

**Before the
Federal Communications Commission
Washington, D.C. 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 MOTOROLA, INC.

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SUMMARY

Motorola supports the FCC's consideration of creative solutions to address the need for broadband services within the public safety community. However, the Commission's proposals for a national broadband network for public safety require certain modifications and refinements if the plan is to warrant further discussion.

Consistent with its comments previously submitted in this proceeding, Motorola again urges the Commission to provide public safety the flexibility to deploy either broadband or wideband systems in the 12 MHz of 700 MHz public safety spectrum under discussion, to help ensure that deployments reflect localized requirements. This point was amply supported by other public safety commenters. This position is consistent with the overarching view held by Motorola and many public safety organizations that local public safety users must retain significant control over the build-out and management of any public safety network in order to maximize the usefulness of the system. Finally, Motorola agrees with many public safety officials that argue that the importance of protecting narrowband public safety spectrum requires the FCC to reject its proposal to allow secondary broadband use of the narrowband spectrum.

Both Motorola and public safety recognize the importance of providing first responders and emergency workers effective communications capabilities as soon as possible. Therefore, Motorola urges the Commission to expeditiously resolve all issues surrounding the use of the 700 MHz public safety spectrum.

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REPLY COMMENTS OF MOTOROLA, INC.

Motorola, Inc. (Motorola) respectfully replies to comments made in response to the Federal Communications Commission's ("Commission" or "FCC") *Ninth Notice of Proposed Rulemaking* ("9th NPRM") in the above-captioned proceeding that proposes to establish a centralized, nationwide interoperable public safety broadband network within the 764-776/794-806 MHz bands currently allocated for public safety use.¹ After reviewing the comments made in this proceeding, especially those made by the public safety community, Motorola continues to believe that certain adjustments to the FCC's proposal are needed if the concept is to be given further consideration.

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, Ninth Notice of Proposed Rulemaking, 21 FCC Rcd 14837 (2006) (9th NPRM).

I. Introduction and Summary

In response to the 9th NPRM, Motorola expressed support for the Commission's desire to apply creative solutions to address the need for broadband services within the public safety community but stressed the need for further discussion and consideration of the Commission's proposals.² Motorola did specifically urge the Commission to provide public safety the flexibility to deploy either broadband or wideband systems in the 12 MHz of 700 MHz public safety spectrum under discussion, to help ensure that deployments reflect localized requirements.³

Motorola also re-emphasized the importance of protecting narrowband public safety spectrum, which is crucial for meeting the mission critical voice needs of public safety. In that regard, Motorola stated that the Commission should prohibit secondary broadband use of the narrowband spectrum.⁴ Motorola recommended that local public safety users retain significant input into, and control over, the build-out and management of any public safety network under any licensing structure implemented by the Commission.⁵ Similarly, Motorola stated that the public safety community is best suited to select the technology standard for broadband interoperability and identified OFDM-

² See Comments of Motorola, Inc., WT Docket No. 96-86 (Feb. 26, 2007) (Motorola Comments).

³ *Id.* at 5.

⁴ *Id.* at 8.

⁵ *Id.* at 12.

based Long Term Evolution (LTE) as a potential suitable platform for public safety air interface broadband technology.⁶

This proceeding has produced a significant amount of interest from a broad range of commenters, including many public safety organizations. Motorola is generally well aligned with public safety commenters regarding conclusions and issues raised in this proceeding. Both Motorola and public safety recognize the importance of providing first responders and emergency workers effective communications capabilities as soon as possible. Therefore, Motorola urges the Commission to expeditiously resolve how the 700 MHz public safety spectrum will be used. If the Commission decides to issue a nationwide license as the most suitable approach to pursuing a nationwide network, the Commission should adopt rules consistent with Motorola's conclusions below to ensure the optimal use of this spectrum.

II. The Commission Must Allow Public Safety To Deploy Wideband As Well As Broadband Technology.

Regardless of how the FCC decides to license the 700 MHz public safety spectrum under discussion, Motorola continues to urge the Commission to provide public safety with flexibility to deploy wideband as well as broadband technologies. As we explained in our comments, broadband may not always be the most appropriate, suitable or cost effective solution for meeting the needs of public safety.⁷ In many cases and for a variety of reasons, wideband technology will prove to be the more appropriate

⁶ *Id.* at 15.

⁷ *Id.* at 5.

technology choice due to an attractive combination of coverage, cost, data rates and compatibility with narrowband technology.

