Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the matter of	)	
	)	
Spectrum Task Force Invites Technical Input	)	ET Docket No. 10–142
on Approaches to Maximize Broadband Use	)	WT Docket Nos. 04–356, 07–195
of Fixed/Mobile Spectrum Allocations in	)	
the 2 GHz Range	)	

To: Chief, Wireless Telecommunications Bureau,
Chief, International Bureau, and
Chief, Office of Engineering and Technology

COMMENTS OF ERICSSON

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EXECUTIVE SUMMARY

Ericsson urges the Commission to be guided by the following policy positions:

- Expand the AWS–1 band wherever possible and maximize the amout of spectrum for AWS–1 services;
- Use voluntary incentive auctions to repurpose spectrum to more efficient uses (*e.g.*, Mobile Satellite Service ("MSS") and Television Broadcast band); and
- Protect PCS services from interference.

Accordingly, Ericsson supports the following 2 GHz spectrum proposals:

- Pair 1675-1710 MHz with 2075-2110 MHz (AWS–4);
- Pair 1755-1780 MHz with 2155-2180 MHz (AWS–3);
- Maintain the existing Unlicensed PCS operations in the PCS duplex gap rather than using 1915-1920 MHz for AWS–2 H Block uplink spectrum;
- Use AWS–2 H Block downlink spectrum at 1995-2000 MHz as a guard band between PCS downlink and MSS uplink; and
- Assuming voluntary incentive auctions, shift the MSS S Band uplink spectrum band from 2000-2020 MHz to 2005-2025 MHz to increase the guard band spectrum between MSS and PCS services.

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COMMENTS OF ERICSSON

Ericsson hereby submits its comments in response to the Commission's May 20 *Public Notice*[1] seeking technical input on approaches to encourage the growth of terrestrial mobile broadband services in the 2 GHz spectrum range allocated for fixed and mobile use.

I. INTRODUCTION

The *Public Notice* seeks technical input on ways to increase terrestrial mobile broadband usage of spectrum in the 2 GHz band, including the 2000-2020 MHz and 2180-2200 MHz band co-allocated for Mobile Satellite Service ("MSS") (the "2 GHz MSS Bands" or "S Band") and certain spectrum designated for Advanced Wireless Service ("AWS"), namely the AWS–2 upper H Block at 1995-2000 MHz, the AWS–2 paired J Block at 2020-2025 MHz and 2175-2180 MHz, and the AWS–3 spectrum at 2155-2175 MHz. The *Public Notice* includes three possible terrestrial band plans in an appendix and asks for comment on these and alternative concepts. It also asks for comment on how certain bands identified by the National Telecommunications and

[1] *Spectrum Task Force Invites Technical Input on Approaches to Maximize Broadband Use of Fixed/Mobile Spectrum Allocations in the 2 GHz Range*, ET Docket No. 10–142 and WT Docket Nos. 04–356, 07–195, *Public Notice*, DA 11–929 (May 20, 2011) ("*Public Notice*").

Information Administration ("NTIA") as potential pairing candidates mesh with these concepts. The *Public Notice* also asks for comments on possible ways for MSS licensees to agree to modification of their licenses, such as voluntary incentive auctions or voluntary return of spectrum.[2]

II. DISCUSSION

A. ERICSSON SUPPORTS THE USE OF INCENTIVE AUCTIONS

The Commission should consider the use of voluntary incentive auctions as a means toward restructuring the 2 GHz band. As the Commission has previously observed, consistent with the National Broadband Plan, a grant of statutory authority by Congress to employ incentive auctions would facilitate "an appropriate mechanism for providing an option for incumbent 2 GHz MSS licensees to vacate the band in favor of mobile broadband providers operating on new licenses."[3] There is no reason why a grant of such authority should delay or impede the enactment of voluntary incentive auction legislation for broadcast spectrum bands. The use of voluntary incentive auctions in the 2 GHz MSS Bands would increase the efficient use of spectrum by permitting the assignment of licenses for standalone terrestrial services pursuant to the Commission's Part 27 rules.

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2 *Public Notice* at 1-4.

3 *Public Notice* at 3 (*quoting Fixed and Mobile Services in the Mobile Satellite Services Bands*, ET Docket No. 10-142, *Notice of Proposed Rulemaking and Notice of Inquiry*, 25 FCC Rcd 9481, 9493 ¶ 28 (2010) (respectively, "*MSS NPRM*" and "*MSS NOI*"); *citing Connecting America: The National Broadband Plan*, at 81, Recommendation 5.4 (2010) ("*NBP*"), *available at* http://www.broadband.gov/plan/).

