LAWLER, METZGER, MILKMAN & KEENEY, LLC

2001 K STREET, NW
SUITE 802
WASHINGTON, D.C. 20006

KENNETH R. BOLEY
PHONE (202) 777-7774

PHONE (202) 777-7700
FACSIMILE (202) 777-7763

November 4, 2005

By Electronic Submission

Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington DC 20554

Re: WT Docket No. 05-157
FCC 05-80
Written Ex Parte Presentation

Dear Ms. Dortch:

On November 4, 2005, Access Spectrum, L.L.C., Pegasus Guard Band, L.L.C., Columbia Capital Equity Partners III, L.P., and PTPMS II Communications, L.L.C. submitted to the Commission for its consideration the attached Supplemental White Paper, "Rule Changes to Implement the Proposed Rebanding of the Upper 700 MHz A and B Blocks for Next Generation Wireless Broadband," and the attached transmittal letter.

Though not a required filing, a copy of this letter is being provided to you for inclusion in the public record of the above-referenced proceeding in the belief that many of the participants in that proceeding will find it of interest.

Sincerely,

Kenneth R. Boley
Counsel to Access Spectrum, L.L.C.

cc: Chairman Kevin J. Martin
Commissioner Kathleen Abernathy
Commissioner Michael Copps
Commissioner Jonathan Adelstein
John Branscome
Fred Campbell
Linda Chang
Lloyd Coward
Paul D'Ari
Bruce Franca
Angela Giancarlo
John Giusti
Daniel Gonzalez
Julius Knapp
Jane Jackson
Cathleen Massey
Paul Moon
Roger Noel
Barry Ohlson
James Schlichting
Catherine Seidel
David Siehl
Alan Stillwell
Joel Taubenblatt
Michael Wilhelm

November 4, 2005

The Honorable Kevin J. Martin
Chairman
Federal Communications Commission
Washington, DC 20554

Dear Chairman Martin:

Access Spectrum, L.L.C., Pegasus Guard Band, L.L.C., Columbia Capital Equity Partners III, L.P., and PTPMS II Communications, L.L.C. hereby submit the attached Supplemental White Paper, "Rule Changes to Implement the Proposed Rebanding of the Upper 700 MHz A and B Blocks for Next Generation Wireless Broadband." The document provides additional detail on changes to the Commission's technical rules and band manager restrictions that would be necessary to implement the rebanding of the Upper 700 MHz band proposed in the White Paper filed on August 3, 2005 in the Emergency Responders proceeding, WT Docket No. 05-157.

Respectfully submitted,

Access Spectrum, L.L.C.

/s/ Michael Gottdenker
Michael Gottdenker
Chairman and Chief Executive Officer

Pegasus Guard Band, L.L.C.

/s/ Marshall Pagon
Marshall Pagon
Chief Executive Officer

RULE CHANGES TO IMPLEMENT THE PROPOSED REBANDING OF THE UPPER 700 MHz A AND B BLOCKS FOR NEXT GENERATION WIRELESS BROADBAND

A Supplemental White Paper Submitted by
Upper 700 MHz A and B Block Licensees
Regarding Changes to Technical Rules
and Band Manager Restrictions

ACCESS SPECTRUM, L.L.C.

COLUMBIA CAPITAL EQUITY PARTNERS III, L.P.

PEGASUS GUARD BAND, L.L.C.

PTPMS II COMMUNICATIONS, L.L.C.

Ruth Milkman
Kenneth Boley
Lawler, Metzger, Milkman & Keeney, L.L.C.
2001 K Street, NW, Suite 802
Washington, DC 20006
Counsel to Access Spectrum, L.L.C.

Dr. Stagg Newman
Charles F. Ellis, P.E.
Technical Consultants to Access Spectrum, L.L.C.

Kathleen Wallman
Wallman Consulting, L.L.C.
9332 Ramey Lane
Great Falls, VA 22066
Consultant to Pegasus Guard Band, L.L.C.

Dale Hatfield
Technical Consultant to Pegasus Guard Band, L.L.C.

With support from

ENTERPRISE WIRELESS ALLIANCE

Dated: November 4, 2005

TABLE OF CONTENTS

I. Introduction.....1

II. Technical Rules 2

A. Changes to Current Rules 3

B. New Rules Would Provide Adjacent Public Safety and Commercial Operations Protection from Undue Interference. 4

1. Out-of-Band Emissions Requirements 4

a. OOBE Limits Replace ACCP Requirements.....5

b. Power Flux Density Limits Replace Cellular Architecture Prohibition.....8

2. Adjacent-Channel Interference From Signal Energy Inside Its Intended Band ("In-Band" Emissions). 9

a. Power Flux Density Limits 11

b. Improvements in Public Safety Receiver Performance 13

c. Effect of the Proposed Rebanding 14

3. Scenarios for Potential Interference 15

a. Option One 16

(i) A Block Interference to Public Safety Narrowband Operations 17

(ii) A Block Interference to Public Safety Broadband Operations 18

(iii) C Block Interference to Public Safety Narrowband Operations 19

(iv) Interference Between Commercial Block Operations (A, C, and D Blocks).....19

b. Option Two 20

(i) B Block Interference to Adjacent Public Safety Narrowband Operations 21

(ii) A Block Interference to Public Safety Narrowband Operations 22

(iii) C Block Interference to Public Safety Narrowband Operations 22

(iv) Interference Between Adjacent Commercial Block Operations (A, B, C, and D Blocks) 23

c. Option Three 23

(i) D Block Interference to Adjacent Public Safety Narrowband Operations 23

(ii) A Block Interference to Public Safety Narrowband Operations 24

(iii) Interference Between Adjacent Commercial Block Operations (A, C, and D Blocks) 24

III. Spectrum Leasing Requirements 24

A. The Band Manager Rules 25

B. The Secondary Markets Spectrum Leasing Rules 27

C. The Secondary Markets Spectrum Leasing Rules Should Replace the Band Manager Rules for A and B Block Licensees 29

IV. Conclusion 32

Appendix: Proposed Technical Rule Changes

Option One A-1

Option Two A-2

Option Three A-2

I. Introduction

This Supplemental White Paper provides additional detail on changes to the Commission's technical rules and band manager restrictions that would be necessary to implement the rebanding of the Upper 700 MHz band proposed in the White Paper filed with the Commission on August 3, 2005.[1] The *August 3 White Paper* outlines a series of topics for a Notice of Proposed Rulemaking ("NPRM") and suggests that a primary goal of the NPRM should be to determine how the Upper 700 MHz A and B Blocks should be reconfigured to facilitate wireless broadband networks that will provide next generation services for commercial and public safety users from both fixed and mobile locations. As we noted in the *August 3 White Paper*, Chairman Martin has consistently emphasized the importance of a policy environment that speeds broadband deployment in the United States. Last month, Chairman Martin explained that "The Commission's top priority is broadband deployment and to make sure other new technologies are deployed as quickly as possible."[2]

In the *August 3 White Paper*, the parties submitting the paper indicated their intent to file additional materials, with a more detailed analysis of potential rule changes, including changes to the technical rules and the band manager restrictions.[3] This Supplemental White Paper describes the technical rule changes required to achieve the broadband and public safety objectives of the

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[1] "Implementing the Vision for 700 MHz: Rebanding the Upper 700 MHz A and B Blocks for Next-Generation Wireless Broadband, A White Paper Submitted by Upper 700 MHz A and B Block Licensees," Access Spectrum, L.L.C., Pegasus Guard Band, L.L.C., Columbia Capital Equity Partners III, L.P., PTPMS II Communications, L.L.C., WT Docket No. 05-157 (Aug. 3, 2005) ("*August 3 White Paper*").

[2] "Online Extra: The FCC's Front Man Talks," BUSINESS WEEK (Oct. 31, 2005), *available at*: <http://www.businessweek.com/@@JBlaE4YQhrXnYxwA/magazine/content/05_44/b3957112.htm>.

[3] *August 3 White Paper* at 19 n.24.

rebanding proposal.[4] These revised technical rules would enable the rebanded A and B Blocks to be used for broadband applications and ensure that Public Safety has the necessary protection from interference. Section II specifies the rule changes proposed, including out-of-band emissions requirements and power flux density ("PFD") limits to replace the current adjacent channel coupled power ("ACCP") requirements and the existing prohibition on cellular architecture.

In Section III, this Supplemental White Paper proposes the elimination of the band manager restrictions and the extension of the secondary markets rules to the Upper 700 MHz A and B Block licensees. The current service rules require A and B Block licensees to operate as band managers, leasing their spectrum to third parties rather than providing services themselves. Three years after promulgating these rules, the Commission adopted its secondary markets spectrum leasing rules, which are designed to achieve the same goals as the band manager rules. This paper proposes that the Commission extend the secondary markets rules to the A and B Blocks, replacing the current band manager restrictions.

