

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matters of

Service Rules for Advanced Wireless Services in
the 2155-2175 MHz Band

Service Rules for Advanced Wireless Services in
the 1915-1920 MHz, 1995-2000 MHz, and 2175-
2180 MHz Bands

WT Docket No. 07-195

WT Docket No. 04-356

REPLY COMMENTS OF 3G AMERICAS

3G Americas LLC, the leading industry association representing the GSM family of technologies (GSM, EDGE, HSPA, and LTE) in the Americas, submits these reply comments in response to the Commission's Further Notice of Proposed Rulemaking ("*Further Notice*") in the above-referenced proceedings concerning service rules for licensed fixed and mobile services, including Advanced Wireless Services (AWS), in the 2155-2175 MHz band (AWS-3) and the H-block.¹ 3G Americas has a broad membership of leading wireless operators and vendors promoting and facilitating the seamless deployment and widespread adoption throughout the Americas of the GSM evolution to 3G and beyond.²

Throughout this proceeding, 3G Americas has supported the most efficient use of the AWS-3 spectrum to allow consumers to maximize benefits from innovative wireless

¹ *Service Rules for Advanced Wireless Services in the 1915-1920 MHz, 1995-2000 MHz, 2155-2175 MHz, and 2175-2180 MHz Bands*, Further Notice of Proposed Rulemaking, FCC 08-158 (2008) ("*Further Notice*").

² 3G Americas Board of Governor members include Alcatel-Lucent, AT&T, Cable & Wireless, Ericsson, Gemalto, HP, Huawei, Motorola, Nortel Networks, Nokia, Openwave, Research in Motion (RIM), Rogers, T-Mobile USA, Telcel, Telefónica, and Texas Instruments.

applications.³ 3G Americas has also emphasized that it is essential that the Commission protect incumbent AWS-1 users from interference from AWS-3 users.⁴ To best achieve these twin objectives, 3G Americas encourages the Commission not to adopt the proposed rules in the *Further Notice* with regard to the AWS-3 spectrum or the H-block. Instead, 3G Americas urges the Commission to designate the 2155-2175 MHz band for downlink use only. Downlink only in 2155-2170 MHz will best maximize consumer benefits, due to the economies of scale use of globally harmonized spectrum brings, and to the interference protection afforded to existing users.

I. The Commission should not adopt the plan proposed for AWS-3 in the *Further Notice*

In the *Further Notice*, the Commission proposed to combine the 2155-2175 MHz band with the 2175-2180 MHz band and to authorize Time Division Duplexing (“TDD”) to permit both downlink and uplink transmission throughout the entire 2155-2180 MHz band.⁵

A. *The Further Notice’s Proposal will not be consistent with the globally-coordinated allocation of spectrum for 3G applications and will deprive consumers of the economies of scale possible from globally harmonized spectrum use*

Allocating spectrum for advanced wireless services has been an issue discussed globally by the United States and other countries since the early 1990’s. Indeed, because of the global importance of coordinating such spectrum use across borders, it has been an issue for the World Administrative Radiocommunication Conferences (“WARC”) since WARC-1992. The International Telecommunication Union (“ITU”) hosts World Administrative Radiocommunication Conferences (since 1993, called World Radiocommunication Conferences (“WRC”)) every several years at which the world’s governments and wireless industries can

³ See e.g., Letter from Patricia Paoletta to Marlene Dortch, Docket Nos. 07-195 and 04-356 (June 25, 2008); Letter from Chris Pearson and Patricia Paoletta to Marlene Dortch, Docket No. 07-165 (May 25, 2008).

