Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	
	)	
Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band	)	PS Docket No. 06-229
	)	
Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010	)	WT Docket No. 96-86

REPLY COMMENTS OF
CTIA – THE WIRELESS ASSOCIATION®

CTIA – The Wireless Association® ("CTIA") respectfully submits these reply comments in the above-captioned proceeding.[1] The initial comments reflect unanimous support to address the communications needs of first responders. Further, there is widespread agreement with the fundamental objectives identified in the *Ninth NPRM*: a centralized and national approach to establish an interoperable, broadband public safety network, leveraging advanced commercial technologies and existing commercial infrastructure to lower costs and speed deployment.

The record demonstrates that a 12 MHz allocation is sufficient to support an interoperable broadband public safety network; in contrast, the showings to support an additional 30 MHz allocation contain numerous faulty premises and unexplained "findings." The record also identifies numerous benefits to using advanced commercial technologies and commercial

---

[1] *Implementing a Nationwide, Broadband, Interoperable Public Safety Network in the 700 MHz Band, Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010*, PS Docket No. 06-229 & WT Docket No. 96-86, Ninth Notice of Proposed Rulemaking, FCC 06-181 (Dec. 20, 2006) ("*Ninth NPRM*").

infrastructure – public safety capabilities and capacity will increase, the cost of build-out will be significantly reduced, and deployment can move ahead rapidly.

The Commission's proposal is the most readily achievable and sustainable plan for nationwide public safety interoperable broadband – no legislation or further rulemakings are necessary. CTIA urges the Commission to act promptly here and in the commercial 700 MHz proceeding as well.[2] Sound public policy dictates that this valuable spectrum be put to use wisely and expeditiously, and action without delay will ensure compliance with the auction and DTV transition deadlines set out in the DTV Transition and Public Safety Act.

I. THE RECORD DEMONSTRATES THAT A 12 MHz DESIGNATION FROM THE CURRENT 700 MHz PUBLIC SAFETY ALLOCATION IS SUFFICIENT TO SUPPORT A NATIONWIDE PUBLIC SAFETY INTEROPERABLE BROADBAND NETWORK

CTIA shares the Commission's view expressed in the *Ninth NPRM* that public safety communications systems should be spectrum efficient and rely on technologies that "appropriately reflect the value of spectrum."[3] The Commission has a unique opportunity to adopt a new public safety model – one that establishes a nationwide architecture with advanced commercial technologies that maximize the spectrum resource. As AT&T Inc. observes, "[U]nlike older, existing public safety networks which generally utilize less efficient technologies, a new broadband network can be built utilizing state-of-the-art, spectrally efficient technology."[4] The Spectrum Coalition for Public Safety agrees with this forward-looking

---

[2] *Service Rules for the 698-746, 747-762 and 777-792 MHz Bands*, Notice of Proposed Rule Making, 21 FCC Rcd 9345 (2006).
[3] *Ninth NPRM* at ¶ 16 (cited in Comments of AT&T, Inc. at 9 ("AT&T Comments")).
[4] AT&T Comments at 9.

approach, noting that "the technologies to enable the next generation of public safety capabilities are currently available."[5]

12 MHz Can Support a Public Safety Broadband Network. The record demonstrates that 12 MHz – indeed 10 MHz – is sufficient to support an interoperable broadband public safety network to meet the public safety community's needs.[6]

First, as CTIA and several other commenters noted, New York City has awarded Northrop Grumman a contract to deploy a citywide interoperable, wireless broadband public safety network using 10 MHz of spectrum in the 2.5 GHz band.[7] The network will create interoperable communications for the Police Department, the Fire Department, the Office of Emergency Management and other city agencies – and the city will work to provide state and federal public safety access as well. The network will deploy UMTS technology in a cellular architecture comprised of roughly 400 base stations, and each base station will support 7.5 Mbps initially, with data rates expected to increase to 35 Mbps within two to three years.[8] This New York City network, which Northrop Grumman describes in its comments as "a system that meets all of the Commission's technological and policy objectives," shows that 10 MHz of spectrum can serve a public safety broadband network in the most populous city in the nation.[9]

Second, in the commercial wireless marketplace, commercial ventures are successfully offering broadband service with the same or less spectrum than what the *Ninth NPRM* proposes

---

[5] Comments of the Spectrum Coalition for Public Safety at 2 ("Spectrum Coalition for Public Safety Comments").

