August 19, 2009

Via Electronic Filing

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 Twelfth Street, SW, TW – A325
Washington, DC 20554

**Re: WT Docket Nos. 07-195 and 04-356 – Notification of Oral Ex Parte Presentation**

Dear Ms. Dortch:

On August 18, 2009, M2Z Networks, Inc.'s co-founders John Muleta and Milo Medin, Paul Kolodzy of Kolodzy Consulting and the undersigned met with Ruth Milkman, John Leibovitz, Joel Taubenblatt, Charles Mathias, Blaise Scinto, Jennifer Tomchin, Kevin Holmes and Paul Malmud of the Wireless Telecommunications Bureau. During the meeting, M2Z discussed the status of the AWS-3 proceeding and the order on circulation. The enclosed materials were provided at the meeting and outline the topics of our discussion.

Pursuant to Section 1.1206(b) of the Commission rules, an electronic copy of this letter is being filed. Please let me know if you have any questions regarding this submission.

Sincerely,

Uzoma Onyeije

cc: Ms. Ruth Milkman, Mr. John Leibovitz, Mr. Joel Taubenblatt, Mr. Charles Mathias, Ms. Blaise Scinto, Ms. Jennifer Tomchin, Mr. Kevin Holmes, Mr. Paul Malmud



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# Prompt Action On the AWS-3 Proceeding is Good Policy and Required by Statute

**August 18, 2009**

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# AGENDA

I. Status of the AWS-3 FNPRM and order on circulation

   a. AWS-3 Policy Implications

   b. Statutory timeline

II. Clarifications about the record before the Commission in the AWS-3 proceeding

   a. Supporting Data and Facts

   b. End Notes

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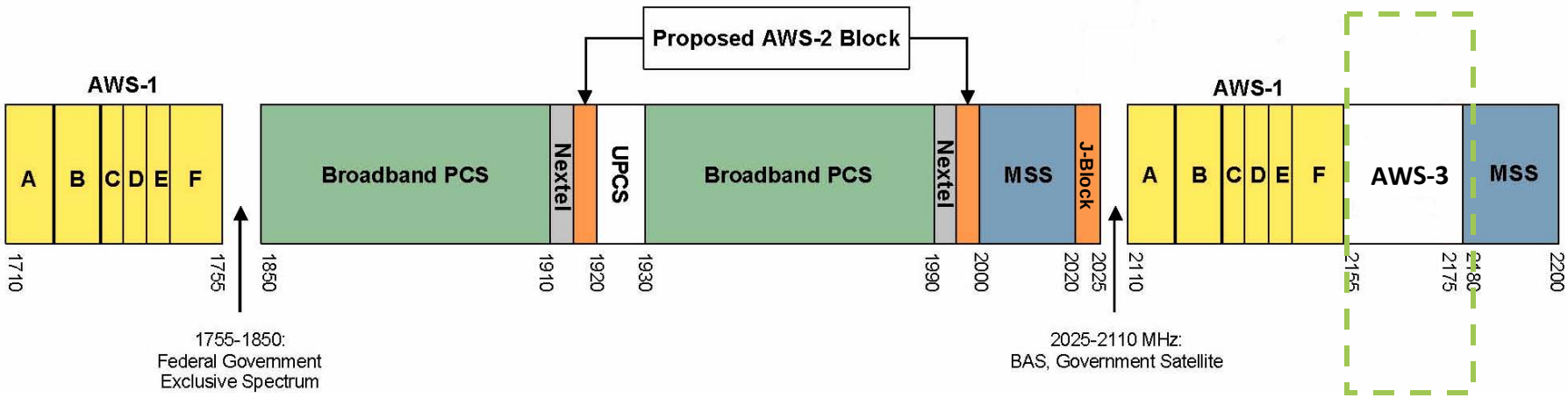
# Advanced Wireless Services (AWS) Band Plan

- Unpaired Allocation at 2155-2180 MHz.
- Designation and Relocation Proceedings completed in 2006.[1]
- AWS-3 still has no service rules in place.

