

**Before the
National Telecommunications
and Information Administration**

Development of the Nationwide)
Interoperable Public Safety Broadband) Dkt. No. 120928505-2505-01
Network)
)

**COMMENTS OF THE
MID-ATLANTIC CONSORTIUM FOR INTEROPERABLE NATIONWIDE ADVANCED COMMUNICATIONS
("MACINAC") INITIATIVE**

I. Introduction

The District of Columbia, the State of Delaware, the State of Maryland, the Commonwealth of Pennsylvania, the Commonwealth of Virginia, and the State of West Virginia have undertaken an effort to facilitate multi-state governance of the nationwide public safety broadband network ("NPSBN") in the mid-Atlantic region. The Mid-Atlantic Consortium for Interoperable Nationwide Advanced Communications Initiative ("MACINAC" or "MACINAC Initiative") has drafted a charter currently under review by each of the six states.

The Notice of Inquiry¹ issued on behalf of the First Responder Network Authority ("FirstNet") by the National Telecommunications and Information Administration's ("NTIA") seeks comment on the "FirstNet Nationwide Network (FNN) Proposal" presented at the FirstNet Board meeting on September 25, 2012. It also seeks "input from interested stakeholders on other options that the FirstNet Board should consider in meeting the Act's requirements to deploy the PSBN based on a single, nationwide network architecture that evolves with technological advancements."² Though MACINAC is still nascent,

¹ *Development of the Nationwide Interoperable Public Safety Broadband Network*, Notice of Inquiry ("NOI"), 77 Fed. Reg. 60680 (Oct. 4, 2012).

² *Id.* at 60681.

it submits these comments through the Statewide Interoperability Coordinators (“SWICs”) for the MACINAC states as a regional partnership of states.

II. The MACINAC Initiative: A Regional Approach for the Mid-Atlantic States

Early in 2011, the SWICs in the states of Delaware, the District of Columbia, Maryland, Pennsylvania, Virginia and West Virginia first sponsored and began developing a multi-state, regional approach to deployment and operation of the mid-Atlantic portion of the nationwide public safety broadband network. The MACINAC Initiative is focused on coordinating its member states to work together where concerted action will result in improved interoperability or cost savings. In addition to its charter, MACINAC has held stakeholder meetings throughout the region to provide policy and technical education and develop user requirements. It has also begun identifying government-owned assets in the states, identified and documented a cooperative procurement process that would allow all states to purchase from a single contract vehicle, and engaged critical infrastructure industries in discussions regarding their potential inclusion in a sustainable business model for the portion of the nationwide network within the MACINAC region.

All of MACINAC’s work is designed to support FirstNet’s efforts to deploy the Nationwide Public Safety Broadband Network (“NPSBN”) in the region, including assisting in the consultation process mandated in the Act.³ By providing a mechanism for the states to coordinate their activities and adopt concerted approaches to common tasks, MACINAC will serve to simplify the consultation process. Depending upon FirstNet’s approach, MACINAC may also serve as a model for regional deployment of the nationwide network.

Though MACINAC is first and foremost focused on the deployment and sustainable operation of the NPSBN in the mid-Atlantic region, it may also serve additional interoperability functions. For

³ Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, 126 Stat. 156 (2012) (“Act”), § 6206(c)(2)(A).

example, through this regional mechanism, the member states may elect to implement and share public safety applications regionally (whether over the NPSBN or otherwise), even in the absence of an agreement to implement such applications nationwide. As the individuals in each state most directly charged with ensuring communications interoperability, SWICs are central to the development not only of interoperable public safety broadband connectivity but also data interoperability in and among their states. Thus, as sponsors of the MACINAC Initiative, the MACINAC SWICs stress the importance of interoperability beyond the immediate task of implementing the NPSBN.

III. The Role of States, Individually or as a Region

A. State and Local Public Safety Requirements Must Drive Architecture Decisions

The Act guarantees at least a consultative role to state and local governments, defined in Section 6206(c)(2)(A). In adopting the second resolution offered at the meeting on September 25, the Board set out to implement this aspect of the Act when it “establishe[d] a State, Regional, Local, and Tribal Consultation Committee and direct[ed] it to establish and execute FirstNet’s State, Regional, Tribal and Local Consultation Plan.” MACINAC strongly supports this effort and looks forward to working with the Consultation Committee.

By ensuring that states are able to consult with FirstNet in “carrying out its responsibilities under the Act,”⁴ however, Congress clearly meant to ensure *meaningful* consultation, a give-and-take of views and information that would have an appropriately substantial impact on the eventual design, architecture, and business model associated with the network. As reflected on its cover page, the FNN presentation is a “proposal” to the Board by a member of the Board. MACINAC is concerned that the Board is considering a network architecture proposal before the Board has had an opportunity to solicit, much less digest, any information from states that would describe public safety’s requirements for the

⁴ Act, § 6206(c)(2)(A).

network.⁵ MACINAC urges FirstNet Board members to avoid adopting, even as a preliminary or tentative matter, any proposal not based on a thoughtful and informed analysis of the requirements of state and local public safety stakeholders via the consultation process.

