

**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
	)	

To: The Commission

**COMMENTS OF  
NORTHROP GRUMMAN INFORMATION TECHNOLOGY, INC.**

Robert F. Brammer, Ph.D.  
Vice President and Chief Technology Officer

Mark S. Adams  
Chief Architect  
Networks and Communications  
Office of the CTO

Northrop Grumman Information Technology, Inc.  
7575 Colshire Drive  
McLean, VA 22102  
(703) 227-8631

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## SUMMARY

Northrop Grumman applauds the Commission's efforts to maximize access to broadband spectrum in the 700 MHz Public Safety band, promote interoperability, and foster development and deployment of advanced broadband applications and technologies incorporating modern, IP-based systems architectures.

The Commission can most advance these goals most by heeding the overwhelming consensus of public safety and others that it adopt the Broadband Optimization Plan under consideration in WT Docket No. 96-86. The Broadband Optimization Plan will remove technical impediments frustrating deployment of 700 MHz public safety broadband networks, create alignment and greater incentives and synergies between public safety and commercial networks, and unleash market forces to meet the Commission's objectives of speeding deployment, decreasing costs, promoting nationwide interoperability, and facilitating shared use of commercial infrastructure.

While the Commission's efforts to re-think and improve the band are laudable, its proposal to capture funding from commercial access to the 700 MHz Public Safety band through public/private partnering is not viable and will not produce revenue for public safety. It is unnecessary and unwise, inasmuch as it could create yet another lengthy deliberative process tying up access to and slowing development of the Public Safety broadband spectrum. The marketplace is already moving to bring affordable, robust and interoperable broadband wireless to public safety, notwithstanding the regulatory barriers of the Commission now in place on the 700 MHz Public Safety spectrum.

The Commission should be cautious with any alternative licensing approach. A single national licensee is not essential to further the Commission's objectives. Any governance

structure for this spectrum must allow for maximum state and local input and flexibility to meet state and local needs, and accommodate new and as yet unanticipated developments in technology and equipment.

Lastly, the Commission should not allow secondary operation on the 700 MHz Public Safety narrowband channels, because such operation would not be of any meaningful benefit and could put the narrowband channels at risk of interference.

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Northrop Grumman Information Technology, Inc. (“Northrop Grumman”) hereby submits its Comments in response to the *Ninth Notice of Proposed Rulemaking* in the above-captioned proceeding.<sup>1</sup> Northrop Grumman applauds the Commission’s effort to “maximize public safety access to interoperable, broadband spectrum in the 700 MHz band, and, at the same time, foster and promote the development and deployment of advanced broadband applications, related radio technologies, and a modern, IP-based system architecture.”<sup>2</sup>

As set forth below, these important goals can be fostered first and foremost by the Commission heeding the cry of the overwhelming consensus of public safety and other

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<sup>1</sup> *Ninth Notice of Proposed Rulemaking*, PS Docket No. 06-229, WT Docket No. 96-86, 21 FCC Rcd 14837 (2006) (“*Ninth NPRM*”). A summary of the *Ninth NPRM* was published in the Federal Register on January 10, 2007, 72 Fed. Reg. 1201.

<sup>2</sup> *Ninth NPRM* at ¶ 3.

commenters<sup>3</sup> that it adopt the Broadband Optimization Plan under consideration in WT Docket No. 96-86. The Broadband Optimization Plan will remove technical impediments frustrating deployment of 700 MHz public safety broadband networks, and create alignment and greater incentives and synergies between public safety and commercial networks. This change will unleash market forces to meet the Commission's objectives to "speed deployment, decrease costs of roll-out, promote nationwide interoperability" and "facilitate the shared use of commercial mobile radio service (CMRS) infrastructure."<sup>4</sup> The Commission is to be lauded for proposing changes to capture the benefits of broadband wireless technology in the 700 MHz Public Safety band. However, regrettably the *Ninth NPRM* leaves adoption of the Broadband Optimization Plan unresolved and opens new issues with proposals that are unlikely to further the Commission's goals.

