

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

In the Matter of)	
)	
Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band)	WT Docket No. 07-195
)	
Service 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
)	

REPLY COMMENTS OF T-MOBILE USA, INC.

Thomas J. Sugrue
Kathleen O'Brien Ham
Sara F. Leibman
Patrick T. Welsh
T-MOBILE USA, INC.
401 9th Street, NW
Suite 550
Washington, D.C. 20004

Howard J. Symons
Tara M. Corvo
Christopher R. Bjornson
MINTZ, LEVIN, COHN, FERRIS,
GLOVSKY AND POPEO, P.C.
701 Pennsylvania Avenue, N.W.
Suite 900
Washington, D.C. 20004

Counsel for T-Mobile USA, Inc.

Thomas S. Dombrowsky, Jr.
Engineering Consultant
WILEY REIN LLP
1776 K Street, NW
Washington, D.C. 20036

August 11, 2008

TABLE OF CONTENTS

INTRODUCTION AND SUMMARY 1

I. THE RECORD PROVIDES NO SUPPORT FOR THE PROPOSED AWS-3 RULES 3

 A. The Proposed Rules Will Create Harmful Interference in the Adjacent Spectrum Bands. 4

 1. The Interference Risk Is Real and Significant. 4

 2. Attempts To Downplay the Interference Risk Are Not Credible. 6

 3. Filters and the Commission’s Proposed Technical Limits Will Not Prevent Harmful Interference. 8

 4. Empirical Testing Using Real Devices Is Required Before the Commission Can Move Forward. 10

 5. Downlink-Only Is the Best Technical Option for the AWS-3 Band. 12

 6. M2Z’s Proposed Modifications to the Commission’s Technical Standards Will Only Exacerbate the Identified Interference Problems. 12

 B. Proposed Technical Rules Are Contrary To Well-Established Commission Policies..... 13

 C. The Proposed Licensing and Service Rules Disserve the Public Interest..... 14

 D. The Few Supporters of the Proposed Rules Provide No Compelling Evidence To Rebut These Concerns. 17

II. EXCLUDING ALL EXISTING PROVIDERS FROM THE AWS-3 AUCTION WILL SUBSTANTIALLY NARROW THE UNIVERSE OF PROSPECTIVE BIDDERS, IN VIOLATION OF THE COMMISSION’S STATUTORY RESPONSIBILITIES 18

III. M2Z’S USE OF INTERNATIONAL EXAMPLES IS INACCURATE AND MISLEADING..... 20

 A. M2Z’s Czech Republic Example Is an Apples-to-Oranges Comparison. 21

 B. M2Z’s Invocation of Ofcom Is Similarly Inapt. 24

 C. TDD Operations in the AWS-3 Band Would Undercut International Harmonization of the Spectrum. 27

CONCLUSION..... 28

Exhibit 1 - Letter from Joachim Horn, T-Mobile International AG (August 8, 2008)

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

In the Matter of)	
)	
Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band)	WT Docket No. 07-195
)	
Service 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
)	

REPLY COMMENTS OF T-MOBILE USA, INC.

T-Mobile USA, Inc. (“T-Mobile”) submits these reply comments in response to the *Further Notice of Proposed Rulemaking* (“*Further Notice*”) in the above-captioned proceedings.^{1/} The comments in these proceedings demonstrate that the proposed technical rules would create unacceptable risks of harmful interference to adjacent-band services, such as T-Mobile’s broadband wireless service, and that the proposed service and licensing rules would disserve the public interest by encumbering the spectrum with the business model of one entity — M2Z Networks, Inc. (“M2Z”). Modifications to the proposed rules suggested by M2Z would only exacerbate their shortcomings, further diserving the public interest.

INTRODUCTION AND SUMMARY

T-Mobile is aggressively deploying advanced wireless broadband services in the AWS-1 band. Thus far in 2008, it has invested approximately \$2 billion to build out its UMTS (3G) network, after having paid more than \$4 billion for its AWS-1 licenses. T-Mobile’s UMTS

^{1/} *Service Rules for Advanced Wireless Services*, WT Docket Nos. 07-195 and 04-356, *Further Notice of Proposed Rulemaking*, FCC 08-158 (rel. June 20, 2008) (“*Further Notice*”).

service will have potential data transmission capabilities of greater than 3 Mbps per sector — truly high speed broadband comparable to the offerings of cable and landline telephone companies. At a time when the Commission and Congress have expressed concern about industry consolidation in the wake of the 700 MHz auction, T-Mobile’s 3G rollout will enhance the consumer choice in wireless broadband by enabling T-Mobile to compete more aggressively with the larger national carriers.

As the record evidence in these proceedings overwhelmingly demonstrates, these substantial public interest benefits will be put at risk if the Commission’s proposed rules for the AWS-3 band are adopted. Carriers and equipment manufacturers confirm T-Mobile’s findings that the Commission’s proposed technical standards create a substantial interference risk that is not mitigated under the proposed rules. Those standards are also contrary to prior Commission statements putting the burden on TDD proponents to “conclusively demonstrate” that there will be no interference to existing operations. Recent efforts by M2Z to interject allegations about TDD operations in the Czech Republic and proposed technical standards in the United Kingdom are simply distractions from the question of how the technical rules proposed in *this* proceeding will affect wireless operations in *this* county. T-Mobile reiterates its request to the Commission to oversee empirical testing before moving forward.

Tellingly, M2Z submitted no empirical test results or other studies to support its assertion that AWS-1 licensees will not face harmful interference from mobile operations in the AWS-3 band. If M2Z truly believes that its proposal will not create harmful interference, it should welcome the opportunity to vindicate its yet-unproven claims. Based on T-Mobile’s own testing, along with the data and comments of numerous other parties, the AWS-3 band should be limited to downlink operations to avoid harmful interference with operations in the adjacent bands.

The comments demonstrate that the proposed licensing and service rules are ill-conceived as well. A major economic study corroborates the costs of “free” service and the inevitability that it will fail. The content filter mandate also raises serious constitutional questions. The encumbrances threaten to skew the auction while not even providing a guarantee that any consumer-welfare benefit will be achieved due to the unanswered questions surrounding the requirements.

M2Z’s proposals to attach additional detrimental conditions to the availability of the AWS-3 spectrum should likewise be rejected. Self-serving eligibility restrictions would vitiate the auction and essentially hand the spectrum to M2Z or one of the other proponents that argued unsuccessfully for such a result only a year ago. This unjust enrichment would be contrary to the statutory requirements and public interest objectives of auction design. And increasing the permitted transmit power of AWS-3 handsets, as M2Z urges, would only exacerbate the already unacceptable threat of harmful interference presented by the proposed rules.

I. THE RECORD PROVIDES NO SUPPORT FOR THE PROPOSED AWS-3 RULES

The comments filed in response to the *Further Notice* produced a near consensus in opposition to the Commission’s proposed AWS-3 technical, licensing, and service rules. Wireless carriers, satellite carriers, equipment vendors and manufacturers, and public interest groups almost unanimously opposed the proposed rules. Like T-Mobile, commenters expressed concerns regarding the lack of sufficient interference protection, demonstrated that the proposed technical rules are not consistent with Commission precedent, and argued strongly against the adoption of service and licensing rules that would encumber the spectrum with the business model of one entity.

