NTIA Notice of Inquiry on the Development of the Nationwide Interoperable Public Safety Broadband Network

Comments of APCO International

November 1, 2012

Docket No. 120928505-2505-01

The Association of Public-Safety Communications Officials-International, Inc. (APCO) submits the following comments in response to the above-captioned Notice of Inquiry (NOI) issued by the National Telecommunications & Information Administration (NTIA) on behalf of the First Responder Network Authority (FirstNet). Founded in 1935, APCO is the nation's oldest and largest organization of public safety communications professionals. Its members include state and local employees of law enforcement, fire, and emergency medical service departments, as well as 9-1-1 public safety answering points (PSAPs) and emergency operations centers (EOCs). APCO's members are the public safety communications professionals that will be the primary users of the nationwide public safety broadband network.[1]

As set forth in more detail below, APCO generally supports many of the network architecture concepts advanced at FirstNet's inaugural meeting, and recommends a number of considerations in designing the network. Further, APCO strongly supports a robust framework for development of public safety-specific applications ("apps") for use by first responders on the nationwide network, and for which APCO is well-suited to play a key role.

I.   Network Architecture

       a.   General Design

APCO applauds the FirstNet board for working swiftly at its inaugural meeting to outline a conceptual vision of the FirstNet Nationwide Network (FNN) architecture. APCO agrees that a model based on a stand-alone network build or working with a single nationwide wireless operator would be unwise. Neither of these options would be consistent with the legislation, or in the best interests of public safety. Rather, APCO strongly favors an approach that underscores the need to create a diverse nationwide network with multiple wireless networks and systems,[2] is based on "commercial standards" as defined in the legislation,[3] and leverages, to the greatest extent economically desirable[4] the sizeable infrastructure of U.S. mobile network operators. As acknowledged in Board Member Craig Farrill's

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[1] APCO's Broadband Committee provided significant technical and operational support for these comments.
[2] *See* Middle Class Tax Relief and Job Creation Act of 2012 ("Spectrum Act") § 6206(c)(1)(A)(i) (requiring requests for proposals to take into consideration "advantages offered through partnerships with existing commercial providers").
[3] *See* Spectrum Act §§ 6001(10), 6202(b)(1)(A), 6202(b)(2)(A).
[4] *See* Spectrum Act §6206(b)(1)(C).

presentation, FirstNet needs to also leverage deployable "micro" networks as well as the infrastructure owned by rural telecom companies, rural electric cooperatives, electric utilities, and federal, Tribal, state and local governments. Further, APCO agrees that FirstNet should consider incorporating mobile satellite networks into the overall design to maximize network coverage.

FirstNet should therefore design a network architecture that leads to significant incentives and opportunities for public/private partnerships. This approach will lead to many network options and variations, which in turn will require the FirstNet board to consider end-user requirements, network service availability (including capacity and coverage), opportunities for a broad range of service providers and suppliers, and financial viability.

By following this incentivized approach, FirstNet will best be able to meet the coverage needs of first responders while ensuring reliable, redundant and interoperable service at reduced costs and with accelerated availability. However, APCO would add two additional goals of fostering network diversity. First would be to achieve the needed levels of network security, both in terms of access and permissions, as well as cybersecurity.[5] As a network specifically designed for critical communications among first responders, 9-1-1 call takers and dispatchers, and emergency operations centers, security is a paramount concern. Second, FirstNet should maximize connectivity with 9-1-1 and emergency operations centers and associated public safety application networks.[6] The nation's PSAPs and EOCs are the single critical link between the public and emergency responders. Much of the data that will be transmitted over the public safety broadband network will be generated by application servers residing within the PSAPs and EOCs, including those supporting Next Generation 9-1-1 and Computer Aided Dispatch (CAD) technologies. These locally-based systems and data should be routed directly between the radio access network and the public safety application networks, without the need to route data outside the local area. Thus, integration of the PSAPs and EOCs across the country with the nationwide network is essential.

b. Band Class 14 Devices and Roaming

Fostering development of affordable Band Class 14 devices for public safety is a must. Further, FirstNet must ensure device availability is tied to the establishment of roaming arrangements as the legislation contemplates.[7] The legislation also requires public safety devices to be backwards compatible with existing generations of commercial networks.[8] While not an ideal solution, roaming onto commercial networks will provide public safety with immediate access to commercial service – including LTE where available – either until the public safety broadband network is built out, or to serve as a redundancy option if the nationwide network is unavailable or congested. Until either the public safety broadband spectrum is fully built out, or roaming agreements are executed with multiple service providers leading to devices with multiple carrier bands, interoperability can be achieved at the 3G or earlier level. The FNN should be able to achieve the same flexibility as experienced in the commercial