## **I. Introduction**

Northrop Grumman Information Technology, Inc., a wholly-owned subsidiary of Northrop Grumman Corporation, is a leading provider of IT, systems engineering and systems integration for the Department of Defense, national intelligence, federal civilian and state and local agencies, and commercial customers. For more than 50 years, Northrop Grumman has been helping public sector organizations build and operate IT systems that support government's critical missions of delivering services and protecting citizenry, providing unbiased engineering and vendor-neutral integration of best-of-class technologies and products from the marketplace. Northrop Grumman is a leader in public safety systems and one of the world's largest suppliers of 911 First Responder Computer-Aided Dispatch systems, as well as a major presence in

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<sup>3</sup> These comments are already on the record in WT Docket No. 96-86 in response to the *Eighth Notice of Proposed Rulemaking, The 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), 21 FCC Rcd 3668 (2006) ("*Eighth NPRM*").

<sup>4</sup> *Ninth NPRM* at ¶ 4.

homeland security initiatives as the number one provider of security solutions to the federal government. Northrop Grumman deploys next-generation secure broadband wireless networks and interoperable voice communications solutions for defense, intelligence, and public safety organizations, and has supplied more than 30,000 mobile data units to law enforcement agencies nationwide.

Northrop Grumman has extensive experience as a systems integrator designing, building, and maintaining the types of systems public safety agencies will deploy in the Upper 700 MHz band. That experience demonstrates that the greater the number of technology options, the greater the benefits in system deployments and the greater the cost savings. Northrop Grumman has participated extensively in WT Docket No. 96-86, urging the Commission to modify the 700 MHz Public Safety band to create larger segments of contiguous public safety spectrum to accommodate public safety wireless broadband operations and offer the widest variety of technology options for public safety agencies.<sup>5</sup>

## **II. The Broadband Optimization Plan Should Be Expeditiously Adopted**

In its previous comments filed in response to the Commission's *Eighth NPRM*, Northrop Grumman urged the Commission to adopt a new band plan and accompanying service rules fully supporting broadband services for public safety users, as well as a broader scope of modifications within the Upper 700 MHz band to eliminate further spectral inefficiencies and minimize the potential for interference within and between the public safety and commercial portions of the band. In the record in WT Docket No. 96-86 there is now nearly universal

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<sup>5</sup> See *Comments of Northrop Grumman Information Technology* in WT Docket No. 96-86, filed on June 6, 2006 (“*NG 8<sup>th</sup> NPRM Comments*”); *Reply Comments of Northrop Grumman Information Technology* in WT Docket No. 96-86, filed on July 6, 2006 (“*NG 8<sup>th</sup> NPRM Reply Comments*”); *Reply Comments of Northrop Grumman Information Technology* in WT Docket Nos. 06-169 and 96-86, filed on November 13, 2006 (“*NG Guard Band NPRM Reply Comments*”).

consensus that the Broadband Optimization Plan initially proposed by Access Spectrum, LLC (“Access Spectrum”), Columbia Capital III, LLC, Intel Corporation and Pegasus Communications Corporation (“Pegasus”)<sup>6</sup> should be adopted by the Commission.<sup>7</sup> As has already been amply demonstrated in the record in WT Docket No. 96-86, the Broadband Optimization Plan would: 1) ensure that the auction of remaining 700 MHz commercial spectrum occurs on a timely basis; 2) maximize spectral efficiency and technological flexibility, enabling more efficient and effective wireless broadband networks; and 3) harmonize the public safety and commercial allocations in the 700 MHz band, and confer a substantial benefit to the public safety community by providing it with an additional 3 MHz of spectrum, better enabling public safety to leverage the technological advances and cost efficiencies of wireless broadband technology and applications available in the commercial wireless marketplace.<sup>8</sup>

Public safety would significantly benefit from this transfer of the 3 MHz of present B Block spectrum.<sup>9</sup> The resulting two 5.5 MHz blocks of contiguous spectrum would be available to public safety entities for wireless broadband use and enable them to use a wide range of commercially available wireless broadband standards and technologies, now and in the future.<sup>10</sup>

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<sup>6</sup> See, e.g., *Comments of Access Spectrum and Pegasus* in WT Docket Nos. 06-169 and 96-86, filed October 23, 2006 (“*Access / Pegasus Guard Band NPRM Comments*”).