B. States in Cooperative Partnership with FirstNet

Though the FNN presentation makes little reference to the role of state and local governments in the design and implementation of the NPSBN, as well as the business model that will have to sustain the network going forward, that role will be critical to FirstNet’s success. As a group of states working together to achieve the goals shared by FirstNet, MACINAC urges FirstNet to work in partnership with the states not only on the planning and design of the NPSBN, but also in the deployment, operation, and maintenance of the network and in developing and implementing the associated business model.

From its start well before the passage of the Act, the MACINAC Initiative has adopted a consolidated, multi-state approach driven by the same logic that underpins the Act’s single nationwide network mandate: that a single network will provide both increased interoperability and substantial economies of scale. Thus, MACINAC strongly endorses the view that the nationwide network will be better for all if every state actively participates in and uses the NPSBN—in other words, if all states “opt in.”

⁵ For example, the Broadband Working Group of the National Public Safety Telecommunications Council (“NPSTC”) is preparing a document describing these requirements. *See*, <http://www.npstc.org/broadband.jsp>. MACINAC highlights particularly the importance to public safety operations of local capability to manage an incident, configure devices, control device provisioning, and manage access to the network generally as well as prioritization of access to network resources more specifically. Security requirements will also be critical, particularly with regard to the open, public applications development approach Chairman Ginn described during the Board meeting. In this regard, FirstNet may find useful the report of the Security and Authentication Working Group of the Public Safety Advisory Committee to the FCC’s Emergency Responder Interoperability Center. *See*, <http://www.fcc.gov/encyclopedia/emergency-response-interoperability-center-eric-public-safety-advisory-committee>. Before progressing toward any particular network architecture or business model, FirstNet should have a robust understanding of such requirements.

States do, however, vary in their requirements, capabilities, preferences, and tolerances; a “one-size-fits-all” nationwide FirstNet offering is unlikely to meet all states’ needs. One state may have a lower service cost tolerance, while others may have differing views on the acceptable minimum level of service. In a scenario where FirstNet, after consulting with the states as required, presents a service that is acceptable only to some states, all will be deprived of the benefits in interoperability and efficiency that would accrue if all states opted in. The FNN presentation proposes an architecture concept prior to FirstNet collecting state requirements. MACINAC is concerned that the FNN presentation offers neither an acknowledgement of the differences among states nor a mechanism for states to work with FirstNet to accommodate those differences.

For these reasons, MACINAC urges FirstNet to provide an avenue for “opt-in” states or groups of states to enter into partnerships with FirstNet under which the states may take on a more decisional role in the planning, deployment, operation, and maintenance of the network and in developing and implementing the associated business model. These partnerships would be cooperative, mutually beneficial, and bounded by parameters defined by FirstNet within its authority under the Act. Through such partnerships with FirstNet, states would help ensure that the quality and affordability of the NPSBN service meet the particular needs of first responders in those states.

Some states are better situated than others to interest in-state private entities in participating in or subscribing to the network, thereby helping offset ongoing operational costs, for example. FirstNet should work in partnership with states to enable them to execute state-specific public-private agreements and to directly realize the resulting benefits. Similarly, state-FirstNet partnerships could enable states to more directly support and manage deployment of the NPSBN within the state, resulting in potentially more cost-effective, user-aligned implementation. States will differ in their desired level of involvement beyond the consultative role required in the Act, but in order to maximize

interoperability and scale efficiencies for public safety nationwide, FirstNet should partner with states to make that level of involvement possible.

IV. Leveraging Carrier Networks

A. Commercial Carrier as Landlord

The FNN presentation correctly recognizes that without using all available resources, the NPSBN will not come to fruition on a truly nationwide basis without substantially more funds than the Act provides. At the meeting, Chairman Ginn stated his intent that the NPSBN would cover “every square foot” of the U.S.; that is an enormous undertaking that will require the leveraging of sites and infrastructure from all manner of entities, from commercial carriers to state, local and tribal governments, and other entities (such as utilities) that possess such assets and are willing to negotiate advantageous terms with FirstNet. By opening the door to a variety of potential partners, FirstNet will be able to win the best terms for public safety users; without such an expansive approach, it may not be able to provide a service that meets its customers’ cost and quality requirements at all.

