There is reluctance within some of the PSAP community to accept multimedia data, especially when it comes to imagery.

¹⁴ Public Safety Answering Points Logging Recorders https://www.nmdfa.state.nm.us/wp-content/uploads/2021/01/00-00000-20-00105_00-00000-20-00105-PSAP-Logging-Recorders-0624.pdf

The CHE procurement agreements stipulate that as the migration from legacy E911 occurs, systems be able to function in an NG911 environment, which includes the ability to accept text-to-911, additional data, and multimedia (images, video etc.).

3.4.7 ADR

Rating: 6.00

When data is made available to telecommunicators early and throughout the 911 call, situational awareness improves—which can result in quicker and more appropriate emergency response. The concept of additional data was introduced in the second version of the NENA i3 standard ([NENA-STA-010.2-2016](#)). Since the concept was announced, the industry has seen incremental and important steps being made to provide more data to telecommunicators during requests for emergency assistance. This data, in most cases, is provided through over-the-top (OTT) or out-of-band solutions that leverage queries directly from the call-handling solution to provide access to additional data, when available, for a call.

Similar to multimedia, CHE procurement requirements include a path forward for PSAPs to accept ADR via CHE. Due to the legacy environment in operation today in New Mexico, few, if any, PSAPs leverage ADR sources; those that do generally use OTT methods.

It is recommended that NM911 require NG911 equipment to provide *integrated* support for ADR. Among other benefits, integrated support assures that ADR data may be easily associated with the call or incident for which it was requested or delivered and track who has accessed that data since its receipt.

3.5 Security

Cybersecurity is of great importance for all broadband-enabled devices and networks. NG911 systems, in particular the ESInet, are no different and, in fact, command greater importance regarding cybersecurity. The number of cyberattacks already perpetrated against corporations and public safety entities the world over is staggering; with each passing year, the number of these attacks continues to grow as does the severity of the attacks.¹⁵

Public safety agencies are encouraged to follow both TFOPA and NIST standards and recommendations as a framework to build a successful cybersecurity management process.

The NIST [Cybersecurity Framework](#) provides a framework and methodology for improving and protecting the public safety infrastructure from cyberthreats. The framework suggests a five-phase approach to cybersecurity preparedness:

1. Identify—develop an organizational understanding of how to identify cybersecurity risks
2. Protect—develop and implement appropriate safeguards to protect against known and unknown threats

¹⁵ “110 Must-Know Cybersecurity Statistics for 2020.” Varonis. <https://www.varonis.com/blog/cybersecurity-statistics/>

3. Detect—develop and implement activities to detect a cybersecurity event if protection fails
4. Respond—develop and implement activities to mitigate a detected cybersecurity incident
5. Recover—develop and implement plans for restoring services due to an incident.

TFOPA's [NG9-1-1 Readiness Scorecard](#), Section 4.4, *Security*, identifies six comprehensive steps for creating a cybersecurity plan that complements the NIST phases:

1. Identification/Discovery—inventory all existing systems and applications
2. Assess/Prioritize—conduct risk assessments and establish security controls
3. Implement/Operate—document policies, procedures, and controls and administer security controls
4. Monitor and Evaluate—monitor and examine operational environments
5. Test/Evaluate—audit and verify findings
6. Improve/Evolve—reassess and reevaluate policies, procedures, and security controls¹⁶

As noted earlier, the MAPS assessment relies on the TFOPA framework, as well as NIST and other standards, to develop a baseline from which to plan and coordinate transition strategies and operational effectiveness to improve security for NG911 readiness. The MAPS tool examines six key areas associated with security to help assess NG911 readiness:

- Cybersecurity Plan/Policy
- Proactive Monitoring
- Risk Assessment
- Network Security
- Physical Security
- Staff Security

Based on the MAPS assessment, a review of the documentation provided, and interviews with NM911 staff, NM911 achieved an overall score of **5.00** for security—a transitional state on the NG911 readiness continuum.

¹⁶ Task Force on Optimal Public Safety Answering Point Architecture (TFOPA) Working Group 2 Phase II Supplemental Report: NG9-1-1 Readiness Scorecard. https://transition.fcc.gov/pshs/911/TFOPA/TFOPA_WG2_Supplemental_Report-120216.pdf

MAPS NG911 Readiness Assessment

New Mexico 911

Security

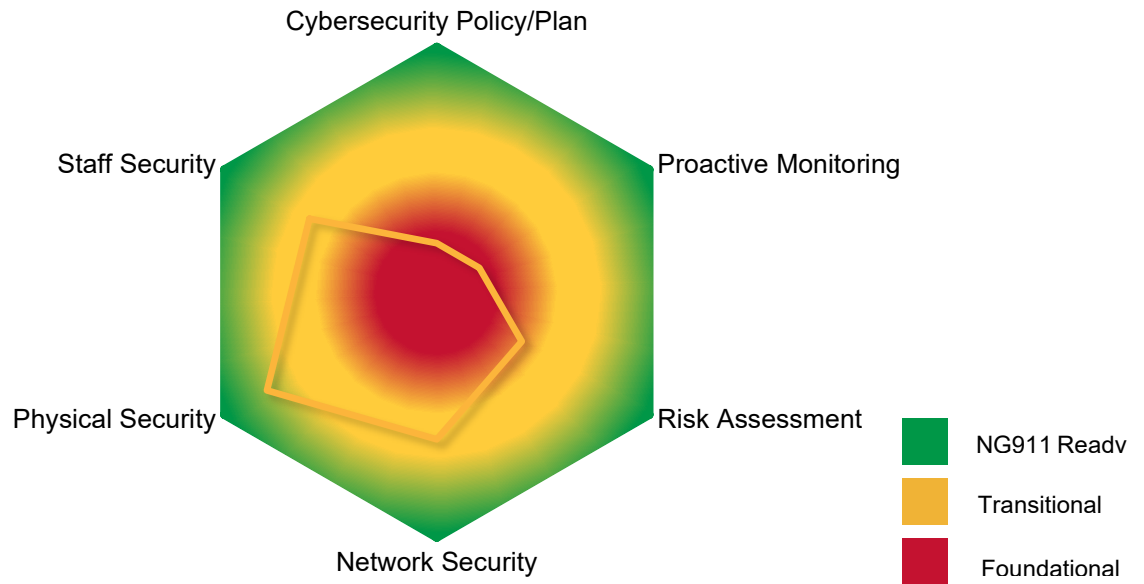


Figure 8: Security MAPS

Table 7: Security Readiness Scores

Lever	Overall Score	Cybersecurity Plan/Policy	Proactive Monitoring	Risk Assessment	Network Security	Physical Security	Staff Security
Security	5.00	4.00	4.00	4.00	4.00	8.00	6.00

3.5.1 Cybersecurity Plan/Policy

Rating: 4.00

Although at the State level, New Mexico has a cybersecurity plan, NM911 does not have its own plan or policies specific to its public safety mission. In addition, NM911 did not include cybersecurity requirements in the current statewide specifications for call handling and recorders and does not offer cybersecurity guidelines or recommendations to the PSAP community. However, the requirements document being

developed for the procurement of a state-level ESInet and NGCS will include comprehensive cybersecurity requirements as a part of any future NG911 solution procurement(s) in New Mexico.