A. The Proposed Rules Will Create Harmful Interference in the Adjacent Spectrum Bands.

The record, complete with laboratory test results, demonstrates that there is a serious harmful interference risk to the adjacent bands if TDD mobile transmissions are permitted in the AWS-3 band, under the Commission's proposed rules. Neither M2Z nor any of the other proponents of the proposed rules submitted any test results to support their claims. Rather, the comments show that mitigation techniques, advanced filters, and the Commission's proposed technical limits will not prevent interference. This interference risk would be better understood with additional empirical testing. In the final analysis, the best technical option for the AWS-3 band is to permit only downlink operations.

1. The Interference Risk Is Real and Significant.

During the initial comment period, T-Mobile conducted laboratory testing to determine the nature of the harmful interference risk posed to AWS-1 mobile devices by mobile TDD operations in the AWS-3 band. The results confirmed what T-Mobile feared — the use of the AWS-3 band for mobile operations will create insurmountable interference to mobile operations in adjacent bands due to out-of-band emissions (“OOBE”), receiver overload, and blocking. Despite M2Z's repeated assertions that interference concerns are “premised on ‘perfect storm’ or worst case scenario interference analysis”,^{2/} T-Mobile's testing clearly shows that the interference would be widespread, essentially unmanageable, not limited in occurrence, and extend well into the AWS-1 spectrum band.^{3/} T-Mobile's AWS-1 customers would be unable to communicate within a large radius around an AWS-3 device transmitting at even moderate

^{2/} Letter from John Muleta, M2Z Networks, to Marlene Dortch, Secretary, FCC, WT Docket 07-195, Exhibit - AWS-3, at 2 (filed Aug. 6, 2008).

^{3/} T-Mobile Comments at 15-17; Exhibit 1 (“T-Mobile Test Results”), at 4-5, 29; Exhibit 2 (“Ray Declaration”) ¶¶ 18-19.

power levels.^{4/} Debilitating impacts include call set-up failures, degraded speech quality, degraded data throughput, and dropped calls — all evidence of serious quality and reliability degradation.^{5/} The lab tests also show interference to the overall operation of the AWS-1 network with deleterious impacts on cell system capacity, coverage, and service.^{6/} These interference-induced outages would not be limited to some rare occurrence, but would arise in a variety of day-to-day situations involving pedestrian interactions, public transportation facilities, private residences, office buildings, vehicular use, and public meeting places.^{7/} The Monte Carlo statistical analysis put forward by M2Z posits unrealistic scenarios that downplay the real-world likelihood of interference arising from these complex interactions.

The interference concerns voiced by T-Mobile are almost universally shared by those with experience in the wireless industry. Nokia, an observer of T-Mobile's testing, explains that allowing AWS-3 uplink transmissions will create significant interference that could not possibly be classified as rare, easily avoided, or limited.^{8/} SpectrumCo notes that, while the worst of the interference will occur in the upper parts of the AWS-1 band, even its B Block spectrum would be adversely affected.^{9/} U.S. Cellular explains that the significant interference spanning across the AWS-1 D, E, and F Blocks could only be mitigated by a large guard band and significant restrictions on power and OOB.^{10/} AT&T questions the Commission's proposal to set attenuation for AWS-3 mobiles at 30 dB less than what it has proposed for the H Block, when

^{4/} T-Mobile Test Results at 21-22; Ray Declaration ¶ 11.

^{5/} T-Mobile Test Results at 5, 23-24; Ray Declaration ¶ 15.

^{6/} T-Mobile Test Results at 23-24; Ray Declaration ¶ 16.

^{7/} Ray Declaration ¶ 19.

^{8/} Nokia Comments at 3-4.

^{9/} SpectrumCo Comments at 2-5.

^{10/} U.S. Cellular Corp Comments at 3-5.

the OOB potential is greater in the AWS-1 band than in the PCS band.^{11/} And as MetroPCS points out, even relying on the statistical probabilities in M2Z's Monte Carlo model means that, at a minimum, there will be substantial interference in some instances.^{12/}

The lack of frequency separation is a major cause of the interference risk. CTIA explains that without frequency separation between the mobile transmit band and the mobile receive band, there will be substantial mobile-to-mobile interference.^{13/} Ericsson shows that, by placing TDD operations next to existing FDD operations, the Commission would be grouping together incompatible frequency uses, resulting in an increase in harmful interference and an inefficient use of the spectrum.^{14/} Finally, Motorola's analysis demonstrates that it is not technically possible to protect AWS-1 band receivers from an unacceptably high level of interference from immediately adjacent AWS-3 TDD operations without a 13 MHz guard band.^{15/}

2. M2Z's Attempts To Downplay the Interference Risk Are Not Credible.

M2Z, despite having never conducted any empirical interference testing for its proposed AWS-3 mobile operations, boldly asserts that it has "demonstrated conclusively" that its proposed operations "would be sufficient to protect adjacent band licensees."^{16/} M2Z's

^{11/} AT&T Comments at 18.

^{12/} MetroPCS Comments at 10.

^{13/} CTIA Comments at 35-36.

^{14/} Ericsson Comments at 3-6.

^{15/} Motorola Comments at 5-6, Appendix. Adjacent band interference would not be limited to the AWS-1 band. An interference analysis submitted by ICO shows that the adjacent band interference caused by AWS-3 TDD operations also will occur to the Mobile Satellite Services ("MSS") spectrum. ICO Comments at 6-7; *see also* TerreStar Comments at 7-8.

^{16/} M2Z Comments at 8.

assertions are unsupported and incorrect — even its engineering consultant termed its technical analysis “preliminary.”^{17/}

First, M2Z’s interference analysis is based on a dubious Monte Carlo statistical technique. There are many flawed assumptions in M2Z’s analysis, including that users are randomly distributed, not inside buildings, and in a relatively static position.^{18/} This distribution method does not reflect real-world scenarios where mobile users tend to be congregated in small spaces, like conference rooms, offices, homes, transportation centers and vehicles. M2Z’s analysis also only extends to dropped calls — it does not include ineffective call attempts, voice quality degradation, capacity reduction or data throughput degradation.^{19/} Further, the choices of parameters and assumptions used in the analysis do not match real-world AWS-1 handsets or T-Mobile’s lab test results.

Second, M2Z suggests several mitigation techniques that could be used to address the interference issues.^{20/} M2Z, however, provides no analysis, technical support, details or strategies showing how these techniques would reduce the interference threat to AWS-1 devices.^{21/} By contrast, T-Mobile has demonstrated through empirical testing that M2Z’s

^{17/} Letter from Uzoma Onyeije, M2Z Networks, to Marlene Dortch, Secretary, FCC, WT Docket Nos. 07-195 and 04-356, Exhibit - Alion Science and Technology, AWS-3 to AWS-1 Mobile-to-Mobile Interference Effect: Preliminary Analysis Results, at 13 (filed June 3, 2008) (“Alion Preliminary Analysis”).

^{18/} U.S. Cellular Corp Comments at 5; Motorola Comments at 8-11; CTIA Comments at 43-44.

^{19/} U.S. Cellular Corp Comments at 5.

^{20/} M2Z Comments at 14-15; Letter from Uzoma Onyeije, M2Z Networks, to Marlene Dortch, Secretary, FCC, WT Docket Nos. 07-195, 04-356, 07-16 and 07-30 (filed July 2, 2008). The letter included an attachment entitled Overview of Technical Issues Concerning the AWS-3 Service Rules (“M2Z Technical Overview”).

