Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	
Service Rules for Advanced Wireless Services	)	WT Docket No. 02-353
in the 1.7 GHz and 2.1 GHz Bands	)	

REPORT AND ORDER

Adopted: October 16, 2003 **Released:** November 25, 2003

By the Commission: Chairman Powell, Commissioners Martin and Adelstein issuing separate statements; Commissioner Copps approving in part, concurring in part and issuing a separate statement.

TABLE OF CONTENTS

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I. INTRODUCTION

1. In this Report and Order, we adopt service rules for Advanced Wireless Services (AWS) in the 1710-1755 and 2110-2155 MHz bands, including provisions for application, licensing, operating and technical rules, and for competitive bidding.[1] Licensees in these bands will have the flexibility to

[1] AWS is the collective term the Commission uses for new and advanced wireless applications, such as voice, data and broadband services provided over a variety of high-speed fixed and mobile networks, and which are popularly referred to as International Mobile Telecommunications-2000 (IMT-2000) or "third generation" (3G) systems. The "3G" nomenclature is based on the popular view that analog cellular systems represent the first generation of advanced wireless devices, that digital cellular and broadband Personal Communications Service systems represent the second, and that the next deployment of wireless technologies (which we include in the collective term "AWS") represents the third generation. The characteristics of IMT-2000/3G systems are described more fully in SPECTRUM STUDY OF THE 2500-2690 MHZ BAND, FINAL REPORT, at 7-10 (OET/MMB/WTB/IB, Mar. 30, 2001) (*FCC Final Spectrum Study*). A copy of this report has been placed in the docket file of ET Docket No. 00-258, and is available on the Internet at <http://www.fcc.gov/3G>.

provide any fixed or mobile service that is consistent with the allocations for this spectrum.[2] We will license this spectrum under our market-oriented Part 27 rules and, in order to accommodate differing needs, our band plan includes both localized and regional geographic service areas and symmetrically paired spectrum blocks with the pairings being composed of different bandwidths. Our licensing plan 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. The licensing framework that we adopt today for these bands will ensure that this spectrum is efficiently utilized and will foster the development of new and innovative technologies and services, as well as encourage the growth and development of broadband services.

2. Our actions today bring us closer to our goals of achieving the universal availability of broadband access and increasing competition in the provision of such broadband services both in terms of the types of services offered and in the technologies utilized to provide those services. The wide spread deployment of broadband will bring new services to consumers, stimulate economic activity, improve national productivity, and advance many other objectives – such as improving education, and advancing economic opportunity for more Americans. By encouraging the growth and development of broadband, our actions today also foster the development of facilities-based competition. We achieve these objectives by taking a market-oriented approach to licensing this spectrum that provides greater certainty, minimal regulatory intervention, and leads to greater benefits to consumers.

II. BACKGROUND

3. The 1710-1755 and 2110-2155 MHz bands have previously been used for a variety of Government and non-Government services. The National Telecommunications and Information Administration (NTIA) identified the 1710-1755 MHz band for transfer from exclusive use by the Federal Government to the Commission for mixed use, effective in 2004, pursuant to the Omnibus Budget Reconciliation Act of 1993 (OBRA-93).[3] The 2110-2150 MHz band was formerly used by private and common carrier fixed microwave services, but in 1992 was identified by the Commission for reallocation to services using new and innovative technologies under its *Emerging Technologies* proceeding.[4] The 2150-2155 MHz band is currently used by the Multipoint Distribution Service (MDS).

[2] The service rules that we adopt today for this spectrum build on the policy objectives set forth in the *Spectrum Policy Task Force Report*. Spectrum Policy Task Force, ET Docket No. 02-135, *Report* (rel. Nov. 15, 2002) (*Spectrum Policy Task Force Report*).

[3] Spectrum Reallocation Final Report, Response to Title VI – Omnibus Budget Reconciliation Act of 1993, NTIA Special Publication 95-32 (Feb. 1995) (*1995 Reallocation Final Report*); *see also* Omnibus Budget Reconciliation Act of 1993, Pub. L. No. 103-66, 107 Stat. 312 (1993) (OBRA-93). Under OBRA-93, "mixed use" means that some of the spectrum transferred from exclusive Government use can be partially retained for use by Federal Government stations. *See* 47 U.S.C. § 923(b)(2).

[4] *See generally* Redevelopment of Spectrum to Encourage the Establishment of Services Using New and Innovative Technologies, ET Docket No. 92-9, *First Report and Order and Third Notice of Proposed Rule Making*, 7 FCC Rcd 6886 (1992); *Second Report and Order*, 8 FCC Rcd 6495 (1993); *Third Report and Order and Memorandum Opinion and Order*, 8 FCC Rcd 6589 (1993); *Memorandum Opinion and Order*, 9 FCC Rcd 1943 (1994)*; Second Memorandum Opinion and Order*, 9 FCC Rcd 7797 (1994), *aff'd*, Association of Public Safety Communications Officials-International, Inc. v. FCC, 76 F.3d 395 (D.C. Cir. 1996) (collectively, "*Emerging Technologies* proceeding").

A. AWS Allocation Order

4. In November of last year, we adopted a *Second Report and Order* in ET Docket No. 00-258 that allocated spectrum for advanced services in the 1710-1755, 2110-2150 and 2150-2155 MHz bands and combined these latter two bands into a single 45-megahertz allocation (*i.e.*, 2110-2155 MHz).[5] Specifically, in the *AWS Allocation Order*, we allocated the 1710-1755 MHz band for fixed and mobile services on a co-primary basis contingent on the spectrum becoming available for mixed use by January 1, 2004. The 2110-2150 MHz band was already allocated to the fixed and mobile services on a primary basis. In order to create a second contiguous 45-megahertz band for advanced services, we added five megahertz of spectrum to the 2110-2150 MHz band from the upper adjacent band.[6] We reallocated the 2150-2155 MHz band from MDS, added a mobile allocation to this segment, and combined it with the 2110-2150 MHz band. As a result, we created two contiguous 45-megahertz bands, both allocated to the fixed and mobile services, and made this spectrum available for AWS.

5. By providing two 45-megahertz blocks of contiguous spectrum that could be paired, we allocated a significant amount of spectrum that can be used to support a wide variety of AWS applications, including though not limited to those associated with "3G" and "IMT-2000" technologies. In keeping with our flexible use policies, this allocation could be used by current service providers to expand their capacity for offering wireless voice and data services. Alternatively, it could be used by either current providers or new entrants to support the development of entirely new applications that are distinct from existing wireless offerings.

6. Before these bands can be put to effective use, however, incumbent licensees in these bands must be relocated to other spectrum. The 1710-1755 MHz band is currently used for Federal Government operations. As indicated above, NTIA originally identified the 1710-1755 MHz band for transfer in 1995 and indicated that the band could be made available to non-Federal Government users on a mixed-use basis in 2004.[7] NTIA noted, however, that Federal Government use of this band would have to be protected indefinitely at 333 fixed microwave stations used by Federal Power Agencies, at 111 stations used for aviation-related safety communications, and at 16 sites used by Department of Defense for fixed microwave, tactical radio relay, and aeronautical mobile stations.[8]

7. In July 2002, NTIA offered a plan that, if fully implemented, could largely clear this band of Federal Government users by no later than December 31, 2008.[9] The plan indicates that in order for

[5] 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, *Second Report and Order*, 17 FCC Rcd 23193 (2002) (*AWS Allocation Order*), *recons pending*.

[6] This spectrum was part of a 10-megahertz block (12 megahertz in the top fifty markets) that was allocated to MDS in the 2150-2160/2162 MHz band. MDS stations licensed after 1992 to use the 2160-2162 MHz band are on a secondary basis.

[7] *1995 Reallocation Final Report*, *supra* n.3.

[8] *Id*. at App. E and p. F-4.

[9] U.S. Department of Commerce, National Telecommunications and Information Administration, "An Assessment of the Viability of Accommodating Advanced Mobile Wireless (3G) Systems in the 1710-1770 MHz and 2110-2170 MHz Bands," *Report*, at 2-4, rel. July 22, 2002 (*NTIA AWS Assessment*). The Commission sought comment on the *NTIA AWS Assessment.* FCC Seeks Comment On The National Telecommunications and Information Administration's Report, *An Assessment Of The Viability Of Accommodating Advanced Mobile Wireless (3G) Systems In The 1710-1770 MHz and 2110-2170 MHz Bands*, ET Docket No. 00-258, *Public Notice*, (continued….)

the time line to be achieved certain actions would be required to be accomplished.[10] Any significant delays in the availability of relocation funds or delays in the other assumptions upon which the December 31, 2008 clearance date is based could require the predicted clearance time line to be revised.[11] Along with requiring commercial users to reimburse Federal users' relocation costs, part of this plan requires the Commission to conduct a rulemaking that would reallocate other spectrum to accommodate Federal systems that otherwise would remain in the 1710-1755 MHz band indefinitely. We initiated this rulemaking proceeding with the issuance of a *Fourth Notice of Proposed Rulemaking* in ET Docket No. 00-258 this past July.[12]

8. As discussed above, we created the 2110-2155 MHz band by combining two adjacent band segments. The 2110-2150 MHz segment of this band is currently used by incumbent point-to-point fixed microwave licensees. In the *AWS Allocation Order*, we stated that we will use existing relocation rules to provide for the migration of these licensees to other spectrum.[13] The 2150-2155 MHz segment of the 2110-2155 MHz band is currently used by MDS, and we are considering relocation spectrum and procedures for MDS operations in this band in another proceeding.[14]

B. AWS Service Rules NPRM

9. Concurrently with adoption of the *AWS Allocation Order*, we also adopted a *Notice of Proposed Rulemaking* in WT Docket No. 02-353 that sought comment on licensing, technical and operational rules to govern the use of the 1710-1755 and 2110-2155 MHz bands.[15] In the *AWS Service Rules NPRM*, we proposed licensing and service rules that would permit maximum licensee flexibility and sought to remove regulatory barriers to innovation. Consistent with this approach, we proposed that the 1710-1755 and 2110-2155 MHz bands could be used to provide any service, including AWS, that is consistent with the bands' fixed and mobile allocations. We proposed to license these bands under Part 27 of the Commission's rules. Part 27 provides a flexible regulatory framework that we have applied to multiple bands and services, which includes basic licensing requirements and sets out certain technical requirements to prevent interference. We also proposed to assign licenses in these

(Continued from previous page)
17 FCC Rcd 14390 (2002). The *NTIA AWS Assessment* was incorporated into 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, *Fourth Notice of Proposed Rulemaking*, ET Docket No. 00-258, 18 FCC Rcd 13235 (2003).