⁴ See *id.*

⁵ *Further Notice* at ¶ 3.

come to together to harmonize the use of spectrum for communications services. Leading up to WARC-1992, the Commission recognized publicly that “[i]t is desirable for the spectrum chosen to be compatible with similar international developments” and that WARC-1992 would “focus on this spectrum for mobile use.”⁶

At the 1992 World Administrative Radio Conference, international agreement was reached that the bands 1885-2025 MHz and 2110-2200 MHz would be allocated for advanced wireless services.⁷ Eight years later, WRC-2000 identified additional bands for advanced wireless services, including 1710-1885 MHz.⁸ While identification of these bands does not establish priority in the Radio Regulations nor preclude use of the bands for other services to which the bands are allocated, the United States has noted that the identification of this spectrum by WARC-92 “provide[s] uniform guidance to administrations, operators and manufacturers in terms of deploying IMT-2000 and other advanced communication applications[.]”⁹ The United States likewise urged international coordination for AWS spectrum, proposing that “administrations deploying [advanced wireless services] should use the relevant international technical characteristics, as identified by ITU-R and ITU-T Recommendations.”¹⁰

Within the United States, the Commission and the National Telecommunications and Information Administration (NTIA) studied the 1710-1770 MHz and 2110-2170 MHz bands to assess their use for advanced wireless services. At the time of the study six years ago, “[i]t was envisioned that the 2110-2170 MHz band could be use[d] for the base station part of 3G and the

⁶ *Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies*, Notice of Proposed Rulemaking, 7 FCC Rcd 1542 (1992).

⁷ See Implementation of International Mobile Telecommunications in the bands 1885-2025 MHz and 2110-2200 MHz, Res. 212 (WARC-92) and footnote 5.388. In ITU parlance, Advanced Wireless Services are referred to as International Mobile Telecommunications-2000 or IMT-2000.

⁸ See Additional Frequency Bands Identified for IMT-2000, Res. 223 (WRC-2000).

⁹ *Proposal for Terrestrial and Satellite Components of IMT-2000*, United States of America Proposals for the Work of the Conference, 15, WRC-2000 (Apr. 17, 2000).

¹⁰ *Id.* at 16.

1710-1770 MHz band could be use for the hand-held units.”¹¹ For mobile operations, downlink use is synonymous with base station transmission.

Although the expectation that 2110-2170 MHz would be used for downlink-only, or base station transmit has not yet been embodied into service rules by the Commission, both the ITU and the Organization of American States’ Committee on Telecommunications (“CITEL”) have made recommendations for the international use of this spectrum consistent with this expectation. The United States, including with participation by Commission personnel, is an active participant in both the ITU and CITEL, which serves as the body in which governments and industry in the Americas prepare regional positions for the WRCs. Recommendation ITU-R M.1036-3 provides that for advanced wireless services, Administrations pair 2110-2170 MHz as a downlink band with an uplink band at either 1920-1980 MHz or 1710-1770 MHz.¹² In Region 2, the Americas, CITEL has also endorsed pairing the 2100-2170 MHz band as a downlink band with the 1710–1770 MHz uplink band.¹³ For the sake of global economies of scale, 3G Americas supports the Commission allocating downlink-only operations at 2155-2175 MHz, consistent with CITEL and ITU Recommendations.

Despite these international recommendations about the use of the AWS-3 band, M2Z has claimed that “global[]” evidence instead supports its proposal to allow TDD operations in the AWS-3 band. However, the “global” evidence M2Z points to is only an oversimplified description of deployment in one city in one Eastern European country, which uses different

¹¹ An Assessment of the Viability of Accommodating Advanced Mobile Wireless (3G) Systems in the 1710-1770 MHz and 2110-2170 MHz Bands, National Telecommunications and Information Association, 6 (July 22, 2002) available at <http://www.fcc.gov/3G/3Gva072202.pdf>

¹² *Frequency arrangements for implementation of the terrestrial component of International Mobile Telecommunications-2000 (IMT-2000) in the bands 806-960 MHz, 1710-2025 MHz, 2110-2200 MHz and 2500-2690 MHz*, Recommendation ITU-R M.1036-3, Table 2 and Sec. 6.1.4.2 (2007).

