

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Procedures for Commission Review of State Opt- Out Requests from the FirstNet Radio Access Network)	PS Docket No. 16-269
)	
Implementing Public Safety Broadband Provisions of the Middle Class Tax Relief and Job Creation Act of 2012)	PS Docket No. 12-94
)	
Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band)	PS Docket No. 06-229
)	
Service Rules for the 698-746, 747-762 and 777- 792 MHz Bands)	WT Docket No. 06-150
)	

REPLY COMMENTS OF AT&T

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REPLY COMMENTS OF AT&T

I. INTRODUCTION AND SUMMARY

AT&T Services Inc. (“AT&T”), on behalf of the subsidiaries and affiliates of AT&T Inc. (collectively, “AT&T”), hereby submits the following reply comments in response to the Federal Communications Commission’s (“Commission”) Notice of Proposed Rulemaking (“NPRM”) seeking comment on proposed procedures for administering the State opt-out process set forth in the Middle Class Tax Relief and Job Creation Act of 2012 (the “Spectrum Act” or “the Act”).¹

When it authorized the Nationwide Public Safety Broadband Network (“NPSBN”), Congress was primarily concerned with providing first responders access to a single, nationwide interoperable communications system. In the wake of 9/11 and Hurricane Katrina, it was clear

¹ *Procedures for Commission Review of State Opt-Out Requests from the FirstNet Radio Access Network, Implementing Public Safety Broadband Provisions of the Middle Class Tax Relief and Job Creation Act of 2012, Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, Service Rules for the 698-746, 747-762 and 777-792 MHz Bands*, Notice of Proposed Rulemaking, FCC 16-117 (rel. Aug. 26, 2016) (“NPRM”).

that first responders needed a network that was truly interoperable, allowing first responders from different agencies, and even different municipalities and states, to be able to communicate with one another. Moreover, Congress envisioned that the network would be nationwide, to facilitate communication among first responders from across the country who might be called upon to help fight wildfires or respond to other natural disasters hundreds of miles away. By the time Congress acted, mobile broadband networks capable of supporting applications like live video streams made it clear that the network should be not only nationwide and interoperable, but broadband. To ensure that these vital objectives—nationwide, broadband and interoperable—would be achieved, Congress created the First Responder Network Authority (“FirstNet”), providing the agency with funding and a 20 MHz nationwide spectrum license to construct the NPSBN on a nationwide scale.

Congress also provided a mechanism for a State to choose to deploy a portion of the NPSBN, but only the radio access network (“RAN”). To ensure that the NPSBN was truly a single nationwide network, any state-constructed RAN would be connected to the NPSBN Core constructed by FirstNet. Moreover, any State planning to “opt out” and build its own RAN would be permitted to do so only after submitting a detailed alternative plan for its state, and the review and approval of the Commission, NTIA, and FirstNet.² The Commission’s role in this process is critical. Should a state propose to opt out, the Commission must carefully review the state’s alternative plan to ensure that the interoperability mandated by Congress is not compromised by allowing a third party—the State—to construct a portion of the NPSBN.³

² See 47 U.S.C. § 1442(e)(3).

³ *Id.* § 1442(e)(3)(C)(i). See also note 13 *infra*.

AT&T provides these comments based on its experience building and managing an evolving nationwide network comprised of diverse devices, technologies, and services, along with numerous resellers, partners, enterprises, and other customers. As with any nationwide communications network, achieving and maintaining interoperability for the NPSBN will be incredibly challenging. The complexities will be multiplied if a State should opt-out, and Congress' objective for a nationwide, interoperable network would be doomed if such a State should fail to establish and maintain an interoperable RAN. Indeed, a lack of interoperability in a single State could have a catastrophic impact on the NPSBN as a whole. Accordingly, a State that submits an alternative plan should be required to demonstrate in detail how its RAN would be interoperable with the NPSBN, and demonstrate a serious long-term commitment of resources, funding, expertise, and cooperation. Without such showings and commitments from opt-out States, FirstNet's NPSBN risks being balkanized—neither nationwide nor interoperable.