[10] *NTIA AWS Assessment* at 2.

[11] *Id*. at 2-4 (detailing the assumptions upon which NTIA predicted clearance by December 31, 2008).

[12] 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, *Fourth Notice of Proposed Rulemaking*, 18 FCC Rcd 13235 (2003).

[13] *AWS Allocation Order*, 17 FCC Rcd at 23215 ¶ 46.

[14] *See AWS Allocation Order*, 17 FCC Rcd at 23212-13 ¶ 41; s*ee also* 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, *Third Report and Order, Third Notice of Proposed Rulemaking and Second Memorandum Opinion and Order*, 18 FCC Rcd 2223 (2003); Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Use of the Universal Licensing System in the 2150-2162 and 2500-2690 MHz Bands, WT Docket No. 03-66, *Notice of Proposed Rule Making and Memorandum Opinion and Order*, 18 FCC Rcd 6722 (2003).

[15] Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands, WT Docket No. 02-353, *Notice of Proposed Rulemaking*, 17 FCC Rcd 24135 (2002) (*AWS Service Rules NPRM*).

bands through competitive bidding and sought comment on a number of auction-related issues, including the use of bidding credits, in connection with these licensing procedures.

10. In addition, we asked what geographic areas should be used to license this spectrum, whether the bands should be divided into particular blocks of spectrum, and, if so, what size the blocks should be and what pairings would be appropriate for this spectrum. Among other proposals, we proposed ten-year license terms, proposed to permit post-auction disaggregation and partitioning, and sought comment on possible construction requirements. We also sought comment on a variety of technical issues, including on how best to control in-band and out-of-band interference, appropriate power limits, RF safety limits, and Canadian and Mexican coordination.

11. Comments on the *AWS Service Rules NPRM* were due by February 7, 2003, and reply comments were due by March 14, 2003. Eighteen comments and eight reply comments were filed in response to the *AWS Service Rules NPRM*. A list of commenters and reply commenters can be found in Appendix A. In addition, as permitted under our rules, there have been *ex parte* presentations.

III. DISCUSSION

A. In General

1. Flexible Use

12. *Background*: In the *AWS Service Rules NPRM*, we proposed to allow licensees in the 1710-1755 and 2110-2155 MHz bands flexibility to provide any fixed or mobile or combination of fixed and mobile services permitted by the United States Table of Frequency Allocations. We concluded that this approach was consistent with Section 303(y)(2) of the Communications Act, as amended by the Balanced Budget Act of 1997, which grants the Commission authority to permit flexible use of spectrum if it finds that such use: (1) is in the public interest; (2) would not deter investment in communications services and systems, or technology development; and (3) would not result in harmful interference among users.[16] We sought comment on our tentative conclusion to permit flexible use of this spectrum.

13. *Discussion*: In order to promote innovative services and encourage the flexible and efficient use of the 1710-1755 and 2110-2155 MHz bands, we permit licensees to use this spectrum for any use permitted by the United States Table of Frequency Allocations contained in Part 2 of our rules (*i.e.*, fixed or mobile services). All of the comments we received on this issue support permitting flexible use of this spectrum.[17] CTIA states "flexibility in spectrum regulation can improve access to spectrum, promote efficiency and allow spectrum to migrate to the most highly-valued uses."[18] Cingular observes that "[l]icensees need flexibility to deploy new technologies, implement service innovations, expand capacity in response to growing demand, and otherwise respond to market forces."[19] PetroCom states that flexibility gives "licensees the freedom to determine the services the public desires."[20] Flexibility thus allows spectrum to move to its highest valued use without regulatory

[16] Balanced Budget Act of 1997, Pub. L. No. 105-33, 111 Stat. 251 (1997) (BBA-97); 47 U.S.C. § 303(y); *see AWS Service Rules NPRM*, 17 FCC Rcd 24135, 24140-41 ¶ 12.

[17] CTIA Comments at 2-3; Ericsson Comments at 2; Nokia Comments at 1; PetroCom Comments at 6-8; Cingular Reply Comments at 3-4; TDD Coalition Reply Comments at 2-5.

[18] CTIA Comments at 2.

[19] Cingular Reply Comments at 3.

[20] PetroCom Comments at 7.

lag, an economically efficient result.[21] Given the expected use of the 1710-1755 and 2110-2155 MHz bands, permitting flexible use of these bands is clearly in the public interest.

14. In fact, we believe flexibility will spur investment in communication services and systems and technology development. We find that permitting licensees to use this spectrum for any use permitted by the spectrum's allocation will not deter investment in communications services and systems, or technology development. The record in this proceeding supports this determination. Ericsson states that flexibility "is imperative to ensure the successful development and deployment of AWS."[22] CTIA observes that flexibility "fosters the development of innovative, state-of-the-art service offerings."[23] Cingular asserts that flexibility permits licensees "to deploy new technologies, implement service innovations, expand capacity in response to growing demand, and otherwise respond to market forces."[24] Our experience with licensing the Personal Communications Services (PCS) supports the conclusion that flexibility spurs investment and service innovations. In the PCS bands, flexibility has encouraged industry investment, promoted competition, and fostered technology innovations. We believe, as PetroCom observes, that flexibility "will promote investment in different technologies . . ."[25]

15. We also find that permitting licensees to employ this spectrum for any fixed or mobile use permitted by the United States Table of Frequency Allocations will not result in harmful interference among spectrum users. The technical rules we adopt below reflect careful consideration of potential interference scenarios, both during the transition period before incumbents relocate and as the spectrum becomes developed.[26] Further, potential for interference between different services and technologies is mitigated by our decision to adopt geographic area licensing and a band plan that takes interference considerations into account. Finally, the flexibility we are permitting will itself provide licensees the ability to adjust their operations to minimize any interference that might occur. As the TDD Coalition states, "flexibility in choosing various technologies for spectrum allocation will negate any significant potential interference that occurs when differing technologies are permitted to co-locate within the same spectrum band."[27] Our technical rules for the 1710-1755 and 2110-2155 MHz bands will therefore permit licensees to provide a wide variety of services in these bands with a minimum of interference, and will permit both in-band and adjacent band licensees to operate with sufficient certainty and clarity regarding their rights and responsibilities.[28] In this case, licensees will be able to

[21] The *Spectrum Policy Task Force Report* found that "[f]lexibility enables spectrum users to make fundamental choices about how they will use spectrum (including whether to use it or transfer their usage rights to others), taking into account market factors such as consumer demand, availability of technology, and competition." *Spectrum Policy Task Force Report* at 16.

[22] Ericsson Comments at 2.

[23] CTIA Comments at 3.

[24] Cingular Reply Comments at 3.

[25] PetroCom Comments at 7.

[26] The *Spectrum Policy Task Force Report* cautioned that clear technical rules (*e.g.*, power limits, interference standards) are necessary in order to facilitate the co-existence of multiple spectrum uses in common and adjacent bands. *Spectrum Policy Task Force Report* at 16; *see also* Nokia Comments at 1.

[27] TDD Coalition Reply Comments at 4-5.

[28] *See* Verizon Wireless Comments at 1-3; Cingular Reply Comments at 1-3.

provide any service that is consistent with the spectrum's allocation and the operating and technical rules.[29]

2. Regulatory Framework

16. *Background*: In the *AWS Service Rules NPRM*, we proposed to license the 1710-1755 and 2110-2155 MHz bands under Part 27 of the Commission's rules.[30] We reasoned that the flexibility that these rules provide is consistent with our proposal that licensees in these bands could use this spectrum for any service consistent with the bands' fixed and mobile allocations. Alternatively, we sought comment on whether the bands should be licensed under Parts 22, 24, some other rule part, or a newly created rule part.

17. *Discussion*: We will license the 1710-1755 and 2110-2155 MHz bands under Part 27 of the Commission's rules, as those rules are modified below to reflect certain characteristics of this spectrum. Our Part 27 rules reflect a market oriented approach to licensing, and the flexibility these rules provide will encourage the deployment of a wide variety of fixed and mobile services in these bands. We agree with the TDD Coalition that "Part 27 is sufficient to govern these bands due to its flexible nature, and the fact that it was created for miscellaneous wireless services, and their interoperability."[31] We note, however, that as with other Part 27 licensees, licensees in these bands will be required to comply with rules of general applicability contained in other parts of the Commission's rules.[32]

18. AT&T Wireless, Cingular, CTIA, Ericssson, Motorola, and Verizon Wireless oppose licensing this spectrum under Part 27. They argue that the bands should be licensed under Part 24 of the Commission's rules, which was used to license broadband and narrowband PCS.[33] These commenters state that this spectrum will be used for services similar to services already being offered in the PCS bands. They assert that applying the same regulatory framework to both the PCS and AWS bands will avoid imposing disparate regulatory and technical requirements on carriers offering the same or similar advanced wireless services in both bands.

19. We disagree with the assertion that these bands should be licensed under the Commission's Part 24 rules. While both Part 27 and Part 24 provide substantial flexibility, our Part 24 rules are service-specific and focus exclusively on PCS, whereas our Part 27 rules provide a broader and more flexible regulatory framework that has been applied to different services in multiple spectrum bands (*i.e.*, the upper and lower 700 MHz bands and the 2.3 GHz band).[34] There are also several differences between the two rules parts that provide slightly greater flexibility to Part 27 licensees. For example, the Part 24 rules permit fixed and mobile services, while the Part 27 rules

[29] The *Spectrum Policy Task Force Report* recommended that our approach to licensing should be to allow licensees to do anything not explicitly prohibited by the Communications Act, the Commission's rules, Commission orders, licenses or authorizations. *Spectrum Policy Task Force Report* at 18.

[30] *AWS Service Rules NPRM*, 17 FCC Rcd at 24141 ¶ 13.

[31] TDD Coalition Reply Comments at 5.

[32] 47 C.F.R. § 27.3; *see infra* ¶¶ 84-86.

[33] AT&T Wireless Comments at 9-11; CTIA Comments at 3-4; Ericsson Comments at 2, 10; Motorola Comments at 3-5; Verizon Wireless Comments at 3; Cingular Reply Comments at 4-5; Motorola Reply Comments at 5.