[6] *See, e.g.*, Comments of MetroPCS Communications, Inc. at 3 ("MetroPCS Comments").

[7] *See, e.g,*,Comments of the High Tech DTV Coalition at 12 n.25; Comments of Northrop Grumman at 8 ("Northrop Grumman Comments"); Comments of CTIA – The Wireless Association® at 9 ("CTIA Comments").

[8] Bob Brewin, *NYC to Cover City with 2.5 GHz Wireless*, FCW.COM (Sept. 25, 2006), *available at* http://www.fcw.com/article96172-09-25-06-Print.

for public safety broadband needs.[10] MetroPCS, for example, is providing state-of-the-art broadband service with 10 MHz of spectrum in major metropolitan areas.[11] These market realities contrast with concerns expressed by some that the *Ninth NPRM* proposal "provides no realistic means to build and maintain an advanced broadband network."[12]

The claim that 30 MHz is needed has no technical foundation. Despite this real-world evidence, Cyren Call and supporters assert that a 30 MHz allocation is necessary. In support, Cyren Call submits a technical showing that does not explain its calculations, cannot be reproduced, and should not be relied on.[13] The following examples – which are not exhaustive – demonstrate that its assumptions are faulty and its analysis is incomplete.

As an initial matter, Cyren Call's technical showing assumes that 3 million public safety first responders intensively use the network at all times, that each first responder has the same capacity needs, spread out evenly across the nation.[14] This level of analysis is not thorough enough to rely on for any sensible purpose.

Cyren Call's baseline assumptions ignore next generation wireless technology. It appears that Cyren has applied a 1:3 frequency reuse calculation to its analysis, meaning that its network would use only one out of every three frequencies at each cell or sector.[15] As Motorola states,

---

[9] Northrop Grumman Comments at 8.
[10] Comments of Verizon Wireless at 6 ("Verizon Wireless Comments").
[11] MetroPCS Comments at 4.
[12] Comments of the National Public Safety Telecommunications Council Comments at 8.
[13] *See* Comments of Cyren Call Communications Corp., Appendix 1, "Public Safety Broadband Capacity Analysis" at 8 ("Cyren Call Appendix").
[14] *Id.* at 10 (noting that "[f]or this analysis the business modeling assumptions were taken from the Cyren Call business model using an even distribution of users across the network.").
[15] Cyren Call refers to a reuse factor of 3/1. *See id.* at 4. Based on their capacity calculations we do not believe that this can possibly refer to a system with universal frequency reuse that operates using 3 sectors at each cell site. Consequently, we believe that they are referring a system that uses a frequency once in every three cells.

however, "[b]roadband technologies being deployed today and being developed for tomorrow are highly efficient and can be deployed in a 1:1 frequency reuse configuration with the same channel available at every site."[16] A system with universal frequency reuse, but otherwise with the same characteristics of Cyren Call's system, would fit in a 10 MHz allocation.

In addition, Cyren Call vastly overstates the amount of network capacity that public safety requires. For example, it assumes that *each* first responder will transmit streaming video uplink for 8100 seconds a day, or 2.25 hours a day.[17] Cyren Call's own analysis shows that this amount of video streaming accounts for a full 84 percent of the uplink capacity needs of the public safety users.[18] In addition, Cyren Call's capacity analysis assumes that each first responder will receive streaming video for 8100 seconds per day. If we assume that public safety users do not both transmit and receive streaming video at the same time, streaming video would occupy 4.5 hours of each first responder's day. Video streaming no doubt is an important application, but these demand assumptions are not reality-based.

Further, Cyren's service characterization appears to be severely flawed. For example, Cyren Call lists all voice applications as requiring 24 kbps of system capacity.[19] In fact, APCO P25 voice uses 9.6 kbps today, and broadband systems such as EVDO and WCDMA can economize on transmission capacity while the user is not talking to achieve capacity

---

[16] Comments of Motorola at 15 ("Motorola Comments"); *see also* QUALCOMM Release, *QUALCOMM to deliver 28 Mbps mobile broadband with HSPA+ in 2007, including up to three-fold increase in WCDMA voice capacity, available at* http://www.qualcomm.co.in/press/releases/2007/070212_deliver_28_mbps.html.