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# What is at stake in the pending AWS-3 Order?

Service rules that create a nationwide wireless broadband network on 25 MHz of fallow unpaired spectrum. As we understand it, the pending rules would specify the 2155-2180 MHz spectrum is to be auctioned with the following public interest commitments outlined in the June 2008 FNPRM:

1) **Open access network:** no blocking of content (similar to 700 MHz "C" Block);[2]

2) **Open platform network:** no proprietary end-user equipment (similar to 700 MHz "C" Block);[3]

3) **Nationwide Free Broadband Service:** at least 25% of the network capacity dedicated to a free (no monthly subscription charge or other fees) service with a minimum of 768 kbps (download) which is the FCC's definition of basic broadband;[4]

4) **Aggressive build out requirements:** coverage of 50% of the population in 4 years; 95% within 10 years (with license revocation as a remedy for failure to comply).[5]

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# The pending AWS-3 order promotes the public interest

1. **An open nationwide broadband network that empowers consumers.[6]**
   - creates competition to the walled garden approach of existing wireless and wireline broadband providers.
   - nationwide broadband service enables roaming for both consumers and alternative broadband carriers.
   - openness creates a scalable development environment for devices and applications benefitting consumers and entrepreneurs.

2. **A free Nationwide Broadband Service removes the recurring cost of broadband as the most significant barrier to broadband adoption.**
   - According to PEW Research, 37% of the population still does not have broadband primarily due to affordability and the impact is on the poor and on minorities.[7]
   - A July 2009 study by the University of Illinois (Chicago) on citywide technology use within Chicago finds:[8]
     - Nearly 40 percent of Chicago residents, especially African-Americans, Latinos and those aged 67 or more, have limited or no access to the Internet.
     - Both African-Americans and Latinos without Internet access at home are more likely than whites to cite costs as the main reason for not being online, rather than a lack of interest.

3. **Nationwide licensing with aggressive build out creates a new unaffiliated entrant to provide broadband competition.**


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# Will innovative approaches that generate significant consumer welfare and discipline the broadband market get opportunities?

Two economic studies in the record estimate the net present value of consumer benefits from the proposed AWS-3 service rules and public interest obligations could exceed $18 billion.

***Current Advertised Rates for Wireless Broadband Access***
***(Proprietary Consumer Equipment purchased separately)***

| | | |
|---|---|---|
| $ 60.00/ month[9] | $59.99/ month[10] | $ 59.99/ month[11] |
| with typical data rates of up to 600-1.7 Mbps downloads | with typical data rates of up to 600-1.4 Mbps downloads | with typical data rates of up to 700-1.5 Mbps downloads |
| Proprietary CPE | Proprietary CPE | Proprietary CPE |
| at&t | verizon | T-Mobile |
| $ 40.00/ month[12] | $ 20.00/ month[13] | $ 0.00/ month[14] |
| with data rates of 400-700 kbps download | with data rates of up to 768 kbps download | with data rates of 768 kbps |
| Proprietary CPE | Proprietary CPE (?) | Open Device Platform |
| cricket | clearwire wireless broadband | AWS-3 |

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# The AWS-3 rulemaking is long overdue

## § 157. New technologies and services[15]

(a) It shall be the policy of the United States to encourage the provision of new technologies and services to the public. Any person or party (other than the Commission) who opposes a new technology or service proposed to be permitted under this chapter shall have the burden to demonstrate that such proposal is inconsistent with the public interest.

(b) The Commission shall determine whether any new technology or service proposed in a petition or application is in the public interest within one year after such petition or application is filed. If the Commission initiates its own proceeding for a new technology or service, such proceeding shall be completed within 12 months after it is initiated.

