

North Carolina 911 Board



911 Call and Data Interoperability Resiliency Compendium

Version 1
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Resiliency Compendium Overview

Hurricane Helene was one of the most destructive storms in North Carolina history. The high winds coupled with the overwhelming volume of water proved disastrous. The last mile infrastructure required to deliver 911 calls was decimated, leaving 19 Public Safety Answering Points (PSAPs) in either an alternate or abandonment route status for days, and in some cases weeks after the event.

The Emergency Services Internet Protocol Network (ESInet), a closed, private, secure network for 911 call voice and data only, performed as intended and designed, allowing for the seamless delivery of 911 calls outside the impacted area to other PSAPs for call processing. If a 911 caller had service or could get a dial tone on a landline or wireless telephone, the 911 call was successfully placed.

The overwhelming amount of 911 call information that needed to be delivered back to the local PSAPs contributed to the excessive traffic on the State's land mobile radio (LMR) system, resulting in the inability to effectively leverage the network as a method for the exchange of 911 call data information. This inability to consistently deliver processed 911 call information quickly from partner, or what has become known as "friend" PSAPs, to the intended PSAP was identifiable as a gap for the PSAPs during Hurricane Helene. Several alternative and nontraditional methods for processing and relaying 911 call information were successfully utilized. Examples provided by PSAPs include North Carolina Division of Criminal Information System (DCI), shared Google Documents, Microsoft Teams dedicated channels, personal and agency cellular phones (when available), and in some cases, a combination of these methods to ensure 911 call information was relayed back to the intended PSAP.

During the storm response period, 911 Board staff convened two virtual meetings on October 4 and October 29, 2024, to obtain detailed input from impacted PSAPs and the partner agencies regarding the data-sharing methodologies employed during the event. The information gathered resulted in the development of a preliminary list or technical catalog outlining potential 911 call-data interoperability solutions. These options included low earth orbit (LEO) satellite connectivity, electronic push-to-talk (PTT) radio communication pathways, real-time call-data exchange across multiple PSAP environments, and the use of smartphones or other Internet-of-Things (IoT) devices to support resilient inter-agency communications.

Following these virtual meetings, staff collaborated with the Board's legal counsel to develop an implementation strategy for these technologies. This work focused on confirming that NG911 Fund usage complies with federal and North Carolina law, outlining procurement procedures for devices and software, establishing device-management processes for updates and user administration, coordinating installation and deployment logistics, and defining expectations for testing and ongoing maintenance.

A panel discussion was conducted at the August 2025 PSAP Managers Conference on “Successes in Hurricane Helene” with managers operating PSAPs located in the impact area of Hurricane Helene, and the partner PSAPs who assisted with call processing during and after the storm. In that discussion, one of the most emphasized concerns was the challenge “friend” PSAPs had in contacting the primary PSAPs in real time to provide 911 call information for dispatch of emergency calls.

911 Board staff understood the concerns expressed by the PSAPs and continued brainstorming how the Board could assist the PSAPs by providing additional tools to ensure delivery of 911 call information to the local PSAP responsible for dispatching the call. Through the development of the *Resiliency Compendium*, the 911 Board staff continues to explore technologies to add a multi-level approach for added resiliency, with the primary goal of expanding effective options for 911 call data sharing and interoperability between the 911 Board funded PSAPs.

This document will provide a detailed explanation of the technology offerings available through the *Resiliency Compendium*, expanding upon information in the Hurricane Helene After Action Report (AAR) for the 911 Board. The *Resiliency Compendium* is intended to be an evolving document, with periodic reviews of current technology effectiveness for providing 911 call information sharing and data interoperability, and exploration of emerging technologies to serve the primary goal. Board staff will continue to explore additional solutions, while working within the 911 Board’s legislative requirements and use of funds authority, following the State’s procurement processes, and developing implementation strategies for rolling out such technologies. Staff encourages and welcomes input regarding other potential solutions to accomplish the goal of this *Resiliency Compendium*.