The FNN presentation (slide 10) describes an approach in which the Band Class 14 public safety network (the NPSBN itself) is comprised to some extent of eNodeBs (“eNBs”) mounted on carrier towers, saving FirstNet the complexity and expense of identifying or constructing alternative towers. The presentation seems to suggest that mobile network operators would be the preferred source of sites for FirstNet, though it does state that the “FNN can also partner with” rural telecommunications companies, rural electric companies, mobile satellite companies, and state and local networks. MACINAC agrees that carrier sites must be included in the pool of potential NPSBN sites, but it urges FirstNet to consider other potential sources of sites equally, weighing them based on the site provider’s operational and economic terms. Though looking to carrier sites first may seem a quicker and less complex approach, it will not in all cases (perhaps not even in most cases) be a better approach for the public safety network.

Perhaps the greatest concern regarding reliance upon commercial carrier sites relates to FirstNet’s ability to negotiate with those carriers. On a broad, national basis, there are very few carriers with which to negotiate, thus limiting the competitive pressure upon carriers to bid aggressively for FirstNet’s business by offering the most attractive terms. Using commercial sites, of course, will require payment of rent on an ongoing basis, thus raising total operational costs of the network. For carriers, there already exists the worry that the NPSBN will compete for existing carrier customers—not just public safety users but critical infrastructure customers and perhaps others, as well. As the non-competitive landlords of the NPSBN, carriers will be in a position to make up in rent what they may otherwise lose in subscriber fees. Further, once FirstNet eNBs are installed on carrier towers and put into service, FirstNet will have little realistic ability to switch landlords if it so chooses—whether because the carrier does not perform as required, or because a more advantageous option presents itself to FirstNet.

For these reasons, MACINAC urges FirstNet to use government-owned sites for the NPSBN where the operational and economic terms are advantageous. Though such sites may not be without their own complexities, they will not suffer from commercially driven drawbacks such as those described above. Since the beneficiaries of the network are state and local first responders, the interests of the landlord and tenant would be better aligned than in the case of commercial infrastructure. State and local governments have the same interest as FirstNet in providing affordable and quality service for the NPSBN. State and local governments will not be concerned about using rent to make up for any lost subscriber revenue. The Act recognizes the importance of leveraging existing infrastructure based on economic considerations: not only does it require FirstNet to leverage “commercial or other communications infrastructure” “to the maximum extent economically desirable,”⁶ but it also applies

⁶ Act, §§ 6206(b)(3), 6206(b)(1)(c), and 6206(c)(3)(A).

the same requirement to the use of “Federal, State, tribal, or local infrastructure.”⁷ FirstNet should not overlook the benefits of greater reliance upon government-owned infrastructure than upon commercial infrastructure.

B. Relying on Commercial Networks to Achieve Reliability

Slide 11 in the FNN presentation is entitled “Multiple Network Diversity Increases Reliability.”

The slide includes an illustration showing that as the number of commercial networks available to users of the NPSBN increases, the overall assurance of some mobile connectivity for first responders also increases. It is undoubtedly true that where a multiplicity of networks is available, a user of any one could maintain connectivity by moving to another when the user’s current network becomes unavailable. Thus, a user of the NPSBN could, if his or her device is capable, use a commercial network if the NPSBN is unavailable. But the existence of additional networks does not make any one of those networks—including the NPSN—*itself* more reliable.

MACINAC agrees that using commercial networks as roaming partners where the NPSBN is unavailable—whether because of outdoor coverage holes, inability to provide indoor coverage, network overload, or other causes—is a necessary and valuable approach. The availability of commercial networks, however, cannot justify the construction of an NPSBN that fails *on its own* to meet public safety reliability requirements. NPSBN reliability at or near 99.999% has long been a goal of public safety.⁸ The illustrative table on slide 11 suggests⁸ that FirstNet would achieve 99.999% reliability by including in the calculation the availability of commercial networks. In other words, the presentation suggests that leveraging commercial networks would allow FirstNet to build an NPSBN that is not, on its

⁷ Act, § 6206(c)(3)(B).

⁸ *Public Safety 700MHz Broadband Statement of Requirements – Version 0.6*, Broadband Working Group of the National Public Safety Telecommunications Council (NPSTC) (Nov. 8, 2007), § 2.2 (individual element availability of 99.999% and system availability of 99.995%, noting voice systems provide 99.999% availability), *available at* <http://www.npstc.org/statementOfRequirements.jsp>.

own, as reliable as public safety might like or even require. MACINAC urges FirstNet to avoid such an approach unless the commercial networks guarantee a level of service at least equivalent to that provided by the NPSBN; otherwise, the NPSBN should be as reliable as public safety needs it to be, regardless of the availability of any commercial networks.⁹

Though MACINAC supports the idea of enabling NPSBN users to roam to four different commercial cellular networks and a satellite system with the same device they use on the NPSBN, we are concerned about the business viability of creating and purchasing such a device. It is one thing to urge a national carrier to build devices that work on the NPSBN and its own 3G and 4G networks; asking that carrier to place massive orders of devices that include bands and technologies used by other carriers seems a tall order. In its Report providing its recommended minimum technical requirements for the NPSBN, the Technical Advisory Board for First Responder Interoperability predicted carriers' resistance to such a request and moved to address it, at least partially. The Report, as transmitted by the Federal Communications Commission to FirstNet (via NTIA) as required under Section 6203(c)(3)(A) of the Act, states,

FirstNet should ensure that its devices enable FirstNet to enter roaming agreements and public-private partnership arrangements with any commercial service provider and allow FirstNet users to obtain service in those commercial networks. A device that is capable of obtaining such service in certain bands shall operate on all FirstNet roaming partner networks operating in those bands and not be locked to a subset of FirstNet roaming partner networks operating in those bands.