II. Technical Rules

Achieving the broadband and public safety objectives of the rebanding proposal would require changing existing rules applicable to the current A and B Blocks. Such changes would not only enable the rebanded A and B Blocks[5] to carry next-generation broadband services, but they would also ensure that Public Safety has the necessary protection from interference. This

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[4] See Section II, below.

[5] The *August 3 White Paper* describes three rebanding options. Option Two would result in commercial A and B Blocks after the rebanding; for Options One and Three there would be no separate B Block after the rebanding.

section specifies the rule changes proposed and evaluates their impact as compared to existing rules. Proposed language for the new technical rules is provided in the Appendix.[6]

A. Changes to Current Rules

As explained in Section IV.B.2 of the *August 3 White Paper*, there are two existing rules that would pose direct obstacles to the deployment of broadband in the rebanded A and B Blocks. First, the adjacent channel coupled power ("ACCP") requirements, set forth in Section 27.53(d) of the Commission's rules, establish channel-specific limitations on the signal strength transmitted by A and B Block base stations and mobile units. The channel sizes specified in the rule, however, are 6.25 kHz, 12.5 kHz, 25 kHz and 150 kHz; the ACCP requirements include no provision for channels capable of containing a broadband operation, such as the 1.25 MHz broadband channels contemplated in the *August 3 White Paper*. The ACCP requirements should be replaced by protections that are designed to address emissions from channels of other bandwidths, including those channels contemplated for broadband operations.[7]

Second, the existing rule prohibiting the use of "cellular system architecture" in the current Upper 700 MHz A and B Blocks[8] would likely prevent the deployment of broadband in the rebanded A and B Blocks. The broadband operations envisioned for the rebanded A and B Blocks would most likely utilize low-power, low-site cellular systems in order to achieve necessary capacity, throughput, and service quality levels. Achieving the broadband objectives

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[6] *See* pages A-1 through A-3, attached.

[7] Although the current ACCP requirements arguably do not prohibit broadband operations *per se*, their failure to provide emissions standards for channels greater than 150 kHz creates uncertainty as to the emissions standard that would apply to a 1.25 MHz channel in the rebanded A and B Blocks.

[8] 47 C.F.R. § 27.2(b); *see also Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules*, Second Report and Order, 15 FCC Rcd 5299, ¶¶ 19-24 (2000) ("*Upper 700 MHz Second R&O*").

of the *August 3 White Paper* rebanding proposal would require eliminating the cellular architecture prohibition and substituting other protections for the adjacent public safety spectrum.

B. New Rules Would Provide Adjacent Public Safety and Commercial Operations Protection from Undue Interference.

Radio transmissions that pose a risk of interference to adjacent-channel operations can be divided into two general categories: radio transmissions that leak outside of their intended band and into adjacent spectrum (out-of-band emissions, or "OOBE"), and those that remain confined to their intended band but are picked up by receivers on systems operating in other bands. The following proposed rule changes are designed to provide Public Safety as well as commercial operations with protections from interference that are as strong or stronger than those currently in effect for both general categories of transmission. These rigorous protections against interference to adjacent operations are possible because of the development of new, currently available technology, as described below.

1. Out-of-Band Emissions Requirements

Out-of-band emissions are a major interference concern because there is nothing the receiver can do to reject them. For example, the signal from a commercial base station transmitting on Channel X may leak into adjacent Channel Y, which is used by Public Safety. The energy of the commercial signal in Channel Y would be an out-of-band emission, but the Public Safety receivers tuned to Channel Y would not be able to distinguish this out-of-band commercial signal from the Public Safety signal on Channel Y. As a result, the commercial signal in Channel Y, if it were sufficiently strong, would interfere with the Public Safety receiver.

a. OOBE Limits Replace ACCP Requirements

Under the current regulatory regime, the Section 27.53(c) ACCP requirements described above are the primary rules addressing A and B Block out-of-band emissions ("OOBE"). In order to provide OOBE protections flexible enough to address channel sizes not contemplated in the ACCP requirements, including broadband channels of 1.25 MHz, operations in the rebanded A and B Blocks should have the option of meeting rigorous OOBE restrictions instead of ACCP requirements.

Current rules applicable to C and D Block operations require that signals generated inside the C or D Blocks be attenuated outside the transmitting frequency by a minimum of 43 + 10 log (P) dB below the transmitter power (P).[9] C and D Block signals must be attenuated even further inside spectrum used by Public Safety for narrowband or wideband operations by at least 65 + 10 log (P) dB below transmitter power for mobile transmissions and by 76 + 10 log (P) dB below transmitter power for base station transmissions, as measured in a 6.25 kHz band segment.[10] In order to protect Upper 700 MHz band Public Safety narrowband channels from OOBE generated in the rebanded A Block (or B Block for Option Two), these existing OOBE rules should be extended to apply to the rebanded A and B Blocks. As discussed below, the appropriate OOBE limit for the rebanded A Block with respect to the adjacent Public Safety

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[9] 47 C.F.R. § 27.53(c)(1) and (2).

[10] 47 C.F.R. § 27.53(c)(3) and (4). The current C and D Block OOBE limits apply to the Public Safety Block regardless of the type of application occupying the Public Safety spectrum. Because the current rules channelize the Public Safety blocks into narrowband and wideband (but not broadband) channels, the current C and D Block OOBE limits do not contemplate that the spectrum will be used for Public Safety broadband operations. 47 C.F.R. § 90.531.

broadband block (as in Option One) should require attenuation to 43 + 10 log (P) dB as measured in a 100 kHz band segment.[11]

Under this proposed rule, the protection Public Safety narrowband operations receive from A and B Block OOBE would be as strong as required by current rules, and even stronger in most cases. Rather than establishing an attenuation standard based on transmitter power, the existing ACCP requirements set signal power limits for specified channel sizes relative to "the displacement from the channel center frequency."[12] Although the measurement bandwidth increases as the displacement from the channel center frequency increases, the maximum ACCP relative to the carrier signal decreases as the displacement increases.[13]

The existing C and D Block OOBE rule restricts emissions by requiring out-of-band signal power to be attenuated such that the maximum out-of-band signal power maintains a constant relation to the transmitter power: in Public Safety spectrum, the ratio is 65 + 10 log (P) dB for mobile units and 76 + 10 log (P) dB for base stations, and in commercial spectrum the ratio is 43 + 10 log (P) dB. In practice, however, the signal attenuates further as it leaks into frequencies increasingly distant from the transmitted frequency. Thus, the C and D Block OOBE rule is similar to the ACCP requirements: they both necessitate increased attenuation as spectral distance increases. As the graphs below show, if the C and D Block OOBE rule were applied to commercial operations adjacent to Public Safety spectrum, the level of OOBE protection for Public Safety would be greater (*i.e.*, OOBE would be attenuated to a lower value below carrier power) than the level of OOBE protection compelled by the current ACCP requirements.

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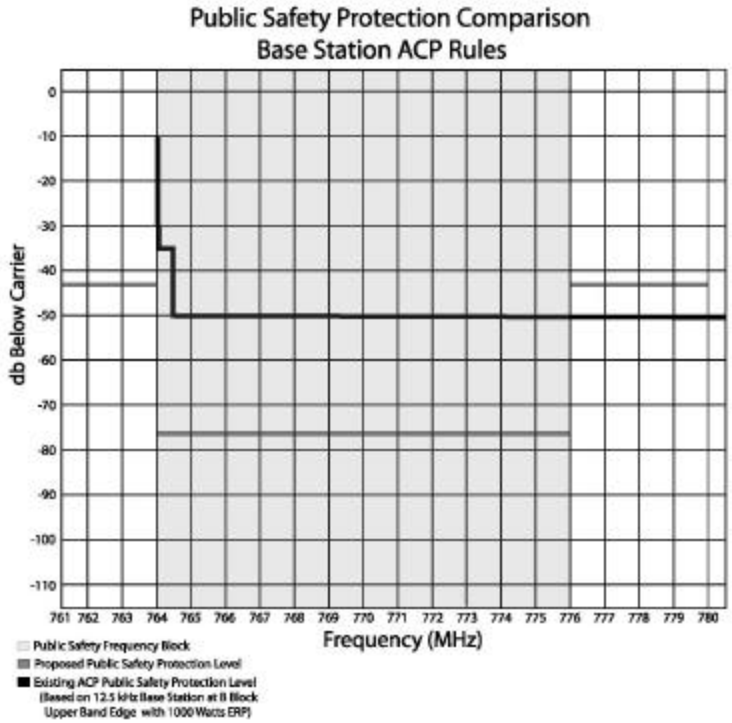
[11] As in the existing OOBE rule for the C and D Blocks, the measurement bandwidth in the 100 kHz immediately outside the A Block may be as little as 30 kHz. 47 C.F.R. § 27.53(c)(5). See Section II.B.3.a(ii), below, for discussion of interference between broadband systems.

[12] 47 C.F.R. § 27.53(d)(1).

[13] 47 C.F.R. § 27.53(d).