^{21/} AT&T Comments at 19-23.

proposed mitigation measures will not work.^{22/} Indeed, M2Z’s assertions in this regard were so far-fetched that QUALCOMM felt compelled to “correct the record in this proceeding” about one of M2Z’s asserted mitigation measures, stating that it “is not the case” that power control can mitigate interference from AWS-3 operations to AWS-1.^{23/} And, although ArrayComm, a developer of multi-antenna signal processing technology, suggests that interference concerns can be managed by using its technology,^{24/} it submitted no technical analysis or other data that would warrant according any weight to its assertion.

Finally, M2Z’s claim that the Commission’s 700 MHz rules provide a template for the lack of technical restrictions for the AWS-3 band is unwarranted. As AT&T explains at length, M2Z’s simplistic 700 MHz analysis does not account for the mandatory duplexing requirements, the notice given to all parties bidding in the 700 MHz auction *before* the auction, and the enhanced OOB limits established for the Upper 700 MHz C Block.^{25/} Even if the Commission’s rules do not preclude TDD operations in the 700 MHz band, the standards for UMTS, 3GPP LTE, and CDMA2000 have all specified that FDD operation is assumed in the 700 MHz paired bands — a fact M2Z ignores.^{26/}

3. Filters and the Commission’s Proposed Technical Limits Will Not Prevent Harmful Interference.

Conclusively rebutting M2Z’s misleading claims, the record confirms that filters on an AWS-1 mobile receiver can do nothing to protect against OOB interference from an AWS-3 device, because they are designed only to reject strong signals outside of the intended passband

^{22/} See Attachment to Letter from Howard J. Symons to Marlene Dortch, Secretary, FCC, WT Docket Nos. 07-195, 04-356, 07-16 and 07-30 (filed July 18, 2008), at 7-8.

^{23/} QUALCOMM Comments at 7.

^{24/} ArrayComm Comments at 6.

^{25/} AT&T Comments at 28-31; *see also* T-Mobile Comments at 19-22.

^{26/} *Id.* at 31-32.

— they do not and cannot prevent in-band interference from OOBE.^{27/} As Motorola states, it is “not technically possible today or in the foreseeable future to protect receivers in the 2110-2155 MHz band from an unacceptably high level of interference from immediately adjacent TDD operations in the 2155-2175 MHz band” by using filters.^{28/}

The engineering analyses and laboratory testing placed in the record also show that the Commission’s proposed technical limits would not be sufficient to protect against harmful interference.^{29/} Much tighter limits would be needed. T-Mobile’s testing demonstrated that to protect adjacent AWS-1 mobile receivers, OOBE must be limited to -66 dBm/MHz or $96 + 10 \log (P) \text{ dB}$.^{30/} Mobile power, assuming the Commission’s $60 + 10 \log (P) \text{ dB}$ OOBE limit remains in place, would need to be restricted to (a) -11 dBm/MHz (with no guard band between AWS-1 and AWS-3 operations) or (b) -4 dBm/MHz (with 15 MHz of guard band).^{31/} And, even with the OOBE limit for AWS-3 at $96 + 10 \log (P) \text{ dB}$, mobile transmit power would need to be limited to (a) 2 dBm/MHz (with no guard band between AWS-1 and AWS-3 operations) or (b) 10 dBm/MHz (with 15 MHz of guard band).^{32/}

^{27/} Ericsson Comments at 4 (“the additional front-end filtering proposed by M2Z to protect AWS-1 receivers from AWS-3 signals would only occur for signals above 2170 MHz. And the resulting increase in the passband loss for *all* terminals would cause a loss of capacity [and] coverage for the entire AWS-1 system.”) (emphasis in original); AT&T Comments at 25-27 (“there is simply nothing an AWS-1 device can do to filter out OOBE from AWS-3 transmitters”); CTIA Comments at 41; Motorola Comments at 5-6; Nokia Comments at 6; U.S. Cellular Corp Comments at 4.

^{28/} See Motorola Comments at 6; Letter from Steve Sharkey, Motorola, to Marlene Dortch, Secretary, FCC, WT Docket No. 07-195, at 2 (filed June 5, 2008). M2Z’s assertion that filters could somehow prevent the interference is a “false assumption that this interference can be addressed through use of better filters or changes in equipment design.” *Id.*; see also Letter from Patricia Paoletta, Counsel to 3G Americas, to Marlene Dortch, Secretary, FCC, WT Docket No. 07-195, at 4 (filed June 25, 2008) (debunking the “myth of the magic filter”).

^{29/} See, e.g., Ericsson Comments at 5; AT&T Comments at 12-14; CTIA Comments at 35-37; U.S. Cellular Corp Comments at 3-6.

^{30/} T-Mobile Test Results at 20-22, 29; Ray Declaration ¶ 24.

^{31/} T-Mobile Test Results at 20-23, 29; Ray Declaration ¶ 23.

^{32/} T-Mobile Test Results at 23-24, 29; Ray Declaration ¶ 24.

The technical analyses submitted by other commenters reinforce T-Mobile's finding that much more stringent standards would be required before any TDD use in the AWS-3 band could be contemplated. AT&T recommends a 10 MHz guard band, a mobile power limit of 13 dBm across the entire AWS-3 band, and OOB limits of -66 dBm/MHz.^{33/} Motorola submits an engineering analysis showing that the Commission's proposed limits could be acceptable only with a 13 MHz guard band.^{34/} Motorola also notes that there is no reason to believe that AWS-1 receivers can accommodate an additional 30 dB into the band than can PCS receivers without harmful interference and that, therefore, the OOB limit should be tightened to $90 + 10 \log (P)$ dB.^{35/} SpectrumCo's technical assessment concludes that a 15 MHz guard band, an OOB requirement of $103 + 10 \log (P)$, and a power limit of 20 dBm EIRP would be necessary to allow even an ideal theoretical band pass filter to sufficiently protect against harmful interference.^{36/}

4. Empirical Testing Using Real Devices Is Required Before the Commission Can Move Forward.

Independent, empirical testing under the Commission's supervision, with adequate time for public review and comment on the results, is essential to an informed and reasoned decision in this proceeding. Such testing would be consistent with the Commission's course of action in other proceedings in which similarly difficult technical issues have arisen.^{37/} Given the

^{33/} AT&T Comments at 27-28.

^{34/} Motorola Comments at 6-7, Appendix.

^{35/} *Id.* at 7; *see also* CTIA Comments at 40 (arguing that it is arbitrary and capricious to adopt significantly less stringent OOB interference protection rules for the AWS-1 band than for the PCS band).

^{36/} SpectrumCo Comments at 4-5.

^{37/} T-Mobile Comments at 4, 8-10; T-Mobile Request for Extension of Time to File Comments, WT Docket Nos. 07-195, 04-356, at 3-4 (filed July 1, 2008); Letter from Thomas J. Sugrue, Vice President, Government Affairs, and Neville Ray, Senior Vice President, Engineering and Operations, T-Mobile USA, Inc., to Kevin Martin, Jonathan Adelstein, Michael Copps, Robert McDowell, and Deborah Taylor Tate, Commissioners, FCC, WT Docket No. 07-195 (filed June 13, 2008).

significance of the unresolved interference issues raised by the proposed rules, numerous other commenters urge the Commission to conduct its own open and transparent testing to determine what and if any technical limits would protect AWS-1 operations from the harmful interference caused by AWS-3 mobile TDD operations.^{38/}

M2Z's pronouncements that interference testing is unnecessary and merely serves as a "delay" tactic^{39/} are at odds with sound decisionmaking and the Commission's own practice of conducting such testing in similar circumstances and the statutory requirements that agencies engage in sound decisionmaking based on a complete record.^{40/} And while M2Z cites a December 2007 QUALCOMM filing to support its technical arguments,^{41/} QUALCOMM itself argues that the Commission should not adopt technical rules for the AWS-3 band in the absence of definitive testing in the band.^{42/} Even M2Z's technical consultant, Alion, concludes that more testing should be conducted because its Monte Carlo study is merely a "preliminary analysis" and that "[a]dditional cases should be explored to develop a more complete characterization of the possible scenarios and system parameter excursions."^{43/} Unfortunately, the reality is that the

^{38/} See, e.g., QUALCOMM Comments at 4-5, CTIA Comments at 39-40; OPASTCO Comments at 5; PCIA Comments at 1-2; Rural Independent Competitive Alliance Comments at 9; Rural Telecommunications Group Comments at 2; SpectrumCo Comments at 4.