[17] Cyren Call Appendix at 14, Table A.1.

[18] *See id.* at 17, Table B.1. According to the table, a representative public safety user would have an average demand for 18.06021 kbps of capacity on the proposed system. However, streaming video accounts for 15.12594 kbps or 83.75% of that demand (83.75% = 15.12594/18.06021). The numbers for downlink are slightly different. Average downlink demand is 19.53222 kbps of which 15.12594 or 77.44% is streaming video. *See id.*

[19] *See id.* at 5.

requirements closer to 4 to 6 kbps per speech path.[20] Thus, Cyren Call has overstated the spectrum requirements for voice by a factor of between 3 and 4. Their spectrum requirements for many other applications appear to be similarly inflated.

Finally, even if one accepts Cyren Call's faulty assumptions, its conclusion does not add up. Cyren Call asserts that a "network with 30 MHz could support between nearly 7 million to nearly 11 million Public Safety users"[21] with blocking between 0.0001-2.0 percent and then claims, without explanation, that a 12 MHz allocation can support just 1.2 million public safety users.[22] But, under Cyren Call's analysis, an allocation of 40 percent of that 30 MHz, that is a 12 MHz allocation, would provide capacity for about 40 percent of the 7 to 11 million users or 2.8-4.4 million first responders, at the same blocking rates.[23] Cyren Call acknowledges, moreover, "a conservative and high estimate" of 3 million for the number of public safety users.[24] Its analysis of a 12 MHz system makes no sense. Ultimately, the number of users that could be served would, of course, increase dramatically under several more reasonable scenarios – for example, if the analysis were to incorporate universal frequency reuse described above, rather

---

[20] The APCO Project 25 vocoder is more efficient than 9.6 kbps. That figure includes all the various error-correcting and system control overheads as well – factors that are not included in Cyren Call's 24 kbps requirement. Cyren Call estimates that such factors consume about 20% of system capacity. *See id.* at 8. Thus, to make an apples to apples comparison the 24 kbps figure must be increased to 24/(0.8) = 30 kbps.

[21] *Id.* at 11.

[22] *Id.* at 13.

[23] CTIA notes that public safety systems are typically engineered for busy hour blocking of roughly 5 percent. For example, the Virginia State Police are upgrading their mobile radio system through the Virginia Statewide Agencies Radio System (STARS), which includes performance criteria providing for 5% delayed calls in the busy hour. *See* STARS Program, Request for Proposal, Vol. II, Appendix A, 3-5 (2001) *available at* http://www.vsp.state.va.us/stars.shtm. *See also* Mississippi Department of Information Technology Services Request for Proposal, Section 9.1.3.2.3, Grade of Service, at 45 (2006) *available at* http://www.its.state.ms.us/rfps/rfp3429.pdf. Furthermore, Cyren Call assumes that public safety would not be using this network for its primary voice service but predominantly for data communications. Service quality required for data communications is typically different than that required for mission-critical voice, and thus Cyren Call's assumed blocking level may not be appropriate.

than a one in three reuse pattern. Cyren Call's own flawed analysis thus indicates that 12 MHz is sufficient, indeed more than sufficient, to serve public safety needs.

The 4.9 GHz band offers incident-level broadband solutions. Finally, several commenters point out that, in considering public safety broadband capabilities, policymakers must take into account the 50 MHz public safety allocation in the 4.9 GHz band in addition to the 700 MHz band. For example, the manufacturer M/A-COM notes, "initial uses for public safety broadband are likely to be most critical at an incident scene and can be efficiently supported over 4.9 GHz."[25] Many vendors have developed equipment for use in the 4.9 GHz band which is, as Cisco points out, "ideally suited" for incident level networks – mobile networks "generally supported by a command vehicle at the incident that serves as the base station for nomadic devices on the scene."[26] The 4.9 GHz band, therefore, should be used in conjunction with the 700 MHz spectrum to help form a "system of systems" for public safety networking.