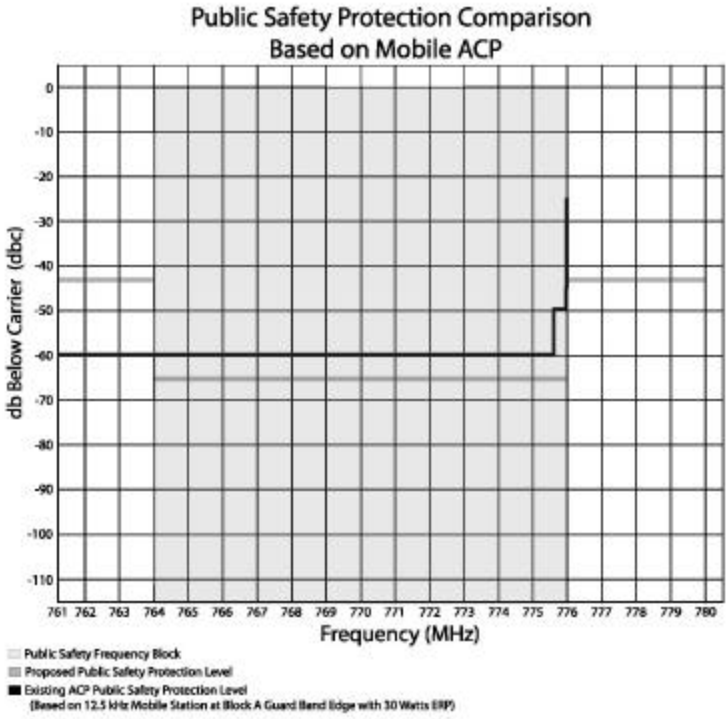
Public Safety Protection from Interference Under Proposed OOBE Limit vs. Current ACCP Requirements



ACP Graph Based on Various
Measurement Bandwidths

Offset from Center Frequency (kHz)	Measurement Bandwidth (kHz)
9.375	6.25
15.625	6.25
21.875	6.25
37.500	25.00
62.500	25.00
87.500	25.00
150.000	100.00
250.000	100.00
>400 to receive band	30(s)
In receive band	30(s)

s--Swept Measurement



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>400 to receive band	30(s)
In receive band	30(s)

s--Swept Measurement

b. Power Flux Density Limits Replace Cellular Architecture Prohibition

In the *Second R & O*, the Commission stated that the prohibition on the use of cellular architecture in the A and B Blocks would also reduce the likelihood that OOBE would cause interference to Public Safety operations.[14] The use of cellular architecture raises interference concerns because of what is commonly known as the "near-far" problem. As the Commission described the problem in the *Second R&O*, such a situation would arise "where a public safety official situated in a home might be required to use a handset to call for 'back-up.' Under this scenario, potential interference to the handset from a [commercial] base station located on a nearby rooftop would be of great cause for concern."[15] Such interference would arise because the source of the commercial signal would be nearby and thus the signal would be relatively strong; if this strong commercial signal were picked up by the Public Safety receiver, it could cause interference to the Public Safety receiver such that a transmission from a distant Public Safety base station would be unintelligible to the Public Safety official using the mobile handset.

Although a blanket prohibition on cellular architecture may be one way to reduce the risks of the near-far problem, there are other, less restrictive ways to achieve the same goal. One alternative, proposed in this paper, would be to impose a restriction on power flux density ("PFD"). A PFD restriction would address the near-far problem by specifically restricting the signal strength of the commercial signal measured on the ground near the commercial base station transmitter antenna. The Commission has already adopted a PFD restriction to combat

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14 *Upper 700 MHz Second R&O*, ¶¶ 21-22.

15 *Upper 700 MHz Second R&O*, ¶ 22 n.50.

adjacent-channel interference to ground-based devices in the Lower 700 MHz band.[16] At the time the Commission considered the cellular architecture prohibition for the Upper 700 MHz band, however, none of the parties had proposed using a PFD restriction, and the Commission did not consider such an option in its decision. Today, in light of advances in technology that help prevent interference, a PFD restriction would provide the necessary protection to Public Safety. See Section II.B.2.a, below, for a detailed description of the proposed PFD restriction.[17]

2. Adjacent-Channel Interference From Signal Energy Inside Its Intended Band ("In-Band" Emissions).

As explained above, the current rules for the A and B Blocks restrict out-of-band emissions predominantly by applying the ACCP requirements. When the Commission set the technical requirements for the A and B Blocks in March 2000, it also expressed concern that signal energy that is not out-of-band and does not enter the adjacent channel pass-band could nonetheless cause interference to adjacent-channel Public Safety operations.[18] Such energy (called "in-band" emissions) can cause interference because the Public Safety narrowband receiver has a "wide" front-end: although the Public Safety receiver is most sensitive to signal within its intended channel, it is designed also to pick up signal within adjacent commercial channels, but with decreasing sensitivity. Although commercial system signal at the band edges is usually relatively weak, in cases where it is strong it could result in interference to the Public

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[16] 47 C.F.R. § 27.55(b); *Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59)*, Report and Order, 17 FCC Rcd 1022, ¶¶ 104-105 (2002) ("*Lower 700 MHz Order*").

[17] Although the PFD proposal detailed in this paper is in relation to interference from in-band emissions, it is also effective in preventing interference from OOBE because it ensures that the power of any signal—including OOBE—measured near the commercial base station transmitter antenna is sufficiently low that it will not interfere with a Public Safety mobile in that area as it tries to receive a signal from a distant Public Safety transmitter.

[18] *Upper 700 MHz Second R&O*, ¶ 15 & n.37.

Safety system by one or more of the following phenomena: (1) intermodulation with other signals in the receiver, (2) receiver overload, and/or (3) desensitization of the receiver to the desired signal.

The cellular architecture prohibition was intended in large part to help protect against interference caused by emissions that remain confined to their intended band. Specifically, the Commission was concerned that a Public Safety narrowband mobile receiver (with a wide front-end) attempting to receive a relatively weak signal from a distant Public Safety base station transmitter would also receive a signal from a commercial narrowband or wideband operation, even if the commercial signal remained in-band. If the commercial system used a cellular architecture, it could have a large number of base stations emitting such signals, thereby increasing the likelihood that the in-band commercial signal would be sufficiently strong that it would interfere with the Public Safety mobile receiver's ability to receive and "understand" the desired transmission from the distant Public Safety base station.[19]

As explained above, the current prohibition on cellular architecture in the A and B Blocks is a serious obstacle to the deployment of broadband because today's broadband technologies are cellular systems. Although the goal of the prohibition was protection of narrowband Public Safety operations from interference caused by signal transmitted in the adjacent commercial spectrum,[20] such interference is not caused by the cellular infrastructure *per se*: it is caused by a single low-power, low-antenna-height transmitter that provides a relatively high field intensity in geographic areas where the desired Public Safety signal is weak, thus resulting in interference to the Public Safety receiver by the undesired commercial signal. New rules that impose rigorous power limits on commercial signal strength, combined with current receiver technology and the

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19 *Id*.

20 *Id*., ¶¶ 19-20.

proposed rebanding itself, would alleviate this concern without obstructing broadband deployment.[21]

a. Power Flux Density Limits

In the Lower 700 MHz band, the Commission imposed a "power flux density" ("PFD") limitation of 3,000 microwatts per square meter to restrict the received signal strength on the ground in the vicinity of transmitting base stations, thereby limiting interference between commercial operations on adjacent channels.[22] This PFD limitation was set to correspond to the energy of the signal that would be received on the ground within one kilometer of a 305-meter high antenna transmitting at 1 kilowatt effective radiated power ("ERP"), which is the maximum power level permitted in the commercial blocks of the Upper 700 MHz band, including those adjacent to Public Safety spectrum.[23]

Although the Commission found that a PFD of 3,000 microwatts per square meter was an appropriate limit for the Lower 700 MHz band, it expressly noted that the Lower 700 MHz band did not present the same concern about protecting Public Safety operations as did the Upper 700

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[21] In his paper entitled *Flexible Spectrum Use Rights Tutorial*, NTIA's Robert J. Matheson set out a general approach to regulation for the flexible use of spectrum that is very similar to the approach taken in this paper: OOBE restrictions, scalable limits on signal field intensity at ground level, and unregulated receiver performance. *Flexible Spectrum Use Rights Tutorial—ISART 2005*, Robert J. Matheson, National Telecommunications and Information Administration, Institute for Telecommunications Sciences, at 157 (2005), *available at*: <http://www.its.bldrdoc.gov/pub/ntia-rpt/05-418/05-418_matheson.pdf>.

[22] *Lower 700 MHz Order*, ¶ 104; 47 C.F.R. § 27.55(b).

[23] *Lower 700 MHz Order*, ¶¶ 102, 105; 47 C.F.R. § 27.50(b). Effective radiated power for transmitters in the Upper 700 MHz commercial blocks is currently—and would continue to be under this proposal—controlled by Section 27.50(b)(1)-(3) of the Commission's rules, which restricts fixed and base station transmitters to one kilowatt ERP for antenna heights less than 305 meters above average terrain (with reduced ERP for higher antennae), control and mobile station transmitters to 30 watts ERP, and portable stations to 3 watts ERP. 47 C.F.R. § 27.50(b)(1)-(3).

