




May 16, 2024

**MEMORANDUM FOR:** Alan Davidson  
Assistant Secretary of Commerce for Communications  
and Information and NTIA Administrator  
National Telecommunications and Information Administration

**FROM:**   
Arthur L. Scott, Jr.  
Assistant Inspector General for Audit and Evaluation

**SUBJECT:** *Management Alert: The NPSBN Band 14 Signal Strength Does Not Consistently Provide Adequate Band 14 Service for First Responders*  
Final Memorandum No. OIG-24-022-M

Attached is a management alert on the First Responder Network Authority's (FirstNet Authority's) coverage measurement for the Nationwide Public Safety Broadband Network (NPSBN) contract. Our ongoing audit objective is to determine whether FirstNet Authority is ensuring that AT&T is achieving the desired results for network coverage for each state and territory. During our fieldwork, we observed an issue that poses a risk of overstating the coverage area and services the NPSBN provides. We discussed the issue with FirstNet Authority on June 26, 2023, October 5, 2023, and again on February 26, 2024. We also briefed the National Telecommunications and Information Administration (NTIA) and the U.S. Department of Commerce's Office of Acquisition Management on February 26, 2024. At AT&T's request, we met with AT&T representatives on May 9, 2024, for a listening session regarding their concerns about the issue reflected in this management alert.

Consistent with the Inspector General Act of 1978, as amended (IG Act),<sup>1</sup> we are notifying NTIA leadership of the potential risks that could affect first responders' ability to serve the public effectively during emergencies.

The key issue in this memorandum was briefed to cognizant NTIA and FirstNet Authority officials in advance. On March 7, 2024, we issued a draft of this management alert to NTIA for comment. In response, NTIA and FirstNet Authority provided technical comments. We considered NTIA's and FirstNet Authority's comments and made changes to the final management alert where appropriate. Per requests made by FirstNet Authority, we have

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<sup>1</sup> The IG Act establishes that offices of inspectors general will "provide a means for keeping the head of the establishments and Congress fully and currently informed about problems and deficiencies relating to the administration of those programs and operations and the necessity for and progress of corrective action[.]" 5 U.S.C. § 402(b)(3).

redacted certain business sensitive information and/or information otherwise protected from disclosure from the public version of this report.

Pursuant to Pub. L. No. 117-263, Section 5274, non-governmental organizations and business entities specifically identified in this alert have the opportunity to submit a written response for the purpose of clarifying or providing additional context to any specific reference. Any response must be submitted to Analee Striner-Brown, Division Director, at [astriner-brown@oig.doc.gov](mailto:astriner-brown@oig.doc.gov) and [OAE\\_ProjectTracking@oig.doc.gov](mailto:OAE_ProjectTracking@oig.doc.gov) within 30 days of the alert's publication date. The response will be posted on our public website. If the response contains any classified or other non-public information, those portions should be identified as needing redaction in the response and a legal basis for the proposed redaction should be provided. We will post this alert on our public website.

If you have any questions or concerns about this memorandum, please contact me at (202) 577-9547 or Analee Striner-Brown, Director for Telecommunications, at (202) 893-8759.

#### Attachment

cc: Joseph Wassel, Executive Director and Chief Executive Officer, FirstNet Authority  
Stephanie Weiner, Acting Chief Counsel and Audit Liaison, NTIA  
Jack Sander, Director, Policy and Internal Controls, FirstNet Authority  
Olivia Bradley, Senior Procurement Executive and Director of Acquisition Management,  
Office of the Secretary  
Puja Satiani, Assistant Vice President – Senior Legal Counsel, AT&T Public Sector Solutions  
Marcellus Brooks, Director, AT&T Global Public Sector Contracts, AT&T Global Public  
Sector Solutions, Operations & Wholesale



# Management Alert

## The NPSBN Band 14 Signal Strength Does Not Consistently Provide Adequate Band 14 Service for First Responders

May 16, 2024

Final Memorandum No. OIG-24-022-M

### Key Issue

FirstNet Authority measures NPSBN Band 14 coverage at a signal strength over 15 times less powerful than the one AT&T (the NPSBN contractor) uses to report its commercial non-Band 14 network to FirstNet Authority. This could indicate that the total area AT&T reports as Band 14 coverage is overstated, and the services provided in the coverage area are not sufficient to allow first responders to effectively respond to emergencies. This difference can adversely impact NPSBN services and ultimately affect public safety users' ability to communicate with each other during emergencies. We believe that management attention is warranted to ensure that the NPSBN provides consistent, reliable service to public safety users.

### Proposed Action for Change

FirstNet Authority should take steps to improve the signal strength at the edge of the coverage area through future NPSBN contract modifications and investments.