The Commission can help achieve Congress's vision by conducting a robust review of States' alternative plans. It should hew to the commands in the Spectrum Act and require that opt-out States meet rigorous interoperability standards. In these comments, AT&T offers some examples of certain core requirements opt-out States will need to meet in order to be able to deploy and maintain an interoperable RAN as part of the NPSBN.

II. NATIONWIDE INTEROPERABILITY IS THE CENTRAL FEATURE OF THE NPSBN, AND IS ESSENTIAL TO FIRST RESPONDERS, BUT WILL BE DIFFICULT FOR OPT-OUT STATES TO ACHIEVE.

Congress adopted the Spectrum Act to ensure that first responders would have access to a nationwide interoperable broadband network in times of crisis. While Congress contemplated a single network, it acknowledged that individual States might want to take on the burden of deploying and operating their own RAN portions of the NPSBN. To ensure that the NPSBN would be truly nationwide and interoperable, however, Congress set a high bar for States

proposing to opt out, requiring detailed showings in state plans, and careful review by the Commission, NTIA and FirstNet itself.

A. Congress’s vision depends on seamless interoperability.

Most public safety emergencies occur without warning. A coordinated response, across multiple agencies, disciplines and jurisdictions, is often critical to protecting life and safety and restoring order.⁴ Crises easily transcend state lines, as in the New York metro area (which includes New Jersey and Connecticut), or in metropolitan Washington D.C., with multiple federal, state and local government agencies, and several independent transportation authorities. Without reliable and interoperable communications, however, a coordinated response becomes nearly impossible, jeopardizing the mission and safety of our nation’s first responders and the communities they serve.⁵ The September 11, 2001 attacks and Hurricane Katrina made this clear, as first responders were unable to communicate effectively because they lacked access to an interoperable communications system.⁶ Correcting this problem and providing first responders with interoperable communications tools is the central purpose of the legislation that created FirstNet and charged it with constructing the NPSBN.

To address “the need for public safety communications interoperability,” Congress established FirstNet and directed the agency to create a single nationwide interoperable

⁴ See Technical Advisory Board for First Responder Interoperability, *Recommended Minimum Technical Requirements to Ensure Nationwide Interoperability for the Nationwide Public Safety Broadband Network*, at 1.2 (May 22, 2012) (“Minimum Technical Interoperability Requirements Report”).

⁵ *Id.*

⁶ 157 Cong. Rec. S128 (daily ed. Jan. 25, 2011) (Statement of Sen. Rockefeller); *see also* S. Rep. No. 112-260, *Senate Commerce Committee Report to Accompany S. 911*, at 2 (Dec. 21, 2012) (“Despite being almost 10 years since the September 11, 2001 tragedies, and almost 6 years since Hurricane Katrina, there is no nationwide interoperable public safety communications system.”).

broadband network capable of supporting a diverse assortment of public safety users. Through the Act, Congress intended to provide first responders with a seamless experience when navigating different locations, agencies, authorities, and jurisdictions.⁷ In reallocating spectrum resources to create the NPSBN, Congress signaled that the allotment would “at long last, support a national, interoperable, wireless broadband network that will help first responders protect us from harm.”⁸ As APCO has explained, FirstNet’s “special focus” on interoperability is intended to address the communications problems that “have historically plagued first responders.”⁹

Congress structured the Act to reflect its paramount concern with establishing a nationwide interoperable network that would endure for generations. The Act demands that FirstNet “ensure the establishment of a nationwide, interoperable” network “based on a single, national network architecture.”¹⁰ To support FirstNet’s challenging interoperability mission, the Act also created the Commission’s Technical Advisory Board for First Responder Interoperability (“Interoperability Board”) and charged it with developing minimum technical requirements to ensure a “nationwide level of interoperability” across the NPSBN.¹¹

In recognition of the possibility that a State might wish to take over the deployment and operation of the State’s portion of this NPSBN, Congress provided a State “opt out” mechanism

⁷ See S. Rep. No. 112-260; see also 157 Cong. Rec. S1528 (daily ed. Mar. 10, 2011) (Statement of Sen. Rockefeller) (“Too often, first responders lack that interoperable network that is essential to providing an effective response in emergencies . . . a lot of them very desperate.”).