**Sept. 2007**

**AWS-3 NPRM issued**

**"[**We seek] comment on rules for licensing this newly designated spectrum in a manner that will permit it to be fully and promptly utilized to bring advanced wireless services to American consumers."[16]

**June 2008**

**AWS-3 FNPRM Issued with specific rule proposals**

"In taking a further step towards adoption of service rules for these bands, our goal is 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."[17]

**Sept. 2008**

**AWS-3 Statutory deadline expires**

**Oct. 2008**

**AWS-3 OET Report Issued**

"This report tentatively concludes that for the static case that is examined AWS-3 devices could operate at a power level of up to 23 dBm/MHz equivalent isotropic radiated power (EIRP) and with out-of-band emissions (OOBE) attenuated by 60 + 10*log(P) dB without a significant risk of harmful interference."[18]

**June 2009**

**AWS-3 FNPRM Pending 12 Months**

**August 2009**

**AWS-3 NPRM Nearly 2 years old**

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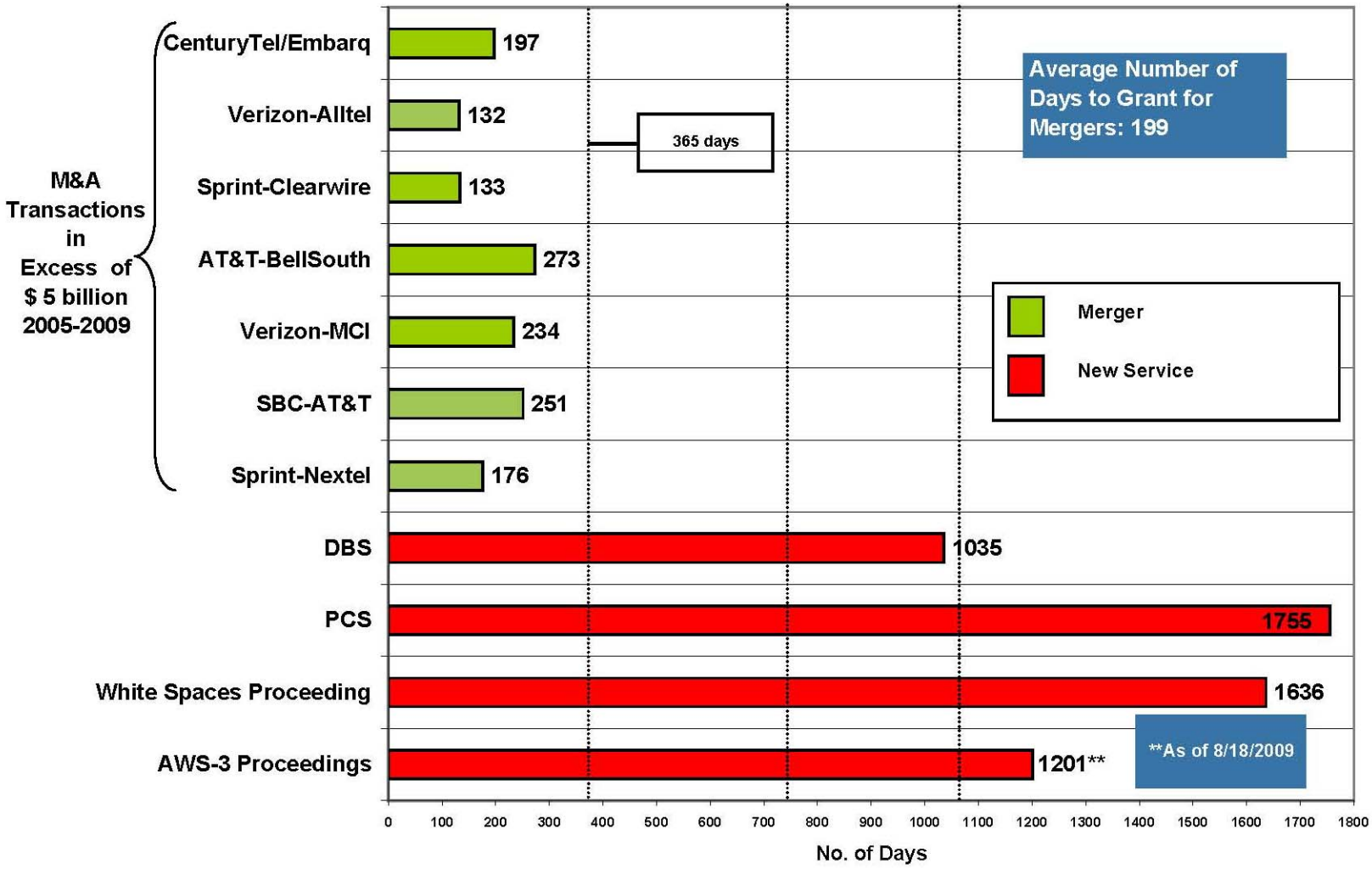
# Will consolidations and license transfers continue to be prioritized ahead of new service proceedings?*




