



NG9-1-1 Readiness Assessment

Report

PREPARED SEPTEMBER 2019 FOR
ASSOCIATION OF CENTRAL OKLAHOMA GOVERNMENTS

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Executive Summary

The Association of Central Oklahoma Governments (ACOG) operates as a problem-solving and planning organization to support coordination and collaboration regarding local government activities. The four separate divisions within ACOG are Administrative Services, Transportation Planning Services, Water Resources, and 9-1-1 & Public Safety.

ACOG formed the 9-1-1 Association of Central Oklahoma Governments (9-1-1 ACOG) in 1988 to implement and oversee Enhanced 9-1-1 (E9-1-1) service across the region. The 9-1-1 & Public Safety Division provides staffing and program resources to support 9-1-1 ACOG. There are currently nine ACOG employees working in the four functional areas of 9-1-1 ACOG, which is managed by the 9-1-1 Public Safety division director, who reports to ACOG's executive director and 9-1-1 ACOG's board of directors. The 9-1-1 & Public Safety Division of ACOG is organized according to the following functional areas: Administration and Planning, 9-1-1 Technology and Systems Support, 9-1-1 Training Institute, and 9-1-1 Geographic Information System (GIS) and Data Integrity Services.

In the fourth quarter of fiscal year (FY) 2019, Mission Critical Partners (MCP) worked with 9-1-1 ACOG to conduct a Next Generation 9-1-1 (NG9-1-1) readiness assessment.

At the heart of the assessment were stakeholder interviews conducted using MCP's proprietary Model for Advancing Public SafetySM (MAPS) 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 NG9-1-1. Using criteria based on industry benchmarks, national standards and best practices, 9-1-1 ACOG's answers were translated into easy-to-understand scores, which were used to build a roadmap with priorities and action ideas.

To help move toward NG9-1-1 readiness, 9-1-1 ACOG established the following vision:

To be at the forefront of NG9-1-1 solutions in the State of Oklahoma by providing the highest levels of service to its members and the Central Oklahoma community. 9-1-1 ACOG desires to bring the same level of service to its member agencies with the transition to NG9-1-1.

9-1-1 ACOG seeks to accomplish this vision through the following objectives:

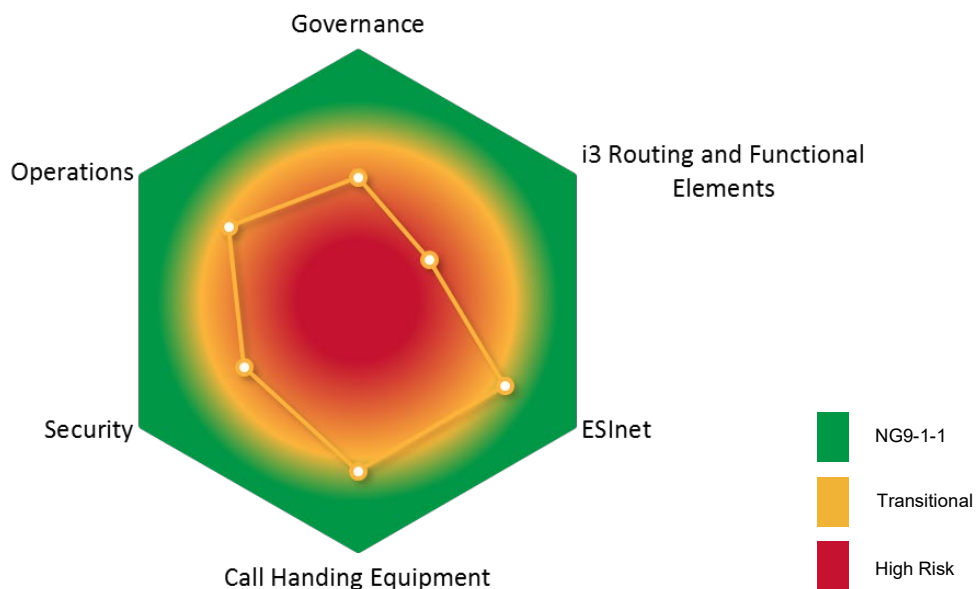
- Transition from a regional agency providing funding and operational support of legacy 9-1-1 solutions to a region operating and supporting NG9-1-1 call-routing and call-handling solutions.
- Evaluate and/or optimize systems, data, policy, procedures, and organizational structure to adequately support future needs regarding NG9-1-1 system operation.

- Plan, procure and implement solutions that provide the greatest value to the agencies and citizens of the region.
- Carefully and strategically plan and execute necessary organizational and technical objectives with minimal disruption to stakeholders.

If one imagines NG9-1-1 readiness as a continuum from one to ten, where one represents “At risk/Not ready for transition,” five represents “transitional” and ten represents “NG9-1-1 ready,” the MAPS assessment assigned 9-1-1 ACOG an overall score of 5.49. This indicates that 9-1-1 ACOG is in a transitional stage where some aspects of the agency’s transition to NG9-1-1 are further along than others. 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 NG9-1-1.

MAPSSM NG9-1-1 Readiness Assessment

Association of Central Oklahoma Governments



Lever	Score	Questions											
	Overall Score	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Governance	5	2	4	4	6	6	8	4	4	10	2		
NENA i3 Routing and FE	3.33	4	2	2	2	4	4	2	6	4			
ESInet ¹	6.8	6	2	10	10	4	10	10	4	2	10		
CHE ²	6.5	10	6	6	2	10	10	8	2	10	6	4	4
Security	5.33	2	2	2	10	6	10						
Operations	6	2	10	4	6	2	4	10	10				

Prudence in taking measured strategic approaches and establishing or reinforcing an already strong organizational structure are hallmarks of an organization poised to be successful in the transition to NG9-1-1. While this assessment is focused on addressing the current state of the 9-1-1 ACOG technical and operational environments, as outlined below, it should be noted that 9-1-1 ACOG has proactively

¹ Internet Protocol (IP) network (ESInet)

² Call Handling Equipment (CHE)

initiated numerous strategic planning actions in parallel with this assessment to demonstrate the high level of commitment at the executive level for transitioning to NG9-1-1 across the region.

A thorough data review and numerous staff interviews conducted as a function of this assessment revealed the following findings regarding technical, operational, and structural aspects of 9-1-1 ACOG and the 9-1-1 & Public Safety Division

- NG9-1-1 is at a greenfield stage in Oklahoma and leading the migration to it will require 9-1-1 ACOG to establish new policies
- Governance structure and supporting documentation must be strengthened to define commitments, authority and operational responsibilities
- Additional staff members likely are needed to continue the level of service that member agencies expect after NG9-1-1 is implemented
- Focus must shift from reactionary to a more strategic approach
- 9-1-1 ACOG needs to expand communication within and beyond the stakeholder community
- 9-1-1 ACOG needs to build on successes regarding the local emergency services ESInet used to support the hosted call-handling solution
- A need exists for a heightened cybersecurity posture with the transition to IP-based routing networks
- 9-1-1 ACOG must define technical and operational requirements for a competitive procurement (i.e., a request for proposals) that advances 9-1-1 ACOG toward regional end-state NG9-1-1

1 Introduction

1.1 Background

1.1.1 Association of Central Oklahoma Governments

The Association of Central Oklahoma Governments (ACOG) is a regional council and voluntary association of local governments for Central Oklahoma. Established in June 1966, ACOG is one of 11 Councils of Governments in the State of Oklahoma (hereafter, the State), with each regional council having its own organizational structure, bylaws and/or articles of agreement. The five separate divisions of ACOG are Administrative Services, Transportation Planning Services, Water Resources, Community & Economic Development, and 9-1-1 & Public Safety).

1.1.2 9-1-1 & Public Safety Division

Nine ACOG employees work in the four functional areas. They are managed by the 9-1-1 & Public Safety director, who reports to ACOG's executive director and 9-1-1 ACOG's board of directors.

1.1.3 9-1-1 ACOG

ACOG formed the 9-1-1 Association of Central Oklahoma Governments (9-1-1 ACOG) in April 1988 to implement and oversee Enhanced 9-1-1 (E9-1-1) service across the region. ACOG's divisions provide day-to-day management of 9-1-1 ACOG programs and services to the communities it serves. ACOG provides staffing and program resources to support 9-1-1 ACOG, which manages one of the largest 9-1-1 systems in the state, supporting 23 public safety answering points (PSAPs) that serve citizens living and working in 50 towns, cities or counties in Central Oklahoma.

9-1-1 ACOG was created to more efficiently provide emergency communication technologies and facilities for Central Oklahoma. It offers funding and operational support for E9-1-1 systems and provides legislative advocacy for better 9-1-1 solutions. 9-1-1 ACOG is organized into four functional areas: Administration and Planning, 9-1-1 Technology and Systems Support, 9-1-1 Training Institute, and 9-1-1 Geographic Information System (GIS) and Data Integrity Services.

1.2 History

Since fiscal year (FY) 2001, 9-1-1 ACOG has set aside funds for "future technologies." The Budget Committee, consistent with board policies, recommends maintaining the restricted reserve fund balance, as established in FY 2001, for future acquisition of E9-1-1 system-improvement and data-management systems. The goal shall be 25 percent of the estimated cost of such systems. The Budget Committee further recommends maintaining the operating reserve, also established in FY 2001, with a goal of 33 percent of the 9-1-1 department budget (i.e., four months of operating costs). While Next Generation 9-1-1 (NG9-1-1) had not been conceptualized at the time these precedents were established, 9-1-1 ACOG's board recognized the need to plan for the future as it related to technology; over time this need became more clearly defined and focused on the transition to an NG9-1-1 solution.

This transition is necessary as technology progresses, legacy equipment reaches end of life and the public's expectations about speed and ease of communication during an emergency increase. 9-1-1 ACOG recognized that the transition would require a lot of resources and planning—even before any system procurement or implementation—and in April 2019 selected Mission Critical Partners (MCP) to assess its ability to support an NG9-1-1 environment and to methodically help guide them toward achieving the agency's mission and vision.

2 Approach and Methods

To holistically understand 9-1-1 ACOG's readiness for NG9-1-1, MCP first collected and reviewed data provided by 9-1-1 ACOG and ACOG's 9-1-1 & Public Safety Division. Recognizing that the transition from legacy 9-1-1 is significant and goes beyond the replacement of technology, MCP focused on understanding the current operational processes, staff policies, governance (policies, procedures and bylaws), funding models, and technical networking and architecture.

Further, MCP conducted interviews with key staff members using its proprietary Model for Advancing Public SafetySM (MAPS) tool to assess 9-1-1 ACOG's readiness for an NG9-1-1 environment. The MAPS assessment is designed to incorporate a range of recognized industry standards and best practices developed by organizations and workgroups such as: Task Force on Optimal PSAP Architecture (TFOPA), National Institute of Standards and Technology (NIST), National Emergency Number Association (NENA), and Association of Public-Safety Communications Officials (APCO). The tool includes customized questions that are grouped into topic-specific categories based on best practices and industry standards.

The 9-1-1 ACOG staff members were asked 60 conversational questions regarding six NG9-1-1 readiness categories: governance, operations, NENA i3 routing and functional elements, emergency services Internet Protocol (IP) networks (ESInets), call-handling equipment (CHE), and security. The staff's responses to these questions were scored and the resulting chart reveals a high-level view of the areas requiring prioritized focus. The comprehensive MAPS assessment becomes a customized blueprint for developing the customer's strategic plan.

3 Review and Recommendations

3.1 Current State and Desired Future State

3.1.1 Current State

Today, 9-1-1 ACOG very successfully supports its PSAP members and provides a high-quality level of 9-1-1 service to the citizens, workers, and visitors that frequent the region. The agency is adequately funded for legacy operations and has set aside a significant fund balance to support transitioning to NG9-1-1.