### Background

The Middle-Class Tax Relief and Job Creation Act of 2012 (the Act) established FirstNet Authority as an independent authority within the National Telecommunications and Information Administration (NTIA).<sup>2</sup> The Act states that FirstNet Authority shall ensure an NPSBN is established "in consultation with Federal, State, tribal, and local public safety entities."<sup>3</sup> The Act also authorizes FirstNet Authority to enter a public-private arrangement to construct, manage, and operate the NPSBN.<sup>4</sup>

In March 2017, FirstNet Authority signed a 25-year contract with AT&T to establish the NPSBN, with a contract ceiling of up to \$100 billion. FirstNet Authority's NPSBN contract includes (a) the initial obligation of up to \$6.5 billion and (b) AT&T's use of dedicated broadband spectrum (Band 14). On March 30, 2018, FirstNet Authority issued task order 4 (\$ billion) assigning AT&T the responsibility of building the radio access network (RAN),<sup>5</sup> which will provide coverage to all 56 states and territories. The NPSBN contract specifies the coverage area in square miles that AT&T must provide as part of the network. The edge of the coverage area, as agreed to by FirstNet and AT&T, is defined as the point where the network signal strength is equivalent to decibel

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<sup>2</sup> 47 U.S.C. § 1424(a).

<sup>3</sup> Id. at § 1426(b)(1).

<sup>4</sup> Id. at § 1426(b)(4).

<sup>5</sup> Per the Act, the RAN "consists of all cell site equipment, antennas, and backhaul equipment" required for wireless communications with NPSBN devices.

milliwatts<sup>6</sup> (dBm). FirstNet Authority noted that the definition of the coverage area is based on the Federal Communications Commission's (FCC's) 2012 Technical Advisory Board report. The report did not recommend minimum data rates, but it stated that requests for proposal for FCC waiver recipients had largely specified minimum data rates of 256 kilobits per second (kbps) uplink and 768 kbps downlink, which AT&T translated to a signal strength of [REDACTED] dBm in its 2016 contract proposal. That proposal was incorporated into the NPSBN contract by reference.

The dedicated broadband spectrum, Band 14, refers to a portion of the radio spectrum set aside specifically for first responders and for which FirstNet Authority holds the nationwide license. During periods of high demand, Band 14 is reserved exclusively for FirstNet subscribers, with any commercial traffic being moved to other bands (non-Band 14). We recognize that the FirstNet Authority solution is an "all-band" solution giving public safety access to Band 14 as well as AT&T's commercially licensed spectrum (non-Band 14). However, the focus of this report is on the dedicated Band 14 coverage for first responders.

## Our Observations to Date

During our fieldwork, we reviewed the NPSBN contract and contractor-submitted coverage documents, interviewed FirstNet Authority personnel, and reviewed the results of a drive test program that measured the NPSBN's performance. We found that FirstNet Authority measures the NPSBN coverage area at a minimal signal strength significantly lower than the one AT&T reports to FirstNet Authority regarding its commercial (long-term evolution, also known as LTE) non-Band 14 network, which could affect the service quality that NPSBN public safety customers receive.

### The NPSBN's Minimal Signal Strength is Significantly Weaker Than What AT&T Uses to Report to FirstNet Authority Regarding Its Commercial Non-Band 14 Network

The signal strength FirstNet Authority used to measure the edge of the NPSBN coverage area, [REDACTED] dBm, is over 15 times weaker than the [REDACTED] dBm AT&T uses to report non-Band 14 coverage to FirstNet Authority. Strong signal strength ensures reliable connectivity between the network and devices, enabling smooth communication without dropped calls or delays. The difference of 12 decibels equates to the difference between what a user would experience being outdoors versus indoors,<sup>7</sup> which significantly reduces the user's experience. The Act requires FirstNet Authority to obtain an appropriate coverage area and service level.<sup>8</sup> Additionally, the Act requires the RAN to be based on commercial standards.<sup>9</sup> However, FirstNet's measurement of NPSBN coverage does not even meet the way AT&T reports its own commercial non-Band 14 coverage to FirstNet Authority.

FirstNet Authority stated that AT&T validated that the [REDACTED] dBm signal strength would deliver the required throughput at the edge of the coverage area. However, we found that a signal strength of [REDACTED] dBm did not always provide sufficient service. In July 2021, FirstNet Authority contracted with

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<sup>6</sup> Decibel milliwatts is a measure of the signal strength user devices would receive.

<sup>7</sup> Building structures, such as walls, windows, and doors, weaken the signal the device receives indoors.

<sup>8</sup> 47 U.S.C. § 1426(c).