[34] *Compare* 47 C.F.R. § 24.1 *with* 47 C.F.R. § 27.1.

permit any service consistent with a band's allocation.[35] Part 27 is also more flexible in terms of build out requirements, and indeed many commenters supporting Part 24 regulation actually advocate that we apply more flexible build out requirements like those in Part 27.[36]

20. Based on these considerations, we regard Part 27 as more suitable than Part 24 for regulation and licensing of new spectrum to which we intend to apply flexible, market-oriented rules. We do not believe that proponents of Part 24 licensing will be disadvantaged by licensing these bands under Part 27 and, in fact, we see benefits to licensing this spectrum under Part 27. The Part 27 rules are designed to promote flexibility and permit market forces rather than the Commission to determine what services are offered in the spectrum licensed under this rule part. Hence, the Part 27 rules permit a licensee to provide any services for which its frequency bands are allocated.[37] This light-handed regulatory approach means that licensees in the 1710-1755 and 2110-2155 MHz bands will not be restricted to providing Commission-defined services. Spectrum licensed under Part 27 can be used in a multiple of ways by the same or different licensees, and the spectrum can be put to different uses across the country. As a result, the marketplace rather than the Commission will determine how this spectrum is to be used, and this should not only encourage research and investment but also spur the development and deployment of innovative services to consumers. Licensing this spectrum under Part 27 also means that licensees in these bands will be free to change the services they provide and the technologies that they utilize as market conditions change.[38]

21. In addition, the technical requirements that we adopt below are consistent with the technical requirements for broadband PCS, and therefore PCS licensees who acquire spectrum in the 1710-1755 and 2110-2155 MHz bands will not be subject to disparate treatment. For example, we adopt the same out-of-band emission limits for AWS transmitters that are currently used for broadband PCS.[39] As a result, only a minimum amount of design modification will be needed by PCS equipment manufacturers in producing AWS equipment.

3. Assignment of Licenses

22. *Background*: In the *AWS Service Rules NPRM*, we acknowledged that Section 3002 of the Balanced Budget Act of 1997 requires the Commission to assign certain spectrum, including the majority of the AWS bands, through competitive bidding.[40] We recognized, however, that one portion of the AWS bands -- 2150-2155 MHz -- is not subject to a band specific directive to assign by competitive bidding.[41] We noted that the 2150-2155 MHz band was only subject to the general section 309(j) requirement that the Commission assign licenses through the use of competitive bidding when mutually exclusive applications for initial licenses are accepted for filing, unless certain specific statutory exemptions apply.[42] We also tentatively concluded that it serves the public interest to assign

[35] *Compare* 47 C.F.R. § 24.3 *with* 47 C.F.R. § 27.2(a).

[36] *See infra* ¶¶ 73-79; *see also* Verizon Wireless Comments at 3-4.

[37] 47 C.F.R. § 27.2(a).

[38] *See infra* ¶¶ 84-86 (discussing other rule parts that may apply to licensees in the 1710-1755 and 2110-2155 MHz bands).

[39] *See infra* ¶¶ 92-94.

[40] *AWS Service Rules NPRM*, 17 FCC Rcd at 24141-42 ¶ 15 (citing Balanced Budget Act of 1997, Pub. L. No. 105-33, 111 Stat. 251. § 3002(b), (c)(1)(D), (c)(3)).

[41] *Id*.

[42] *Id*.

licenses for all portions of the AWS bands by the same mechanism.[43] Consequently, we explained that if we adopt a licensing scheme for all portions of the AWS bands that permits the filing of mutually exclusive applications, consistent with both statutory obligations, we would resolve such applications through competitive bidding.[44] However, we also sought comment on other approaches to assign licenses that include the 2150-2155 MHz portion of the AWS bands.[45] In suggesting other approaches, commenters were requested to use the analytical framework established in the *BBA Report and Order* regarding the Commission's exercise of its 309(j) auction authority.[46]

23. *Discussion*: One commenter supports our tentative conclusion to assign all portions of the AWS bands by the same mechanism.[47] Other commenters also generally concur that, to the extent that we adopt a licensing scheme that permits the filing of mutually exclusive applications, consistent with statutory obligations, we should resolve such applications through competitive bidding.[48] In addition, most commenters agree with our proposal to adopt a geographic area licensing scheme for the 1710-1755 and 2110-2155 MHz bands.[49] However, two commenters believe that we should assign licenses through other mechanisms or that the Commission should not utilize competitive bidding.[50]

24. Specifically, one commenter, Mizelle, urges the Commission to adopt an application process coupled with yearly fees based upon gross revenue.[51] Another commenter, Goldstein, requests that the Commission offer licenses to "eligible local exchange carriers" in rural areas and not subject such licenses to competitive bidding.[52] Both commenters fail to explain how their proposals would comply with the Commission's statutory obligations under Section 3002 of the Balanced Budget Act

[43] *Id*.

[44] 47 U.S.C. § 309(j).

[45] *AWS Service Rules NPRM*, 17 FCC Rcd at 24141-42 ¶ 15.

[46] *See* Implementation of Sections 309(j) and 337 of the Communications Act of 1934 as Amended, WT Docket No. 99-87, *Report and Order and Further Notice of Proposed Rule Making*, 15 FCC Rcd 22709, 22717-35 ¶¶ 18-50 (1999) (*BBA Report and Order*). Section 309(j)(2) exempts from competitive bidding licenses and construction permits for public safety radio services, digital television service licenses and permits given to existing terrestrial broadcast licensees to replace their analog television service licenses, and licenses and construction permits for noncommercial educational broadcast stations and public broadcast stations described in section 397(6) of the Communications Act. 47 U.S.C. § 309(j)(2). Section 647 of the Open-Market Reorganization for the Betterment of International Telecommunications Act prohibits the Commission from employing competitive bidding to assign spectrum or orbital locations used for the provision of international or global satellite communications services. Pub. L. No. 106-180, 114 Stat. 48 § 647. In this instance, because there is no broadcast or satellite allocation, the noncommercial educational broadcast station and Orbit Act exemptions are plainly inapplicable. Similarly, because we have not designated the 1710-1755 and 2110-2155 MHz bands as public safety radio service spectrum, the public safety radio services exemption does not apply.

[47] *See* TDD Coalition Reply Comments at 6.

[48] *See, e.g.,* CTIA Comments at 15 (supporting the Commission's tentative conclusion to license the AWS bands through competitive bidding pursuant to Section 309(j) of the Communications Act); Cingular Reply Comments at 1.

[49] *See infra* ¶ 30.

[50] *See, e.g.,* Mizelle Comments at 1-2; Goldstein Comments at 1; *see also* RCA Comments at 2 (arguing that the use of auctions "inherently favors entities with access to money from the public markets").

[51] Mizelle Comments at 1-2.

[52] Goldstein Comments at 1.

of 1997 and Section 309(j) of the Communications Act.[53] We note that neither Mizelle nor Goldstein specified whether they were addressing all portions of the AWS bands or the 2150-2155 MHz band. In addition, they also fail to address basic questions that would arise when contemplating an alternative mechanism for assigning licenses. For example, Mizelle fails to indicate how the Commission might choose between mutually exclusive applicants under its proposal. Goldstein's proposal is also flawed because there is no indication of the circumstances under which a local exchange carrier would be eligible for a license. Nor does Goldstein indicate what would occur if a local exchange carrier was not interested in a reserved license or if the local exchange carrier decided to subsequently sell the license for a profit. Thus, in addition to statutory infirmities, both proposals raise some of the same policy concerns the Commission encountered in prior licensing regimes, *i.e.*, comparative hearings or lotteries.[54]

25. As explained below, we are adopting a geographic area licensing scheme that permits the filing of mutually exclusive applications.[55] Accordingly, pursuant to Section 309(j) of the Communications Act and Sections 3002(b), (c)(1)(D), and (c)(3) of the Balanced Budget Act of 1997, we must resolve mutually exclusive applications for licenses in these bands through competitive bidding.[56] We will address the particular competitive bidding rules in a subsequent section.[57]

26. While initial licenses for this spectrum will be assigned through competitive bidding, it also will be possible for entities to acquire spectrum in these bands through such post-auction mechanisms as disaggregation and partitioning and secondary markets.[58] In our recently released *Secondary Markets Report and Order*, we took action to remove unnecessary regulatory barriers to the development of secondary markets.[59] We adopted new policies and procedures that enable most wireless licensees, including Part 27 licensees, to lease some or all of their spectrum usage rights to

[53] We note that adoption of the assignment mechanisms suggested by Mizelle and Goldstein would require an amendment to Section 309(j) of the Communications Act.

[54] The comparative hearing process was complex and often led to proceedings that substantially delayed the award of licenses. *See, e.g., Ranger Cellular and Miller Communications, Inc. v. FCC*, 2003 WL 21495159, 1 (D.C. Cir. July 1, 2003) ("*Ranger*") (citations omitted); *see also* Implementation of Section 309(j) of the Communications Act – Competitive Bidding, *Second Report and Order*, 9 FCC Rcd 2348, 2359 ¶ 64 (1994) (finding that comparative hearings are lengthy, contentious and complex). Lotteries, by contrast, did not compare applicants' qualifications, and sometimes resulted in the disqualification of the winner, necessitating a new lottery and raising the concern about lottery winners being unjustly enriched. *Ranger*, at 1; *see also* Reexamination of the Comparative Standards for Noncommercial Educational Applicants, *Report and Order*, 15 FCC Rcd 7386, 7391 ¶¶ 13,14 (2000). The disadvantages of these two systems were recognized in a 1993 report by the House Committee on Energy and Commerce, 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.

[55] *See infra* ¶ 30-34.

[56] 47 U.S.C. § 309(j); Balanced Budget Act of 1997, Pub. L. No. 105-33, 111 Stat. 251. § 3002(b), (c)(1)(D), (c)(3)).

[57] *See infra* ¶¶ 136-149.

[58] *See infra* ¶¶ 80-82 (discussing disaggregation and partitioning).