If NM911 chooses to do so, it likely could significantly improve compliance with any such cybersecurity policies, recommendations, and standards by providing educational, planning, and operational materials to the PSAPs on how to implement an effective cybersecurity program at the PSAP level.

3.5.2 Proactive Monitoring

Rating: 4.00

From a security perspective, there is no proactive monitoring of the existing 911 systems in New Mexico. While some of the service and solution providers may monitor their respective equipment, networks, and software, there is no requirement or expectation that this information is shared with NM911. The NG911 requirements currently being developed, however, will place increased importance on cybersecurity as an integral part of the overall monitoring system platform, providing visibility and transparency to NM911. The requirements document will further recommend regular third-party audits of systems, networks, and facilities as well as regular reviews of security policies and procedures to maintain a strong security posture for all 911 systems across the state.

3.5.3 Risk Assessment

Rating: 4.00

NM911 has demonstrated an appreciation for the risks posed by cyberthreats by engaging a trusted partner company to pilot a security penetration and testing assessment. However, risk assessments are handled by the localities. NM911 does not require PSAPs to have a tested cybersecurity plan.

As more PSAPs connect to the statewide ESInet in the future, the security of the entire network is only as strong as the weakest security practices of a PSAP.

3.5.4 Network Security

Rating: 4.00

New Mexico DoIT manages the NM911 infrastructure. If NM911 procures a statewide ESInet, it is recommended that the service provider(s) must have NG911-compliant security (NG-SEC) for all personnel and equipment. These protections and/or increased security must be in place for all future NG911 systems procured by NM911. These requirements should align with NM911-defined policies and procedures or be through legislated mandate for all systems interfacing with the NG911 solution in the state.

3.5.5 Physical Security

Rating: 8.00

For the most part, NM911 follows the State's guidelines for providing physical security of facilities, equipment, and other property. NM911 does not have its own policies and does not provide recommendations, guidelines, or requirements for PSAPs. While PSAPs are expected to follow the security policies of their governing agencies, there is no collaboration or process for establishing shared requirements. PSAPs, as they operate 24 x 7 and provide a vital service to the community, have some unique security needs that may not be covered by a typical government agency security policy.

Locally, PSAPs that use Criminal Justice Information Services (CJIS) must follow specifications for physical and network security. This includes limiting access to secure areas of buildings or escorting and logging guests' access.

3.5.6 Staff Security

Rating: 6.00

Access to the NM911 facility is limited; electronic badge access is required, or guests must be escorted. Contractors may get badge access but rarely are subcontractors rendered to perform maintenance on the state network. Criminal history background checks are required to be granted badge access.

3.6 Geographic Information System

Technological advancements over the last 50 years necessitate a long-overdue fundamental change in the technology used to connect emergency callers to 911 centers. NG911 is meant to bridge the disparity between the communications technology used today and the antiquated systems implemented to support 911 operations dating back to the 1960s.

At the core of NG911 is GIS data. Spatially enabled GIS datasets drive the analytics that find the 911 caller (e.g., LVF) and determine the appropriate 911 center to which the emergency call should be routed (e.g., emergency call routing function [ECRF]). GIS datasets employed to fulfill these functions must be refined to public-safety-grade with exact geospatial accuracy and complete attribution of all information necessary for completing the complex queries.

There are seven core GIS datasets required for NG911 operation: address points, road centerlines, PSAP boundary, provisioning boundary, and emergency service boundaries (ESBs) (fire, law, EMS¹⁷) polygons. These data will interact within the GIS to provide location validation and 911 call-routing functions. Errors in any of these datasets potentially could delay 911 call delivery or result in the call being routed to the incorrect PSAP. In addition to complete and accurate attribution of every GIS dataset, geo-positional accuracy is vital to the proper functionality of the NG911 system.

¹⁷ Emergency medical services

To meet the requisite match rates between the GIS data and the legacy 911 tabular ALI and MSAG, New Mexico jurisdictions also must improve the GIS data internally and with neighboring jurisdictions. Overlaps and gaps in individual polygonal datasets must be eliminated. ESBs must nest in the PSAP polygon. Both must nest within the provisioning polygon. Address points and road centerlines must be wholly contained within the provisioning polygon as well. MCP was able to perform a high-level review of the statewide road centerlines and address points.

Although the migration to NG911 is being coordinated by NM911, the most accurate GIS data is developed and maintained by local jurisdictions. The further implementation of a large-scale, enterprise-wide capability such as geospatial data collection, aggregation, validation, and dissemination will require a tremendous effort through a phased approach, significant stakeholder coordination and collaboration, and adequate and sustained funding streams. However, by cooperatively implementing a program in adherence to nationally accepted standards, New Mexico will position itself in a forward-thinking mode by facilitating interoperable data-sharing practices that create flexibility and sustainability within its 911 program.

3.6.1 Overall Readiness

Key GIS capabilities related to NG911 and industry best practices for GIS administration were considered in developing the GIS readiness criteria. The ability of GIS to support NG911 relies upon much more than just a 98% match between the GIS road centerlines and the legacy ALI and MSAG tables. GIS must meet or exceed criteria in eight evaluation factors:

- Data Readiness
- Production Environments
- Regional Coordination
- Training
- CAD
- General Information Technology (IT)
- Addressing
- Documentation

To achieve GIS data readiness (Factor 1), NM911 staff must receive training (Factor 4) and be supported by current and robust technology (Factor 6) in a well-performing production environment (Factor 2). Beyond the State's GIS staff, a high level of regional coordination (Factor 3) is necessary to ensure that GIS data and addressing (Factor 7) not only are accurate within each municipality, county, and Tribal community (collectively jurisdictions) but also are validated between jurisdictions across the State.

The same GIS data that drives NG911 call-routing and location-validation functions also is necessary for alternative-routing scenarios (i.e., failover routing to another PSAP when a PSAP has been rendered inoperable, uninhabitable, or inaccessible). To support this advanced capability of NG911, this data must be aggregated and provisioned into the CAD system within the PSAP (Factor 5). It is important to note that CAD system provisioning is not a NENA requirement, but is an industry best practice necessary to support alternate-routing scenarios. Finally, the processes and workflows used to maintain NG911 GIS data must have proper documentation (Factor 8).

Based on the MAPS assessment, NM911 achieved an overall score of **7.26** for GIS to support the migration to geospatial routing and NGCS.