^{39/} M2Z Comments at 4.

^{40/} The importance of testing has been recognized by senior members of Congress. See, e.g., Letter from Hon. John Dingell, Chairman U.S. House Committee on Energy and Commerce, to Hon. Kevin Martin, Chairman, FCC, ET Docket Nos. 04-186 and 02-380, at 1 (August 5, 2008) (praising the FCC's testing in the television white spaces proceeding as a part of a "deliberate, thoughtful approach" that "has, thus far, fulfilled [the Commission's] duty to promote and protect the public interest.").

^{41/} *Id.* at n.7.

^{42/} QUALCOMM Comments at 4-5.

^{43/} Alion Preliminary Analysis at 13.

Further Notice did not seek, nor did it afford sufficient time to permit, careful study of the interference problems associated with the proposed rules.^{44/}

5. Downlink-Only Is the Best Technical Option for the AWS-3 Band.

Commenters recognize that downlink-only use of the AWS-3 spectrum would (1) avoid interference problems, (2) create opportunities for asymmetric pairing in support of data-intensive, high-bandwidth applications that provide for a more dynamic network and improved user experience, and (3) avoid orphaning the 2020-2025 MHz band.^{45/} As the Commission itself acknowledged in the *AWS-3 NPRM*, the new downlink-only spectrum could be matched with existing AWS-1, AWS-2, or other CMRS spectrum (including the J Block) for uplink.^{46/} Such an approach would also be consistent with the Commission's "good neighbor" policy of grouping technically compatible systems and devices in close proximity.^{47/} T-Mobile agrees with the vast majority of commenters that this technical approach is the best alternative.

6. M2Z's Proposed Modifications to the Commission's Technical Standards Will Only Exacerbate the Identified Interference Problems.

Notwithstanding the substantial technical problems presented by the technical rules proposed by the Commission in the *Further Notice*, M2Z now claims that these standards are "overly restrictive"^{48/} and seeks to weaken the OOB limit and increase the power limit for AWS-3 mobile devices from 23 dBm/MHz to 33 dBm.^{49/} Consistent with its approach to this proceeding, M2Z presents no empirical support for these changes and thus they should be

^{44/} SpectrumCo Comments at 4-5; QUALCOMM Comments at 4.

^{45/} See AT&T Comments at 24-25; Ericsson Comments at 10-12; MetroPCS Comments at 11-14; Motorola Comments at 5-7; SpectrumCo Comments at 6-7.

^{46/} *Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band*, Notice of Proposed Rulemaking, 22 FCC Rcd. 17035, 17046 ¶ 20 (2007) ("*AWS-3 NPRM*").

^{47/} CTIA Comments at 45 (citing the FCC's Spectrum Policy Task Force Report).

^{48/} M2Z Networks Comments at 10.

^{49/} *Id.* at 2. M2Z proposes adoption of what it calls the "standard" $43 + 10 \log (P)$ OOB limit.

dismissed out of hand. As detailed above, the overwhelming record evidence and T-Mobile's test results confirm that the rules as currently proposed are insufficient to protect adjacent band licensees from harmful interference. M2Z's proposal will substantially exacerbate this already serious harmful interference threat.

B. The Proposed Technical Rules Are Contrary to Well-Established Commission Policies.

The vast majority of comments support T-Mobile's view^{50/} that the Commission's failure to develop sufficient interference protections fatally undermines the lawfulness of its proposed rules.^{51/} The Commission's lack of notice to AWS-1 licensees that its operations would be subject to harmful interference without sufficient protection is especially troubling because changing the rules in the middle of the game would subject the Commission to breach of contract and retroactive rulemaking claims,^{52/} rendering the AWS-3 spectrum unusable until the inevitable judicial challenges are resolved.

As T-Mobile has shown, the Commission required TDD proponents to "conclusively demonstrate" that they would not cause interference to FDD operations.^{53/} M2Z first tried to avoid this standard by simply ignoring its existence.^{54/} Now it seeks to avoid this burden by arguing that the "conclusively demonstrate" standard was limited to potential TDD operations in the AWS-1 band and noting that the Commission said it would try to accommodate TDD

^{50/} T-Mobile Comments at 24-39.

^{51/} See, e.g., AT&T Comments at 35-36; CTIA Comments at 31-33; MetroPCS Comments at 15-20; U.S. Cellular Corp Comments at 6.

^{52/} See AT&T Comments at 34-37; CTIA Comments at 30-35.

^{53/} T-Mobile Comments at 29-31.

^{54/} See Letter from Uzoma Onyeije, M2Z Networks, to Marlene Dortch, Secretary, FCC, WT Docket Nos. 07-195, 04-356, 07-16 and 07-30 (filed June 5, 2008) (citing paragraph 46 of the *AWS-1 Service Rules Order* but omitting critical sentences).

operations in the future.^{55/} In any event, which AWS order the “conclusively demonstrate” standard appears in is irrelevant — it takes an incredible leap of logic to suggest that the Commission otherwise approved of TDD interference to AWS-1 licensees simply because it would originate in an adjacent band.^{56/} Even M2Z has admitted as much to the media — but not on the record in this proceeding — by stating that “the whole point of the FCC rules” is to address and prevent harmful interference.^{57/}

C. The Proposed Licensing and Service Rules Disserve the Public Interest.

The *Further Notice* would impose service and licensing rules on the AWS-3 band that run counter to the generally deregulatory approach that Congress and the Commission have adopted for wireless services generally, and wireless broadband in particular. This abrupt change in posture is unwarranted and unwise.

Commenters with marketplace experience overwhelmingly, if not unanimously, oppose the “free service” requirement. MetroPCS’s characterization of the requirement as a “designer allocation” that will fail is particularly apt.^{58/} The proposed requirement is designed around the business plan of one entity.^{59/} It has universally failed where it has been attempted by public and private sector entities.^{60/} And, given the success of the wireless industry in rolling out broadband

^{55/} See M2Z Comments at 14 & n.39.

^{56/} T-Mobile Comments at 31 (The FCC “in no way suggested it would permit harmful interference in future allocations”).

^{57/} Fawn Johnson, *T-Mobile Appeals To FCC To Rethink ‘Free Internet’ Proposal*, CNNMONEY.COM, July 17, 2008, available at http://money.cnn.com/news/newsfeeds/articles/djf500/200807171720DOWJONESDJONLINE000899_FORTUNE5.htm (quoting M2Z CEO John Muleta as saying “In radio, there’s always interference - that’s the whole point of the FCC rules.”).

^{58/} MetroPCS Comments at 21-26.

^{59/} *Id.* at 21-23.

^{60/} CTIA Comments at 11-15; T-Mobile Comments at 56-59.

services,^{61/} a “free service” requirement is unnecessary to expand broadband penetration or serve as a “lifeline” service.^{62/} The difference between previous failures and the current proposal is that the previous free service failures did not sacrifice valuable spectrum to such a dubious experiment.