II. STATE-OF-THE-ART TECHNOLOGY, COMMERCIAL OFF-THE-SHELF EQUIPMENT, AND SHARED USE OF CMRS INFRASTRUCTURE WILL DRAMATICALLY REDUCE THE COST OF A NATIONWIDE PUBLIC SAFETY NETWORK AND THE BURDEN OF FUNDING

Numerous commenters – both commercial and public safety-oriented – support the Commission's view that advanced commercial technologies and shared use of existing commercial infrastructure will dramatically lower the cost and speed deployment of a nationwide public safety broadband network. In turn, this reduces the burden of funding substantially.

---

[24] See Cyren Call Appendix at 4.
[25] Comments of M/A-COM, Inc. at 9.
[26] Comments of Cisco Systems, Inc. at 7.

Use of commercial technologies and infrastructure will lower costs and speed deployment. Ericsson states that use of commercial off-the-shelf ("COTS") technologies, commercial network siting and infrastructure, and existing facilities "will achieve significant cost savings, particularly when compared to the cost of individual localities and agencies funding their own network development and deployment."[27] The Spectrum Coalition for Public Safety concurs, noting "[t]here are technologies available today that will deliver unprecedented speeds at low costs" and, "with spending from public safety concentrated towards a single standard, prices will decline and options will expand." [28]

For example, the National Capital Region ("NCR") has received a waiver to use 2.5 MHz of spectrum in the 700 MHz band to provide a broadband network for Washington, DC and surrounding areas. NCR announced that Alcatel-Lucent will deploy a 1xEV-DO Rev A network with the capacity to transmit video, data and voice communications with peak speeds of nearly 5 Mbps. The District of Columbia Government noted, "This solution delivers the economy of scale of commercial cellular technologies with public safety grade construction and reliability."[29]

The record also reflects strong support for the use of CMRS infrastructure to lower costs and speed deployment. As APCO observes, "infrastructure sharing may reduce the number of new dedicated public safety facilities that would need to be constructed."[30] Verizon Wireless estimates that shared network infrastructure (towers, base station cabinets, primary and back-up power sources, certain base station hardware, backhaul, and routing networks) could reduce

---

[27] Comments of Ericsson, Inc. at 14.
[28] Spectrum Coalition for Public Safety Comments at 3.
[29] District of Columbia Government, *National Capital Region First to Deploy 700 MHZ Wireless Network for Public Safety Communication*, (Feb. 28, 2007), *available at* http://dc.gov/news/release.asp?id=1071.
[30] Comments of APCO at 10.

initial costs of deployment by one-third and public safety's operating costs by as much as one-half over a ten-year period.[31] Further, shared infrastructure use could cut deployment time from seven years to four years.[32]

The Commission should also consider Verizon Wireless' proposal for an open, competitive RFP process to deploy a comprehensive, cost effective national broadband network "[t]o promote the greatest cost savings possible."[33]

Even with significantly lower costs, funding solutions must be wide-ranging. While the Commission should allow for commercial leasing of the public safety spectrum on a preemptible basis, CTIA believes that public funding must be an integral part of the nationwide network. CTIA supports state and local resources applied on a fee-for-service basis. Further, the Commission may also want to consider the potential for state and local funding devoted to buildout. Some commenters suggest that provisions be made to allow local bodies to fund sections of the network in their local area that meets their needs and timing requirements while consistent with the overall network structure and agreements.[34]

Finally, there should be a role for federal support as well. Congress has already directed that $1 billion of 700 MHz auction revenues be committed to interoperability in the 700 MHz band. CTIA would support efforts to commit additional auction revenues for the deployment of an interoperable nationwide public safety system.

---

[31] Verizon Wireless Comments at 12-13.
[32] *Id.* at 14.
[33] *Id.*
[34] Motorola Comments at 13-14.

III. CONCLUSION

For the reasons discussed above, the Commission should adopt the proposal in the *Ninth NPRM* to establish a national broadband licensee in the current 700 MHz public safety band.

Respectfully submitted,

/s/ *Christopher Guttman-McCabe*

CTIA – THE WIRELESS ASSOCIATION®
1400 16th Street, NW Suite 600
Washington, D.C. 20036
(202) 785-0081

Michael F. Altschul
Senior Vice President, General Counsel

Christopher Guttman-McCabe
Vice President, Regulatory Affairs

Paul W. Garnett
Assistant Vice President, Regulatory Affairs

Brian M. Josef
Director, Regulatory Affairs

March 12, 2007