¹³ See XXI Meeting of Permanent Consultative Committee III: Radiocommunications, CITEL, *Final Report*, OEA/Ser.I/XVII 4.3, PCC.3/doc. 2371/02 rev.2, at 21 (July 25, 2002) (Option 5, “Mobile transmit band 1 710–1 770 MHz, paired with the global base transmit band 2 110–2 170 MHz, consistent with a duplex separation of 400 MHz.”), available at <http://www.citel.oas.org/pcc3_old/final/P3-2371r2_i.doc>.

technical parameters than those proposed by M2Z for the United States.¹⁴ Moreover, despite a de facto guard band separating FDD and TDD operations in that single city, the operator will experience more interference as adjacent FDD operations increase. Overall, if carefully considered, M2Z's comparison to one city is a false analogy similar to comparing oranges to orangutans. By contrast, the international recommendations from the WRCs and CITELE are multi-national recommendations which the United States helped to craft and which were specifically intended for use on an international basis.

3G Americas urges the Commission now to adopt service rules consistent with these international recommendations, which will allow U.S. consumers to realize the benefits of lower-cost handsets and the greater number of innovative applications that global economies of scale enable. As the Commission has noted previously, if its AWS allocation “overlap[s] to a large extent the international allocation for a terrestrial component of advanced services at 2110-2170 MHz[, it] will promote the timely introduction of new equipment and services in this spectrum.”¹⁵

Indeed, this is exactly the situation that exists today. As the United States noted they would and should, manufacturers have based design plans on the spectrum identified for AWS at the WRCs and have looked to the ITU and CITELE recommendations for guidance in the manufacture of 3G devices.¹⁶ As a result, AWS-1 handsets currently are designed and

¹⁴ Rhonda Wickham, *T-Mobile Takes Umbrage with M2Z's Critique*, *Wireless Week*, Aug. 1, 2008, at <http://www.wirelessweek.com/article.aspx?id=161910>. Even if the Commission were fully to credit this oversimplified comparison, TDD proponents still have presented no empirical evidence that their proposal will not cause harmful interference to existing AWS-1 licensees. Rather, the empirical evidence that is in the record indicates the opposite. See *infra* § I.B. Given the existence of such empirical evidence, Commission testing – not merely an oversimplified comparison – would be needed to demonstrate that the *Further Notice's* proposal would not interfere with AWS-1 users.

¹⁵ *Advanced Wireless Services*, 68 Fed. Reg. 11986 (Mar. 13, 2003), cited in 47 C.F.R. 2.106 NG178 (regarding the bands 2165-2180 MHz).

¹⁶ See *supra* p. 3 and n. 9.

manufactured in accordance with these internationally harmonized standards.¹⁷ However, if the proposal in the *Further Notice* is adopted, manufacturers would be forced to develop costly new AWS-1 handsets and new filters for these handsets to attempt to mitigate interference from uplink transmissions in AWS-3. But even these costly new filters would not provide existing users with adequate protection, and would result in substandard service.¹⁸ Developing ultimately inadequate filters would also take time and delay consumers' use of the AWS-1 spectrum. Further, a United States allocation for TDD at 2155-2180 MHz would be the only such allocation globally, meaning TDD handsets and base stations would have to be designed specifically for this country.¹⁹ Prices to U.S. consumers would be driven up because manufacturers would be unable to take advantage of global economies of scale resulting from a harmonized international allocation.²⁰

Consumers in the United States will receive maximum benefit from use of the 2155-2175 MHz band that is consistent with international agreements. This will allow consumers to benefit in the quickest time frame possible from new applications in AWS spectrum, and at the most competitive prices from devices that are able to take advantage of global economies.