Public safety commenters echoed Motorola's statements that public safety agencies need the flexibility to choose between wideband and broadband solutions.⁸ According to public safety groups, the need for this flexibility is straightforward – broadband networks cost more to deploy and require significantly more transmitter sites than wideband networks. For public safety agencies in less densely populated areas, the possibility of establishing or operating a broadband network may not be financially feasible.⁹ A Commission mandate to use the 12 MHz of spectrum under discussion only

⁸ See Comments of the Association of Public-Safety Communications Officials-International, Inc., WT Docket No. 96-86 at 2-3 (Feb. 26, 2007) (APCO Comments); Comments of the National Public Safety and Telecommunications Council, WT 96-86 at 6 (Feb. 26, 2007) (NPSTC Comments); Comments of DataRadio Inc., WT Docket No. 96-86 at 2 (Feb. 28, 2007); Comments of the City of Philadelphia, WT Docket No. 96-86 at 6-7 (Feb. 26, 2007) (Philadelphia Comments); Comments of The Metropolitan Washington Airports Authority, WT Docket No. 96-86 at 2 (Feb. 26, 2007) (MWAA Comments); Comments of Region 39, 700 MHz Regional Planning Committee, WT Docket No. 96-86 at 2 (Feb. 26, 2007) (Region 39 Comments); Comments of Region 22, 700 MHz Regional Planning Committee, WT Docket No. 96-86 at 4 (Feb. 23, 2007) (Region 22 Comments).

⁹ See APCO Comments at 3 ("[I]n many areas, especially rural and other sparsely populated regions, the cost of a broadband network would be many times the costs of a wideband system, which generally requires significantly fewer transmitter sites."); NPSTC Comments at 6; Region 22 Comments at 4 ("[I]t remains to be demonstrated that wireless broadband, which requires a very dense infrastructure to achieve acceptable geographic coverage, is economically feasible in non-urban areas."); Region 39 Comments at 2; DataRadio Comments at 2 ("Deployment of broadband only . . . would deny suburban and rural agencies on the outskirts of a major metro area the ability to deploy needed wideband systems.").

for broadband networks could leave these public safety users "unserved by *any* form of high speed data, wideband *or* broadband."¹⁰

Some commercial interests argue that the Commission should limit use of this spectrum exclusively to a national broadband network because wideband systems "have little use" in today's world.¹¹ Such statements are misguided and self-serving. Wideband networks provide data rates sufficient to provide a wide variety of data and video applications for public safety users, particularly in lower density areas.¹² Moreover, these commercial interests fail to recognize that wideband systems will be vital for communications among public safety users, particularly in rural communities. Although public safety users in major cities may benefit from a broadband system, "rural agencies will find the costs [of the system] beyond their reach."¹³ Moreover, Cisco Systems, Inc.'s contention that "wideband networks are not being developed" is false.¹⁴ Indeed, Motorola and other manufacturers are committed to making both wideband and

¹⁰ See APCO Comments at 3.

¹¹ See Comments of Cisco Systems, Inc., WT Docket No. 96-86 at 10 (Feb. 26, 2007) (Cisco Comments); see also Comments of Alcatel—Lucent, WT. Docket No. 96-86 at 3 (Feb. 26, 2007) (Alcatel Comments); Comments of MetroPCS Communications, Inc., WT Docket No. 96-86 at 6 (Feb. 26, 2007) (MetroPCS Comments).

¹² See Philadelphia Comments at 6 ("[T]he benefits of a broadband network are questionable given that broadband appears to be a necessity mainly for one application, real-time video."); Region 22 Comments at 4 ("Wideband technologies can provide a very large geographic coverage footprint, with cell edge performance characteristics comparable to broadband . . . Not all agencies actually need broadband."); DataRadio Comments at 1 ("Long range systems using wideband technology will be the best resource for the majority of First Responders outside major metro areas for many years to come.").

¹³ See DataRadio Comments at 2.

¹⁴ See Cisco Comments at 11.

broadband technologies available for public safety users.¹⁵ The Commission should reject the recommendations of these commercial interests that would undoubtedly benefit from an exclusive broadband network, but which have little or no experience in meeting the mission critical wireless communications requirements of public safety.

Motorola and the public safety community believe that the flexibility to deploy wideband systems is compatible with the nationwide licensee concept proposed in the 9th NPRM.¹⁶ If the Commission pursues a single licensee it must create a structure that includes sufficient input from local and regional public safety entities in order to ensure that the needs of the wide variety of public safety entities taken into consideration. Under a nationwide licensee approach, the licensee could work with local entities to determine the most appropriate mix of broadband and wideband deployment to meet requirements and maximize use of public safety spectrum resources. The Commission should ensure that public safety has the flexibility to choose between wideband and broadband solutions, regardless of whether it adopts the national licensee concept.

III. The Commission Should Not Permit Secondary Broadband Use of Narrowband Spectrum.

Public Safety has repeatedly emphasized that mission critical voice is the highest priority service for first responders and emergency workers. Therefore, it should come as

¹⁵ See Motorola Comments at 16; see also DataRadio at 2-3 (recognizing that wideband systems "have been planned and funded").