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[5] *See* Spectrum Act § 6206(b)(2)(A).
[6] *See* Spectrum Act § 6206(b)(2)(C).
[7] *See* Spectrum Act §§ 6206(c)(5), 6211.
[8] *See* Spectrum Act § 6206(b)(2)(B)(iii).

marketplace, where consumer smartphones can exchange data fairly seamlessly among different carrier networks. FirstNet should strike roaming agreements with multiple mobile network operators, which in turn will lead to devices containing Band Class 14 as well as the LTE and 3G bands of the mobile network operators.

When negotiating roaming arrangements with commercial mobile service providers, FirstNet should try to achieve two additional objectives. First, public safety would benefit from priority access service agreements, which are especially important during emergencies when all networks experience high congestion levels. Additionally, FirstNet should ensure that, when roaming, emergency responders can remain in communication with the dispatch center. Accordingly, FirstNet should take these considerations into account as it fosters a viable Band Class 14 device market and effective roaming arrangements.

c. Spectrum Sharing

The legislation contemplates potential sharing of the FirstNet spectrum on a secondary basis as part of public/private partnerships to implement the network.[9] Regardless of what forms spectrum sharing may take, public safety must always be able to obtain access to and use of the full amount of FirstNet's spectrum. Further, FirstNet should ensure that the public safety user experience does not change in terms of performance and security.

d. Mission-Critical Voice

While mission-critical voice may not be available for a number of years, APCO supports rapid development of such a capability. However, mission-critical voice must be proven viable and meet public safety requirements before being implemented in the FNN. In this regard, FirstNet should pursue targeted research and development[10] and advocacy at standard setting bodies.[11] In the meantime, state and local entities will need to continue to consider new investments in legacy Land Mobile Radio (LMR) networks to support mission-critical communication needs. Therefore, APCO suggests that FirstNet prioritize establishing a technology roadmap for the public safety broadband network to support mission-critical voice, or at least disseminating the latest information on developments toward this goal. This in turn will help public safety agencies determine how best to invest limited funds into current public safety communications networks.

e. Prioritizing Initial Steps

One overarching theme is the need to balance priorities and expectations. Given the limited funding ($2 billion initially, up to $5 billion more over time), and the urgent and overdue need for advanced, interoperable broadband communications for first responders, APCO agrees that FirstNet

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[9] *See* Spectrum Act § 6208(a)(2).

[10] *See* Spectrum Act § 6303 (establishing a NIST-directed public safety communications research and development program).

[11] *See* Spectrum Act § 6206(c)(7) (requiring FirstNet to represent public safety users before standards setting bodies).

must achieve "superior economics" from leveraging existing carrier infrastructure[12] and global economies of scale, while efficiently utilizing the public safety broadband spectrum. Accordingly, FirstNet should initially focus on achieving deployment of the fundamental aspects of the network, in a fashion that retains a flexible platform for continued augmentation to meet the distinguishing characteristics of public safety's needs from the general public's. A substantial network deployment that meets a number of public safety's unique requirements is absolutely within reach. At the same time, FirstNet and all of its stakeholders necessarily must keep a realistic perspective, as the $7 billion in funding is a significant but insufficient sum to achieve all of our goals. APCO supports use of the $7 billion and FirstNet's other assets towards designing the most efficient, effective, and flexible network architecture design possible.

II.   **Applications in the Public Safety Ecosystem**

APCO strongly supports public safety practitioner-driven application development in an open environment. As the largest organization of public safety communications professionals, and thus representative of the intended users of the public safety broadband network, APCO is inherently positioned to serve a key role in public safety applications development. Applications ("apps") built specifically for the public safety community have the potential to revolutionize the role of the first responder. The opportunities stemming from the nationwide public safety broadband network will lead to a substantial amount of innovation in public safety app development, similar to the experience of the consumer smartphone marketplace. The apps used on the network will be among the most important components, as they will be what the vast majority of the network users will actually see and employ to perform their jobs more effectively and safely.

As an American National Standards Institute (ANSI) standards developing organization (SDO), APCO is well-positioned to analyze public safety apps from both an operational and technical standards perspective. APCO can draw on its decades of experience in analyzing public safety requirements and assessing the technical efficacy and integrity of products and apps that serve its constituents to assure consensus-based open standards are integrated into their design.

