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

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

**COMMENTS OF T-MOBILE USA, INC.**


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**COMMENTS OF T-MOBILE USA, INC.**

T-Mobile USA, Inc. ("T-Mobile") hereby submits these comments in response to the *Further Notice of Proposed Rulemaking* in the above-captioned proceedings.[1/] As set forth below, the proposed rules would create pervasive harmful interference to licensees in the AWS-1 band, thereby undermining wireless broadband competition; depart from the Commission's long-standing practice of ensuring that newly authorized operations do not cause harmful interference to existing operations; ignore past Commission findings on the difficulty of locating time division duplex ("TDD") and frequency division duplex ("FDD") systems on adjacent bands; and improperly burden the spectrum with one entity's business plan, which the Commission has already rejected and whose central element — "free" low-speed Internet access — has been a proven failure. In lieu of the proposed rules, the Commission should limit use of the AWS-3 band to downlink operations and accord bidders full flexibility to design business plans that put this valuable spectrum to its highest and best use.

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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*").

## INTRODUCTION AND SUMMARY

In 2003, the Commission rejected the use of TDD operations in or adjacent to the AWS-1 band because it would create significant interference.[2/] Last year, the FCC rejected M2Z Network, Inc.'s ("M2Z's") application for free spectrum to provide free service, finding that the benefits of a public auction would "outweigh the value of any purported public interest benefits of providing M2Z . . . spectrum for free,"[3/] particularly given M2Z's "unremarkable" speed and not "particularly aggressive" construction benchmarks.[4/]

Now, without any reasoned explanation, the Commission has proposed rules that would reverse both of these decisions, substantially undermining the value of real investments in the AWS-1 band in favor of a speculative plan that is almost certain to fail. Notwithstanding its own prior findings and the record evidence in this proceeding, the Commission has proposed rules that damage real competition by undermining the ability of AWS-1 licensees — which pointedly did not seek a government handout but instead *paid* billions of dollars to the government for the spectrum and invested billions more in network deployment — to provide wireless broadband service. These include new entrants to the wireless broadband market, like T-Mobile, who are relying on the AWS-1 band to roll out their advanced 3G services. The proposed rules would impose, by government fiat, a business plan that would almost assuredly drive away competing bidders for the AWS-3 band, providing valuable spectrum at little cost to billion-dollar venture

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2/ *Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, Report and Order, 18 FCC Rcd. 25162, 25179 ¶ 46 (2003) ("*AWS-1 Service Rules Orde*r").

3/ *Applications for License and Authority to Operate in the 2155-2175 MHz Band*, Order, 22 FCC Rcd. 16563, 16570 ¶ 11 (2007) ("*AWS-3 Applications Order*").

4/ *Id*. at 16572-73 ¶ 15.

capital firms on the basis of a promise to relegate low-income Americans to an inferior broadband service that will not even be widely available until 2013.[5/]

Unrestricted mobile TDD transmissions in the AWS-3 band will lead to destructive interference to UMTS mobile units in the adjacent AWS-1 band, in the form of out-of-band emissions ("OOBE") interference and receiver overload. For consumers, the interference will be extensive, widespread, and unpredictable, significantly degrading their service. The interference will not be limited to marginal situations, *e.g.*, in-building use or at the edge of coverage, and it will not even be limited to the mobile unit or units victimized by the harmful interference. Rather, because a Wideband Code-Division Multiple Access ("WCDMA") base station will respond to interference to one unit by raising the downlink power level to all customer handsets in a network, capacity will be reduced for customers throughout the sector. Neither the use of "better" filters nor a guard band of even 15 MHz is sufficient to prevent the harmful interference to AWS-1 mobile units that would result from deployment of TDD in the AWS-3 spectrum under the *Further Notice*'s proposed technical rules. The only reasonable means of adequately protecting consumers from such interference would be to restrict use of the AWS-3 band to downlink-only operations.

The Commission previously indicated that it had no intention of authorizing TDD in the AWS-3 spectrum unless "proponents of TDD can *conclusively demonstrate* that such technologies could be used in these bands or some segments of these bands without causing interference to other spectrum users,"[6/] but neither the FCC nor TDD proponents have provided

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[5/] The first build out benchmark for the AWS-3 band under the Commission's proposed rules of 50% of the population applies four years after the licenses are granted. *Further Notice* ¶ 3. The earliest the licenses could be issued after allowing time to prepare for and conduct an auction and complete the post-auction licensing process is likely to be sometime in mid-2009.

[6/] *AWS-1 Service Rules Orde*r, 18 FCC Rcd. at 25179 ¶ 46.

the required conclusive demonstration here, nor can they. In light of the serious threat of harmful interference to AWS-1 operations, the Commission should, at a minimum, adhere to its long-standing practice of undertaking an empirical analysis and developing appropriate service rules to address the identified interference threat. At the very least, the Commission should take into account the results of T-Mobile's tests, which it undertook at the Boeing laboratory facilities in Seattle when the Commission declined to conduct the requisite analysis itself.[7/] T-Mobile's testing, the results of which are submitted with these comments, confirms that the *Further Notice*'s proposed technical rules will cause pervasive harm to AWS-1 operations by mobile TDD transmissions in the AWS-3 band.

Given the serious and substantial interference concerns raised by commenters in this proceeding, T-Mobile continues to believe that independent 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. Authorizing a service that can be readily predicted to cause harmful interference with the hope that licensees will be able to "work it out" is not a viable option. It is the Commission's duty — and established precedent — to prescribe technical rules for subsequently-authorized services that protect existing licensees that have invested billions of dollars in spectrum, and it is the burden of the new service's proponents to demonstrate conclusively that those rules are sufficient to address interference concerns.

In addition to the serious adjacent band interference issues, the "free" service component of the Commission's AWS-3 proposal is both unwise and unnecessary. There are multiple competitors and a multitude of rate plans already available in the marketplace that are working to

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[7/] *See* T-Mobile USA, Inc., AWS-3 to AWS-1 Interference Laboratory Test Report (July 25, 2008) ("T-Mobile Test Results") (attached as Exhibit 1); Declaration of Neville R. Ray ("Ray Declaration") (attached as Exhibit 2).

bring prices down and make broadband more accessible for all Americans — all *without* the benefit of auctions tailored to fit one company's specific business model and business interests. In marked contrast to the speculative promise of an inferior wireless broadband offering, T-Mobile, which itself is a new entrant into the broadband marketplace, is bringing real competition to consumers today. Utilizing the AWS-1 spectrum for which it paid more than $4 billion dollars, T-Mobile has already launched UMTS (3G) service in New York City, and plans to complete deployment in 25 additional markets by the end of this year. T-Mobile's UMTS service will have potential data transmission capabilities of greater than 3 Mbps per second — truly high speed broadband comparable to the offerings of cable and landline telephone companies. The Commission can and should rely on the marketplace to deliver value and innovative services to American consumers.

Further, the Commission's proposed "free service" requirement, tailored to the specific and unique business plan of one entity, violates the auction statute. Abandoning the Commission's guiding principle of using competitive bidding to ensure that spectrum licenses are provided to those who value them most highly in favor of encumbering the license with a particular business plan will also limit the potential use of the spectrum, deterring other bidders and thereby reducing competition. This will prevent the spectrum from being put to its highest and best use, and will drive down auction revenues substantially, all to the detriment of the public interest.

Requiring the provision of wireless broadband service at a specified price (zero, in this case) and under government-imposed parameters (a mandated download speed and network-based "always-on" filtering of certain objectionable content) also exceeds the Commission's authority to regulate information services such as wireless broadband, and runs afoul of the

Commission's determination just last year that wireless broadband service should be unregulated in order to promote the speediest and broadest service deployment. The requirement to provide so-called free broadband service similarly is economically and technologically unsound, as the history of failed efforts to provide free Internet access service demonstrates. And, perhaps most fundamentally, the Commission's free service proposal would be of little or no help to those it is designed to support given that the "free" aspect of the service would be vastly inferior to any commercial service on the market and will not even be available for years.

## I. THE FCC'S PROPOSED RULES WILL CREATE HARMFUL INTERFERENCE TO MOBILE OPERATIONS IN THE AWS-1 BAND

In the *Notice of Proposed Rulemaking* in this proceeding, the Commission sought comment on rules for Advanced Wireless Services ("AWS") in the band 2155-2175 MHz.[8/] Previously, the FCC sought comment on the use of, among others, the bands 1915-1920, 1995-2000, and 2175-2180 MHz.[9/] In the *Further Notice*, the Commission has now proposed technical rules for all of these bands.[10/]

In the auction for the AWS-1 band (1710-1755 and 2110-2155 MHz bands), 104 parties won 1,087 licenses for a total of just under $14 billion. T-Mobile was the top bidder in that auction contributing nearly $4.2 billion to the United States Treasury for 120 licenses across the country. In addition, T-Mobile has already invested more than $2 billion in infrastructure (approximately 15,000 WCDMA base station sites) toward the deployment of this spectrum.

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

9/ *Service Rules for Advanced Wireless Services in the 1915-1920, 1995-2000, 2020-2025 MHz and 2175-2180 MHz, WT Docket No. 04-356, Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands*, Notice of Proposed Rulemaking, 19 FCC Rcd. 19263 (2004) ("*AWS-2 NPRM*").

10/ Previously, the 2175-2180 MHz band had been designated as the upper half of the so-called "J Block." The Commission now includes this 5 MHz of spectrum as part of a reconstituted 2155-2180 MHz "AWS-3 band." The bands 1915-1920 and 1995-2000 MHz are designated as the "H Block." Service rules for the lower half of the J Block at 2020-2025 MHz remain to be established.

T-Mobile will use the AWS-1 spectrum to provide the voice, data, and advanced wireless services consumers increasingly demand, and therefore has a direct and immediate interest in ensuring that it will be able to utilize this spectrum without harmful interference. As T-Mobile explained in its comments in response to the *AWS-3 NPRM*, the use of the AWS-3 block for mobile TDD operations will cause harmful interference to consumers using T-Mobile's UMTS service in the AWS-1 band. T-Mobile therefore proposed that the AWS-3 block be limited to downlink use only.[11/] Numerous other commenters reached the same conclusion.[12/]

Downlink-only use of the AWS-3 spectrum would not only eliminate interference problems, but would also "create opportunities for asymmetric pairing in support of data-intensive, high-bandwidth applications."[13/] As the Commission 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.[14/] T-Mobile has expressed support for this approach.[15/]

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11/ *See* Comments of T-Mobile USA, Inc., *Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band*, WT Docket No. 07-195, at 3-7 (filed Dec. 14, 2007) ("T-Mobile AWS-3 Comments").

12/ *See, e.g.*, 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); *see also* Letter from Patricia Paoletta, Counsel to 3G Americas, to Marlene Dortch, Secretary, FCC, WT Docket No. 07-195, at 2-3 (filed Jun. 25, 2008); Letter from Cecily Cohen, Nokia, to The Hon. Kevin Martin, Chairman, FCC, *et al.*, WT Docket No. 07-195, at 1-2 (filed June 5, 2005); Letter from Mark Racek, Ericsson Inc, and Lee Hill, Sony Ericsson Mobile Communications Inc., to The Hon. Kevin Martin, Chairman, FCC, *et al.*, WT Docket No. 07-195, at 1-2 (filed June 4, 2005); Comments of Motorola, WT Docket No. 07-195, at 3-8 (filed Dec. 14, 2007).

13/ *See* T-Mobile AWS-3 Comments at 4.

14/ *AWS-3 NPRM*, 22 FCC Rcd. at 17046 ¶ 20.

15/ *See* T-Mobile AWS-3 Comments at 3-4. Several parties in addition to T-Mobile have voiced their support for asymmetrical pairing. *See, e.g.*, Comments of Verizon Wireless, WT Docket No. 07-195, at 13-15 (filed Dec. 14, 2007); Comments of MetroPCS, WT Docket No. 07-195, at 5-7 (filed Dec. 14, 2007); Reply Comments of AT&T, WT Docket No. 07-195, at 2-3 (filed Jan. 14, 2008).

Contrary to the recommendation of T-Mobile and others who have already spent billions of dollars to acquire and develop the AWS-1 band, the *Further Notice* proposes to allow downlink and uplink transmissions throughout the entire AWS-3 band — a proposal entirely inadequate to prevent consumers from experiencing harmful interference. The Commission further proposes that AWS-3 mobiles attenuate OOBE by 60 + 10 log (P) dB outside of the AWS-3 band (and also establishes a power limit for AWS-3 mobile devices of 23 dBm/MHz equivalent istropically radiated power ("EIRP")).[16/] The proposed rules would also limit OOBE to 43 + 10 log (P) dB for AWS-3 base and fixed downlink stations, and base station power to 1640 watts EIRP in non-rural areas and 3280 watts peak EIRP in rural areas.[17/] T-Mobile's comprehensive testing and analysis demonstrate that these technical parameters are woefully insufficient to protect T-Mobile's and other AWS-1 licensees' customers from harmful interference.[18/]

Given the seriousness and complexity of the technical issues raised in this proceeding, it is imperative — and consistent with past practice — for the Commission to institute supervised joint testing to determine the interference impact of its proposed rules on AWS-1 licensees.[19/] The Commission has recognized the importance of having empirical testing data — not just

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16/ Prior to the adoption of the *Further Notice*, the Commission had always specified mobile power limits in terms of total output power. *See, e.g.*, 47 C.F.R. § 27.50(d)(4). T-Mobile believes that the Commission may have erred in its proposal to allow a 23 dBm/MHz peak EIRP for the AWS-3 spectrum. If not, the mobile power allowed would be even greater than expected, as T-Mobile believed that the Commission was limiting mobile total output power to 23 dBm. For a 5 MHz-wide UMTS carrier, the Commission's proposal of 23 dBm/MHz increases total power by 7 dBm – greatly increasing the interference potential to AWS-1 licensees. T-Mobile has performed all of its tests and measurements based on the Commission's *Further Notice* proposal of 23 dBm/MHz.

17/ *Further Notice* ¶ 3.

18/ T-Mobile Test Results at 21; Ray Declaration ¶¶ 11, 13.

19/ *See* T-Mobile Request for Extension of Time to File Comments, WT Docket Nos. 07-195, 04-356 (filed July 1, 2008). Such testing and public comment on the results could be completed in 90 days and would provide the empirical foundation currently lacking in this docket to resolve the serious outstanding technical questions raised by the proposed rules. *See id.*

theoretical modeling or arguments by analogy — to resolve questions of potential harmful interference between co-channel and adjacent channel spectrum uses.[20/] Only laboratory testing will generate the real, empirical data that is essential to reasoned decisionmaking.