The *Resiliency Compendium* functions through the utilization of a layered strategy intended to create an operational environment, eliminating a single point of failure for 911 call data interoperability. These strategies only work if PSAP managers are familiar with the functionality of the technologies and integrate routine use within the PSAPs operation. PSAP managers are encouraged to train personnel in how these technologies work and to incorporate them into the PSAP’s existing Primary, Alternate, Contingency, and Emergency (PACE) communications plans.

Resiliency Compendium Components

Portable Radio Grant

In fiscal year 2024, the NC 911 Board introduced a grant program that provided PSAPs the opportunity to select and purchase one (1) portable from a list of vendors and models and two (2) batteries for each Board-approved seat in the primary PSAP. These radios had to function on the Statewide LMR system and were also required to be programmed with the current, approved North Carolina Voice Interoperability Plan for Emergency Responders (VIPER) talk group template as identified in the Statewide

Communications Interoperability Plan (SCIP), containing all the latest State event talk groups, Domestic Preparedness Regions (DPR) talk groups, and other channels ensuring these radios were as versatile as possible.

These radios added an additional layer of redundancy for those PSAPs that already utilized the State LMR system and provided a level of interoperability for those who may not have previously had access. The overwhelming majority of PSAPs took advantage of this opportunity with a total of 601 radios being purchased and deployed across the State.

Presently, there is a test of the Statewide Call talk group conducted monthly with all Board-funded PSAPs to ensure that connectivity is in place when needed.

FirstNet Wireless Redundant Solution

The 911 Board, along with AT&T as its managed service contracted provider of the ESInet, and various vendors in the telecommunications industry provide dual AT&T Virtual Private Networks (AVPNs) at each primary PSAP. This redundancy eliminates a single point of failure that could result in the loss of connectivity to the ESInet due to an AVPN degradation. However, these connections rely on traditional last mile connectivity offered by local telecommunications providers and are not immune to damage caused by human interference, such as intentional or accidental cuts, or natural disasters, as was experienced during Hurricane Helene.

Prior to the impact of Hurricane Helene, plans were in place to implement additional redundancy in the form of a FirstNet Wireless Redundant Solution from AT&T. FirstNet provides a secure wireless AVPN connection, which can facilitate 911 call delivery to the primary PSAP if both AVPNs experience degradation or are severed. The Board had already contracted with AT&T in its managed service contract in April 2024 to install the solution for all Board-funded primary PSAPs and approved primary backup PSAPs at no cost to the PSAP.

Wireless Enhanced Push-To-Talk Radios

Wireless Enhanced Push-to-Talk Radios, or ePTTs, have been utilized by Board staff since just prior to the impact of Hurricane Helene. The ePTTs allowed for instant connectivity via FirstNet cellular service between 911 Board field personnel and the NMAC, which proved invaluable during the initial impact of the storm. As PSAPs in the impacted area began to lose last mile connectivity and subsequently the ability to receive 911 calls, rapid intervention on the part of 911 Board staff to manually reroute calls became essential. These devices made this process much simpler and faster than placing multiple independent phone calls.

As of this initial release of the *Resiliency Compendium*, the initiative to equip each Board-funded primary PSAP with wireless ePTT radios to enable 911 call data

interoperability for the exchange of real-time situational information between PSAPs during emergency events as well as blue-sky day operations, is actively underway with deployment currently in progress.

The multi-carrier, cross channel, rugged, cellular-based devices enable instant group voice communication with “friend” PSAPs, operating over a cellular network, local Wi-Fi, or low orbiting satellite solution, serving as an additional tool that the PSAPs can utilize for PSAP-to-PSAP communications. Assigned talk groups are coordinated based on alternate and abandonment reroute plans, with provisions to adjust to the needs of any PSAP during an event.

PSAPs are under no obligation to take advantage of this initiative. However, through the NG911 Reserve Fund, the 911 Board can directly provide and fund this technology that meets the statutory mandate for NG911. There is no cost to the PSAPs, and all 113 Board-funded primary PSAPs chose to participate. The radio quantities will be provided based on 25% of the approved seat count for each Board-funded primary PSAP, with a minimum of two devices being assigned. This assignment will include the USB-C power cords and dedicated charging bases. Each PSAP will be required to participate in regular, monthly testing with Board staff to ensure units are functioning normally.