MAPS NG911 Readiness Assessment

New Mexico 911

GIS

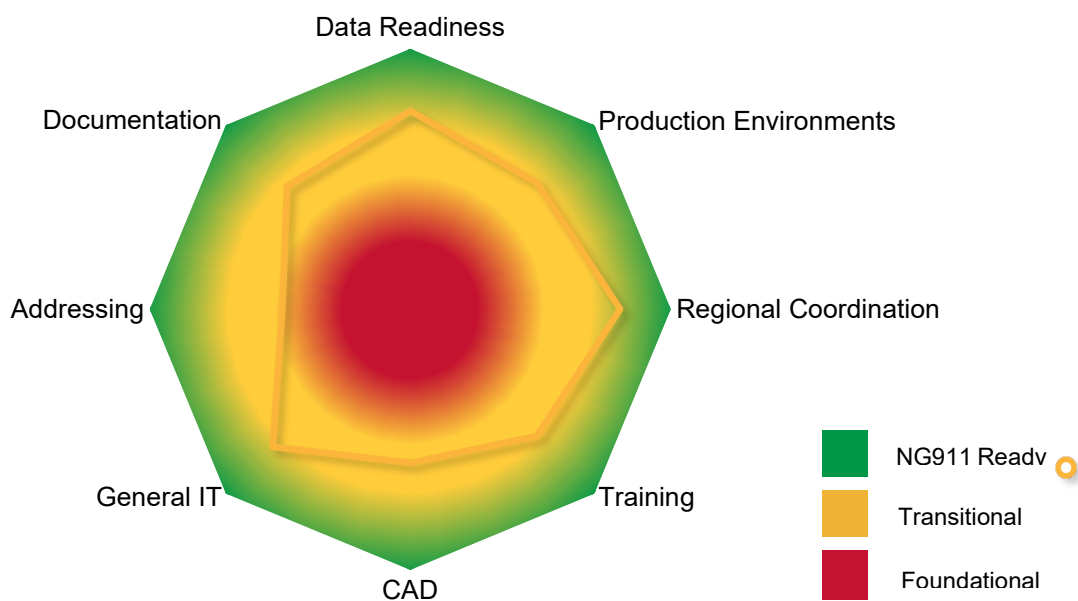


Figure 9: GIS MAPS

Table 8: GIS Readiness Scores

Lever	Overall Score	Data Readiness	Production Environment	Regional Coordination	Training	CAD	General IT	Addressing	Documentation
GIS	7.26	7.75	7.00	8.33	7.00	6.00	7.60	5.00	6.80

3.6.2 GIS Data Readiness

Rating: 7.75

GIS capabilities vary greatly across New Mexico. NM911 should support the data improvement and maintenance efforts of the local data stewards through governance, collaboration, and training opportunities. The State scored well on this factor for several reasons:

- A statewide NG911 data model is available for local use.

- The Earth Data Analysis Center (EDAC) has developed extract, transform, load (ETL) tools for each jurisdiction to use when providing GIS data updates to the State.
- The State supports multiple GIS collaborative groups within the state and nationally.

Although this readiness factor is within the NG911-ready score, NM911's support for local jurisdictions' GIS readiness is necessary to bring the data into NG911 compliance.

- To maintain consistency between the GIS and legacy ALI table, GIS should be given unfettered access to the ALI throughout the NG911 migration.
- Many jurisdictions still are below the 98% match rate threshold for GIS and ALI validation. The State can offer validation tools, data improvement techniques training, or access to state-negotiated or state-sponsored contracts with GIS data development companies to assist locals with their data improvement efforts.
- Approximately 90% of PSAPs require some technical assistance or guidance on data improvement.
- Statewide coordination of boundary polygons is necessary to ensure topological integrity across jurisdictions.
- A single, aggregated dataset for each polygon layer should be developed at the State and shared via a web feature service to ensure against multiple versions of the same data being used by service providers.

3.6.3 Production Environment

Rating: 7.00

New Mexico, like many states, must support the NG911 migration efforts of many jurisdictions with disparate capabilities in maintaining GIS data. The NM911 GIS Data Status Dashboard¹⁸ shows a total of 93 municipal, county, and Tribal GIS data providers with only 58% of the jurisdictions providing GIS data to the State. In addition to providing guidance and a collaborative environment to the data stewards, NM911 also may need to assist with data development either through NM911 staff or through contracted services.

The GIS data produced and maintained by local and regional GIS programs to support NG911 also will need to be validated and aggregated for use in other systems such as CAD to facilitate abandoned call routing and non-ESInet related functions of the PSAP. Although NM911 can perform this work in cooperation with EDAC, the current structure is not capable of supporting the update frequency required by NG911.

The State scored well on this factor for several reasons:

- Most PSAPs have access to GIS tools and expertise.
- The State is well staffed with GIS professionals.
- EDAC readily provides GIS subject-matter expertise support to NM911.

¹⁸ <https://www.arcgis.com/apps/opsdashboard/index.html#/5f2242945d6e4878a0fbc9bff117196b>

Although this readiness factor is within the NG911-ready score, NM911 still can improve upon its production environment as well as assist the jurisdictions with the same.

- The GIS outreach position within NM911 currently is vacant.
- Several jurisdictions have vacant GIS positions.
- Some jurisdictions are maintaining addressing information as paper records.
- The State does not maintain SLAs or intergovernmental agreements (IGAs) with data stewards.
- NM911 should create and fund a dedicated annual GIS budget.

3.6.4 Regional Coordination

Rating: 8.33

The implementation of NG911 is meant to expand PSAP operations beyond that of a singular entity to incorporate failover functionality (i.e., alternate routing) to strengthen the ability of the 911 community to respond to any citizen need. In the NG911 environment, GIS data does not end at the PSAP boundary. Rather, GIS data must be coordinated across multiple PSAP boundaries, not only within a county PSAP's area of operations (AoR) but also with neighboring jurisdictions.

Established NENA standards¹⁹ govern the development of road centerlines and site/structure address points, as well as PSAP, service boundaries, and provisioning polygons. The standards dictate that all road centerlines should be broken at intersections with other roads, and at PSAP, service boundary, and provisioning polygon boundary edges. The State has implemented snap-to points along county boundaries. This geometric continuity is referenced in the GIS community as topological integrity. Topology is one of the primary tests performed on GIS data when assessing it for NG911 readiness. Topological integrity will be tested on individual jurisdictions' data, as well as on an aggregated statewide dataset. The statewide snap-to points aid in ensuring the preservation of topological integrity within and beyond each PSAP's boundary.

PSAP polygons, which primarily will be responsible for emergency call routing in an NG911 environment, also must be coordinated between PSAPs in New Mexico. The placement of such boundary lines is at the discretion of the PSAP director and should be drawn to reduce call transfers between PSAPs. Each time a PSAP boundary is modified, coordination between the neighboring PSAPs and NM911 is necessary to ensure synchronization with all parties.

The support NM911 currently is providing to local jurisdictions resulted in a respectable score for this category.

¹⁹ NENA 02-014 v1, *GIS Data Collection and Maintenance*; NENA-STA-006.1.1-2020, *NENA Standard for NG911 GIS Data Model*; and NENA-STA-015.10-2018, *NENA Standard Data Formats for E911 Data Exchange & GIS Mapping*.
<https://www.nena.org/page/Standards>

- The State provides GIS data both as a file geodatabase and a web feature service for download by the PSAPs.
- Individual jurisdictions and statewide aggregate data are available.
- The State maintains a topologically correct PSAP layer.

Although this readiness factor is within the NG911-ready score, NM911 still can improve upon its support for regional coordination across the state.