⁸ 157 Cong. Rec. S128, at S146.

⁹ Comments of the Association of Public-Safety Communications Officials-International, Inc. (“APCO”), PS Docket No. 16-269, PS Docket No. 12-94, PS Docket No. 06-229, WT Docket No. 06-150, at 2, 3 (Oct. 21, 2016) (“APCO Comments”).

¹⁰ 47 U.S.C. § 1422(a)-(b).

¹¹ *Id.* § 1423(c)(1).

in the Act. But this opt-out mechanism was designed to ensure that a State would submit a detailed alternative to FirstNet’s plan for the construction of the RAN in its State, proving first to the Commission that its plan meets the minimum interoperability standards adopted by the Interoperability Board, then that it would be interoperable with the actual NPSBN specifications themselves.¹² Although the Act allows States to choose to deploy, maintain, and operate their own RAN portion of the NPSBN, the Act does not grant them the right to do so. States may only opt-out after the Commission is satisfied that a State’s RAN plan will be consistent with the Act’s interoperability objectives, and after FirstNet, upon reviewing the state alternative plan and NTIA approval, agrees to a spectrum lease.¹³ Moreover, they may be granted funding to use in constructing the alternative state RAN only if NTIA, after reviewing the state alternative plan, approves. The Commission’s role is therefore key—only State alternative plans that would be fully interoperable with the NPSBN can be approved if Congress’ objectives are to be achieved.

B. Ensuring interoperability across the entire NPSBN with opt-out states will be challenging.

Deploying and preserving an interoperable NPSBN will be a massive endeavor, and may confront unforeseen obstacles. Opt-out States present unique challenges and thus must make compelling showings to the FCC. In particular, achieving the Act’s interoperability directive will require express, credible, and on-going resource commitments from States that choose to deploy their own RANs.

¹² See *id.* § 1442(e)(3)(C). Thereafter, the State may apply to NTIA for funding to construct the RAN and must apply to NTIA to lease spectrum capacity from FirstNet. *Id.* § 1442(e)(3)(C)(iii).

¹³ See *id.* § 1442(e)(3)(C). Opt-out states also must apply to NTIA for a spectrum lease and may apply to NTIA for grant funding. In each case, the State must make additional showings, including that the State has the technical capability to operate, the funding to support, and the ability to maintain interoperability on the NPSBN, among other things. *Id.* § 1442(e)(3)(D).

1. *FirstNet has identified daunting interoperability goals, which require ongoing commitments.*

FirstNet and the Commission have taken important steps to ensure that the network will achieve Congress’s interoperability objectives. The Interoperability Board has set forth its recommended minimum technical requirements for creating and sustaining an interoperable NPBSN.¹⁴ Further, FirstNet has indicated that it is “developing an interoperability compliance matrix that will document the technical standards and network policies that will be needed to ensure interoperability of a State or Territory deployed RAN with the NPSBN.”¹⁵ The matrix is expected to list key data elements that will ensure interoperability and technical interconnectivity between the RAN and the FirstNet Evolved Packet Core (“EPC”).¹⁶ FirstNet intends to finalize the interoperability matrix as it develops a solution with its chosen network partner.¹⁷

While FirstNet and the Commission have begun laying the foundation for a successful network, maintaining nationwide interoperability will be an ongoing challenge, particularly if States opt-out and try to develop their own RANs. Interoperability is not a one-time achievement. Rather, FirstNet’s communications services must support future applications and use cases as technology evolves.¹⁸ It does not lend itself to a static approach. It will require

¹⁴ See Minimum Technical Interoperability Requirements Report.

¹⁵ NPRM ¶ 63 (quoting Richard Reed, FirstNet Chief Customer Officer, *FirstNet Outlines Key Steps for Development of State Plans, Interoperability Requirement* (Jul. 8, 2016), available at <http://www.firstnet.gov/newsroom/blog/firstnet-outlines-key-steps-development-state-plans-interoperability-requirements>).

