

**Before the
National Telecommunications and Information Administration
Washington, DC 20230**

In the Matter of)	
)	
Notice of Inquiry on FirstNet Conceptual)	Docket No. 120928505-2505-01
Network Architecture)	
)	

COMMENTS OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION

Danielle Coffey
Vice President & General Counsel, Government
Affairs

Mark Uncapher
Director, Regulatory and Government Affairs

Brian Scarpelli
Manager, Government Affairs

TELECOMMUNICATIONS INDUSTRY ASSOCIATION
10 G Street N.E.
Suite 550
Washington, D.C. 20002
(202) 346-3240

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Executive Summary

The Telecommunications Industry Association (“TIA”) and our member companies strongly support the important mission of the First Responder Network Authority. TIA’s hundreds of member companies provide, develop, manufacture, and supply information and communications technology (ICT) products and services, including all components of the planned national public safety broadband network. A robust FirstNet network, developed utilizing a competitive vendor ecosystem that encourages all qualified parties to engage in FirstNet’s proposal process, can give emergency responders access to new video and data applications that are not currently available. Such success requires FirstNet to fully consider the wide range of interests affected by its decisions and processes. TIA encourages FirstNet to carefully consider and address the business case issues associated with supporting a national public safety broadband network.

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COMMENTS OF THE TELECOMMUNICATIONS INDUSTRY ASSOCIATION

I. Introduction

TIA hereby submits comments to the National Telecommunications and Information Administration’s (“NTIA”) Notice of Inquiry on the First Responder Network Authority’s conceptual network architecture.¹ TIA is the leading trade association for the information and communications technology (“ICT”) industry, whose hundreds of member companies manufacture or supply the products and services used in global communications across all technology platforms. TIA represents its members on the full range of public policy issues affecting the ICT industry and forges consensus on industry standards. For over 80 years, TIA has enhanced the business environment for broadband, mobile wireless, information technology,

¹ See *Development of the Nationwide Interoperable Public Safety Broadband Network* (Docket No. 120928505–2505–01), National Telecommunications and Information Administration, 77 Fed. Reg. 60680-60681 (Oct. 4, 2012). NTIA later extended the due date of this comment until November 9, 2012. See *Development of the Nationwide Interoperable Public Safety Broadband Network* (Docket No. 121031596–2596–01), National Telecommunications and Information Administration, 77 Fed. Reg. 66588 (Nov. 6, 2012).

networks, cable, satellite, and unified communications. TIA has long supported the public safety community with the tools of advanced communications. Additionally, TIA recognizes the opportunities the latest communications technologies have for empowering the public safety community to perform their vital mission. TIA has numerous members which have and continue to enable early 700 MHz PSBN deployments. TIA is also a standards development organization accredited by the American National Standards Institute.

II. TIA Strongly Supports FirstNet & the Development of a Nationwide Public Safety Broadband Network

TIA has long supported the various jurisdictions that have taken early steps to deploy public safety broadband networks and strongly advocated in favor of the public safety spectrum provisions of the Middle Class Tax Relief and Job Creation Act of 2012 (“Act”).² We encourage FirstNet (“Authority”) to regard the Association and our member companies as an available resource. As telecommunications manufacturers, operators and system integrators, our member companies are sources of expertise in addressing the full spectrum of communications network and service requirements, and have extensive experience in deploying advanced telecommunications infrastructure.

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

III. The Nationwide Public Safety Broadband Network Will Benefit from FirstNet Having Appropriate Institutional Resources & Stakeholder Input

TIA recognizes the vital urgency in finally establishing a nationwide public safety broadband network and commends the Authority for attempting to move forward expeditiously. Yet FirstNet faces significant challenges in reaching this important objective. Not the least of these hurdles are estimates that the \$7 billion available for funding may provide less than half of the capital required, separate and apart from the funds needed for recurring operations and maintenance costs.³ To overcome this reality, FirstNet must engage the available inputs from all stakeholders.

