

**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
)	
)	

**COMMENTS OF ACCESS SPECTRUM, LLC AND
PEGASUS COMMUNICATIONS CORPORATION**

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**COMMENTS OF ACCESS SPECTRUM, LLC AND
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I. Introduction

The *Ninth NPRM*¹ envisions the potential for public-private partnerships that would facilitate development of public safety broadband communications systems that are nationwide in scope, fully interoperable and both economically and spectrally efficient. These are compelling public policy objectives.

Detailed exploration of this vision, of course, presupposes that Public Safety is authorized to utilize its 700 MHz spectrum for the deployment of broadband communications systems. Unfortunately, this is not presently the case – existing regulations provide no authority for Public

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, 21 FCC Rcd 14837 (2006) (“*Ninth NPRM*”).

Safety to utilize its 700 MHz authorization for broadband communications. The *Eighth NPRM*² seeks comment on alternatives to efficiently provide for public safety broadband communications while preserving the public safety narrowband allocation and protecting against the potential for harmful interference to public safety communications by adjacent commercial licensees. These comments of Access Spectrum, LLC (“Access Spectrum”) and Pegasus Communications Corporation (“Pegasus”) anticipate the Federal Communications Commission’s (“Commission” or “FCC”) resolution of those outstanding issues through prompt adoption of an order in response to the *Eighth NPRM*. In particular, in order to achieve the goals of the *Ninth NPRM*, the Commission must adopt the Broadband Optimization Plan (“BOP), which is the sole proposal offered in response to the *Eighth NPRM* that has the unqualified support of Public Safety, the guard band licensees, and the preponderance of commercial commenters.

II. Summary

The *Ninth NPRM* outlines a vision for overcoming the most significant obstacles to public safety broadband networks, namely the ability to fund the build-out of the broadband infrastructure and the acquisition of new devices required for broadband applications and services. The *NPRM* contemplates a public-private partnership in which a network provider provisions both commercial and public safety services and applications. This approach would permit Public Safety to leverage the infrastructure that will be built for commercial users, as well as take advantage of the economies of scale available to commercial providers, while maintaining exclusive public safety spectrum, thereby significantly lowering the cost of public safety broadband networks.

² *The Development of Operational, Technical and Spectrum Requirements for Meeting Federal, State and Local Public Safety Communications Requirements Through the Year 2010*, Eighth Notice of Proposed Rulemaking, 21 FCC Rcd 3668 (2006) (“*Eighth NPRM*”).

This vision cannot be realized without the technical foundation created by the adoption of the BOP proposed by Access Spectrum, LLC (“Access Spectrum”), Pegasus Communications Corporation (“Pegasus”), Intel Corporation and Columbia Capital III, LLC.³ The reconfiguration of the public safety spectrum and the addition of 3 MHz to the public safety allocation to allow for a paired 5.5 MHz block for broadband are prerequisites to the achievement of the goals and objectives outlined in the *Ninth NPRM*.

Failure to adopt the BOP will force the public safety community to rely on more expensive networks with inferior performance, and on more expensive end-user devices that may have far less functionality than commercial devices available to the public at large. Thus, in order to provide Public Safety the opportunity to harness the capabilities of tomorrow’s 4G technologies, the Commission must adopt the BOP immediately. Doing so will permit commercial and public safety entities to begin to work on the best approaches for configuring networks and to ensure the development of commercial technology, perhaps suitably “hardened,” that can be used by Public Safety in its own spectrum allocation. In short, public safety’s broadband allocation must be configured in a way that removes the technical impediments to public-private partnerships. Public Safety must be able to deploy “commercial-like systems,” and public safety broadband spectrum must be directly adjacent to commercial broadband spectrum. The BOP removes these technical impediments and thereby provides public-private partnerships the greatest chance of success. It should be adopted immediately.

³ Comments of Access Spectrum, L.L.C., Columbia Capital III, LLC, Intel Corporation, and Pegasus Communications Corporation, WT Docket No. 96-98 (June 6, 2006) (“*BOP Comments*”).

III. The Broadband Optimization Plan Must Be Adopted Immediately

The *Ninth NPRM* emphasizes the benefits of public-private partnerships for public safety broadband deployment.⁴ In order for public-private partnerships⁵ to be of greatest benefit, public safety and commercial operators must deploy similar technologies, and the public safety broadband operations must use spectrum directly adjacent to that used for commercial broadband operations.