<sup>7</sup> The public safety community overwhelmingly supports the Broadband Optimization Plan, as do a number of significant commercial entities. See *ex parte* letter from Ruth Milkman, Esq., counsel for Access Spectrum, *et al.* to Marlene H. Dortch, Secretary, Federal Communications Commission in WT Docket Nos. 96-86 and 06-169 (dated Feb. 14, 2007) at 2, 2 n.3.

<sup>8</sup> See *Access / Pegasus Guard Band NPRM Comments*.

<sup>9</sup> Northrop Grumman has urged the Commission to adopt the Broadband Optimization Plan in its entirety, including the transfer of the 3 MHz of B Block spectrum to public safety, and not to reallocate any of the guard band spectrum to -- or create any eligibility or entitlement for -- other classes of users, such as “interoperability” functions of “critical infrastructure industries” proposed by Motorola, Inc. and the United Telecommunications Council. See *NG Guard Band NPRM Reply Comments* at 3-4. The 3 MHz of additional spectrum for public safety operations is best placed exclusively in the hands and under the management of public safety, without injecting the involvement and operations of third parties into this critical environment. *Id.*

<sup>10</sup> See, e.g., *NG 8<sup>th</sup> NPRM Comments* at 6-7, 8-10; *NG 8<sup>th</sup> NPRM Reply Comments* at 6; *NG Guard Band NPRM Reply Comments* at 3. These standards and technologies include Code Division Multiple Access 2000 (CDMA 2000), Universal Mobile Telecommunications System (UMTS), Wideband CDMA (WCDMA), UMTS Time Division-CDMA (TD-CDMA) and IEEE 802.16 WiMAX standards, as well as future versions of the 3G CDMA

These broadband commercial wireless technologies offer public safety communicators improved capabilities, efficiencies, capacity and throughput, and interoperability, and provide a competitive environment for public safety network deployment and device procurement. An appropriate broadband allocation of spectrum offers the promise of access to future commercial innovations that can be leveraged by public safety users.

Northrop Grumman agrees with Access Spectrum, Pegasus and others that the Commission should adopt the Broadband Optimization Plan.<sup>11</sup> The record supporting the Broadband Optimization Plan is substantial and compelling, and the matter is ripe for Commission action. Northrop Grumman urges the Commission to adopt it immediately.

### **III. The Proposal to Capture Funding From Commercial Access to the 700 MHz Public Safety Band is Not Viable**

The Commission should be lauded for its willingness to review and re-think the 700 MHz public safety band to capture the benefits of broadband wireless technology. However, in the *Ninth NPRM* the Commission grafts together elements of two disparate concepts – the Broadband Optimization Plan, and the proposal of Cyren Call Communications Corporation

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(1xEV-DO) and FLASH-OFDM (Orthogonal Frequency Division Multiplex) standards. *See, e.g., NG 8<sup>th</sup> NPRM Comments* at 6-7, 8-10; *NG 8<sup>th</sup> NPRM Reply Comments* at 6. To provide for the fullest possible extent of broadband service, Northrop Grumman has urged the Commission to eliminate entirely any channelization of the public safety band for “wideband.” *NG 8<sup>th</sup> NPRM Comments* at 1-4; *NG 8<sup>th</sup> NPRM Reply Comments* at 1, 5. Lucent Technologies, Inc. has documented in great detail that the purported advantages of the “wideband” Scalable Adaptive Modulation (SAM) / TIA-902 standard -- such as lower costs, fewer base transmit sites, less potential for intermodulation and other interference, and greater “wide area coverage” and “data rates near the coverage fringe” -- are completely unfounded. *See Comments of Lucent Technologies, Inc.* in WT Docket No. 96-86, filed June 6, 2006 at 13-28, 36-37, Exhibit B at 1-6, Exhibit C, Exhibit E at 1-8, Exhibit G at 1-12 (comparing SAM / TIA-902 to cdma2000 1x Evolution-Data Optimized Rev A). *See also ex parte* letter from Michael T. McMenamin, Esq., Lucent, to Marlene H. Dortch, Secretary, Federal Communications Commission in WT Docket Nos. 96-86 and 05-157 (dated Nov. 10, 2005) at 10 (many commercial broadband standards have much greater spectrum reuse efficiency than SAM / TIA-902, simplifying the coordination process by the 700 MHz Regional Planning Committees). On all counts including affordability, efficiency and functionality, broadband technologies equal -- or in most cases excel over -- the capabilities of the “wideband” SAM / TIA-902 technology for all environments, urban, suburban and rural.