Consistent with the very substantial needs of a \$7 billion technology enterprise, the enabling legislation provides FirstNet with access to appropriate and necessary professional expertise:

Selection of Agents, Consultants, and Experts-

*(1) IN GENERAL- The First Responder Network Authority shall select parties to serve as its agents, consultants, or experts in a fair, transparent, and objective manner, and such agents may include a program manager to carry out certain of the duties and responsibilities of deploying and operating the nationwide public safety broadband network described in subsections (b) and (c) of section 6206.*⁴

Similarly the legislation envisions FirstNet engaging the necessary advisory groups.⁵

³ See GAO, *Implementation of a Public Safety Broadband Network*, GAO-12-343 (Feb. 2012) at p.29, available at <http://www.gao.gov/assets/590/588795.pdf> (“GAO PSBN Report”).

⁴ Act at Sec. 6205(b).

⁵ See Act at Sec. 6205.

TIA recommends that FirstNet make full use of the resources available through broad stakeholder participation. As previously noted, the Authority will benefit from specific expertise in identifying and addressing the public safety requirements, and with advanced telecommunication network deployment. Among the resources FirstNet should draw upon are telecommunication manufacturers and systems integrators.

Large, multi-year, complex system procurements can raise challenges even with the most experienced procurement processes. To avoid known risks alone, which can and have challenged other technology efforts, FirstNet would benefit from drawing upon available expertise in managing such complex program management risk. This includes technology evaluation, integration and procurement management expertise.

At the same time, FirstNet must be mindful of conflicts of interest, both direct and indirect, including transparency of independent consultants who may have preexisting commercial relationships with industry stakeholders. To ensure FirstNet is getting appropriate voluntary input, such relationships must be documented and transparent, and evaluated for attribution to those entities that may sponsor such consultants.

Similarly, TIA recommends that the Authority draw upon the experience of interoperable early deployments and pilot projects. These early adoptions can inform FirstNet on how best to leverage existing public safety, State and local, as well as commercial resources, and form public-public and public-private partnerships. FirstNet would benefit from incorporating lessons learned into the development of best practices.

IV. NTIA Should Ensure That Public Safety Requirements Are Identified Early

TIA supports the FirstNet Board's interest in moving expeditiously to address its responsibilities. As FirstNet works to define a network architecture, TIA encourages FirstNet to simultaneously work to incorporate an articulated understanding of any outstanding public safety community's mission critical service needs that are not yet identified. The network architecture, absent any meaningful consideration of mission critical service needs, cannot be developed to draw foremost from the experience of core first responders such as fire, police and EMS. Nor can FirstNet inform its network architecture to account for a wide range of secondary first responders, such as highway, corrections, sanitation, and critical infrastructure providers, such as utilities. Secondary users, if appropriately coordinated with the State, local and tribal first responders, may prove to be a financially invaluable partner to FirstNet as it seeks to leverage a broad base of secondary users fees, capital, and resources the secondary user community may contribute to this national objective. Failure to consider mission critical service needs alongside network architectures threatens to put the project's "solution" ahead of the "needs," when in reality they are symbiotic in nature. The risk of developing specific requirements after the architecture is completed is that future specifications may be far more difficult or costly to incorporate into the network because inadequate provisions had been made for these requirements.

We note, for example, the work undertaken by the National Public Safety Telecommunications Council ("NPSTC"),⁶ SAFECOM, and APCO's Broadband Committee as

⁶ See <http://www.npstc.org/>

important to FirstNet's efforts. Even more important is work yet to begin, such as that performed by State and local governments as part of NTIA's State and Local Implementation Grant program.⁷ Part of this work is intended to fund State recommendations to FirstNet about the service and applications needs of actual First Responders. TIA does not endorse any specific set of proposed requirements. We note a number of categories of final requirements which, at some point, need to be addressed to provide mission critical services and which are critical in that no First Responder is under any obligation to subscribe to a FirstNet service in the first instance:

- Quality of Service: What guarantees will a commercial provider offer with respect to latency and throughput to satisfy public safety needs?
- Reliability: What level of reliability must an operator agree to provide FirstNet? What metrics will be used to track this? What degree of resiliency is required in a commercial network to meet the needs of First Responders?
- Security: What are FirstNet's appropriate cyber and physical security needs? To what extent are they distinct from those of an operator's requirements?
- Spectrum Sharing: Consistent with the range of issues outlined above, are there mutually agreeable terms and conditions that could enable commercial mobile operators to use any underutilized FirstNet spectrum capacity for their commercial operations?
- Priority and/or preemption: To the extent FirstNet leverages existing networks, how will FirstNet traffic be treated on those networks?
 - What will the relationship be between a network's own traffic and that of public safety?