B. Adoption of the AWS-3 Proposal in the Further Notice will create Interference to Pre-Existing AWS-1 Users

In the *Further Notice*, the Commission proposed permitting uplink and downlink transmissions throughout the entire AWS-3 band with technical parameters including attenuating OOB by $60 + 10 \log (P)$ dB outside of the AWS-3 band, a power limit for AWS-3 mobiles of 23 dBm/MHz EIRP, OOB limits of $43 + 10 \log (P)$ dB for AWS-3 base and fixed downlink

¹⁷ See Comments of Ericsson Inc. and Sony Ericsson Mobile Communications (USA) Inc. at 7, WT Docket Nos. 07-195 and 04-356 (filed July 25, 2008) (“Ericsson Comments”).

¹⁸ See Ericsson Comments at 8.

¹⁹ See, e.g., Comments of Nokia, Inc. and Nokia Siemens Networks, WT Docket No. 07-195, at 2-3 (filed July 25, 2008) (“Nokia Comments”); Wireless Strategy Affordable Family Friendly Broadband Alternate FDD Proposal at 4 (July 3, 2008).

²⁰ See Ericsson Comments at 7-9 (July 25, 2008).

stations, and base station power limits of 1640 watts EIRP in non-rural areas and 3280 watts peak EIRP in rural areas.²¹ 3G Americas, and numerous other parties, have discussed previously the concerns of interference from AWS-3 users to existing AWS-1 users if the Commission authorizes uplink and downlink operations within the AWS-3 band.²² The proposed operating parameters will not protect existing AWS-1 licensees from harmful interference.

In response to the *Further Notice*, T-Mobile conducted laboratory testing of the proposed parameters and submitted with its comments the results, which demonstrate that two-way transmissions operating under the parameters proposed in the *Further Notice* would cause widespread harmful interference to AWS-1 incumbents.²³ These results confirm the earlier technical submissions by Verizon and Motorola which showed that technical limits more stringent than those proposed by the *Further Notice* would be needed to protect AWS-1 users, should uplink transmissions be permitted in the AWS-3 band.²⁴ The primary concerns of both Verizon and Motorola are OOB interference and receiver overload, and T-Mobile's tests demonstrated that these would both occur under the *Further Notice*'s proposal.²⁵

Currently-available filters cannot solve these problems, despite the claims of TDD proponents. As noted by AT&T, Avago Technologies provided extensive technical comments about filters used in AWS-1 handsets. Avago determined that filters in AWS-1 receivers would not eliminate interference from AWS-3 mobiles because a portion of the AWS-3 band is within

²¹ *Further Notice* ¶ 3.

²² See, e.g., Letter from Chris Pearson and Patricia Paoletta to Marlene Dortch, Docket No. 07-165 (May 25, 2008); Comments of T-Mobile USA, Inc., WT Docket No. 07-195, at 3-7 (filed Dec. 14, 2007); Comments of Verizon Wireless, WT Docket No. 07-195, at 16 (filed Dec. 14, 2007); Comments of MetroPCS, WT Docket No. 07-195, at 6-7 (filed Dec. 14, 2007); Reply Comments of AT&T, WT Docket No. 07-195, at 1-3 (filed Jan. 14, 2008).

²³ T-Mobile Comments at 9.

²⁴ See Comments of Verizon Wireless and Attachment A, "AWS-3 Band Interference Analysis", A technical presentation by V-COMM Telecommunications Engineering to Verizon (filed Dec. 14, 2007); Comments of Motorola, Inc., (filed Dec 14, 2007).

²⁵ T-Mobile Comments at 10-12; T-Mobile Test Results 4-5, 8, 22-29.

the passband of the AWS-1 filters.²⁶ Avago ultimately concluded that a guard band of approximately 13 MHz would be necessary to protect AWS-1 operations from adjacent band mobile operations.²⁷

