**Before the**
**FEDERAL COMMUNICATIONS COMMISSION**
**Washington, DC 20554**

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| In the Matter of | ) | |
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| Service rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands | ) | WT Docket No. 12-70 |
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| Fixed and Mobile Services in the Mobile Satellite Service Bands at 1525-1559 MHz and 1626.5-1660.5 MHz, 1610-1626.5 MHz and 2483.5-2500 MHz, and 2000-2020 MHz and 2180-2200 MHz | ) | ET Docket No. 10-142 |
| | ) | |
| Services Rules for Advanced Wireless Services in the 1915-1920 MHz, 1995-2000 MHz, 2020-2025 MHz and 2175-2180 MHz Bands | ) | WT Docket No. 04-356 |

## COMMENTS OF UNITED STATES CELLULAR CORPORATION

United States Cellular Corporation ("USCC") submits these comments in response to the Notice of Proposed Rulemaking ("NPRM") and Notice of Inquiry ("NOI") released March 21, 2012 in the above-captioned proceedings. The NPRM proposes to increase the nation's supply of spectrum for mobile broadband by removing barriers to flexible use of spectrum currently assigned to the Mobile Satellite Service ("MSS") in the 2000-2020 MHz and 2180-2200 MHz ("AWS-4") spectrum bands. USCC applauds the Commission's efforts to bring to market 2 GHz spectrum that will support innovative mobile broadband services. However, in bringing to use more mobile broadband spectrum, USCC urges the Commission to focus on developing a holistic and comprehensive band plan that considers all the spectrum available for mobile broadband services as well as the interactions between the various bands.

## INTRODUCTION

Timely implementation of the *National Broadband Plan's*[1] recommendations to make 500 megahertz of spectrum newly available for commercial broadband services within the next

[1] FCC, *Connecting America: The National Broadband Plan*, pp. 84-92 (Mar. 2010).

ten years and 300 megahertz between 225 MHz and 3.7 GHz available by 2015 remain urgent priorities. The challenge to find spectrum resources to meet the need for expanded broadband capacity is particularly acute in the near term because the Commission has relatively little auctionable spectrum available in the pipeline to support expanded access to competitive mobile broadband services. Both the scope and urgency of identifying additional spectrum for competitive mobile broadband services have been confirmed in a Commission technical paper, *Mobile Broadband: The Benefits Of Additional Spectrum*, which concluded that "the broadband spectrum deficit is likely to approach 300 MHz by 2014."[2]

Terrestrial deployment of MSS, particularly 2 GHz MSS spectrum, as proposed in the *National Broadband Plan*,[3] is one of several spectrum initiatives intended to reach the Commission's goal of making available 300 MHz of spectrum for mobile broadband uses by 2015. In terms of auctionable spectrum, the most significant initiative – Recommendation 5.8.3 – proposed auctioning sixty megahertz of AWS spectrum, including: (i) the AWS-2 "H" Block comprising a total of 10 MHz at 1915-1920 MHz paired with 1995-2000 MHz; (ii) the AWS-2 "J" Block comprising a total of 10 MHz at 2020-2025 MHz paired with 2175-2180 MHz; (iii) the AWS-3 block comprising 20 MHz unpaired at 2155-2175 MHz; and (iv) reallocated federal spectrum from the 1755-1850 MHz band.[4]

Since the release of the *National Broadband Plan*, there have been two significant developments which should be decisionally significant in this proceeding. First, in February 2012, Congress enacted the Spectrum Act, which carries forward aspects of the *National Broadband Plan* initiatives by requiring that several of the AWS bands listed above, including the H Block and a spectrum block comprising 2155-2180 MHz (including the upper half of J

[2] FCC, Staff Technical Paper, *Mobile Broadband: The Benefits Of Additional Spectrum*, p. 2 (Oct. 2010).

[3] *See National Broadband Plan*, Recommendation 5.8.4.

[4] The auction of Upper 700 MHz D Block spectrum, *see National Broadband Plan*, Recommendation 5.8.2, was eliminated when this spectrum was reallocated for Public Safety use. *See* Middle Class Tax Relief and Job Creation Act of 2012, Pub. L. No. 112-96, Title VI ("Spectrum Act").