* This chart depicts the number of days that these matters were pending prior to being granted.

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# SOME IMPORTANT CLARIFICATIONS ABOUT THE AWS-3 RECORD

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# CLARIFICATION OF THE RECORD IN AWS-3

| Technical and Engineering Arguments Concerning the AWS-3 Record and the FNPRM | Data and Facts |
|---|---|
| The proposed AWS-3 rules (that permit TDD) could result in harmful interference to AWS-1 and other adjacent licensees. | OET's October 2008 report found that permitting TDD would not "cause significant harmful interference" to adjacent band operations. Analysis based on T-Mobile test setup and configuration.[19] |
| Adjacent licensees to AWS-3 need more protection than FCC precedent allows or shown by the interference tests. | Proposed rules would reduce TDD OOBE to 2% of what is permitted in 700 MHz[20] and other broadband bands even though OET's analysis and conclusion support a higher level of OOBE. The proposed rules provide more protection than in any other recently assigned band.[21] |
| The alternative Broadband Maximization Plan (BMP) is good policy. | The Broadband Maximization Plan requires <u>mandatory</u> prohibition of TDD (two way) service in the AWS-3 band.[22] On the other hand, the pending order promotes technological flexibility by allowing the licensee the right to choose FDD or TDD.[23] |
| The Broadband Maximization Plan is more spectrally efficient and yields more system capacity than TDD. | The claims of superior efficiency for asymmetric FDD are based on assumptions that ignore important facts:[24]<br>▪ The proposal is premised on a mandatory 10 MHz guard band which is inconsistent with the OET report.<br>▪ Additional assumptions ignore significant improvements made possible in range and capacity from TDD technologies of AAS and SDMA. |
| TDD (unpaired) configuration would not provide robust broadband service. | Current generation TDD-based broadband services (e.g., WiMax) can provide up to 6-14 Mbps download speeds to consumers similar to competitive technologies.[25] |

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# CLARIFICATION OF THE RECORD IN AWS-3

| Policy Arguments Concerning the AWS-3 Record and the FNPRM | Data and Fact |
|---|---|
| There is no need for nationwide broadband competition. | The record indicates that broadband has an HHI of over 3000, compared to the normal uncompetitive indicator of 1800, indicates that more broadband competition is needed and quickly.[26] |
| There is no need for TDD spectrum allocations. | In the last 8 years, the FCC has allocated less than 10%[27] of the spectrum on an unpaired basis even though TDD is more spectrally efficient service for broadband.[28] |
| There is no need for nationwide allocations. | Between 2005-2008, less than 4% of the total spectrum made available by the FCC has been nationwide allocation.[29]<br><br>**The FCC has previously found that:** "[W]e have on more than one occasion noted that nationwide assignments are more likely to stimulate investment in new technologies and can provide a critical means of achieving greater spectrum efficiency and promoting research and development."[30] |
| There is no urgency for deciding this issue. | The FCC is behind in meeting its statutory obligation to resolve the AWS-3 NPRM. Section 7 required the FCC to <u>conclude</u> the AWS-3 NPRM in September 2008.[31] |
| Pending AWS-3 Order requires content filtering. | No.[32] |