9-1-1 ACOG provides a high-reliability hosted/shared West/Intrado Viper CHE solution for all member agencies, which includes redundancy nodes and network path diversity. In addition to the core functionality, 9-1-1 ACOG staff members provide 24 hours a day, 7 days a week, 365 days a year (24 x 7 x 365) technical support for the CHE's tier 1 and tier 2 functions and assist in the integration of third-party applications—such as RapidSOS Lite—to supplement and enhance local PSAP situational awareness capabilities and to speed emergency response.

While not specifically evaluated for this report, GIS is a core support service offered by 9-1-1 ACOG to its member agencies.³ Support offered by GIS staff members ranges from full service to consultation and analysis, depending on the size and capability of the member agencies. More specific details of the GIS readiness assessment can be found in the separate report provided specifically to address GIS readiness needs for NG9-1-1

The 9-1-1 Institute of Oklahoma created and staffed by 9-1-1 ACOG since 1994 provides valuable training to not only member PSAPs but across the region to increase the level of telecommunicator professionalism. This program has been highly successful and is among the top-rated services identified by 9-1-1 ACOG member agencies.

While leadership is aware that several key support staffing shortages exist, 9-1-1 ACOG generally has been able to sustain its operations at a satisfactory level. This, however, is not optimal long-term as it requires the team to remain focused on near-term or immediate needs sometimes to the detriment of long-term planning and execution.

9-1-1 ACOG staff actively participate in numerous local, state, and regional workgroups to find operational and technical solutions to issues challenging PSAPs within 9-1-1 ACOG's area of operation, but also within the larger 9-1-1 community of Oklahoma. In addition to providing resources for participation in committees and workgroups, the 9-1-1 ACOG staff members work directly with neighboring agencies to coordinate activities such as the implementation of text-to-9-1-1 service, ensuring a coordinated message to both the public and telecommunicators.

3.1.2 Desired Future State

As a result of the MAPS assessment, and clarified understanding of current operations and capabilities, 9-1-1 ACOG is forward-focused and established the following vision:

To be at the forefront of NG9-1-1 solutions in the State of Oklahoma by providing the highest levels of service to its members and the Central Oklahoma community. 9-1-1 ACOG desires to bring the same level of service to its member agencies with the transition to NG9-1-1.

³ The GIS assessment team facilitated a separate meeting with the ACOG GIS team to produce a MAPS assessment specifically for the area of GIS and included eight categories for GIS readiness.

9-1-1 ACOG seeks to accomplish this through the following objectives:

- Transition from a regional agency providing funding and operational support of legacy 9-1-1 solutions to a region operating and supporting NG9-1-1 call-routing and call-handling solutions.
- Evaluate and/or optimize systems, data, policy, procedures, and organizational structure to adequately support future needs regarding NG9-1-1 system operation.
- Plan, procure and implement solutions that provide the greatest value to the agencies and citizens of the region.
- Carefully and strategically plan and execute necessary organizational and technical objectives with minimal disruption to stakeholders.

3.2 Considerations and Implications

3.2.1 Funding

- 9-1-1 ACOG has \$19 million reserved and earmarked for NG9-1-1 implementation. 9-1-1 ACOG is actively participating in a funding study to identify rough order of magnitude (ROM) cost considerations for the NG9-1-1 transition to determine if available funding is sufficient for costs related to procurement, implementation, transition, and operation.
- The State legislature passed a \$0.25 monthly increase per subscriber line on wireless, prepaid wireless and voice over Internet Protocol (VoIP) 9-1-1 fund balance fees. There is a holdback of \$0.06, leaving \$0.19 for the PSAPs. This increase became effective on Jan 1, 2017. 9-1-1 ACOG receives the additional \$0.19 but returns \$0.18 to member PSAPs. The 9-1-1 ACOG board of directors approved this return in July 2018, which was made retroactive to January 2018. If ACOG member agencies are to pay their share to fund the transition to, and operation of, an NG9-1-1 environment, the amount of returned fees may need to be renegotiated.
- Member agencies pay 9-1-1 ACOG some portion of the original \$0.50 per wireless subscriber line fee and wireline tariff amount for the shared call-handling and call-routing equipment provided by 9-1-1 ACOG, as well as other services. It would be prudent to discover whether there are funds from these sources that could be used for the NG9-1-1 transition costs.
- Returning to the State legislature for further fee increases may present political barriers, as the legislature specifically passed the increase to fund NG9-1-1 initiatives and the \$0.18 that PSAPs keep is not currently used for that purpose.
- 9-1-1 ACOG may be able to qualify for a state/federal grant offered by the Oklahoma 9-1-1 Coordinator's Office, depending on the priorities established by that office. The current grant priorities are for procuring CHE for the five dark counties in the state and for obtaining GIS public-safety-level mapping data that meets Oklahoma Geographic Information Council standards for the entire state.
- Sales taxes specifically directed to staffing public safety personnel have been passed by Oklahoma City, the City of Norman, and the City of Tulsa. This may be an option for the municipal and county PSAPs to offset the return of 9-1-1 fund balance fees.

- There may be some concern as to what the PSAPs are using the return fees for and if they are strictly adhering to the allowable categories.

3.2.2 Operations

- 9-1-1 ACOG provides equipment and technical support as well as basic training to PSAPs. 9-1-1 ACOG's stance is that the PSAP members cannot be told how to operate, but an NG9-1-1 environment likely will require changes to operational policies and procedures due to the interoperability between PSAPs and the increased complexity of emergency request modes.
- Training will need to be enhanced to include NG9-1-1-specific training.
- Staffing levels at 9-1-1 ACOG may be insufficient to achieve the training, technology and GIS support that will be required for NG9-1-1 implementation, especially if 9-1-1 ACOG chooses a model that includes owner-operated equipment.

3.2.3 Political, Statutory, Regulatory Implications

- 9-1-1 ACOG has strong ties to the statewide 9-1-1 board, known as the Oklahoma 9-1-1 Management Authority (OK9-1-1MA)⁴ and to its predecessor, the Oklahoma 9-1-1 Advisory Board. The 9-1-1 ACOG division director is a voting member of the 9-1-1 Management Authority.
- 9-1-1 ACOG is perceived as a leader in 9-1-1/public safety communications within the state and risks OK9-1-1MA perceiving that it does not need the assistance that the less-well-funded PSAPs will need.
- 9-1-1 ACOG has State support but not in terms of identified funding unless the funding is uniformly applied to the entire state or unless 9-1-1 ACOG is selected as an early adopter for lessons to be learned.
- The additional data coming into an NG9-1-1 center may require a new approach by 9-1-1 ACOG to establish and enforce local policy and ensure compliance with legal requirements at the PSAP level.

3.2.4 Stakeholder Resistance, Support or Influence

- NG9-1-1 and the associated transition can result in fear of the unknown for stakeholder member agencies that may be unsure of the changes that NG9-1-1 will bring, including concerns about costs, forced adoption, telecommunicator overload, etc.
- Member agencies also are looking forward to the one thing they understand—better location services and enhanced routing capabilities for emergency callers and responders. Managing expectations regarding NG9-1-1 will be an important task for 9-1-1 ACOG.

⁴ In 2016, HB 3126, the Oklahoma 9-1-1 Management Authority Act was passed, creating the new Oklahoma 9-1-1 Management Authority.

- Larger agency members such as the cities of Edmond and Norman may have greater ability to influence the adoption of NG9-1-1 due to their size and public safety resources. These agency leaders have roles in both the state, regional and local arenas.

3.2.5 Technology

- Keeping all levels of technology working during the transition will be important, otherwise, member PSAPs could opt out or delay implementing NG9-1-1. This means some legacy equipment will remain operational for a period of time during the transition to enable backward compatibility.
- Future considerations may result in consolidation for those that cannot afford the operational and/or technical costs to support and maintain an NG9-1-1 system.
- Adjacent agencies may lag in similar implementations resulting in the need to extend PSAP connectivity to legacy selective-routing solutions. Further resistance to the NG9-1-1 implementation could occur due to bureaucracy-related slowdowns that are outside of 9-1-1 ACOG's control.
- Another consideration is synchronizing 9-1-1 ACOG's ESInet procurement and implementation with the State's planning for a statewide ESInet system. Timing, procurement, compatibility and resources sharing should be considered to determine whether this is a good approach.

4 Findings

4.1 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 9-1-1 ACOG staff, the 9-1-1 ACOG board, the Regional Planning and Advisory Committee (RPAC), PSAPs, 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 9-1-1 to NG9-1-1 because the transition impacts every aspect of 9-1-1—from network technology changes outside the four 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 member organization must be aware of and involved in the transition process. Communication between the 9-1-1 ACOG staff, the board and the member agencies is key to this transition.

The Federal Communications Commission (FCC) [TFOPA](#) was created to provide a framework for readiness and maturation of the NG9-1-1 transition model from foundational to end-state NENA i3 (i.e., NG9-1-1). 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 upon NG9-1-1 readiness.

The MAPS tool examines ten key areas associated with or requiring governance to help assess NG9-1-1 readiness:

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

Based on the MAPS assessment, a review of the documentation provided, and interviews with 9-1-1 ACOG staff and board members, governance receives a comprehensive score of 5. This score places governance in the transitional state on the NG9-1-1 readiness continuum.

MAPSSM NG9-1-1 Readiness Assessment

Association of Central Oklahoma Governments



Lever	Score	Questions									
	Overall Score	Documentation	Strategic Planning	Communication	Coordination	Technology	Budget	Funding	Staffing	Procurement	Standards and Best Practices
Governance	5	2	4	4	6	6	8	4	4	10	2

4.1.1 Documentation Rating: 2

9-1-1 ACOG has a formal agreement that governs how it operates, but no documentation that specifies how 9-1-1 ACOG, the 9-1-1 ACOG board and the RPAC operate and interoperate. Although bylaws likely were spelled out as part of the original agreement, none exist today that specifically formalize 9-1-1 ACOG's existence and operation. The organization should formalize these bylaws, especially in light of the NG9-1-1 initiative. This is a goal of the ACOG executive director in fiscal years 2019-2020.

Neither the ACOG Executive Committee nor the 9-1-1 ACOG board or RPAC have a structure that lends itself to partnering with neighboring PSAPs that are not part of the 9-1-1 ACOG for the purpose of coordinating resources, determining decision-makers or establishing a benchmark for common emergency services. Currently, 9-1-1 ACOG's committees are focused internally. As 9-1-1 ACOG becomes the first region in the state to transition to NG9-1-1, 9-1-1 ACOG needs to focus on how it intends to engage these neighboring agencies that are not members and determine operational procedures that integrate and maintain situational awareness until the other agencies also have transitioned to NG9-1-1. Building these relationships is integral to interoperability in the NG9-1-1 environment and beyond.

4.1.2 Strategic Planning Rating: 4

9-1-1 ACOG has identified goals and objectives for an NG9-1-1 transition and has tracked it as a long-term budget priority; however, it has not formulated those goals and objectives into a formal strategic plan that outlines an actionable path to NG9-1-1. A formalized strategic plan provides a mechanism to engage and inform stakeholders and identifies the strategy to reach end-state NG9-1-1. The strategic plan will outline the work that must be done and detail the metrics to determine whether the tasks are complete and acceptable.

9-1-1 ACOG has initiated this process by defining a vision/mission and prioritized goals and objectives. In 2019 9-1-1 ACOG intends to finalize the strategic plan.

4.1.3 Communications Rating: 4

The transition to NG9-1-1 is a sea change that will have a broad impact on stakeholders. Inaccurate information easily can spread, so it is important to have a comprehensive communications plan. A communications plan will help 9-1-1 ACOG communicate the vision, mission and goals, keep track of key stakeholder messages, and identify the timing for communicating those key messages and the best methods to use. It is important to share project benchmarks and milestones, but perhaps most important is openly communicating challenges and mitigation plans. Transparency, inclusiveness, timeliness and thorough communications are essential to building trust in the organization and its ability to meet the needs of its constituent agencies. 9-1-1 ACOG understands this requirement and strives to encourage open dialogue and to minimize a disconnect between the needs of the stakeholder constituent agencies and 9-1-1 ACOG's mission.