- More outreach and education are needed to Tribal communities to raise awareness of and increase participation in GIS data development and sharing.
- Many Tribal communities remain underserved by advancements in 911 services.
- NM911 also should coordinate with neighboring jurisdictions bordering New Mexico.

3.6.5 Training

Rating: 7.00

The GIS community, like most technology sectors, is advancing rapidly and is ever-changing. It is imperative that GIS professionals receive regular training on the advancements within the software and relational database management systems (RDBMS) used to create, maintain, store, and distribute GIS data. The migration to NG911 presents new requirements, standards, software, and training opportunities for GIS personnel. NM911 should promote, and the jurisdictions should embrace, the benefits of cross-training GIS staff members to fully support the PSAPs.

A large part of implementing new GIS programs, such as NGCS support, requires educating leadership on the effort and reasons for reallocating resources or requesting additional staff members. Unfortunately, leadership in many jurisdictions does not understand the importance of GIS to the NG911 migration. It is vital for NM911 to promote the need for NG911 and the roles GIS plays in the new system. Targeted outreach to elected officials, County administration, Tribal leadership, and the statewide GIS coordinating bodies may be required.

NM911 readily supports training programs for individuals and jurisdictions which places the State on the cusp of an NG911-ready score.

- The State raises NG911 needs and promotes successes at least quarterly in 911 and GIS forums.
- GIS training is an allowable use of 911 funds by jurisdictions and the State.

NM911 must improve upon the education and outreach program to become NG911 ready.

- Local government commissioners/council members do not understand NG911, GIS or the reliance on GIS for NG911 success.
- The largest use of GIS in local governments is for printed maps.
- NM911 is seeking to develop an educational video to help resolve these issues for executive leadership and elected officials within local jurisdictions.

3.6.6 CAD

Rating: 6.00

The same GIS data that supports the spatial interface (SI) on the ESInet also should be used in the CAD systems at each PSAP to enhance local call-processing and call-dispatching efforts, as well as provide the CAD system map display necessary to facilitate alternate-call-routing support between jurisdictions. Sharing such data will enable the PSAPs to utilize the ESInet to automatically reroute (i.e., alternate route) emergency calls for any reason. The alternate PSAP receiving these calls may be unfamiliar with the new geography. Making GIS data available to the receiving PSAP increases the capabilities of the telecommunicators to successfully handle these calls.

The State does collect, aggregate, and validate GIS data monthly. Of the 93 identified GIS data providers in the state, 40% have not provided any GIS data updates in the past six months²⁰. The integration of NG911 GIS data with CAD systems is not mandatory for the successful migration to NG911. However, to fully realize the benefits of NG911, counties must implement regional GIS data into their CAD systems and maintain this data regularly.

The State's scores in this factor suffered for several reasons:

- GIS data only is current from just over half of the GIS data providers.
- Not all jurisdictions' CAD systems can utilize regional GIS data.
- Interjurisdictional data correction efforts have not propagated to all jurisdictions, which can cause data errors during data aggregation,

To advance this factor to an NG911-ready score, NM911 should implement the following recommendations:

- Expand the outreach and education program to include the importance of GIS data sharing between jurisdictions and with NM911.
- For jurisdictions that do not have GIS staff, offer statewide contracting for GIS services to reduce the cost to jurisdictions and ensure adherence to State standards for deliverables.
- Offer statewide contracting for PSAPs without GIS-capable CAD systems.
- Further promote the wide use of GIS to increase return on investment.

3.6.7 General IT Support

Rating: 7.60

The State provides many services to the GIS data providers in support of the NG911 migration. The backbone of these services is the infrastructure—data and web servers, GIS software, archiving, and

²⁰ GIS Data Status Dashboard, New Mexico 911 (NM911) Program.
<https://www.arcgis.com/apps/opstdashboard/index.html#/5f2242945d6e4878a0fbc9bff117196b>

retrieval of historic dataset applications—that connects the State and local agencies. NM911 has heavily invested in these systems and this commitment to the jurisdictions is reflected in the score on this evaluation factor.

The State currently does not have a statewide enterprise licensing agreement (ELA) with Esri²¹, the provider of GIS software for the State; some agencies do have agency-wide ELAs. The State likely could realize cost savings by rolling Esri licensing into a single, statewide ELA. Since GIS software is an allowable expenditure of 911 funds in New Mexico, the State could expand the ELA to include agencies for which NM911 currently funds this software.

Only minor improvements are necessary to improve the next generation IT standing for NM911:

- Consolidate Esri licensing into a single State ELA.
 - Some GIS software needs are filled by EDAC, which is a risk to NM911.
- Ensure GIS servers and needs are included in the State continuity of operations (COOP) plan with the same needs as other 911 systems.

3.6.8 Addressing

Rating: 5.00

Every step in providing 911 services relies upon location. Address standards, from creation to display of addresses on the 911 telecommunicator's screen, are vital to the 911 mission. The processes used to create, verify, and manage addressing must meet 911 standards and best practices. The address data also must be kept current, ahead of real-estate development in the conceptual stages of construction, to provide 911 services to the men and women building new roads and homes.

NM911 is developing a statewide addressing standard and associated workflow that are thorough and inclusive regarding GIS and 911. NM911 is optimistic that the standard will be adopted by the jurisdictions' addressing authorities, although adoption is not mandated. Although the creation of addressing standards and workflows generally is well-coordinated, the State does not have the authority to impose workflow and standards requirements on the municipalities.

Address points are one of the required NG911 GIS datasets and are collected, aggregated, and disseminated by NM911. Currently, 95 of 107 addressing authorities across the state participate in the sharing of address points with the State.

This readiness factor is distant from being NG911-ready; NM911 should improve the statewide addressing capabilities of the local jurisdictions by implementing the recommendations below:

- Education and outreach on the importance of location information to successful delivery of emergency services should be delivered to the local jurisdictions.

²¹ <https://www.esri.com/en-us/home>

- Promotion of the State addressing standards and workflows for local adoption to local addressing authorities.
- Document the agreed-upon address creation to updated address point dataset to the State workflow for each jurisdiction.

3.6.9 Documentation

Rating: 6.80

The migration to NG911 is complex and requires careful planning. The processes for creating and maintaining GIS data may change—sometimes drastically—to meet the demands of the NG911 environment. Mitigating the many risks to the success of this undertaking necessitates the development of, and strict adherence to, documents regarding strategic plans, standard operating procedures (SOPs), workflows, and industry standards.

At the top of the list of documents is a strategic plan. This plan will identify the short-term and long-term goals for GIS data. Comparing these goals with the current capabilities and availability of staff members will provide justification for staff augmentation requests. The strategies for GIS data should support the goals and schedule of the broader public safety program as well as supporting the migration of every PSAP in New Mexico. Crucially, the strategic plan must align with the State's overall strategy and should identify local milestones towards which the jurisdictions can plan. It is important to annually maintain NM911's strategic plan to ensure continued alignment, show progress toward strategic goals, and facilitate budgeting and staffing projections.