<sup>11</sup> *See ex parte* letter from Michael I. Gottdenker, Access Spectrum, *et al.* to Marlene H. Dortch, Secretary, Federal Communications Commission in WT Docket Nos. 96-86, 06-150 and 06-169 (dated Jan. 29, 2007) at 1-2.

“Cyren Call”<sup>12</sup> seeking reallocation and assignment of 30 MHz to a single licensee for deployment of a nationwide, broadband network for shared public safety and commercial use. Under the Commission’s proposal in this docket, the 12 MHz of spectrum now designated for “wideband” would be authorized for broadband use similar to elements of the Broadband Optimization Plan, and the spectrum would be licensed to a single national public safety licensee entity and authorized for “secondary, unconditionally preemptible” use for commercial purposes.<sup>13</sup> The Commission surmises that fees from the commercial use of the spectrum, in a manner akin to the Cyren Call proposal, “could provide an additional source of funding for the buildout of a nationwide public safety system,” and that this “additional funding, coupled with the potential cost savings of shared use of CMRS infrastructure, could allow a more rapid and extensive buildout of a broadband public safety system than could be achieved under traditional licensing and funding mechanisms.”<sup>14</sup>

Lost in the Commission’s construct is the very real difference between it and the parameters and underlying economics of the Cyren Call proposal. While Cyren Call proposes to add 30 MHz of additional spectrum for licensing to a public safety trust and for non-priority use by commercial carriers, the *Ninth NPRM* seeks merely to make use of 12 MHz of public safety spectrum for shared use. But the 12 MHz available for broadband is not enough to meet the needs of public safety while yielding capacity and material economic value for any commercial carriers.

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<sup>12</sup> See *Petition for Rulemaking* of Cyren Call, RM 11348, filed April 27, 2006. The Public Safety and Homeland Security Bureau dismissed Cyren Call’s *Petition* without prejudice, leaving the rule making docket open. *Order, Reallocation of 30 MHz of 700 MHz Spectrum (747-762/777-792 MHz) from Commercial Use and Assignment of 30 MHz of 700 MHz Spectrum (747-762/777-792 MHz) to the Public Safety Broadband Trust for Deployment of a Shared Public Safety/ Commercial Next Generation Wireless Network*, 21 FCC Rcd 13123 (PSHSB 2006).

<sup>13</sup> *Ninth NPRM* at ¶ 19, 29.

<sup>14</sup> *Id.* at ¶ 29.

There will likely be little if any material “headroom” left for secondary commercial use as local and regional broadband 700 MHz systems are developed and pool the needs of public safety entities and essential government operations on an efficient combined basis to build large-scale, robust networks providing service and interoperability. For example, Northrop Grumman is in the process of constructing and operating a broadband public safety network for the City of New York on 10 MHz of spectrum. This system is anticipated to require essentially all of that available capacity on a dynamic basis for government applications meeting the priorities of the city first responders, critical infrastructure, as well as the needs of other essential city operations.<sup>15</sup> It is highly unlikely in any urban area of any scale that a system developed to pool the needs of public safety entities would have any useful excess capacity at all operating on just 12 MHz of Public Safety spectrum.<sup>16</sup> Even if meaningful capacity were available in more remote areas for commercial use, such secondary capacity would have little or no economic value for commercial carrier(s), as there is already other underutilized and fallow *commercial* spectrum in small and rural markets that would be more attractive for commercial carrier use.

These facts contrast sharply with the Cyren Call proposal employing 30 MHz of spectrum. There is a very real prospect of substantial economic value deriving from carrier-grade commercial services operating on the unused excess capacity of a 30 MHz public safety shared system. This commercial capacity would be available in all markets, including the major markets that are the key to the commercial value of such a system. There also is the likelihood that a system using 30 MHz would provide enough of this excess capacity on a full-time basis, while not jeopardizing essential public safety needs. Such a nationwide full-time commercial

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<sup>15</sup> The system operates using TD-CDMA architecture on 10 MHz of contiguous spectrum in the 2.5 GHz band.