APCO's significant resources, including its Training Institute, Automated Frequency Coordination (AFC) unit, Communications Center and 9-1-1 Services division, and the expertise of its 15,000+ members can provide a comprehensive forum for end-to-end vetting of public safety apps. APCO is thus in a unique position to offer a holistic approach to verifying apps for the public safety communications market, and provide the best forum to serve the stakeholder community.

A large body of public safety-related applications already exists, served by agency networks and carried by current 4G and 3G commercial networks. Thus, one immediate task is to identify, vet, and import the most useful of these to the FNN. The sources of these apps include those developed in the commercial market targeted at consumers, public safety practitioner-developed apps, and apps developed for enterprise and back-end systems.

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[12] *See* Spectrum Act § 6206(b)(1)(C).

As referenced by Chairman Sam Ginn at the initial FirstNet Board meeting, one clear example of a public safety practitioner-developed app is PulsePoint, conceived by San Ramon Valley Fire Chief Richard Price.[13] Through crowdsourcing, the PulsePoint app delivers smartphone alerts to users trained in cardiopulmonary resuscitation (CPR) at the same time first responders are dispatched for a nearby cardiac arrest. Linking practitioners like Chief Price with the right partners will lead to many new innovations. For example, APCO can envision apps that report Commercial Mobile Alert System (CMAS) status, document evidence, provide situational awareness, transmit bio-telemetry, check identification, calculate drug doses, contain procedure manuals, locate fire hydrants, access local or national databases and enterprise networks, etc. This practitioner-driven model would benefit from the creation of a marketplace and clearinghouse for public safety apps.

In its Final Report, the Technical Advisory Board for First Responder Interoperability recommends that FirstNet "establish specific Application Programming Interface (API) specifications for applications on the network."[14] API specifications are crucial for ensuring that apps work properly and do not jeopardize network performance or security. Developing apps for public safety will also require unique technical knowledge. Consolidating these functions into a clearinghouse will lead to a more efficient vetting process.

Establishing a centralized public safety apps clearinghouse would also offer certainty to the public safety app market/ecosystem by offering a safe, secure, and all-encompassing virtual meeting space for public safety practitioners and vetted app developers. The clearinghouse would serve as a technical resource for developers and a marketplace of standards-compliant apps that public safety users can trust, and would ultimately lead to a more efficient delivery of high quality apps for public safety users.

The clearinghouse would perform the following functions:

- Create templates and standards for app development, or adopt standards and guidelines from other sources, to help developers and foster a development ecosystem.
- Create and maintain application interface control documents, to facilitate quality control.
- Create and maintain security policies and security verification regimens, to facilitate establishing and maintaining security assurance objectives. This is a logical extension of APCO's standards-making role.
- Catalog and index apps that exist now or are under development.
- Cross-pollinate ideas between developers, so developers working in different parts of the country on similar apps can share experiences and resources.

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[13] More information on the PulsePoint foundation can at: http://pulsepoint.org/.

[14] Technical Advisory Board for First Responder Interoperability, *Recommended Minimum Technical Requirements to Ensure Nationwide Interoperability for the Nationwide Public Safety Broadband Network*, 4.3.4 Nationwide Application Testing, May 22, 2012, available at http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-12-68A3.pdf.

- Engage a testing service to test apps according to APCO-defined testing requirements, to provide for quality assurance; e.g. that they have the right "look-and-feel," are frugal with network bandwidth, secure, etc.
- Maintain a library of subroutines or code for developer use, to help foster a sustainable business model for app development and associated IPR (intellectual property rights) policies.

Any approach to fostering app development raises a number of questions that would require resolution and guidance from FirstNet. First is the matter of how to fund app development and the costs incurred by the clearinghouse. Also, we need to identify what models should be used to address how apps would be obtained, whether purchased by individual users or agencies, and how to coordinate IPR licensing. APCO favors an open, collaborative environment that would address some of these issues.

III.   Conclusion

Even at this early stage, FirstNet has taken important steps to engage with the public to devise a nationwide network architecture that best meets the requirement of the legislation and serves the needs of public safety. APCO is also pleased to see FirstNet adopt resolutions to promptly engage with state, local, and tribal jurisdictions. Going forward, APCO will seek to work with FirstNet and all stakeholders to forge the best paths to developing a sustainable network architecture and effective platform for public safety app development.