A. The Band Plan Must Enable Public Safety to Deploy “Commercial-Like Systems.”

An optimal partnership requires the deployment of similar technologies by both Public Safety and its commercial partner(s). First, the commercial wireless market is larger than the public safety wireless market by two orders of magnitude.⁶ Consequently, the commercial market will drive technological advancements and cost efficiencies. Second, in order to share commercial infrastructure, Public Safety must deploy “commercial-like systems,” meaning networks that use commercial technologies and become increasingly similar to the low-site cellular systems expected to be deployed by commercial licensees.

Failure to adopt the BOP will prevent Public Safety from deploying “commercial-like systems.” If the Commission is to achieve the goals of the *Ninth NPRM*, the public safety

⁴ See *Ninth NPRM* ¶ 35.

⁵ For purposes of these comments, a “public-private partnership” is an arrangement under which Public Safety would maintain its own exclusive spectrum, would share commercial infrastructure, and would employ “hardened” commercial off-the-shelf equipment.

⁶ There were approximately 213 million commercial wireless subscribers in the United States in 2005. See *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993; Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, Eleventh Report, 21 FCC Rcd 10947, ¶ 158 (2006). In announcing its First Responder Initiative, the White House estimated there to be just over 2 million first responders nationwide. See “Facts About First Responders,” available at: <<http://www.whitehouse.gov/infocus/mutualaidagreements/firstresponder.html>>.

broadband spectrum must be expanded and cannot be located between two public safety narrowband segments as contemplated in the proposals in the *Eighth NPRM*.⁷ The failure to consolidate public safety narrowband spectrum and augment public safety's allocation would cause significant technical problems for public safety broadband as detailed in the Second Report of the 700 MHz Technical Working Group,⁸ including serious risk of harmful interference from intermodulation and substantial reduction in the amount of usable broadband spectrum for Public Safety. These problems likely would prevent Public Safety from deploying "commercial-like systems" and would reduce greatly the likelihood that Public Safety and a commercial operator would be able to form a successful public-private partnership.

In order for public safety narrowband operations to function properly and for public safety and commercial broadband operations to perform adequately, the band plan and rules must minimize intermodulation interference ("IMI"). Implementing the BOP is essential to minimizing IMI without seriously degrading broadband performance for both commercial and public safety entities.⁹ Unless the BOP is adopted, the public safety broadband system would

⁷ *Eighth NPRM* ¶¶ 14-22.

⁸ See Second Report of the 700 MHz Technical Working Group, transmitted via letter from Ruth Milkman, Counsel for Access Spectrum, LLC and Kathleen Wallman, Adviser to Pegasus Communications Corp., WT Docket Nos. 06-169 and 96-86, at Appendix A (Jan. 26, 2007) ("*Second Report of the 700 MHz Technical Working Group*").

⁹ Simply consolidating public safety's narrowband allocation to reduce the potential for IMI is not sufficient. A "6+6" plan, such as the plan proposed by Alcatel-Lucent, would create significant problems for Public Safety. Specifically, this configuration would not augment Public Safety's spectrum capacity and would fail to address issues related to the Canadian border, the re-programming of existing 700 MHz systems and the need to update the CAPRAD software database, the resolution of which were preconditions set forth by Public Safety before any consideration of making any changes to their allocation. See Comments of the National Public Safety Communications Council ("NPSTC"), WT Docket Nos. 96-86 and 06-169, at 7-9 (Oct. 23, 2006); Comments of APCO International, WT Docket Nos. 96-86 and 06-169 (Oct. 23, 2006); Letter to Marlene H. Dortch, FCC Secretary, from Ruth Milkman, Counsel to Access Spectrum, LLC, and Kathleen Wallman, Adviser to Pegasus Communications Corporation, WT Docket Nos. 96-86 and 06-169, at 2-4 (Feb. 14, 2007) ("*Access/Pegasus Feb. 14 Letter*"). The

have to operate at significantly reduced power levels on the ground to prevent IMI into the public safety narrowband channels,¹⁰ thus significantly decreasing the network's performance (*e.g.* access speed, particularly at the edge of the cell)¹¹ and total capacity. Public Safety would be faced with the Hobson's choice of tolerating IMI into its narrowband spectrum, or deploying a broadband system that is severely constrained in performance and capacity – unlike commercial systems – in order to minimize the IMI.¹²