<sup>16</sup> Contrary to the Commission’s statement, there is no magic to be had in “multiplexing...and...combining users with different periods of peak traffic, as may be generally true with public safety and commercial traffic.” *Id.* at ¶25. Northrop Grumman is unaware of any basis for such a time offset between public safety and commercial peak traffic loads. Often these peak loads may be simultaneous and even directly correlated.

network would allow commercial operators to create successfully a business that generates significant economic value and justifies building a substantial network infrastructure.

#### **IV. Fostering Public/Private Partnering in this Manner is Unnecessary and Unwise**

While the Commission seeks to “speed deployment, decrease costs of roll-out, promote nationwide interoperability, and provide a source of funding for constructing a broadband public safety communications network,”<sup>17</sup> the *Ninth NPRM*’s framework for public/private partnering will not achieve these ends and may even undermine them. All of the myriad details and issues that the Commission ponders in proposing this framework<sup>18</sup> raise the specter of yet another lengthy deliberative process, both at the FCC and additionally within the national licensee itself, all the while tying up the only potential Public Safety broadband spectrum throughout the entire nation. In this way the Commission’s proposals in the *Ninth NPRM* could do harm to public safety.

Tellingly the marketplace is already moving to bring affordable and robust broadband wireless to public safety, notwithstanding the barriers that the Commission itself has in place on the 700 MHz Public Safety spectrum. As discussed above, Northrop Grumman is in the process of building a full-scale public safety broadband wireless system in New York City serving public safety and other critical services agencies – a system that meets all of the Commission’s technological and policy objectives. In the Washington, D.C. area, the local governments of the National Capital Region are deploying the initial phase of a regional broadband network on 700 MHz Public Safety spectrum pursuant to a waiver issued by the Commission.<sup>19</sup> As with the

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<sup>17</sup> *Id.* at 4.

<sup>18</sup> *See id.* at ¶¶ 31-37, 41-43.

<sup>19</sup> *See Order, Request by National Capital Region for Waiver of the Commission’s Rules to Allow Establishment of a 700 MHz Interoperable Broadband Data Network*, WT Docket No. 96-86, DA 07-454 (PSHSB)(rel. January 31, 2007).

natural growth and evolution of the commercial wireless marketplace, the forces of technology and economy are taking hold in public safety, as the Commission has hoped, beginning in these major urban areas. With ever-growing economies of scale for these systems using open standards and IP-based technology, and especially if the Commission adopts the Broadband Optimization Plan, these systems will proliferate across the nation.

Another source of cost savings and efficiency, shared infrastructure synergies between commercial carriers and public safety networks, will soon increase as a natural outgrowth of the technological shift to broadband. While some shared infrastructure arrangements between public safety and commercial networks already exist, such sharing will accelerate as public safety supplements its present “high site” Land Mobile Radio architecture with the cellularized architecture for broadband networks that is more in common with commercial carrier infrastructures. Such sharing arrangements ultimately are driven by market forces – not the regulatory constructs of the Commission – and they will occur when there is commonality and mutual benefit, just as they have among commercial carriers. In all cases however, public safety will have to assure carefully that important network attributes like security, redundancy and reliability are delivered with any shared system.

With broadband architecture, technological progress and the marketplace will make most interoperability regulation largely unnecessary.<sup>20</sup> Interoperability can be achieved through the commercial broadband wireless and network open standards, and by the tremendous inherent flexibility of IP-based networks, including the future possibility of widespread implementation of IP Multimedia Subsystem (IMS) protocols.<sup>21</sup> The robust adaptability of the latest broadband

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<sup>20</sup> See *NG 8<sup>th</sup> NPRM Comments* at 7; *NG 8<sup>th</sup> NPRM Reply Comments* at 2.