911 Call Data Interoperability Platform

As previously referenced, while call routing was in place and functioned as designed during Hurricane Helene, which allowed for 911 call processing, there was an obvious challenge on the part of partner/“friend” PSAPs to relay information back to local PSAPs for call dispatch.

The NC 911 Board, through an amendment of its managed service contract with AT&T, will be providing the RapidSOS UNITE Collaborator module to all Board-funded primary PSAPs in North Carolina. This module mitigates issues with information-sharing delays by delivering real-time, cross-jurisdictional visibility through the existing Agency Share & Chat (ASC) functionality.

It automatically shares 911 incidents, including live transcription and call summarization, from the answering PSAP back to the authoritative local PSAP. It also enables seamless communication among call-takers within RapidSOS UNITE, allowing them to exchange critical incident context without relying on call transfers or traditional land mobile radio systems. In addition, the module displays incident-related call data across regional and statewide boundaries, enhancing situational awareness and supporting efficient deployment of mutual-aid resources. As an added layer of redundancy, Collaborator can also be accessed on AT&T-provided laptops connected to the Next Generation Security Appliance through the Satellite Redundant Solution.

Deployment of the 911 call-data interoperability platform is underway. This effort requires the development of a comprehensive implementation and training schedule,

and while that work is ongoing, the project is currently projected to be completed by the end of calendar year 2026

Satellite Solution

Another offer through the NC 911 Board's amended managed service contract with AT&T is an initiative to provide satellite devices to be activated when traditional Internet access or cell service is degraded, allowing the ability of Wi-Fi calling, email exchange, or online application access to enable 911 call data interoperability for the exchange of real-time situational information between PSAPs during emergency events as well as blue-sky day operations.

Satellite based connectivity solutions have long been used in the disaster setting as a means of reliable communications. Though technologies have changed over the years and have improved how these devices work, conceptually, capabilities have remained essentially the same. A connection is created that bypasses whatever terrestrial components have been damaged creating a true site-to-site connection.

There are several options for satellite connectivity, each with unique and exclusive benefits. Low Earth Orbit (LEO) provides a lower latency than satellites that function at a higher orbit. Medium Earth Orbit (MEO) and Geostationary Orbit (GEO), which offer more stable coverage, have a higher latency, which can impact functionality depending on the use. Regardless of the method chosen, the intent for all types is to provide reliable, non-terrestrial connectivity in the event of loss of connectivity through traditional means.

LEO satellite solutions were successfully deployed by multiple vendors and agencies following Hurricane Helene, providing critical connectivity to a wide range of organizations, public safety agencies, businesses, and even residential users following the impact of Hurricane Helene. These units proved to be highly valued and fostered a much-needed source of connectivity in the hardest hit areas of the State where traditional means of communications were unavailable due to catastrophic infrastructure damage.

As of the first publication of this *Resiliency Compendium*, efforts are underway to develop the implementation and training schedule of all 911 Board-funded primary PSAPs. The equipment rollout will require extensive planning to coordinate scheduling, deployment, and training. No definitive completion date has been established at the time. PSAPs can anticipate outreach to initiate the coordination process at the beginning of Fiscal Year 2027. A yet-to-be determined cadence of testing with 911 Board staff will be required for any primary PSAP that is provided with a device.

PSAP Cybersecurity Assessments

The 911 Board is required to coordinate, adopt, and communicate all necessary technical and operational standards and requirements to ensure an effective Statewide interconnected NG911 network. [G.S. 143B-1402(a)(14)] Under this statutory authority, the Board must establish performance measures of the services necessary to accomplish a secure network, with one of the key components being to ensure cybersecurity. [G.S. 143B-1400(19a)] Through the NG911 managed service contract with AT&T, as approved in the March 2026 amendment, network security assessments and physical security evaluations will be conducted for all Board-funded PSAPs as well as all Board-funded backup PSAP locations. The focus will be vulnerability scanning, centered on elevating the protection and resilience of Board's contracted ESInet, which is a critical public safety infrastructure. The process will involve structured, industry-standard analytical steps that leverage continually evolving threat-detection techniques.