CTIA submitted a study by Criterion Economics that carefully examined the consumer-welfare claims made by M2Z and concluded that the proposed free service is both unnecessary and not likely to provide any benefit to the public.^{63/} Criterion points out that there is no market failure — instead, broadband penetration has steadily increased, prices have fallen, investment in new capacity is aggressive, and wireless providers are making inroads against traditional, fixed providers.^{64/} It also notes that any benefits are likely to be insignificant because few American households lack access to broadband today, M2Z’s build-out of its network may well exclude those households, and M2Z’s comparatively slow service would not be a substitute for current broadband offerings.^{65/} And, to the extent there are a few meager benefits, they would be swamped by the opportunity costs caused by the displacement of another use of the AWS-3 band and the dynamic costs associated with regulatory micromanagement.^{66/}

Several commenters likewise raise concerns with the Commission’s proposal to require the AWS-3 licensee to screen out certain content that constitutes “obscenity or pornography and, in context, as measured by contemporary community standards and existing law, any images or

^{61/} CTIA Comments at 6-9.

^{62/} *Id.* at 11-15.

^{63/} CTIA Comments, Exhibit B - Criterion Economics, L.L.C., *The Static and Dynamic Inefficiency of Abandoning Unrestricted Auctions for Spectrum: A Critique of Professor Wilkie’s Analysis of the M2Z Proposal*, at 30 (July 2008) (“Criterion Study”).

^{64/} *Id.* at 4-12; *see also* CTIA Comments at 2-4; *id.*, Exhibit A - CostQuest Associates, Inc., *U.S. 3G Mobile Wireless Broadband Competition Report* (July 14, 2008).

^{65/} Criterion Study at 12-18.

^{66/} *Id.* at 21-26.

text that otherwise would be harmful to teens and adolescents.”^{67/} This requirement is constitutionally suspect on First Amendment grounds and would be subject to strict scrutiny by the courts.^{68/} As commenters also note, the filtering requirement would negatively affect application development and innovation,^{69/} carrier competition,^{70/} the ability of the public to access the Internet,^{71/} and the deployment of the AWS-3 network.^{72/}

Commenters also rightly criticize the proposed free service mandate as lacking specifics, creating the likely prospect that the free service and other encumbrances will deter most would-be bidders while allowing the eventual winner to avoid providing service to those that need it most.^{73/} Numerous other questions about the free service remain unanswered, including how the speed of the free service would be measured; whether the premium services will be subject to non-discrimination requirements; what is meant by the ability to “prioritize” the fee-based service; and whether free customers would have their privacy rights protected.^{74/} The absence of answers to these questions raises significant doubts on the ability to achieve the purported consumer-welfare benefits of a free service.

^{67/} Proposed 47 C.F.R. § 27.1193(a)(1).

^{68/} ACLU Comments at 3-6; Center for Democracy *et al.* Comments at 2-10; Harvard Internet Scholars Comments at 9-13.

^{69/} Harvard Internet Scholars Comments at 4-8.

^{70/} *Id.* at 8-9.

^{71/} Center for Democracy *et al.* Comments at 15-16.

^{72/} *Id.* at 16 (arguing that mandating filters would delay implementation of an AWS-3 network due to litigation and administrative delay).

^{73/} TCA Comments at 8.

^{74/} MetroPCS Comments at 34-43; CTIA Comments at 11.

D. The Few Supporters of the Proposed Rules Provide No Compelling Evidence To Rebut These Concerns.

None of the supporters of the proposed rules provided an engineering analysis to deal with the interference issues and no supporter provided any empirical test results. To the contrary, M2Z's comments are full of hints that it will try to avoid any responsibility for interference mitigation by shifting that burden to AWS-1 licensees.^{75/}

Similarly, none of the supporters provided any economic analysis in support of the encumbrances proposed for the AWS-3 band, or any details on how the purported consumer benefits would be achieved. Indeed, one of the few free broadband proponents, NetfreeUS, agrees that the details of the Commission's (and M2Z's) free service rules are entirely too vague, leaving loopholes available for the AWS-3 licensee to discriminate against users of the service.^{76/}

In contrast to the vast array of comments demonstrating that adoption of the Commission's proposed rules would cause unacceptable interference to consumers in adjacent bands, raise troubling First Amendment issues, devalue the spectrum, and deter auction participation, there is an absolute dearth of evidence showing that the "M2Z plan" would serve the interests of anyone other than M2Z and its wealthy financial backers. The Commission should heed the comments and establish rules that adhere to its long-held policies of putting spectrum in the hands of those that will put it to its highest and best use without unduly interfering with the operations of other providers.

^{75/} M2Z Comments at 15-16.

^{76/} NetfreeUS Comments at 5-7.

II. EXCLUDING ALL EXISTING PROVIDERS FROM THE AWS-3 AUCTION WILL SUBSTANTIALLY NARROW THE UNIVERSE OF PROSPECTIVE BIDDERS, IN VIOLATION OF THE COMMISSION’S STATUTORY RESPONSIBILITIES

M2Z’s proposal to exclude all existing providers from the AWS-3 auction^{77/} is just another cynical ploy to reserve the spectrum for itself.^{78/} NetfreeUS’s proposal to limit the auction to the seven entities that previously filed applications is similarly disingenuous.^{79/} An eligibility requirement that eliminates existing providers such as T-Mobile would effectively bar the best hope for true broadband competition while granting a windfall to speculators like M2Z and NetfreeUS that lack the wherewithal to fulfill the statutory and public interest objectives of auction design.

T-Mobile previously explained how the proposed service rules violate the auction statute by effectively excluding interested parties from the auction and artificially depressing auction proceeds.^{80/} Other commenters concur. AT&T notes how “heavy-handed regulation...will dramatically reduce participation in the auction, rendering the ‘auction’ more akin to an allocation of this spectrum to M2Z at a fraction of its market value.”^{81/} Without the encumbrances, CTIA estimates that more than 40 small, medium and large carriers would bid during an AWS-3 auction.^{82/} But M2Z’s business plan would serve as a “poison pill” that would lower the spectrum’s value and drive away bidders.^{83/}

^{77/} M2Z Comments at 6-7.

^{78/} T-Mobile Comments at 44-50 (“M2Z’s goal has been and continues to be to obtain a free license for the AWS-3 spectrum.”).

^{79/} NetfreeUS Comments at 7-10.

^{80/} T-Mobile Comments at 51-56.

^{81/} AT&T Comments at 40.

^{82/} CTIA Comments at 23-28.

^{83/} *Id.*

M2Z's and NetfreeUS's new proposals would simply assure this outcome. While M2Z argues that a blanket exclusion is the best means of "facilitat[ing] the entry of a new, nationwide broadband competitor,"^{84/} such a restriction ignores the very real public interest benefits that would flow from allowing entities such as T-Mobile to use the AWS-3 spectrum to enhance their broadband service with greater download capacity and thereby more effectively compete with larger carriers with more extensive spectrum portfolios.^{85/} By excluding such willing bidders and thereby reducing spectrum revenue, eligibility restrictions also limit the public's recovery of value for the spectrum, frustrating the objective of section 309(j)(3)(C).^{86/}

Restricting entities like T-Mobile from participating is particularly unwise, given the massive investment required to deploy a national infrastructure in the aggressive timeframe proposed in the *Further Notice*. If all potential bidders other than the least experienced entities are excluded from the auction, it is highly likely that this build-out will not be completed, frustrating section 309(j)(3)(A)'s objective of ensuring the development and rapid deployment of new technologies, products and services for the benefit of the public, including those residing in rural areas.^{87/}

In effect, the combination of service obligations and the aggressive national build-out requirement could eliminate large and small bidders, leaving an open field for spectrum speculators like M2Z and NetfreeUS. By removing all competition from any AWS-3 auction,

^{84/} M2Z Comments at 7.