¹⁶ See APCO Comments at 3 ("[I]f the Commission proceeds down the path of the *Ninth NPRM*, it should permit the national public safety licensee to authorize local deployment of wideband systems in areas where that would better serve the needs of public safety."); see Motorola Comments at 7.

no surprise that most commenters stressed that the Commission should not place these voice communications at risk by permitting secondary use of the narrowband spectrum based on untested technology and undefined sharing mechanisms.¹⁷ The Commission's proposal suggests that cognitive radios and techniques are available to enable secondary broadband access to narrowband spectrum. However, Motorola and most commenters believe that cognitive radios are not currently capable of protecting mission critical public safety voice use from broadband interference.¹⁸ In fact, the Spectrum Coalition for Public Safety believes that cognitive radios will likely create significant risks "given the way radio network architectures utilize the spectrum."¹⁹

In the face of this broad consensus, Cisco Systems nevertheless suggests that secondary broadband use would be "good public policy."²⁰ But Cisco fails to explain how broadband services could successfully operate on the narrowband spectrum without

¹⁷ See APCO Comments at 12; NPSTC Comments at 3; Comments of The Spectrum Coalition for Public Safety, WT Docket No. 96-86 at 14 (Feb. 26, 2007) (Spectrum Coalition Comments); Comments of the Missouri State Highway Patrol, WT Docket No. 96-86 (Feb. 26, 2007) (Missouri Patrol Comments); Comments of the State of California, Department of General Services, PS Docket No. 06-229 at 2 (Feb. 26, 2007) (California Comments); MWAA Comments at 2; Comments of Northrop Grumman Information Technology, Inc., WT Docket No. 96-86 at 11 (Feb. 26, 2007) (Northrop Comments); Comments of M/A-Com, Inc., WT Docket No. 96-86 at 6 (Feb. 26, 2007) (M/A-Com Comments).

¹⁸ See Motorola Comments at 9; APCO Comments at 12; NPSTC Comments at 3; Spectrum Coalition Comments at 14; Comments of the National Association of Counties, WT Docket No. 96-86 at 3 (Feb. 26, 2007) (NACo Comments); California Comments at 2; Northrop Comments at 11; Comments of the Software Defined Radio Forum, WT Docket No. 96-86 at 7-9 (Feb. 23, 2007).

¹⁹ See Spectrum Coalition Comments at 14.

²⁰ See Cisco Comments at 14-15.

causing interference. Moreover, Cisco does not seem to grasp the importance of narrowband voice communications for the public safety community. Given that Cisco's comments stand inapposite to the rest of the commenters' conclusions, the Commission would be wise to discount Cisco's ideas about what constitutes good public policy.

The public safety community has spent the past decade planning for the use of this 700 MHz narrowband spectrum.²¹ Because of this planning, the 700 MHz band now provides the best opportunity to solve long-standing voice interoperability problems among public safety systems. Secondary use of this spectrum for broadband purposes would undercut these plans.

IV. Local Public Safety Users Must Retain Input in the Building and Management of Networks Constructed On 700 MHz Public Safety Spectrum.

Most commenters—including Motorola—requested that the Commission ensure that local and regional public safety agencies have input in the deployment and management of whatever type of network is built on the 12 MHz of 700 MHz public safety spectrum.²² Commenters agreed that because of "the fundamentally local nature of

²¹ See Comments of the Association of Public-Safety Communications Officials-International, Inc. to the Eighth 700 MHz NPRM, WT Docket No. 96-86 at 2-4 (June 6, 2006); M/A-Com Comments at 6 ("[T]he 700 MHz public safety spectrum has been the focus of planning by public safety agencies for years and should not be subject to competing demands and potential interference from secondary users.").

²² See Motorola Comments at 12-14; APCO Comments at 6; NPSTC Comments at 9; Philadelphia Comments at 3; Missouri Patrol Comments at § 6; Comments of the National Association of Telecommunications Officers and Advisors, WT Docket No. 96-86 at 6 (Feb. 26, 2007); NACo Comments at 3-4; Region 22 Comments at 2; Region 39 Comments at 2; California Comments at 1; Comments of the State of Nebraska Division of Communications, WT Docket No. 96-86 at 3 (Feb. 26, 2007) (Nebraska Comments);

first responses to emergencies," local public safety input is "vital in establishing an effective public safety interoperability model."²³

Although many commenters did not ardently support the national licensee concept, they still outlined guidelines for effective local public safety—national licensee relations. Specifically, commenters stressed the importance of local public safety participation in technology selection—whether its wideband or broadband, planning, build-out, operations, and network maintenance.²⁴ Some commenters, including Motorola, urged the Commission to allow local entities to build sections of the network in their local area to "accommodate regional coverage, capacity, and environmental requirements."²⁵ In the end, such input will ensure that the nationwide interoperable network actually meets the public safety needs of state and local communities, including the need for hardened systems that meet the need to operability as well as interoperability.