Conclusion of the data gathering will generate detailed IP Traffic Analysis Reports, Network Vulnerability Reports, and Network Architecture Reviews. Each PSAP will receive a prioritized remediation plan alongside a Cyber-Incident Response Plan Development Guide and templated key policy documents. Additionally, a physical security assessment will be conducted on-site to evaluate facilities against NIST SP 800-53 standards, identifying vulnerabilities and recommending actionable risk mitigation strategies to protect critical assets.

This initiative will require extensive coordination among the PSAPs, local cybersecurity offices, and the vendor responsible for conducting the assessments. The objective is to complete this work in time for PSAPs to fully leverage the next cycle of the Board's Cybersecurity Remediation Initiative (CRI) funding program.

Due to the sensitive nature of this initiative, all communication and coordination related to the assessment will occur exclusively among the PSAP manager, designated jurisdictional representatives, specified 911 Board staff, and the assessment vendor. All documents and the final report will be provided exclusively to the respective PSAP and its designated local representative(s). To ensure this sensitive public security information is protected, neither the 911 Board nor its staff will receive this report. The only information shared with the 911 Board will be an executive summary outlining the aggregate findings of all assessments, without any PSAP-specific identifiers. This summary will support the Board in strengthening the CRI funding initiative by highlighting system-wide needs and opportunities to better assist PSAPs in addressing identified deficiencies.

Ongoing Resiliency Efforts

Network Monitoring and Assistance Center (NMAC)

To ensure system integrity, reliability, and security, the Board provides centralized network management and security monitoring through the NMAC. The NMAC has been operational since 2018. In addition to the NMAC manager, the center is staffed with Tier 1 and Tier 2 technicians who deliver 24-hour monitoring and support for all PSAPs. These capabilities strengthen the overall resiliency framework and contribute directly to the broader goals of this Statewide *Resiliency Compendium*.

Incident Network Monitoring and Assistance Center (iNMAC)

As an outcome of Hurricane Helene PSAP coordination efforts, staff determined that overall effectiveness would be improved through physical co-location with NMAC personnel at the Board's office facility rather than with ESF2 in the State Emergency Operations Center (SEOC). This activation posture has proven to support a more cohesive exchange of information related to 911 call delivery and enable direct communication with impacted PSAPs, while minimizing disruption to other ESF2 operations. This designated space, the incident Network Monitoring and Assistance Center (iNMAC), also provides the opportunity for vendor and operational partners to participate in person when incident conditions or operational needs warrant such presence.

The establishment of dedicated workspace of the iNMAC enhances the efficiency and practicality of PSAP coordination efforts, strengthens organizational resiliency, and ensures the capability to maintain continuous situational awareness and collaboration with ESF2 at the SEOC. This approach reinforces the ability to sustain uninterrupted operational support during emergencies, regardless of facility impacts or evolving incident conditions. As 911 Board staff does serve within the SERT as the ESF2/PSAP Coordination Unit, assigned personnel will report to the SEOC when incident conditions or operational requirements necessitate on-site presence, when coordination demands exceed the capabilities of the iNMAC, or when directed through an activation order. This structure ensures timely integration into Statewide response operations, supports unified command objectives, and reinforces the continuity and resiliency of ESF2 and PSAP coordination functions during all phases of incident management.

AT&T Tiger Team

Service efficiency and overall resiliency have been further strengthened through the establishment of the AT&T "Tiger Team" under a 2024 amendment to the AT&T managed service contract. This specialized group of AT&T technicians and engineers are dedicated to implementing and supporting the State's Next Generation 911 (NG911) system, particularly the ESInet and hosted call-handling services. It functions as a hands-on deployment and troubleshooting unit working directly with the NMAC and 911

Board-funded PSAPs. The use of this team, assigned solely as a North Carolina PSAP resource, has significantly reduced resolution times, expanded remote-troubleshooting capabilities, and enhanced NMAC technician proficiency through direct, ongoing collaboration.

NG911 CAD-to-CAD Cloud-Based Subscription Service

Approved in September 2023, with initial funding available in FY2024, the 911 Board established the NG911 CAD-to-CAD Cloud-Based Subscription Service, offered to primary PSAPs as an eligible Next Generation 911 expense under G.S. 143B-1407(e). Participating primary PSAPs must maintain formal operational agreements for the receipt and dispatch of 911 calls with all partner PSAPs, while secondary PSAPs support their share of costs through cost-per-call allocations.