Block pairing and AWS-3 block), be auctioned and initially licensed by February 22, 2015. The Spectrum Act also requires that the Commission, by February 22, 2015, reallocate for commercial use, auction, and initially license: (i) 15 megahertz of spectrum from the 1675-1710 MHz band; and (ii) "fifteen megahertz of contiguous spectrum to be identified by the Commission."[5]

Second, on March 27, 2012, the NTIA released its long-awaited assessment of the 1755-1850 MHz band, which concludes that it is possible to repurpose the 95 megahertz of spectrum contained in this band for wireless broadband services.[6] Following the release of this report, there has been significant renewed interest in examining how federal spectrum at 1755-1780 MHz can be reallocated for commercial use and paired with 2155-2180 MHz block which, as described above, is already required under the Spectrum Act to be auctioned and initially licensed on or before February 22, 2015.

While USCC supports the Commission's efforts to increase terrestrial deployment in the 2 GHz MSS spectrum, it is critical that the analysis of possible service and technical rules for this proposed terrestrial deployment not delay, diminish, or impair the other initiatives to allocate, auction, and license additional spectrum that is urgently needed to support the expansion of commercial mobile broadband service.

## DISCUSSION

### A. The Commission Must Ensure the Continued Viability of the H Block in Order to "Increase the Deployment Options Available to New Licensees" and "Maximize the Value of the Spectrum by Achieving Greater Spectrum Efficiency."

The potential for interference between terrestrial uplink transmissions in the 2 GHz band and future downlink operations in the AWS-2 H Block (*i.e.*, 1995-2000 MHz) should be resolved so that any future version of the AWS-4 band plan adopted by the Commission requires

[5] Spectrum Act, §6401.

[6] *See* U.S. Dep't of Commerce, *An Assessment of the Viability of Accommodating Wireless Broadband in the 1755-1850 MHz Band* (Mar. 2012) ("*NTIA 1755-1850 MHz Report*").

sufficient AWS-4 out-of-band emissions limits in addition to a guard band between these future services.

When the Commission redesignated the 1915-1920 MHz band for AWS and paired it with the 1995-2000 MHz band to create the H Block, it concluded that this pairing "would benefit from the design of high power PCS equipment in the adjacent Broadband PCS bands, which in turn would promote the rapid design and deployment of new systems and result in economies of scale."[7] It also found that the H Block would "increase the deployment options available to new licensees" and "maximize the value of the spectrum by achieving greater spectrum efficiency."[8] The Commission therefore should not permit new AWS-4 operations to reduce, or even eliminate, this potential of the H Block. In this respect, USCC asserts that none of the Commission's three proposals with respect to adjacent band interference sufficiently addresses potential interference to future H Block operations.

Instead, USCC urges the Commission to require that fixed and mobile transmitters operating in the AWS-4 uplink band attenuate emissions below 2005 MHz by $70+10*\log_{10}(P)$ dB. As the Commission notes, this attenuation level "is consistent with the emissions limit below 1995 MHz,"[9] which was designed to protect PCS operations in the 1930-1990 MHz band rather than operations immediately below 1995 MHz.[10] In other words, to fully protect PCS operations, the Commission concluded that actual out-of-band emissions below 1990 MHz must

[7] *Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, including Third Generation Wireless Systems, et al.*, ET Docket No. 00-258, *et al.*, Sixth Report and Order, Third Memorandum Opinion and Order, and Fifth Memorandum Opinion and Order, 19 FCC Rcd 20720, 20739 (2004).

[8] *Id.*

[9] NPRM, ¶ 38.

[10] *See Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands, et al.*, IB Docket No. 01-185, *et al.*, Report and Order and Notice of Proposed Rulemaking, 18 FCC Rcd 1962, 2026 (2003).

be attenuated by even more than $70+10*\log_{10}(P)$ dB,[11] an outcome that came about by requiring terrestrial operations in the 2 GHz MSS band to attenuate emissions below 1995 MHz by $70+10*\log_{10}(P)$ dB.[12] Thus, in order to sufficiently protect future H Block operations from harmful interference from AWS-4 transmitters, the Commission should similarly establish a $70+10*\log_{10}(P)$ dB attenuation level below 2005 MHz to ensure that out-of-band emissions below 2000 MHz are sufficiently attenuated to allow meaningful and interference-free use of the H Block by the eventual auction winners of this spectrum.