⁷ See Act at Sec. 6302.

We also suggest there is value in adding to the general framework the issue of consistency and continuity of service.

- Consistency and continuity of service: From jurisdiction to jurisdiction, whether local-to-local or local-to-state, state-to-state or local/state-to-federal, will the network created and services provided result in a consistent user experience -- that is responsive and adherent to the needs for jurisdictional mobility and jurisdictional governance?

Although many of the detailed public safety network requirements are familiar, FirstNet would benefit from more precise definitions and quantification where appropriate.

An additional consideration is the need to create a functional management and competent organizational team in the form of the FirstNet Agency, itself. The FirstNet Board should not be a management team, but rather provide the essential executive leadership to ensure FirstNet moves forward properly on all fronts. The FirstNet management organization must build a team of professionals who drive the process, can translate the user and market needs into a design and business-model, and manage day-to-day operations. They would be responsible for contracts, capacity, subscribers, partners, roaming agreements, interoperability and numerous others, and then manage the deployment and FirstNet's ongoing operation. While TIA appreciates the need for FirstNet to take advantage of NTIA resources as it begins its work, TIA believes that FirstNet must staff up, and much like the FirstNet board itself, FirstNet's staff requires practical experience in network deployment, operations, and technology procurement.

V. Network Operator Model

FirstNet’s “Conceptual Network Architecture” appropriately raises a number of critical issues associated with designating a network carrier. For example TIA concurs with the threshold conclusion that, where FirstNet leverages commercial carrier networks, no single carrier may be able to provide necessary coverage in each geographic region. However, breadth of coverage should only be one of many considerations. As discussed above, more robust development of network requirements forms a critical component of any analysis.

Similarly, it would be more instructive if FirstNet might clearly articulate the business model underlying its conceptual network architecture, which in turn might render the network architecture itself more accessible to thorough analysis. For example, based on the presentation itself, the “Conceptual Network Architecture” might be analogized in many respects to a Mobile virtual network operator (MVNO),⁸ in which the public safety broadband network may be, to a greater or lesser extent, dependent on commercial carriers, at least from the start. Although the proposed design outline anticipates specialized Band 14 access and prioritization, it is not clear the extent to which other specialized public safety requirements would be wholly dependent on the capacity of various participating commercial carriers. To the extent that some carriers in various geographies are better suited to meet the specific requirements of local public safety agencies or offer similar public safety-grade services on their commercial networks at similar cost, might those agencies opt to bypass FirstNet in order to contract directly with carriers? In

⁸ A Mobile virtual network operator (“MVNO”) is characterized by neither having their own mobile license nor own mobile infrastructure. The MVNO has the direct customer relationship with the end user as a reseller of telecommunications services.

addition to network capability considerations, commercial carriers able to support the requirements of first responders might be able to offer more attractive commercial terms, such as contract length. This could reduce many of the economies associated with having an integrated single national public safety broadband network. Answers to these questions may have significant ramifications, in that the wrong answer (TIA is not suggesting there is a correct answer today) may make it difficult for FirstNet to win many direct subscribers, as State and local public safety jurisdictions across the nation determine there is no actual benefit to switching from their existing services to FirstNet-provided services. State and local procurement processes alone may serve as a barrier-to-entry to the extent FirstNet's initial architecture does not meaningfully differentiate the service it provides versus services of existing commercial providers.

To the extent that FirstNet leverages commercial carriers, the FirstNet "mixed carrier" model poses several significant business challenges. For example:

- How will compensation issues, such as roaming, be resolved? In any capital expenditure, these "cost of operations" are a significant consideration in the buying decision.
- How will public safety agencies be able to change carrier relationships? Does FirstNet anticipate structuring competition among carriers for public safety agency business?
- Alternatively, does FirstNet anticipate making these contractual choices on behalf of public service agencies?
- Further, how are all of the delivery-chain participants performance-managed, objectively held accountable, and interoperability assured?

Independent of carrier partner considerations, the presentation suggests the deployment of Band 14-specific infrastructure at the inception of service. Will this be primarily in congested urban environments or in rural areas? Some mix of urban and rural deployment of value to State and local public safety jurisdictions? Clarifications about where and when Band 14 infrastructure will be deployed are important to create a sense of vision that is compelling to First Responders.