[59] Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets, *Report and Order and Further Notice of Proposed Rulemaking*, WT Docket No. 00-230, FCC 03-113 (rel. Oct. 6, 2003) (*Secondary Markets Report and Order*).

third-party spectrum lessees.[60] The spectrum leasing policies established in that proceeding will be applied to the new AWS services established in this proceeding in the same manner that those policies apply to other Part 27 services (with the exception of Guard Band Manager licensing which has its own set of spectrum leasing policies and rules), and all other exclusive use Wireless Radio Services.[61] The flexible policies adopted in that proceeding and with respect to the AWS bands will allow more entities access to the AWS spectrum and permit the marketplace to decide what use is made of this spectrum.

B. Band Plan

27. *Background*: In the *AWS Service Rules NPRM*, we proposed to license the 1710-1755 and 2110-2155 MHz bands using a geographic area licensing scheme (instead of station-defined site-by-site licensing) and sought comment on this proposal. In addition, we sought comment on the related issue of what size geographic licensing area or areas should be used to license this spectrum. We asked whether nationwide, regional, local, or some combination of these approaches should be used to license this spectrum. We also sought comment on the amount of spectrum that should be included in each license, and the associated issue of whether the spectrum should be paired.

28. *Discussion*: We adopt a geographic area licensing approach to license spectrum in the 1710-1755 and 2110-2155 MHz bands. This approach will use both regional and localized service areas. We will employ symmetrically paired spectrum blocks with the pairings being comprised of different bandwidths. In total, we will make available 946 licenses for spectrum in the 1710-1755 and 2110-2155 MHz bands. The table below summarizes our band plan for these two bands.

Blocks	Pairings	Amount	Area	Licenses
A	1710-1720 and 2110-2120	2x10	EA	176
B	1720-1730 and 2120-2130	2x10	REAG	12[62]
C	1730-1735 and 2130-2135	2x5	REAG	12
D	1735-1740 and 2135-2140	2x5	RSA/MSA	734
E	1740-1755 and 2140-2155	2x15	REAG	12

29. We believe this band plan best implements the auction objectives and other guidance set forth in section 309(j), and also best comports with the record evidence regarding likely uses of this spectrum. Of course, bidders will be able to aggregate (*i.e.*, acquire multiple) licenses during the auction. In addition, after the licenses are awarded, licensees may engage in a variety of secondary market transactions (*i.e.*, aggregation, disaggregation, partitioning, or spectrum leasing). Therefore, if we have specified license dimensions that do not directly meet the needs of certain auction applicants, the secondary market will provide them with the opportunity to acquire the geographic and bandwidth footprints required to implement their business plans. As we note in the Competitive Bidding section of this Report and Order, the Wireless Telecommunications Bureau ("WTB"), consistent with statutory obligations,[63] will seek comment on auction-related procedural issues,

[60] *Id*. at ¶ 84.

[61] *Id*.

[62] Of the 12 REAGs, the first six cover the continental United States and the other six cover smaller areas (*i.e.*, Alaska, Hawaii, the islands, and the Gulf of Mexico). 47 C.F.R. § 27.6(a)(1).

[63] *See* 47 U.S.C. § 309(j)(3)(E)(i)(obligation to permit notice and comment on proposed auction procedures before issuance of bidding rules).

including auction design, prior to the start of the AWS auction pursuant to WTB's existing delegated authority.[64] This will provide WTB with an opportunity to weigh the benefits and disadvantages of any particular bidding design, prior to the start of the auction.

1. Geographic Area Licensing

30. We will license the 1710-1755 and 2110-2155 MHz bands using geographic area licensing. The record supports this decision with only one commenter voicing concern with this approach. None of the commenters advocate site-by-site licensing. CTIA states that it "strongly supports the Commission's proposal to adopt a geographic area -- rather than a site-by-site -- licensing scheme for the AWS bands."[65] Cingular observes that "[g]eographic area licensing is especially beneficial where spectrum is likely to be used for services, such as CMRS, that require ubiquity and mobility over wide areas."[66] AT&T Wireless asserts that "the AWS spectrum should be licensed on a geographic area basis."[67] Ericsson states that it supports geographic area licensing.[68] Other commenters implicitly agree that geographic area licensing should be used to license these bands because their comments address what size geographic areas should be used to license this spectrum.[69]

31. Our experience has been that geographic area licensing offers many advantages over site-by-site licensing for the types of services expected in these bands. It affords licensees substantial flexibility to respond to market demand, which results in significant improvements in spectrum utilization. In particular, geographic area licensing permits economies of scale because it allows licensees to coordinate usage across an entire geographic area to maximize the use of spectrum. It also reduces regulatory burdens and transaction costs, because licensees do not require site-by-site approval and can aggregate their service territories without incurring the administrative costs and delays associated with site-by-site licensing. This is especially advantageous where spectrum is likely to be used for services that require ubiquity and mobility over wide areas. As a result, licensees can more rapidly roll out their services, which was our experience with PCS.

32. In addition, as noted above, section 3002 of the Balanced Budget Act of 1997 requires the Commission to assign licenses for the majority of the 1710-1755 and 2110-2155 MHz spectrum through competitive bidding.[70] A geographic licensing scheme is likely to result in the acceptance of mutually exclusive license applications, which under section 309(j) must be assigned through

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[64] *See* 47 C.F.R. §§ 0.131(c) (functions of WTB); 0.331 (authority delegated to WTB); 0.332 (actions taken under WTB's delegated authority); 1.2103 (competitive bidding design options, including simultaneous multi-round and combinatorial bidding auctions, among others); 1.2104 (competitive bidding mechanisms). *See also* Amendment of Part 1 of the Commission's rules—Competitive Bidding Procedures, *Order, Memorandum Opinion and Order, and Notice of Proposed Rule Making*, 12 FCC Rcd 5686, 5697-98 ¶ 16 (1997). *See, e.g.,* Auction of Regional Narrowband PCS Licenses Scheduled for September 24, 2003, Comment Sought on Package Bidding Procedures, Reserve Prices or Minimum Opening Bids, and Other Auction Procedures, 18 FCC Rcd 6366 (2003).

[65] CTIA Comments at 5.

[66] Cingular Reply Comments at 9.

[67] AT&T Wireless Comments at 1.

[68] Ericsson Comments at 3.

[69] *See* Motorola Comments at 6; RCA Comments at 2-4; U.S. Cellular Comments at 3-8; Verizon Wireless Comments at 8-10; Cingular Reply Comments at 9; TDD Coalition Reply Comments at 7.

[70] *See supra* ¶ 24.

competitive bidding. Accordingly, a geographic area licensing scheme serves the Commission's statutory obligation to assign licenses for the majority of these bands through competitive bidding. For this additional reason, therefore, we will use a geographic area licensing scheme for this spectrum.

33. The National Radio Astronomy Observatory (NRAO) opposes the use of geographic area licensing for the 1710-1755 and 2110-2155 MHz bands to the extent that such licensing would permit AWS fixed stations to operate within the National Radio Quiet Zone without prior coordination.[71] NRAO requests that the 1718.8-1722.2 MHz band remain available for radio astronomy use outside the National Radio Quiet Zone and that this spectrum not be made available for use by AWS.

34. The Commission has long recognized the National Radio Quiet Zone in its rules. Specifically, applicants and licensees planning to construct and operate a new or modified station at a permanent fixed location within a 13,000 square mile rectangular area must coordinate with the NRAO site located at Green Bank, West Virginia and the Naval Radio Research Observatory (NRRO) located at Sugar Grove, West Virginia.[72] We find that the requirement to protect NRAO and NRRO is in no way compromised by our adoption of geographic area licensing for AWS because Section 1.924 applies to applicants and licensees regardless of whether they are licensed on a site-by-site or geographical area basis. With regard to the other radio astronomy observatories listed in footnote US311 of section 2.106, we note that RAS facilities located outside the National Radio Quiet Zone observe in the band 1718.8-1722.2 MHz on an unprotected basis.[73] We continue to believe that this status is appropriate for these facilities.[74] Therefore, we will not adopt formal coordination procedures to protect these RAS observatories. Where practicable, we do, however, recommend that AWS licensees make reasonable efforts to avoid the use of frequencies at stations in the fixed and mobile services that could interfere with the RAS observatories listed in footnote US311.

2. Size of Geographic Areas

35. In order to meet competing needs and to provide maximum flexibility, we will license the 1710-1755 and 2110-2155 MHz bands using a range of geographic licensing areas. These include large regional licensing areas, smaller regional licensing areas, and local licensing areas. The approach we adopt will foster service to rural areas[75] and tribal lands, and will promote investment in and rapid deployment of new technologies and services.[76] By including these varied-sized geographic licensing areas in our band plan for this spectrum, we promote the policy goal of disseminating licenses among a wide variety of applicants.[77] The record in this proceeding supports this approach. While some of the commenters request that this spectrum be licensed using nationwide or large regional geographic licensing areas,[78] others request smaller localized licensing areas,[79] and still others

[71] *See* NRAO Comments at 9.

[72] *See* 47 C.F.R. § 1.924(a).

[73] *See* 47 C.F.R. § 2.106, footnote US311. Greenbank is listed in footnote US311 as means of reminding applicants and licensees of its existence. However, this listing does not alter the requirement for AWS licensees to comply with 47 C.F.R. § 1.924(a).

[74] *See, e.g., AWS Allocation Order*, 17 FCC Rcd at 23205 ¶ 25.

[75] *See* 47 U.S.C. § 309(j)(3)(A).

[76] *See* 47 U.S.C. § 309(j)(4)(C)(iii).

[77] *See* 47 U.S.C. § 309(j)(3)(B), (4)(C).

[78] Verizon Wireless Comments at 8-10.

request a combination of large and small geographic licensing areas.[80] We believe that there is enough spectrum available in these two bands to accommodate the competing need for both large and small geographic licensing areas and that by including these varied-sized areas in our band plan for this spectrum we are providing carriers with the flexibility to tailor their licensing areas to meet their individual business needs and goals.

36. Offering the three geographic license sizes we have chosen will implement the objectives of section 309(j) given the record before us. Offering only a single, large geographic license size would not meet the needs of many prospective bidders and could lead to post-auction disaggregation and partitioning costs. On the other hand, offering only small geographic licenses intended to be used as building blocks would in effect impose unneeded, excess aggregation costs (either during an auction or in post-auction secondary transactions). However, specifying three different geographic sizes will best directly meet the various expressed needs of prospective entrants. It will also best meet the needs of incumbents who have varying spectrum positions today and likely varying needs for added spectrum. However, we have also chosen our license definitions so that if they do not directly meet the needs of bidders, then combining them is facilitated.