Some SOPs supporting data development and maintenance exist. Once developed, these SOPs also must be updated with process or staffing changes. Consistency is key to the validation of individual and aggregated GIS datasets. SOPs for the creation, maintenance, distribution, and refresh of GIS data assist greatly in meeting the requirements of the NG911 environment. SOPs are especially important in mitigating the risks to productivity due to staff turnover.

Current, accurate, and fully attributed GIS data is quintessential to the operation of the NG911 system. The loss of GIS data or services for any length of time could prove disastrous to the public safety mission. NM911 must maintain a disaster recovery plan to ensure that the data, systems, and staff members are able to update the GIS data used for location validation and emergency call routing. The ESInet can continue to operate with the aggregated statewide GIS data, but the longer the delay in provisioning locally generated GIS data updates into the NGCS, the greater the risk of emergency calls misrouting or other location-based issues.

NM911 should promote the development of memoranda of agreement (MOAs) to govern the relationship between the jurisdictions and the maintenance of GIS data. An MOA would protect the data-provisioning process in the ESInet and continue to provide current GIS data to the CAD system despite staff turnover.

With the introduction of the more stringent specifications for NG911, it is recommended that the State implement an SLA as opposed to an MOA with local jurisdictions. The SLA should reflect the current level

of service being provided by each GIS data steward. All agreements should be reviewed annually and updated appropriately.

Proper, complete, and current documentation will greatly assist NM911 in mitigating staff turnover, breakdowns in intergovernmental relationships, and other unforeseen obstacles that may jeopardize the NG911 migration. The following improvements are recommended or required for NM911 to improve its documentation posture:

- Complete the 2021 NM911 GIS strategic plan update.
- Add performance metrics to the GIS strategic plan.
- Review existing SOP and workflow documentation and update as necessary.
- Update DoIT COOP plan to include GIS needs.
- Update EDAC COOP plan to include NM911 GIS needs.
- Formalize and document the governance structure for the multiple GIS advisory groups.

3.7 Operations

Many would say that implementing NG911 technology is the easy part. The more challenging part is operationalizing the processes, methods, and training, and managing the additional data and other support structures, such as COOP planning and incident management.

Having an operational state that supports the implementation of NG911 is one of the key factors in a successful implementation. Policies and training must exist that support both transitional and end-state NG911. Having appropriate staff support for NG911 is also crucial—many managers and administrators at both the state and local level already are overwhelmed, wearing multiple hats each day. Without proper support, the needed tasks that are essential to the proper function of the NG911 environment may have to be added to an already overworked staff member. There is then a risk that these tasks are not completed in a timely manner, or at all.

Ensuring an effective and efficient operation long has been the goal of NM911 and planning for operational effectiveness in the NG911 environment requires NM911 to review current operations and plan for the changes that will come.

The MAPS tool examines six key areas associated with operations to help assess NG911 readiness:

- | | |
|---------------------------|-----------------------|
| • Policies and Procedures | • COOP Plan(s) |
| • Training | • Succession Planning |
| • Additional Data | • Facility |

Based on the MAPS assessment, a review of the documentation provided, and interviews with NM911 staff, NM911 achieved an overall score of **4.06** for operations—while this score is foundational, some work has been made towards the early phases of a transitional state on the NG911 readiness continuum.

MAPS NG911 Readiness Assessment

New Mexico 911

Operations

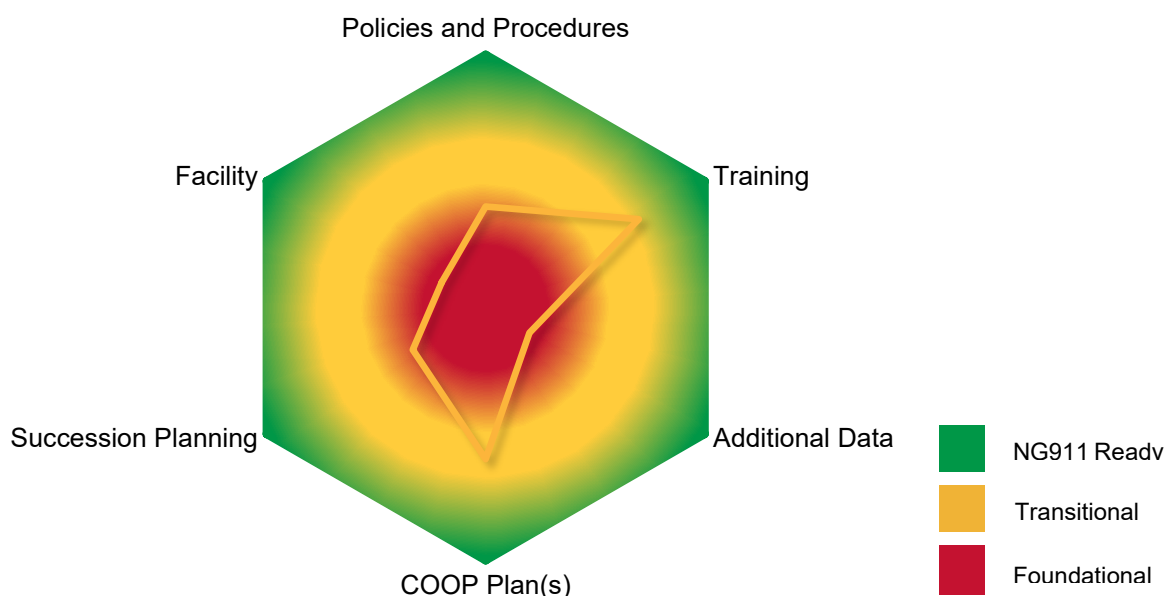


Figure 10: Operations MAPS

Table 9: Operations Readiness Scores

Lever	Overall Score	Policies and Procedures	Training	Additional Data	COOP Plan(s)	Succession Planning	Facility
Operations	4.06	4.00	7.00	2.00	6.00	3.33	2.00

3.7.1 Policies and Procedures

Rating: 4.00

NM911 requirements are outlined in Title 10 *Public Safety and Law Enforcement*, Chapter 6 *Local Governments Law Enforcement Agencies*, Part 2 *Enhanced 911 Requirements*. The rules and regulations

are designed to assist in the development, operation, and maintenance of a reliable, uniform E911 system. The rules are focused on E911 and currently do not contain any provisions for NG911.

NM911 does not prescribe how systems are operated but does provide guidelines for basic and E911 service; system, equipment, and network design; and maintenance. The guidelines state that E911 call information shall be based on NENA standards. Further, the requirements define what an agency must do to qualify as a PSAP. The requirements address:

- PSAP equipment (CHE, recorders, uninterruptible power supplies [UPS], TDD/TTY²², etc.)
- GIS
- Planning and implementation of enhanced wireless service
- PSAP consolidation
- Telecommunicator/Dispatcher training
- Wireless cost recovery guidelines²³

3.7.2 Training

Rating: 7.00

All PSAP telecommunicators/dispatchers are required to be trained in accordance with the Public Safety Telecommunication Training Act.²⁴ The public safety telecommunicator (PST) certification course is a minimum of 130 hours.²⁵ Training is completed both at the local agency as well as by attending the PST training academy that is hosted by the Department of Public Safety (DPS).