<sup>21</sup> See *NG 8<sup>th</sup> NPRM Comments* at 7; see also *Comments of Lucent Technologies, Inc.* in WT Docket No. 96-86, filed June 6, 2006 (“Lucent Comments”) at 15, 21-22, 33, Exhibit F at 1-2; *Comments of Lockheed Martin Corporation* in

wireless user equipment (with software-defined characteristics and multi-mode capabilities) can provide imbedded interoperability for the physical (radiofrequency) layer. While there may be a role for the Commission in fashioning competitively neutral interoperability standards if they prove necessary or useful to achieve network-level authentication or other specific elements of interoperability, there is no need for the total nationwide homogeneousness being contemplated by the Commission in the *Ninth NPRM*.<sup>22</sup>

#### **V. The Commission Should Be Cautious With Any Alternative Licensing Approach**

Northrop Grumman urges the Commission to exercise great care in making any changes to the present licensing and coordination structure for the 700 MHz Public Safety band such as licensing of all of the potential broadband spectrum in a single nationwide license to one public safety-related entity.<sup>23</sup> As discussed above, the prospect of private/public partnering, one of the principal reasons for which the Commission advocates a single national licensee, is not viable using the 12 MHz of public safety spectrum available for broadband. Moreover, there is no necessity for a single national licensee in order to foster shared infrastructure or assure interoperability of broadband services. In the absence of these rationales, the Commission should be certain that there is clear benefit with a single national licensee over the present system of frequency planning and coordination by the 700 MHz Regional Planning Committees. It is essential that any governance structure for this spectrum allow for maximum state and local input and flexibility to meet state and local needs, and accommodate new and as yet unanticipated

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WT Docket No. 96-86, filed June 6, 2006, at 5. For example, Northrop Grumman has delivered fully secure, high-speed, Internet Protocol-based broadband wireless solutions to numerous federal, state and local public safety agencies that enable the convergence of data, voice and video onto one network, with full interoperability across disparate communications systems.

<sup>22</sup> See, e.g., *Ninth NPRM* at ¶ 21.

<sup>23</sup> Northrop Grumman notes that issuance of a single nationwide license may conflict with 47 U.S.C. §337(a)(1) and (f)(1) specifying Public Safety services eligibility. See *Comments of RCC Consultants, Inc.*, filed on February 15, 2007, at 10-39.

developments in technology and equipment. Northrop Grumman urges the Commission to be certain that any national licensing structure not monopolize public safety's only broadband spectrum and preclude development of multiple networks that could provide for innovation, choice and redundancy.

## **VI. The Commission Should Not Authorize Secondary Operation on the Narrowband Channels**

The Commission proposes that the national public safety licensee be permitted to operate on a secondary basis on the other 12 MHz of public safety spectrum in the 700 MHz band (the narrowband channels) using technologies such as cognitive radios.<sup>24</sup> Northrop Grumman disagrees with the Commission that such operation would be of any meaningful benefit, and urges the Commission not to put the narrowband channels at any risk of interference, however inadvertent, from secondary users of the narrowband spectrum. Northrop Grumman urges the Commission not to authorize secondary use on the narrowband channels.

## **VII. Conclusion**

The Commission can realize the opportunities for advanced services, improved spectrum efficiency, interoperability, and ongoing technological evolution for the 700 MHz Public Safety band by adopting the Broadband Optimization Plan and by providing fully for broadband operations in lieu of the outdated "wideband" channelization. The Commission's efforts to re-think and improve the band are laudable. However, the proposal to capture funding from commercial access to the 700 MHz Public Safety band through public/private partnering is not viable and will not produce revenue for public safety, and is unnecessary and unwise. Lastly, the Commission should be cautious with any alternative licensing approach including a single national licensee, and should not allow such a licensee to operate on a secondary basis on the 700

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<sup>24</sup> *Ninth NPRM* at ¶¶ 38-40.

MHz Public Safety narrowband channels. Northrop Grumman urges the Commission to modify its proposal and adopt rules as set forth above.

Respectfully submitted,

**NORTHROP GRUMMAN INFORMATION  
TECHNOLOGY, INC.**



Robert F. Brammer, Ph.D.  
Vice President and Chief Technology Officer

Mark S. Adams  
Chief Architect  
Networks and Communications  
Office of the CTO

Northrop Grumman Information Technology, Inc.  
7575 Colshire Drive  
McLean, VA 22102  
(703) 227-8631

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