¹⁶ See *id.*

¹⁷ See *id.*

¹⁸ Minimum Technical Interoperability Requirements Report at 3.2 (“[FirstNet’s] communications services must support existing and future applications and operate across functional, geographic and jurisdictional boundaries.”).

constant commitment—by FirstNet, its network partner, and any opt-out States—to managing evolving technologies and meeting changing public safety needs, all while ensuring a seamless user experience. This goal can only be met through extensive cooperation and coordination among FirstNet, opt-out States, and FirstNet’s network partner. Indeed, as the Interoperability Board has advised, “interoperability can only truly be established and preserved over time through vigilant policies, governance, and practices associated with creation, evolution, and operation” of the NPSBN.¹⁹

With over 60,000 public safety agencies that could rely upon the NPSBN, interoperability will be no small feat. No doubt, as State Chief Information Officers have acknowledged, “opting-out will be a challenging process and one that will require significant resources and technical ability.”²⁰ The NPSBN will be implemented in phases, with participation and equipment coming from multiple vendors. It will be “important to ensure interoperability is maintained throughout all deployment phases” and across all vendors.²¹ With numerous moving components, interoperability will be complex, requiring close coordination and detailed planning.²² Coordinating with opt-out States will only compound these challenges.

¹⁹ *Id.* at 1.2.

²⁰ Comments of the National Association of State Chief Information Officers (NASCIO), NTIA Docket No. 160706588-6588-01, at 2 (Aug. 18, 2016) (“NASCIO State Alternative Plan Program Comments”).

²¹ Minimum Technical Interoperability Requirements Report at 3.2.

²² *See, e.g.*, Comments of NTCA – The Rural Broadband Association, NTIA Docket No. 160706588-6588-01, at 12-14 (Aug. 18, 2016) (discussing challenges associated with providing interoperable coverage in rural areas) (“NTCA State Alternative Plan Program Comments”); Comments of the Competitive Carriers Association, NTIA Docket No. 150306226-5226-01, at 3 (Apr. 28, 2015) (“CCA Second PN Comments”) (noting that there will be “challenges to interoperability arising from the phased implementation of the network, the use of equipment from multiple vendors, and the need for connectivity with networks operated by multiple commercial carriers across geographic and jurisdictional boundaries”).

2. *Opt-out States must make comprehensive showings and commitments to the Commission, which should not unduly narrow its role or rely on self-certification by opt-out States.*

States that choose to opt-out of FirstNet’s nationwide RAN deployment have a responsibility not only to public safety within their own borders, but to public safety and citizens in adjoining States and across the country that will be dependent on an interoperable NPSBN. States that seek to construct their own RAN introduce “many serious risks to the communications capabilities of first responders within [their] own borders as well as across the nation.”²³ As FirstNet notes, “if a single state or territory fails to maintain interoperability with the NPSBN, it would result in a failure of nationwide interoperability.”²⁴ To avoid a harmful cascading effect, FirstNet, NTIA, and the Commission should work together to manage the opt-out process and ensure that Congress’s central goal of maintaining an interoperable network is not compromised.

The Commission has an important role to play in ensuring nationwide interoperability. The Act charges the Commission with responsibility for approving or disapproving State alternative plans based upon its assessment of the State’s showing that the State RAN will be compliant with the Minimum Technical Interoperability Requirements Report and interoperable with the NPSBN,²⁵ based on the compliance matrix. Under this framework, opt-out States must demonstrate to the Commission their full compliance with the Minimum Technical Interoperability Requirements specifically and interoperability with the NPSBN generally,

²³ APCO Comments at 2.

²⁴ Comments of the First Responder Network Authority, PS Docket No. 16-269, PS Docket No. 12-94, PS Docket No. 06-229, WT Docket No. 06-150, at 6 (Oct. 21, 2016) (“FirstNet Comments”).

²⁵ 47 U.S.C. § 1442(e)(2)(C).

including by demonstrating ability and commitment to satisfy the compliance matrix.²⁶ To do so, opt-out States must meet a heavy burden of demonstrating true interoperability and an ongoing, genuine commitment to maintaining interoperability across the network—from the RAN to devices to applications and beyond—throughout the duration of FirstNet’s operation.