B. THE 2 GHZ BAND IS CRITICAL FOR WIRELESS BROADBAND BECAUSE OF ITS PROXIMITY TO THE AWS–1 BAND

An important feature of the spectrum in the 2GHz band is its proximity to the AWS–1 band. The extension of the AWS–1 band has the potential to address expeditiously a significant part of the nation's mobile broadband needs. The National Broadband Plan recognized the importance of the AWS–1 spectrum in this regard and supported supplementation of the spectrum in this band with nearby spectrum as a key element of any plan addressing projected industry demands for wireless broadband capacity.[4]

C. ANALYSIS OF THE COMMISSION'S BAND PLAN CONCEPTS

To get the "biggest bang for the buck" in its spectrum realignment efforts, the Commission can take steps that will maximize the efficiency with which spectrum can be used while ensuring the protection of PCS operations from interference. As Ericsson has recently noted in other proceedings, the Commission, where possible, should adhere to these principles:

- Ensure that spectrum is available in large contiguous blocks. Avoid reliance on aggregating widely separated blocks of spectrum through technological means, because large contiguous blocks make radio implementations tractable and ensure that a majority of customers can be covered with practical deployments. Using widely separated spectrum blocks may require extensive filtration, adding cost, size, and complexity.[5]

- Take into account the nature of the services using spectrum. Group similar services together to maximize compatible spectrum use, instead of requiring fundamentally different and potentially interfering services to work together in narrow spectral confines.[6]

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4 *See NBP* at 78, 82, 86-87, Recommendation 5.8.3.

5 *See* Comments of Ericsson, ET Docket No. 10–237, at 12 (filed Feb. 28, 2011) ("Ericsson Dynamic Sharing Comments"); Comments of Ericsson, ET Docket 10–23, at 9 (filed April 22, 2011) ("Ericsson NTIA Spectrum PN Comments").

6 *See* Ericsson Dynamic Sharing Comments at 14-15; Ericsson NTIA Spectrum PN Comments at 9-10.

- Be mindful of global standards and spectrum allocations. Avoid creating unique allocations for the United States, thereby increasing costs and retarding development and deployment.

- Recognize that spectrum usage technologies require development and testing when applied to a new environment. Do not assume that techniques used in one environment will work as well under different circumstances.[7]

Based on these principles, Ericsson has proposed the following alternative spectrum bandplan to the concepts in the Appendix to the *Public Notice*:

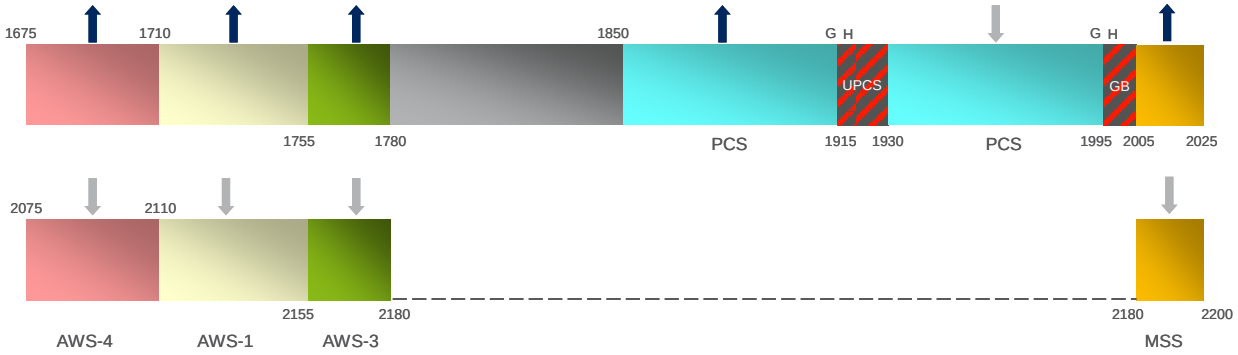

Figure 1. 2 GHz Option D

The following sections describe the alternative proposal, Option D.

1. EXPANSION OF AWS–1 WITH A NEW AWS–4 BAND

The three proposed band plan "concepts" for the 2 GHz band that the *Public Notice* included as a basis for discussion appear to overlook viable proposals for expansion of the AWS–1 band in focusing on the MSS bands. For example, Ericsson has advocated the addition of licensed spectrum in the 1675-1710 MHz and 2075-2110 MHz bands to the AWS–1 ecosystem, which could be considered the AWS–4 band.[8] The 2075-2110 portion of this

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7 *See id.* at 17.