37. Economic Areas (EAs) and Regional Economic Area Groupings (REAGs) are related to each other.[81] EAs can be aggregated to form REAGs. As a result of being related to each other, EAs and REAGs can be combined to form specific service territories or existing service providers can acquire a licensing area in order to supplement their existing spectrum capacity. MSAs and RSAs, however, cannot be combined to form EAs because several MSAs/RSAs cross EA borders. These licensing areas can either be acquired through the competitive bidding process, or through post-auction, secondary market mechanisms (*e.g.*, partitioning and disaggregation, leasing, etc.). Either way, the licensing areas we have chosen will allow licensees to make adjustments to suit their individual needs.

38. By utilizing REAGs, we meet the needs of those carriers interested in creating regional or nationwide service territories.[82] For instance, a carrier interested in providing this type of service could combine the REAGs to create a nationwide service territory. Alternatively, a REAG could be combined with geographically related EA or MSA to create a regional service area with aggregated spectrum. In addition, an existing service provider could chose to increase its spectrum capacity by acquiring a REAG or acquire EAs in particular areas where it has a need for additional capacity. These types of large licensing areas permit carriers to take advantage of economies of scale and they allow service providers greater flexibility in the build-out of their services, since they are less constrained by geographical license limits. These types of licensing areas also require less coordination because there are fewer adjacent licensees.

39. While some carriers may desire regional or nationwide service territories, others are interested in localized service areas. Our band plan meets this need by including licensing areas based on MSAs and RSAs.[83] These local service areas will be optimal for incumbent operators who may

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[79] ATT Wireless Comments at 4; RCA Comments at 2-4; TDD Coalition Reply Comments at 7.

[80] CTIA Comments at 5-7; U.S. Cellular Comments at 3-8; Cingular Reply Comments at 8-9.

[81] *See* 47 C.F.R. § 27.6.

[82] *See, e.g.,* CTIA Comments at 6; U.S. Cellular Comments at 5-8; Verizon Wireless Comments at 8.

[83] MSAs and RSAs are collectively referred to as Cellular Market Areas (CMAs). MSAs and RSAs were originally used to license cellular service. 47 C.F.R. § 22.909. They have more recently been refined and used for (continued….)

need spectrum capacity only in limited areas. These local service areas also favor smaller entities, such as rural telephone companies and small service providers, with localized business plans and no interest in providing large-area service. As RCA observes, MSAs and RSAs permit entities who are only interested in serving rural areas to acquire spectrum licenses for these areas alone and avoid acquiring spectrum licenses with high population densities that make purchase of license rights too expensive for these types of entities.[84] These types of service providers could acquire a RSA and create a new service area or they could expand an existing service territory or supplement the spectrum they are licensed to operate in by adding a RSA. They could also combine a few MSAs and RSAs to create a larger but localized service territory. MSAs and RSAs allow entities to mix and match rural and urban areas according to their business plans. By being smaller, these types of geographic service areas provide entry opportunities for smaller carriers, new entrants, and rural telephone companies. Their inclusion in our band plan will foster service to rural areas and tribal lands and thereby bring the benefits of advanced services to these areas.[85]

40. API and PetroCom assert that the Gulf of Mexico should be licensed as a separate service area or areas.[86] PetroCom states that "[t]he Commission should separately license one or more service areas to cover the Gulf rather than including the Gulf as part of larger land based service areas."[87] PetroCom is concerned that if the Gulf is included in a land based service area the licensee of that service area could meet its coverage requirements without providing service to the Gulf.[88] We have addressed the issue of licensing the Gulf of Mexico in other proceedings and we will follow established policy on this issue. Consistent with API's and PetroCom's request and with established policy, for Blocks A, B, C, D, and E we will separately license the Gulf of Mexico as EA licensing area 176,[89] REAG licensing area 12,[90] and MSA licensing area 306.[91] As we did in licensing other Part 27 services, the Gulf of Mexico service area is comprised of the water area of the Gulf of Mexico starting 12 nautical miles from the U.S. Gulf coast and extending outward.[92]

3. Spectrum Blocks and Pairing

41. We will license the 1710-1755 and 2110-2155 MHz bands using symmetrically paired spectrum blocks of five, ten, and fifteen megahertz. Most of the commenters support licensing this

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licensing the lower 700 MHz band. 47 C.F.R. § 27.6(c)(2). For purposes of the 1710-1755 and 2110-2155 MHz bands, we will use the same MSAs and RSAs used for licensing the lower 700 MHz band.

[84] RCA Comments at 2-3; *see also* U.S. Cellular Comments at 5-7.

[85] While we did not receive any comments from Tribal governments, we remain interested in ensuring that the communication needs of these communities are met. *See AWS Service Rules NPRM*, 17 FCC Rcd at 24146-47 ¶ 25; *see also* Statement of Policy on Establishing a Government-to-Government Relationship with Indian Tribes, *Policy Statement*, 16 FCC Rcd 4078 (2000).

[86] API Comments at 8; PetroCom Comments at 3-5.

[87] PetroCom Comments at 3.

[88] *Id*. at 4.

[89] *See* 47 C.F.R. § 27.6(a)(1).

[90] *See id*.

[91] *See* 47 C.F.R. § 27.6(c)(2)(ii).

[92] 47 C.F.R. § 27.6(a)(2) and (c)(2)(ii).

spectrum using spectrum blocks of five, ten, or fifteen megahertz.[93] No one advocates licensing this spectrum using spectrum blocks smaller than five megahertz and none argue for spectrum blocks larger than 15 megahertz. Most of the commenters advocate licensing this spectrum using symmetrically paired 10 and 15 megahertz blocks.[94] Two commenters advocate licensing this spectrum using unpaired spectrum.[95]

42. As with our approach to geographic areas, our approach here is to offer multiple bandwidth amounts in order to enable the various efficient uses of the spectrum suggested by the record without, in so far as possible, requiring substantial aggregation during an auction or substantial secondary market transactions. Also as with our approach to geographic dimension, however, we have chosen bandwidth dimension and arrangement to facilitate aggregation during the auction, should individual bidders in fact find that valuable. This flexibility will allow carriers to tailor their acquisition of spectrum in these bands to meet their individual business plans and it will allow market forces rather than the Commission to ultimately determine how this spectrum is licensed.

43. Along with allowing licensees to tailor their acquisition of licenses to meet their individual business plans, our spectrum block arrangement provides licensees with maximum flexibility to resolve adjacent band interference issues and issues related to the relocation of existing licensees in the 1710-1755 and 2110-2155 MHz bands.[96] By placing the larger 10 and 15 megahertz blocks at either end of the two bands, licensees in these segments will have sufficient bandwidth and maximum flexibility to resolve adjacent band interference concerns. In addition, by placing the smaller blocks toward the middle of these two bands, we have made aggregation easier. Our band plan allows licensees to acquire spectrum in a manner that takes into account existing incumbents in these bands and accommodates their eventual relocation out of these bands.

44. The record in this proceeding indicates that a bandwidth of at least five megahertz is required to accommodate all of the 3G radio interfaces.[97] Five megahertz blocks can be used for new technologies and can be used for some data services, including Internet access. Paired five megahertz blocks enable a single wideband CDMA channel, which is sufficient to provide some forms of Internet access. Five megahertz blocks also provide entry opportunities for small and rural service providers. The larger ten and fifteen megahertz blocks should enable a broader range of broadband services, including Internet access at faster speeds. These larger blocks should also accommodate future, higher data rates, and provide operators with additional capacity, and, importantly, with greater flexibility. The larger blocks should also be of interest to those service providers contemplating a large regional or nationwide service. We believe that the availability of blocks of different sizes will allow operators to better accommodate their needs, particularly the capacity they need to serve and the mix of services (*e.g.*, data/voice) they may wish to offer.

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[93] AT&T Wireless Comments at 7; CTIA Comments at 4-5; Ericsson Comments at 4; Lucent Comments at 2; Motorola Comments at 6; Nokia Comments at 2; RCA Comments at 4; U.S. Cellular Comments at 3; Verizon Wireless Comments at 10; Cingular Reply Comments at 8.

[94] *Cf.* Goldstein Comments at 1-3 (advocating blocks of 6.5 megahertz, 5.625 megahertz, and five megahertz).

[95] ArrayComm Reply Comments at 2-4; TDD Coalition Reply Comments at 8, 15.

[96] *See* Verizon Wireless Comments at 5-7.

[97] Lucent Comments at 2. Worldwide spectrum for advanced wireless services have not been licensed using anything less than five megahertz blocks.

45. In the *AWS Service Rules NPRM*, we noted that most carriers in the U.S. have indicated plans to provide service that meets the IMT-2000 data rates by deploying systems based on CDMA2000 and W-CDMA technologies.[98] The record in this proceeding supports this observation.[99] CDMA2000 and W-CDMA technologies employ a frequency division duplex (FDD) transmission mode that requires a paired-channel architecture and operates in symmetric paired blocks of spectrum. FDD is the most commonly used transmission procedure for PCS, cellular, and other mobile telephony applications and the record indicates it is the technology most likely to be employed in this spectrum. As a result, we will license all of the spectrum in the 1710-1755 and 2110-2155 MHz bands using symmetrically paired spectrum blocks.

46. Our band plan does not include unpaired spectrum that might be suitable for use by entities interested in using time division duplexing (TDD) transmissions. The TDD Coalition asserts that unpaired five megahertz blocks could be used by small carriers to offer wireless local assess network (WLAN)-type products.[100] 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.[101] We note that if proponents of TDD can conclusively demonstrate that portions of 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. In the meantime, we will make every effort to provide spectrum opportunities for TDD systems in future allocation and spectrum proceedings, such as in the *AWS Allocation* proceeding.[102] Our commitment to finding additional spectrum for TDD is supported by our decisions to allocate unpaired spectrum in the 1670-1675 MHz band and the lower 700 MHz band.[103]

C. Band Clearance and Reimbursement

47. As we explained in the *AWS Service Rules NPRM*, the 1710-1755 MHz band, the 2110-2150 MHz band, and the 2150-2155 MHz band each have incumbents who will be covered by different clearance and reimbursement plans. As detailed below, the reimbursement plan for the 2110-

[98] *AWS Service Rules NPRM*, 17 FCC Rcd at 24148 ¶ 30.