Likewise, Nokia, the largest purchaser of mobile handset filters in the world, is aware of “no filters on the market today or planned for the near future that can significantly mitigate interference between adjacent FDD and TDD systems . . . [and t]here are currently no filters on the market or in any major filter manufacturer’s roadmaps that provide suppression beginning at 2155 MHz.”²⁸ Ericsson conducted a technical analysis of passband filters and likewise concluded that “AWS-1 Operators would be required to develop and use specialized handsets to address interference assuming, *arguendo*, that such interference-mitigating handsets are even feasible.”²⁹ And even if developing such handsets were possible, “[t]o redesign AWS-1 filters at this late date would lead to an expected additional two years of delay in deployment of AWS-1 terminals and at significant increased expense.”³⁰

Although M2Z’s claims that current AWS-1 handsets were “designed without due regard for the well-noticed possibility of TDD operations in the adjacent AWS-3 band,”³¹ it was, to the contrary, prospective TDD operators that were put on notice that they must “conclusively demonstrate that portions of this spectrum could be used for [TDD] transmissions without causing interference to . . . other licensees.”³² Indeed, the currently-used AWS-1 handsets were designed under the guidance of the international agreements concluded at the WRCs and CITELE.

The United States has been an active participant in both these fora. Manufacturers looked to

²⁶ Comments of AT&T at 15-16 (filed July 25, 2008).

²⁷ *Id.*

²⁸ Nokia Comments at 5.

²⁹ Ericsson Comments at 4 (filed July 25, 2008) (“Ericsson Comments”).

³⁰ Nokia Comments at 6.

³¹ Comments of M2Z Networks, Inc. at 13 (filed July 25, 2008) (“M2Z Comments”).

³² Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands, 18 FCC Rcd 25162 ¶ 46 (2003).

these international agreements as serving exactly the function the United States explained they were to serve – as guidance for manufacturers and Administrations.³³

Further, despite M2Z’s claims that interference would only occur in “rare” situations of proximity, transmission timing, and location,³⁴ T-Mobile’s testing “demonstrates that under common circumstances there would be significant exclusion zones around any AWS-3 mobile transmitter.”³⁵ As T-Mobile explained, during busy hours at hotspot areas, such as airports or train stations, interference would be common, as even M2Z acknowledges.³⁶ The holes this interference would create in AWS-1 service would undermine the ability of AWS-1 providers to provide a viable offering, to the detriment of users.³⁷

3G Americas therefore continues to oppose TDD operations in the AWS-3 spectrum. If the Commission chooses to allocate the AWS-3 band for uplink and downlink transmissions, stringent technical limits and a significant guard band will be required to protect AWS-1 licensees. The empirical evidence in the record shows that the power and OOB limits proposed in the *Further Notice* are not sufficient to protect existing AWS-1 licensees.³⁸ Rather than adopt the *Further Notice*’s proposal in light of such overwhelming and contradictory evidence, 3G Americas urges the Commission to conduct its own testing of the proposed parameters. If the Commission declines to conduct its own tests, 3G Americas urges the Commission to license the AWS-3 band for downlink-only use consistent with the technical evidence in the record and with global allocations.

³³ See *supra* at 3.

³⁴ See M2Z Comments at 13-14.

³⁵ T-Mobile Comments at 15.

³⁶ *Id.* at 16; see also M2Z Comments at 13-14

³⁷ *Id.* at 15-16.

³⁸ See generally T-Mobile Comments and T-Mobile Test Results; Comments of Verizon Wireless and Attachments A and B (filed Dec. 14, 2007); Comments of Motorola, Inc. (filed. Dec. 14, 2007).

Finally, incumbents in the AWS-1 band purchased the spectrum with no reasonable expectation that the Commission might adopt the rules now proposed for AWS-3. Indeed, AWS-1 incumbents had every reason to expect that rules for the AWS-3 spectrum within the United States would be consistent with ITU and CITELE Recommendations, because the United States – including Commission officials - participated in their development. To now adopt rules that dramatically limit the use of the AWS-1 spectrum would unfairly and impermissibly undermine the value of the AWS-1 spectrum after that auction, and harm consumers.³⁹ The diminution of U.S. standing in future CITELE meetings and WRCs that would result from adopting the current proposal would be contrary to the public interest. The Commission should instead adopt rules for AWS-3 spectrum that do not retroactively decrease the value of AWS-1 licensees' investments and that instead provide consumers with the benefits of affordable equipment and global roaming that arise from globally-harmonized spectrum.