The Commission should demand that opt-out States meet this burden, and should include user equipment (“UE”) and applications in its review. The *NPRM* “tentatively conclude[s] that UE-related interoperability considerations are outside of the scope of our opt-out evaluation.”²⁷ This is too narrow a view. User equipment and application interoperability should not be placed beyond the scope of the Commission’s review, or the detailed showings that must be made in any alternative plan. User equipment and applications for first responders represent the edge of the RAN and are key to “radio access” between mobile stations and the base stations. User equipment and applications provided to first responders by an opt-out State must be able to interact with the NPSBN core and access the applications, features and functionality that the NPSBN makes available. Power, antennas, filters and firmware on user equipment will affect the user’s ability to access the NPSBN and the quality of the service. Moreover, the opt-out State RAN will need to support user equipment, applications, features and functionality available to NPSBN users from outside the state when they are in the opt-out state RAN. These sorts of considerations affect not only user equipment, but drive determinations regarding the acceptability of the quality, capacity and redundancy of backhaul as well as equipment, including antennas, radioheads, eNodeBs and other RAN equipment. Accordingly, UE and application interoperability should not be deemed “out of scope.”

²⁶ See *NPRM* ¶¶ 68, 70.

²⁷ *Id.* ¶ 65.

Similarly, the FCC should not rely on “self-certification by the governor or his/her designee” for something as critical as interoperability to the NPSBN.²⁸ While a State’s certification that it will construct, maintain, operate and improve its alternative RAN in compliance with FirstNet interoperability requirements and network policies would be important, it not clear that there is much value in a requirement that a state governor or other official “certify” that its plan would meet interoperability requirements. Having the State or a third party certify that the plan meets FirstNet interoperability requirements would appear to be an abdication of the role Congress assigned to the Commission as an expert agency to support the development and maintenance of the NPSBN. The Commission should fulfill its role, and it should do so based upon an analysis of an opt-out State’s detailed factual showing, comments, and evidence from FirstNet and other interested parties. Failure by the Commission to make a proper determination based on a full factual record could render the NPSBN neither national nor interoperable.

III. STATES SEEKING TO OPT-OUT WILL NEED TO MAKE NUMEROUS TECHNICAL AND OPERATIONAL SHOWINGS AND FUTURE COMMITMENTS TO ACHIEVE AND PRESERVE THE NPSBN’S INTEROPERABILITY.

States that choose to deploy their own RANs will embark upon “a painstaking endeavor.”²⁹ Deploying or acquiring a wireless network is a serious endeavor. From a process perspective, opting-out is likely to impose serious burdens. Opt-out States will need to hire additional personnel, issue requests for proposals, procure network equipment, identify and leverage existing infrastructure, negotiate complex contracts, coordinate with FirstNet to facilitate, test, and certify EPC integration, and take responsibility for managing their network

²⁸ *Id.* ¶ 72.

²⁹ APCO Comments at 4.

infrastructure and operations, including customer care, for years to come.³⁰ The technical challenges inherent in such an undertaking would be staggering for most large private entities; they will be even more challenging for state governments.

Interoperability and interconnection with the NPSBN will be an evolving effort; any State that wishes to deploy and maintain its own RAN must do so with full awareness of the litany of technical, operational, and financial burdens that entails. Below are some of the issues with which opt-out States will need to grapple should they choose to develop alternative plans to deploying their own RANs. This list is not exhaustive—nor can it be—given the evolving technological needs of the public safety community and the uncertainties FirstNet and its network partner will encounter as the NPSBN is deployed over the next 25 years or more.