Unfortunately, even though it extended the time period for comments on the *Further Notice* in part because of numerous expressions of concern about interference, the Commission has thus far been unwilling to engage in such testing.[21/] Therefore, T-Mobile used the additional time to conduct its own empirical testing of the impact of interference from AWS-3 mobile operations on AWS-1 handsets.[22/] T-Mobile invited the Commission's Office of Engineering and Technology to come to Boeing's laboratory to observe the testing, but receiving no response, T-Mobile moved ahead without such observation in order to complete the analysis before the comment date.[23/]

The scope of that testing necessarily has been constrained by the limited time provided by the Commission, but the results nevertheless confirm what T-Mobile feared — that the use of the AWS-3 band for mobile operations will create insurmountable interference to mobile operations in adjacent bands. The data indicate that such interference would be widespread and not limited in occurrence, and that it will be present well into the AWS-1 spectrum band.[24/] Only the adoption of rules limiting the use of the AWS-3 band to downlink transmissions would address

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20/ *See, e.g.*, *Unlicensed Operation in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, 21 FCC Rcd. 12266, 12273 ¶ 15 (2006) (recognizing "the importance of conducting tests to ensure that whatever standards are ultimately adopted for such devices will protect incumbent radio services from harmful interference").

21/ *See* Sec. II.C., *infra.*

22/ Ray Declaration ¶¶ 7-10 (describing T-Mobile's test plan).

23/ 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).

24/ T-Mobile Test Results at 4-5, 29; Ray Declaration ¶ 18-19.

these issues, maximizing the utility of the AWS-3 spectrum while minimizing the risk to AWS-1 licensees.

### A. AWS-3 Mobile TDD Transmissions Under the Parameters Proposed by the FCC Will Create Harmful Interference to AWS-1 Mobile Receivers Operating with FDD Technology.

As T-Mobile, other AWS-1 licensees, mobile equipment vendors, and others have consistently informed the Commission, interference between spectrally close mobile operations is well recognized as a real-world problem.[25/] Operation of AWS-3 mobile devices in physical proximity to AWS-1 mobiles will lead to significant deleterious effects, including loss of capacity, quality of service diminution, reduction in signal coverage, dropped calls, and blocking for AWS-1 licensees. These effects are due to two key issues, OOBE interference and receiver overload.

#### 1. Operation of TDD Mobile Units in the AWS-3 Band Will Cause OOBE Interference That Filters Will Not Alleviate.

Radiofrequency devices are generally not capable of maintaining all emissions from their operations within their authorized channels. These out-of-band emissions are regulated by the Commission, to attempt to ensure that adjacent band licensees do not receive interference.[26/] Restriction of OOBE must occur at the transmitter side (in this case, in the AWS-3 mobile transmitter) because AWS-1 mobiles will receive the energy as in-band, co-channel interference

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[25/] *See, e.g.*, Comments of Verizon Wireless, WT Docket No. 07-195, at 5-13 (filed Dec. 14, 2007); Comments of CTIA, WT Docket No. 07-195, at 2-6 (filed Dec. 14, 2007); Comments of MetroPCS, WT Docket No. 07-195, at 6 (filed Dec. 14, 2007); *see also* Letter from Patricia Paoletta, Counsel to 3G Americas, to Marlene Dortch, Secretary, FCC, WT Docket No. 07-195, at 4-5 (filed June 25, 2008); Letter from Cecily Cohen, Nokia, to The Hon. Kevin Martin, Chairman, FCC, *et al.*, WT Docket No. 07-195, at 1-2 (filed June 5, 2005); Letter from Mark Racek, Ericsson Inc, and Lee Hill, Sony Ericsson Mobile Communications Inc., to The Hon. Kevin Martin, Chairman, FCC, *et al.*, WT Docket No. 07-195, at 1-2 (filed June 4, 2005); Letter from Edward Black, Computer and Communications Industry Association, to Marlene Dortch, Secretary, FCC, WT Docket No. 07-195, at 1 (filed June 4, 2005); Comments of Motorola, WT Docket No. 07-195, at 7-8 (filed Dec. 14, 2007).

[26/] *See, e.g.*, 47 C.F.R. §§ 24.238, 27.53.

that cannot be filtered by AWS-1 receivers.[27/] In other words, the out-of-band emissions from AWS-3 mobile operations appear within the frequency range of 2110-2155 MHz, the band that has been authorized for AWS-1 licensees' exclusive use. OOBE must be reduced at the transmitter with a combination of emission mask and transmit filtering to attenuate emissions into AWS-1 spectrum.[28/]

***As the record in this proceeding and T-Mobile's testing demonstrate, filters on an AWS-1 mobile receiver can do nothing to protect against OOBE interference from an AWS-3 device.***[29/] This is because "out-of-band" emissions from an AWS-3 device are "in-band" as far as the AWS-1 device is concerned. A filter that rejected these emissions from the AWS-3 device would be rejecting the very frequencies on which the AWS-1 handset is authorized to operate. Thus, the only ways to eliminate OOBE interference are filtering at the transmitter and reducing in the allowed transmit power from the AWS-3 mobile transmitter.[30/] In practice, this would require such an extreme limitation on AWS-3 mobile unit power levels that providing service in that band would be untenable.

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27/ T-Mobile Test Results at 6, 20-21; Ray Declaration ¶ 22.

28/ *See* Comments of Verizon Wireless, WT Docket No. 07-195, at 6-7 (filed Dec. 14, 2007); *see also* Reply Comments of AT&T Mobility, WT Docket No. 07-195, at 7-8 (filed Jan. 14, 2008).

29/ T-Mobile Test Results at 4-5, 8, 23-26; Ray Declaration ¶ 20-22. Other parties have noted that even the best filters available do not prevent mobile-to-mobile interference. *See* Letter from Steve Sharkey, Motorola, to Marlene Dortch, Secretary, FCC, WT Docket No. 07-195, at 2 (filed June 5, 2008) (stating 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" and the 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"); *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").

30/ *See* Comments of Verizon Wireless, WT Docket No. 07-195, Attachment B, Avago Technologies, Some Comments on RF Filtering at 13 (filed Dec. 14, 2007) ("Avago Analysis").

### 2. AWS-3 Mobile Operations Would Cause Receiver Overload.

AWS-3 mobile operations also would cause receiver overload (also known as "blocking" or "adjacent channel interference") of AWS-1 mobile receivers.[31/] AWS-1 mobile receivers use a receive filter to attenuate signals from other (undesired) bands. While AWS-1 filters can attenuate adjacent band signals, there are practical physical limits to the ability of mobile receive filters to eliminate adjacent-band interferers that are very strong and very close spectrally. No perfect filter exists; therefore no filter can reject all adjacent-band signals.

As Avago and others have demonstrated in this proceeding,[32/] in the 2110-2170 MHz band, there must be at least 12.5 to 13 MHz of guard band between mobile transmitters and receivers to protect against adjacent channel interference. Without this amount of frequency guard band between mobile transmitters and mobile receivers, the mobile receiver filter will not be able to achieve the adjacent channel rejection needed to protect against harmful interference.[33/]

### 3. The Proposed Rules Do Not Protect Against Harmful Interference.

T-Mobile's extensive testing at the Boeing facility was designed to measure interference effects from AWS-3 mobile devices operating in accordance with the proposed Commission limits for mobile power (23 dBm/MHz) and OOBE (60 + 10 log (P) dB). Additionally, the environment was designed to provide the opportunity for the Commission, other interested service providers, and equipment vendors to observe or participate in the testing. To ensure that the assumptions used in the testing were realistic, T-Mobile developed the test plan to measure the AWS-3 interference power levels at which serious degradation (*i.e.* the inability to establish a

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31/ T-Mobile Test Results at 22-29; Ray Declaration ¶ 14.

32/ Avago Analysis at 12.

33/ *Id.* at 13.

connection, excessive block error rates, or dropped calls) occurred in the AWS-1 mobiles operating under a variety of typical serving signal conditions.

Critically, the T-Mobile testing also tested the band pass filter at the edge of the AWS-1 band (2110 MHz), where such filtering was designed to roll off in the best fashion possible, to demonstrate whether "better" filtering would eliminate or reduce receiver overload interference from AWS-3 operations. Several different AWS-1 devices, which are in customer hands today and being used on T-Mobile's network, were tested. Testing was performed outdoors at three different receive signal strengths (-105 dBm, -100 dBm, and -90 dBm), representing three realistic operational scenarios.[34/]

As more fully explained in the test report and the declaration from T-Mobile's chief engineer attached hereto, the AWS-3 test results demonstrate that there will be significant harmful interference if AWS-3 mobiles are permitted to operate under the proposed AWS-3 mobile power and OOBE limits. In particular:

- To protect adjacent AWS-1 mobile receivers, OOBE must be limited to -66 dBm/MHz or 96 + 10 log (P) dB.[35/]
- Mobile power, assuming the Commission's 60 + 10 log (P) dB OOBE limit remains in place, would need to be restricted to (1) -11 dBm/MHz (with no guard band between AWS-1 and AWS-3 operations) or (2) -4 dBm/MHz (with 15 MHz of guard band).[36/]
- With the OOBE limit for AWS-3 at 96 + 10 log (P) dB, mobile transmit power would be limited to (1) 2 dBm/MHz (with no guard band between AWS-1 and AWS-3 operations) or (2) 10 dBm/MHz (with 15 MHz of guard band).[37/]
- Further, T-Mobile tested AWS-1 mobiles assuming an AWS-3 interferer operated at the 2110 MHz band edge, because its AWS-1 devices contain filters designed to

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34/ T-Mobile Test Results at 21-24.

35/ T-Mobile Test Results at 20-22, 29; Ray Declaration ¶ 24.

36/ T-Mobile Test Results at 20-23, 29; Ray Declaration ¶ 23.

37/ T-Mobile Test Results at 23-24, 29; Ray Declaration ¶ 24.

reject transmissions below 2110 MHz. The tests demonstrate that "better" filters would have no practical effect on receiver overload (only a 1-2 dB improvement over the "unfiltered" 2155 MHz band edge was observed).[38/]

- At receive signal strengths of -100 dBm or less, a large exclusion zone would be created — where AWS-1 mobiles could not operate — around each AWS-3 device operating under the Commission's proposed AWS-3 service rules.[39/]

- Test results of a WiMAX interfering source indicate that the suggested OOBE and mobile power limits may need to be even more restrictive; WiMAX interference appears to be equal to or worse than a UTMS interfering source to AWS-1 adjacent band operations.[40/]

The results of the testing clearly demonstrate that the Commission's proposed OOBE and power limits for mobile transmit operations in the AWS-3 band would have widespread harmful interference effects throughout the AWS-1 network.

#### 4. Interference Would Result in Degradation of Coverage, Quality of Service, and Capacity.

The coverage and quality of UMTS (WCDMA) systems (the network deployed by T-Mobile in the AWS-1 band)[41/] are intrinsically linked to the capacity of the system: the more traffic (or in this case, the more interference from AWS-3 devices) carried within a cell, the smaller the coverage area and the smaller the capacity for the cell becomes. In UMTS systems, each transmitted signal increases the noise plus interference level ($N_o$) of the overall system. Because the traffic on a particular cell is constantly changing, depending on the behavior of subscribers and of proposed AWS-3 operations, the coverage range and network capacity would decrease as more AWS-3 noise interference is introduced. This phenomenon is due to the fact

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38/ T-Mobile Test Results at 23-26; Ray Declaration ¶ 22.

39/ T-Mobile Test Results at 20-21; Ray Declaration ¶ 11.

40/ T-Mobile Test Results at 26-28; Ray Declaration ¶ 23-24.

41/ UMTS stands for Universal Mobile Telecommunications System and is a third-generation (3G) broadband, packet-based transmission of text, digitized voice, video, and multimedia. UMTS offers a consistent set of services to mobile computer and phone users, and is by far the most widely deployed wireless broadband technology around the world.

that downlink radio capacity is fundamentally constrained by the interference levels in the network, because in WCDMA systems (the particular air interface used in UMTS networks), the base stations transmit simultaneously to many users sharing a common frequency channel, resulting in mutual interference.[42/]

Because AWS-3 interference, even from a single AWS-3 mobile unit within the cell, causes an AWS-1 mobile to require additional power to overcome this interfering source, coverage and quality degradation will ripple through the entire cellular coverage area. This hard degradation or blocking would disrupt reception of communications within the T-Mobile network.[43/] Contrary to claims that such interference effects would be manageable or minimal,[44/] the reality is that AWS-3 interference to AWS-1 operations would be widespread and essentially unmanageable within any area where AWS-1 and AWS-3 handsets are widely deployed.[45/]

M2Z argues that interference to any given AWS-1 mobile is "highly probabilistic," as if this means that no measures need be taken to prevent such interference.[46/] But the fact that interference may not occur all of the time for all users does not reduce the severity of the interference nor the debilitating impacts to customers when it does occur, as it surely will. As explained in the attached test report, T-Mobile's testing demonstrates that under common circumstances there would be significant exclusion zones around any AWS-3 mobile

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42/ *See, e.g.*, Downlink Capacity Estimation for UMTS Network: Impact of Users' Position, Service Bit Rates and Cell Radius at http://www.supcom.mincom.tn/mediatron/articles/icecs05SHPGSTab.pdf.

43/ T-Mobile AWS-3 Comments at 6.

44/ Letter from Uzoma Onyeije, M2Z Networks, to Marlene Dortch, Secretary, FCC, WT Docket Nos. 07-195, 04-356, 07-16 and 07-30, at 1 (filed June 17, 2008).

45/ Ray Declaration ¶ 19.

46/ M2Z Networks, Overview of Technical Issues Concerning the AWS-3 Service Rules, at 13 (July 1, 2008) (attached to 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)) ("M2Z Technical Overview").

transmitter.[47/] No AWS-1 provider would be able to attract or maintain customers with a network full of ever-shifting holes in which service is unavailable — many of which would occur in areas of heavy use such as airports, sporting events, train stations, and apartment complexes. M2Z's contention that this interference would be "highly probabilistic" is completely undermined by the actual, empirical evidence provided herein.

Similarly inapt is M2Z's observation that "unrelated events must occur simultaneously for there to be any chance of mobile-to-mobile interference."[48/] Just as vehicular traffic patterns are manifested (*e.g.*, daily congestion and traffic jam areas), wireless usage exhibits strong geographical and temporal traffic trends. Busy hours and traffic hot spots are most typically correlated and hence neither "unrelated" nor "independent." Thus, wireless users "operating close in space" is not an "unrelated event" to users "overlapping in time."[49/] Contrary to M2Z's unsupported speculation, mobile-to-mobile interference in hotspot areas, such as airports or train stations, where wireless usage would peak at busy hours, would not be "rare."