MHz band.[24] Accordingly, this paper proposes the adoption of PFD limits as in the Lower 700 MHz Order, but at the far lower, more restrictive level of 25 microwatts per square meter in the area within one kilometer of the transmitting base station antenna—a level that recognizes the increased caution with which the Commission appropriately approaches the risk of interference to Public Safety operations.[25] Our preliminary analysis indicates that if commercial operations adjacent to Public Safety spectrum limit their PFD to the level proposed herein, today's Public Safety receivers possess more than adequate adjacent channel rejection and intermodulation rejection to prevent in-band emissions from causing interference. See Section II.B.2.b, below, for a discussion of current receiver technology.

This limitation on signal strength in the vicinity of commercial base and fixed station antennae would help combat the near-far problem for Upper 700 MHz Public Safety operations. Under Option One, it would provide an upper bound on the strength of the signal on the ground within one kilometer of the base of broadband antennae in the newly rebanded A Block and the 1 MHz portion of the rebanded C Block that is adjacent to Public Safety. For Option Two, the limitation would apply to the rebanded B Block (but would not apply to the A Block, which would not be adjacent to Public Safety) and the 1 MHz portion of the rebanded C Block that is adjacent to Public Safety. And under Option Three, commercial signal strength would be limited in this fashion in the rebanded A Block.

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24 *Lower 700 MHz Order*, ¶ 103.

25 This preliminary PFD level was determined by considering the receive characteristics of Class A Public Safety radios, and conservatively assumes that the front-end of the receiver does not offer any out-of-band attenuation. The Longley-Rice 1.2.2 model was used to determine RF levels at six feet above ground, taking into account the vertical pattern of the antennas and typical cellular type antenna heights and ERPs. For the purposes of this initial investigation, flat terrain was assumed.

b. Improvements in Public Safety Receiver Performance

As the Commission recognized in the 800 MHz proceeding, improvements in receiver performance can greatly reduce the risk of interference to Public Safety operations.[26] In that proceeding, the Commission made Public Safety's entitlement to full protection against unacceptable interference in the 800 MHz band contingent upon a given level of performance of Public Safety receivers.[27] These performance criteria were largely adopted from the TIA Class A standard and "manufacturers' technical filings contained in the record, standard reference works and manufacturers' specification sheets for voice equipment" which at that time "represent[ed] the state of the art in affordable public safety and CII radios."[28]

Public Safety systems in the Upper 700 MHz band likely will use radios that meet the Class A standards. Even in 2004, "93 percent of [Motorola's] recent portable receiver inventory me[t] Class A standards."[29] Radios that meet Class A standards will resist and largely eliminate the risk of interference to Public Safety receivers caused by in-band emissions. According to Motorola, it is "not aware of any reports of interference to mobile radios which meet the TIA

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[26] *Improving Public Safety Communications in the 800 MHz Band*, Report and Order, Fifth Report and Order, Fourth Memorandum Opinion and Order, and Order, 19 FCC Rcd 14969, ¶¶ 109-114 (2004) ("*800 MHz Order*").

[27] *800 MHz Order*, ¶ 109; 47 C.F.R. § 22.970(b) (requiring for finding of unacceptable interference that mobile voice units possess 75 dB intermodulation and adjacent channel rejection ratio, and -116 dBm reference sensitivity; and that portable voice units possess 70 dB intermodulation and adjacent channel rejection ratios, and -116 dBm reference sensitivity).

[28] *800 MHz Order*, ¶ 110 (noting also that the Commission relied only "on those portions of the [TIA] standard that affect intermodulation rejection, adjacent channel selectivity, and receiver sensitivity.").

[29] *Id.*, ¶ 99 n.297.

Class A specification."[30] It seems most likely that radios produced for use in the Upper 700 MHz Public Safety Block will likewise meet the Class A standard.

Combined with the power flux density field strength limitation for commercial broadband transmissions proposed above, the robust performance of today's Public Safety receivers would ensure that on the ground near the commercial transmitter antenna where the near-far phenomenon is particularly problematic, the Public Safety receiver would not receive interference from commercial in-band emissions.

c. Effect of the Proposed Rebanding

Assuming that broadband operations are deployed in the commercial spectrum adjacent to the Public Safety block as contemplated in the proposed rebanding, the energy of such commercial transmissions would be very low on a per-Hertz basis. In other words, because a broadband channel is so large, the energy of a broadband transmission is spread out over a relatively wide swath of spectrum, causing a reduction in the number of watts per Hertz of bandwidth. This measure is important because it relates directly to the amount of interference the commercial broadband signal may impose on adjacent Public Safety operations: fewer watts per Hertz means that less energy from the commercial signal will enter the Public Safety receiver, which will receive signal only within a particular bandwidth (the Public Safety channel plus adjacent segments of spectrum, depending on the receiver's emissions mask). The prohibition on cellular architecture in the current rules was based on the assumption that commercial spectrum adjacent to Public Safety operations would carry only narrowband or

[30] Letter from Steve B. Sharkey, Director, Spectrum and Standards Strategy, Motorola, Inc. to Edmond Thomas, Chief, Office of Engineering and Technology, FCC, WT Docket No. 02-55, at 13 (May 6, 2003).

wideband channels, which concentrate energy in relatively small segments of spectrum.[31] Indeed, a typical 1-kilowatt system on a 12.5 kHz channel under current rules would carry 80 milliwatts per Hertz; by comparison, a 250-watt broadband system on a 1.25 MHz channel as contemplated in the proposed rebanding would carry only 0.2 milliwatts per Hertz. Because this energy is spread over broadband channels, if Public Safety receivers were to pick up a commercial broadband signal outside the Public Safety spectrum, the power of that received signal would be relatively low and less likely to cause intermodulation, front-end overload or desensitization.

In addition, the use of the spectrum as contemplated in Option One of the *August 3 White Paper* would significantly reduce the risk of interference to Public Safety narrowband operations from commercial in-band transmissions. The Public Safety broadband operation that would occupy the extra 1.5 MHz paired spectrum provided to Public Safety would be a substantial and sufficient buffer, effectively eliminating the risk of interference to the nearest Public Safety narrowband operation from both OOBE and in-band emissions generated in the rebanded A Block.

3. Scenarios for Potential Interference

Whether interference will occur between adjacent systems depends in large part upon the spectral proximity of the operations involved. Accordingly, this section explains how operations in each segment of spectrum involved in the proposed rebanding would be protected from interference caused by adjacent operations.

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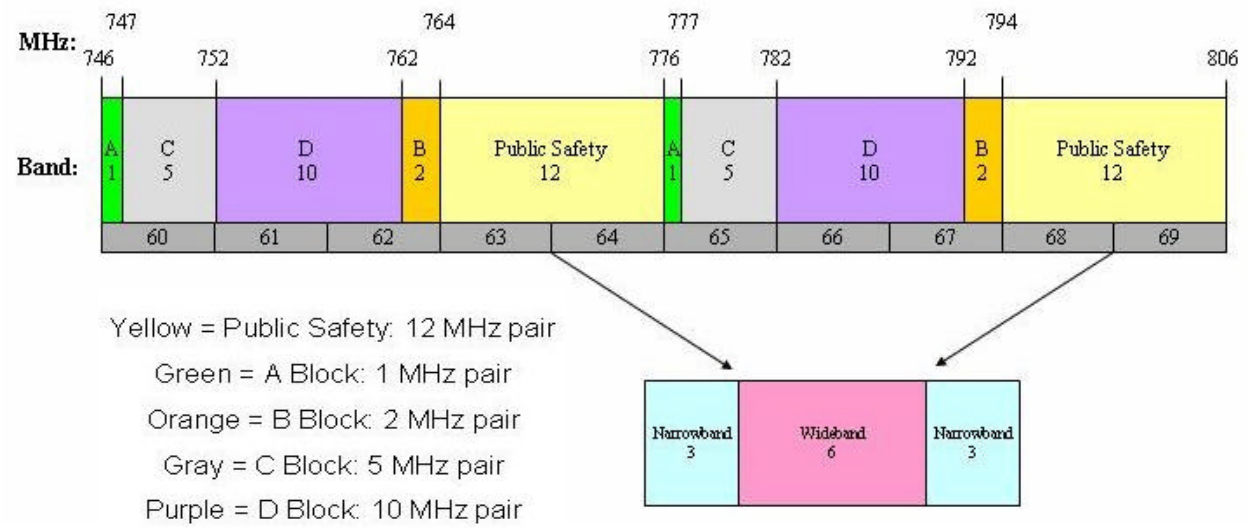
[31] As described above, the Commission set ACCP rules assuming that the largest commercial channel adjacent to Public Safety in the Upper 700 MHz band would be 150 kHz. 47 C.F.R. § 27.53(d).