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# Supporting Data

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# Direct Capacity Comparisons Demonstrate that TDD is more efficient in AWS-3

| Using 25 MHz<br>2155-2180 | |
|---|---|
| T-Mobile Analysis of TDD in AWS-3 | Technology Neutral Plan<br>(TDD Deployment in AWS-3) |
| 25 MHz AWS-3 TDD<br>+<br>10 MHz guard band | 25 MHz AWS-3 TDD with internal guard consistent with OET report |
| **22.9 Mbps** | **45.5 Mbps*** |

| Using 30 MHz<br>2155-2180 + J-Block | |
|---|---|
| T-Mobile BMP FDD only proposal | Technology Neutral Plan<br>(TDD Deployments in AWS-3 + J-Block) |
| 25 MHz AWS-3 FDD Downlink<br>+<br>5 MHz J-Block FDD Uplink | 25 MHz AWS-3 TDD<br>+<br>5 MHz J-Block TDD |
| **39 Mbps** | **49.8 Mbps*** |

* Even under extremely conservative assumptions, TDD use in the AWS-3 band (without the unnecessary use of excessive guardband) is more efficient that FDD use of the band. The efficiency gains of TDD become even more pronounced through the aggressive use of technology such as AAS and beamforming.

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# The proposed AWS-3 technical rules are based on worst case static scenarios and could be relaxed.

| Technical Rule | 700 MHz | FCC June Proposal | UK's OfCom Analysis April 2008 | AWS-3 Test Results | AWS-3 Broadband Opponents |
|---|---|---|---|---|---|
| OOBE Rejection (per MHz) | 33+10log(P) | 60+10 log(P) | 49+10log(P) | 48+10log(P)<br>59+10log(P) | 90+10log(P) |
| Transmit Power | 34 dBm | 23 dBm/MHz | 31 dBm | 42 dBm | 23 dBm |
| Spectrum Band | 6 MHz | 25 MHz | 25 MHz | 25 MHz | 12 MHz |
| Required Guard band | 0 MHz | 0 MHz | 0 MHz<br>First adjacent 5 MHz with power limits | 0 MHz | 12-13 MHz |
| Broadband Capacity (Capacity/Spectrum Ratio) | > 6 MHz<br>(~ ≥100%) | ~18 MHz<br>(~72%) | 20 MHz full power<br>5 MHz reduced power<br>(~88%) | 20 MHz<br>(~90%) | Not useable for 2 way broadband– "downlink only"<br>(0%) |
| Assumed FDD (e.g., AWS-1) Received Signal Limit | Not Known | Not Known | -85 dbm | -90 dbm | -105 dbm |

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# Recent trends in FCC technical rules call for 43+10 log (P) OOBE

| EMISSION BAND | Permitted Channel Adjacencies | OOBE Limit | OOBE Measurement Bandwidth | Adjusted OOBE LIMIT @ 1 MHZ bandwidth[1] |
|---|---|---|---|---|
| BROADBAND PCS | FDD Downlink only | 43 + 10 log (P) | 1 MHz | 43 + 10 log (P) |
| BRS | FDD and TDD (mobile-to-mobile) | 43 + 10 log (P) | 1 MHz | 43 + 10 log (P) |
| AWS-1 | FDD Downlink only | 43 + 10 log (P) | 1 MHz | 43 + 10 log (P) |
| 700 MHZ– PUBLIC SAFETY | FDD and TDD (mobile-to-mobile) | 65 + 10 log (P) | 6.25 KHz | 43 + 10 log (P) |
| 700 MHZ | FDD and TDD (including mobile-to-mobile) | 43 + 10 log (P) | 100 kHz | 33 + 10 log (P) |

[1] Conversion from A + 10 log (P) over bandwidth BW (in kilohertz) to B + 10 log (P) over 1 MHz bandwidth is B = A + 10 log (BW/1000). Thus 65 + 10 log (P) over 6.25 kHz computes to B = 65 + 10 log (6.25/1000) = 65 – 22 = 43, and thus is equal to 43 + 10 log (P) over 1 MHz.