<sup>9</sup> *Id.* at § 1422(b).

an independent vendor to complete drive testing<sup>10</sup> within the NPSBN coverage area. At FirstNet Authority's direction, the drive test vendor chose routes that were at least 75 percent rural. As such, the results of the drive tests would likely differ from the results of drive test routes in non-rural areas where there is a greater density of cell towers. Drive tests provide a snapshot of network performance. In the drive test results, the vendor reported network performance measures such as call success rates, which considered the number of call attempts, successful connections, failed attempts, and dropped calls. We reviewed the results of the independent drive testing for the 7 states tested as of April 2022.<sup>11</sup> While the quality of some services, such as average downlink throughput, was rated as "good" in all seven states, we found that voice call success rates were noted as "poor" (below 90 percent) in 4 states (57 percent), which means that at least one in ten calls was either a failed attempt or dropped. These poor ratings were obtained despite the measured signal strength being at or over [REDACTED] dBm more than 98 percent of the time when the test devices were within predicted coverage of [REDACTED] dBm or better. This illustrates that [REDACTED] dBm was not sufficient to provide consistent, reliable service.

FirstNet Authority personnel acknowledged that service may be insufficient near the edge of the NPSBN coverage area. One FirstNet Authority official stated that public safety and tribal authorities reported that the data transmission rate of the NPSBN is insufficient at the edge of the coverage area in rural locations. Another FirstNet Authority official stated that the coverage definition should be updated because it was different than what is used in the industry and the data rates at the edge of the coverage area would be "incredibly low."

The NPSBN contract requires AT&T to implement a high-performance network; however, a signal strength of [REDACTED] dBm at the edge of the coverage area is not sufficient to meet public safety needs or be considered high-performance if first responders cannot make and retain calls. The use of the [REDACTED] dBm signal strength could make it difficult for public safety personnel to effectively respond to emergencies due to poor call capability—especially at the edge of the coverage area. Additionally, the use of [REDACTED] dBm to measure the edge of the coverage area, versus a higher signal strength such as [REDACTED] dBm, expands the coverage area despite the poor level of service, which allowed AT&T to meet coverage requirements for the NPSBN contract without providing a high-performing network.

FirstNet Authority personnel told us that, after the contract was executed, AT&T offered to measure both NPSBN coverage and coverage on its commercial network based on a signal strength of [REDACTED] dBm (an improvement over the [REDACTED] dBm), which would make the coverage reporting process easier for AT&T. FirstNet Authority decided not to update the coverage definition in the NPSBN contract to the proposed [REDACTED] dBm because AT&T agreed to the [REDACTED] dBm definition and it was codified in the contract. FirstNet Authority personnel also stated that they did not want to inform the states of a potential change in the coverage definition because changing the definition after the fact would decrease the total coverage previously reported by AT&T and make it appear that the states are receiving less coverage than promised. However, AT&T continued to report [REDACTED] dBm for

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<sup>10</sup> Drive testing is a method of verifying the performance of a wireless broadband network. It consists of placing specialized equipment in a vehicle and using that equipment to measure network performance data such as upload and download speeds, signal strength, and data transmission delays throughout the service area.

<sup>11</sup> Fifteen states were scheduled to be tested in the base year of the contract. We reviewed all drive test data that were available as of April 20, 2022, which was the time of our initial request to FirstNet Authority. Test results included data for Arizona, California, Maryland, Nevada, Oregon, Texas, and Virginia.

non-Band 14 coverage and [REDACTED] dBm for NPSBN Band 14 coverage to FirstNet Authority. Again, using the [REDACTED] dBm signal strength could affect the service quality that NPSBN public safety customers receive. We note that FirstNet Authority had multiple opportunities in multiple contract modifications<sup>12</sup> to negotiate an improved NPSBN measurement of coverage, and it did not do so.

## Proposed Action for Change

To address our concerns and ensure that first responders have the services they need to effectively perform their duties, FirstNet Authority should take steps to improve the signal strength at the edge of the coverage area through future NPSBN contract modifications and investments.

Our objective was to determine whether FirstNet Authority is ensuring that AT&T is achieving the desired results for network coverage for each state and territory. We conducted our fieldwork from July 2022 through November 2023. We conducted our work in accordance with Quality Standards for Inspection and Evaluation issued by the Council of the Inspectors General on Integrity and Efficiency. Those standards require that the evidence must sufficiently and appropriately support our findings and provide a reasonable basis for our conclusions. We believe that the evidence obtained provides a reasonable basis for our observations and conclusions. We will post this alert on our public website.

## Summary of Agency Response and OIG Comments

On March 7, 2024, we provided NTIA with a draft of this alert for comment. In response, NTIA and FirstNet Authority provided technical comments regarding the signal strength used to measure coverage. On March 14, 2024, we requested supporting documentation for the technical comments relating to the AT&T non-Band 14 coverage signal strength. In response, FirstNet Authority provided only two email threads and did not provide any other documentation to support its comments on the AT&T non-Band 14 coverage signal strength. We have considered the technical comments and made changes to this final alert where appropriate.