9-1-1 ACOG communicates with member stakeholders through board meetings and quarterly RPAC meetings. Other tools, such as blog posts and newsletters, have been used in the past, but these methods are now largely underutilized. Earlier public education efforts have consisted of campaigns and materials that primarily are directed toward youth audiences for teaching children how to call 9-1-1.

A new public information director has been hired to serve all of ACOG's communication needs and to ensure consistent messaging. This action coupled with increased efforts by the RPAC should help bring a renewed focus on NG9-1-1 and enhance the communications strategy.

4.1.4 Coordination Rating: 6

To ensure that interoperability remains unbroken, it is important to take a holistic approach in planning and coordinating all state activities related to emergency communications technology capabilities. 9-1-1 ACOG actively participates in decisions made at a state level regarding interoperability efforts. As one of the largest agencies in the state with regional responsibility, it is important that 9-1-1 ACOG has input into the activities of the state to ensure that decisions they make locally are in alignment with the State's NG9-1-1 plan.

9-1-1 ACOG staff actively participate in operations, technical, training and GIS-focused committees at the state level, in addition to the coordinated activities in which the 9-1-1 ACOG director engages as a member of OK9-1-1MA.

In addition to the staff's state-level coordination, the RPAC engages in requirements gathering and planning activities that often require coordination with neighboring agencies. The staff reports that they actively reached out to neighboring states and agencies regarding NG9-1-1 operations and/or planning to identify best practices and lessons learned.

4.1.5 Technology Rating: 6

9-1-1 ACOG has a technical committee that recently became the 9-1-1 RPAC. It is comprised of the 9-1-1 ACOG staff, ACOG PSAPs and Central Oklahoma community leader representatives.

9-1-1 ACOG intends to leverage the RPAC to support review and definition of NG9-1-1 call-routing and call-handling technical requirements. This will ensure that stakeholders are engaged in the process and have ownership in the project's outcome. RPAC will support the development of requirements to be contained in a request for proposals (RFP), as well as reviews of the technical NG9-1-1 solution. This will ensure that the stakeholders implement a solution that meets their needs, guarantees buy-in, and ensures greater opportunity for successful outcomes.

9-1-1 ACOG plans to include technology planning in NG9-1-1 governance in the future. The RPAC can be a great resource to teach its members how to advocate for 9-1-1 objectives. These members are willing to talk to their mayors and city managers regarding the importance of 9-1-1 systems for the future because they are fully informed and educated about its benefits. NG9-1-1 advocacy is viewed as a component of the communications plan. Information and clarity of messaging builds buy-in and confidence in 9-1-1 ACOG and the work that is conducted.

4.1.6 Budget Rating: 8

9-1-1 ACOG has taken a proactive position in planning its budget for NG9-1-1. 9-1-1 ACOG has set aside approximately \$19 million to support the transition. While 9-1-1 ACOG is confident that the current operating budget more than adequately supports legacy 9-1-1 and the support of consulting augmentation, it remains unclear regarding the level of funding that will be needed to support the ongoing operation of an NG9-1-1 solution.

It is not clear how much funding will be needed in total to transition local PSAPs to NG9-1-1. While some localities have started to plan, many are not clear on what is needed for the transition and the impact of NG9-1-1 implementation.

9-1-1 ACOG is conducting a funding study on the potential costs associated with long-term NG9-1-1 needs. This formalized process will help the member agencies understand the transition costs and the need to set aside appropriate levels of funding.

4.1.7 Funding Rating: 4

State law establishes 9-1-1 funding through fees assessed on wireline, VoIP, and wireless devices. The passage of [HB 3126](#) in 2016 increased monthly 9-1-1 fees on wireless and VoIP phone bills to \$0.75 per month per device. The fees are remitted by wireless/VoIP carriers to the Oklahoma Tax Commission and then distributed to the primary PSAP jurisdiction or its designee. Wireline fees are a percentage of the base bill and the rate of collection is established by vote of individual county and municipal constituents.

9-1-1 ACOG depends on its member agencies to release their claim to PSAP 9-1-1 fees in exchange for the value-add support it provides. Any fee adjustments necessary to support additional operations will require amendments to state law. 9-1-1 ACOG remits \$0.18 back to PSAPs for operational expenses from its collection of wireline/wireless/VoIP revenues, while the remaining funds are used for 9-1-1 ACOG operational expense/capital expense needed to carry out the 9-1-1 ACOG program of services. In addition to the remittance, a small revenue stream is received as a result of courses offered through ACOG's 9-1-1 Training Institute. 9-1-1 ACOG is in the process of investing funds to increase revenues by having its financial institution sweep fund balance overages at the end of each month into an active investment program.

4.1.8 Staffing Rating: 4

9-1-1 ACOG is reviewing its current staffing model to determine its ability to support a regional transition to NG9-1-1. The current structure appears inadequate for maintaining current operations, communications and training, as well as deploying technology improvements, let alone support NG9-1-1 transition activities or system improvement implementation.

Specialized technical skill sets to support 9-1-1 CHE are necessary and can take seven to eight months to build up the skill sets required for staff members to work independently. Current technical staff are required to have their pagers active at all times, even on weekends or while using paid leave, and cannot totally disconnect. There is no rotation of on-call support staff and the demands of the service position are leading to frustration and fatigue. Mitigating burnout and loss of key personnel to better-paying positions is a priority concern for 9-1-1 ACOG executive staff.

Additional GIS personnel with an understanding of 9-1-1 also are required to support current commitments. In addition, while there is a defined process for contract management and invoice approvals, there may be a need for technology contract compliance oversight to ensure effective management of the 9-1-1 program overall.

Depending on the implementation model (own/operate model versus service model), 9-1-1 ACOG potentially may be limited in its ability to fully support the needs of NG9-1-1 in the way it supports legacy 9-1-1 today.

4.1.9 Procurement Rating: 10

Procurement receives the highest rating possible because, as of January 2019, 9-1-1 ACOG has a revised procurement policy outlining requirements for the purchase of goods and services. 9-1-1 ACOG has authority, derived from various statutes, rules or regulations, to engage in the procurement process.

4.1.10 Standards and Best Practices Rating: 2

Many would say that implementing NG9-1-1 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 continuity of operations planning (COOP) and incident management. Ensuring an effective and efficient operation long has been the goal of 9-1-1 ACOG and planning for operational effectiveness in the NG9-1-1 environment requires 9-1-1 ACOG to review current operations and plan for the changes that will come.

4.2 Operations

Many would say that implementing NG9-1-1 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 continuity of operations planning (COOP) and incident management. Ensuring an effective and efficient operation long has been the goal of 9-1-1 ACOG and planning for operational effectiveness in the NG9-1-1 environment requires 9-1-1 ACOG to review current operations and plan for the changes that will come.

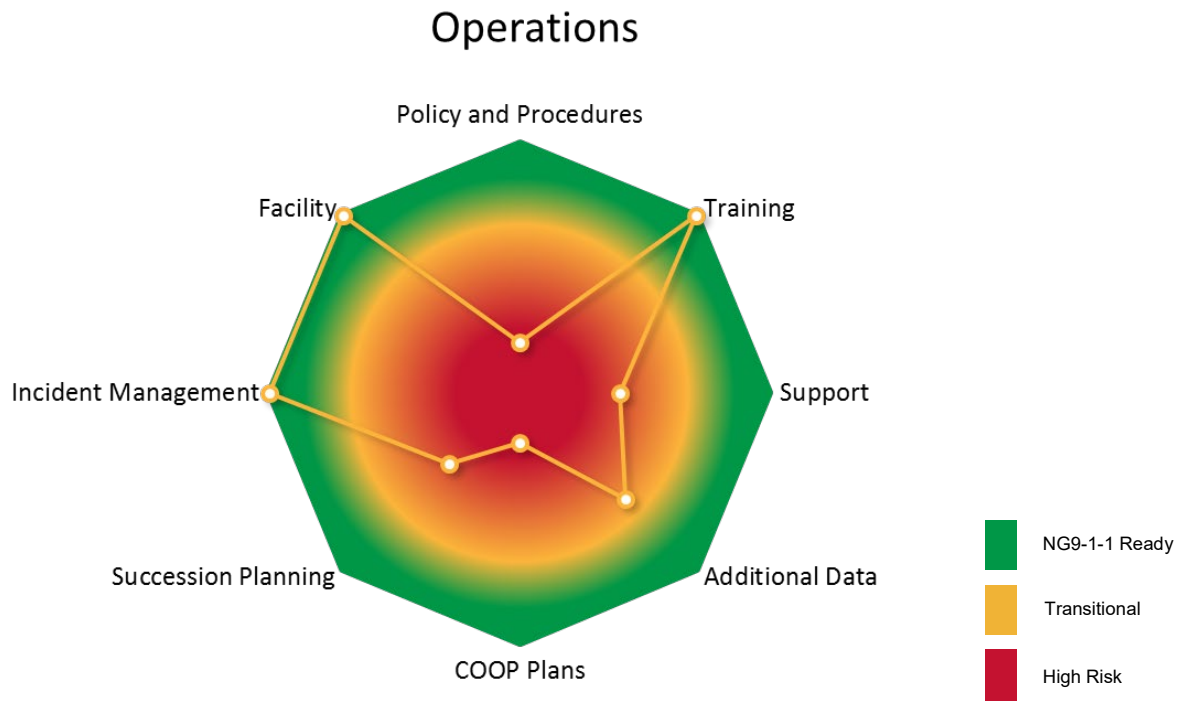
The MAPS tool focuses on eight key areas to measure NG9-1-1 operations readiness:

- Policy and procedures
- Training
- Support
- Additional data
- COOP
- Succession planning
- Incident management
- Facility

Based on the MAPS assessment, a review of the documentation provided, and interviews with the 9-1-1 ACOG staff and board members, 9-1-1 ACOG receives a comprehensive operations score of 6. This score aligns with a transitional level of NG9-1-1 readiness.

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Lever	Score	Questions							
	Overall Score	Policy and Procedures	Training	Support	Additional Data (ADR)	COOP Plans	Succession Planning	Incident Management	Facility
Operations	6	2	10	4	6	2	4	10	10

4.2.1 Policy and Procedures Rating: 2

9-1-1 ACOG does not have and/or has not undertaken any efforts to develop or define the operational processes and procedures needed for NG9-1-1. While 9-1-1 ACOG does not define or dictate policies and procedures to local PSAP operations, it does anticipate being the first regional entity to deploy NG9-1-1 in the state. As such, it will be important for the organization to have internal and external policies and procedures. Internally, operational policies that are in place were created by an individual to increase his/her own awareness of job responsibilities, while procedures were provided by a vendor regarding the use and optimization of equipment and software.

Externally, there does not appear to be barriers to 9-1-1 ACOG initiating discussions about processes and procedures for interoperation between agencies.

4.2.2 Training Rating: 10

ACOG's 9-1-1 Training Institute (hereafter, the Institute) meets APCO minimum training standards and the NENA/APCO/training industry jointly developed Recommended Minimum Training Guidelines for Telecommunicators issued by the National 9-1-1 Program in 2016.

The Institute offers emergency telecommunicators in central Oklahoma a top-quality, affordable and nationally accredited alternative to expensive out-of-state training. The Institute hosts several dispatcher courses including APCO Public Safety Telecommunicator I Certification, APCO Communications Training Officer (CTO) Certification, Fire Service Communications, Domestic Violence, Crimes in Progress, Active Shooter, Crisis and Hostage Negotiations, Critical Incident Dispatching, Suicide Intervention, APCO Communications Center Supervisor, and many others.