8 The Commission sought comment on the 1675-1710 MHz band last year, *see Office of Engineering and Technology Requests Information on Use of 1675–1710 MHz Band*, ET Docket No. 10–123, *Public Notice*, 25 F.C.C.R. 7285 (2010), and Ericsson supported the allocation of that band as a supplement to AWS–1, *see* Comments of Ericsson Inc, WT Docket 10–123 (June 28, 2010). Subsequently, Ericsson advocated pairing the 1675-1710

(continued)

proposed band is in the center of the 2 GHz band and should be examined as an important element of an alternative to the band plans in the *Public Notice.*

As Ericsson has previously shown, this allocation of 2×35 MHz is of a sufficient size to support broadband services, maintains the same duplex distance between uplink and downlink as is used in AWS–1 and therefore allows the use of existing, proven technology. It also avoids the technical obstacles that would ensue if the 1695-1710 MHz band were allocated for time division duplex ("TDD") transmissions, given its adjacency to the AWS–1 band, and does not present the obstacle to global harmonization that would be posed by the smaller TDD allocation that would be unique to the United States.[9]

2. THE AWS–3 BAND

The Commission's three band plan concepts also give short shrift to the AWS–3 band, both as it is currently allocated and as it may be expanded and paired with spectrum currently used by the government. The current AWS–3 band, which is unpaired, occupies 2155-2175 MHz. It is adjacent to the upper AWS–2 J band, at 2175-2180, and the Commission has proposed combining these to make the AWS–3 band occupy 2155-2180 MHz.[10] Moreover, NTIA is considering whether to make 1755-1780 MHz available for pairing with the enlarged AWS–3 band,[11] and the Commission has previously sought comment on this proposal.[12]

(footnote continued)

MHz band with the 2075-2110 MHz band as an AWS–1 supplement. *See* Ericsson NTIA Spectrum PN Comments at 2, 18.

9 *See* Ericsson NTIA Spectrum PN Comments at 18.

10 *See Service Rules for Advanced Wireless Services*, WT Docket No. 07–195, *Further Notice of Proposed Rulemaking*, 23 F.C.C.R. 9859 (2008).

11 NTIA, *An Assessment of the Near-Term Viability of Accommodating Wireless Broadband Systems in the 1675–1710 MHz, 1755–1780 MHz, 3500–3650 MHz, and 4200–4220 MHz, 4380–4400 MHz Bands* at 2-3 to 2-5 and 3-25 to 3-29 (Oct. 2010), *available at* http://www.ntia.doc.gov/reports/2010/FastTrackEvaluation_11152010.pdf.

Ericsson strongly supported NTIA's proposed reallocation of spectrum and its combination with AWS–3, stating:

> Industry has especially focused on . . . 1755–1780 MHz, to be paired as an uplink band with the AWS–3 band as a downlink band. This allocation would provide 2×25 MHz of contiguous spectrum that can be allocated in the wider blocks necessary for the technologies, such as LTE, that will be used to provide mobile broadband. This allocation and pairing also would extend existing uplink and downlink spectrum in the neighboring AWS–1 band and facilitate the expansion of an existing ecosystem. Therefore existing equipment could be modified to operate in this proposed pairing and thereby eliminate the need to develop a new band, which is always problematic to incorporate in equipment.
>
> . . . 1755–1780 MHz has two unique benefits: it is the final remaining band identified internationally for next generation wireless systems that the U.S. has not yet allocated for mobile broadband service, and it has existing standards developed in accordance with those recommendations. . . .
>
> All of these characteristics mean that this band provides numerous significant advantages that will enable a faster rollout of more affordable broadband and devices than if a different band were allocated for commercial use in its place. Because the band is adjacent to AWS–1 and the pairing has the same duplex separation between base and mobile operations as is present in AWS–1, multi-band devices will not need to support an additional band. As a result, existing AWS–1 base station receive antennas would require little, if any, modification to accommodate use of the 1755–1780 MHz band, and new network equipment, handsets, and other mobile devices can be produced at lower cost. In producing new equipment, manufacturers will be able to take advantage of global economies of scale instead of building network and handset equipment solely for the U.S. market, also enabling lower-cost broadband and mobile devices. Internationally-harmonized bands also enable U.S. markets to benefit from exporting new technologies and services to other markets and U.S. consumers to benefit from developments in international markets.[13]

(footnote continued)

[12] *See Spectrum Task Force Requests Information on Frequency Bands Identified by NTIA as Potential Broadband Spectrum,* ET Docket 10–123, *Public Notice,* 26 F.C.C.R. 3486, 3486-87 (2011).

[13] Ericsson NTIA Spectrum PN Comments at 19-21.

The spectrum allocation chart in the Appendix to the *Public Notice* correctly depicts the existing AWS–3 band and AWS–2 J Block.[14] Moreover, the text of the *Public Notice* acknowledges that NTIA is conducting its evaluation on spectrum in the 1755 MHz to 1850 MHz bands to determine whether the frequencies can be repurposed for commercial broadband use and therefore making available spectrum suitable for pairing with the expanded AWS–3 band,[15] and that the Commission has solicited comment on such pairing.[16] Nevertheless, the band plan concepts in the Appendix appear to ignore the possible outcome of the NTIA evaluation. The band plan concepts also appear to ignore the suitability of much or all of the existing AWS–3 and AWS–2 upper J Block spectrum for wireless broadband. The first band plan concept leaves both of these out of its proposed mobile and fixed allocation for terrestrial broadband. The second incorporates the AWS–2 upper J Block and omits the AWS–3 band, and the third incorporates the AWS–2 upper J Block and 5 MHz of AWS–3.