Under the current band plan, the A and B Blocks border the Public Safety Block, which is divided into narrowband and wideband segments. The A, B, and Public Safety Blocks are all configured with the lower frequency band used for base transmit and the upper frequency band used for mobile transmit.

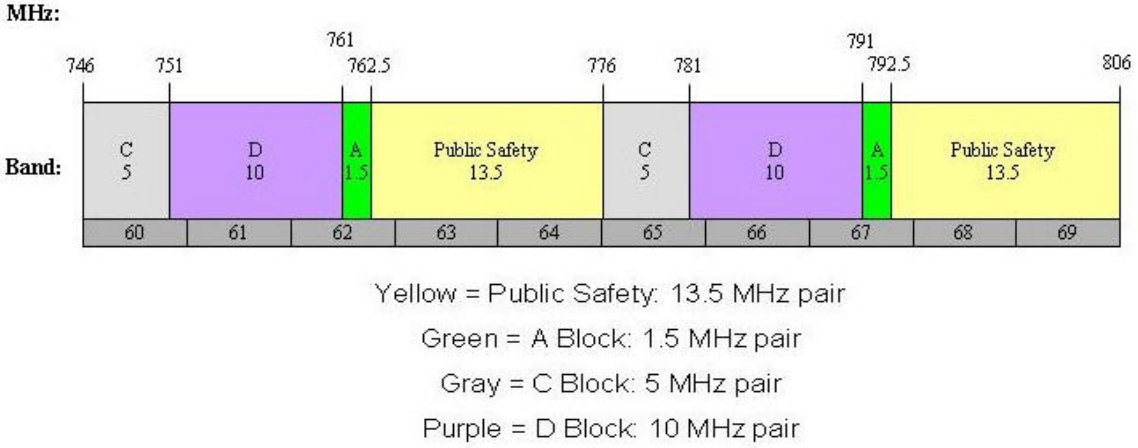
Current Band Plan



a. Option One

Under Option One, Public Safety would gain 1.5 MHz of paired spectrum for a broadband operation. The expanded Public Safety Block would be bordered by the A Block on one side and the C Block on the other.

Option One



(i) A Block Interference to Public Safety Narrowband Operations

Under Option One, the proposed band plan itself provides protection to Public Safety narrowband operations from both OOBE and in-band emissions generated by A Block operations. The additional 1.5 MHz paired spectrum provided to Public Safety to accommodate a new Public Safety broadband operation under Option One would be located between the rebanded A Block and the existing Public Safety Block, thus providing a buffer that would further prevent A Block emissions (both in-band and out-of-band) from causing interference to Public Safety narrowband operations.

Interference from A Block OOBE to Public Safety narrowband operations[32] also would be restricted by OOBE limits that require emission power attenuation outside the band below the transmitter power (P) by at least 76 + 10 log (P) dB measured in a 6.25 kHz band for base and fixed stations, and 65 + 10 log (P) dB measured in a 6.25 kHz band for mobiles and portables.[33]

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[32] Current regulations require that each 12 MHz Public Safety Block be configured with a 6 MHz segment used for wideband bordered on both sides by 3 MHz segments used for narrowband. 47 C.F.R. § 90.531.

[33] 47 C.F.R. § 27.53(c).

As explained above, these rules would allow less A Block commercial signal to leak into Public Safety narrowband and wideband spectrum than the existing ACCP rules permit today.

Because of the proposed power flux density limits and the wide channel across which the broadband signal energy would be spread, the undesired signal received by a Public Safety narrowband unit in the A Block would be relatively low-power, thus preventing the undesired signal from overloading the Public Safety receivers or causing interference due to intermodulation.[34] By comparison, the desired Public Safety signal would be sufficiently strong that it would not be lost in the event of desensitization caused by any undesired signal.

Finally, the performance characteristics of the narrowband receivers that Public Safety would use in the Upper 700 MHz band would be significantly improved in comparison with those contemplated at the time the Commission adopted the cellular architecture prohibition. Today's narrowband receivers have better front ends, better adjacent channel rejection, and improved intermodulation rejection—as a result, they are better able to prevent signals outside the Public Safety band from causing harmful interference to Public Safety narrowband operations.

(ii) A Block Interference to Public Safety Broadband Operations

Interference from A Block broadband OOBE to Public Safety adjacent broadband operations would be restricted by the requirement to attenuate emission power outside the band below the transmitter power (P) by at least 43 + 10 log (P) dB, which is the current standard for OOBE interference between cellular operations in the C and D Blocks. The proposed power flux density limits and the wide spread of broadband signal energy would greatly constrain the

[34] Intermodulation is not a concern unless the received signal is relatively strong. *800 MHz Order*, ¶ 91.

strength of the commercial broadband signal, thus controlling interference to the Public Safety broadband operation from adjacent commercial in-band emissions. In addition, the broadband receivers used by Public Safety would be better able to prevent signals outside the Public Safety band from causing harmful interference to Public Safety broadband operations than the narrowband receivers contemplated at the time the current A and B Block rules were established.

(iii) C Block Interference to Public Safety Narrowband Operations

Out-of-band emissions from the rebanded C Block commercial broadband operation under Option One would be controlled by the current C and D Block OOBE limits requiring emission power attenuation outside the band below the transmitter power (P) by at least 76 + 10 log (P) dB for base and fixed stations, and 65 + 10 log (P) dB for mobiles and portables measured in a 6.25 kHz band segment. Interference to Public Safety narrowband operations from C Block in-band signal under Option One would be controlled by the power limits on the commercial C Block signal and the improved Public Safety receivers.

(iv) Interference Between Commercial Block Operations (A, C, and D Blocks)

Under both the current rules and the proposed new rules, commercial operations in the Upper 700 MHz band are all protected from OOBE generated by operations in other commercial blocks—commercial signal power must be attenuated outside the licensee's band below transmitter power by at least 43 + 10 log (P) dB as measured in a 100 kHz band segment.[35] In addition, because the systems in the new commercial blocks will likely employ spread spectrum technology, commercial mobiles and base stations will not receive undue interference from OOBE. As the Office of Spectrum Planning and Policy Analysis has stated, "Spread spectrum

[35] The measurement bandwidth in the 100 kHz immediately outside the A Block may be as little as 30 kHz. 47 C.F.R. § 27.53(c).

techniques … are characterized by high immunity to interference and low probability of intercept. These qualities, coupled with their low potential for causing interference to other devices, make spread spectrum systems an attractive technology for consumer use."[36]

In addition, commercial operations would receive no unacceptable interference from in-band signals in other commercial blocks because the Commission's current power restriction rule for commercial systems would remain in place, limiting the energy of the transmitted commercial signal to 1,000 watts ERP for base stations, 30 watts ERP for mobiles, and 3 watts ERP for hand-held devices.[37] Finally, today's commercial receivers possess adjacent channel rejection, intermodulation rejection and sensitivity characteristics that will further combat the risk of interference from in-band adjacent commercial signals.

b. Option Two

The new band plan under Option Two is the same as that proposed in Option One, except that the 1.5 MHz paired addition to Public Safety spectrum instead becomes the new commercial B Block. Thus, Public Safety spectrum is bordered by the B Block on one side and the C Block on the other.

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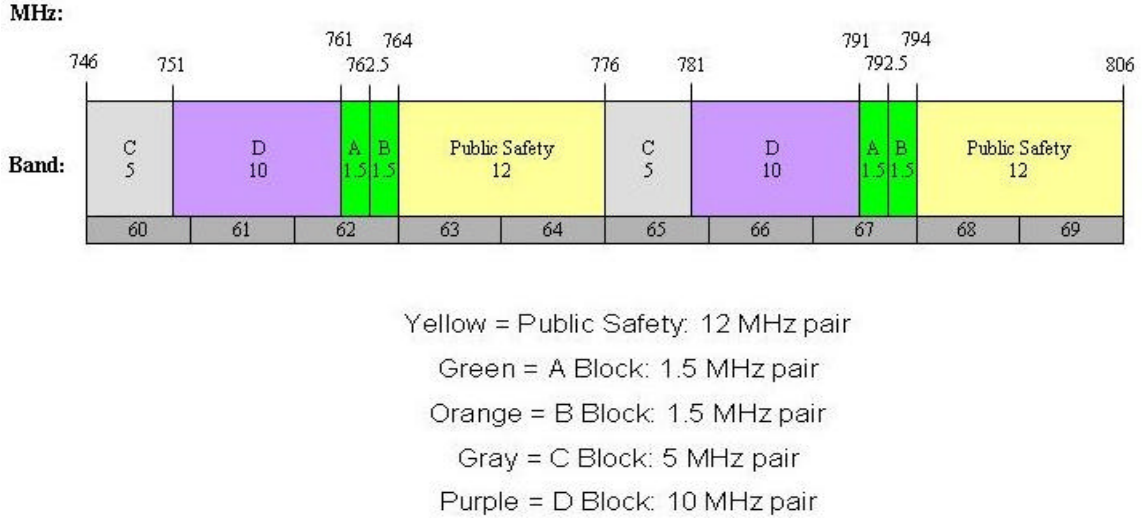
[36] OSP Working Paper Number 39, "Unlicensed and Unshackled: A Joint OSP-OET White Paper on Unlicensed Devices and Their Regulatory Issues," 2003 FCC LEXIS 3117, at *14 (May 2003).