The required training topics are:

- Academy prerequisites – Incident Command System (ICS)
- Academy administration
- Basic PST skills
- Law
- Crisis intervention/management
- National Crime Information Center (NCIC) operations
- Fire and medical communications
- Critical incident management (CIM) and interdisciplinary ICS

The training academy uses APCO's PST 7th Edition for its lesson plans. The topics covered in this course are in alignment with the [Recommended Minimum Training Guidelines for the Telecommunicator](#) published by the National 911 Program. The training curriculum also covers NG911 at an awareness level. While

²² Telecommunications Device for the Deaf/Teletypewriter

²³ New Mexico Administrative Code, CHAPTER 6, 10.6.2 NMAC - ENHANCED 911 REQUIREMENTS.
<http://164.64.110.134/nmac/T10C006>

²⁴ Ibid.

²⁵ New Mexico Administrative Code, CHAPTER 29, 10.29.10 NMAC - PUBLIC SAFETY TELECOMMUNICATOR.
<http://164.64.110.134/parts/title10/10.029.0010.html>

there is no practical training yet on NG911 tools and technology (i.e., text, images, multimedia, etc.), the training academy is ready to institute once needed.

To maintain certification as a telecommunicator/dispatcher, PSTs must complete 20 hours bi-annually of continuing education units (CEUs).²⁶

While the legislative requirements are in alignment with minimum guidelines, input from the 911 community to curriculum development is limited. Neither 911 personnel nor NM911 have representation on the Law Enforcement Academy Board and/or the Law Enforcement Certification Board, despite being required to meet the standards and pay for the training. It is recommended that both 911 personnel and NM911 have representation on the boards.

3.7.3 Additional Data

Rating: 2.00

Currently, PSAPs are required to have the “capacity to record both sides of a conversation on each incoming 911 call and all radio communications while dispatching the 911 call.”²⁷ However, there are no specific policies on the use of NG911 additional data (i.e., digital media, location information, etc.). NENA defines additional data as “information which can be associated with a given emergency call, and is managed and sourced from outside the ESInet and its associated NG911 Core Services (NGCS).”²⁸

New Mexico requires that PSAPs have a continuous logging recorder to capture 911 call information. New Mexico defines this as “a device that records date, time, voice, and TDD/TTY communications, and other transactions involved in the processing of calls to and from the PSAP 24 x 7.”²⁹ While this requirement does not specifically address NG911 additional data logging, it does not preclude a PSAP from purchasing a continuous logging recorder that has the capability to log additional data.

While NM911 does maintain a database, the information collected is used in a static manner and is not designed to be used in a live environment to provide additional location information to the E911 system. For NM911:

*Database means information that is collected, formatted and disseminated and that is necessary for the functioning of the E911 system, including geographic information system (GIS) addressing and digital mapping information.*³⁰

²⁶ New Mexico Administrative Code, CHAPTER 29, 10.29.7 NMAC – IN-SERVICE TRAINING REQUIREMENTS.

<http://164.64.110.134/parts/title10/10.029.0007.html>

²⁷ New Mexico Administrative Code, CHAPTER 6, 10.6.2 NMAC - ENHANCED 911 REQUIREMENTS. 10.6.2.11 C.(14)(a). <http://164.64.110.134/nmac/T10C006>

²⁸ NENA Standard for NG9-1-1 Additional Data, NENA-STA-012.2-2017. National Emergency Number Association, December 21, 2017, section 2. https://www.nena.org/page/NG911_AdditionalData

²⁹ New Mexico Administrative Code, CHAPTER 6, 10.6.2 NMAC - ENHANCED 911 REQUIREMENTS. 10.6.2.11 C.(14)(a). <http://164.64.110.134/nmac/T10C006>

³⁰ Ibid.

Under New Mexico's records retention laws, "Radio Frequency/Telephone Audio Recording (911 Recorded Calls)" and the "Emergency Dispatch" schedule, records should be retained for three years. However, neither retention schedule references the different types of media that are related to 911 such as multimedia or text. Each locality is required to "adopt the schedule by resolution to give it legal authority."³¹

3.7.4 COOP Plans

Rating: 6.00

NM911 does not have a formal COOP policy that aligns with Federal Emergency Management Agency (FEMA)-defined requirements. Employees can telework, which has given the office flexibility, especially during the COVID-19 pandemic. Additionally, another bureau within DFA can assist NM911 in case of a crisis; however, this plan is not written.

NM911 does try to support local PSAPs with LEC outages, but visibility into these outages is very limited. Once NM911 is made aware of an issue, there are no SLAs in place to determine the level of support NM911 staff should offer.

As part of PSAP eligibility, NM911 requires that PSAPs "shall devise a contingency plan to provide continued emergency service when the PSAP is out of service." This includes the ability to transfer 911 calls. PSAPs also must report on the type of backup power installed, such as a UPS and backup generator.³²

3.7.5 Succession Planning

Rating: 2.00

Succession planning is a process for identifying and developing staff who can function in other roles; it ensures that NM911 can continue to run smoothly if a person leaves or is unable to function (e.g., quarantines due to COVID-19). NM911 staff have some succession planning in place. Roles are established and each team member could work in another role. In addition, as earlier discussed, another bureau within DFA can absorb NM911 functions.

3.7.6 Facility

Rating: 2.00

As NM911 develops their migration plan for NG911 they will need to identify facilities that are adequate to host server-type equipment in a secure facility that has adequate power, cooling capacity, rack space, and diverse entrance facilities from more than one telco provider. Use of facilities would have to be coordinated with DoIT. NM911 does have some state mapping servers located at various PSAPs today. As NM911

³¹ [New Mexico Municipal Records Retention Schedule. https://nmml.org/wp-content/uploads/2011/08/NM-Municipal-Records-Retention-Schedule-protected.pdf](https://nmml.org/wp-content/uploads/2011/08/NM-Municipal-Records-Retention-Schedule-protected.pdf)

³² New Mexico Administrative Code, CHAPTER 6, 10.6.2 NMAC - ENHANCED 911 REQUIREMENTS

moves forward, it still will need to identify the specific requirements for facility hosting of NG911 technology.

4 Recommendations

This section presents recommendations for resolving challenges that NM911 faces in its advancement toward NG911 readiness. In many cases, the transition to the NG911 end state is an iterative process and may take years to materialize. Technical and operational needs are intertwined and must be addressed in parallel to make the full transition to NENA i3-compliant NG911, which, in some cases, will require technology or compliance outside NM911's sphere of influence.

4.1 Governance

Much of the governance in place today is focused solely on E911 and work is needed in all areas to advance towards the NG911 end state. Focus should be given to creating committees and working groups to assist with development of the governance structure and updated policies and documentation required.

The recommendations below are provided to address gaps in the governance area.