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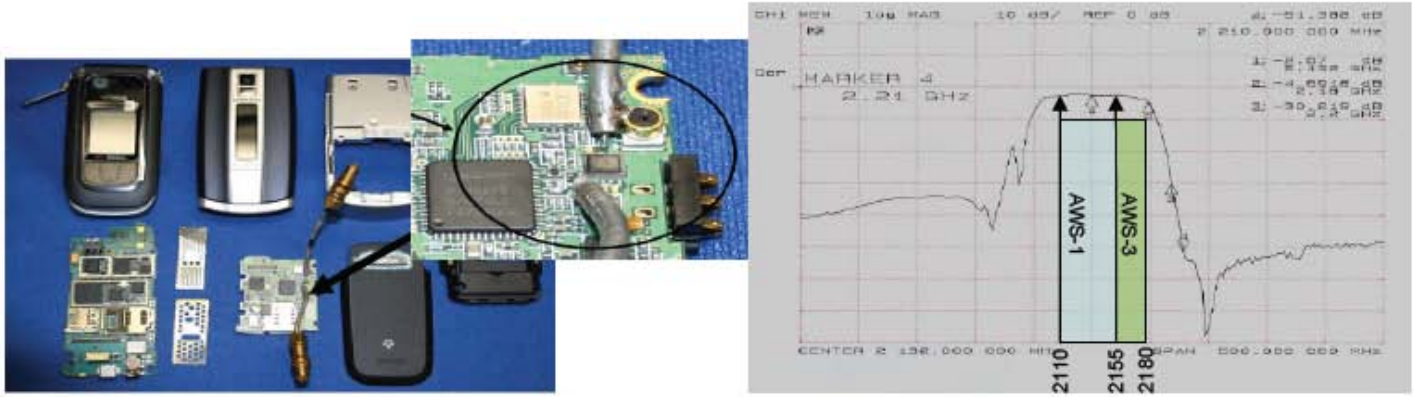
# Some AWS-1 CPE were deployed with filters that pass trough 2110-2180 MHz instead of 2110-2155 MHz

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# Allocations of unpaired spectrum are rare in the US

Despite significant advances in TDD technology, unpaired spectrum allocations in the US have been rare and in small segments thereby limiting opportunity for new broadband services and carriers to develop

**Broadband-Capable Paired and Unpaired Terrestrial Spectrum Below 3GHz Offered at Auction**
**October 22, 2001 – November 20, 2008**

| Auction | Year | Band Name | Total Spectrum (MHz) | Paired Spectrum (MHz) | Unpaired Spectrum (MHz) | % of Unpaired (MHz) |
|---|---|---|---|---|---|---|
| 73 | 2008 | Upper 700 MHz Band | 62 | 56 | 6 | 10% |
| 69 | 2007 | 1.4 GHz Band | 8 | 6 | 2 | 25% |
| 66 | 2006 | AWS-1 | 90 | 90 | 0 | 0% |
| 65 | 2006 | 800 MHz Air-Ground | 4 | 4 | 0 | 0% |
| 55 | 2004 | 900 MHz | 5 | 5 | 0 | 0% |
| 46 | 2003 | 1670-1675 MHz Band | 5 | 0 | 5 | 100% |
| 45 | 2002 | Cellular RSA | 25 | 25 | 0 | 0% |
| 44 | 2002 | Lower 700 MHz Band | 18 | 12 | 6 | 33% |
| **Total** | | | **217** | **198** | **19** | **9%** |