Among other things, opt-out States will need to:

- *Actively Engage in Coordination Efforts.* Early coordination and close collaboration between opt-out States, FirstNet, and FirstNet’s network partner will be essential. As FirstNet has explained, working closely and sharing information to ensure absolute clarity and transparency will help FirstNet reach its interoperability goals. As this list highlights, an opt-out State will need to work closely with FirstNet’s network partner to connect its RAN to the FirstNet Core and ensure that the State RAN is fully interoperable with the NPSBN.
- *Adhere to the More General Interoperability Board Requirements as Well as The Specific FirstNet Interoperability Requirements and Network Policies.* AT&T agrees that State alternative plans must show how they will comply with both the Interoperability Board Requirements set forth in Appendix B of the *NPRM*,³¹ as well as the specific interoperability specifications of the NPSBN itself. In other words, a State seeking to opt-out should likewise be required to demonstrate compliance with the interoperability matrix developed by FirstNet and its network partner. Interoperability includes compliance with network configuration standards established by FirstNet and its network partner. Interoperability also requires a state RAN to use numbering and addressing plans established by FirstNet and its network partner. In conducting its review, the Commission

³⁰ See *id.* at 3-4.

³¹ *NPRM* ¶ 69.

should “independently and impartially evaluate whether alternative plans comply with the interoperability-related requirements established by FirstNet.”³²

- *Keep Pace with Evolving Open Standards.* Opt-out states must commit resources to evolve their RANs and processes to address and meet evolving best practices and third party standards, as well as fully support any features and services that FirstNet requires in the future. The wireless industry is rapidly evolving to provide consumers with cutting-edge mobile technologies and services. To facilitate this growth, open standards, like 3GPP, are constantly being updated. FirstNet is charged with upgrading the NPSBN as new standards are released.³³ State-deployed RANs likewise must keep pace, complying with new releases from standard bodies like 3GPP, and upgrading their RANs in step with the rest of the NPSBN to ensure that the NPSBN remains fully interoperable. Over and above showing in detail how interoperability with the NPSBN will be achieved at the outset, a State should be required to demonstrate that it will have the means and the expertise to maintain interoperability in the future, to stay in step with upgrades in the NPSBN.
- *Ensure Backhaul Redundancies and Network Diversity.* To provide public safety with appropriate quality of service, opt-out States will need to provide multiple redundant routes of sufficient capacity and security, back to the FirstNet Core. Diverse fiber paths to haul traffic to the FirstNet Core, in particular, will be critical to ensuring reliability and interoperability. Moreover, redundancies will minimize risk of link loss due to single point of failure faults and will help maintain adequate throughput.
- *Aggregate Backhaul.* The State will need to aggregate and transport backhaul to a primary and backup NPSBN location. Using a backhaul aggregation solution specified by FirstNet and its network partner will help ensure that traffic is securely and efficiently transported to the FirstNet Core. Accordingly, State alternative plans should make clear that the State operator will be responsible for aggregating backhaul from each cell site, including monitoring, performance, troubleshooting, and repairs, subject to approval of the backhaul solution by FirstNet.
- *Utilize Ethernet and other Connections of Sufficient Quality, Size, Integrity and Reliability for Backhaul and Transport.* To provide the quality of service that first responders will expect from a LTE wireless broadband network, the State will have to utilize Ethernet or similarly equivalent capacity. To support bandwidth hungry applications and multiple simultaneous users, connections below 100 mbps likely should be the exception and not the rule.

³² *Id.*

³³ *See* 47 U.S.C. § 1422(a) (directing the creation of an NPSBN that “evolves with technological advancements”).