[99] AT&T Wireless Comments at 7-8; CTIA Comments at 4-5; Ericsson Comments at 4-5; Goldstein Comments at 2-3; Lucent Comments at 1-3; Motorola Comments at 5; Nokia Comments at 1-2; Cingular Reply Comments at 8.

[100] TDD Coalition Reply Comments at 22; *see also* ArrayComm Comments at 2.

[101] *See infra* ¶¶ 104-111.

[102] *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, *Third Report and Order, Third Notice of Proposed Rulemaking and Second Memorandum Opinion and Order*, 18 FCC Rcd 2223 (2003). We note that among other alternatives, one possible way this might be accomplished is by creating spectrum blocks that are unpaired but appropriately spaced so that they are also suitable for paired use, and then auctioning using a package bidding design. This could effectively allow bidders desiring unpaired spectrum to bid for licenses on that basis, while others could bid on a package that pairs the spectrum. The result could be an effective market test that determines whether FDD or TDD is the highest valued use.

[103] *See* 47 C.F.R. §§ 27.5(c)(2), 27.5(f).

2150 MHz band was addressed in the *AWS Allocation Order*.[104] Further, we note that the clearance and reimbursement plans for the other portions of the AWS bands will not be resolved in this order. Accordingly, potential applicants and other interested parties are strongly encouraged to monitor the separate proceedings and legislative proposals discussed below. Finally, as explained below, while we conclude that the public interest supports adopting final service rules before all relocation issues have been resolved, we are not deciding the timing for licensing or auctions in this order.[105]

1. The 1710-1755 MHz Band

48. *Background*: The transfer of the 1710-1755 MHz band from Federal Government use to non-Government commercial use is subject to the provisions of the National Telecommunications and Information Administration Organization Act,[106] as amended by the Strom Thurmond National Defense Authorization Act for Fiscal Year 1999 (NDAA-99).[107] NDAA-99 requires new non-Government licensees to reimburse Federal users for their relocation costs.[108] NDAA-99 requires Federal users to notify NTIA prior to auction of the "marginal costs anticipated to be associated with such relocation or with modifications necessary to accommodate prospective licensees."[109] NTIA is directed, in turn, to provide such cost information to the Commission so that it can make such information available to potential auction applicants.[110] A Federal user retains its primary status until relocation is complete and NTIA limits or terminates the Federal user's operating license.[111] NDAA-

[104] *AWS Allocation Order*, 17 FCC Rcd at 23213-15 ¶¶ 42-46 (also noting that certain fixed microwave incumbents in the 2130-2150 MHz band segment consist of links that are paired with frequencies in the 2180-2200 MHz band allocated to MSS).

[105] The Wireless Telecommunications Bureau, consistent with statutory obligations will determine the timing for licensing and auctions pursuant to its delegated authority. *See* 47 U.S.C. §309(j)(3)(E)(i)(ii); 47 C.F.R. §§ 0.131(c) (functions of WTB); 0.331 (authority delegated to WTB); 0.332 (actions taken under WTB's delegated authority); 1.2103 (competitive bidding design options, including simultaneous multi-round and combinatorial bidding auctions, among others); 1.2104 (competitive bidding mechanisms); *see also* Amendment of Part 1 of the Commission's rules—Competitive Bidding Procedures, *Order, Memorandum Opinion and Order, and Notice of Proposed Rule Making*, 12 FCC Rcd 5686, 5697-98 ¶ 16 (1997).

[106] Pub. L. 102-538, 106 Stat. 3533 (1992).

[107] Pub. L. 105-261, 112 Stat. 1920 (1999), as codified at 47 U.S.C. § 923(g) (section 923(g)(1)(F) specifically notes that the 1710-1755 MHz band is subject to NDAA-99); *see* 47 C.F.R. § 301.10(a)(iii) (notes that the 1710-1755 MHz band is subject to the reimbursement rules promulgated by NTIA pursuant to NDAA-99).

[108] 47 U.S.C. § 923(g)(1)(A) ("[a]ny person on whose behalf a Federal entity incurs costs . . . shall compensate the Federal entity in advance for such costs. Such compensation may take the form of a cash payment or in-kind compensation."). We note that NTIA previously provided a summary of the Federal incumbents in the 1710-1755 MHz band. *NTIA AWS Assessment* at 1-2.

[109] 47 U.S.C. § 923(g)(1)(A). Previously, NTIA issued a report estimating the costs of relocation for Federal operations in the 1710 -1755 MHz band to alternate frequency bands. NTIA's Special Publication 01- 46, *The Potential for Accommodating Third Generation Mobile Systems in the 1710-1850 MHz Band: Federal Operations, Relocation Costs, and Operational Impacts - Final Report*, at 5-1 – 5-13 (Mar. 2001) (*NTIA AWS Report*). NTIA has stated that the final cost estimates for the 1710-1755 MHz band may differ from prior estimates based upon the receipt of additional data. *NTIA AWS Assessment* at 8.

[110] 47 U.S.C. § 923(g)(1)(A); 47 C.F.R. § 301.110 (NTIA shall provide the Federal entity's estimated marginal cost information to the Commission at least 180 days prior to the date on which the auction is scheduled to commence).

[111] 47 U.S.C. § 923(g)(2); *Mandatory Reimbursement Rules for Frequency Band or Geographic Relocation of Federal Spectrum-Dependent Systems,* Department of Commerce, National Telecommunications and (continued….)

99 also grants the Federal user a limited right to reclaim spectrum.[112] We note, however, that the Department of Commerce has proposed legislation to change the reimbursement process by creating a relocation fund using auction proceeds ("relocation trust fund").[113]

49. Pursuant to NDAA-99's direction, NTIA adopted rules governing the reimbursement process.[114] The *NTIA Reimbursement Order*, however, did not adopt rules that would allow for the sharing of relocation costs where more than one licensee benefits from the relocation of the federal incumbents.[115]

50. *Discussion*: As noted above, although this Order will not directly address the existing reimbursement scheme and other band clearance issues, we received a comment directly related to these issues. Specifically, RCA requests that the Commission develop dispute resolution procedures when parties cannot agree on relocation cost or timing issues.[116] In support of its request, RCA asserts that incumbents must not be permitted to impede use of the 1710-1755 MHz band by unreasonable reimbursement demands or delay.[117] We note, however, that with respect to Federal incumbents, the

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Information Administration, 67 Fed. Reg. 41182, 41184 ¶ 18 (June 17, 2002) (*NTIA Reimbursement Order*); *AWS Service Rules NPRM*, 17 FCC Rcd at 24149 ¶ 33. We also note that not all Federal incumbents in the 1710-1755 MHz band are required to relocate. Exempt entities, however, may voluntarily relocate and negotiate relocation costs in the same manner as non-exempt entities. *Id.* at 41186 ¶¶ 34-35; *see also AWS Allocation NPRM*, 16 FCC Rcd 596, 613 ¶ 40, 650-653 App. E and F (providing information regarding exempt entities).

[112] 47 U.S.C. § 923(g)(3) ("If within one year after the relocation the Federal entity demonstrates to the Commission that the new facilities or spectrum are not comparable to the facilities or spectrum from which the Federal Government station was relocated," the new licensee "shall take reasonable steps to remedy any defects or pay the Federal entity for the expenses incurred in returning the Federal Government station to the spectrum from which such station was relocated"); *see also AWS Service Rules NPRM*, 17 FCC Rcd at 24149 ¶ 33.

[113] U.S. Department of Commerce, National Telecommunications and Information Administration, "Commerce Department Asks Congress to Create Spectrum Relocation Fund for Federal Agencies Whose Spectrum Is Reallocated to Commercial Use," NTIA Press Release, July 23, 2002 (available at http://www.ntia.doc.gov/ntiahome/press/2002/relocationfund7242002.htm>). The proposed legislation is available on the NTIA Web site at http://www.ntia.doc.gov/ntiahome/congress/2002/ legistransmittal7232002.htm>; *see also* http://www.ntia.doc.gov/ntiahome/congress/2003/spectrum0319.htm.// legistransmittal7232002.htm>. Commenters generally support the proposed legislation to change the reimbursement process through the use of a relocation trust fund. *See, e.g.*, CTIA Comments at 16 ; Ericsson Comments at 3; Motorola Comments at 9; and Motorola Reply Comments at 13-14. In addition, some commenters suggest that the relocation trust fund proposal should be expanded to pay for the relocation of incumbents in the other AWS bands at issue here. RCA Comments at 8. Other commenters urge the Commission to oppose proposals to use auction proceeds for alternative purposes. AT&T Wireless Reply Comments at 5, referencing, among others, CTIA Comments at iii, 15-16; Ericsson Comments at 3; Motorola Comments at 9-10; RCA Comments at 7-8.

[114] 47 U.S.C. § 923(g)(1)(A); *NTIA Reimbursement Order,* 67 Fed. Reg. at 41186 ¶¶ 34-35.

[115] *NTIA Reimbursement Order*, 67 Fed. Reg. at 41188 ¶ 46 (NTIA stated that through a further Notice of Proposed Rulemaking, it would develop a cost-sharing plan and seek proposals for a clearinghouse or some other mechanism for administering a cost-sharing plan).

[116] RCA Comments at 8.

[117] *Id*.

reimbursement procedures, including dispute resolution, are governed by rules adopted by NTIA in the *NTIA Reimbursement Order*.[118]

51. Some commenters also request that the release of a final order in this proceeding should not occur until there is finality as to the relocation and reimbursement plan for Federal incumbents.[119] Alternatively, if the Commission does not delay release of this order pending conclusion of the related proceedings, other commenters request that the Commission note that, until comparable spectrum is allocated for Federal incumbents, the 1710-1755 MHz band will be significantly encumbered by Federal operations.[120] While we are sympathetic to the concerns expressed by the commenters regarding the uncertainties relating to the reimbursement scheme that will finally be implemented, delay in adopting the band plan and service rules will not serve to expedite resolution of those issues. Further, delay in the adoption of service and competitive bidding rules could serve to delay the eventual deployment of AWS spectrum. Moreover, by taking this substantial step toward the goal of full deployment of AWS spectrum, we increase the likelihood that potential applicants and others with an interest in the AWS bands will work to ensure that the reimbursement and relocation process is expedited.[121] Thus, our action here should facilitate resolution of the relocation and reimbursement process.[122] With respect to the request to note significant incumbency in the 1710-1755 MHz band, as noted above, Federal incumbents retain their primary status until relocation is complete and NTIA limits or terminates the Federal incumbent's operating license.[123]

2. The 2110-2150 MHz Band

52. *Background*: The *AWS Allocation Order* specified that those incumbents in the 2110-2150 MHz band who have primary status would be entitled to compensation for relocation under policies based on the *Emerging Technologies* proceeding.[124] Specifically, we noted that these

[118] *NTIA Reimbursement Order*, 67 Fed. Reg. 41182 at ¶ 66 (adopting a requirement for non-binding arbitration where parties have not reached agreement after the negotiation/mediation period), 47 C.F.R. §§ 301.120, 301.130.