In any event, T-Mobile's testing data demonstrate that these events would be common. Large exclusion zones on the order of tens of meters would be prevalent throughout an AWS-1 licensee's operation area, creating a "Swiss" cheese effect on service. System-wide capacity would be degraded by even a single AWS-3 interference source within an AWS-1 cell sector, and each additional interferer would continue to degrade the capacity and performance of the AWS-1 network. As described in Mr. Ray's declaration, the AWS-3 TDD operations that would

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47/ T-Mobile Test Results at 21-22.

48/ M2Z Technical Overview at 14.

49/ *Cf. id.* at 13-14.

be allowed under the Commission's proposed rules would have extensive and pervasive harmful effects upon AWS-1 operations.[50/]

### 5. Mobile-to-Mobile Interference Is More Severe than Other Forms of Interference, Including Base-to-Base Interference, and Cannot Be Easily Mitigated.

M2Z, the leading proponent of mobile TDD operations in the AWS-3 band, claims that the interference between AWS-1 and AWS-3 operations will be mutual — that AWS-3 base stations would receive interference from AWS-1 base stations, and AWS-1 mobiles would receive interference from AWS-3 mobile operations.[51/] M2Z argues that if TDD transmissions are permitted in the AWS-3 band, AWS-3 licensees would have "more incentive to cooperate and work jointly to avoid interference because base-to-base interference . . . is static,"[52/] suggesting that base-to-base interference is more of a threat than mobile-to-mobile interference.

As a threshold matter, an FCC licensing scheme cannot rely on a licensee's "incentive." It must incorporate sound engineering practices. More significantly, M2Z's claim is contrary to engineering facts. The mobile-to-mobile interference under the Commission's proposed technical framework cannot be remedied. On the other hand, base-to-base interference is well-recognized and several well-established techniques exist that can correct or ameliorate the interference.

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50/ Ray Declaration ¶¶ 18-19.

51/ Letter from Uzoma Onyeije, M2Z Networks, to Marlene Dortch, Secretary, FCC, WT Docket Nos. 07-195, 04-356, 07-16 and 07-30, at 2 (filed June 17, 2008). T-Mobile has also refuted the "mitigation" methods proposed by M2Z for AWS-1 licensees to handle AWS-3 interference. *See* Ex Parte Communication of T-Mobile, WT Docket. No. 07-195 (filed July 18, 2008).

52/ Letter from Uzoma Onyeije, M2Z Networks, to Marlene Dortch, Secretary, FCC, WT Docket Nos. 07-195, 04-356, 07-16 and 07-30, at 2 (filed June 17, 2008).

Base-to-base interference, unlike the mobile-to-mobile interference faced by T-Mobile, has potential methods for mitigation. In particular, as even M2Z has recognized,[53/] base-to-base interference is a static interference case. Resolution of the interference is more achievable because tighter filtering can be applied to the base station than a handset, [54/] and collocation and directionality of antennas can be undertaken, since the AWS-1 base stations are not mobile but are located at a particular site.

In contrast, mobile-to-mobile interference is a systemic, recurring problem that cannot be remedied by geographic or spectral separation. AWS-1 license holders have no control over where their subscribers will utilize their mobile devices, nor do they have any ability to control where AWS-3 subscribers may use their mobile devices. As T-Mobile's test results demonstrate, there is a high likelihood, based on real-world measurements of typical signal strengths used by AWS-1 mobile devices in T-Mobile markets, that a significant portion of T-Mobile's customers will be adversely affected by AWS-3 operations if the Commission's proposed technical limitations are adopted.[55/]

No coordination or negotiation between AWS-1 and AWS-3 licensees will remedy this interference. As discussed in greater detail above, the interference effect of AWS-3 mobile operations, if permitted to have 23 dBm/MHz of peak EIRP and only limited to OOBE of 60 + 10 log (P) dB, will degrade system capacity, coverage, and service quality throughout the AWS-1 coverage area. T-Mobile's testing results show that while filtering would immaterially mitigate receiver overload interference, out-of-band emissions cannot be filtered out by AWS-1

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53/ *See* Letter from Uzoma Onyeije, M2Z Networks, to Marlene Dortch, Secretary, FCC, WT Docket Nos. 07-195 and 04-356, at 2-6 (filed June 17, 2008).

54/ Comments of Verizon Wireless, WT Docket No. 07-195, at 7-8 (filed Dec. 14, 2007).

55/ T-Mobile Test Results at 20-23, 29; Ray Declaration ¶¶ 18-19.

mobile receivers — indeed the power limits that would be necessary to protect AWS-1 receivers would have a preclusive effect on the viability of any mobile operations in the AWS-3 spectrum.[56/] For this reason, T-Mobile maintains that the AWS-3 band should be used as it has always been intended: for downlink-only operations.

Finally, while AWS-1 mobiles operating in the vicinity of AWS-3 mobile transmissions would be subject to an interference exclusion zone, the reverse scenario would not be true because AWS-1 mobiles transmit in a band far removed in frequency from the AWS-3 band. Thus, AWS-1 mobiles would suffer interference while AWS-3 mobiles would not.

### B. 700 MHz Comparisons Are Misplaced.

As T-Mobile's chief engineer previously has explained,[57/] claims by TDD proponents that the 700 MHz band rules allow for relaxed power and OOBE limits and should be used as the model for the AWS-3 band,[58/] are inaccurate. The 700 MHz band rules and requirements were adopted *prior* to the auction of the spectrum, allowing all parties to fully understand the technical requirements of the band plan, including the stringent out-of-band emission protections for public safety licensees in the upper 700 MHz band, the continuing interference effects from high powered TV Channel 51 operations adjacent to the lower 700 MHz A block spectrum, and the presence of potentially high powered uses in the lower 700 MHz D and E blocks. More importantly, the technical restrictions placed on the 700 MHz spectrum effectively dictated the outcome: the spectrum would be used for FDD, and not TDD, operations.

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56/ T-Mobile Test Results at 4-5, 23-26.

57/ *See* Declaration of Neville Ray, Ex Parte Communication of T-Mobile, WT Dkt. No. 07-195 ¶ 10 (filed June 5, 2008).

58/ *See, e.g.*, Letter from Uzoma Onyeije, M2Z Networks, to Marlene Dortch, Secretary, FCC, WT Docket Nos. 07-195 and 04-356, at 2-6 (filed June 17, 2008).

The 700 MHz auction results demonstrate that bidders were aware of, and fully weighed, the spectrum's technical limitations *a priori*. Bids for the lower 700 MHz A block, where the most significant interference concerns from the TV Channel 51 operations and the high powered D and E blocks existed, were significantly less than for the lower 700 MHz B block. Lower 700 MHz A block spectrum licenses were sold at an average valuation of $1.16/MHz-POP, while lower 700 MHz B block spectrum licenses raised an average valuation of $2.67/MHz-POP.[59/] Notably, the technical rules and build out requirements for these two spectrum blocks were exactly the same. The only difference was in the interference concerns raised by the adjacent TV Channel 51 operations and potentially high powered lower 700 MHz D and E block license operations.

The results of the 700 MHz auction demonstrate that when prospective bidders are aware of a potential limitation in their use of spectrum, they take that limitation into account in their bids — in that case applying a 57 percent discount to the lower 700 MHz A block licenses. In contrast, M2Z seeks a retroactive application of technical rules that would adversely affect AWS-1 licensees that bid and won their spectrum licenses with the expectation of exclusive, non-interfering use of their spectrum, after the FCC had explicitly acknowledged the interference that would be created if TDD operations were located in the AWS-1 *or adjacent* bands.[60/]

Further, the technical limitations placed by the Commission on the upper 700 MHz block for protection of public safety had a ripple effect throughout the band. First, the Commission required that the normal duplex direction for the upper 700 MHz public safety band be flipped. Mobile operations are required to be in the upper portion and base operations are required to be

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59/ *See* Public Notice, Federal Communications Commission, Auction of 700 MHz Band Licenses Closes, DA 08-595, at 1-2 (rel. March 20, 2008).

60/ *See* Sec. II.B., *infra.*

in the lower portion (the opposite of the usual configuration)[61/] with tightened out-of-band emission requirements of 65 + 10 log (P) dB.[62/] M2Z has attempted to argue that the public safety 65 + 10 log (P) dB in a 6.25 kHz bandwidth is equivalent to a 43 + 10 log (P) dB in a 1 MHz bandwidth.[63/] This argument is belied, however, by the FCC itself. In particular, when adopting this OOBE limit the Commission said: "As noted above, based on the record, we are persuaded that we should adopt *an OOBE limit higher than 43 + 10 log (P) dB* in order to provide adequate protection to public safety."[64/]

Once the duplexing direction and stringent OOBE requirements were mandated for the public safety spectrum, CMRS licensees were required, by general engineering principles, to match their operations with public safety. Similarly, the lower 700 MHz spectrum was required to maintain the normal duplexing direction — the upper portion reserved for base operations and the lower portion reserved for mobile operations — to match the pairing established by the upper 700 MHz band. This arrangement, despite M2Z's arguments, was clearly known and well understood. For example, standards efforts within 3GPP[65/] and 3GPP2[66/] illustrate that, well prior to the 700 MHz auction, the band would be used for FDD operations, with this method of duplex pairing.

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61/ *See* 47 C.F.R. § 90.531.

62/ *See* 47 C.F.R. § 27.53.

63/ *See* Letter from Uzoma Onyeije, M2Z Networks, to Marlene Dortch, Secretary, FCC, WT Docket Nos. 07-195, 04-356, 07-16 and 07-30, at 2-5 (filed June 17, 2008).

64/ *See Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules*, First Report and Order, 15 FCC Rcd. 476, 519 ¶ 105 (emphasis added).

65/ *See, e.g.*, 3GPP TR 25.822, UTMS 700 MHz Work Item Technical Report, *available at* http://www.3gpp.org/ftp/Specs/html-info/25822.htm. Each working document clearly assumes an FDD pairing consistent with T-Mobile's understanding of the 700 MHz band.

66/ *See, e.g.*, 3GPP2, Band Class Specification for cdma2000 Spread Sprectrum Systems Revision A, at 2-28 (Dec. 22, 2007), *available at* http://www.3gpp2.org/Public_html/specs/C.S0057-A_v1.0_060112.pdf.

The Commission, and the commercial entities commenting on the adoption of the 700 MHz band, would have had no interference concerns about possible TDD use in the upper and lower 700 MHz block because it was clear that such use would not be feasible based on standards efforts and the mandatory mobile/base duplexing direction for public safety systems. M2Z's assertions that the 700 MHz rules should be used as a model for the AWS-3 spectrum band therefore are unavailing — except to the extent that they support the Commission doing exactly what it did in the 700 MHz band and mandating duplex pairing in a fashion that will best protect incumbent AWS-1 license holders.

### C. Based on Overwhelming Evidence of Interference From Mobile Use of the AWS-3 Band, the FCC Should Designate the AWS-3 Band for Downlink-Only Operations.

T-Mobile's testing results confirm the prior technical submissions of Motorola and Verizon Wireless in this proceeding: as they all demonstrate, the AWS-3 spectrum is best designed for downlink-only operations.[67/] Every AWS-1 license holder who has provided comments to the Commission has argued forcefully that this is the most appropriate outcome for this spectrum,[68/] as has every equipment vendor that manufactures equipment in the AWS-1 band.[69/]

No TDD proponent has conducted any testing or submitted any empirical evidence that refutes T-Mobile's analyses and the preliminary test results. Nor has the Commission itself

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67/ T-Mobile Test Results at 4-5, 20-23.

68/ *See, e.g.*, 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).

69/ *See, e.g.*, Letter from Patricia Paoletta, Counsel to 3G Americas, to Marlene Dortch, Secretary, FCC, WT Docket No. 07-195, at 2-3 (filed June 25, 2008); Letter from Cecily Cohen, Nokia, to The Hon. Kevin Martin, Chairman, FCC, *et al.*, WT Docket No. 07-195, at 1-2 (filed June 5, 2005); Letter from Mark Racek, Ericsson Inc, and Lee Hill, Sony Ericsson Mobile Communications Inc., to The Hon. Kevin Martin, Chairman, FCC, *et al.*, WT Docket No. 07-195, at 1-2 (filed June 4, 2005); Comments of Motorola, WT Docket No. 07-195, at 3-8 (filed Dec. 14, 2007).

performed or observed any testing. The weight of the evidence is therefore clearly in favor of limiting AWS-3 spectrum to downlink-only operations. A downlink-only requirement for the AWS-3 spectrum will ensure that, as the Commission itself has recognized, similar services are placed in adjacent spectrum bands.[70/] This outcome would be consistent with international harmonization of the 2155-2180 MHz spectrum for downlink-only operations.[71/] Most importantly, approval of downlink-only operations for the AWS-3 spectrum would be the only method for the Commission to ensure that it is complying with the requirements of the Communications Act — to "prevent interference between stations."[72/]

A downlink-only requirement for the AWS-3 spectrum does not preclude new entrants from purchasing this spectrum, should the Commission adopt an FDD plan for the band. In particular, the Commission could allow for downlink-only operations in the 2155-2180 MHz band, paired with uplink-only operations in the 2020-2025 MHz band, which would allow for a new entrant. This asymmetric pairing, while nontraditional, is an outcome contemplated by standards bodies and matches well with the asymmetric nature of broadband data traffic.[73/] As the Commission is well aware, wired Internet services provided to the public are generally provided in an asymmetric fashion. For example, Comcast offers broadband packages with downlink speeds of 6 Mbps, and uplink speeds of only 1 Mbps.[74/] Other wired broadband providers have similar asymmetries in their downlink/uplink data speeds/capacities. As such, an

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70/ Federal Communications Commission Spectrum Policy Task Force, Report of the Interference Protection Working Group, at 20-24 (Nov. 15, 2002).

71/ Letter from Patricia Paoletta, Counsel to 3G Americas, to Marlene Dortch, Secretary, FCC, WT Docket No. 07-195, at 2-3 (filed June 25, 2008).

72/ *See* 47 U.S.C. § 303(f).

73/ *See, e.g.*, 3GPP TS 25.101 v.7.5.0.

74/ *See* Press Release, Comcast Corporation, Comcast Increases Upstream Speeds for Its High-Speed Internet Customers for No Additional Charges (June 12, 2008), *available at* http://biz.yahoo.com/bw/080612/20080612005162.html?.v=1.

asymmetric FDD pairing of the 2155-2180 MHz band with the 2020-2025 MHz band for wireless broadband data services would be a viable option for a new entrant in the AWS-3 spectrum.