- *Establish and Maintain a Network Operations Center (“NOC”) Providing 24/7 Monitoring and Support.* Responding to RAN outages, customer and user complaints, and other problems with the RAN will be the responsibility of the opt-out States. State alternative plans should confirm that opt-out States will establish a centralized NOC and interface with FirstNet’s network partner to facilitate RAN and Core network maintenance and support. Opt-out States will have to be able to meet appropriate network operation and customer care policies and procedures specified by FirstNet. The State NOC must be staffed on a 24/7 basis with sufficient personnel, and States will need to monitor their RANs 24/7 and must develop and include remote notification and trouble ticket systems. Support must be robust and interoperate with the Core network provider’s systems, to coordinate with FirstNet and its network partner to resolve any issues related to the RAN and Core networks, as well as provisioning new subscribers and timely addressing customer issues.
- *Conform with Various Core Network Standards and Specifications.* State opt-out RANs will need to comply with a number of network standards and specifications, as specified by FirstNet or its network partner, including conforming with naming standards, defined network configuration standards, and addressing plans. In order to guarantee service interoperability, any opt-out State will need to ensure that its device vendor(s) will comply with all relevant technical specification provided by FirstNet and its network partner.
- *Define, Implement and Maintain Rigorous Security Measures.* Security must be included in all aspects of network design, construction, and operation, regardless of RAN type. Security in such a network is complex and must meet the technical requirements of FirstNet and its contractor. Opt-out States will need to help design and implement network and communication security, encryption and authentication schemes with FirstNet and its network partner.
 - Opt-out States must provide a detailed assessment of their processes for ensuring the integrity of their RAN, systems and software. By way of one example, they should explain how Trojan horse or malicious insertions are avoided during the development, deployment, and usage lifecycle.
 - Opt-out States will need to stay abreast of evolving standards and best practices, in conjunction with FirstNet. Opt-out States must provide a detailed assessment of all policies and procedures to ensure compliance with any applicable government and industry-mandated information security standards.
 - Opt-out States will have to provide a detailed assessment of all capabilities for ensuring the confidentiality of all personal and proprietary information on a need-to-know basis.
 - Opt-out States must provide a detailed assessment of access controls. This includes all functional access control capabilities for mediating access to

applications, networks and systems based on documented policy. The assessment should discuss how applications, systems and users gain access rights, *e.g.* role-based access.

- With respect to physical security, opt-out States must provide a detailed assessment of all functional RAN capabilities to ensure the physical protection of assets.
- Opt-out States must provide a detailed statement of their willingness to submit to an independent security audit or assessment by FirstNet, the network partner, or their agents regarding the State opt-out RAN's overall security and trust program.
- Opt-out States must provide a detailed assessment of their capabilities regarding IPsec and encryption algorithms. This should address the type of authentication, integrity and cyphering algorithms supported. Cryptographic implementations must use industry standard cryptographic algorithms and standard modes of operations. For example, IKE2, SHA2, AES.
- Opt-out States must address ciphering key management. For example, key generation must be performed using commercial tools that comply with standards to be developed by FirstNet and its network partner. Trusted certificates (X.509) must be managed in a similar manner, with validation and annual renewal. Self-signed certificates must not be used.
- *Address Risk Management and Acceptance.* Opt-out States must provide a detailed assessment of all documented policies and procedures related to the State RAN to ensure security risk is adequately managed.
- *Address Vulnerability Management.* Opt-out States must provide a detailed assessment of how they will deal in real-time with the discovery or announcement of vulnerabilities in the state RAN and related systems.
- *Include Security Alarms and Logs.* Opt-out States will need to provide a detailed assessment of all real-time security alarming and logging capabilities embedded in their applications, networks and systems.
- *Provide for Incident Response, Business Continuity and Disaster Recovery.* Opt-out States will need to provide a detailed assessment of all documented policies and procedures to ensure application, network, system and information availability in the event of natural disasters and other unusual events, such as a terrorist attack. This includes a detailed assessment of incident response capability during an actual or potential compromise.
- *Utilize Certified and Approved Equipment, Vendors and Service Providers.* It is commonplace for network operators to evaluate, certify and oversee equipment

and service providers and vendors, for quality of service, security, and other reasons. Integration and operational complexity must be reduced where possible.