Instead, Ericsson strongly supports combining the AWS–2 upper J Block with AWS–3, and pairing that enlarged AWS–3 block with the 1755-1780 MHz spectrum that NTIA is considering making available. To the extent any band plan concept would disturb that prospect by reallocating spectrum from the AWS–2 J Block and/or AWS–3 to be combined with terrestrial-use spectrum from the MSS bands, Ericsson believes such a band plan would be contrary to the public interest because, if implemented, it would destroy the possibility of a paired 2×25 MHz AWS–3 band that would directly complement AWS–1 and could delay access

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[14] Public Notice at 6 (Appendix).

[15] Public Notice at 2 & n.10; *see also* Letter dated January 19, 2011 from Karl B. Nebbia, Associate Administrator, Office of Spectrum Management, NTIA, to Julius Knapp, Chief, Office of Engineering and Technology, FCC, *available at* http://www.ntia.doc.gov/filings/2011/NTIA_FCC_Letter_115%20MHz_01192011.pdf.

[16] *See Public Notice* at 2 & n.10.

to the AWS–2 J Block and/or AWS–3 spectrum if aggregated with the MSS spectrum as shown in "Concepts" due to the uncertainty of the MSS spectrum availability and use.

3. THE AWS–2 UPPER H BLOCK

The third band plan concept in the Appendix to the *Public Notice* appears to propose incorporating the AWS–2 upper H Block into a terrestrial mobile and fixed allocation together with the 2 GHz MSS Bands, the upper and lower AWS–2 J Block, and 5 MHz of the current AWS–3 band. As discussed in the previous section, Ericsson does not believe the public interest would be served by stripping spectrum away from the AWS–3 band, including the AWS–2 upper J Block . Accordingly, Ericsson does not support the one band plan concept that addresses the AWS–2 upper H Block.

The H Block has long been controversial because of interference concerns. The lower part of the H Block, at 1915-1920 MHz, has posed a potential interference threat to unlicensed PCS ("UPCS") devices operating at 1920-1930 MHz, and while UPCS devices were initially slow to develop, rule changes have made widespread use of UPCS devices possible, and many cordless phones use this technology.[17] As a result, there is continued concern about interference from H Block devices to UPCS devices.[18] In addition, there have long been serious concerns about interference from lower H Block devices to PCS devices in the PCS downlink bands from 1930-1990 MHz.[19]

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[17] Comments of the Telecommunications Industry Association, WT Docket Nos. 07–195, 04–356, at 4 (filed Oct. 3, 2008).

[18] *See, e.g.*, Comments of Panasonic Corporation of North America, WT Docket Nos. 07–195, 04–356, at 2 (filed Oct. 8, 2008).

[19] *See* Comments of Ericsson Inc and Sony Ericsson Mobile Communications (USA) Inc., WT Docket Nos. 07–195, 04–356, at 12-13 (filed July 25, 2008); *see also* Comments of CTIA–The Wireless Association, WT Docket Nos. 04–356, 02–353, at Attachments A-C (filed Dec. 8, 2004).

Instead of proceeding to license the AWS–2 H Block and potentially creating widespread interference with both cordless phones and PCS devices, Ericsson submits that the public interest would be served by considering the use of the upper H Block, from 1995-2000 MHz, as a guard band between MSS uplink transmissions and the upper end of the PCS downlink spectrum. As a variant on this, it may be possible to utilize this as a guard band while also using it to support low-powered devices operating over a short range.

4. MSS

As discussed above, Ericsson supports a Congressional grant of authority to the Commission to use voluntary incentive auctions as a means of modifying MSS allocations with the licensees' consent. There are many possibilities that the Commission can and should explore in this investigation of maximizing MSS spectrum use. For instance, incentive auctions would be an appropriate means to establish an additional guard band between the PCS downlink spectrum and the MSS uplink spectrum beginning at 2000 MHz, given that the 5 MHz of guard band using the upper H Block will still be insufficient. Therefore, the MSS downlink band would shift from 2000-2020 MHz to 2005-2025 MHz creating additional spectrum for a guard band between uplink operations in the MSS band and PCS downlink.

III. CONCLUSION

For the reasons stated, Ericsson asks that the Spectrum Task Force take into consideration the views expressed herein.

Respectfully submitted,

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