Additionally, AWS-1 and even PCS license holders could add the 2155-2180 MHz spectrum in an asymmetric fashion to greatly increase downlink transmission speeds. As T-Mobile has initiated its AWS-1 broadband rollout, it has become increasingly clear that downlink capacity requirements are much more significant than are uplink requirements for wireless broadband services. Should the Commission allow for AWS-3 spectrum to be licensed in this asymmetric fashion, unfettered by unnecessary and harmful social regulations and restrictions, T-Mobile, as the largest holder of AWS-1 spectrum and the national wireless carrier with the thinnest overall spectrum position, would seriously consider bidding for these additional frequencies.

## II. THE PROPOSED TECHNICAL RULES ARE CONTRARY TO WELL-ESTABLISHED COMMISSION POLICIES REGARDING INTERFERENCE PROTECTION AND THE COMMISSION'S SPECIFIC REJECTION OF TDD OPERATIONS WHEN THERE IS A THREAT OF INTERFERENCE

In light of the specter of harmful interference to AWS-1 operations, the Commission must, at a minimum, adhere to its long-standing practice of undertaking careful engineering analyses and developing appropriate service rules to address the identified interference threat. Even M2Z admits that "the whole point of the FCC rules" is to address and prevent harmful interference.[75/]

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75/ 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.").

The FCC's failure to develop sufficient interference protections fatally undermines the lawfulness of its proposed rules. Moreover, the Commission has specifically acknowledged the likelihood of harmful interference to FDD operations from TDD transmissions and ruled that TDD proponents must "conclusively demonstrate" that such interference will not occur. Neither TDD proponents nor the FCC itself has met this burden.

### A. The Commission Does Not Require Licensees To "Work Out" Interference Issues, But Rather Establishes Technical Rules for Subsequently-Authorized Services That Protect Existing Licensees.

M2Z has suggested that adjacent band interference issues between AWS-3 and AWS-1 band licensees can simply be dealt with by the licensees "during deployment" as "often" occurs with Commission licensees.[76/] There is no support for this claim. The Commission does not "often" put off addressing interference issues by directing adjacent band licensees to "work out" those issues during deployment, especially when the adjacent band licensees have already deployed under preexisting technical rules. Rather, Commission precedent shows that when the agency adopts rules for a new service allocation, as it will here, it takes steps to protect existing adjacent band licensees from harmful interference.

The Commission should do the same in this proceeding and protect AWS-1 licensees from interference originating in the AWS-3 band by limiting the use of that band to downlink-only operations. Failure to do so will jeopardize the progress that T-Mobile, an actual new entrant into the wireless broadband market, is making on deploying its 3G broadband network and service at a cost of billions of dollars of investment in spectrum and infrastructure. The concrete competitive benefits that will accrue to the public as a result should not be sacrificed in

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[76/] Letter from Uzoma Onyeije, M2Z Networks, to Marlene Dortch, Secretary, FCC, WT Docket Nos. 07-195, 04-356, 07-16 and 07-30, at 1 (filed June 5, 2008).

favor of the speculative prospect of a new entrant in the AWS-3 band who has not yet invested a dime in any network assets and is, at best, years away from serving any customers.

### 1. The Commission Consistently Uses Service Rules To Prevent Adjacent Band Interference.

As recent examples demonstrate, the FCC has consistently sought to ensure that existing licensees are protected from harmful interference when new service rules are adopted. In authorizing Mobile Satellite Service ("MSS") licensees to provide an ancillary terrestrial component ("ATC"), for instance, the FCC adopted specific emission limits on MSS ATC operations to prevent interference to Personal Communications Service ("PCS") operations in the adjacent 1930-1990 MHz band.[77/] More recently, to protect Broadband Radio Service ("BRS") licensees from interference by the use of the adjacent MSS band for ATC, the FCC required the MSS licensee, Globalstar, to "adhere to the out-of-band emission standards applicable to BRS/EBS licensees, measured from the upper edge of Globalstar's ATC authorization at 2495 MHz."[78/] Globalstar also voluntarily agreed to abide by the "stricter" BRS/EBS out-of-band emission standards in order to protect the BRS operations in the adjacent band.

Similarly, when the FCC redesignated the 1910-1915 MHz band from Unlicensed Personal Communications Service ("UPCS") to licensed Fixed and Mobile Services and assigned the spectrum to Nextel as replacement spectrum for the spectrum that Nextel was abandoning in the 800 MHz band, it required Nextel to conform to the same technical standards

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77/ *Flexibility for Delivery of Communications by Mobile Satellite Service Providers in the 2 GHz Band, the L-Band, and the 1.6/2.4 GHz Bands*, Report and Order, 18 FCC Rcd. 1962, 2025-26 ¶ 119 (2003).

78/ *Globalstar Licensee LLC, Authority to Implement an Ancillary Terrestrial Component, IB Docket No. 07-253*, Report and Order and Order Proposing Modification, FCC 08-98, ¶¶ 31, 32, 34 (rel. April 10, 2008).

applicable to licensed PCS systems in order to minimize interference to the adjacent broadband PCS operations in the 1850-1910 MHz band.[79/]

The service rules for bands that were transferred from the Federal government to private use in 2002 also included specific interference rules — emission mask requirements — designed to protect adjacent band services.[80/] For the 1670-1675 MHz band, the FCC determined that a balanced approach was appropriate and adopted the "standard 43 + 10 log (P) dB limit on out-of-band emissions" to protect adjacent services.[81/] Noting that the 1392-1395 MHz band is adjacent to the Wireless Medical Telemetry Service ("WMTS") band at 1395-1400 MHz, the FCC specifically limited emissions into that band at the site of any WMTS operations.[82/] For other locations, the FCC imposed the same OOBE limits it imposed on the 1670-1675 MHz band.[83/] Finally, for the 2385-2390 MHz band, the FCC adopted emission limits (43 + 10 log (P) dB) to protect the adjacent Satellite Digital Audio Radio Service ("SDARS") from harmful interference.[84/] In each case, the protections established ensured that the new operations would not interfere with existing uses. Standard interference measures are appropriate where there are no particularized interference concerns. Where such particularized interference concerns exist, however, like the TDD-FDD adjacent band issues in this proceeding, the Commission has

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79/ *Improving Public Safety Communications in the 800 MHz Band*, Report and Order, 19 FCC Rcd. 14969, 15086-89 ¶¶ 225, 230 (2004).

80/ *Amendments to Parts 1, 2, 27 and 90 of the Commission's Rules to License Services in the 216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz Government Transfer Bands*, Report and Order, 17 FCC Rcd. 9980, 10029-32 ¶¶ 118-130 (2002).

81/ *Id.* at 10030 ¶ 123.

82/ *Id.* at 10031 ¶ 126.

83/ *Id.* ¶ 127.

84/ *Id.* at 10032 ¶ 129.

consistently looked beyond standard interference measures and adopted more specific mitigation mechanisms designed to protect the affected services.[85/]

### 2. "Mutual" Resolution of Interference Concerns Is Only Appropriate when Licensees Share Frequencies.

It is only when licensees share a band — a situation not applicable to AWS-1 and AWS-3 licensees — that resolution of mutual interference concerns during deployment is appropriate. Even then, the processes the FCC has mandated be used to resolve interference are designed to ensure that *existing* licensees are protected from harmful interference. For example, the FCC recognized the potential for 17/24 GHz Broadcasting-Satellite Service feeder link earth stations to interfere with existing and future 24 GHz frequency operations, but instead of implementing additional performance and power limits, it chose to require the co-primary, frequency-sharing parties to coordinate the inter-service interference issues.[86/] Similarly, in the wireless broadband service in the 3650-3700 MHz band, the FCC required terrestrial service operations to coordinate with grandfathered Fixed Satellite Service ("FSS") operations in certain geographic

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[85/] The rationale for adopting appropriate interference protections in the service rules is a practical one, as a negative example demonstrates. In the satellite radio context, pending the adoption of service rules for terrestrial repeaters, the Commission granted Special Temporary Authorization to Sirius Satellite Radio Inc. and XM Radio Inc. to operate terrestrial repeaters in several markets without adopting formal interference protection measures for the adjacent bands. *See, e.g., XM Radio, Inc. Application for Special Temporary Authority to Operate Satellite Digital Audio Radio Service Complementary Terrestrial Repeaters*, Order and Authorization, 16 FCC Rcd. 16781 (2001). The service rules remain pending today. Because of the resulting "uncertainty regarding the rules . . . and the degree to which WCS operations will be protected from harmful interference," the Wireless Communications Service ("WCS") band has gone unused for over a decade. *See Consolidated Request of the WCS Coalition for Limited Waiver of Construction Deadline for 132 WCS Licenses*, Order, 21 FCC Rcd. 14134, 14137 ¶ 5 (2006). The FCC was forced to extend the original ten-year construction requirement for WCS as a result. *Id.* at 14139 ¶ 9.

[86/] *See Establishment of Policies and Service Rules for the Broadcasting-Satellite Service at the 17.3-17.7 GHz Frequency Band*, Report and Order and Further Notice of Proposed Rulemaking, 22 FCC Rcd. 8842, 8890-92 ¶¶ 117, 121 (2007).

"coordination zones." The FCC required the coordination in order to ensure that the existing FSS operations were protected from interference from the new terrestrial service operations.[87/]

### B. The FCC Has Specifically Held That It Will Not Authorize TDD Operations Without a "Conclusive Demonstration" That They Will Not Cause Interference.

Consistent with its long-established practice of adopting rules designed to protect existing licensees, the Commission has specifically recognized the interference threat posed by TDD operations to FDD operations and held that it will not authorize TDD operations unless proponents can "conclusively demonstrate" that the threat of harmful interference has been properly addressed.[88/] No such demonstration has been forthcoming.

The Commission carefully catalogued the harms from TDD. For instance, the Commission found that "mixing base and mobile transmissions" in the band "would either directly result in interference or could require the implementation of costly measures to *prevent* interference."[89/] It also concluded that TDD operations would "likely [require] tighter out-of-band emission (OOBE) limits and lower power levels, and possibly even require guard bands and interference zones."[90/] Finally, the Commission noted that even TDD proponents like the TDD Coalition acknowledged an ITU finding that "the co-existence of TDD and FDD systems on *adjacent bands* in the same geographic area would cause interference to the stations of both systems. . . ."[91/] Based on these concerns, the Commission rejected TDD:

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87/ *Amendment of the Commission's Rules With Regard to the 3650-3700 MHz Government Transfer Band*, First Report and Order and Second Notice of Proposed Rulemaking, 15 FCC Rcd. 20488, 20500 ¶ 26 (2000).

88/ *AWS-1 Service Rules Order*, 18 FCC Rcd. at 25179 ¶ 46.

89/ *Id.* at 25203-04 ¶ 109 (emphasis in original).

90/ *Id.*

91/ *Id.* at 25203 ¶ 107 (emphasis added).

> Stricter OOBE limits would require licensees to employ more expensive transmitting equipment; implementing interference zones would result in a *loss of coverage within a licensee's authorized area of operation*; and *guard bands would result in a waste of usable spectrum*. The additional costs associated with equipment that provides stricter emission limits is certainly not a requirement we would want to impose on future licensees operating in the AWS bands. And *we do not believe that the potential loss of spectrum and coverage area that would result from the use of guard bands and interference zones are conditions we should necessarily accept* in our efforts to manage the spectrum and provide wireless service to the public.[92/]

This technical finding was not limited to the AWS-1 band itself, but extended to adjacent bands. And it was not limited to any one class of user. For Government users, the Commission found that allowing both base and mobile transmissions in the lower AWS paired bands could result in interference to systems that "currently operate below, within, and above that band."[93/] For adjacent band non-Government users, the mixing of base and mobile transmissions "would either directly result in interference or could require the implementation of costly measures to *prevent* interference."[94/]

But the Commission did more than just acknowledge the serious TDD interference threat to FDD operations in adjacent bands in the *AWS-1 Service Rules Order*; it refused to permit TDD operations due to the "technical constraints" posed by harmful interference and established a standard to determine when TDD operations would be permitted adjacent to FDD operations. Indeed, it held that TDD proponents must "conclusively demonstrate" that there would not be interference risks before it would permit TDD operations adjacent to FDD operations:

> While we remain committed to allowing new and innovative technologies to develop in this spectrum, *there are certain technical constraints that do not allow us at this time to include unpaired spectrum in our band plan for this spectrum that might be suitable for TDD*. We note that *if proponents of TDD can conclusively demonstrate* that portions of

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92/ *Id.* (emphasis added).

93/ *Id.* at 25203-04 ¶ 109.

94/ *Id.*

> this spectrum could be used for such transmissions without causing interference to Federal Government users or other licensees, we could revisit this issue at a future date.[95/]

In other words, the Commission recognized that allowing TDD operations alongside other AWS operations would be problematic and that it therefore would not permit such operations. While the Commission indicated that it would "make every effort to provide spectrum opportunities for TDD systems in future allocation and spectrum proceedings," including future AWS proceedings,[96/] it in no way suggested that it would permit harmful interference in future allocations. The risk of harmful interference simply is not something the Commission ignores in making public interest determinations.[97/]

### C. Neither the FCC Nor TDD Proponents Have Provided the Required Conclusive Demonstration that TDD Operations Will Not Cause Harmful Interference.

Neither the Commission nor TDD proponents have provided any plausible showing that TDD operations will not cause harmful interference into the adjacent AWS-1 band, far less the "conclusive demonstration" required in the *AWS-1 Service Rules Order*. By contrast, T-Mobile's laboratory tests confirm the widely-accepted view that TDD will impose harmful interference on the AWS-1 band.

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95/ *Id.* at 25179 ¶ 46 (emphasis added).

96/ *Id.*

97/ M2Z suggested that, despite the harmful interference concerns raised by the FCC in the *AWS-1 Service Rules Order*, the burden should be on TDD opponents under section 7 of the Communications Act. Letter from Uzoma Onyeije, M2Z Networks, to Matthew Berry, General Counsel, FCC, WT Docket Nos. 07-195 and 04-356, at 1 (filed June 20, 2008) (citing 47 U.S.C. § 157). But M2Z enjoys no presumption under that provision, given the Commission's prior rejection of its section 7 claims, *see AWS-3 Applications Order*, 22 FCC Rcd. at 16570-74 ¶¶ 12-18, the Commission's determination that TDD proponents have the burden of demonstrating the absence of harmful interference, and the unrebutted empirical evidence that such interference would occur.