The corresponding Recommended Requirement 15 reads as follows: "All User Devices (UEs) deployed on the NPSBN that support roaming onto commercial LTE networks SHALL operate on any FirstNet

⁹ Though not addressed in the FNN presentation, the NPSBN in rural areas with no reliable commercial coverage presumably would need to be built to meet public safety reliability requirements on its own. For example, in the National Radio Quiet Zone, an area covering approximately 13,000 square miles spanning the border between Virginia and West Virginia, it is difficult to deploy *any* radio systems at all, whether public safety or commercial. See, <http://www.gb.nrao.edu/nrqz/>.

roaming partner network using bands supported by the device.”¹⁰ Thus, though the Report recognizes that carriers may resist enabling their devices to operate on other networks and partially addresses that concern by requiring a carrier’s LTE devices to work on any LTE network in the same band, the Report does nothing to help ensure that a device works on LTE networks in *other* bands, or non-LTE networks in *any* band. It may not be realistic for FirstNet to convince partner carriers to produce devices for the NPSBN that operate not only on the device-producing carrier’s network, but also on the networks of other carriers, using different bands and different technologies.

However daunting the technical and business challenges, however, ensuring the mass production of such a multi-mode, multi-band, public safety-grade device is ultimately critical to the multiple-network approach to achieving reliability illustrated on slide 11 of the FNN presentation. If, as the slide suggests, required reliability is to be achieved by reliance on a multiplicity of available commercial networks, then every user of the NPSBN must carry a device that can operate on three or four commercial networks everywhere in the U.S. Because commercial networks (especially in more rural areas) are often regional and not nationwide in service area, the four networks available in one part of the country may be different—and operate on different bands with different technologies—from the four networks available in another part of the country. Thus, a single device that can move between these two parts of the country may need to operate on networks that include more than four mode/band combinations. In light of the challenges of the required device interoperability, it is perhaps a better approach to build a single, ubiquitous NPSBN that meets public safety reliability requirements *on its own* without substantial reliance upon commercial networks.

In addition, though we endorse the vision, we are concerned that the physical complexities of a multi-band, multi-mode device supporting the bands and technologies of up to four different cellular

¹⁰ *In the Matter of Recommendations of the Technical Advisory Board for First Responder Interoperability*, Order of Transmittal, PS Docket No. 12-74, FCC-12-68 (June 21, 2012) App. A at 45, Sec. 4.2.1.3.

carriers and an additional satellite-based carrier will cause the price of such a device to exceed public safety's ability to pay. Producing such device in mass market quantities would reduce the unit price, but achieving such scale is at odds with carriers' recognized reticence to produce devices that work on other carriers' networks, as discussed above.

Finally, to the extent that such leveraging of commercial infrastructure entails an arrangement whereby commercial entities may access public safety broadband spectrum, the devil truly is in the details. MACINAC recognizes the potential benefit to the NPSBN business model of monetizing the value of the public safety spectrum. Nonetheless, FirstNet *must* ensure that public safety has access to and control of *all* of the public safety broadband spectrum when it requires use of that spectrum. Such certainty requires not simply contractual language, but also technical and operational capabilities that public safety must retain to enforce that access and control in real time and without complication or delay.

V. Conclusion

Sponsored by the SWICs of six mid-Atlantic states, the MACINAC Initiative set out almost two years ago to maximize interoperability and efficiency by supporting the deployment of a single public safety wireless broadband network, the same strategy adopted in the Act and followed by FirstNet. MACINAC urges FirstNet to take steps to ensure the success of this strategy by approaching states (or groups of states such as MACINAC) as partners, engaging them at the levels that they, to varying degrees, may require—including the negotiated sharing with FirstNet of decisional roles. MACINAC also urges FirstNet to receive and digest state and local public safety requirements prior to adopting any architectural or business model solution, even on a tentative basis. Finally, though MACINAC sees the potential benefits of leveraging existing commercial infrastructure where appropriate, it urges FirstNet to carefully consider the business challenges and conflicting incentives of heavy reliance upon such

commercial infrastructure, as well as the implications for reliability and service quality for public safety users.

Respectfully submitted,

Sponsors of the MACINAC Initiative:

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