[119] NTIA Comments at 3 (arguing that release of a final order in this proceeding should occur simultaneously with the release of a final order regarding allocation actions for comparable relocation spectrum for Federal incumbents); Verizon Wireless Comments at 7 ("it would be premature to adopt spectrum-clearing rules until the Commission has given Congress sufficient time to enact a Spectrum Relocation Fund").

[120] NTIA Comments at 3, n.4; *see also* TDD Reply Comments at 16 (supporting NTIA's position).

[121] *See* Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, Carriage of the Transmissions of Digital Television Broadcast Stations, Review of the Commission's Rules and Policies Affecting the Conversion to Digital Television, *Memorandum Opinion and Order and Further Notice of Proposed Rulemaking*, 15 FCC Rcd 20845, 20865, ¶50, ¶53 (acknowledging the benefits of voluntary agreements to assist in band clearing).

[122] We note, however, that once the final reimbursement and band clearance schemes for all portions of the AWS bands are finalized, if we believe it appropriate to modify the rules adopted here, we will do so in a separate order.

[123] *See supra* ¶ 48 and n.111; *AWS Allocation Order*, 17 FCC Rcd at 23197-98 ¶ 8.

[124] *AWS Allocation Order*, 17 FCC Rcd at 23213 ¶ 42; *AWS Allocation NPRM*, 16 FCC Rcd at 618 ¶ 54 n.102; *see also* Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies, ET Docket No. 92-9, *First Report and Order and Third Notice of Proposed Rule Making*, 7 FCC Rcd 6886 (1992). In the Emerging Technologies proceeding, we allowed new entrants to provide incumbents with comparable facilities using any acceptable technology. *Emerging Technologies Third R&O*, 8 FCC Rcd 6589, 6591, 6603 ¶¶ 5, 36 (1993). Under this policy, incumbents must be provided with replacement facilities that allow (continued….)

incumbents are entitled to compensation for relocation of any links that may pose an interference threat to new fixed or mobile system licensees, including all engineering, equipment, site, and Commission fees.[125] We note that certain fixed microwave incumbents in the 2130-2150 MHz band segment consist of links that are paired with frequencies in the 2180-2200 MHz band allocated and licensed to MSS. The relocation and reimbursement obligations of these paired segments was discussed and resolved in the *AWS Allocation Order*.[126]

53. *Discussion*: As noted above, although this Order will not directly address the reimbursement and band clearance issues regarding 2110-2150 MHz band, we received some comments directly addressing such issues.[127] In addition, one commenter, RCA, requests that certain information be provided to auction applicants regarding 2110-2155 MHz band incumbents prior to auction. Specifically, RCA requests that information regarding all incumbent licensees in the 2110-2155 MHz band and maximum reimbursement liability of the new licensees should be disclosed to potential auction applicants not less than 90 days prior to the deadline for submission of the FCC Form 175 ("short-form application") for any AWS auction.[128] In support of its request, RCA states that interested parties need sufficient time to develop business plans, and knowledge of relocation costs and related timing issues are important components of those plans.[129] RCA also requests the Commission to determine the maximum reimbursement payable to non-Federal incumbents.[130] API opposes both requests.[131] With respect to the disclosure of information regarding the incumbents, API argues that there is already a wealth of pertinent information regarding fixed service incumbent licensees in the 2.1 GHz band and potential auction applicants may access such information via the Commission's Universal Licensing System ("ULS") and other licensing databases.[132] Thus, API argues that RCA's request would unnecessarily and unfairly shift auction participants' burden of due diligence to

(Continued from previous page)
them to maintain the same service in terms of throughput, reliability and operating costs. *See, e.g.,* 47 C.F.R. § 101.91.

[125] *AWS Allocation Order*, 17 FCC Rcd at 23213-15 ¶¶ 42-46; *AWS Allocation NPRM,* 16 FCC Rcd at 618 ¶¶ 54-55.

[126] *AWS Allocation Order*, 17 FCC Rcd at 23213-15 ¶¶ 42-46.

[127] For example, API requests that the Commission resolve petitions for reconsideration and/or clarification of the Commission's *Second Report and Order* in ET Docket No. 95-18 and restates its concerns in the comments filed in this proceeding. API Comments at 4 -6 (referencing the Joint Petition for Clarification and Reconsideration, filed by the Fixed Wireless Communications Coalition, the Critical Infrastructure Communications Coalition, API, the Association of American Railroads, the Association of Public Safety Communications Officials International, Inc. and the United Telecom Council, in ET Docket No. 95-18 on September 6, 2000); *see also* PCIA Comments at 1 (proposing the establishment of a band-clearing cost-sharing clearinghouse for the 2110-2150 MHz band to facilitate the relocation of point-to-point microwave incumbents and also proposing the amendment of section 101.99 to allow a cost sharing among all licensees that benefit from the same path clearance). PCIA's comments on a cost-sharing clearinghouse mirror points subsequently made in a February 24, 2003 Petition for Partial Reconsideration of the *AWS Allocation Order*. PCIA Petition for Partial Reconsideration in ET Docket No. 00-258, filed February 24, 2003.

[128] RCA Comments at 7-8 (requesting information regarding all incumbent licensees in the 2110-2155 MHz band and maximum reimbursement liability of the new licensees).

[129] RCA Comments at 8.

[130] *Id*. at 7.

[131] API Reply Comments at 4-5.

[132] *Id*. at 2-4.

incumbent licensees. API also argues that a pre-auction determination of the maximum reimbursement would unfairly cap incumbents' costs.[133]

54. We deny RCA's request to have incumbents provide auction applicants with additional information. Our action here is consistent with our actions in prior proceedings.[134] For example, we denied the request of a Mobile Satellite Service ("MSS") provider that urged the Commission to collect extensive technical, operational, and equipment inventory data from fixed service incumbents in the 2 GHz band so that MSS operators could better assess the cost of relocating such incumbents.[135] In support of its decision, the Commission stated, "enough information is currently available, both in our databases and from commercial sources, to permit sufficient estimates [of relocation costs] for business planning."[136] While we recognize that the due diligence burden on auction applicants in encumbered services is not inconsequential, we concur with API in that it would be inequitable to shift the burden of due diligence onto the incumbents. Further, as we stated in the MSS proceeding, we believe that there is sufficient information currently available to permit sufficient estimates of relocation costs by potential auction applicants.[137] Similarly, we believe that a Commission determination of maximum reimbursement liability prior to auction would be contrary to the policy favoring negotiation adopted in the *Emerging Technologies* proceeding.[138] Further, such pre-auction determination may inject unnecessary administrative delay to any auction because incumbents or interested parties might dispute the Commission's determination of maximum reimbursement liability.[139]

3. The 2150-2155 MHz Band

55. *Background*: In the *AWS Allocation Order*, we reallocated 5 megahertz at 2150-2155 to the AWS service from MDS but deferred to a later proceeding issues relating to MDS licensees, including the disposition of the remaining MDS spectrum and identification of replacement spectrum and relocation procedures.[140] Subsequently, we adopted a *Third Notice of Proposed Rulemaking* in ET

[133] *Id*. at 4-5.

[134] Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use by the Mobile-Satellite Service, ET Docket No. 95-18, *Second Report and Order and Second Memorandum Opinion and Order*, 15 FCC Rcd 12315, at ¶¶ 114-121 (2000) ("*MSS Second Report and Order*").

[135] *MSS Second Report and Order* at ¶ 119.

[136] *Id.* at ¶ 120.

[137] Relevant information regarding incumbents can be found in the Commission's databases, including our Universal Licensing System. In contrast, certain information regarding unclassified Federal incumbents will only be available after NTIA provides such information to the Commission prior to auction. 47 C.F.R. § 301.110 (b) (detailing the type of information to be provided). We note, however, that for sensitive or classified assignments such information will not be available prior to the auction. For those assignments, the auction winner or new licensee can only have access to classified information after obtaining the required security clearances, consistent with the National Industrial Security Program Operating Manual. 47 C.F.R. § 301.110 (c) and (d).

[138] *AWS* Allocation *Order* at ¶¶ 44-46. *See also* 47 C.F.R. § 101.99 (c) (capping the reimbursement obligation for a subsequent new entrant where the initial new entrant relocates a paired link of a microwave incumbent).

[139] 47 U.S.C. § 309(j)(3)(A) (providing that the Commission shall seek to promote the development and rapid deployment of new technologies, products, and services for the benefit of the public without administrative or judicial delays).

[140] *AWS* Allocation *Order*, 17 FCC Rcd at 23214 ¶ 41; *AWS Service Rules NPRM*, 17 FCC Rcd at 24150 ¶ 35.

Docket No. 00-258[141] that, among other things, proposed that if relocation were deemed necessary,[142] MDS incumbents would be entitled to comparable facilities or adequate replacement spectrum.[143] In the *Third Notice of Proposed Rulemaking*, we also asked for a suggested timeframe for clearing the band, the types and magnitude of costs that would be involved,[144] and the amount and location of spectrum needed to relocate MDS operations at 2150-2160/2162 MHz. In particular, we sought to minimize disruption to existing services and to minimize the economic impact on MDS licensees providing those services.

56. *Discussion*: As noted above, although this Order will not directly address the reimbursement and band clearance issues regarding 2150-2155 MHz band, we received one comment related to these issues. Specifically, WCAI requests that the Commission resolve the pending proceedings relating to MDS channels 1 & 2/2A (occupying the 2150-2160/2162 MHz band)[145] at one time.[146] Consistent with our decision above, we determine that the public interest is best served by proceeding with the adoption of service and competitive bidding rules for all portions of the AWS band.

D. Licensing and Operational Rules

1. Regulatory Status

57. *Background*: In the *AWS Service Rules NPRM*, we observed that Part 27 licensees may render any kind of communications service consistent with the regulatory status indicated in its license

[141] 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, *Third Report and Order, Third Notice of Proposed Rulemaking and Second Memorandum Opinion and Order*, 18 FCC Rcd 2223 (2003) (*Third Notice of Proposed Rulemaking*).