[37] 47 C.F.R. § 27.50(b).

Option Two



(i) B Block Interference to Adjacent Public Safety Narrowband Operations

Potential interference from commercial broadband operations in the rebanded B Block to adjacent Public Safety narrowband operations under Option Two would be controlled by OOBE limits requiring attenuation below the transmitter power (P) by at least 76 + 10 log (P) dB for base and fixed stations, and 65 + 10 log (P) dB for mobiles and portables, both measured in a 6.25 kHz band segment.[38] As explained above, this requirement would result in less B Block OOBE in Public Safety narrowband spectrum than is permitted by the current ACCP requirements. This OOBE limit as applied to B Block mobile transmitters would be sufficient to protect Public Safety from interference even near 794 MHz where B Block mobile units likely would be transmitting on spectrum adjacent to Public Safety base station receivers.

The broadband operation in the B Block would be subject to the new power flux density limits proposed herein and would transmit very low power on a watts-per-Hertz basis, thus combating both the near-far problem and the potential for interference from in-band emissions. In addition, improved filtering of B Block base stations would ameliorate the risk of interference

[38] 47 C.F.R. § 27.53(c).

to Public Safety mobile receivers near 764 MHz. Finally, the improved ability of Public Safety narrowband receivers to reject intermodulation and adjacent channel signal would help prevent interference.

(ii) A Block Interference to Public Safety Narrowband Operations

The protections against potential interference under Option Two between broadband operations in the rebanded A Block and narrowband operations in the Public Safety Block are the same as those described above with regard to Option One, with one exception: the proposed power flux density limit would apply only to spectrum adjacent to Public Safety spectrum, so although it would apply to the A Block under Option One, it would not under Option Two. In Option Two, Public Safety narrowband operations are protected from A Block interference by the buffer provided by the 1.5 MHz paired spectrum B Block, OOBE limits more stringent than the current ACCP requirements, existing power restrictions applicable to the A and B Blocks, the low energy per bandwidth of the A Block broadband signal, and Public Safety narrowband receivers with improved interference prevention capabilities.

(iii) C Block Interference to Public Safety Narrowband Operations

The analysis of potential interference from C Block broadband operations to Public Safety narrowband operations under Option Two is similar to that applicable to the rebanded B Block: it would be constrained by OOBE limits more stringent than the current ACCP requirements, by the proposed power flux density limitations, by the low energy per Hertz of the contemplated broadband systems, and by the improved performance characteristics of today's narrowband Public Safety receivers.

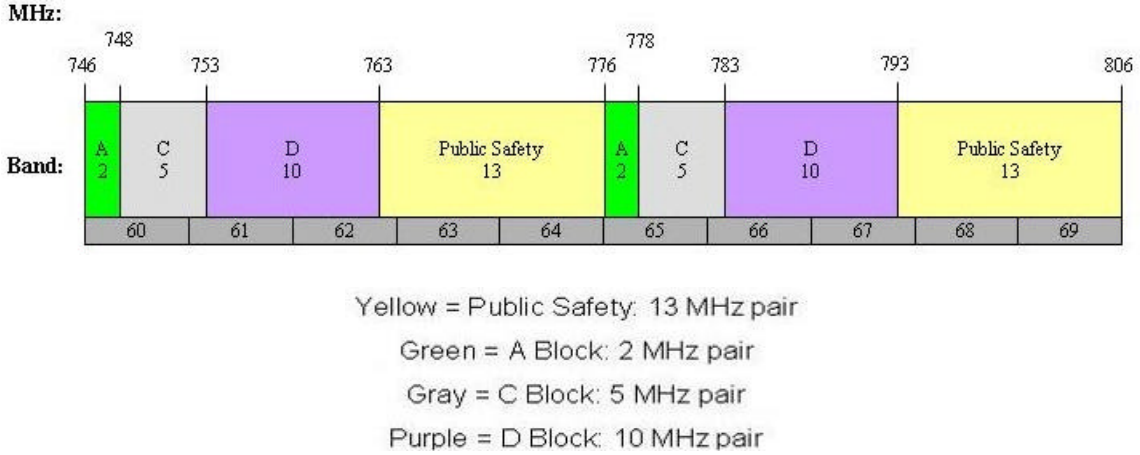
(iv) Interference Between Adjacent Commercial Block Operations (A, B, C, and D Blocks)

As in Option One, and for the same reasons, unacceptable interference between adjacent commercial operations would not be a concern under Option Two. These reasons include the application of existing OOBE and power limits, the likely use of spread spectrum technology in commercial systems, and the ability of current commercial receivers to reject in-band signal.

c. Option Three

In Option Three, the current band plan would be changed by expanding the A Block to 2 MHz paired and adding another 1 MHz paired to the lower end of the Public Safety Block.

Option Three



(i) D Block Interference to Adjacent Public Safety Narrowband Operations

Under Option Three, the additional 1 MHz paired spectrum provided to Public Safety would be a significant buffer between Public Safety narrowband operations at 764/794 MHz and commercial broadband operations in the rebanded D Block; the rebanded D Block would be one MHz away from the spectrum designated for Public Safety narrowband receivers today. Other protections would include: current C and D Block OOBE limits; very low power on a watts-per-Hertz basis; and improved Public Safety receiver characteristics.

(ii) A Block Interference to Public Safety Narrowband Operations

A commercial broadband operation operating on 1.25 MHz paired channels in the rebanded A Block as contemplated in Option Three would have sufficient spectrum to place the channels near the edge of the A Block furthest from Public Safety spectrum, thereby creating a buffer of perhaps 500 kHz between the commercial broadband operation and Public Safety. In addition, the rebanded A Block would be subject to OOBE restrictions more rigorous than the current ACCP requirements; the proposed power flux density limit; low power on a watts-per-Hertz basis; and the improved ability of current Public Safety receivers to combat the potential for interference caused by adjacent A Block in-band transmissions.

(iii) Interference Between Adjacent Commercial Block Operations (A, C, and D Blocks)

As in Options One and Two—and for the same reasons—unacceptable interference between adjacent commercial operations would not be a concern under Option Three. These reasons include the application of existing OOBE and power limits, the use of spread spectrum technology in commercial systems, and the ability of current commercial receivers to reject in-band signal.

III. Spectrum Leasing Requirements

Licensees in the Upper 700 MHz A and B Blocks currently operate as band managers under rules established by the Commission early in 2000. These rules, which the Commission adopted as an experiment to improve spectrum access, flexibility, and efficiency by allowing the development of a “free market” in spectrum, provide licensees the ability to lease spectrum to

third parties, but they also impose significant restrictions.[39] Three years after it adopted the band manager rules, the Commission promulgated separate rules to enable and govern secondary market spectrum leasing.[40] Although these new secondary markets rules apply to most wireless radio services, the Commission has not extended the rules to licensees in the Upper 700 MHz A and B Blocks.[41] As a result, the band manager rules continue in effect for A and B Block licensees, potentially limiting business plans in ways that are contrary to public policy. As explained below, the Commission should lift the restrictions in the band manager rules and extend the secondary markets rules to licensees in the Upper 700 MHz A and B Blocks.

A. The Band Manager Rules

In March 2000, when the Commission adopted the band manager model for the A and B Blocks of the Upper 700 MHz band, it explained that

> enabling a "free market" in spectrum to develop could have significant public interest benefits in ensuring the limited spectrum resource is used efficiently, and the Guard Band Manager approach should help us advance that goal.[42]

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[39] *Upper 700 MHz Second R&O*, ¶¶ 29-31, 54 (band manager "will act only as a spectrum broker and not as a wireless service provider"), 59 ("[I]n order to ensure that we conduct a useful test of the Band Manager concept and obtain the full benefits of this new licensing approach, … we will require Guard Band Managers to lease the predominant amount of the spectrum to non-affiliates.").

[40] *Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets*, Report and Order and Further Notice of Proposed Rulemaking, 18 FCC Rcd 20604, ¶ 2 (2003) ("*Secondary Markets First R&O*").

[41] *Secondary Markets First R&O*, ¶ 85 n.189; *Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets*, Second Report and Order, Order on Reconsideration, and Second Further Notice of Proposed Rulemaking, 19 FCC Rcd 17503, ¶ 64 (2004) ("*Secondary Markets Second R&O*"). The Commission also did not extend the secondary markets spectrum leasing rules to the 220 MHz band, where it had earlier authorized Access Spectrum to operate as a band manager, pursuant to band manager requirements that are similar, but not identical, to those applicable to the Upper 700 MHz band A and B Blocks. *Access 220, LLC Request for Waivers to Provide Band Management Services Utilizing Licenses in the 220-222 MHz Band*, Memorandum Opinion and Order, 17 FCC Rcd 20464, ¶¶ 9-19 (2002).