^{85/} T-Mobile Comments at 48; *see also* Letter from Thomas J. Sugrue, T-Mobile USA, to Marlene Dortch, Secretary, FCC, WT Docket 07-195, at 2-3 (filed June 5, 2008).

^{86/} *See* 47 U.S.C. § 309(j)(3)(C); *see also* Sec. I.C.3, *supra*; CTIA Comments at 23-25; Criterion Study at 21-25.

^{87/} *See* 47 U.S.C. § 309(j)(3)(A).

these entities are not seeking to achieve any public interest objective, but rather only hope to rig the auction in their favor — an unjust enrichment prohibited by the Communications Act.^{88/}

III. M2Z'S USE OF INTERNATIONAL EXAMPLES IS INACCURATE AND MISLEADING

In response to the evidence detailed above, M2Z has steadfastly insisted that minimal interference protections would be sufficient. And just as steadfastly, it has refused to vindicate its unproven claim by conducting its own empirical tests or even to join T-Mobile in calling on the Commission to oversee joint testing. Instead, M2Z advances one red herring after another. For example, it initially argued that AWS-1 licensees could protect themselves with better handset filters. That argument was refuted by numerous commenters and conclusively disproved by T-Mobile's empirical testing, which showed that the principal source of harmful interference to AWS-1 operations would result from AWS-3 devices emitting energy into the AWS-1 band, a situation that even the most perfect filters in AWS-1 handsets would be wholly unable to prevent. Then M2Z tried to convince the Commission that AWS-1 bidders were somehow put on notice that they would have to accommodate an interfering use in the AWS-3 band even though the Commission's orders state exactly the opposite — that it had no intention of authorizing TDD in the AWS-3 spectrum unless the TDD proponents could conclusively demonstrate that such technologies can be deployed without causing interference to other spectrum users.

Now M2Z asserts that concerns expressed by T-Mobile and the vast majority of parties filing in this proceeding over interference from TDD operations in the AWS-3 band are somehow inconsistent with the experience in Europe in permitting TDD systems to operate adjacent to FDD systems. Like its earlier red herrings, this argument is inaccurate and

^{88/} See 47 U.S.C. § 309(j)(3)(C).

misleading and does nothing to advance efforts to resolve the serious issues raised in this proceeding.

A. M2Z’s Czech Republic Example Is an Apples-to-Oranges Comparison.

It is no secret that TDD spectrum is allocated next to FDD spectrum in Europe. Yet, in practice, there are few, if any, TDD networks operating immediately adjacent to FDD operations. M2Z points to a single TDD network operating under the T-Mobile International (“TMI”) umbrella in one Eastern European city as its sole example of “how TDD and FDD operations are deployed next to each other globally.”^{89/} As explained in the attached letter from Joachim Horn, TMI’s Chief Technology Officer, however, M2Z omits several critical facts, which demonstrate that the TDD/FDD scenario in the Czech Republic is very different from what M2Z proposes for the AWS-3 band, and thus, any extrapolation of broader lessons from these operations is fundamentally flawed.^{90/}

First, unlike in the U.S., where the AWS-3 band is adjacent to the AWS-1 FDD *downlink*, the UMTS TDD band in Europe is adjacent to the UMTS FDD *uplink*. This means the interference from TDD to FDD is base-to-base interference, which, as T-Mobile and others have explained in this proceeding, is considerably more manageable than mobile-to-mobile interference. Because base stations are large, fixed assets, interference mitigation techniques such as the use of special antenna models, placements, and orientations, and bulky custom filtering are available that simply are not feasible for addressing mobile-to-mobile interference.

Second, while there is the possibility of mobile-to-mobile interference in the Czech Republic, it is TMI’s TDD devices that are the potential victims of such interference. TMI’s

^{89/} Letter from John Muleta, M2Z Networks, to Marlene Dortch, WT Docket 07-195, at 1 (Aug. 6, 2008).

^{90/} Letter from Joachim Horn, T-Mobile International AG, to Neville Ray, T-Mobile USA, Inc. (August 8, 2008) (“Horn Letter”) (attached hereto as Exhibit 1).

Czech Republic TDD network is used exclusively for data services, with customer devices consisting of PC cards and external modems. This has implications for both the impact of interference on the customer and the likelihood that the device will be able to protect itself from interfering signals it encounters from FDD devices. When mobile-to-mobile interference occurs in the Czech Republic, data throughput slows, and if the IP session is interrupted, it automatically restarts.^{91/}

The situation in the United States is exactly the opposite — T-Mobile’s AWS-1 networks in the U.S. will be used primarily by consumers with handheld devices, which will be subject to interference from the AWS-3 TDD licensee’s laptop and other data device transmitters. Thus, the AWS-1 devices will not be able to increase power to an extent sufficient to protect themselves. In turn, when voice customers receive harmful interference from an AWS-3 device, their calls generally will fail — either by not establishing the connection or by dropping the call. For those calls that suffer interference but do not drop, the reaction of the serving system will be to increase base station transmit power (limited by maximum available base station RF power) to improve the signal-to-noise ratio for the affected mobile device. This response further impacts other customers in the area by reducing overall system capacity, because energy invested in repairing one link will deprive other users in the system of that energy. The end result, therefore, is an overall degradation in spectrum efficiency for the AWS-1 operator.

Third, mobile-to-mobile interference to TMI’s TDD devices is mitigated in the Czech Republic because there is little traffic on the nearby FDD network. Telefónica O2 operates a robust GSM and 450 MHz EV-DO network, so its UMTS FDD network is lightly loaded. In addition, TMI has limited the use of TDD spectrum (1910-1915 MHz) near FDD spectrum

^{91/} See Ray Declaration ¶ 15 (explaining that degraded data throughput is a debilitating impact caused by AWS-3 mobile transmissions to AWS-1 mobile devices).

(1920-1980 MHz) to one city — Prague — and uses the 872 MHz band in the rest of the country for its UMTS TDD network. In the U.S., by contrast, both the AWS-1 and AWS-3 networks will be widely available and heavily used. T-Mobile is aggressively building out its AWS-1 network nationwide, with New York City, Austin, and Las Vegas on air today and another 20-plus markets scheduled to launch by year's end. T-Mobile will face interference from an AWS-3 network that must, under the *Further Notice's* build-out requirements, cover 50% of the population within four years and 95% of the population within 10 years.

Fourth, there is 5 MHz of separation between TMI's TDD and Telefónica O2's FDD operations. While M2Z correctly notes that this 5 MHz block is allocated for TDD and is not an express guard band, it was unassigned when T-Mobile launched its UMTS TDD network in 2005 and remains unassigned today. Such a *de facto* guard band provides for increased attenuation of the adjacent FDD signal. And although a 5 MHz guard band is insufficient to protect against interference from AWS-3 systems operating at the power and OOB limits proposed by M2Z (a result confirmed by T-Mobile's lab test results), a 5 MHz guard band is certainly better than no guard band at all in reducing interference between TDD and FDD systems.^{92/}

Finally, as mobile-to-mobile interference inevitably increases with the rise in traffic on Telefónica O2's FDD network, TMI will migrate affected customers onto its newer and more powerful next-generation network based on Long Term Evolution (LTE) standards in another band.^{93/} In the U.S., by contrast, T-Mobile doesn't have the option of migrating to new spectrum if it encounters interference — it is using the AWS-1 band to launch its next-generation network.