Table 10: Governance Recommendations

Category	Recommendations
Documentation	• Update legislation – Define the role of NM911 in relation to NG911 implementation and coordination – Remove legacy terminology – Define NM911 as an “essential government service” and the employees as essential personnel during a disaster declaration • Update New Mexico Administrative Code E911 10.6.2 rules
Strategic Planning	• Update the strategic plan to include NG911 (in progress)
Communication	• Create a robust formalized communications plan
Coordination	• As NG911 planning continues, begin coordination with other public safety stakeholders and neighboring states
Technology	• Create technical, operational, and governance working groups or committees to assist in NG911 governance and policies

Category	Recommendations
Budgeting	- Perform a financial analysis to determine current 911 costs and projected costs of the NG911 transition - Determine if an increase to the 911 surcharge is necessary
Funding	Investigate funding options based on financial analysis
Staffing	Hire program manager to assist with policy creation, workgroup facilitation, and stakeholder communications
Procurement	Investigate procurement requirements and the potential for exceptions related to the ESInet and NGCS
Standards and Best Practices	Update the PSAP Manager's Guide with NG911 program policy statements based upon industry standards and best practices and remove any legacy policies that no longer apply

4.2 Next Generation Core Services

The common theme identified to address the technical or operational deficiencies related to NGCS is procurement. This includes the development of robust technical requirements that assist NM911 in holding a selected NG911 system service provider accountable to deliver contracted terms and conditions.

The recommendations below are provided to advance NM911 toward the NG911 end state.

Table 11: NGCS Recommendations

Category	Recommendations
Technology Procurement	Develop an RFP to procure an NG911 solution that meets the technical and operational needs of the State
Functional Elements	Include technical requirements in RFP that support transitional and end-state i3 requirements
Routing Solutions	Ensure all routing solutions procured are i3-compliant and interoperable with legacy, transitional, and i3 solutions provided by other disparate solutions
ALI DBMS/LIS	Ensure procurement of the NGCS solution includes capabilities to support transitional data management and LDBs for transitional services and i3 LIS
SLAs	Ensure procurement of NGCS identifies stringent SLAs to hold the selected NG911 service provider accountable for consistent delivery of the service

Category	Recommendations
Reporting/MIS	• Ensure procurement of the NGCS incorporates operational requirements for reporting, monitoring, and MIS, allowing visibility of system health and metric tracking at both the state and local levels
Interoperability	• Ensure technical requirements for the NGCS provider specify interoperability with legacy, transitional, and i3-compliant solutions • Ensure appropriate policies/legislation are in place to support operational needs for interoperability with all applicable entities
Call Transfer	• Ensure NG911 solution supports the ability to transfer voice and data including audio, video, text, and other data
ADR	• Ensure procurement vehicle incorporates the ability for the State to integrate third-party ADRs and third-party LISs

4.3 Emergency Services IP Network

As the foundational transport for all data (voice, video, images, short message service [SMS], etc.) in the NG911 ecosystem, a robust and NENA i3-compliant ESInet is the first technology that needs to be deployed to set NM911 on the path to establishing a unified NG911 infrastructure. While MCP strongly recommends a single, statewide ESInet to ensure parity and interoperability between all New Mexico PSAPs and partner agencies (both within and outside the state's borders), the i3 specification does support a network-of-networks design, meaning regional ESInets may be built separately and easily interconnected, provided they all comply with the NENA i3 specifications.

Regardless of the ESInet topology (monolithic or network-of-networks) that NM911 ultimately chooses to pursue, the first step is the definition of a comprehensive set of requirements that all such networks in the state must satisfy. These requirements can ensure that any ESInet(s) deployed within New Mexico will be interoperable with any other neighboring ESInets that meet the same standards-compliant requirements. To the greatest extent possible, a well-defined set of requirements is the best insurance that New Mexico's next generation infrastructure will be built to grow with, and adapt to, the ongoing evolution of 911 technology.

The recommendations below identify some key requirements for a standards-based and future-proof ESInet that should be included in the RFP for a statewide ESInet.

Table 12: ESInet Recommendations

Category	Recommendations
Carrier Ingress	Include a requirement to support both legacy telephony connections (via a legacy network gateway [LNG]) as well as multi-modal IP interfaces for ingress of next generation content, primarily via Session Initiation Protocol (SIP) (e.g., SMS, VoIP, Internet of Things [IoT], remote alarm and sensor messages, etc.)
Interconnectivity	- Include a requirement to support interoperability and interconnectivity with other i3 ESInets as well as with legacy selective routers (via legacy selective router gateways [LSRG]), to ensure continued interoperability and cooperation with agencies still served by LSRs - Include a requirement to support legacy PSAP gateways (LPGs) to allow non-i3-compliant PSAP CHE to connect to the ESInet, leveraging the capabilities of the NG911 infrastructure to the greatest extent possible
Survivability	Include requirements for the highest standards of survivability through robust redundancy, security, and resiliency Note: NENA and other public safety and telecommunications standards bodies provide a comprehensive set of network design best practices, meant to ensure such levels of reliability and survivability for any network that complies with these standards
Monitoring	- Include a requirement to offer a comprehensive set of tools that quickly (i.e., in near-real-time) present a clear operational picture of the activity and performance of the ESInet - Include a requirement to provide trend analysis, send alerts and notifications of identified anomalies in the performance or activity on the ESInet, and make recommendations to the viewer for actions to take to avert potential issues - Include a requirement to support a map-based dashboard view of ESInet activity
Change Management	Include a requirement to implement a structured process for managing any changes made to the ESInet infrastructure
Reporting and MIS	Include a requirement to provide a robust and transparent set of activity- and performance-reporting capabilities at both the State and local levels
Bandwidth	Include a requirement to support the flexible allocation of bandwidth across ESInet links, allowing quick and reasonably priced changes to connection capacities without costly changes to the physical network infrastructure
Netclock	Include a requirement to include local traceable time sources (typically GPS-based) at each ESInet facility, as opposed to using a single, central time source, which distributes timing across the wide-area network (WAN)

Category	Recommendations
QoS	• Include a requirement to support the marking with, and enforcement of, differentiated network traffic classifications and prioritization
Documentation	• Include requirements to provide: – A complete and accurate package of as-built documents at each significant project milestone and to commit to providing updates to this documentation as the project evolves – A complete set of user documentation for all applications, programs, portals, and tools to which State or PSAP end-users would have access – A documented set of procedures (including issue escalation) and contact information for reporting issues and accessing support resources 24 x 7

4.4 Call-Handling Equipment

CHE is a key component in the NG911 environment and NM911 has made significant progress towards NG911 end state by creating a statewide procurement vehicle for CHE. A common theme identified to ensure CHE is fully i3 capable is ensuring requirements and procurement remain current with evolving industry standards.

The recommendations below are to help guide the procurement of CHE during the State's transition to i3.