Approval of initial purchases and recurring costs requires timely submission of a Letter of Intent, supporting documentation, and reimbursement materials as a single PDF to the designated Board email, with reimbursements issued through the same method as monthly 911 distributions. By enabling real-time data exchange, reducing manual call-handling steps, and strengthening interoperability among PSAPs, CAD-to-CAD services can enhance operational resiliency, ensuring faster, more coordinated responses during high-demand events, system outages, or cross-jurisdictional incidents.

The Board issues advance notice to PSAPs regarding the upcoming CAD-to-CAD initiative cycle, outlining all requirements including the proposal submission deadline so that requests are received, reviewed, and approved in sufficient time for inclusion in budgeting and planning for the next fiscal year.

PSAP Cybersecurity Remediation Initiative (CRI)

The PSAP CRI provides NG911 funding to help primary PSAPs address vulnerabilities that could compromise call-taking operations, related processing functions, or the broader Statewide NG911 ecosystem. Building on the confidential PSAP cybersecurity assessments provided by the Board in 2020 and 2021, and all future assessments, this initiative supports remediation efforts that strengthen each PSAP's cybersecurity posture while remaining limited to expenditures directly tied to the primary PSAP. Proposals must demonstrate the specific risks to be mitigated, the scope of work, project oversight, and associated costs. The proposals must be submitted with all required documentation by the established deadline to be reviewed, approved, and incorporated into the Board's upcoming fiscal year budget planning. Reimbursements are processed through the NG911 Fund following approval, and all submissions must adhere to the designated format and communication requirements.

As with the CAD-to-CAD funding initiative, the Board provides advance notice to PSAPs regarding the upcoming CRI cycle, outlining all requirements and identifying the

proposal submission deadline to ensure requests are received, reviewed, and approved in time for incorporation into the next fiscal year's budgeting and planning. All proposals are reviewed by the Board staff and the Technology Committee in closed session, and those recommendations are then presented to the full Board for final approval.

Call Routing Partners/"Friends"

NC 911 Board staff continue to work with PSAPs in each region to assist them with selecting alternate and abandonment call routing partners. PSAPs are required to identify at least four (4) partner/"friend" PSAPs and are allowed to have as many as nine (9). Regional Coordinators work with each other to find suitable partner or "friend" PSAPs in other regions, different from the primary PSAP. This strategy applies a "safe distance" concept to call routing, to ensure that calls are routed away from the area of impact.

Additionally, PSAPS are encouraged to choose call routing partners utilizing a different call handling platform and on a different physical server for that platform. This methodology provides diversity, ensuring if there is a degradation on a particular platform or host, 911 calls are still able to be delivered to a "friend" PSAP.

PSAPs are also strongly encouraged to develop written agreements with partner PSAPs to ensure the needs of each jurisdiction are understood by the partner agencies. Agreements should clearly specify that a 911 call received from outside the PSAP's jurisdiction is not to be treated as a misrouted call requiring transfer to the local PSAP. It should also define the method by which 911 call information will be transmitted back to the appropriate PSAP and outline the procedures for dispatching call information in situations where the originating PSAP is completely unable to process the call. Telecommunicators in each PSAP should be trained on how to deliver the 911 call information back to the intended PSAP and should understand the agreements in place between the PSAPs.

Resiliency Compendium Concluding Perspective

The North Carolina 911 Board's *Resiliency Compendium* reflects a comprehensive, forward-looking commitment to strengthening the continuity, interoperability, and security of 911 services Statewide. Through layered technological strategies, coordinated operational planning, and sustained collaboration with PSAPs and partner agencies, the Board continues to enhance the State's ability to withstand disruptions and maintain uninterrupted emergency communications. As emerging technologies evolve and lessons from real-world events continue to shape best practices, this compendium will serve as a dynamic framework guiding ongoing investments in resilience, ensuring that North Carolina's 911 system remains robust, adaptable, and capable of supporting public safety under any conditions.