TIA recommends that instead of solely focusing on leveraging the assets of selected carrier(s) in a carrier-led model (e.g. the vast majority of which are leased by carriers in the context of towers and other infrastructure), FirstNet might consider a model that incorporates a broader ecosystem of stakeholders. For example, system integrators may better maximize usage of existing assets (towers, right of ways, etc.) owned by a wide range of stakeholders rather than solely focusing on those owned by existing commercial service providers. This could also ensure FirstNet can prioritize of public safety considerations over those of commercial carriers.

Without a clearly defined business model, it is difficult to discern the actual meaning of FirstNet's conceptual architecture.

VI. Developing a “Business Case” for Deploying a Nationwide Public Safety Broadband Network

Associated with the business relationship and “Network Operator Network” questions raised above, is a broader challenge for FirstNet of developing a business case for network deployment. While the \$7 billion in funding provided under the Spectrum Act makes a substantial contribution toward the deployment of the Nationwide Public Safety Broadband

Network, it is widely acknowledged that it is not enough to build a free-standing network. A February 2012 Government Accountability Office (“GAO”) report, Emergency Communications: Various Challenges Likely to Slow Implementation of a Public Safety Broadband Network, comments that although a May 2010 FCC report had estimated the cost as \$15 billion, “FCC staff told [GAO], based in information in the marketplace, the cost of the network has risen since the May 2010 publication.”⁹

To the extent that FirstNet can perhaps provide less than half of the necessary financial resources for capital investment, the Authority must be prepared to attract and leverage additional resources. FirstNet should be prepared to accommodate public safety agencies on a number of transition issues, including the timing of capital expenditures and the integration of the network with existing public safety and commercial communications resources. Additionally, public safety agencies, as public entities, typically have well developed legal procurement requirements. Given FirstNet’s own limited resources, its business case needs to be sufficiently flexible to allow public safety agencies to draw upon additional funding. TIA recommends that FirstNet require any State/local jurisdictions bringing resources to the table utilize transparency and competition requirements at least as strong as is expected of FirstNet under the Act.

These capital expenditure estimates address the capital costs associated only with constructing the buildout of a nationwide Public Safety Broadband Network. FirstNet and the public safety agencies will have to further absorb ongoing, recurring expenses, such as the roaming expenses, an issue raised above. These expenses will also be factored into “cost of ownership” for capital expenditures. Other issues will include the integration of public safety

⁹ GAO PSBN Report at 2 (FN 7).

communications with other government technology resources. Central to understanding FirstNet's business case will be determining how public safety agencies will be able to negotiate in the future for telecommunication services.

This procurement and the objectives it is meant to support, is extremely complex and has a high degree of risk in terms of service delivery, deployment and operation. We urge NTIA and FirstNet to define the necessary management and oversight mechanisms and structures to ensure appropriate services and deliverability. In order to incorporate accountability processes into its operations, we also urge the Authority to define metric management and risk management into the design, development and implementation of the business. In the absence of internal resources, a third party program manager could help form, structure, and create the FirstNet entity.

VII. Application Architecture

Beyond the network access and connectivity created by a National Public Safety Broadband Network, the most important value will arise from the real-time use of applications that will "ride", be enabled by, and are stored on, the network. The development of applications that are suitable for use on this Network is appropriate and needed. Applications that will meet the needs of fire, police and EMS first responders are myriad in possibility and many already exist in legacy form. Understanding and defining what new applications are created, how they will be accredited, standardized and certified, and how they will be stored will be essential for FirstNet. There must also be a sustainable technical and operational model that makes it easy for

existing technology resources to be used during the transition while the network is being deployed. Essential to the success of this model will be the integration of available public safety information technology resources. For example, timely access to databases requires more than communications connectivity. Realizing the ultimate value and utility found in applications for first responders takes us right back to the point of making sure FirstNet identifies and understands – upfront – the needs of the public safety community and its network users.

VIII. Conclusion

In addition to its consideration of a tentative Conceptual Network Architecture, TIA urges the FirstNet board to actively engage stakeholders, to identify public safety requirements early, and to develop a more clearly defined business case in support of a nationwide public safety broadband network.

Respectfully submitted,

TELECOMMUNICATIONS INDUSTRY ASSOCIATION

Danielle Coffey
Vice President & General Counsel, Government
Affairs

Mark Uncapher
Director, Regulatory and Government Affairs

Brian Scarpelli
Manager, Government Affairs

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