Additionally, we received a comment letter, dated April 12, 2024, from AT&T, which we took into consideration. We made some changes to the report prior to receiving AT&T's comment letter to differentiate Band 14 and non-Band 14 coverage. The letter was not incorporated into this report as an attachment because it was marked confidential by AT&T.

Summaries of NTIA's and FirstNet Authority's comments and our responses to those comments are below.

- NTIA and FirstNet Authority commented that, as of today, the network performance exceeds the [REDACTED] dBm requirement significantly within the boundary of the plan of record.

OIG Response: We concur that the cell area performance will exceed the cell edge performance. However, as we stated in this alert, we are concerned with the quality of service provided near the cell edge where there is claimed coverage. Based on the drive test

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<sup>12</sup> We addressed the multiple major modifications made to the NPSBN contract in a draft report issued to FirstNet Authority on February 28, 2024.

data that was available for us to review, the service quality was poor despite having a signal strength at or above [REDACTED] dBm, which could impact first responders' experience.

- As part of FirstNet Authority's response to our request for clarification, it commented that AT&T now uses a signal strength of [REDACTED] dBm for external coverage maps.

OIG Response: Our focus is on the fact that AT&T continues to measure and report [REDACTED] dBm for non-Band 14 coverage but [REDACTED] dBm for NPSBN Band 14 coverage to FirstNet Authority. Also, it was evident that FirstNet Authority was not aware that AT&T had changed the signal strength used to generate public commercial coverage maps until March 6, 2024. However, regardless of what AT&T uses to develop its external coverage maps, AT&T continued to report the [REDACTED] dBm signal strength to FirstNet Authority for non-Band 14 coverage. Additionally, this does not address our concern—that FirstNet Authority agreed to the contract measurement of [REDACTED] dBm while knowing that AT&T was measuring and reporting its commercial non-Band 14 network at [REDACTED] dBm.

- NTIA and FirstNet Authority commented that signal strength alone cannot describe service availability and quality.

OIG Response: Service quality is correlated with signal strength. Therefore, a stronger signal strength would likely result in a better quality of service.

- FirstNet Authority requested we clarify that the coverage measurement and performance were fully compliant with the NPSBN contract.

OIG Response: We acknowledge that the measurement of coverage complied with contract terms; however, our alert reports that the contract's measurement of coverage provides inadequate service near the edge of the coverage area. Additionally, we are concerned that FirstNet Authority agreed to the contract measurement of [REDACTED] dBm while knowing that AT&T was measuring and reporting its commercial network at [REDACTED] dBm. Further, in a report provided by FirstNet Authority, it recognized that stakeholders identified dependability and coverage as the top two drivers for leaving or not subscribing to NPSBN services.

- NTIA and FirstNet Authority requested we clarify that AT&T did not formally offer to change its reported signal strength to [REDACTED] dBm.

OIG Response: After reviewing this alert, FirstNet Authority provided an email exchange in which AT&T initially requested to move the threshold for non-Band 14 coverage from [REDACTED] dBm to [REDACTED] dBm and then requested to put the move to [REDACTED] dBm on hold, citing challenges associated with moving to [REDACTED] dBm from a contractual change perspective. This email did not address the discussions surrounding the Band 14 coverage signal strength, but it did support that AT&T and FirstNet Authority discussed options regarding signal strength. We noted a gap in conversations included in the email thread, which could indicate that the discussion was completed offline. We were informed during interviews with FirstNet Authority personnel that they had conversations with AT&T about adjustments to the NPSBN Band 14 signal strength, which is reflected above.

- FirstNet Authority noted that “the NPSBN is an all-band network and FirstNet users have access to all AT&T commercial spectrum as well as to the Band 14 deployment. Thus, FirstNet users always have access to the best network available.”

OIG Response: We recognize that the FirstNet solution is an “all-band” solution giving first responders access to Band 14 as well as AT&T’s commercially licensed spectrum (non-Band 14). However, the focus of this report is the dedicated Band 14 coverage for first responders. Additionally, when we reviewed drive test data as we reported above, it included AT&T commercial network test results. We found that voice call success rates were noted as “poor” (below 90 percent) in five of the seven states (71 percent) we reviewed. These results do not support that, even if other commercial spectrum was leveraged, first responders’ experience would improve.

## Our Future Work

The concerns presented in this memorandum and any action taken by FirstNet Authority as a result of this management alert will be considered in our future audits of FirstNet Authority. We are not requesting a formal action plan in response to this memorandum, as the key issue discussed in it was briefed to cognizant NTIA and FirstNet Authority officials in advance of issuance.