[42] *Upper 700 MHz Second R&O*, ¶ 31.

As envisioned by the Commission, an A or B Block licensee would be a "spectrum broker" that would "coordinate the use of frequencies among its customers to minimize interference," tailoring the use of its spectrum subject to certain technical restrictions to meet the temporal and geographic spectrum needs of its customers (such as a short-term need for access to spectrum, or access to spectrum covering an irregular geographic area).[43] In order to meet these objectives, the Commission permitted band managers to lease their spectrum holdings to third-party customers pursuant to written agreements while continuing to hold the Guard Band manager-licensee responsible for lessee compliance with the Act and the Commission's rules.[44]

Although the Commission intended the Guard Band manager concept to facilitate the efficient use of spectrum, it imposed a number of requirements that significantly restrict the use of Guard Band spectrum. For example, under the rules adopted by the Commission in 2000, Guard Band licensees (1) must make the licensed spectrum available to third parties only through "leasing" the spectrum, acting only as a "spectrum broker," and are not permitted to use the spectrum themselves as wireless service providers;[45] and (2) are required to lease the "predominant amount of their spectrum" to non-affiliates.[46] In addition, there are limits on the ability of band managers to negotiate freely with lessees regarding use of the licensed frequencies.[47]

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43 *Id.*, ¶¶ 28-29.

44 *Id.*, ¶¶ 46-49; 47 C.F.R. § 27.601(a). The rules enabling and regulating band managers in the A and B Blocks of the Upper 700 MHz Band (746/776-747/777 MHz and 762/792-764/794 MHz) are set forth in Part 27, Subpart G of the Commission's rules, 47 C.F.R. §§ 27.601-27.607.

45 *Upper 700 MHz Second R&O*, ¶¶ 27, 54. Band managers are permitted to lease some of their licensed spectrum to affiliated entities for the affiliates' own internal use or for their provision of commercial or private radio services. *Id.*, ¶ 59.

46 *Id.*, ¶ 59; 47 C.F.R. § 27.603(c).

47 47 C.F.R. §§ 27.602(g), 603(b). For example, in leasing spectrum rights a Guard Band manager cannot require an end user to purchase telecommunications equipment only from one

The restriction on a band manager in using its spectrum to provide wireless services complicates prospects for any broadband system that an A or B Block licensee might wish to deploy on its own or through affiliates, particularly in combination with the requirement that the band manager lease the majority of its spectrum to unaffiliated parties. Because a single broadband channel would occupy all or at least most of the spectrum in either the A or the B Block (even after rebanding), the current rules appear to foreclose an affiliate-deployed broadband service in the A and B Blocks, unless the two blocks are licensed to a single entity, which is one possible outcome for Option Two of the *August 3 White Paper*.[48] And in that case, the rules appear to foreclose an affiliate-deployed system that made full use of the A and B Blocks.

B. The Secondary Markets Spectrum Leasing Rules

Three years after adopting the band manager rules for A and B Block licensees, the Commission again promulgated rules[49] designed to create a "free market" in spectrum leasing rights, describing its goals in very similar language to that used in connection with the band manager approach:

> These flexible policies continue our evolution toward greater reliance on the marketplace to expand the scope of available wireless services and devices, leading to more efficient and dynamic use of the important spectrum resource to the ultimate benefit of consumers throughout the country.[50]

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manufacturer or vendor, to require use of a particular technology, or to impose operating rules that would have the same practical effect. *Upper 700 MHz Second R&O*, ¶ 66. In contrast, licensees of other spectrum bands may negotiate such lease provisions, with the Commission relying on the marketplace to ensure that the transaction maximizes efficiency.

[48] *August 3 White Paper* at 9-11.

[49] The secondary markets spectrum leasing rules are set forth mostly in Part 1, Subpart X of the Commission's rules, 47 C.F.R. §§ 1.9001-1.9060.

[50] *Secondary Markets First R&O*, ¶ 2.

Rather than limit the application of the new rules to a single set of licensees, the Commission applied the secondary markets rules far more broadly, including most wireless radio services,[51] though explicitly excluding services in the Upper 700 MHz A and B Blocks.[52] Also, the secondary markets rules contemplate two different kinds of leasing arrangements: "spectrum manager" leasing,[53] where the licensee retains *de facto* control over the license (similar to band managers); and "*de facto* transfer" leasing, in which the lessee takes over control of, and greater responsibility for, the license.[54]

Under "spectrum manager" leasing,

> licensees and spectrum lessees may enter into spectrum leasing arrangements—for any amount of spectrum, in any geographic area, and for any period of time within the scope and term of the license—without the need for prior Commission approval.[55]

Although the licensee may apply the lessee's activities toward meeting any construction or performance requirements, the spectrum manager licensee is primarily and ultimately responsible for compliance with the Act and the Commission's rules, including interference-related requirements, much like a band manager licensee.[56] Unlike a band manager, however, a

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51 *Id.*, ¶ 84 n.181.

52 When it initially promulgated the secondary markets spectrum leasing rules, the Commission excluded the Guard Band Manager Service and a number of other services, most of which involved shared frequencies. *Secondary Markets First R&O*, ¶¶ 82-85. Upon revisiting the question, the Commission again declined to extend the secondary markets spectrum leasing rules to the Guard Band Manager Service because it "already has its own distinct set of policies and rules regarding leasing arrangements, and no commenter proposed replacing those policies." *Secondary Markets Second R&O*, ¶ 64.

53 In this Supplemental White Paper, "spectrum manager" is used as a term of art applicable only to the secondary markets rules, which are distinct from the band manager rules.

54 *Secondary Markets First R&O*, ¶¶ 12-13.

55 *Id.*, ¶ 12.

56 *Id.*

"spectrum manager" is not subject to any restriction on the amount or proportion of its spectrum that it may lease to an affiliate or that it may retain and use to offer its own services.

Under the "*de facto* transfer of control" leasing option, it is the lessee and not the licensee that is directly and primarily responsible for meeting the Act and the Commission's rules, including interference rules, though the licensee is responsible for the lessee's ongoing and egregious violations about which the licensee knew or should have known.[57] Thus, while the licensee retains *legal* control of the leased spectrum, it is the lessee that is using and operationally controlling the spectrum on a day-to-day basis and is responsible for such use, including the responsibility of interacting with the Commission with regard to the leased spectrum.[58] Although the Commission requires licensees to make applications to and receive advance approval from the Commission for this type of leasing option, its rules provide for immediate grant of most applications filed electronically through the Universal Licensing System.[59]

C. The Secondary Markets Spectrum Leasing Rules Should Replace the Band Manager Rules for A and B Block Licensees

The secondary markets spectrum leasing rules effectively have overtaken the band manager experiment, achieving similar policy objectives in a more tailored manner. Prior to the *Secondary Markets First R&O,* the Commission had endorsed no method other than the band manager approach for making licensed spectrum readily and easily available to users other than

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57 47 C.F.R. § 1.9030(b)(1), (2).

58 *Secondary Markets First R&O,* ¶ 13.

59 *Secondary Markets Second R&O,* ¶ 29.

the licensee itself.[60] That band manager approach was a test,[61] however, and an unintended consequence has been the inefficient use of highly valuable spectrum, creating a stark contrast with the Commission's more recent efforts to provide licensees greater flexibility. The secondary markets spectrum leasing rules represent such an effort,[62] and they have overtaken the band manager experiment, enabling licensees to use or lease as much of their licensed spectrum as they wish, effectively meeting the goals of the band manager model adopted earlier in the *Upper 700 MHz R&O*, including the promotion of more efficient use of the spectrum.

As contemplated in the *August 3 White Paper*, Upper 700 MHz A and B Block spectrum will likely be used for broadband applications, whether the systems are deployed by unaffiliated spectrum lessees, by lessees affiliated with the licensee, or by the licensees themselves. The band manager rules, as explained above, require that a licensee lease more than half of its spectrum to non-affiliated entities and prohibit the licensee from using the spectrum to offer its own services. While the band manager rules require that the licensee bear responsibility for lessee compliance with Commission rules, the secondary markets rules provide a "transfer of *de facto* control" option where the lessee takes that responsibility. Because of these differences, the

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60 *Secondary Markets First R&O*, ¶ 34 n.57. Although leasing was permitted as long as the licensee retained control as defined in the 1963 *Intermountain Microwave* standard, the Commission in the *Secondary Markets First R&O* refined that "outdated" standard to "better accord[] with our contemporary market-oriented spectrum policies, fast-changing consumer demands, and technological advances." *Id.*, ¶ 3.

61 *Upper 700 MHz Second R&O*, ¶ 59 (FCC endeavoring to conduct "a useful test of the Band Manager concept").