In order to permit transmitters in the AWS-4 uplink band to attain this level of attenuation below 2005 MHz, the Commission should create a 10 MHz guard band between the AWS-4 uplink band and the H Block (*i.e.*, from 2000-2010 MHz). As the Commission recognized, it is unlikely that AWS-4 transmitters will be able to attenuate emissions by $70+10*\log_{10}(P)$ dB in an immediately adjacent spectrum band without reducing power to such a degree that services would be severely impaired, if at all practical.[13] Accordingly, in order to meet this attenuation level below 2005 MHz, AWS-4 transmitters should not be permitted to operate below 2010 MHz.

At a minimum, the Commission must establish a guard band of at least 5 MHz between the AWS-4 uplink band and the H Block (*i.e.*, from 2000-2005 MHz). As the Commission concluded with respect to PCS services, an attenuation level of at least $70+10*\log_{10}(P)$ dB at band edge is necessary to prevent interference from 2 GHz uplink operations. Also, as noted,

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[11] *See id.* at n. 333 ("In setting out requirements for attenuating out-of-band emissions by 43 + 10 log P dB at 2000 MHz and at 70 + 10 log P dB at 1995 MHz, we would expect that the actual out-of-band emissions in the PCS band at 1930-1990 MHz would be attenuated even more.").

[12] *See id.* at n. 332 ("In addition to adopting this -70 dBW/MHz emission to protect PCS receivers, the Commission's decision to reallocate the 1990-2000 MHz band to services other than MSS will result in a 10 MHz separation between ATC and current PCS operations.").

[13] *See* NPRM, ¶ 38 (noting that this attenuation level "may be difficult to meet for mobile transmitters in the 2000-2020 MHz band"); Comments of the Cellular Telecommunications & Internet Association, ET Docket No. 00-258, *et al.*, p. 3(Apr. 14, 2003) ("[R]educing the gap between the edge of the PCS base transmit band and the MSS/ATC uplink band to 0 MHz is not viable under any realistic deployment scenario. Under such an allocation, the MSS/ATC mobiles would significantly degrade PCS mobiles, even at large distances.").

this level of attenuation cannot reasonably be attained with respect to an immediately adjacent spectrum band. Thus, a 5 MHz guard band from 2000-2005 MHz is the minimum necessary separation required to prevent harmful interference into the H Block while also permitting these future mobile broadband services to operate at sufficiently high power levels. Under this band plan, transmitters operating in the AWS-4 uplink band would be required to attenuate emissions below 2000 MHz by $70+10*\log_{10}(P)$ dB, which could be achieved as a result of the 5 MHz guard band from 2000-2005 MHz.

As the Commission acknowledges, whether 5 or 10 MHz, any spectrum used to create a guard band must come out of the AWS-4 uplink band.[14] Obviously, insufficient spectrum is available in the 5 MHz H Block downlink band to carve out a guard band. Moreover, because Congress recently required the Commission to auction off the H Block, the Commission cannot legally remove or otherwise handicap spectrum from this band.[15] In other words, any reduction to the value of the H Block, whether by carving out a portion of it for a guard band or by allowing interference from AWS-4 operations to substantially reduce its viability, would conflict with the recently enacted spectrum legislation.

In addition, using a portion of the AWS-4 uplink spectrum for a guard band would be appropriate because, rather than conduct an auction, the Commission proposes to grant terrestrial authority to operate in the AWS-4 bands to the current 2 GHz MSS licensee.[16] Thus, only the H Block would provide additional spectrum for mobile broadband services while also providing the

[14] *See* NPRM, ¶ 42 (proposing to shift the AWS-4 uplink band up either 5 or 10 MHz).

[15] *See* Spectrum Act, §6401(b)(1) ("[N]ot later than 3 years after the date of the enactment of this Act, the Commission shall … (A) allocate the spectrum described in paragraph (2) for commercial use; and (B) through a system of competitive bidding … grant new initial licenses for the use of such spectrum, subject to flexible-use service rules."); *id.* at §6401(b)(2)(B) ("The frequencies between 1995 megahertz and 2000 megahertz.").