If the BOP were not adopted, Public Safety likely would be driven to deploy a medium-site or high-site broadband system. Commercial broadband operations, by contrast, are low-site systems designed for maximum end-user performance and capacity. This critical difference in public safety and commercial broadband architectures would prevent commercial and public safety broadband systems from sharing tower sites, thus erasing one of the most significant potential cost savings contemplated in the *Ninth NPRM*.¹³

BOP addresses each of these concerns and thus has the support of the public safety community. *See, e.g.,* Letter to Marlene H. Dortch, FCC Secretary, from Vincent R. Stile, NPSTC Chair, WT Docket Nos. 96-86 and 06-169 (Dec. 6, 2006, filed Dec. 7, 2006); Letter to Marlene H. Dortch, FCC Secretary, from Vincent R. Stile, NPSTC Chair, WT Docket Nos. 96-86 and 06-169 (Feb. 22, 2007).

¹⁰ *Second Report of the 700 MHz Technical Working Group* at 6-7.

¹¹ *See* Spectrum Coalition for Public Safety, “Public Safety Spectrum: How Much Do We Need for Data?” at 9-10 (Oct. 25, 2005) (describing user throughput requirements), attached to letter from Bill Butler, Spectrum Coalition for Public Safety, to Marlene H. Dortch, FCC Secretary, WT Docket No. 05-157 (Oct. 27, 2005).

¹² Current technology for software-defined radios and cognitive radios cannot address this problem. When a single public safety narrowband user is detected, the entire neighboring broadband channel would either be shut down or its power level would be significantly reduced, resulting in an intolerable performance environment for the neighboring broadband channel, which frequently would be either inoperable or operating at greatly reduced power levels, thereby impairing its access speed and capacity.

¹³ *Ninth NPRM* ¶¶ 23, 35. New filtering antenna and receiver technology may offer an additional method for further reducing IMI to narrowband operations. That technology works by blocking out energy from below a certain point on the spectrum. Under the bifurcated narrowband configuration proposed in the *Eighth NPRM*, the narrowband segments would be

B. The Band Plan Must Allow Commercial and Public Safety Broadband Operations on Adjacent Spectrum.

The public-private partnership is best facilitated by locating the public safety broadband spectrum directly adjacent to the broadband spectrum of the commercial partner.¹⁴ Specifically, because there would be no intervening commercial or public safety operations to protect, the partnered commercial and public safety broadband operations would be free to remain at full power all the way to the shared band edge, resulting in greater performance and capacity. If the partners' spectrum were separated, operations in the partners' blocks would need to reduce power near the edges of the bands in order to meet out-of-band emissions limits in the intervening spectrum, thus reducing performance and capacity. If the intervening spectrum contained narrowband channels protected by a more restrictive emissions limit, the power reduction would be particularly severe.¹⁵

Similarly, a shared system on adjacent spectrum blocks would not need to waste spectrum for buffer spaces between non-compatible operations. Instead, carriers could be stacked directly next to each other, thus increasing capacity, spectrum efficiency, and cost-effectiveness. Finally, operations on adjacent spectrum would require the least amount of

located both above and below the public safety broadband segment, thus eliminating the ability of this new technology to help reduce IMI significantly.

¹⁴ Failure to provide for adjacent commercial and public safety broadband operations is one reason that the "6+6" configuration proposed by Alcatel-Lucent is inferior to the BOP for meeting the goals of the *Ninth NPRM*. See, e.g., Letter to Marlene H. Dortch, Secretary, Federal Communications Commission, from Michael McMenamin, Global Government & Public Affairs, Alcatel-Lucent, WT Docket Nos. 96-86 and 06-169 (Jan. 26, 2007); *Access/Pegasus Feb. 14 Letter*.

¹⁵ Current rules require that commercial broadband operations in the Upper 700 MHz band attenuate transmitter power (P) out-of-band by at least $43 + 10 \log (P)$ dB, except inside public safety narrowband spectrum and wideband spectrum, where attenuation must be at least $76 + 10 \log (P)$ dB for base station transmissions and $65 + 10 \log (P)$ dB for mobile unit transmissions. 47 C.F.R. § 27.53(c).

filtering for handsets and base station transmitters. Separating the partners' spectrum with an intervening segment would be less advantageous, requiring additional filtering capabilities to avoid interfering with the intervening spectrum.