II. The *Further Notice*'s Proposal for H Block is Insufficient to Protect PCS Operations.

The *Further Notice* proposes rules for the H block that set OOB limits of $90 + 10 \log P$ (-60 dBm/MHz) for mobile emissions falling within the PCS band and that limit mobile power to 23 dBm/MHz EIRP.⁴⁰ The record evidence indicates that these suggested technical parameters will be insufficient to protect the “hundreds of millions”⁴¹ of PCS handsets in use from harmful interference.

As AT&T has argued, the evidence in the record from tests conducted by parties with regard to H block shows that stricter technical rules than those proposed in the *Further Notice*

³⁹ See AT&T Comments at 33-37.

⁴⁰ *Further Notice* at 4.

⁴¹ AT&T Comments at 5.

will be necessary to protect PCS licensees.⁴² Specifically, CTIA conducted tests showing that receiver overload interference would occur when a PCS handset is in close proximity to an H block handset if the 23/dBm/MHz (200 mW/MHz) power limit is adopted, and that under the standard 3GPP/UMTS OOB limit of -66 dBm/MHz, H block mobiles would largely not interfere with PCS phones, given a separation distance of 1 meter.⁴³ 3G Americas agrees with the comments of AT&T that should the Commission authorize mobile operations within the H block, the technical limitations on such use should include an OOB level allowed into the 1930-1990 MHz band of -66 dBm/MHz and a mobile transmit power limit of 13 dB across the entire H Block.⁴⁴

Under the *Further Notice*'s proposal, interference from H block mobiles to PCS mobiles would most likely be extremely common. There are numerous situations where wireless consumers use their devices in close proximity at the same time. A few of these include: in cars or public transportation, in airport or hotel lobbies, in schools and colleges, at public entertainment venues such as movie theaters and sports stadiums, and at emergency events.⁴⁵

To address the interference problem, PCS licensees would need to develop and deploy new replacement filters in every PCS-capable handset in the marketplace – the technical feasibility of which is uncertain and which would be very costly, disruptive to users, and take “countless years”⁴⁶ to develop and deploy, leaving PCS users in the end with no protection from H block interference. And even if it were accomplished, the replacement filters could only

⁴² *Id.* at 11.

⁴³ *Id.* at 5-6.

⁴⁴ *Id.* at 11.

⁴⁵ *Id.* at 9.

⁴⁶ *Id.* at 8.

address receiver overload interference, not OOB interference.⁴⁷ Such a “solution” would not be in the public interest, and therefore should not be adopted in any service rules.

Should the Commission nonetheless proceed to adopt the *Further Notice*’s proposal for H block, not only will H Block licensees lose the value of their investments, but the public will be dramatically negatively impacted. Most disturbingly, many PCS customers are public safety agencies who would experience “lost calls, distorted audio quality, the inability to make or receive calls, the inability to determine location (including for E911 calls), and reduced data rates.”⁴⁸ Clearly, the diminished public safety that would result from such degradation in service is contrary to the public interest. 3G Americas accordingly encourages the Commission to prevent such public harm.

⁴⁷ *Id.* at 8.

⁴⁸ *Id.* at 7.

III. Conclusion

3G Americas encourages the Commission to adopt rules for the AWS-3 band and H Block that will maximize public benefits. The record evidence indicates that the public will receive the greatest benefit in affordable handsets and innovative services from a globally-harmonized AWS-3 band. More specifically, users in the AWS-1 and PCS bands, especially public safety, will be better protected by use of the AWS-3 band that comports with international allocations. For these reasons, the Commission should not adopt the proposals for the AWS-3 band and the H block presented in the *Further Notice*.

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