The Institute offers an average of 38 hours of training opportunities per month. Over the last twelve months, twenty-five training classes were held, equaling 456 hours, with 417 students attending. 9-1-1 ACOG is aware of the need for NG9-1-1-specific training; however, it is not pursuing such training until there is additional clarity on the features/needs of the selected solution. PSAPs request training program refreshes and improvements, but the staff's capacity and ability to provide the training support to meet those requests is limited. Training for text-to-9-1-1 has been developed and is being implemented in the first and second quarters of FY 2020.

There is no training committee as part of the RPAC to engage stakeholders to provide guidance to the Institute regarding desired training desired or an assessment of what is most effective for the end user.

Further, there does not appear to be any internal staff training plan to keep skill sets current with best practices and industry trends, or the need for the NG9-1-1 transition. 9-1-1 ACOG new-employee training was identified as a need but the inability to conduct that training in a comprehensive and consistent manner with defined processes is a drain on 9-1-1 ACOG's efficacy. Staff members are trained internal to their functional area, but cross-training across the organization does not occur.

4.2.3 Support Rating: 4

9-1-1 ACOG is undertaking a workforce optimization study with the desire to understand current staffing resource needs and those related to the NG9-1-1 transition. There is a strong belief that 9-1-1 ACOG is understaffed to support current needs, a situation that only exacerbates with the NG9-1-1 transition. 9-1-1 ACOG anticipates that it will address future hiring needs based on the outcome of this assessment and in alignment with the procurement of NG9-1-1 solutions.

4.2.4 Additional Data Rating: 6

9-1-1 ACOG leverages over-the-top applications for additional data, which NENA defines as “information which can be associated with a given emergency call, and is managed and sourced from outside the ESInet and its associated Next Generation Core Services (NGCS).”⁵ These applications are made available to local PSAPs upon request; however, 9-1-1 ACOG does not establish or enforce local policies, or compliance with policies or legal requirements at the PSAP level. It does, however, provide guidance and best practices for PSAPs to consider. PSAPs generally follow state policies or statutes regarding the handling of records and protected data.

4.2.5 Continuity of Operations Plans Rating: 2

9-1-1 ACOG does not have a formal COOP. While it has identified and documented some elements of a COOP, these are insufficient to qualify as a COOP that complies with the Federal Emergency Management Agency (FEMA)-defined requirements. 9-1-1 ACOG does have a disaster recovery service information document that is used by the technical staff when service disruptions occur on the 9-1-1 transport network. This document is a guide for outage mitigation.

4.2.6 Succession Planning Rating: 4

ACOG has defined roles and a path for career progression established. While ACOG’s organizational structure recently has undergone revisions, the 9-1-1 & Public Safety Division was not changed in anticipation of MCP’s workforce optimization report; therefore, existing career progression plans may be out of date. Lack of opportunity for advancement or career enhancement is a concern for 9-1-1 ACOG executive leadership—which needs to retain well-trained, quality employees—and those employees seeking career advancement. While there is no merit compensation plan in place that rewards specialized training and high-achieving performance, for the last two years 9-1-1 & Public Safety personnel have received cost-of-living increases and targeted merit increases per annual performance evaluations.

4.2.7 Incident Management Rating: 10

9-1-1 ACOG has a robust service desk for incident management. It uses cloud-based “SysAid” as its incident-management tool. SysAid is described on the vendor’s website as “Aligned with ITIL’s IT service management (ITSM) best-practice framework.” 9-1-1 ACOG has an established Service Level Agreement (SLA) with its member agencies for the support provided. It was reported that while the tool is effective, the PSAPs’ use of the trouble-reporting system is inconsistently applied. Help desk personnel will create the ticket if time allows on behalf of the PSAP. Workload assessments and adequate and thorough trouble-reporting documentation review are not conducted.

⁵ [NENA-STA-012.2-2017](#), *NENA Standard for NG9-1-1 Additional Data*.

4.2.8 Facility Rating: 10

9-1-1 ACOG has two diverse, hardened facilities that host its Viper call-handling solution. 9-1-1 ACOG staff reports that the two facilities have adequate rack space, protected power/cooling and diverse entrances using more than one telecommunications provider. TierPoint is the primary data center and MIDCON is the secondary data center. They are located in the Oklahoma City metropolitan area with approximately 15 miles of separation between them. Both locations are referenced on the internet as tier 3 facilities. Both facilities have adequate growth capabilities for rack space, power, and cooling. 9-1-1 ACOG equipment is hosted in a locked caged with locked racks; fully redundant meshed fiber links the data centers. Firewall management is provided through TierPoint. TierPoint enjoys a high industry rating because of its location diversity across the country. 9-1-1 ACOG staff reports that there is ample room for growth in these two data centers.

4.3 NENA i3 Routing and Functional Elements

NGCS are the functional elements responsible for NG9-1-1 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*. Given the often-transitional nature of NG9-1-1 routing solution implementations, it is common for agencies to have some or all routing technologies in place for the transition to NG9-1-1 while still integrated with legacy call-routing elements. The result is a broad spectrum of readiness ranging from foundational to end-state NG9-1-1

For the NENA i3 routing and functional elements evaluation, the following areas were reviewed:

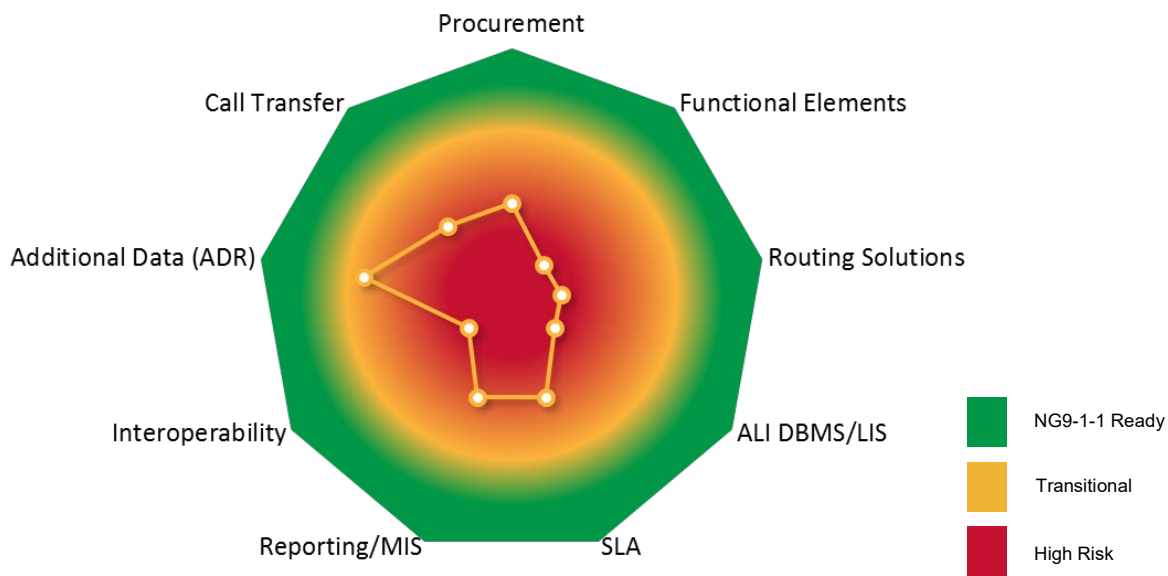
- Procurement
- Functional elements
- Routing solutions
- Automatic location identification (ALI) database management system (DBMS)/location information server (LIS)
- SLAs
- Reporting/management information system (MIS)
- Interoperability
- ADR
- Call transfer

As an outcome of the effort to evaluate 9-1-1 ACOG-provided data, the MAPS assessment, and associated interviews, 9-1-1 ACOG achieved a score of 3.33 in this category. This rating aligns with a foundational level of readiness, which is anticipated given the legacy call-routing model currently used by 9-1-1 ACOG.

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i3 Call Routing and Functional Elements



Lever	Score	Questions								
	Overall Score	Procurement	Functional Elements	Routing Solutions	ALI DBMS/LIS	SLA	Reporting/MIS	Interoperability	Additional Data	Call Transfer
NENA i3 Routing and FE	3.33	4	2	2	2	4	4	2	6	4

4.3.1 Procurement of NG9-1-1 Call-Routing Solutions Rating: 4

A key function of this report is to identify any specific technologies needed to prepare 9-1-1 ACOG for the procurement process and subsequently apply information identified in this assessment to support technical and operational requirements needed for an RFP to procure NG9-1-1 call-routing solutions. 9-1-1 ACOG has taken the following initial actions to acquire an NG9-1-1 call-routing solution: planned for the procurement; contracted with MCP to develop initial technical and operational requirements; updated the procurement requirements. As a result, this rating is in the early stages of the transitional state on the NG9-1-1 readiness continuum.

4.3.2 Functional Elements Rating: 2

9-1-1 ACOG is supported by a legacy call-routing solution and has not procured or implemented any NGCS functional elements. This score places functional elements in the foundational state on the NG9-1-1 readiness continuum.

4.3.3 Routing Solutions Rating: 2

9-1-1 ACOG employs selective routing provided by AT&T and interfaces with the Oklahoma City selective router. Based on the [NENA 03-002](#), [NENA 03-005](#), and NENA-STA- 010.2 standards, the current routing technologies used by 9-1-1 ACOG are rated as foundational. As indicated at the onset of this analysis, this was commonly understood and anticipated based on technical artifacts provided in the data-collection phase of the analysis and validated through MAPS.

4.3.4 ALI DBMS/LIS Rating: 2

9-1-1 ACOG is supported by AT&T's ALI DBMS service (provided by West/Intrado). Based on the [NENA 02-011](#) and [NENA 02-103](#) standards, the current ALI service in use by 9-1-1 ACOG is rated as foundational. In alignment with the current routing technologies, this rating was commonly understood and anticipated based on data provided in preparation for the analysis and validated through MAPS.

4.3.5 Service Level Agreements Rating: 4

Strong SLAs are critical to any 9-1-1 system. 9-1-1 agencies over the past 50 years largely have been forced to accept the level of service that the 9-1-1 system service provider—in most cases the incumbent local exchange carrier (ILEC)—was willing to provide. With the transition to NG9-1-1, procuring agencies no longer are bound by incumbent provider terms and are free to seek better solution and service options, thus creating a competitive market for these commodities that has not existed previously.

Whereas in a legacy environment there may be very little defined or documented in the way of expected level of service, NG9-1-1 offers the buyer significantly more power to define these terms. 9-1-1 agencies procuring NG9-1-1 solutions should, at a minimum, have well-defined SLAs for mission-critical systems such as call-routing and call-handling. The current solution in place at 9-1-1 ACOG is a tariff-defined service; therefore, this category is rated as early transitional on the NG9-1-1 readiness continuum, given that there are contractual terms defined for the service.

4.3.6 Reporting/MIS Rating: 4

Much like the discussion regarding SLAs, the transition from legacy 9-1-1 to NG9-1-1 allows procuring agencies far more negotiating power. As a result of this awareness of market demand, NG9-1-1 system service providers largely have taken proactive steps to provide significantly more transparency related to call detail records and telephony information and metrics. Whereas legacy reporting in many cases is defined by tariffs that not always were negotiated in the best interests of 9-1-1 agencies, NG9-1-1 places the procuring agency in the driver's seat to define what, how, and when reports and MIS data are available to support operational decisions that now are in the hands of the 9-1-1 agencies. 9-1-1 ACOG is supported

by legacy tariff-negotiated services and therefore has access to a very limited amount of data regarding the performance and operation of the legacy environment. 9-1-1 ACOG does not receive regular call volume reports from the service provider. Despite this, 9-1-1 ACOG's design solution has resulted in high availability of service; as a result, there has been limited-service degradation. Therefore, 9-1-1 ACOG has seen little need for regularly scheduled reports regarding call volume at the selective-routing level. 9-1-1 ACOG does, however, have access and regularly uses West/Intrado for ALI reports. Based on this data, and by having some limited reporting data available for the entire solution, the readiness rating is early transitional.