TDD proponents, by their own admission, have not conducted any empirical testing to support their unfounded technical assertions.[98/] The technical analysis accompanying M2Z's comments describe the potential interference between a TDD system operating in a band adjacent to an FDD downlink channel as "potentially crippling."[99/] The only other engineering analysis submitted by TDD proponents was not based on any empirical testing, was "limited to a few representative cases," and was merely a "preliminary analysis."[100/] And, even then, the analysis admitted that "[a]dditional cases may be explored to develop a more complete characterization of the possible scenarios and system parameter exclusions."[101/] This is hardly the conclusive demonstration that the FCC said it would require before TDD operations in the AWS-3 band would be permitted.

Likewise, the Commission has not conducted its own testing or analysis of the interference to AWS-1 mobiles from TDD operations in the AWS-1 band, or even set forth a framework for analyzing these issues. Indeed, the Commission has offered no explanation or technical support for reversing its prior conclusion that "technical constraints" regarding adjacent band interference would not permit the use of TDD in the AWS band.[102/] While the Commission is under no legal obligation to undertake its own testing, its decision not to do so here — where a proven potential interference risk exists — stands in dramatic contrast to the "white spaces" proceeding, where the Commission has deferred action on proposed technical rules until it

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98/ Letter from Uzoma Onyeije, M2Z Networks, to Marlene H. Dortch, Secretary, FCC, WT Docket Nos. 07-195, 04-356, 07-16 and 07-30, at 2 (filed June 6, 2008) (admitting that M2Z has not tested any AWS-3 equipment).

99/ Comments of M2Z Networks, Inc., WT Docket No. 07-195, Appendix B (WiMAX Forum White Paper of April 10, 2007, at 21-22) (filed Dec. 14, 2007).

100/ Alion Science and Technology, AWS-3 to AWS-1 Mobile-to-Mobile Interference Effects, at 3 (May 30, 2008) (performed under Alion's contract with M2Z for engineering support services).

101/ *Id.*

102/ *AWS-1 Service Rules Order*, 18 FCC Rcd. at 25178 ¶ 46, 25203 ¶ 107.

completes interference testing of prototype devices to determine their impact on television broadcast licensees. That testing has been extensive, having begun nearly two years ago,[103/] and is still underway.[104/] The Commission has provided no explanation of its refusal to engage in testing in the instant proceeding while it does so in the "white spaces" docket, nor is there any reasonable explanation for this fundamental discrepancy.

### D. The FCC Provided No Notice That It Might Permit Disruptive TDD Operations in the AWS-3 Band Without the Required Conclusive Demonstration.

The FCC's proposal is fundamentally unfair to AWS-1 auction winners because it changes the rules of the road, imposing substantial unforeseen costs without any timely notice. M2Z has suggested that the FCC has long contemplated TDD operations in the AWS-3 band,[105/] but the statements it cites prove exactly the opposite. For instance, neither the *AWS-1 Allocation NPRM* nor the *AWS-1 Service Rules Order* provides any notice of the prospect of TDD operations. TDD use was only one of a "number of proposals" suggested in the former,[106/] and *mobile* TDD was never even discussed there. In any event, a suggestion that TDD operations might someday be authorized cannot be read to mean that necessary power and OOBE limits would not also be adopted at that time or that TDD would be permitted even if interference to

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103/ *See Unlicensed Operation in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band*, First Report and Order and Further Notice of Proposed Rulemaking, 21 FCC Rcd. 12266, 12290 ¶ 63 (2006).

104/ *See, e.g.*, Public Notice, Federal Communications Commission, FCC's Office of Engineering and Technology Announces the Initiation of Field Testing for Prototype TV White Spaces, DA 08-1635 (rel. July 10, 2008).

105/ *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) ("Attachment to M2Z June 5th Letter") (attaching chart listing decisions that purportedly demonstrate such notice).

106/ *See Amendment of Part 2 of the Commission's Rules to Allocate Spectrum Below 3 GHz for Mobile and Fixed Services to Support the Introduction of New Advanced Wireless Services, including Third Generation Wireless Systems*, Third Notice of Proposed Rulemaking, 18 FCC Rcd. 2223, 2255 ¶¶ 68-69 (2003).

neighbors could not be effectively resolved by such limits. And in the *AWS-1 Service Rules Order*, as discussed above, the Commission *rejected* a proposal for TDD operations and put the burden squarely on TDD proponents to demonstrate that such operations would not create harmful interference to AWS-1 licensees.[107]

Nor was the AWS-1 band plan designed so that licensees in the AWS-1 outer bands (those band segments nearest to services in other adjacent bands) "would have the ability to deal with adjacent band interference on an internalized basis, as M2Z suggests."[108/] Such an interpretation of the FCC's *AWS-1 Service Rules Order* is far-fetched. As with other allocations, the FCC's technical rules for the AWS-1 band were designed to protect existing *incumbent* adjacent band licensees. The cited sentence reflects the FCC's intent to position the larger spectrum blocks nearest to adjacent channel licensees so that AWS-1 licensees in those larger blocks would have the flexibility to provide that protection. The FCC did not provide that flexibility so that AWS-1 licensees could respond to interference caused to them by *future* AWS-3 band operations.[109/]

Nor did the standard wording in the *AWS-1 Auction Order* warning bidders to conduct due diligence before placing their bids constitute fair or adequate "notice" of possible interfering TDD operations. In fact, pre-auction due diligence would have revealed that the *AWS-1 Service Rules Order* recognized the harm to AWS-1 licensees posed by TDD interference and that the Commission's long-standing practice is to ensure that newly authorized operations do not cause harmful interference to existing operations. Taken together, these factors demonstrate that the

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107/ *AWS-1 Service Rules Orde*r, 18 FCC Rcd. at 25179 ¶ 46.

108/ *See* Attachment to M2Z June 5th Letter.

109/ *AWS-1 Service Rules Orde*r, 18 FCC Rcd. at 25176 ¶ 43. The citation provided by M2Z references the Verizon Wireless comments. The Verizon Wireless comments, however, deal with how to best protect existing licensees, not potential creation of interference from future licensees. Verizon Wireless Comments, WT Docket No. 02-353, at 5-6 (filed Feb. 7, 2003).

Commission would *not* contemplate the plan the Commission now proposes.

The FCC's post-auction adoption of new rules governing radiated power for AWS-1 base stations does not presage TDD operations in the AWS-3 band, contrary to the suggestions of TDD proponents. Nothing in the *2008 Streamlining Order* indicates that the FCC adopted new radiated power rules to inoculate AWS-1 licensees from interference created by future adjacent-band TDD operations.[110/] To the contrary, the *2008 Streamlining Order* was merely intended to harmonize the method by which the FCC measures transmitter power in the AWS and PCS with other wireless services.[111/] No party to the *2008 Streamlining Order* — including TDD proponents — contemporaneously asserted that the new radiated power measurement rules would have any effect on future AWS-3 operations, nor would there have been any grounds for such an assertion. While the Commission did adopt adjacent block coordination requirements as part of the *2008 Streamlining Order*, it applied them only to instances where rural AWS licensees seek to use power levels higher than those permitted in non-rural areas. That change is consistent with the Commission's practice of adopting rules designed to protect existing licensees and was not a warning that licensees would be required to adapt to future interfering sources.

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110/ *See Biennial Regulatory Review - Amendment of Parts 1, 22, 24, 27 and 90 to Streamline and Harmonize Various Rules Affecting Wireless Radio Services*, Third Report and Order, 23 FCC Rcd. 5319, 5331 ¶ 25 (2008) ("*2008 Streamlining Order*").

111/ While the new rules may have the effect of "allow[ing] AWS-1 licensees to operate at higher power at their base stations," in M2Z's words, that is only because the increased power — consistent with how the FCC measures radiated power in other services — may now be spread over a wider bandwidth; the EIRP in any 1 megahertz bandwidth remains the same. M2Z's suggestion that the *2008 Streamlining Order* increased AWS-1 base station EIRP is incorrect.

Finally, while it is true that the *AWS-3 NPRM* sought comment on whether TDD operations should be permitted in the AWS-3 band,[112/] the *AWS-3 NPRM* contains no suggestion that the Commission was contemplating reversing its prior policy that TDD would only be accommodated if proponents conclusively demonstrated that its operations would not cause harmful interference. To the contrary, the *AWS-3 NPRM* assumed that any service rules would have as their first principle the protection of AWS-1 licensees from harmful interference.[113/] Any such attempt at notice would have been ineffectual, in any event, since the *AWS-3 NPRM* was released well after the AWS-1 auction and therefore would not have been available to even the most diligent potential bidders in that auction.

### E. The Proposed Service Rules Would Be Impermissibly Retroactive.

Rather than a logical extension of past Commission decisions, the proposed service rules are an unexpected reversal that would negatively affect the investments made by T-Mobile and others in reliance on the regulatory framework established by the Commission. Such secondary retroactivity rules[114/] are only permitted if they are "reasonable both in substance *and in being made retroactive*."[115/]

Secondary retroactivity analysis weighs the costs and benefits of the proposed rule both to licensees and the Commission,[116/] and is valid if the agency can demonstrate that its solution

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112/ *Service Rules for Advanced Wireless Systems in the 2155-2175 MHz Band*, WT Docket No. 07-195, Order, DA 08-1614 ¶ 4 (rel. July 8, 2008).

113/ *AWS-3 NPRM*, 22 FCC Rcd. at 17045 ¶ 16 ("adjacent band operations should be protected regardless of the type of application a licensee decides to deploy").

114/ Secondary retroactivity occurs "if an agency's rule affects a regulated entity's investment made in reliance on the regulatory status quo before the rule's promulgation." *Mobile Relay Associates v. FCC*, 457 F.3d 1, 11 (D.C. Cir. 2006).

115/ *Celtronix Telemetry, Inc. v. FCC*, 272 F.3d 585, 589 (D.C. Cir. 2001) (emphasis in original) (quotation omitted).

116/ *See id.* at 590.

"reasonably advances at least one [of its statutory] objectives and that its decisionmaking process was regular."[117/] As discussed elsewhere, many of the statutory objectives articulated in section 309(j) of the Communications Act are not advanced, and actually harmed, by the current proposal.

Even despite a reasoned justification, a rule that is secondarily retroactive might still be arbitrary and capricious if it is "sufficiently unfair."[118/] "[A]n agency cannot, in fairness, radically change the terms of an auction after the fact."[119/] The proposed change here would be manifestly unfair. As described above, the Commission's prior orders did not give AWS-1 bidders any notice of the possibility that the Commission would subsequently allow the use of TDD in adjacent spectrum, thereby rendering much of the AWS-1 licensees' spectrum useless.

Moreover, the AWS-1 auction created a binding contract between the Commission and the winning auction bidders, with the terms set out in the public notices and orders issued by the Commission prior to the auction,[120/] and the Commission's adoption of the proposed rules would be a breach of that contract. As discussed above, the Commission's pronouncements and precedent made clear that AWS-1 licensees would not be forced to give up use of their spectrum or have the value of their spectrum grossly devalued due to interference from TDD in adjacent bands. Breaching its auction contract with AWS licensees who paid *billions* of dollars for the use of the affected AWS-1 spectrum is certainly "sufficiently unfair" that it qualifies as arbitrary

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117/ *U.S. AirWaves, Inc. v. FCC*, 232 F.3d 227, 234 (D.C. Cir. 2000).

118/ *Id.* at 235.

119/ *Id.*

120/ *See, e.g., Amendment of the Commission's Rules Regarding Installment Payment Financing for Personal Communications Services (PCS) Licensees*, Second Order on Reconsideration of the Second Report and Order, 14 FCC Rcd. 6571, 6581 ¶ 17 n.66 (1999); *BDPCS, Inc.*, Memorandum Opinion and Order, 15 FCC Rcd 17590, 17599-600 ¶ 16 & n.63 (2000).

and capricious. Moreover, such action could expose the Commission and the United States to litigation in the Court of Federal Claims.[121/]

### F. Because the Record in this Proceeding Unequivocally Shows that TDD Will Produce Significant Harmful Interference to AWS-1 Licensees, a Commission Finding to the Contrary Would Not Be Supported by Substantial Evidence.

An agency's actions are arbitrary and capricious if they are not supported by substantial evidence.[122/] There is no evidence in the record, let alone substantial evidence, to support the conclusion that allowing TDD in the AWS-3 band would not cause harmful interference to AWS-1 licensees. To the contrary, the record shows just the opposite.

The Commission itself has not conducted any internal tests, and thus far has not given any indication that it plans to conduct any future testing. Along with its comments in the *AWS-3 NPRM*, M2Z submitted a white paper from the WiMAX Forum to support its contention that using TDD in the AWS-3 band will not cause interference with AWS-1 operations. But even that white paper, prepared by an organization whose mission is to "promote" the use of WiMAX, a TDD technology,[123/] describes the interference between a TDD system operating in a band adjacent to an FDD downlink channel as "potentially crippling."[124/] As the white paper acknowledges, even costly solutions such as requiring the use of higher performance analog transmit/receive filters "can only achieve so much when considering systems operating very close together in frequency because the filters still have to pass the wanted signals without

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121/ *See, e.g.*, *Cellco Partnership d/b/a Verizon Wireless v. United States*, No. 02-280C (Ct. Cl.).

122/ *See, e.g.*, *Assn of Data Processing Serv. Orgs., Inc. v. Bd. of Governors of Fed. Reserve Sys.*, 745 F.2d 677, 683-84 (D.C. Cir. 1984).

123/ *See* WiMAX Forum Overview, *available at* http://www.wimaxforum.org/about/ (last visited July 7, 2008).

124/ *See* Comments of M2Z Networks, Inc., WT Docket No. 07-195, Appendix B (WiMax Forum White Paper of April 10, 2007, at 21) (filed Dec. 14, 2007).

significant distortion or attenuation."[125/] At the same time, T-Mobile has now submitted extensive evidence showing that the interference concerns are real, substantial, and likely.

The Supreme Court has directed that "[t]he substantiality of evidence must take into account whatever in the record fairly detracts from its weight."[126/] Here, the evidence overwhelmingly detracts from any finding that the Commission's proposal is viable or reasonable. In fact, the only evidence the Commission has to the contrary is theoretical, and as the D.C. Circuit recently reminded the Commission, it cannot simply ignore contrary empirical evidence while supporting its own conclusions using mere theoretical modeling data.[127/]

Finally, the Commission has a heightened obligation to consider contrary evidence in circumstances such as these, where the implications of its actions are to (1) inject uncertainty into the Commission's licensing regime and muddy the waters for any future auctions; (2) diminish the value of spectrum for which huge sums have been paid; and (3) impact the public interest by harming a licensee's ability to serve the public. As noted above, T-Mobile has submitted empirical evidence establishing that harmful interference will occur. The agency has no empirical evidence before it suggesting that AWS-1 licensees will not suffer harmful interference under the rules currently being contemplated. The Commission therefore cannot proceed to adopt rules that permit the use of TDD operations in the manner proposed.