Table 13: CHE Recommendations

Category	Recommendations
I3-capable Call Handling	• Regularly review and update when necessary NM911's requirements for CHE to comply with the latest industry standards regarding NG911 (and beyond) techniques, technologies, and specifications
Text-to-911	• Develop a plan and a set of guidelines, recommendations, or requirements defining NM911's vision for a cohesive statewide deployment of text-to-911 • Assure interoperability is a key focus if no single statewide system is to be deployed
Logging and Recording	• As the State and PSAPs gain more experience with the provided logging and recording solutions, assure all stakeholders regularly review and revise requirements to meet the evolving needs of the State and PSAPs who depend on those recordings and logs • Update PSAP requirements that include the ability for a PSAP to record NG911 data

Category	Recommendations
Mapping	• Provide a mechanism for PSAPs to exchange ideas on additional mapping requirements, features, and needs that may be added to the State's existing mapping requirements
MIS	• Regularly, review and revise NM911's requirements for CHE to ensure MIS and CHE reporting capabilities continue to support the evolving needs of the State and local PSAPs.
ADR	• Begin to develop policies, procedures, guidelines, recommendations, requirements, and (possibly) legislation to manage the receipt, visibility, usage, storage, and security of additional data • Assure such policies, procedures, guidelines, recommendations, and requirements are general enough to cover a broad spectrum of data types, as it is impossible to predict what may become available in the future

4.5 Security

The MAPS security assessment only touches the surface in readying an organization properly for cyberthreats. Special care should be considered in conducting a full-scale network security assessment in addition to localized assessments and policies to support the proactive protection of all state assets. The common theme in the PSAP arena is not having sufficient awareness or controls in place to identify threats, whereas the general expectations at the ESInet and NGCS provider level are that the provider be tasked with ensuring compliance with proactive cybersecurity posture and monitoring.

The recommendations below are designed to help NM911 achieve a greater level of cybersecurity preparedness and become more cybersecurity aware as it moves towards NG911 readiness.

Table 14: Security Recommendations

Category	Recommendations
Cybersecurity Plan/Policy	• Develop a statewide NG911 cyber plan including interface specifications and policy for usage
Proactive Monitoring	• Procure an NG911 solution that incorporates end-to-end monitoring of the ESInet and NGCS • Require the solution to provide an executive dashboard and near-real-time status of system health • Establish SLAs for service providers
Risk Assessment	• Ensure that provisions for regular third-party audits are contractually supported in the NG911 solution • Require local security plans and audits prior to establishing ESInet connectivity

Category	Recommendations
Network Security	- Ensure service providers comply with relevant standards and best practices, to include NM911-mandated policy regarding data security and network partitioning into different operational domains - Such policies, procedures, and rules should also address the risks associated with non-malicious and malicious threats from within, especially surrounding the use and access to mission-critical equipment assets
Physical Security	
Staff Security	

4.6 Geographic Information System

The migration to NG911 in New Mexico necessitates a dramatic, collaborative improvement to geospatial capabilities for Tribal, local, regional, and statewide GIS programs. NM911 plays a vital role not only in the improvement of State GIS capabilities but in cultivating robust GIS programs for all stakeholders.

The recommendations below are designed to improve NM911's geospatial capabilities and position it to fully support local, Tribal, and regional GIS programs.

Table 15: GIS Recommendations

Category	Recommendations
Data Readiness	- Sponsor access to ALI data for all jurisdictions - Provide validation tools to jurisdictions to promote data development to the 98% match rate - Provide technical guidance to jurisdictions below the 98% threshold
Production Environment	- Fill vacant GIS position within NM911 - Offer State contract for GIS services for jurisdictions with vacant GIS positions - Create and fund a dedicated GIS annual budget - Promote and provide templates for SLAs and IGAs with data stewards
Regional Coordination	- Increase outreach and education to Tribal communities to raise awareness of and participation in GIS data development and sharing - Facilitate the coordination of data development between New Mexico jurisdictions and neighboring jurisdictions
Training	Create a promotional video to explain NG911, the importance of GIS to the NG911 migration, the need for high-quality GIS data from local jurisdictions, and to raise awareness of elected officials and jurisdiction leaders of the need for NG911

Category	Recommendations
CAD	- Expand the outreach and education program to include the benefits of GIS data sharing to local CAD systems and CAD interoperability - Offer statewide contract for jurisdictions without GIS-capable CAD - Further promote the wide use of GIS data to increase the return on investment
General IT Support	- Consolidate Esri licensing into a single State ELA - Add GIS needs to the State's COOP plan
Addressing	- Conduct education and outreach on the importance of location information for the successful delivery of emergency services - Promote State addressing standards and workflows for local adoption
Documentation	- Complete the 2021 GIS strategic plan update - Add performance metrics to the GIS strategic plan - Review existing SOPs and workflows and update as necessary - Update DoIT COOP plan with GIS needs - Update EDAC COOP plan with NM911 GIS support needs - Formalize and document the governance structure for the multiple 911 and GIS advisory groups

4.7 Operations

NG911 will demand more coordination and collaboration than ever before, and NM911 will be looked to for guidance. NM911 will be expected to ensure operational effectiveness regardless of the system solution chosen; to operate effectively, stakeholder engagement will be needed to establish functional operational policies that all member agencies can adopt and follow.

The MAPS assessment revealed that requirements, policies and procedures, and best practices need to be updated, captured, or created on a diverse range of topics (security, training, COOP, interoperability, etc.).

The recommendations below are provided to address gaps in the operations area.

Table 16: Operations Recommendations

Category	Recommendations
Policies and Procedures	- Update the PSAP requirements to include NG911 functionality - Create subcommittees (i.e., funding, technical, and operations) to assist in the development of policies

Category	Recommendations
Training	• Update legislation to include representatives from both the 911 community and NM911 to serve on the Law Enforcement Academy Board and/or the Law Enforcement Certification Board • Develop a training working group to partner with the training academy to ensure that the curriculum meets the needs of the PSAPs • Update the curriculum, as NG911 technology is deployed • Include a section on occupational wellness in the PSAP curriculum focused on the stress of NG911
Additional Data	• Create a policy for the use of additional data after consulting Federal and State statutes for guidance • Update state record retention legislation to address additional data that is collected • Review guidance and best practices for NG911 applicability
COOP Plans	• Engage staff and stakeholders to develop a comprehensive COOP plan template for NM911 and PSAPs that aligns with FEMA recommendations, including an annual review process • Expand PSAP requirements to include a COOP plan
Succession Planning	• Develop a succession plan and update regularly • Conduct training for staff members to function in a role that is one above their position for emergency backup, succession training, and to increase organizational depth • Cross-train staff (to the degree feasible) to augment current staff shortages until additional staff is acquired
Facility	• Identify the specific requirements for facility hosting of NG911 technology

5 Conclusion

NM911 has already taken some measures to lay the groundwork for the transition to NG911. NM911 recognizes and had prioritized the need for accurate GIS data. Additionally, NM911 has developed procurement documents for PSAPs to leverage that specifies equipment should be i3-capable.

Use of the MAPS tool has provided insight into where gaps lay across the seven evaluated categories—governance, NGCS, ESInet, CHE, security, GIS, and operations. While NM911 is rated overall as foundational, several areas of the evaluation were rated as transitional, indicating that some aspects of the State’s transition are further along than others.

This assessment will help assist NM911 to develop an NG911 strategic plan and prioritize the elements to tackle first—to help move from a foundational state to the end state of NG911 readiness. During the transition, NM911 will have many decisions to make on how it will accomplish its objectives. A well-thought-out NG911 strategic plan—based on stakeholder input and the areas for improvement identified through this NG911 Assessment—is a key component to a successful transition.