4.3.7 Interoperability Rating: 2

A hallmark of NG9-1-1 is the ability to interoperate between networks (i.e., a network of networks) to bring an unprecedented level of interconnected support for information sharing and enhanced mutual-aid support capabilities. Legacy networks very rarely interconnect between disparate selective routers within a given incumbent provider's network, and even more rarely when traversing multiple provider networks. Therefore, it is critical to ensure commitment to interoperability between NG9-1-1 system service providers in procurement, contract negotiations, and solutions implementation—at both the network and service level. Given that 9-1-1 ACOG is operating in a legacy environment, the MAPS-rated score indicates that the interoperability is in the foundational state of the NG9-1-1 readiness continuum.

4.3.8 Additional Data Rating: 6

More data made available to telecommunicators early and throughout the 9-1-1 call improves not only situational awareness but also results in quicker emergency response. The concept of additional data was introduced in the second version of the NENA i3 standard (NENA-STA-010.2). 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” 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. This model constitutes a transitional approach to ADR integration. The data provided by ADRs generally are used as supplemental information to inform telecommunicators, as opposed to making routing decisions. 9-1-1 ACOG has made a transitional solution available to PSAPs within its area of responsibility and therefore receives a transitional rating in this area.

4.3.9 Call Transfer Rating: 4

The 9-1-1 ACOG-provided solution allows for selective call transfer with voice/data within the tandem but does not support out-of-tandem call transfers. Calls are transferred through 9-1-1 system service provider-managed selective routers. 9-1-1 ACOG does not intend to expand its network to support other services, such as computer-aided dispatch (CAD) with the transition to NG9-1-1. As a result of the limitations of the current solution, the call transfer rating is foundational.

As indicated in the outcomes of the assessment, 9-1-1 ACOG's call-routing solution capabilities and services place it solidly in the foundational category. This rating is anticipated, and it should be noted that 9-1-1 ACOG has developed and implemented a very solid and redundant legacy routing solution that

integrates redundant centralized automatic message accounting (CAMA) trunking through its diverse/redundant host call-handling solution, which functions extremely well with virtually no disruption.

4.4 Emergency Services IP Network

Per [NENA-INF-016.2-2018](#), an ESInet is defined as “... 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.”

Given the transitional nature of NG9-1-1 network implementations, it is common for agencies to have ESInet facilities in place to support NG9-1-1-ready host/remote CHE and other IP-based network services. The level of redundancy varies widely representing the full range of categories from foundational—single point-to-point connections between sites—to redundant, resilient rings and mesh networks (end state).

9-1-1 ACOG recognizes that the ESInet concept will incorporate a much broader scope in an NG9-1-1 environment than the solution that currently is in place. The ESInet of the future may be a wholly separate network solution designed and implemented for the purpose of supporting NGCS or may be implemented in tandem with the hosted call-handling solution. These design decisions will be addressed at a future date and incorporated into the NG9-1-1 procurement processes.

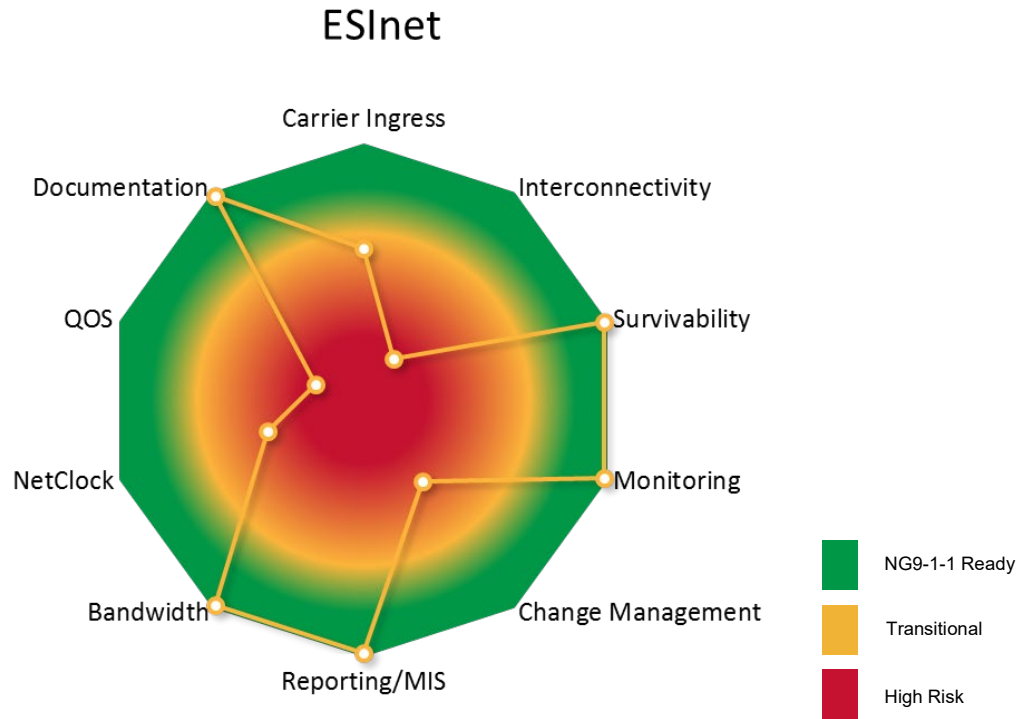
The following areas were reviewed based on the ESInet that currently in place, which supports the hosted Intrado Viper call-handling solution:

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

After evaluating data provided by 9-1-1 ACOG, the MAPS assessment, and feedback from associated interviews, 9-1-1 ACOG achieved a score of 6.8 for the ESInet element of NG9-1-1 readiness. This score aligns with the transitional level of readiness, which was anticipated given the overall design and implementation of the current network.

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Lever	Score	Questions									
	Overall Score	Carrier Ingress	Interconnectivity	Survivability	Monitoring	Change Management	Reporting/MIS	Bandwidth	NetClock	QOS	Documentation
ESInet	6.8	6	2	10	10	4	10	10	4	2	10

4.4.1 Carrier Ingress Rating: 6

Voice traffic is delivered via digital CAMA trunks on multiple T1 circuits to integrated access devices (IADs) located in two diverse data centers. The IADs break the CAMA trunks into analog lines that are converted to the session initiation protocol (SIP) by gateways in the data centers. Text-to-9-1-1 and data traffic are delivered over internet connections and delivered natively as IP traffic to the CHE. This score places carrier ingress in the transitional state on the NG9-1-1 readiness continuum.

4.4.2 Interconnectivity with Neighboring ESInets Rating: 2

There are currently no NG9-1-1 solutions operating in the state, thus all call transfers must be handled either through the legacy selective routers or through the public switched telephone network (PSTN) to administrative lines in the PSAPs. This score places interconnectivity in the foundational readiness state on the NG9-1-1 continuum.

4.4.3 Survivability Rating: 10

9-1-1 ACOG has designed and implemented a redundant, resilient, and highly available network solution along with alternate ring groups, redundant hosts, and roaming profiles, to support its hosted call-handling equipment. PSAPs have dual connections to multiple network rings. This network solution has been failover tested to ensure that it functions as designed. This score places survivability in the end state on the NG9-1-1 readiness continuum.

4.4.4 Monitoring Rating: 10

9-1-1 ACOG currently provides in-house technical support on a 24 x 7 x 365 basis for its network and call-handling equipment. Monitoring is supported through a combination of internal systems and software, combined with vendor partner solutions and services. This score places the monitoring rating in the end state on the NG9-1-1 readiness continuum.

4.4.5 Change Management Rating: 4

9-1-1 ACOG requires third-party vendors to provide a method of procedure (MOP) for approval prior to implementing changes in most cases. 9-1-1 ACOG maintains backups of configurations and notifies agencies regarding maintenance, but does not follow a singular, defined change-management process. Further, 9-1-1 ACOG does not have a tracking system for changes nor does it have a formal approval process. The PSAPs have the last word on operational and technological changes. This score places change management in the transitional state on the NG9-1-1 readiness continuum.

4.4.6 Reporting and MIS Rating: 10

9-1-1 ACOG has access to, and regularly obtains, operational reports through ad hoc reporting via West's Power 9-1-1 MIS. TierPoint also provides regular reports regarding network bandwidth usage at its data centers. Reports are obtained and reviewed on a monthly basis. This score places reporting and MIS in the end state on the NG9-1-1 readiness continuum.

4.4.7 Bandwidth Rating: 10

9-1-1 ACOG has a redundant, resilient fiber network supporting call and data delivery from the CHE hosts to remote workstations at the PSAPs. The solution is more than adequate for current and future bandwidth needs. This score places bandwidth in the end state on the NG9-1-1 readiness continuum.

4.4.8 NetClock Rating: 4

9-1-1 ACOG employs a single instance of the Spectracom NetClock network synchronization device. The NetClock solution is not made available to PSAPs for synchronization of network time among the various devices on the network. This score places NetClock in the transitional state on the NG9-1-1 readiness continuum with this score.

4.4.9 Quality of Service Rating: 2

9-1-1 ACOG does not mark QoS settings for its network. To date, its customers have not reported voice quality issues, and this is largely attributable to the robust network design and active maintenance approach. However, 9-1-1 ACOG recognizes that its current servers, switches, and routers are reaching end of life and will require replacement. This score places QoS in the foundational state on the NG9-1-1 readiness continuum.

4.4.10 Documentation Rating: 10

9-1-1 ACOG actively maintains network diagrams, IP address data, and configuration file backups for fallback during incidents or maintenance events. All documentation is updated as changes are made. This score places documentation in the end state on the NG9-1-1 readiness continuum.

4.5 Call-Handling Equipment

Given the cyclic nature of hardware refreshes, it is common for agencies to have a mix of call-handling capabilities in place, ranging from foundational to regional end-state NG9-1-1. The MAPS tool focuses on 11 key areas to measure call-handling NG9-1-1 readiness:

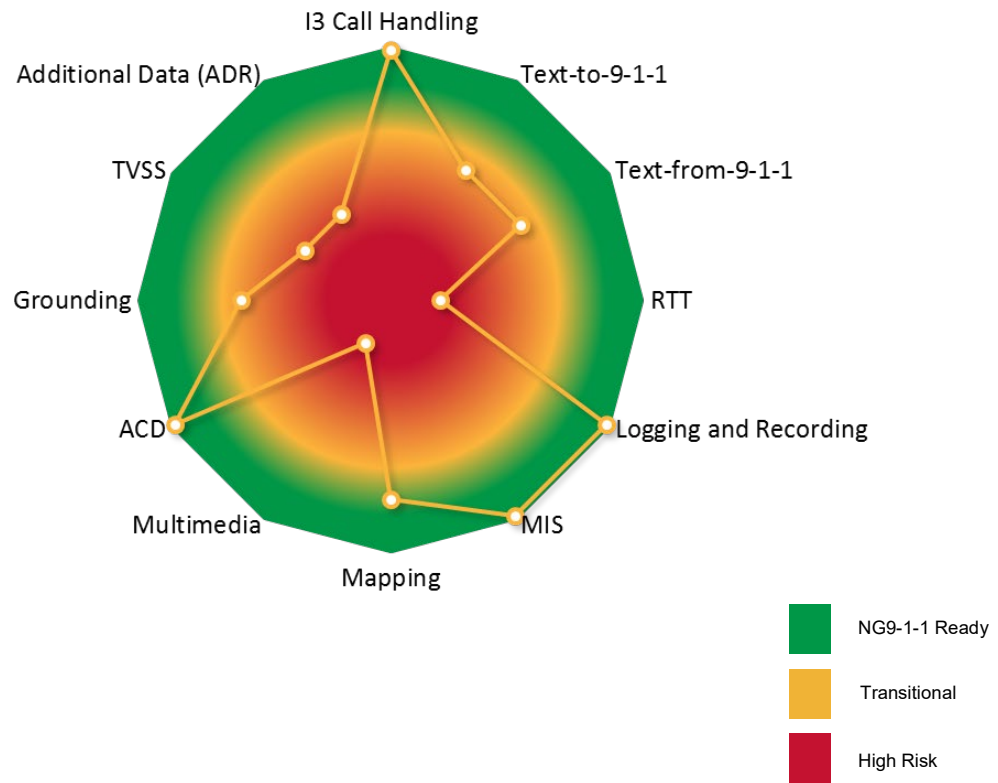
- CHE
- Text-to-9-1-1
- Real Time Text (RTT)
- Logging recorder
- Mapping
- MIS
- Multimedia
- Automatic Call Distribution (ACD)
- ADR
- Grounding
- Transient voltage surge suppression (TVSS)

The overall score of 6.5 places CHE in the transitional state of the NG9-1-1 readiness continuum.