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125/ *Id.* at 22.

126/ *Universal Camera Corp. v. NLRB*, 340 U.S. 474, 488 (1951).

127/ *See Amer. Radio Relay League v. FCC*, 524 F.3d 227, 240-41 (D.C. Cir. 2008).

## III. THE REQUIREMENT TO PROVIDE "FREE" BROADBAND SERVICE EXCEEDS THE COMMISSION'S AUTHORITY AND IS ECONOMICALLY AND TECHNOLOGICALLY UNSOUND

### A. With Multiple Wireless Broadband Service Providers Offering Service or Building Networks, a Free Service Requirement Is Unnecessary.

As detailed below, the proposed requirement to provide so-called free broadband service is economically and technologically unsound, as the history of failed efforts to provide free Internet access service demonstrates; would unlawfully encumber the AWS-3 license; and would violate the auction statute by precluding the AWS-3 spectrum from being used most efficiently. Perhaps most important, however, there is simply no need for such a requirement in view of the multiple competitors and multitude of rate plans already available in the marketplace that are working to bring prices down and make broadband more accessible for all Americans.

Wireless service providers have invested billions of dollars to deploy and upgrade broadband service. CTIA reports that in the last three years alone, wireless carriers have devoted over $70 billion to these efforts, not including spectrum acquisition costs such as auctions or secondary market transactions.[128/] These investments have paid off: nearly 100% of the total U.S. population can receive service from one or more mobile wireless service providers and 92% of the U.S. population can receive 3G wireless service.[129/]

T-Mobile is a perfect example of how the market is working to bring consumers innovative new service options. After paying nearly $4.2 billion for its AWS-1 licenses in 2006 (including around $1.4 billion for those in the F Block and $1.14 billion for those in the E Block), T-Mobile has thus far invested approximately $2 billion more to build out its network in 2008 alone. It has launched UMTS service in New York City, and plans to complete

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128/ Letter from Christopher Guttman-McCabe, CTIA - The Wireless Association, to Marlene Dortch, Secretary, FCC, WT Docket No. 07-195, at 2-3 (filed June 5, 2008) ("CTIA June 5 ex parte").

129/ *See id.*

deployment in 25 additional markets by the end of this year. T-Mobile's UMTS 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. T-Mobile has already placed approximately one million UMTS-ready handsets either in customer hands or the supply chain, and other handsets, including an Android Open Handset Alliance device, are well into the development phase. As an innovator and value-leader in the wireless industry, T-Mobile is using these exciting innovations in its AWS-1 wireless broadband service to enhance the competitiveness of the wireless marketplace 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 RBOC-affiliated competitors also are all rolling out broadband wireless services. AT&T, as part of the merger commitments related to its acquisition of BellSouth, also plans to "offer mobile or fixed wireless broadband service to 25 percent of the population covered by its WCS licenses . . . by July 21, 2010."[130/] In addition, AT&T recently announced that it will extend its 3G network, which offers download speeds of up to 1.4 Mbps, to nearly 350 metropolitan areas by year end.[131/] Verizon Wireless similarly states that its growing high-speed wireless network covers more than 245 million people in 254 major metropolitan areas and 233 primary airports in the United States, with downloads having typical speeds of 600 Kbps to 1.4 Mbps and uploads with typical speeds of 500-800 Kbps.[132/]

In addition to the substantial investments in 3G by T-Mobile and other licensees, the

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130/ *Twelfth CMRS Competition Report* ¶ 150.

131/ News Release, AT&T, AT&T to Offer Next-Generation iPhone on Its High-Performance 3G Network (June 9, 2008), *available at* http://www.att.com/gen/press-room?pid=4800&cdvn=news&newsarticleid=25791.

132/ Verizon Wireless, Broadband Access Coverage & Speeds, *available at* http://b2b.vzw.com/broadband/coveragearea.html.

Commission has found that wireless carriers generally have "greatly expanded and upgraded their broadband networks to allow subscribers access to the Internet."[133/] In its most recent *CMRS Competition Report*, the Commission recognized the deployment of Clearwire Corporation's ("Clearwire's") portable wireless high-speed Internet access and VoIP services to consumers over the 2.5 GHz BRS/EBS spectrum band, and noted that "[a]s of June 2007, the company had launched broadband service in 39 markets, mainly smaller towns and cities, covering approximately 10 million people in portions of 13 U.S. states."[134/] In its first quarter 2008 earnings announcement, Clearwire stated that those numbers had increased, reporting that it had "markets covering more than 36 million people in various stages of design, development and construction" and that it experienced a net subscriber growth of 72% over the same quarter the previous year.[135/] In addition, Clearwire and Sprint have announced a plan to combine their next generation wireless broadband businesses to form a new company focused on expediting the deployment of the first nationwide mobile WiMAX network.[136/] The new company's network is anticipated to reach up to 140 million people in the United States within 30 months, and will

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133/ *Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996*, Fifth Report, FCC 08-88 ¶ 19 (rel. June 12, 2008) ("*Fifth 706 Report*").

134/ *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993 Annual Report and Analysis of Competitive Market Conditions With Respect to Commercial Mobile Services*, Twelfth Report, 23 FCC Rcd. 2241, 2264 ¶ 26 (2008) ("*Twelfth CMRS Competition Report*").

135/ News Release, Clearwire Corporation, Clearwire Reports First Quarter 2008 Results (May 12, 2008), *available at* http://newsroom.clearwire.com/phoenix.zhtml?c=214419&p=irol-newsArticle&ID=1143894&highlight=.

136/ *See* Press Release, Sprint Nextel Corporation, Sprint and Clearwire to Combine WiMAX Businesses, Creating a New Mobile Broadband Company (May 7, 2008), *available at* http://newsreleases.sprint.com/phoenix.zhtml?c=127149&p=irol-newsArticle_newsroom&ID=1141088; Public Notice, FCC, Sprint Nextel Corporation and Clearwire Corporation Seek FCC Consent to Transfer Control of Licenses and Authorizations, DA 08-1477 (rel. June 24, 2008).

offer fixed, portable, and mobile broadband Internet access.[137/]

Other providers are developing wireless broadband networks as well. A smaller operator, Ntelos, a provider of wireless voice and data services in West Virginia and Virginia, announced that it would launch an $80 million commitment to bring mobile broadband service to its entire network.[138/] A rural provider, Stelera, recently launched a wireless broadband network to communities with less than 20,000 residents in parts of Texas, South Dakota, North Dakota and other states.[139/] DigitalBridge Communications is connecting citizens to the Internet using wireless broadband in such places as Jackson, Wyoming, Appomattox, Virginia, and Idaho Falls, Idaho.[140/] The Commission itself has noted that these efforts mean that "[a]s of June 2007, 35.3 million mobile wireless devices were capable of accessing the Internet" versus "almost none at the end of 2003."[141/]

Notably, all of these new wireless broadband competitors are emerging in the marketplace *without* the benefit of auctions tailored to their specific business model that amount to a government-sponsored subsidy. And all of these competitors are emerging with services that have a more aggressive rollout and faster speeds than those proposed by M2Z. By the time M2Z is in a position to serve a single customer, there will be at least four national wireless players in almost all markets and several regional providers in many. This robust competition is

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137/ Sprint/Clearwire Application, WT Docket No. 08-94, Public Interest Statement at 1, 3, 16.

138/ News Release, Ntelos, Ntelos Launches Nationwide High Speed Mobile Broadband Service Using EV-DO Technology in Charleston (June 16, 2008), *available at* http://ir.ntelos.com/releasedetail.cfm?ReleaseID=317358 (announcing the launch of its most recent wireless broadband network service).

139/ News Release, Stelera Wireless, Stelera Wireless Receives $35 Million to Deploy Broadband Services in Rural America (March 12, 2008), *available at* http://www.stelera.com/Portals/0/docs/3.12.08,%20Stelera%20Receives%20$35M.pdf.

140/ Zachary Goldfarb, *Surfing Roads Less Traveled*, WASH. POST, June 30, 2008, at D1.

141/ *Fifth 706 Report* ¶ 21.

not a reason to prevent a new entrant if one wants to enter. But it is a reason not to bend and twist the Commission's long-standing policies to favor one party based on illusory promises. Indeed, far from being necessary to promote competition,[142/] the proposed service rules could interfere with the market by creating a regulatory subsidy for M2Z that advantages M2Z over other licensees that had to pay market price for their spectrum, resulting in an unlevel playing field.[143/] Adding such uncertainty about whether spectrum investments will be protected as promised could have a severe negative effect on providers' willingness to risk capital, just at the time when private investment and innovation are taking off and leading to the rapid rollout of wireless broadband.

### B. By Improperly Encumbering the AWS-3 Band with M2Z's Business Plan, the Proposed Rules Significantly Lower the Potential Value of the AWS-3 Spectrum and Unjustly Enrich M2Z.

M2Z's goal has been and continues to be to obtain a free license for the AWS-3 spectrum.[144/] The Commission correctly rejected M2Z's initial proposal for a free license on the ground that the benefits of a public auction "outweigh the value of any purported public interest benefits of providing M2Z . . . spectrum for free."[145/] It found that the "relatively slow speed of

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142/ *Further Notice* ¶ 1 (noting the Commission's goal to promote the "deployment and ubiquitous availability of broadband services across the country and to facilitate the use of AWS spectrum for the benefit of consumers").

143/ *See* Letter from Caressa Bennet, Counsel to Rural Telecommunications Group, to Marlene Dortch, Secretary, FCC, WT Docket No. 07-195, at 2 (filed June 3, 2008) ("FCC should not engage in 'designer allocations,' crafting rules to require or benefit one specific business model of the FCC's choosing" as such a plan "will discourage" universal broadband service.).

144/ *See M2Z Networks v. FCC*, Nos. 07-1360 and 07-1441 (D.C. Cir. 2008) (appealing Commission's denial of its application for free spectrum). In response, the Commission has noted that while "M2Z succeeded in demonstrating that it could solicit large numbers of supporting letters, it failed to show that the Commission was required to grant it an exclusive license without even establishing service rules, assessing alternative proposals, or considering whether to provide other companies with a fair opportunity to compete for this valuable piece of spectrum." Brief for Appellee/Respondents, *M2Z Networks v. FCC*, Nos. 07-1360 and 07-1441, at 25 (June 23, 2008) ("FCC Brief") (citing *AWS-3 Applications Order* ¶ 14).

145/ *AWS-3 Applications Order*, 22 FCC Rcd. at 16570 ¶ 11.

M2Z's proposed broadband service" did not support its claim that it is providing a "'new' technology or service," as contemplated by section 7 of the Communications Act and commented that the "transmission speeds proposed by M2Z are unremarkable compared to other broadband services currently being deployed."[146/] Characterizing M2Z's construction benchmarks as not "particularly aggressive,"[147/] the Commission concluded that approval of M2Z's proposal would actually "prevent, rather than facilitate, widespread broadband deployment" and determined that it was not in the public interest.[148/]

Just last month, the Commission defended this decision to the D.C. Circuit Court of Appeals, characterizing M2Z's proposal as a "radical proposal to replace the normal licensing framework with one of its own creation."[149/] Again and again, the Commission in that brief stressed the importance of considering all possible uses for and users of valuable spectrum in order to assure it is licensed for its highest and best use.[150/] Despite M2Z's "predisposition" and "unshakeable conviction" that it was entitled to a free, exclusive, nationwide license, the Commission concluded that it had "rightly refused to blind itself to . . . important considerations" such as the possibility that other potential users might employ the spectrum more efficiently and the likelihood that an auction would better ensure the "recovery for the public of a portion of the value" of the spectrum.[151/]

Other than putting the license out for "auction," however, the service rules the

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146/ *Id*. at 16571-72 ¶ 14.

147/ *Id*. at 16572-73 ¶ 15.

148/ *Id*. Along the same lines, the Commission recently explained that "granting M2Z's application could effectively impede the development of more cutting-edge broadband services" by "preclud[ing] use of the spectrum by other service providers that might offer higher-speed or more advanced broadband service." FCC Brief at 32.

149/ *Id.* at 1.

150/ *See id.* at 15, 20, 23-24.

151/ *Id.* at 43, quoting 47 U.S.C. § 309(j)(3)(C).

Commission now proposes now accommodate — indeed, mirror — each of M2Z's self-designed proposals, notwithstanding the shortcomings identified by the Commission itself in rejecting that proposal last year.[152/] In particular, the proposed free service is nearly as "sluggish" as before, and the proposed construction benchmarks are arguably less stringent than what M2Z offered.

Moreover, the proposed rules not only allow for M2Z's plan, but are so narrowly circumscribed to the terms of M2Z's particular unique plan that M2Z is the only entity that can realistically be expected to bid for it. In particular, the rules' requirement that 25% of the network capacity be used to offer a free service significantly reduces the uses to which the spectrum could be put, reducing potential participation in the auction and making "competitive bidding" very unlikely.

M2Z seeks to justify this requirement by characterizing the spectrum as unwanted and good for no use other than its own proposal,[153/] but the record shows that multiple parties believe they could make good use of the spectrum if it could be purchased with no free service strings attached.[154/] T-Mobile, for example, has proposed that the AWS-3 band could be used as

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[152/] There are only minor changes between the *Further Notice* and M2Z's original proposal. The concept for a minimalist, "free service requirement" is the same. The *Further Notice* mandates a downstream rate for free service of 768 kbps but provides no upstream rate requirement. *See Further Notice* ¶ 3. M2Z proposed a downstream rate of 384 kpbs with an upstream rate of 128 kbps rate. *See* M2Z Networks, Inc. Application for License and Authority to Provide National Broadband Radio Service in the 2155-2175 MHz Band, WT Docket 07-16, at 22-23 (filed as amended Sept. 1, 2006) ("M2Z Application"). M2Z initially proposed buildout requirements at two years to commence service, three years to offer service to 33 percent of the population, five years to offer service to 66 percent and ten years to offer service to 95 percent. *Id.* at 23-24. The proposed rules lighten the buildout benchmarks, only requiring a fourth year benchmark of 50 percent and the requirement to offer service to 95 percent of the population by year ten. *Further Notice* ¶ 3.

[153/] M2Z Application at 16 ("Because the spectrum is unpaired and has no long term plan for use, it will likely remain underused or fallow for many years due to the limited number of carriers with the capability of operating in unpaired spectrum.").