62 *Secondary Markets First R&O*, ¶ 2. *See also Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands*, Report and Order and Further Notice of Proposed Rulemaking, 19 FCC Rcd 14165, ¶ 1 (2004) ("*2.5 GHz Report and Order*") (adopting fundamental restructuring of 2.5 GHz licensing scheme to "greatly enhance[] flexibility in order to encourage the highest and best use of spectrum domestically and internationally, and the growth and rapid development of innovative and efficient communications technologies and services").

secondary markets rules would provide a framework to A and B Block licensees that is better suited to deploying next generation wireless broadband services than is the band manager approach.

The secondary markets rules not only meet the spectrum efficiency and technology deployment goals of the band manager approach, but they also provide similar protections from interference to operations on adjacent spectrum. Under the band manager model, the licensee is responsible to ensure that the lessee complies with the terms of its lease and with the Commission's operational requirements, including those related to interference.[63] Under the "spectrum manager" leasing approach in the secondary markets framework, the FCC relies upon the same vehicle as under the band manager approach—the licensee's obligation—to protect adjacent operations from interference; the FCC also applies the interference rules to the lessee.[64] Thus, like a band manager,[65] a spectrum manager serves as a single entity to coordinate the frequency usage and operating parameters of sites in the area of its license. Even under "*de facto* transfer of control" leasing as provided by the secondary markets rules, where the lessee rather than the licensee is directly and primarily responsible for compliance with interference protection requirements, the licensee is still responsible for the lessee's ongoing violations and other egregious behavior about which the licensee knows or should know.[66] Lessees under the secondary markets rules must be qualified and eligible—just as a licensee must be—to operate in

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[63] 47 C.F.R. § 27.601 (band manager may lease spectrum to user as long as compliance with FCC rules is maintained).

[64] 47 C.F.R. §§ 1.9020(b) ("The licensee is directly and primarily responsible for ensuring the spectrum lessee's compliance with the Communications Act and applicable Commission policies and rules."), 1.9020(d)(1) ("The interference … rules applicable to the use of the spectrum by the licensee as a condition of its license authorization also apply to the use of the spectrum leased by the spectrum lessee.").

[65] *Upper 700 MHz Second R&O*, ¶ 30.

[66] 47 C.F.R. § 1.9030(b)(1), (2).

the spectrum.[67] Thus, under the secondary markets rules, the Commission has provided protection from interference to adjacent operations that is equivalent to or greater than that provided under the band manager rules.

Finally, one benefit of the band manager approach—making spectrum available for specialized communications needs (such as a private radio service for a railroad company in a long, narrow area)[68]—is met equally well by a spectrum manager lease or *de facto* transfer of control lease. Under the secondary markets rules, the flexibility to tailor spectrum offerings to the specialized needs of specific customers is inherent in the market and the flexibility of the lease instrument, not specific regulatory restrictions.

Thus, the experimental band manager rules, while an important innovation at the time of their adoption, have been overtaken by the more comprehensive, secondary markets approach. In addition, because of technological advances, next-generation wireless broadband applications are now feasible in the rebanded A and B Blocks. We urge that the time has come for the Commission to apply the secondary markets spectrum leasing rules to A and B Block licensees, thereby allowing them to choose, like other licensees, between "spectrum manager" leasing and "*de facto* transfer" leasing.[69]

IV. Conclusion

As explained in the *August 3 White Paper*, the Upper 700 MHz A and B Blocks offer an opportunity to foster the deployment of next-generation wireless broadband services in the very

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[67] 47 C.F.R. §§ 1.9020(d)(2) and 1.9030(d)(2) ("The spectrum lessee must meet the same eligibility and qualification requirements that are applicable to the licensee...").

[68] *Upper 700 MHz Second R&O*, ¶ 32.

[69] Although the Commission in the *Secondary Markets Second R&O* did consider extending the secondary markets rules to band managers, it had received no comment making this proposal and thus declined to do so at that time. *Secondary Markets Second R&O*, ¶ 64.

near term. As soon as possible, the Commission should consider the rebanding options and associated proposed rule changes described in the *August 3 White Paper* and this Supplemental White Paper, and initiate a Notice of Proposed Rulemaking to adopt a new band plan and rules that maximize the potential use for broadband operations while protecting Public Safety operations from interference.

APPENDIX

PROPOSED TECHNICAL RULE CHANGES

Option One:

New OOBE limits:

Subsection 27.53(c) is amended by deleting "For operations in the 747 to 762 MHz band and the 777 to 792 MHz band" and inserting in lieu thereof "Subject to the option described in subsection (d) of this section, for operations in the 746 to 762.5 MHz band and the 776 to 792.5 MHz band".

Subsection 27.53(c)(1) is amended by deleting "the 747 to 762 MHz band" and inserting in lieu thereof "746 to 762.5 MHz band".

Subsection 27.53(c)(2) is amended by deleting "the 777 to 792 MHz band" and inserting in lieu thereof "the 776 to 792.5 MHz band".

Subsection 27.53(d) is amended by deleting "(d) For operations in the 746-747 MHz, 762-764 MHz, 776-777 MHz, and 792-794 MHz bands, transmitters must meet the following limitations:" and inserting in lieu thereof "(d) Operations in the 761-762.5 MHz and 791-792.5 MHz bands may meet the following emissions limitations in lieu of those set forth in subsection (c) of this section:".

Prohibition on Cellular Architecture Repealed:

Subsection 27.2(b) is deleted and subsequent subsections are re-designated accordingly.

Commercial Transmitter Power Flux Density Limit

Subsection 27.55(b) is amended by deleting "(b) *Power flux density limit.* For base and fixed" and inserting in lieu thereof, "(b) *Power flux density limit.* (1) For base and fixed".

A new paragraph 27.55(b)(2) is added as follows:

> (2) For base and fixed stations operating in the 761-762.5 MHz, 776-777 MHz, and 791-792.5 MHz band, the power flux density that would be produced by such stations through a combination of antenna height and vertical gain pattern must not exceed 25 microwatts per square meter on the ground over the area extending to 1 km from the base of the antenna mounting structure.

Option Two:

New OOBE limits:

Subsection 27.53(c) is amended by deleting "For operations in the 747 to 762 MHz band and the 777 to 792 MHz band" and inserting in lieu thereof "Subject to the option described in subsection (d) of this section, for operations in the 746 to 764 MHz band and the 776 to 794 MHz band".

Subsection 27.53(c)(1) is amended by deleting "the 747 to 762 MHz band" and inserting in lieu thereof "746 to 764 MHz band".

Subsection 27.53(c)(2) is amended by deleting "the 777 to 792 MHz band" and inserting in lieu thereof "the 776 to 794 MHz band".

Subsection 27.53(d) is amended by deleting "(d) For operations in the 746-747 MHz, 762-764 MHz, 776-777 MHz, and 792-794 MHz bands, transmitters must meet the following limitations:" and inserting in lieu thereof "(d) Operations in the 761-764 MHz and 791-794 MHz bands may meet the following emissions limitations in lieu of those set forth in subsection (c) of this section:".

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A new paragraph 27.55(b)(2) is added as follows:

> (2) For base and fixed stations operating in the 762.5-764 MHz, 776-777 MHz, and 792.5-794 MHz band, the power flux density that would be produced by such stations through a combination of antenna height and vertical gain pattern must not exceed 25 microwatts per square meter on the ground over the area extending to 1 km from the base of the antenna mounting structure.

Option Three:

New OOBE limits:

Subsection 27.53(c) is amended by deleting "For operations in the 747 to 762 MHz band and the 777 to 792 MHz band" and inserting in lieu thereof "Subject to the option described in subsection (d) of this section, for operations in the 746 to 763 MHz band and the 776 to 793 MHz band".

Subsection 27.53(c)(1) is amended by deleting “the 747 to 762 MHz band” and inserting in lieu thereof “746 to 763 MHz band”.

Subsection 27.53(c)(2) is amended by deleting “the 777 to 792 MHz band” and inserting in lieu thereof “the 776 to 793 MHz band”.

Subsection 27.53(d) is amended by deleting “(d) For operations in the 746-747 MHz, 762-764 MHz, 776-777 MHz, and 792-794 MHz bands, transmitters must meet the following limitations:” and inserting in lieu thereof “(d) Operations in the 746-748 MHz and 776-778 MHz bands may meet the following emissions limitations in lieu of those set forth in subsection (c) of this section:”.

Prohibition on Cellular Architecture Repealed:

Subsection 27.2(b) is deleted and subsequent subsections are re-designated accordingly.

Commercial Transmitter Power Flux Density Limit

Subsection 27.55(b) is amended by deleting “(b) *Power flux density limit.* For base and fixed” and inserting in lieu thereof, “(b) *Power flux density limit.* (1) For base and fixed”.

A new paragraph 27.55(b)(2) is added as follows:

> (2) For base and fixed stations operating in the 776-778 MHz band, the power flux density that would be produced by such stations through a combination of antenna height and vertical gain pattern must not exceed 25 microwatts per square meter on the ground over the area extending to 1 km from the base of the antenna mounting structure.