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Call Handling Equipment



Lever	Score	Questions											
	Overall Score	NENA i3 Call Handling	Text-to-9-1-1	Text-From-9-1-1	RTT	Logging and Recording	Reporting/MIS	Mapping	Multimedia	ACD	Grounding	TVSS	AADR
CHE	6.5	10	6	6	2	10	10	8	2	10	6	4	4

4.5.1 Call-Handling Rating: 10

The first step toward NG9-1-1 is upgrading call-handling equipment to an IP-based system. 9-1-1 ACOG has documented baseline configurations for end systems and network hardware, as well as appropriate hardware maintenance coverage. In addition, 9-1-1 ACOG has West/Intrado's Viper IP-based call-handling systems running newer software at redundant host sites. These Viper systems convert analog and/or digital 9-1-1 and administrative lines to SIP using gateways. This score places CHE in the end state on the NG9-1-1 readiness continuum.

4.5.2 Text-to-9-1-1 Rating: 6

Interim text-to-9-1-1 service is the capability of an originating service provider (OSP)-provided text control center (TCC) to send a message to a PSAP via short message service (SMS); however, the TCC can interface with the NENA i3-capable functional elements that then deliver the 9-1-1 text to the PSAP's CHE while incorporating NG9-1-1 policy rules. 9-1-1 ACOG has implemented integrated text using message session relay protocol (MSRP) from West/Intrado; however, it should be noted that some features—such as mapping—have been reported as lacking in operational capabilities regarding the current implementation. This score places text-to-9-1-1 in the transitional state of the NG9-1-1 readiness continuum.

4.5.3 Text-from-9-1-1 Rating: 6

Text from 9-1-1 is a feature made available by some manufacturers that enables give telecommunicators to send texts to 9-1-1 callers as opposed to being passive recipients of callers' texts. While not widely available, MCP's understanding from client data is that the solution currently planned for implementation includes the capability to initiate text-from-9-1-1 service. This score aligns with the text-to-9-1-1 rating above.

4.5.4 Real Time Text Rating: 2

9-1-1 ACOG's CHE does not currently support RTT, which not only is a logical successor to text-to-9-1-1 but also has several advantages over TTY/TDD:⁶

- RTT is more reliable than TTY technology over IP networks, producing less garbling and fewer drop-offs on calls.
- Both parties to an RTT call can send and receive text in real time at the same time, unlike a TTY call, which requires turn-taking.
- RTT can eliminate the need to purchase specialized devices, such as a TTY, to send text in real time over wireless phones.

⁶ Teletypewriter/telecommunications device for the deaf.

4.5.5 Logging Recorder Rating: 10

9-1-1 ACOG's recording solution records the voice portion of 9-1-1 calls. The recording solution is SIP-capable, so it may be capable of supporting event and audio recording as 9-1-1 ACOG moves toward regional end-state NG9-1-1.

4.5.6 Mapping Rating: 10

9-1-1 ACOG utilizes and makes available the GeoLynx mapping server solution to all member agencies. Local agencies can choose to use this solution or operate their own CAD mapping solution.

4.5.7 Management Information System Rating: 8

9-1-1 ACOG supports internal operations and local member agencies through West's Power 9-1-1 MIS capabilities. This is available for scheduled and ad hoc reports by member agencies, but the support team also provides customized reports upon request.

4.5.8 Multimedia Rating: 2

All NENA i3-compliant PSAPs must support all media, including voice, video, images and text. If a PSAP receives a message containing both MSRP and RTT, it should send an answer with only one of them. If the PSAP receives an answer containing both RTT and MSRP, it must be prepared to deal with both simultaneously. When placing callbacks, PSAPs should offer all supported media choices, subject to operational considerations. ACOG's CHE does not currently support multimedia for service requests.

4.5.9 Automatic Call Distribution Rating: 10

ACD is a powerful tool for call treatment at the PSAP level. Rather than connecting callers to busy tones during heavy call periods, PSAP administrators can elect to place callers in queues for a designated amount of time and then overflow to other queues. Some systems can display real-time call status on wall-mounted monitors that are viewable anywhere in the PSAP, empowering call-takers and administrators to rapidly make staffing adjustments. 9-1-1 ACOG's CHE has ACD capability that is enabled upon request for member agencies and managed by local profiles on a per-agency basis.

4.5.10 Additional Data Repository Rating: 4

The introduction of additional or supplemental data to support 9-1-1 telecommunicators in providing more information to emergency responders is a recent service available in the public safety technology market. Most applications employed to date utilize over-the-top or out-of-band implementation methods prior to or during a transition to an NG9-1-1 call-routing solution, which enables a broader spectrum of interface capabilities in the core network. 9-1-1 ACOG supports RapidLite at the hosted CHE upon request of the local agency.

4.5.11 Grounding Rating: 6

As public safety moves away from analog and time-division multiplexing (TDM) interfaces, the faster, more powerful equipment taking its place is more reliant on properly grounded environments. One of the better environments is covered in Motorola R56®, *Standards and Guidelines for Communication Sites*. 9-1-1 ACOG utilizes colocated facilities for its geo-diverse, hosted solution. Rack equipment is grounded using 6-gauge copper from the device to the rack, which is grounded to the main. ACOG should follow Motorola's R56 grounding recommendations at PSAPs and host locations.

4.5.12 Transient Voltage Surge Suppression Rating: 4

Secondary TVSS devices protect metallic incoming and outgoing equipped ports that are or could be, connected to wireless or wireline private or leased line facilities, including central office POTS⁷ lines, 9-1-1 trunks, DS1 circuits, Ethernet, or 9-1-1 ACOG's CHE. TVSS also is referred to as lightning protection and is commonly used to protect equipment and personnel from hazardous voltage. 9-1-1 ACOG utilizes primary protection only for ingress 9-1-1 trunks. 9-1-1 ACOG should install TVSS hardware in all PSAPs and host locations to protect telephony and local-area network (LAN) metallic circuits to protect equipment and personnel.

4.6 Security

Public safety agencies use both TFOPA and NIST standards/recommendations as a framework to build a successful cybersecurity management process.

NIST Special Publication 800-53, *Recommended Security Controls for Federal Information Systems and Organizations*, 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 to manage cybersecurity risks
2. Protect—develop and implement appropriate safeguards
3. Detect—develop and implement activities to identify a cybersecurity event.
4. Respond—develop and implement activities to mitigate a detected threat
5. Recover—develop and implement plans for restoring services due to an incident.

TFOPA Standard Section 4.4, *Security*, identifies six comprehensive steps for creating a cybersecurity plan.

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/Evaluate—monitor and examine operational environments

⁷ Plain old telephone service.

5. Test /Evaluate—audit and verify findings
6. Improve/Evolve—reassess and reevaluate policies, procedures and security controls

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 NG9-1-1 readiness. The MAPS tool focuses on six key areas to measure security in terms of NG9-1-1 readiness:

- Cyber plan/policy
- Proactive monitoring
- Risk assessment
- Physical assessment
- Logical security
- Staff security

The overall score for security is 5.3, which places this element in the transitional state on the NG9-1-1 readiness continuum.

MAPSSM NG9-1-1 Readiness Assessment

Association of Central Oklahoma Governments



Lever	Score	Questions					
	Overall Score	Cyber Plan/Policy	Proactive Monitoring	Risk Assessment	Physical Security	Logical Security	Staff Security
Security	5.33	2	2	2	10	6	10

4.6.1 Cyber Plan/Policy Rating: 2

Based on interviews and information identified during the MAPS assessment, 9-1-1 ACOG has not developed a formal cybersecurity plan to address threats and vulnerabilities on the 9-1-1 ACOG-managed network used to support the West/Intrado Viper host/remote controller solution. This issue has been delegated to TierPoint and MIDCON facilities management, which provide 9-1-1 ACOG with hosted facilities and demarcation for network ingress/egress. While this practice is not uncommon in public safety, the need for more direct control or awareness of security practices is warranted given the mission-critical nature of 9-1-1 operations. Hosted services such as those provided by TierPoint/MIDCON often serve a variety of clients, each having their own unique needs—as such, it is critical to define a plan specifically to meet the needs of 9-1-1 ACOG. At a minimum, formal documentation of cybersecurity plans managed by service providers should be available to 9-1-1 ACOG; further, public safety agencies are highly encouraged to mitigate risk in this area by formally developing a plan in conjunction with service providers to ensure a robust cybersecurity posture. As 9-1-1 ACOG prepares to move toward NG9-1-1 and away from TDM-based networks, the need for a robust cybersecurity plan only increases.

4.6.2 Proactive Monitoring Rating: 2

Recognizing that 9-1-1 ACOG has not reported a malicious attack or penetration of its network, it does not mean that attempts to gain unauthorized access to the network are not occurring. Consequently, 9-1-1 ACOG needs to take proactive measures to ensure that future penetration does not occur. 9-1-1 ACOG relies on hosted third-party vendors (TierPoint/MIDCON) for security device management at the network edge. Based on interview data, there is no clearly defined schedule or process outlined for review or updates to access-control list (ACL) or other security policies, and/or software/firmware updates, which can contribute to network vulnerabilities. As such, this presents an increased risk malicious attacks over time. Integrating future ESI-nets will increase the need to remain vigilant and take proactive steps, such as active monitoring of security devices and establishing a plan to maintain software and firmware security updates on networked equipment.

4.6.3 Risk Assessment Rating: 2

Establishing a baseline cybersecurity posture is a critical first step in addressing vulnerabilities. Identifying all networked devices and determining the current versioning is a key component of this task. In addition to evaluating these elements, documented plans and policies are critical to developing an action plan to address any identified gaps. 9-1-1 ACOG does not have a scheduled or planned cybersecurity assessment

plan to address risk in the network. 9-1-1 ACOG has recognized the need to address this gap and has engaged in initial conversations with third-party vendors capable of providing such an assessment.

4.6.4 Physical Security Rating: 10

While establishing a strong cybersecurity posture is critical, there are other elements of a complete security plan that are equally vital. Physical security plays a key role in the overall posture, especially when leased or shared facilities are leveraged by public safety agencies. 9-1-1 ACOG equipment is hosted in data centers that are hardened and require keycard and/or biometrics for access, which is logged 24 x 7 x 365. Further, 9-1-1 ACOG equipment is staged in segregated locked cages and racks, which provides access control to only authorized individuals, which contributes to the high score.

4.6.5 Logical Security Rating: 6

Situational awareness is critical to prevention. Regular review of logs and monitoring is recommended. 9-1-1 ACOG leverages a managed/monitored firewall service from TierPoint/MIDCON. While 9-1-1 ACOG does not actively receive logs or have real-time monitoring capabilities or access-control lists, data indicates that 9-1-1 ACOG is provided this information/access in the event of an incident.