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# Nationwide licenses are rare but necessary for scaleable competition

FCC spectrum allocations are significantly weighted in favor of small and/or regional and unlicensed allocations.

| *2005-2008 SPECTRUM GEOGRAPHIC BLOCKS DECISIONS* | | | |
|---|---|---|---|
| **Band** | **Total Spectrum (MHz)** | **Geographic Blocks** | **License Type as % of Total Across All Bands** |
| 3650-3700 MHz | 50 | **UNLICENSED** | **46%** |
| 5.2-5.8 GHz | 250 | | |
| BRS/EBS | 190 | **BTA** | **29%** |
| AWS-1 | 90 | **BEA/CMA/REAG** | **22%** |
| 700 MHz 2008 Auction** | 52 | | |
| **AWS-3*** | **25** | **NATIONWIDE** | **4%** |
| Total | 657 | | |

*AWS-3 is part of the pending rulemaking

** Excludes 10 MHz of D block designated public safety interoperability

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# End Notes

1. *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*, ET Docket No. 00-258, Ninth Report and Order, FCC 06-45 (rel. Apr. 21, 2006) ("*AWS 9th R&O*") (establishing procedures for relocation of incumbent users)

2. *See Service Rules for Advanced Wireless Services in the 2155-2175 MHz Band; Service Rules for Advanced Wireless Services in the 1915-1920 MHz, 1995-2000 MHz, 2020-2025 MHz, and 2175-2180 MHz Bands*, WT Docket Nos. 07-195 & 04-356, Further Notice of Proposed Rulemaking, FCC 08-158, at ¶ 3 and proposed rule 27.16(b) (rel. Jun. 20, 2008) ("AWS-3 FNPRM").

3. *Id.*

4. AWS-3 FNPRM at ¶ 3 and proposed rule 27.1191.

5. *Id at ¶3 and proposed rule 27.14(a).*

6. *See Service Rules for the 698-746, 747-762 and 777-792 MHz Bands, Second Report and Order, 22 FCC Rcd 15289, ¶195 (2007).* ("700 MHz order")

7. *See* John Horrigan, Pew Internet & American Life Project, "Home Broadband Adoption 2009" p. 3, 37, Jun. 17, 2009, available at: http://www.pewinternet.org/Reports/2009/10-Home-Broadband-Adoption-2009.aspx .

8. *See* Karen Mossberger and Caroline J. Tolbert, "Digital Excellence in Chicago" p. 6, Jul. 2009, available at: http://egov.cityofchicago.org/webportal/COCWebPortal/COC_ATTACH/Digital_Excellence_Study_2009_--_Web.pdf.

9. Advertised Rates by AT&T available at: http://www.att.com/gen/general?pid=11023.

10. Advertised Rates by Verizon available at: http://www.verizonwireless.com/b2c/mobilebroadband/?page=plans&lid=//global//plans//mobile+broadband+plan.

11. Advertised Rates by T-Mobile available at: https://www.t-mobile.com/shop/plans/cell-phone-plans-detail.aspx?tp=tb1&rateplan=T-Mobile-webConnect-Data.

12. Advertised Rates by Cricket available at: http://www.mycricket.com/cricketplans/details/broadband.

13. Advertised Rates by Clearwire available at: http://www.clearwire.com/.

14. *See* AWS-3 FNPRM at ¶ 3 and proposed rule 27.1191 (b).

15. 47 U.S.C. § 157.

16. AWS-3 NPRM ¶ 1.

17. June 2008 AWS-3 FNPRM ¶ 1.

18. *See* Advanced Wireless Service Interference Test Results and Analysis, WT Docket. Nos. 07-195 & 04-356, at 3, (rel. Oct. 10, 2008) ("OET AWS-3 Test Results and Analysis").

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# End Notes

19. *Id.*

20. *AWS-3 FNPRM at ¶3. See* also *47 C . F . R . 27.53. (*limiting OOBE for 700 MHz at 43+10 log (P) ).