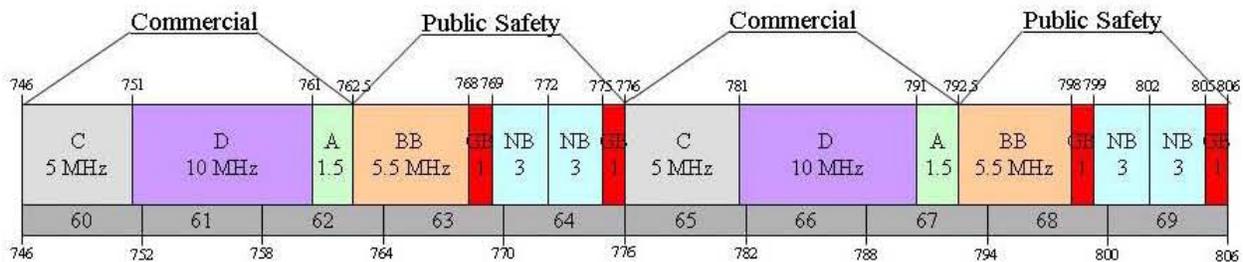
C. The BOP Enables Public Safety to Deploy “Commercial-Like Systems” on Spectrum Adjacent to Commercial Broadband.

The BOP provides a superior solution to meet the goals of the *Ninth NPRM* because it would enable Public Safety to deploy “commercial-like systems” and would place public safety broadband spectrum directly adjacent to commercial broadband spectrum. The BOP would provide an additional 3 MHz of public safety spectrum and would consolidate the public safety narrowband channels toward the top of the public safety block. The record reflects a consensus that the BOP band plan would enable public safety broadband networks with considerably better performance (fewer dropped or noisy calls) than would any configuration in which a public safety broadband block is located between public safety narrowband segments.¹⁶ In addition, the

¹⁶ In addition to the BOP's original proponents, the entities supporting the Broadband Optimization Plan include: the National Public Safety Telecommunications Coalition (the members of which are the American Association of State Highway Transportation Officials, American Radio Relay League, American Red Cross, Association of Public-Safety Communications Officials-International, Association of Fish & Wildlife Agencies, Forestry Conservation Communications Association, International Association of Chiefs of Police, International Association of Emergency Managers, International Association of Fire Chiefs, International Municipal Signal Association, National Association of State Emergency Medical Services Officials, National Association of State Foresters, National Association of State Telecommunications Directors), Major Cities Chiefs Association, Major County Sheriffs Association, the National Sheriffs Association, the New York State Office for Technology, Motorola (supports a slightly modified version of the BOP), Northrop Grumman, Arcadian Networks, Enterprise Wireless Alliance, the Software Defined Radio Forum, the WiMAX Forum and the following 700 MHz Regional Planning Committees: Region 4 (Arkansas), Region 5 (Southern California), Region 7 (Colorado), Region 8 (Metropolitan New York City Area), Region 9 (Florida), Region 10 (Georgia), Region 11 (Hawaii), Region 13 (Illinois except Southern Lake Michigan counties), Region 14 (Indiana except Southern Lake Michigan counties), Region 17 (Kentucky), Region 22 (Minnesota), Region 24 (Missouri), Region 26 (Nebraska), Region 30 (New York - Albany area), Region 32 (North Dakota), Region 33 (Ohio), Region 35 (Oregon), Region 39 (Tennessee), Region 45 (Wisconsin except Southern Lake

BOP would place public safety broadband spectrum directly adjacent to commercial broadband spectrum, resulting in a number of benefits, explained below. The BOP enables a full 5.5 MHz of public safety spectrum for broadband, exclusive of a separate 1 MHz designated for use as a guard band between the public safety broadband and narrowband operations (and an additional 1 MHz designated for use as a guard band on the other side of the public safety narrowband block, adjacent to commercial broadband operations).