^{92/} As T-Mobile's lab tests demonstrated, a 5 MHz guard band between AWS-1 and AWS-3 would be sufficient if the power and OOB limits on the AWS-3 TDD operations were stricter than what the Commission has proposed and what M2Z has argued for in this proceeding. *See* Ray Declaration ¶¶ 23-24.

^{93/} Horn Letter at 1.

B. M2Z's Invocation of Ofcom Is Similarly Inapt.

Like its Czech Republic analogy, M2Z's comparison to the United Kingdom and Ofcom's analysis of potential interference in the 2.6 GHz band^{94/} is misplaced. While M2Z claims that Ofcom's report "conclusively demonstrates acceptable coexistence" between TDD and FDD systems, it fails to note that Ofcom conducted no empirical field testing to support its findings and that such "coexistence" has not been tried in the marketplace. Indeed, several commenters in the U.K. proceeding, including Ericsson, Nokia, TMI and the UMTS Forum, challenged Ofcom's statistical modeling on the ground that it assumed "a situation which is very far removed from any real life scenario."^{95/} In addition, when the 2.6 GHz spectrum is auctioned in the U.K., it is likely that rational bidders, having been put on prior notice of the adjacency of the band (unlike AWS-1 licensees), will take that fact into account when determining the value to accord them. And, not surprisingly, M2Z has cited only those parts of the Ofcom analysis that it presumably believes support its position and omits a number of key technical assumptions that are material in interpreting and extending the Ofcom conclusions to an informed assessment of AWS-3 mobile-to-mobile interference.

^{94/} Ofcom, On the impact of interference from TDD terminal stations to FDD terminal stations in the 2.6 GHz band, Statement (April 21, 2008), *available at* <http://www.ofcom.org.uk/consult/condocs/2ghzregsnotice/tech.pdf> ("Ofcom Report").

^{95/} Ericsson, Response to the Ofcom Award of Available Spectrum 2500-2690 MHz, 2010-2025 MHz Consultation of August 1, 2007, at 2 (filed Sept. 28, 2007), *available at* <http://www.ofcom.org.uk/consult/condocs/2ghzdiscuss/responses/Ericsson.pdf>; UMTS Forum, Response to the Ofcom Award of Available Spectrum 2500-2690 MHz, 2010-2025 MHz Consultation of August 1, 2007, at 3 (filed Sept. 28, 2007), *available at* <http://www.ofcom.org.uk/consult/condocs/2ghzdiscuss/responses/UMTS.pdf> (noting that "Ofcom analysis on the blocking effect assumed a 15 MHz carrier separation between the FDD victim receiver . . . which will never be the case"); Nokia, Response to the Ofcom Award of Available Spectrum 2500-2690 MHz, 2010-2025 MHz Consultation of August 1, 2007, at 3 (filed Sept. 28, 2007), *available at* <http://www.ofcom.org.uk/consult/condocs/2ghzdiscuss/responses/Nokia> ("The study on adjacent channel interference has omitted the most serious scenario of interference altogether - namely mobile to mobile"); T-Mobile International, Response to the Ofcom Award of Available Spectrum 2500-2690 MHz, 2010-2025 MHz Consultation of August 1, 2007, at 2 (filed Sept. 28, 2007), *available at* <http://www.ofcom.org.uk/consult/condocs/2ghzdiscuss/responses/T-Mobile.pdf>.

First, Ofcom assumes a distribution of received signal powers^{96/} (the strength of the desired signal into the victim receiver) which are unrealistically high for the AWS scenario. An assumed receive signal strength at that high level is not applicable to the U.S. market, where receive signal levels are typically much lower, as has been shown by T-Mobile drive testing. Indeed, T-Mobile conducted drive tests in two UMTS markets and measured *actual* signal strengths at much lower levels.^{97/} Obviously, interference effects are considerably more dramatic when the desired signal received levels are lower, as in AWS because the victim receiver is more vulnerable and sensitive to interference.

Second, Ofcom's analysis evaluates TDD interference into FDD data terminals and focuses on the impact of interference to "bursty" data systems rather than voice systems.^{98/} Because Ofcom's focus was limited to data, its predicted interference also was limited to reductions in data service link throughput and ignored the more profound impacts of interference on voice calls, such as call set up failures, dropped calls, call quality degradations, and E911 call reliability. While Ofcom's assumption that interference will only prevail when the interferer and victim systems are transmitting at the same time may be reasonable when both the FDD and TDD systems are data networks that transmit and receive in short "bursts" distributed in the time domain, it is not an appropriate assumption when the victim is receiving continuous FDD transmissions such as circuit switched voice and data. This is the very transmission scheme used by T-Mobile in the AWS-1 band today and the same scheme used by the overwhelming majority of wireless systems in the U.S. In stark contrast to the Ofcom assumptions, the empirical laboratory tests performed by T-Mobile quantify the interference effects of "bursty" sources of

^{96/} Ofcom Report at 13 Figure 4.

^{97/} T-Mobile Test Results at 13-14.

^{98/} Ofcom Report at 10 ¶ 4.4.

interference on continuous FDD transmissions, and those results make clear that the Ofcom analysis is not applicable to, and proves nothing about, the ability of FDD and TDD to coexist in *this country*.

Third, while Ofcom’s conclusions on data system impacts may be directionally correct, Ofcom did not assess the possible impacts to FDD system capacity resulting from TDD interference. Nor does the Ofcom analysis provide relevant data from which extrapolations can be made and applied reliably to the AWS-3 situation. By contrast, T-Mobile’s analysis shows that mobile TDD transmissions can negatively impact overall FDD cell capacity for mixed voice and data services^{99/} and result in reduced spectrum efficiency.^{100/}

Fourth, M2Z fails to acknowledge Ofcom’s assumption that “restricted” blocks are necessary for adjacent channel TDD spectrum to reduce base-to-base interference.^{101/} Even with use restrictions, moreover, Ofcom notes that these TDD blocks only provide “limited protection” from terminal-to-terminal interference.^{102/} Ofcom concludes that “it is likely that these restricted blocks could only be used for deployment of TDD picocells” due to power restrictions required to reduce interference.^{103/} M2Z, by contrast, has argued to the Commission that it should be able to operate its TDD mobile transmitters directly adjacent to the AWS-1 FDD band at full power and with virtually no technical limitations.

Fifth, Ofcom’s analysis does not adequately address the obvious scenario of in-home use, especially as it is and will be deployed in the U.S. market. Indeed, M2Z describes its proposed business plan as being focused on delivering good value to residential consumers. Thus, it is

^{99/} Ray Declaration ¶ 17.

^{100/} See T-Mobile Test Results at 22-26.

^{101/} Ofcom Report at 15 ¶ 4.21.

^{102/} *Id.* at 19 ¶ 5.8.

^{103/} *Id.* at 15 ¶ 4.21.

highly likely that, within a household, TDD and FDD devices (for example, a T-Mobile UMTS handset and a laptop computer with an M2Z card) will routinely come within close proximity. As T-Mobile’s testing showed, under such circumstances, damaging interference will prevail and the customer will suffer a communications “meltdown”, with disruption to critical voice services including E911 calling.