4.6.6 Staff Security Rating: 10

In addition to physical barriers, provisions should be in place for updating employee rosters, removing staff who no longer require access to mission-critical facilities and securing their keys/badges. The facilities that host 9-1-1 ACOG equipment require badge/biometrics to access all mission-critical facilities.

4.7 Overarching Themes

9-1-1 ACOG seeks to lead Oklahoma into the NG9-1-1 era by continuing its tradition of excellent service to participating agencies. The transition to NG9-1-1 requires, in many cases, a paradigm shift not only in technology but also in operations. Through this assessment several key themes across the focus areas emerged:

- NG9-1-1 is greenfield in the state and leading the way will require 9-1-1 ACOG to establish new policies
- Governance structure and supporting documentation must be strengthened to define commitments, authority, and operations
- Additional staff likely are needed to continue to provide the level of service that member agencies expect after NG9-1-1 is implemented
- Focus must shift from reactionary to a more strategic stance
- 9-1-1 ACOG needs to expand communication within and beyond the stakeholder community

- 9-1-1 ACOG needs to build on successes regarding the local ESInet used to support the hosted call-handling solution
- A need exists for a heightened cybersecurity posture with the transition to IP-based routing networks
- 9-1-1 ACOG must define technical and operational requirements for a competitive procurement (i.e., a request for proposals) that advances 9-1-1 ACOG toward regional end-state NG9-1-1

5 Recommendations

This section includes recommendations for resolving challenges that 9-1-1 ACOG faces in its advancement toward NG9-1-1 readiness. In many cases, the transition to the NG9-1-1 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 NG9-1-1, and in some cases will require technology or compliance outside 9-1-1 ACOG's sphere of influence.

5.1 Governance

While the 9-1-1 & Public Safety staff has been planning for the future of NG9-1-1, the documentation does not exist to communicate that plan externally to the member agencies or to the 9-1-1 ACOG and RPAC. Developing a strategic plan and a communications plan that defines benchmarks, demonstrates progress, and identifies any challenges encountered, will continue to build trust and confidence in ACOG's 9-1-1 staff and the NG9-1-1 implementation project. Written processes, standards and/or recommended best practices will result as the NG9-1-1 implementation progresses. As staff members participate in the statewide NG9-1-1 planning, they will be able to communicate the 9-1-1 ACOG strategic plan and identify any areas that are not in alignment and correct course before a significant investment.

Formalizing the commitments and expectations between the 9-1-1 & Public Safety staff and the 9-1-1 ACOG board, as well as the RPAC, will clarify roles and responsibilities and ensure that the staff can perform to expectations. It also will identify the additional resources that are needed to meet those expectations and provide a baseline for training the staff.

The following recommendations are provided to address gaps in the governance area:

Category	Recommendation
Documentation	<ul style="list-style-type: none"> • Develop an official set of bylaws that formalize 9-1-1 ACOG existence and operation • Develop an official set of bylaws that formalize the existence and operation of the 9-1-1 ACOG Board and the RPAC • Create operational processes that define commitments to member PSAP agencies

Category	Recommendation
	<ul style="list-style-type: none"> Identify a strategy for RPAC to engage neighboring non-member PSAPs and determine operational procedures that integrate and maintain situational awareness during and after the NG9-1-1 transition
Strategic Planning	<ul style="list-style-type: none"> Finalize the strategic plan Develop benchmarks and a reporting mechanism for communicating progress against the plan
Communication	<ul style="list-style-type: none"> Periodically communicate to outside agencies, the public, and stakeholders regarding NG9-1-1 transition progress Develop a communications plan to keep member agencies and the 9-1-1 ACOG Board informed of the progress and challenges Develop a crisis communications plan
Coordination	<ul style="list-style-type: none"> Continue a close working relationship and active participation in NG9-1-1 statewide planning so that the region's needs are addressed and to ensure that the regional NG9-1-1 solution is in alignment
Technology	<ul style="list-style-type: none"> Leverage the RPAC to support review and definition of NG9-1-1 call-routing and call-handling technical requirements Assign staff members to the technology subcommittee Engage the RPAC in the development of RFP requirements and technical reviews of proposed NG9-1-1 solutions
Budget	<ul style="list-style-type: none"> Conduct a funding study to determine transition costs and ongoing operations requirements for 9-1-1 ACOG and the local PSAPs Communicate funding requirements. Use the results of the funding study to determine NG9-1-1 procurement options and ongoing sustainability of funding Develop a sustainable funding plan
Funding	<ul style="list-style-type: none"> When costs are known, begin discussions with 9-1-1 ACOG Board, RPAC representatives, and member PSAPs to develop a long-range funding strategy.
Staffing	<ul style="list-style-type: none"> Use information from the workforce optimization study to determine current staffing gaps/requirements and future staffing needs for NG9-1-1 support and operations Add GIS personnel Create an assistant 9-1-1 director position Provide relief to technical staff by either implementing an on-call rotation or adding technical staff to the organization—or both if necessary
Procurement	<ul style="list-style-type: none"> None—continue to employ documented policies and processes
Standards and Best Practices	<ul style="list-style-type: none"> During bylaws development, ensure compliance with established standards or best practices Engage stakeholders (RPAC, staff, member PSAPs) in developing standards and best practices

5.2 Operations

9-1-1 ACOG has operated effectively despite a lack of formalized agreements, policies, and procedures. However, the changing role of a regional agency such as 9-1-1 ACOG in the NG9-1-1 environment will challenge its ability to continue effectively in the former way. The MAPS assessment reveals that strain is already noted in staffing, the need for clarified processes, and the ability to respond to stakeholder demands and meet expectations of member agencies. The common theme of lack of written documentation regarding procedures used and consistent practices will cause ineffective operations in the future. NG9-1-1 will demand more coordination and collaboration than ever before, and 9-1-1 ACOG will be looked upon to provide the guidance for these practices. 9-1-1 ACOG will be expected to ensure operational effectiveness regardless of the system solution chosen, and to operate effectively will need to engage stakeholders to establish functional operational policies that all member agencies can adopt and follow.

The following recommendations are provided to address gaps in the operations area:

Category	Recommendation
Policies and Procedures	<ul style="list-style-type: none">• Ensure that governance documents provide for the authority to establish policies and procedures for effective NG9-1-1 operations in the 9-1-1 ACOG service area• Update documented policies and procedures that are currently posted in Paycom Employee Self Service modules and also include policies and procedures for such things as:<ul style="list-style-type: none">– How manuals will be kept current and frequency of review– Employee reporting requirements– Communications expectations– Documentation procedures– Requests for additional tools, equipment or technology—such as software/computer or printer equipment and outside agency training– Inclement weather call-out and notification procedures– Authority levels– Expectations regarding the orientation period for new employees• Develop an internal-focused and an external-focused NG9-1-1 transition policy
Training	<ul style="list-style-type: none">• Establish a training committee as part of the RPAC to engage stakeholders to provide guidance to the 9-1-1 Institute regarding training curriculum and assessment tools, to determine what is most effective for the end user. Engage this training committee in curriculum development and training program planning• Conduct NG9-1-1 internal and external training• Conduct an internal needs analysis to assess gaps in staff skillsets and seek training to augment the current knowledge base

Category	Recommendation
	<ul style="list-style-type: none"> • Conduct external training needs analysis to revise and refresh training offered to PSAP stakeholders • Update the external training program
Support	<ul style="list-style-type: none"> • Complete a comprehensive staffing analysis and workforce optimization study • Fill vacant/ positions as soon as they are approved for hire. • Employ effective use of technology tools to improve efficiency in low-staff situations. • Align job function with a job description, including behavior objectives for benchmarking and performance evaluation • Determine gaps in training and skills to address through additional training and mentoring
Additional Data	<ul style="list-style-type: none"> • RPAC should create a policy for the use of additional data after consulting federal standards and state statutes for guidance • Establish a checklist for stakeholders that identifies records and protected-data compliance requirements according to state statutes • Review guidance and best practices for NG9-1-1 applicability
COOPs	<ul style="list-style-type: none"> • Develop a comprehensive 9-1-1 ACOG COOP including an annual review process. • Engage staff and stakeholders to develop a comprehensive COOP template for PSAP agencies that are aligned with FEMA recommendations and the 9-1-1 ACOG COOP, including an annual review process • Conduct an annual review and update of the mitigation plan.
Succession Planning	<ul style="list-style-type: none"> • 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. • Develop a processes-and-procedures manual for each 9-1-1 position to describe functions of the position, how to conduct work, tools to use for improved performance, benchmarks and performance measurements • Develop a new-employee orientation-and-training package for each position using the processes-and-procedures manual described above, as well as general information on employment and 9-1-1 ACOG's administrative operations, e.g., payroll recording, approved holidays, and expense-reimbursement policies
Incident Management	<ul style="list-style-type: none"> • Review the trouble-ticket reporting process to verify consistent use • Assess workload based on the outcome of the aforementioned analysis
Facility	<ul style="list-style-type: none"> • None

5.3 NENA i3 Routing and Functional Elements

Drawing from the conclusions outlined in the data analysis and MAPS assessment findings, the following recommendations are made to advance 9-1-1 ACOG toward the NG9-1-1 end state. The common theme identified to address each of these technical or operational deficiencies related to call-routing is procurement. This entails the development of robust requirements for inclusion into a request for proposals document that achieves the advancement toward NG9-1-1 that 9-1-1 ACOG seeks and provides for a contracted scope of work that holds a selected NG9-1-1 system service provider accountable to deliver upon the contracted terms and conditions.

Category	Recommendation
Procurement	<ul style="list-style-type: none"> Define and document a procurement workflow that provides a window into marketplace technologies to inform 9-1-1 ACOG Develop and execute a competitive procurement based on technical and operational needs to move 9-1-1 ACOG toward regional end-state NG9-1-1
Functional Elements	<ul style="list-style-type: none"> Define technical and operational requirements for a competitive procurement that moves 9-1-1 ACOG toward regional end-state NG9-1-1
Routing Solutions	<ul style="list-style-type: none"> Define technical and operational requirements for a competitive procurement that moves 9-1-1 ACOG toward regional end-state NG9-1-1
ALI DBMS/LIS	<ul style="list-style-type: none"> Define technical and operational requirements for a competitive procurement that moves 9-1-1 ACOG toward regional end-state NG9-1-1.
SLAs	<ul style="list-style-type: none"> Define and document strong SLAs encompassing both ESInet and NGCS components for the following (but not limited to): high reliability and availability, defects and replacements, and response/notification/repair Further, define and train PSAP users on the 9-1-1 ACOG SLAs and support processes to clarify and delineate the roles between systems support and GIS
Reporting/MIS	<ul style="list-style-type: none"> Define and document minimum reporting metrics and/or reports, including formatting and frequency. Ensure that requirements for an executive portal/dashboard are defined as a mandatory requirement in an NG9-1-1 solution procurement
Interoperability	<ul style="list-style-type: none"> The procurement of any NG9-1-1 solution must be interoperable with other similar or disparate vendor-delivered solutions in other geographic areas of Oklahoma or neighboring states. Well-defined requirements and penalties should be outlined in any RFP
ADR	<ul style="list-style-type: none"> Define technical and operational requirements for a competitive procurement that moves 9-1-1 ACOG toward regional end-state NG9-1-1
Call Transfer	<ul style="list-style-type: none"> Define technical and operational requirements for a competitive procurement that moves 9-1-1 ACOG toward regional end-state NG9-1-1

5.4 ESInet

Recognizing that an ESInet can serve a variety of purposes for public safety telecommunications—call handling, call routing, CAD, or a hybrid of all these solutions—MCP’s recommendations are two-fold. First, identify items that may improve upon the existing network in service, and second, identify items that focus on future needs for an ESInet to support NGCS routing functions.