[154/] *See* CTIA June 5 ex parte (citing Copper Valley Telephone Cooperative *Ex Parte*, WT Docket Nos. 07-195 and 04-356 (June 3, 2008); CentraCom Interactive *Ex Parte*, WT Docket Nos. 07-195 and 04-356 (June 3, 2008); Penasco Valley Telecommunications *Ex Parte*, WT Docket Nos. 07-195 and 04-356 (June 3, 2008); Van Buren Telephone Co., Inc. *Ex Parte*, WT Docket Nos. 07-195 and 04-356 (June

downlink spectrum for asymmetric pairing to enable it to offer more robust wireless broadband offerings to compete with cable and wireline providers.[155/] T-Mobile has indicated that it would be interested in bidding on the spectrum if it is unencumbered with one entity's business plan.[156/]

By saddling the spectrum auction with burdensome service rules tailored precisely to a single company's business plan, however, the Commission will effectively eliminate the majority of potential bidders. This will ensure that there will not be true competition for the spectrum to drive the price up to its true market value, despite the charade of an "auction" the Commission seeks to present.[157/] Indeed, given the restrictive nature of the license conditions, it is quite possible that M2Z will be the *only* bidder for the AWS-3 license. As a result, M2Z is likely to secure the spectrum for an extremely low price that is far less than what the spectrum is worth.

Analysts have predicted that the service conditions proposed by the Commission can "be

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3, 2008); Midstate Communications *Ex Parte*, WT Docket Nos. 07-195 and 04-356 (June 3, 2008); New Ulm Telecom, Inc. *Ex Parte*, WT Docket Nos. 07-195 and 04-356 (June 3, 2008); Kennebec Telephone Co., Inc. *Ex Parte*, WT Docket Nos. 07-195 and 04-356 (June 3, 2008); Big Bend Telephone *Ex Parte*, WT Docket Nos. 07-195 and 04-356 (June 3, 2008); Rural Broadband Group *Ex Parte*, WT Docket Nos. 07-195 and 04-356 (June 3, 2008); and Marne & Elk Horn Telephone Company *Ex Parte*, WT Docket Nos. 07-195 and 04-356 (June 3, 2008)).

155/ *See* CTIA June 5 ex parte (citing Comments of T-Mobile USA, Inc., WT Docket No. 07-195, at 4 (Dec. 14, 2007); Reply Comments of T-Mobile USA, Inc., WT Docket No. 07-195, at 3 (Jan. 14, 2008)); *see also* Sec. I.C., *infra*.

156/ Letter from Thomas J. Sugrue, T-Mobile USA, Inc., to the Hon. Kevin J. Martin, Chairman, FCC, WT Docket No. 07-195, at 2-3 (filed June 5, 2008).

157/ Notably, past efforts to tailor rules to one party's business plan have repeatedly failed in the past. *See* CTIA June 5 ex parte at 3-5 (describing the FCC's attempt to tailor the D Block auction to Frontline's business plans, its attempt to "shoehorn a terrestrial MVPD service into the DBS spectrum," its insistence at one company's request that the *1670-1675 MHz* spectrum offer a nationwide license, and its accommodation of one company's request for limiting eligibility for the DBS auction of 2 channels at the 61.5 degrees W.L. orbit location," all of which failed and in some cases resulted in no party bidding for the spectrum at issue).

expected to lower the value of this license by an appreciable amount," in the range of 40%.[158/] Unencumbered, according to these analysts, the AWS-3 spectrum is worth somewhere between $2-3 billion.[159/] As proposed, by contrast, "the free Internet service obligations . . . are likely to have a substantial revenue-reducing effect for the operator, and this impact will be revealed directly in auction revenues."[160/]

M2Z is not a charitable entity; it is funded by billion-dollar venture capital firms Kleiner Perkins, Redpoint Ventures, and Charles River Ventures that stand to make a windfall profit in the future if they are able to win the spectrum for a reduced price today.[161/] Given that $2 billion is "probably low" because "spectrum may be more valuable today than in the past,"[162/] the effects on auction revenue could be extremely significant. The Commission should not be furthering such a scheme. The Commission should be especially cautious given the recent delay

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158/ George S. Ford, Chief Economist, Phoenix Center For Advanced Legal & Economic Public Policy, Calculating the Value of Unencumbered AWS-III Spectrum at 1 (June 25, 2008) ("June 25 Phoenix Center Study"), *available at* http://www.phoenix-center.org/perspectives/Perspective08-01Final.pdf. (cautioning that "policymakers should be aware of the impact that their decisions to condition or encumber spectrum licenses might have upon the auction value of spectrum and the services offered over such licenses"). *See also* Adam Thierer and Berin Szoka, Progress & Freedom Foundation, What's Worse Than Rigged Auctions & Internet Censorship? How About Both in One Package! at 2 (June 2008), *available at* http://www.pff.org/issues-pubs/ps/2008/ps4.12M2Zauctioncensorship.html (noting that the structure of the auction makes it extremely unlikely many will bid, and that the free service being offered will not be of interest to any users due to its extremely poor quality).

159/ George S. Ford, PhD, "Valuing the AWS-3 Spectrum: A Response to Comments," Phoenix Center for Advanced Legal & Economic Public Policy Studies (July 21, 2008) ("July 21 Phoenix Center Study"), *available at* http://www.phoenix-center.org.

160/ June 25 Phoenix Center Study at 3.

161/ *See* Matt Richtel, *Company Asks U.S. to Provide Radio Space for Free Internet*, N.Y. TIMES, May 23, 2006 (reporting that "M2Z Networks is backed by several prominent Silicon Valley venture capitalists" and noting that Charles River Ventures was one of three companies that initially provided funding); Steve Rosenbush, *Free Broadband for the Masses, Backed by VC Cash, a Former FCC Official's Startup is Out to Provide No-fee, Ad-supported Wireless Service*, BUSINESS WEEK, May 22, 2006 (reporting that the three notable venture capital firms, Kleiner Perkins Caufield & Byers, Charles River Ventures, and Redpoint Ventures, had invested undisclosed amounts of money to the venture); *The Political Spectrum***,** WALL ST. J., June 6, 2008, at A14 (noting that the three venture capital firms are located in the districts of Congressional supporters of the spectrum plan).

162/ June 25 Phoenix Center Study at 3.

and uncertainty caused by the need to reauction the 700 MHz D Block when no entity came forward to bid on a license that had been heavily encumbered by regulatory prescriptions.

Nor do the purported consumer benefits associated with the availability of free broadband justify imposing this requirement. While M2Z has argued that free broadband would provide significant social welfare benefits, one commenter has noted that the studies it provided to the Commission in connection with its initial application considered only consumer welfare benefits.[163/] Free broadband would not advance overall *social* welfare, which takes into account the impact on producers – *e.g.*, broadband providers — as well as consumers. While the availability of free service may create a consumer surplus, it would be offset by larger losses incurred by producers in complying with the free service mandate.[164/] As the Phoenix Center has concluded, such a result would be "as bad for social welfare as an unregulated monopoly."[165/] And eventually, the impact on producers will result in long-term harm to consumers, as other investment or services are discouraged as a result of the skewed market the FCC's proposed auction scheme will create. The FCC should decline to impose such a costly burden on social welfare.

Moreover, many of the consumer benefits that M2Z attributes to its own proposal, especially the decreased price of broadband service due to enhanced competition, are not unique to M2Z and will be realized by *any* licensing and use of the AWS-3 spectrum. The Phoenix Center estimates that a full 75% of M2Z's estimated consumer benefits would still be gained if

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163/ George S. Ford, PhD, "Valuing the AWS-3 Spectrum: A Response to Comments," Phoenix Center for Advanced Legal & Economic Public Policy Studies (July 21, 2008) ("July 21 Phoenix Center Study"), *available at* http://www.phoenix-center.org.

164/ *Id.* at 2.

165/ *Id.* at 3-4.

the license were unencumbered.[166/] Given that of the remaining 25% of M2Z's claimed consumer benefits, 15% comes from the "socially wasteful" provision of free service,[167/] and that M2Z's analysis fails to account for the fact that the interference created by M2Z's proposal would reduce consumer welfare by impeding AWS-1 licensees from offering service, M2Z's estimate of consumer benefits is largely illusory.

### C. The Proposed Rules Violate the Commission's Duty To Set Service Rules That Promote the Best Result for the Public Interest.

Intentionally decreasing the auction value of spectrum and depriving the public treasury of funds that would otherwise be obtained runs contrary to the Commission's obligations under section 309 of the Communications Act.[168/] While Congress did not intend for the Commission to design auctions solely to maximize proceeds, it specified that one of the objectives of the auction should be the "recovery for the public of a portion of the value of the public spectrum resource,"[169/] and it certainly did not sanction service rules that artificially depress auction proceeds while achieving no overriding competing statutory purpose. To the contrary, section 309(j)(3) requires the Commission to seek to promote a range of public interest objectives.[170/] Here, the proposed service rules depress auction proceeds and work against the public interest in numerous ways.

*First*, the Commission's proposed rules are inconsistent with section 309(j)(3)(D) of the Act, which requires the Commission to promote "efficient and intensive use of the electromagnetic spectrum." The Commission and the courts have recognized repeatedly that the

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166/ *Id.* at 4.

167/ *Id.*

168/ 47 U.S.C. § 309.

169/ 47 U.S.C. § 309(j)(3)(C).

170/ 47 U.S.C. § 309(j)(3).

best way to promote "efficient and intensive use" of spectrum is to maximize the pool of potential auction bidders and award the spectrum to the highest bidder. As the Commission has explained, "[s]ince a bidder's abilities to introduce valuable new services and to deploy them quickly, intensively, and efficiently increases the value of a license to a bidder, an auction design that awards licenses to those bidders with the highest willingness to pay tends to promote the development and rapid deployment of new services in each area and the efficient and intensive use of the spectrum."[171/] Similarly, the Commission has recognized that giving bidders "flexibility" in how they use spectrum "allows spectrum to move to its highest valued use without regulatory lag, an economically efficient result," and "spur[s] investment in communication services and systems and technology development."[172/] The Commission can be justly proud of the substantial public benefits that have accrued from this combination of flexible service rules and the use of an auction to determine licensees of valuable spectrum resources.

The Second Circuit has noted that "the broader purpose of § 309(j) was to create an efficient regulatory regime based on the congressional determination that competitive bidding is the most effective way of allocating resources to their most productive uses."[173/] The Court explained that Congress told the Commission "to auction licenses to the highest bidder because such a system was thought likely to promote the development of new technologies and encourage efficient use of the spectrum . . ."[174/]

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171/ *Implementation of Section 309(j) of the Communications Act — Competitive Bidding*, Second Report and Order, 9 FCC Rcd 2348, 2361 ¶ 71 & n.65 (1994) ("*Section 309(j) Implementation Order*") (quoting Comments of PacBell).

172/ *AWS-1 Service Rules Order*, 18 FCC Rcd. at 25167-68 ¶¶ 13-14.

173/ *In re NextWave Personal Comm., Inc.*, 200 F.3d 43, 52 (2d Cir. 1999).

174/ *Id.* Indeed, a primary purpose in requiring auctions was to improve on the comparative-hearing and lottery methods of distributing spectrum, which were not efficient means of allocating licenses to parties. *See, e.g.*, H.R. Rep. No. 103-111, at 247-48 (1993), *reprinted in* 1993 U.S.C.C.A.N. 378, 574-75; *see also NextWave*, 200 F.3d at 51-54 (the primary purpose of enacting Section 309's auction requirement

In contrast, the Commission here proposes restrictions on the use of the AWS-3 spectrum that in effect require all bidders to commit to the M2Z business plan. By proposing to "auction off the rights to operate that business plan (rather than the right to use the spectrum freely on an unencumbered basis)," the FCC will reduce the pool of bidders for the AWS-3 spectrum. As a result, the spectrum will be auctioned for far less than its full market value.[175/] By contrast, if the Commission follows the course it has consistently adopted for its auctioned services of allowing the winning bidders to offer a variety of services at prices and with features determined in the marketplace, it will induce higher bids from a wide range of parties, and the winning bidder will have a strong financial incentive to make "efficient and intensive use" of the spectrum in order to recover what it spent to obtain its license.[176/]

*Second*, allowing TDD in the AWS-3 band also would discourage efficient and intensive use of spectrum from both past and future auctions. If the Commission establishes a precedent

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was to improve the efficiency of spectrum allocation vis-à-vis the comparative-hearing and lottery methods because "[A] method was needed that would direct licenses toward those entities and technologies that would put them to the best use."); *id.* at 247, 574 (Congress enacted the auction procedure "as a means of improving the FCC's licensing process and promoting efficient use of the spectrum."). The Commission, too, has recognized that this was the purpose of Section 309's auction requirement. *See, e.g., AWS-1 Service Rules Order*, 18 FCC Rcd. at 25172 ¶ 24 n.54 (discussing problems with prior licensing regimes, and noting that "[t]he disadvantages of these two systems were recognized" in a House report, "which stated that, 'in many respects the FCC's current licensing methods for assigning spectrum have not served the public interest.' H.R. Rep. No. 111, 103d Cong., 1st Sess. 248 (1993), reprinted in 1993 U.S.C.C.A.N. 378 at 575, 580."); *see also Implementation of Section 309(j) of the Communications Act—Competitive Bidding*, Fifth Report and Order, 9 FCC Rcd. 5532, 5541 ¶ 23 (1994) ("[T]he use of competitive bidding to award broadband PCS licenses, as compared with other licensing methods, will speed the development and deployment of new services to the public with minimal administrative or judicial delay, and will encourage efficient use of the spectrum.").

175/ July 21 Phoenix Center Study at 5. *See also id.* at 3-4 (noting that it is unlikely M2Z's proposal would be found the most valuable in an auction, since it offers the U.S. Treasury only about $274 million, as compared to the approximately $3 billion that would be generated by an unencumbered auction, and that "[t]he fact that M2Z felt the need to ask the FCC to forbear from its auction rules and instead grant it a license directly speaks volumes as to whether M2Z realistically thought that theirs was the most valuable use of this spectrum.").

176/ *See, e.g., Section 309(j) Implementation Order*, 9 FCC Rcd. at 2358 ¶ 58 ("[L]icensees' need to recoup the out-of-pocket expenditure for a license should provide additional motivation to get the most value out of the spectrum.").

of auctioning licenses today and radically altering the terms and usefulness of those licenses tomorrow (as it proposes to do with T-Mobile's and others' AWS-1 licenses), it will undermine transparency and certainty in the bidding process and will introduce inefficiency into the infrastructure-deployment process. It will be much more difficult for carriers to assess the risks and rewards associated with bidding on new spectrum or developing the spectrum that they already possess. This uncertainty will have a chilling effect on those carriers' development of both new and existing spectrum, contrary to the goals of section 309.