Finally, Ofcom concludes that significant mobile-to-mobile interference will exist and could be “an issue”^{104/} if TDD is deployed with macrocells: “Based on the results of the analysis outlined in the previous section, we believe that there is a risk of significant 1st adjacent-block interference from TDD terminal stations towards FDD terminal stations, where the TDD terminal stations are served by high power macro-cellular base stations, and where there is a high density of TDD terminal stations operating in the spatial vicinity of the FDD terminal stations.”^{105/} To meet a 95% nationwide build-out requirement in the U.S., it is obvious that macrocells are contemplated in the AWS-3 band — the serious problem of mobile-to-mobile interference that Ofcom anticipates in such a situation is precisely what T-Mobile has observed in its lab testing and reported to the Commission.

C. TDD Operations in the AWS-3 Band Would Undercut International Harmonization of the Spectrum.

The foregoing facts illustrate the stark differences between M2Z’s international examples and the TDD network M2Z proposes in the U.S., and caution against reliance on the overly simplistic comparisons that M2Z would foist on the Commission in this proceeding. Indeed, M2Z’s attempt to invoke international examples in support of the proposed rules is ironic, to say the least, considering that its proposal to use the AWS-3 band for uplink transmissions would

^{104/} Ofcom Report at 15 ¶ 4.20.

^{105/} *Id.* at 18 ¶ 5.3.

disrupt the international harmonization of 3G spectrum at 2110-2170 MHz.^{106/} As Ericsson points out, the 2110-2170 MHz band has been identified globally as a downlink-only band for 3G use.^{107/} Handsets, networks, and standards have been developed by governments, carriers, and manufacturers in accordance with this globalized standard.^{108/} Moving away from this globalized standard, as M2Z would have the Commission do, would be detrimental to U.S. consumers by increasing costs and reducing competition in the supply of AWS-1 handsets, thereby rendering them more expensive, less innovative, and less useful on a global scale.^{109/}

CONCLUSION

As the comments make clear, the Commission's proposed technical rules would seriously undermine competition in wireless broadband services by creating harmful interference for AWS-1 licensees and their customers, triggering substantial uncertainty about the viability of the AWS-1 band. The proposed service and licensing rules would also encumber the AWS-3 band with needless and ill-defined regulatory requirements and foreclose almost all bidders from competing for the AWS-3 spectrum when it is auctioned. T-Mobile urges the Commission to limit the AWS-3 spectrum to downlink operations, which would avoid harmful interference with new broadband services operating in the AWS-1 and possibly even augment the capacity of

^{106/} CTIA Comments at 47-49; Ericsson Comments at 7-10; Nokia Comments at 5-6.

^{107/} Ericsson Comments at 7.

^{108/} CTIA Comments at 48; Ericsson Comments at 7.

^{109/} CTIA Comments at 48-49; Ericsson Comments at 8; Nokia Comments at 6.

those services. Rather than adopting the ill-considered service rules proposed in the *Further Notice*, this would be the most effective means of using way of using the AWS-3 band to facilitate wireless broadband deployment.

Thomas J. Sugrue
Kathleen O'Brien Ham
Sara F. Leibman
Patrick T. Welsh
T-MOBILE USA, INC.
401 9th Street, NW
Suite 550
Washington, D.C. 20004

Respectfully submitted,

/s/ Howard J. Symons

Howard J. Symons
Tara M. Corvo
Christopher R. Bjornson
MINTZ, LEVIN, COHN, FERRIS,
GLOVSKY AND POPEO, P.C.
701 Pennsylvania Avenue, N.W.
Suite 900
Washington, D.C. 20004

Counsel for T-Mobile USA, Inc.

Thomas S. Dombrowsky, Jr.
Engineering Consultant
Wiley Rein LLP
1776 K Street, NW
Washington, D.C. 20036

August 11, 2008

Exhibit 1 - Letter from Joachim Horn, T-Mobile International AG (August 8, 2008)



T-Mobile International AG
Postfach 301661, 53196 Bonn, Germany

T-Mobile USA Inc.
Neville Ray
SVP Engineering and Operations
12920 SE 38th Street
Bellevue
WA 98006
USA

Our Contact **Joachim Horn, CTO, T-Mobile International AG**

Phone **Phone: +49 228 / 936-18000, Fax: +49 228 / 936-18009, E-Mail: joachim.horn@t-mobile.net**

Date **August 8, 2008**

Dear Neville,

I understand that you are engaged in a public comment cycle on the FCC's proposal to allow TDD operations in AWS-3 spectrum, adjacent to FDD operations. I certainly share your concern that damaging interference to AWS-1 mobile devices is highly probable under such circumstances.

In Eastern Europe, we operate a UMTS-TDD system adjacent to an FDD-UMTS system operated by Telefónica O2 Czech Republic a.s. (previously branded Eurotel PRAHA). Currently, there is an effective 5 MHz guard band between the systems. We deployed the system in October 2005, 2 months prior to the initial launch of Eurotel's UMTS FDD system. At that time we recognized the potential for base-to-base interference from our UMTS TDD base stations into the receivers of Eurotel's UMTS FDD base stations. We took steps to mitigate potential interference by installing sharp filters at our base stations to attenuate unwanted out of band emissions.

We are aware of the potential for harmful interference to our UMTS-TDD mobile devices caused by Out Of Band Emissions (OOBE) from UMTS-FDD mobile devices operated by Telefonica O2. Fortunately, due to the limited geographical spread of Telefonica's service and the use cases of both networks our service has not become significantly affected by interference yet. This is because the UMTS-FDD terminals, specifically when transmitting on low data rates, consistent with voice use, operate on significantly reduced output power, while the UMTS-TDD interference victims are nomadic or stationary data equipment, often operated in homes. With future growth in UMTS-FDD usage, we expect higher interference risk to our UMTS-TDD customers. In preparation, we expect that negatively impacted UMTS-TDD customers will be migrated to newer and more powerful next generation platforms (operating at different frequencies and using FDD rather than TDD), therefore avoiding degradation to the general quality of our services.

T-Mobile International AG

Address Landgrabenweg 151, 53227 Bonn, Germany

Postal address Postfach 301661, 53196 Bonn, Germany

Contact Telephone: +49 228 936-0, Telefax: +49 228 936-39360, Internet: www.t-mobile.net

Bank Information Dresdner Bank AG Bonn, Acct. No. 02 063 062 00, Bank No. 370 800 40, IBAN: DE13370800400206306200, SWIFT-Code: DRESDEFF380

Supervisory Board René Obermann (Chairman)

Board of Management Hamid Akhavan (Chairman), Michael Günther, Lothar A. Harings, Katharina Hollender

Commercial register Amtsgericht Bonn, HRB 12276, corporate seat/Sitz der Gesellschaft Bonn

VAT Reg.No. 205/5777/0518

WEEEReg.-No. DE 189669124



Datum 8. August 2008

Empfänger Neville Ray

Blatt Page 2

As you know, TMO is executing a pan-European strategy to evolve our networks to 4G broadband wireless IP services and we plan to deploy next generation broadband equipment based on Long Term Evolution (LTE) standards. Our decision to deploy UMTS-TDD technology in Prague was designed to allow TMO to develop new business models based on broadband wireless access. We have assessed that LTE operating in FDD spectrum is optimal for the future and we intend to complement the UMTS-TDD system we operate today with a higher capacity/higher performance LTE system in the coming years.

Sincerely,

A handwritten signature in black ink, appearing to read "Joachim Kosm", is located below the "Sincerely," text.