Category	Recommendation
Carrier Ingress	<ul style="list-style-type: none"> Develop technical requirements and execute procurement for an ESInet that ensures the solution supports both TDM and native SIP ingress from carriers simultaneously
Interconnectivity	<ul style="list-style-type: none"> Develop functional requirements and execute procurement for ESInet services that ensure that the solution has the ability to interconnect and interoperate with both legacy and NG9-1-1 network solutions Define minimum standards for interconnectivity with adjacent agencies in conjunction with the contracted NG9-1-1 system service provider
Survivability	<ul style="list-style-type: none"> Leverage the same expectations for survivability in an ESInet procured to support NGCS. The solution should have redundancy and survivability capable of providing 99.999 percent availability, and adequate redundant transport to ensure that all calls are deliverable to the call-handling solution. These mandatory requirements must be defined in the RFP and subsequent service/solution contracts
Monitoring	<ul style="list-style-type: none"> 9-1-1 ACOG provides a high level of service and support of the existing ESInet that supports call handling. To maintain stakeholder satisfaction throughout the NG9-1-1 transition, a decision must be made regarding the procurement of a solution in the own/operate model or software-as-a-solution (SaaS) model. Subsequent to this decision, 9-1-1 ACOG will need adequate staffing and processes in place to support an NG9-1-1 ESInet/NGCS solution that provides the same level of call handling or will need to ensure that sufficient functional/technical requirements are defined in an RFP for a SaaS solution.
Change Management	<ul style="list-style-type: none"> Establish, formalize and document change-management processes that account for: roles and responsibilities between internal working groups, user-request tracking, change-request-status tracking, workflows, approvals, and a backout process Consider establishing a change-management board Ensure that the NG9-1-1 system solution provider commits to a formalized change-management process, including documentation in the RFP for solutions/services
Reporting/MIS	<ul style="list-style-type: none"> MIS reports are available on the existing network; MCP recommends continuing to provide this level of service with the NG9-1-1 call-routing solution Identify specific reports and metrics required for the ESInet to be delivered in the procured solution

Category	Recommendation
Bandwidth	<ul style="list-style-type: none"> The existing network solution that supports call handling has adequate ability to expand for future needs Ensure that the selected NG9-1-1 solution provider conducts traffic studies as necessary to appropriately design and implement NG9-1-1 with no degradation of service, with the ability to easily expand for future needs with no hardware updates to the system.
NetClock	<ul style="list-style-type: none"> MCP recommends redundant NetClocks on ESInets in addition to making the NetClocks available to downstream network devices to ensure consistent timing for reporting and MIS purposes Ensure that redundant NetClock requirements are outlined in procurement documents and available for downstream systems
QoS	<ul style="list-style-type: none"> MCP recommends coordination with the selected NG9-1-1 system service provider for any necessary QoS settings at the call-handling level at the time of implementation
Documentation	<ul style="list-style-type: none"> Continue to maintain the current level of documentation supporting 9-1-1 ACOG solutions and services Ensure as a function of the change-management process for the procured NG9-1-1 solution, that the provider makes available updated network and application diagrams

5.5 Call-Handling Equipment

Based on the MAPS assessment and in conjunction with data provided by 9-1-1 ACOG and analyzed by MCP, the following recommendations are made for the sustainment and enhancement of CHE solutions in preparation for the NG9-1-1 transition.

Category	Recommendation
Call-Handling Equipment	<ul style="list-style-type: none"> Define technical and operational requirements for a competitive procurement that moves 9-1-1 ACOG toward regional end-state NG9-1-1
Text-to-9-1-1/Text-from-9-1-1	<ul style="list-style-type: none"> Define technical and operational requirements for competitive procurement of an integrated text-to-9-1-1 solution that moves 9-1-1 ACOG toward regional end-state NG9-1-1
RTT	<ul style="list-style-type: none"> Define technical and operational requirements for a competitive procurement that moves 9-1-1 ACOG toward regional end-state NG9-1-1
Logging Recorder	<ul style="list-style-type: none"> Determine the level of NENA i3 support provided by the current logging recorder provider. If warranted, define technical and operational requirements for a competitive procurement that moves 9-1-1 ACOG toward regional end-state NG9-1-1

Category	Recommendation
Mapping	<ul style="list-style-type: none"> Continue to provide the level of service available today with respect to mapping offerings Maintain current versions of mapping software applications to manufacture specification
MIS	<ul style="list-style-type: none"> Define and document minimum reporting metrics and/or reports including formatting and frequency Ensure that requirements for individual PSAPs/agencies and enterprise-wide reports for 9-1-1 ACOG are defined as mandatory requirements in an NG9-1-1 solution procurement
Multimedia	<ul style="list-style-type: none"> Define technical and operational requirements for a competitive procurement that moves 9-1-1 ACOG toward regional end-state NG9-1-1
ACD	<ul style="list-style-type: none"> Define technical and operational requirements for a competitive procurement that moves 9-1-1 ACOG toward regional end-state NG9-1-1
ADR	<ul style="list-style-type: none"> Define technical and operational requirements for a competitive procurement that moves 9-1-1 ACOG toward regional end-state NG9-1-1
Grounding	<ul style="list-style-type: none"> Define grounding requirements for a competitive procurement that meet or exceed local and national electrical codes
TVSS	<ul style="list-style-type: none"> Define TVSS requirements for all telephony and LAN metallic circuits from ingress to workstation termination

5.6 Security

Based on the findings from the MAPS assessment, the following recommendations are made to help 9-1-1 ACOG become more cybersecurity aware as it moves towards NG9-1-1 readiness. The MAPS security assessment only touches the surface in readying an organization properly for cyber threats. Special care should be considered in conducting a full-scale network security assessment. The common theme in the PSAP arena is not having sufficient awareness or controls in place to identify threats. These recommendations are designed to help 9-1-1 ACOG achieve a greater level of cybersecurity preparedness.

Category	Recommendation
Cyber Plan/Policy	<ul style="list-style-type: none"> MCP highly recommends utilizing TFOPA's security standards document (Section 4.4) to engage in creating the six-step plan to address cybersecurity threats and mitigate vulnerabilities. Once a cybersecurity plan is in place, PSAPs are better positioned to manage cyberattacks
Proactive Monitoring	<ul style="list-style-type: none"> Adhere to TFOPA's security standards document (Section 4.4.4 – Monitor/Evaluate) to proactively monitor and evaluate 9-1-1 ACOG's infrastructure. The first step is to discover the network components to be

Category	Recommendation
	knowledgeable regarding the current environment. Next step is to set up ongoing monitoring and logging processes and to implement incident notifications
Risk Assessment	<ul style="list-style-type: none"> MCP highly recommends conducting a third-party network and operations security assessment and penetration test with social engineering. The TFOPA security standards document (Section 4.4.2 – Assess/Prioritize) communicates the need to conduct assessments to quantify the risks and vulnerabilities found, and to create remediation plans to mitigate these findings.
Physical Security	<ul style="list-style-type: none"> Although 9-1-1 ACOG's third-party data centers are hardened and require keycard access, special care should be used in determining whether these facilities have conducted assessments for all aspects of physical security. Section 4.4.3 – Implement/Operate of the TFOPA standards document focuses on several areas of physical security. In Paragraph K, physical-environment protections include power equipment (uninterruptable power supply systems and backup generators), temperature and humidity controls (i.e., heating, ventilation, and air condition [HVAC]), and emergency power (e.g., batteries)
Logical Security	<ul style="list-style-type: none"> 9-1-1 ACOG needs to leverage a holistic network-monitoring service that provides access to real-time data, including a client dashboard, utilization reports, access to logs, a ticketing system and a real-time map. Section 4.4.4 – Monitor/Evaluate of the TFOPA standards document describes the monitoring process
Staff Security	<ul style="list-style-type: none"> 9-1-1 ACOG's staff utilizes badge and biometrics for access to the remote data centers. There are other areas to consider for staff security. Are the use of security cameras in play at all access points? Do all access points require coded entry? Ensure that policies and procedures are in place to recover staff-access key cards and update the access list to remove separated employees

6 Conclusion

9-1-1 ACOG proactively sought to understand how well prepared it was for the transition to NG9-1-1, demonstrating its focus on continuous improvement and advancement of 9-1-1 services with its member jurisdictions.

Using the MAPS assessment tool, the organization underwent an important evaluation that provided valuable insight into its progress in advancing toward NG9-1-1. Evaluated across six categories—governance, operations, Nena i3 routing, ESInet, call-handling equipment, and security—9-1-1 ACOG's overall score was 5.49. This indicates that the organization is in the thick of the transition, with some aspects further along, like call handling and ESInet than others, like NENA i3-compliant call-routing, governance, and operations.

This assessment will guide 9-1-1 ACOG toward taking the next critical steps that move it from a transitional state to the end state of NG9-1-1 readiness and will help 9-1-1 ACOG achieve its strategic vision and

mission outlined by the organization. During the transition, the 9-1-1 ACOG team has many decisions to make in how it will accomplish its objectives. Advancement toward the NG9-1-1 end state may require ACOG to adjust its 9-1-1 staffing, make operational changes, and rethink its governance structure and stakeholder engagement.

Regardless of the barriers in its path, the organization is dedicated to its member jurisdictions, to maintaining the traditionally high level of customer service and value it has provided and is poised to implement the recommendations found in this report.

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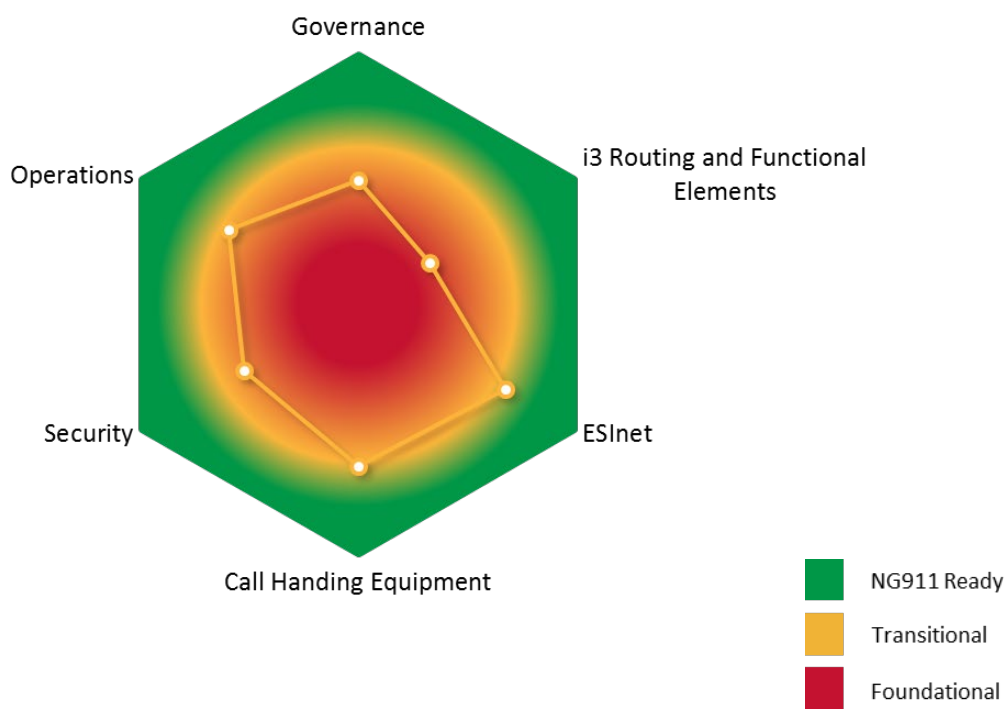


Figure 1: Six Fundamental Areas of Focus