Broadband Optimization Plan ("BOP")



BB=Broadband; NB=Narrowband; GB=Guard Band

The BOP offers benefits to meet the goals of the *Ninth NPRM*, benefits not available under the proposals in the *Eighth NPRM*. First, the BOP’s consolidation of public safety narrowband channels greatly reduces the likelihood of intermodulation interference so that public safety and commercial broadband systems may operate at much greater performance levels without harming public safety narrowband communications, as described above.¹⁷ Second, by consolidating the narrowband channels and increasing the quantity of public safety spectrum, the BOP enables Public Safety’s use of “commercial-like systems” for broadband while protecting narrowband operations. As a result, the BOP establishes an essential predicate for the partnership between Public Safety and commercial operators proposed in the *Ninth*

Michigan counties), Region 54 (Chicago – Southern Lake Michigan counties) and Region 55 (New York – Buffalo).

¹⁷ *Second Report of the 700 MHz Technical Working Group* at 2, 6-8 and Appendix A.

NPRM. Finally, the BOP's placement of public safety broadband spectrum directly adjacent to commercial broadband spectrum further enhances the opportunities for public-private partnerships, enabling public safety broadband operations with increased cost-effectiveness, greater spectral efficiency, and better speed and capacity, as explained in Section III.B, above.

The critical, threshold step to achieving the Commission's goals in the *Ninth NPRM* is the immediate adoption of the BOP. Working from that solid foundation, supported by the many benefits the BOP offers, commercial and public safety entities would be able to focus on determining the best configuration of networks within the BOP's structure, as well as the licensing tools that would best support that configuration.

D. The Commission's Goals Would Best Be Met By Adopting the BOP

Adoption of the BOP is the best way to accomplish the objectives described in the *Ninth NPRM*. In the Commission's other rulemakings addressing plans for the 700 MHz band, Access Spectrum and Pegasus have explained the BOP in great detail and have described the benefits that its implementation would generate.¹⁸ Those benefits align with the Commission's goals stated in the *Ninth NPRM*.¹⁹

Central to the *Ninth NPRM* is the goal of maximizing broadband capabilities for Public Safety;²⁰ the band configuration under the BOP would meet that goal by increasing the amount of usable spectrum available to both public safety and commercial operators and reducing the potential for interference to public safety narrowband operations. Further, the BOP would

¹⁸ See, e.g., *BOP Comments*; Comments of Access Spectrum, LLC and Pegasus Communications Corporation, WT Docket Nos. 96-86 and 06-169 (Oct. 23, 2006); Reply Comments of Access Spectrum, LLC and Pegasus Communications Corporation, WT Docket Nos. 96-86 and 06-169 (Nov. 13, 2006).

¹⁹ *Ninth NPRM* ¶¶ 12-18.

²⁰ *Id.* ¶¶ 12, 31.

enhance public safety broadband technological capabilities and make them more cost-effective by locating public safety broadband spectrum directly adjacent to commercial broadband spectrum, thereby furthering the goal of promoting partnerships between Public Safety and commercial operators.²¹ The direct adjacency would permit Public Safety to utilize broadband “commercial-like systems,” thereby benefiting from the economies of scale and technological advances of commercial equipment. Further, the BOP’s band configuration would reduce the need for expensive or restrictive measures necessary to reduce intermodulation interference from public safety and commercial broadband operations into public safety narrowband spectrum. The BOP would also promote the *Ninth NPRM*’s goal of adequate funding for development and operation of public safety broadband networks²² by making public-private partnerships more cost-effective and attractive to commercial operators. These partnerships would enable sharing of infrastructure and technology. Finally, adoption of the BOP would achieve the goal of efficient spectrum use²³ by reducing the amount of spectrum dedicated to guard bands from 10 MHz to only 3 MHz.

Once the BOP is adopted, commercial and public safety entities will be able to comment more effectively on the appropriate licensing scheme, the requirements for a public safety broadband network, and steps that can be taken to facilitate private-public partnerships, as well as the other questions raised in the *Ninth NPRM*. The Commission should adopt the BOP and, once that certainty is established, afford interested parties an opportunity to file supplemental comments to provide more concrete recommendations in the record as to how best to achieve the goals set forth in the *Ninth NPRM*.

²¹ *Id.* ¶¶ 19, 41, 43.

²² *Id.* ¶¶ 14, 28-30.

²³ *Id.* ¶¶ 16, 25.

IV. Conclusion

For the above reasons, the Commission should adopt the BOP immediately. From that solid foundation, the Commission should work with Public Safety and commercial entities to consider plans that build upon the BOP to best meet the goals of the *Ninth NPRM*.

Respectfully submitted,

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