- *Participate in Robust Certification and Testing.* Commercial networks routinely demand adherence to best practices, as well as various certifications and testing of equipment, devices, software and hardware to connect to Core infrastructure. The Commission should ensure that State RAN operators will use any Public Land Mobile Network Identity (PLMN-ID) codes required by the network operator. This includes device certification requirements. AT&T has extensive experience with testing and certification of network elements, devices, software, and services that operate on its network and knows that such testing is critical to ensuring network functionality, reasonable management, and satisfactory user experiences.
- *Maintain Recommended Software and Patch Loads.* State opt-out RANs must use recommended software and patch uploads to ensure that the statewide network can interconnect with FirstNet's Core effectively. Recommended software updates and patches must be deployed on a timely basis in order to ensure optimal reliability.
- *Comply with a Panoply of Regulatory Requirements.* Deploying, operating, and maintaining a wireless network is a complex task, fraught with obligations. Opt-out States will need to assume various, demanding compliance and surveillance responsibilities. For example, States deploying their own RANs will need to ensure that they meet the many FAA, FCC, environmental, and other local requirements for antennas, cell sites, and deployment of fiber optic cable and other infrastructure. Moreover, many cell sites will require generators that may require States to make various hazardous material commitments.
- *Provision Customers on the State Network.* States that deploy their own RANs will be expected to place customers on the State network. This will likely require provisioning and de-provisioning tools, specifically a BSS/OSS interface with FirstNet, to provision and deactivate users of the NPSBN. It will require opt-out States to develop customer service tools, including various disclosures and user management and training. To enable state RAN users to access the remainder of the NPSBN, and to allow first responders from other states to access the opt out state RAN, the States will have to design, and FirstNet and its network partner will have to review, interoperable interfaces to provide for authentication and feature and functionality support. Opt-out States must provide a detailed assessment of all functional capabilities for enforcing authentication of users to their applications, networks and systems based on identification information. These steps are critical to ensure that only public safety users can connect to the network Core.
- *Track and Manage Users.* States will need a mechanism for distributing SIM cards, provided by the network partner, to customers and tracking device inventory that are capable of accessing the NPSBN. They should choose and manage a mobile device management or enterprise mobile management system

that helps them take security, privacy, and cost-control for users into account. They will also confront complex and evolving authentication and authorization issues affecting devices, systems and data. Government and third party standards bodies study and revisit expectations for access controls and digital authentication. States will have to stay abreast of many evolving efforts and stay in step with NPSBN network policies.

These are only some of the steps States will have to take if they seek to deploy their own RANs.

Critically, opt-out States will need to make their commitment to these tasks on-going, lasting throughout the entire twenty-five year duration of the FirstNet contract. AT&T knows from its relationships with business and network partners that network management issues are ongoing and require a true partnership built on long-term commitments. As the evolution from 3G to 4G LTE and the development of nascent 5G technology demonstrates, wireless technologies evolve rapidly. Today, mobile broadband users rely on technology that would have been unimaginable when legacy public safety systems were put in place. Opt-out States' alternative plans must confirm that they are dedicated to—and will have the budget and capabilities for—keeping pace with upgrades and interoperability challenges for the long haul. With decades of innovation and advancements looming, opt-out States will need to stay abreast of fast-moving technical, operational, and security innovations.

Although integrating opt-out States to the NPSBN will raise difficult issues, AT&T believes that these challenges can be managed through close coordination between FirstNet, its network partner, and opt-out States. To comply with the Spectrum Act's commands, nationwide interoperability must remain a top priority for FirstNet, the Commission, and opt-out States alike. Seamless handoff across varied network topologies should be the goal. To accomplish this mission, the Commission should be clear in demanding that opt-out State alternative plans make substantial commitments to interoperability now and in the future. By doing so, the Commission

will appropriately discharge its obligations under the Act and help solidify the long-term success of a vibrant NPSBN ecosystem.

IV. CONCLUSION

AT&T commends the Commission for soliciting input on its proposed procedures for reviewing and approving State opt-out alternative plans. Interoperability is the hallmark of the Spectrum Act. Enabling first responders to communicate and coordinate emergency response is essential to public safety missions across the country. Ensuring network interoperability will be challenging. The Act permits States to deploy their own RANs, but it forbids such States from frustrating NPSBN's nationwide interoperability.

The Commission has a key role to play in reviewing State plans and demanding detailed demonstrations of how a State's plans would meet each of the NPSBN's interoperability requirements, as well as robust commitments to maintain such interoperability as the NPSBN evolves in the future. Indeed, as AT&T has outlined, States that choose to opt-out will need to undertake substantial long-term technical and operational efforts to achieve the Act's vision of a truly interoperable NPSBN.

Respectfully submitted,

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