Northrop Comments at 10; DataRadio Comments at 2; Comments of NTCH, Inc., WT Docket No. 96-86 at 4 (Feb. 27, 2007).

²³ See Philadelphia Comments at 2-3.

²⁴ See Motorola Comments at 12-14; M/A-Com Comments at 2; Missouri Patrol Comments at § 4, 6; APCO Comments at 6; Region 39 Comments at 2-4; California Comments at 1; Nebraska Comments at 2-3.

²⁵ See M/A-Com Comments at 2; Motorola Comments at 13-14; APCO Comments at 6.

V. In Choosing a Broadband System, the Commission and Public Safety Must Leverage Commercial Technologies and Should Consider Next Generation Technologies, Including LTE.

Motorola and other commenters agree that the national licensee and local public safety agencies should leverage commercial technologies in deploying any nationwide broadband network on the 700 MHz public safety spectrum.²⁶ By relying on widely-used commercial broadband technologies, the national licensee and public safety agencies will undoubtedly benefit from greater economies of scale.

Specifically, the Commission and public safety should consider relying on next generation commercial technologies for the deployment and operation of the national broadband network. These technologies will offer improved performance and lower costs over current technologies. Such technologies would also have a potential 15 year lifespan. As Motorola stated in its comments, examples of next generation technologies include Orthogonal Frequency Division Multiplex (OFDM) based technologies, such as WiMax and LTE.²⁷ LTE stands for Long Term Evolution and is the evolution path in 3GPP for GSM/UMTS/HSPA technologies. Both Motorola and Ericsson noted in their comments that the benefits of LTE technologies include scalable bandwidths, greater spectral efficiency, greater throughput and capacity, improved performance in multi-path

²⁶ See Motorola Comments at 15; Comments of Ericsson Inc., WT Docket No. 96-86 at 6-7 (Feb. 26, 2007)(Ericsson Comments); Alcatel Comments at 4-5; Comments of the High Tech DTV Coalition, WT Docket 96-86 at 10 (Feb. 26, 2007) (High Tech DTV Comments).

²⁷ See Motorola Comments at 16.

environments, lower self-interference, and lower latency.²⁸ Moreover, because multiple manufacturers including Motorola, Ericsson, Qualcomm, and Nokia have contributed Intellectual Property Rights (IPR) to the LTE standard, public safety will benefit from a competitive marketplace.²⁹ Indeed, Ericsson already stated in its comments that it is "committed to supplying the public safety broadband network with . . . 700 MHz LTE systems, equipment, and services that include standardized public safety requirements."³⁰

As Motorola explained in its initial comments, the Commission should not mandate a broadband standard at this time because no broadband technology has been developed that specifically takes into account the unique needs of public safety.³¹ Nevertheless, if the Commission decides pursue a single nationwide licensee to implement the proposed nationwide network, the Commission should empower the national licensee and public safety agencies to select an appropriate broadband standard.

VI. The Commission Must Provide a Swift and Definitive Resolution Regarding the Future Use of the 700 MHz Public Safety Spectrum.

A broad range of commenters have urged the Commission to provide a swift and definitive resolution regarding the future use of the 700 MHz public safety spectrum.³² Currently, the public safety community waits in limbo for a final determination. This

²⁸ See Motorola Comments at 16; Ericsson Comments at 3, n. 5.

²⁹ See Motorola Comments at 16.

³⁰ See Ericsson Comments at 3.

³¹ See Motorola Comments at 17.

³² See APCO Comments at 13 ("[A] decision is needed quickly, either to open the way for deployment based upon existing rules, or to establish clear direction for a *viable* alternative."); Alcatel Comments at 2, 8; DataRadio Comments at 3; MetroPCS Comments at 6; High Tech DTV Comments at 20.

uncertainty has slowed the planning and implementation of public safety communications projects because entities are afraid of investing time and resources in projects that may be inconsistent with the Commission's eventual determination.³³ Thus, Motorola urges the Commission to promptly provide a final resolution, so that first responders, emergency workers, and the public at large may benefit from interoperable communications as soon as possible.

VII. Conclusion.

Motorola applauds the Commission for pursuing creative ideas intended to strengthen the safety and security of our country by advancing the efforts of public safety to deploy broadband technologies. Although significant work remains, the proposal warrants serious consideration if certain adjustments and requirements are adopted at the outset.

Respectfully Submitted,

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³³ See APCO Comments at 13 ("The Commission's consideration of the issues in this *Ninth NPRM*, and the uncertainties it poses, has already caused public safety planning to slow."); DataRadio Comments at 3 (The extended 700 MHz proceeding has "resulted in wideband licenses being held in abeyance. The unfortunate result is to delay or even cancel needed systems which have been planned and funded."); Alcatel Comments at 8.