[16] *See* NPRM, ¶ 74.

U.S. Treasury with much needed revenue.[17] USCC's proposed band plan also would allow the Commission to better meet its obligation to recover for the public "a portion of the value of the public spectrum resource made available for commercial use and avoid[] unjust enrichment through the methods employed to award uses of that resource."[18]

In sum, the addition of new spectrum for mobile broadband services in the AWS-4 bands should not come at the expense of increased interference in the previously allocated H Block, which, pursuant to congressional mandate, various bidders will have the opportunity to obtain while benefitting the public through both auction revenue *and* additional mobile broadband service. Accordingly, the Commission should create a 10 MHz guard band between the AWS-4 uplink band and the H Block downlink band and require transmitters operating in the AWS-4 uplink band to attenuate emissions below 2005 MHz by $70+10*\log_{10}(P)$ dB. Otherwise, the H Block will not be viable spectrum, and could not be successfully auctioned as Congress intended.

B. USCC Opposes Adoption of Both 2 GHz Extension Options Proposed in the NOI in Order to Preserve the Viability of Paired Spectrum Initiatives for the 1695-1710 MHz and the H Block.

To further ensure the continued viability of the various other spectrum initiatives, USCC opposes adoption of both band plan configurations proposed in the NOI as a 2 GHz Extension Band Concept. The 35 megahertz AWS-Extension block consisting of the existing MSS downlink band at 2180-2200 MHz paired on the uplink with the NTIA's proposal to reallocate the 1695-1710 MHz band to commercial use would conflict with a preferable alternative – pairing the 1695-1710 MHz block with the "fifteen megahertz of contiguous spectrum to be identified by the Commission," as required under the Spectrum Act. USCC also opposes the 30 megahertz PCS-Extension block consisting of the existing MSS uplink band at 2000-2020 MHz

[17] Last year, Congressmen Dingell and Waxman both expressed their preference that the Commission auction any terrestrial rights it creates in the 2 GHz MSS bands by separately introducing legislation that would have mandated such an auction. *See* H.R.2482, 112th Cong., §303(b) (2011); H.R.3509, 112th Cong., §302(c) (2011).

[18] 47 U.S.C. §309(j)(3)(C) (emphasis added).

combined with the lower portion of the AWS-2 J Block at 2020-2025 MHz and the upper portion of the AWS-2 H Block at 1995-2000 MHz, all of which would be converted to downlink use. As discussed above, USCC's recommendation is for the Commission to adopt technical rules for the H Block which preserve the value of this paired spectrum to meet near-term mobile broadband requirements.

C. USCC Also Supports Prompt Commission Action to Implement the Spectrum Auction Provisions in the Spectrum Act and Complete the Assessment of Proposed Commercial Mobile Uses of the 1755-1780 MHz Band.

Finally, consistent with the *National Broadband Plan's* recommendation and the Spectrum Act, USCC urges the Commission to adopt service and technical rules as promptly as possible after the Secretary of Commerce submits a report to the President "identifying 15 megahertz of spectrum between 1675 megahertz and 1710 megahertz for reallocation from Federal use to non-Federal use."[19] Prompt action will be necessary to allow this spectrum to be auctioned and licensed by the February 22, 2012 deadline.[20] USCC also strongly supports the recent initiatives of the NTIA and Commission to explore options that could accelerate the reallocation of the 1755-1780 MHz band so this spectrum can be auctioned and licensed in a pairing with 2155-2180 MHz band, which must be auctioned and licensed by February 22, 2012.[21]

## CONCLUSION

If, as suggested in the NPRM, the Commission decides to license terrestrial uses so that the current license holder for 2 GHz MSS satellite spectrum obtains exclusive terrestrial network deployment rights, it is essential that other commercial providers also have a way forward to meet their own spectrum requirements by acquiring licensed spectrum. Through the Spectrum

[19] Spectrum Act, §6401(a)(2).

[20] *See id.* §6401(b).

[21] *See id.* at §6401(b)(2)(D).

Act, Congress has already expressed a clear preference for the use of spectrum auctions to meet such requirements. USCC supports a balanced Commission approach where the urgent need for auctionable spectrum is recognized and given near-term priority.

Respectfully submitted,


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