21. AWS-3 FNPRM at ¶ 3. *See also* OET AWS-3 Test Results and Analysis at 3. (noting that "also notes that the Commission has in the past adopted less stringent OOBE standards under flexible service rules whereby the licensees and industry work together cooperatively to manage potential interference.").

22. *See* Letter from Thomas J. Sugrue, T-Mobile to Marlene H. Dortch, Secretary, FCC WT Docket Nos. 07-195 and 04-356 (filed Nov. 17, 2008).

23. *See* Letter from Uzoma Onyeije, Vice President for Regulatory for M2Z Networks, to Marlene H. Dortch, Secretary, FCC, WT Docket Nos. 07-195 and 04-356 (Dec. 12, 2008).

24. *See supra note 22. See also See* Letter from Kathleen O'Brien Ham, T-Mobile to Marlene H. Dortch, Secretary, FCC WT Docket Nos. 07-195 and 04-356 (filed Dec. 5, 2008).

25. *See* WiMAX. (2009). In Webster's New World Telecom Dictionary Retrieved August 17th, 2009, from www.yourdictionary.com/telecom/wimax. *See e.g.* Motorola wi4WiMax, at p. 15, (Oct. 2007) available at: http://www.motorola.com/staticfiles/Business/Products/Wireless%20Networks/Wireless%20Broadband%20Networks/WiMAX/_Documents/Static%20Files/Operator_Guide_to_WiMAX_October2007(2).pdf.(citing comparisons performed by the WiMax Forum).

26. *See FNPRM Reply Comments of Dr. Gregory Rose, WT Docket Nos. 07-195 and 04-56, Exhibit II at , Sec. II C, ¶18 (filed Aug. 11, 2008) ("Dr. Gregory Rose Reply").*

27. *Information developed from FCC Auctions Home Page (http://wireless.fcc.gov/auctions/default.htm?job=auctions_home). According to the information listed there, the FCC has conducted 37 spectrum related auctions since 2001. Spectrum listed on this chart is for new terrestrial spectrum below 3 GHz auctioned between 2001 and 2008 which can be used to deliver high throughput broadband services directly to consumers. See also* slide 17.

28. *See Reply Comments of the TDD Coalition, WT Docket No. 02-353, at 17 (filed Mar. 14, 2003) ("TDD-based 3G implementations both transmit and receive within the same frequency band, thereby offering a higher spectral efficiency (i.e., more bits transmitted per hertz of bandwidth) for an equal amount of spectrum than FDD implementations."). See, e.g., ArrayComm Further Notice Comments at 2-3; See also Reply Comments of M2Z Networks, Inc., WT Docket Nos. 07-195 and 04-356, Technical Appendix 5, (filed Aug. 11, 2008).*

29. *Information developed from FCC Auctions Home Page (http://wireless.fcc.gov/auctions/default.htm?job=auctions_home). See* also slide 18.

30. *See In the Matter of 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, 17 FCC Rcd 9980, 9992(2002) (citing WCS Report and Order, 12 FCC Rcd at 10807-08 ¶45; Amendment of Part 90 of the Commission's Rules to Provide for the Use of the 220-222 MHz Band By the Private Land Mobile Radio Services, PR Docket No. 89-552, Report and Order, 6 FCC Rcd 2356, 2361 ¶34 (1991)).*

31. *47 U.S.C. §157(b). ("If the Commission initiates its own proceeding for a new technology or service, such a proceeding shall be completed within 12 months after it is initiated.").*

32. *See Lynette Luna, FCC's Martin circulates new AWS-3 Plan, Dec. 31, 2008 available at: http://www.fiercebroadbandwireless.com/story/fccs-martin-circulates-new-aws-3-plan/2008-12-31?utm_medium=nl&utm_source=internal&cmp-id=EMC-NL-FBW&dest=FBW*


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