*Third*, adoption of the proposed license conditions would be inconsistent with section 309(j)(3)(C), which requires the Commission to promote "recovery for the public of a portion of the value of the public spectrum resource made available for commercial use and avoidance of unjust enrichment through the methods employed to award uses of that resource." As discussed above, allowing M2Z's business plan to dictate the auction terms would dramatically reduce the revenues paid into the U.S. Treasury and would enrich one entity and its investors at the expense of the public.

*Fourth*, the proposed service rules and license conditions are inconsistent with section 309(j)(3)(A), which requires the Commission to promote "the development and rapid deployment of new technologies, products, and services for the benefit of the public, including those residing in rural areas, without administrative or judicial delays." The Commission has recognized that maximizing the pool of potential bidders is the best way to ensure the development and rapid deployment of new technologies, products, and services,[177/] not radically

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177/ *Implementation of Competitive Bidding Rules to License Certain Rural Service Areas*, Report and Order, 17 FCC Rcd. 1960, 1966 ¶ 10 (2002) ("[W]e believe that maximizing the pool of auction applicants helps to ensure that licenses are awarded to entities that value them most highly and are, therefore, most likely to offer prompt service to the public"); *see also id.* at 1968 ¶ 13 ("[T]he bidder who is willing to pay the most will be highly motivated to rapidly put the license to a use that the public finds valuable because only such a use will make its investment worthwhile.").

shrinking it — perhaps to one — as it is considering here. Moreover, given the high likelihood of interference problems, permitting the use of TDD in the AWS-3 band would result in significant administrative and potential judicial delays. To accommodate the use of TDD, the Commission would need to establish detailed rules concerning interference before allowing the winning bidder to develop the spectrum. Deployment would also be hampered by the need for AWS-1 and AWS-3 licensees to negotiate and coordinate their activities to minimize interference. All of these activities would prevent the "rapid deployment" of services over the AWS-3 band.[178/] Further, as noted above, by changing the rules mid-stream, the Commission's proposal would create uncertainty for all auction winners in all bands, thus interfering with the stability and predictability providers need in order to invest in "the development and rapid deployment of new technologies, products, and services."

Section 309 does not require the Commission to abandon the notion of using the AWS-3 band to provide broadband services. Rather, it requires only that the Commission not accord special privilege to M2Z's unique business plan, including M2Z's unworkable technical proposals, over all other broadband business plans. The Commission has a "duty to consider responsible alternatives to its chosen policy and to give a reasoned explanation for its rejection of such alternatives."[179/] Because T-Mobile and other commenters have suggested viable alternatives to the service rules and license conditions proposed,[180/] the Commission cannot

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178/ Adoption of the *Further Notice*'s proposed license conditions and service rules also could result in significant judicial delays, because the unlawful conditions and rules are highly likely to be challenged in court. Such litigation delays also would result in uncertainty causing the auction winner a strong disincentive to invest in providing service on the AWS-3 band before the legal battles are resolved.

179/ *City of Brookings Mun. Tel. Co. v. FCC*, 822 F.2d 1153, 1169 (D.C. Cir. 1987).

180/ In particular, T-Mobile and others have advocated a downlink-only approach. Such an approach would permit wireless broadband service while mitigating interference concerns to existing licensees, and would maintain a more compatible pairing of base-station to base-station operations in adjacent spectrum bands. *See, e.g.*, T-Mobile AWS-3 Comments at 3. The Commission itself acknowledged in its earlier

lawfully adopt its proposed plan without carefully considering these alternatives and explaining its reasons for rejecting them. Allowing providers to develop innovative business plans for the spectrum would result in higher auction proceeds and greater value for the consumer. Efficiency is best served by a "licensing plan [that] will allow the marketplace rather than the Commission to ultimately determine what services are offered in this spectrum and what technologies are utilized to provide these services."[181/] Adopting auction rules that privilege one competitor's business plan — here, M2Z's — over all others would be akin to returning to the comparative hearing and other inefficient assignment mechanisms of the past — or perhaps even worse.[182/]

### D. Imposing a "Free" Service Requirement on AWS-3 Is Inconsistent with the Classification of Wireless Broadband as an Information Service and Contrary to Congress's Goal of Promoting Broadband Deployment.

Just last year, the Commission held that wireless broadband Internet access was an information service, finding that such a classification would create "a minimal regulatory environment" that, by encouraging competition in the provision of advanced services and removing barriers to infrastructure investment, will promote the FCC's "primary policy goal" of promoting the "ubiquitous availability of broadband to all Americans."[183/] Requiring the provision of wireless broadband service at a specified price (zero, in this case) and under government-imposed parameters (a mandated download speed and network-based "always-on" filtering of certain objectionable content) is fundamentally inconsistent with the deregulatory

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NPRM that designating the AWS-3 spectrum as downlink-only "would greatly simplify the treatment of interference issues in this band." *AWS-3 NPRM*, 22 FCC Rcd. at 17046 ¶ 21.

181/ *AWS-1 Service Rules Order*, 18 FCC Rcd at 25163 ¶ 1.

182/ In a traditional comparative hearing the Commission would, at the very least, go through the process of soliciting competitive business plans for the spectrum and conducting an evidentiary hearing on which one would best serve the public interest. Here the Commission is simply imposing M2Z's business plan on the band without any careful analysis or consideration of alternatives.

183/ *Appropriate Regulatory Treatment for Broadband Access to the Internet Over Wireless Networks*, Declaratory Ruling, 22 FCC Rcd. 5901, 5902 ¶ 2, 5911 ¶ 27 (2007) ("*Wireless Broadband Ruling*").

policy embodied in the *Wireless Broadband Ruling*, which the Commission recognized would best promote widespread deployment of wireless broadband services.

The proposed service requirements also exceed the Commission's authority. As CTIA has pointed out, a requirement to make service available to the public indiscriminately at a specific rate (even zero) is classic common carrier regulation, but the Commission cannot rely on its common carrier authority in this instance because the service at issue – wireless broadband Internet access service – is an information service, not a telecommunications service. Nor does the FCC have any other source of jurisdictional authority to require the free offering of wireless broadband service.[184/] And the network-based filtering obligation raises serious constitutional issues.[185/] As with the lack of interference protection for AWS-1 licensees, the Commission offers no explanation for these departures from law and settled policy. They should be rejected.

### E. A Free Service Business Model Is Not Economically Sustainable and Will Unnecessarily Restrict Licensees.

Business models premised on the notion of subsidizing free service with other commercial revenues sound appealing, but have repeatedly proven in the marketplace not to be viable. There is no reason to think that the result would be any different here. Tailoring the service rules to require such an approach is tantamount to dooming the service to failure before it even starts.

The record in this proceeding already well documents the stream of businesses that have tried to offer free broadband services and failed.

- NetZero, Inc., Juno Online Services, Spinway, Freei, and Bluelight unsuccessfully

184/ *See* WT Docket Nos. 04-356 & 07-195, Ex Parte Notice of CTIA (filed Jun. 26, 2008) at 1-3 ("CTIA June 26 ex parte").

185/ *Id.*

tried to offer free Internet access.[186/]

- Numerous efforts to offer free Wi-Fi service over municipal networks have failed or been cancelled for lack of financial viability, including in Philadelphia, PA[187/]; Chicago, IL; Springfield, IL; San Francisco, CA; Houston, TX; St. Louis, MO; Sacramento, CA; New Orleans, LA; Portland, OR; Concord, CA; Cupertino, CA; Foster City, CA; Riverside, CA; San Jose, CA; Santa Clara, CA; and others.[188/]

- MetroFi, which sought to balance its ad-supported free access with a paid service offering no advertisements, recently announced it was exiting all of its markets in all three states it serves, and would shut down its networks since it had been unable to find a buyer.[189/]

M2Z claims that it will be able to subsidize its free service with revenues generated from advertising,[190/] but analysts observing the failures of similar plans have concluded that the ad-supported free service model is "fatally flawed."[191/] M2Z offers no compelling reason its service will succeed where so many others have failed, and analysts have questioned the viability of M2Z's plan specifically, calling the proposal to rely on advertising to generate revenue a

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186/ *See* CTIA June 5 ex parte at 5 (also noting that Spinway, Freei, and Bluelight went bankrupt and were bought by United Online, and that NetZero and Juno, also owned by United, have been forced to change their business models and no longer offer an advertiser-supported free service).

187/ EarthLink, the Internet provider that built Wireless Philadelphia, asked a federal judge last month for permission to dismantle it because EarthLink was losing up to $200,000 a month on the network. EarthLink, which valued the network equipment at about $17 million, offered to turn it over to a new owner for free in a bid to get out of its contract. New owners took over the network in June 2008 but terms of the deal were not announced. Chris Brennan, *Wireless Philadelphia May Survive After All*, PHILADELPHIA DAILY NEWS, June 17, 2008, *available at* http://www.philly.com/dailynews/local/20080617_Wireless_Philadelphia_may_survive_after_all.html.

188/ *See* CTIA June 5 ex parte at 5-6.

189/ Sarah Skidmore, *MetroFi ending Wi-Fi Service in Calif., Ore., Ill.*, Yahoo News, June 19, 2008, http://news.yahoo.com/s/ap/20080619/ap_on_hi_te/metrofi_wireless; *see also* CTIA June 5 ex parte at 6 (discussing MetroFi's hope it would find a buyer).

190/ *See* Comments of M2Z Networks, WT Docket No. 07-195, at 20 (filed Dec. 14, 2007); M2Z Application at 1.

191/ *See* CTIA June 5 ex parte at 5-7. *See also* July 21 Phoenix Center Study at 4 ("[E]ven if the M2Z proposal offers a high social value as a hypothetical, its actual social value may be low due to the likelihood of financial failure.").

"serious consumer drawback."[192/]

As with the other providers that have tried and failed to subsidize a free broadband offering with advertising, it is unlikely that advertising revenues alone will be sufficient to cover the costs of a free service offered on the AWS-3 band. Here, however, the required subsidy would be on top of the costs of acquiring and building out a nationwide AWS-3 license and operating it for 10 years — estimated to be as much as $43 billion.[193/] If anything, these substantial costs make it almost certain that the licensee would not be able to absorb the costs of subsidizing the required free service. Of course, if an advertisement-based model for free service were commercially viable, M2Z or any other party who became the licensee in the AWS-3 band could adopt it voluntarily. T-Mobile is not asking the Commission to prohibit the use of such a business model, but neither should it effectively impose it and subsidize it.

Facing the likely significant shortfall in funds needed to subsidize the free service, a provider will have no choice but to raise prices for its paying customers and divert capital away from its commercial offering. Each of these results will place the service at a competitive disadvantage and so drive customers to other commercial offerings that do not bear these burdens, and with each departing customer, the resulting burden on the remaining paying customers will increase.

Saddling any provider with an obligation doomed to render its service unattractive to potential customers is unfair, and is wholly inconsistent with the traditional flexible nature of the industry, which has succeeded so well in large part because of its historical and demonstrated ability to adapt to changes in consumer needs and interests. But more importantly, creating an unworkable set of service rules would have a serious negative impact on the future use of AWS-

192/ Cyren Call, *M2Z Still Waiting on the FCC*, LIGHT READING (Sept. 2006).

193/ *See* Comments by Andrew M. Seybold, WT Docket No. 07-195, at 2 (July 14, 2008).

3 spectrum. If the free service plan fails, it will leave the spectrum unused and unusable until the Commission devises a new plan or removes the condition.[194/] If the new plan is replaced with some other set of prices or service characteristics to try to keep the service viable, it could result in a level of rate and service regulation that is more characteristic of the monopoly landline era over 30 years ago than today's competitive wireless industry.[195/]

The Commission's free service proposal would not only have a negative effect on providers and the wireless broadband market, it would be of little to no help to those it is designed to support. Under the proposed rules, the service's maximum speed under the best of circumstances — which, as noted below, will rarely be the case — will be 768 kbps downstream. Such a service would be frustratingly slow and unappealing if offered *today*, but this service will not be available *at all* until 2013 and will not be fully available for ten years — by which time it will be a technological dinosaur.[196/]

### F. The Proposed Free Service Plan Raises Technical Concerns.

The proposed free service rules also raise significant technical concerns that could pose even a further likelihood of the plan's failure. First, if, as M2Z claims, any appreciable number of customers use the free service, the 25% of capacity required to be set aside for that service will soon be exhausted. It would be difficult to offer a free 768 kbps wireless service on 5-6 MHz of spectrum to *any* appreciable number of people, let alone the percentage of the U.S

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194/ This risk further demonstrates that the Commission's proposal is inconsistent with the agency's obligation to put spectrum to its best and most efficient use. *See* Sec. III.C., *supra*.

195/ *See* Letter from Thomas J. Sugrue, T-Mobile USA, Inc., to the Hon. Kevin J. Martin, Chairman, FCC, WT Docket No. 07-195, at 2-3 (filed June 5, 2008).

196/ Moreover, M2Z's specific plan calls for consumers to pay an upfront cost of $250 for a reception device — a requirement that would be cost-prohibitive for the majority of the targeted beneficiaries of the service. As Dr. Ford observes, "[i]t has been demonstrated time and again that low income people have much greater difficulty with large upfront payments than they do with low monthly recurring ones." July 21 Phoenix Center Study at 4. Yet the proposed service rules allow charges for equipment with no proposed restrictions.

population M2Z claims it will benefit. As a result, the licensee will either need to use more than 25% of its licensed capacity for the free service, or, as the proposed rules suggest,[197/] downgrade the service's transmission speeds for all users, leading to an even less attractive service and making the likelihood of failure even higher.

Second, allowing the licensee to manage network demand over 25% of network capacity "using any lawful network management protocol,"[198/] is an invitation to uncertainty and endless litigation before the Commission and ultimately the courts. The licensee will inevitably be drawn into constant disputes over whether and to what extent its reduction in transmission speeds or other traffic management practices qualifies as a "lawful network management protocol" and would also face charges of discrimination or content favoritism on its broadband service. The uncertainty regarding the standards to be applied will invite confusion and litigation and will inhibit licensees from effectively addressing network issues, all of which will further encumber the offering of this service.

197/ *See* Proposed § 27.1191(b)(2).

198/ Proposed § 27.1191(b)(2).

## CONCLUSION

The Commission's proposed service 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, and foreclosing multiple bidders from competing for the AWS-3 spectrum when it is auctioned. T-Mobile urges the Commission to permit the use of AWS-3 spectrum for downlink purposes only to ensure that existing advanced broadband wireless services are not disrupted. In addition, the Commission should not encumber the AWS-3 band with a pre-determined and faulty business plan. By properly modifying its proposed service rules, the Commission can ensure that the AWS-3 band facilitates the deployment and ubiquitous availability of broadband services across the country for the benefit of consumers.

Respectfully submitted,

**/s/ Howard J. Symons**

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