[142] Under our relocation policies only stations with primary status are entitled to relocation. *Third Notice of Proposed Rulemaking*, 18 FCC Rcd at 2256-57 ¶ 72. Because secondary operations, by definition, cannot cause harmful interference to primary operations, new entrants are not required to relocate secondary operations. *Id*.; 47 C.F.R. § 2.105(c)(2). Before the adoption of the *AWS Allocation Order*, the 2150-2160 MHz band was allocated domestically to the Fixed Service on a primary basis. *Third Notice of Proposed Rulemaking*, 18 FCC Rcd at 2253-54 ¶ 66. As previously stated, MDS stations licensed after 1992 to use the 2160-2162 MHz band are on a secondary basis. We also note that our relocation policies do not dictate that systems be relocated to spectrum-based facilities or even to the same amount of spectrum as they currently use, only that comparable facilities be provided. *See, e.g.,* Amendment of Section 2.106 of the Commission's Rules to Allocate Spectrum at 2 GHz for Use by the Mobile-Satellite Service, ET Docket No. 95-18, *Second Report and Order and Second Memorandum Opinion and Order*, 15 FCC Rcd 12315 (2000).

[143] *Second R&O*, 16 FCC Rcd at 16061¶ 40; *Third Notice of Proposed Rulemaking*, 18 FCC Rcd at 2256 ¶ 71. This would be similar to the approach followed in the *Emerging Technologies* proceeding.

[144] *Third Notice of Proposed Rulemaking*, 18 FCC Rcd at 2256 at ¶¶ 71-72.

[145] MDS licensees may operate in the 2160-2162 MHz band only in the country's top 50 markets. *See supra* n.6.

[146] WCAI defines the related proceedings as including those that address reallocating additional spectrum for AWS, relocating incumbent licensees displaced by AWS to comparable spectrum, reallocating spectrum in the 1990-2000/2020-2052/2165-2180 MHz band from MSS for AWS or displaced incumbents, allowing MSS licensees to utilize their remaining spectrum for an ancillary terrestrial component (ATC), and imposing service rules on AWS and ATC operations. WCAI Comments at 1-2.

and with the Commission's rules applicable to that service.[147] In this case, we indicated that licensees in the 1710-1755 and 2110-2155 MHz bands would be free to provide common carrier, non-common carrier, or private internal communications or any combination of these services in a single license. Under this approach, along with being authorized to provide private internal communications, applicants would be permitted to select common carrier status as well as non-common carrier status for authorization in a single license, rather than having to choose between common and non-common carrier status. We proposed that applicants and licensees in the 1710-1755 and 2110-2155 MHz bands be required to indicate a regulatory status based on any services they choose to provide, and that if a licensee were to change the service or services it offers such that its regulatory status would change, the licensee must notify the Commission.

58. *Discussion*: We adopt our regulatory status proposal and require licensees in the 1710-1755 and 2110-2155 MHz bands to comply with the regulatory status provisions of section 27.10 of the Commission's rules.[148] Under this flexible regulatory approach, licensees in the 1710-1755 and 2110-2155 MHz bands may provide common carrier, non-common carrier, or private internal communications or any combination of these services under a single license at any time anywhere within their licensed service areas.[149] Similarly, licensees may use this spectrum to provide public safety services, although this spectrum has not been designated as exclusive public safety radio service spectrum. This broad licensing framework will encourage licensees to develop new and innovative services with minimal regulatory restraint. However, since the 1710-1755 and 2110-2155 MHz bands have not been allocated for broadcast services, licensees may not use these bands for broadcast services.

59. To fulfill our enforcement obligations and to ensure compliance with Titles II and III of the Communications Act, we will require all licensees to identify the regulatory status of the service(s) they intend to provide. Consistent with section 27.10 of the Commission's Rules, licensees in the 1710-1755 and 2110-2155 MHz bands will not be required to describe their particular services, but only to designate the regulatory status of the service(s). We remind potential applicants that an election to provide service on a common carrier basis requires that the elements of common carriage be present;[150] otherwise the applicant must choose non-common carrier status.[151] If potential applicants are unsure of the nature of their services and their classification as common carrier services,

[147] *AWS Service Rules NPRM*, 17 FCC Rcd at 24150-51 ¶ 36.

[148] 47 C.F.R. § 27.10.

[149] *See* FCC Form 601.

[150] *See* 47 U.S.C. § 153(44) ("A telecommunications carrier shall be treated as a common carrier under this Act . . ."); *see also* 47 U.S.C. § 332(C)(1)(A) ("A person engaged in the provision of a service that is a commercial mobile service shall, insofar as such person is so engaged, be treated as a common carrier for purposes of this Act . . .").

[151] *See* Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service (WCS), GN Docket No. 96-228, *Report and* Order, 12 FCC Rcd 10785, 10848 ¶¶ 121-22 (1997) (*Part 27 Report and Order*). The Commission examined services in the *LMDS Second Report and Order* and explained that any video programming service would be treated as a non-common carrier service. Rulemaking to Amend Parts 1, 2, 21, and 25 of the Commission's Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Service and for Fixed Satellite Services, CC Docket No. 92-297, *Second Report and Order, Order on Reconsideration, and Fifth Notice of Proposed Rulemaking*, 12 FCC Rcd 12545, 12639-41 ¶¶ 213-15 (1997) (*LMDS Second Report and Order*); *aff'd*, *Melcher v. FCC*, 134 F.3d 1143 (D.C. Cir. 1998).

they may submit a petition with their applications, or at any time, requesting clarification and including service descriptions for that purpose.[152]

60. We also determine that if a licensee elects to change the service or services it offers such that its regulatory status would change, the licensee must notify the Commission.[153] A change in a licensee's regulatory status will not require prior Commission authorization, provided the licensee is in compliance with the foreign ownership requirements of section 310(b) of the Communications Act that apply as a result of the change.[154] We require notification within 30 days of a change made without prior Commission approval. We note, however, that a different time period may apply, as determined by the Commission, where the change results in the discontinuance, reduction, or impairment of the existing service.[155]

2. Ownership Restrictions

(a) Foreign Ownership

61. *Background*: In the *AWS Service Rules NPRM*, we observed that sections 310(a) and 310(b) of the Communications Act, as modified by the Telecommunications Act of 1996, impose foreign ownership and citizenship requirements that restrict the issuance of licenses to certain applicants.[156] We noted that section 27.12 of our rules implements these restrictions. In terms of filing applications, we proposed that common carriers and non-common carriers be subject to the same reporting obligations. We sought comment on this proposal.

62. *Discussion*: Based on our statutory responsibilities, we determine that the provisions of section 27.12 of the Commission's rules apply to applicants applying for licenses in the 1710-1755 and 2110-2155 MHz bands.[157] Section 27.12 implements section 310 of the Communications Act, as modified by the Telecommunications Act of 1996.[158] All applicants are subject to section 310(a), which prohibits licenses from being "granted to or held by any foreign government or the representative thereof."[159] In addition, as applicable here, an applicant requesting authorization for a common carrier, aeronautical en route or aeronautical fixed service station license would also be subject to the foreign ownership requirements of section 310(b).

63. We did not receive any comments opposing our proposal that common carriers and non-common carriers be subject to the same reporting obligations. In filing applications, therefore, common carriers and non-common carriers will not be subject to varied reporting obligations. By establishing parity in reporting obligations, however, we do not establish a single, substantive standard for compliance. For example, we do not and would not deny a license to an applicant requesting authorization exclusively to provide services not enumerated in section 310(b), solely because its foreign ownership would disqualify it from receiving a license if the applicant had applied for a license

[152] *Part 27 Report and* Order, 12 FCC Rcd at 10848 ¶ 121.

[153] *See* 47 C.F.R. § 27.10(d). *See also* 47 C.F.R. § 27.66(a)-(b).

[154] 47 U.S.C. § 310(b); *see infra* ¶¶ 61-63.

[155] *See* 47 C.F.R. § 27.66(a)-(b).

[156] *AWS Service Rules NPRM*, 17 FCC Rcd at 24151-52 ¶ 39.

[157] 47 C.F.R. § 27.12.

[158] 47 U.S.C. § 310(a),(b).

[159] 47 U.S.C. § 310(a).

to provide the services enumerated in section 310(b). Because we are adopting a flexible approach to licensing these bands, we determine that all licensees will be subject to the same requirements to file changes in foreign ownership information to the extent required by our Part 27 rules.

(b) Spectrum Aggregation Limits; Eligibility Restrictions

64. *Background*: In the *AWS Service Rules NPRM*, we noted that the Commission had previously decided in 2001 to "sunset" the Commercial Mobile Radio Service (CMRS) spectrum aggregation limit, or "spectrum cap,"[160] effective January 1, 2003.[161] At the time it decided to sunset the cap, the Commission also stated that it would continue to pursue the objectives of "discourag[ing] anticompetitive behavior while at the same time maintaining incentives for innovation and efficiency,"[162] but would do so by performing case-by-case reviews of proposed CMRS spectrum transactions rather than by applying a prophylactic rule.[163] The Commission also found that "to the extent that the initial distribution of spectrum through auction is an issue in the future, that is also amenable to case-by-case review, in the sense that [the Commission] can shape the initial distribution through the service rules adopted with respect to specific auctions."[164]

65. Since the CMRS spectrum cap was designated to sunset prior to the auctioning of spectrum in the 1710-1755 and 2110-2155 MHz bands, we observed in the *AWS Service Rules NPRM* that these bands would not be subject to any generalized limits on spectrum aggregation, and tentatively concluded that we would not need to adopt any band-specific service rules addressing spectrum aggregation limits applicable to the initial licensing of these bands.[165] However, we did seek comment on whether any such limits are necessary or appropriate.[166] In particular, we sought comment on whether we should limit the amount of spectrum in these bands that any one entity (or related entities) may acquire at auction in the same geographic licensing area.[167]

66. We further noted that in the initial licensing of some major new services, the Commission has limited eligibility beyond the requirements of section 310, in order to maximize competition by ensuring that at least some licenses go to new entrants.[168] However, we noted that given the current

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[160] *See* 47 C.F.R. § 20.6.

[161] *AWS Service Rules NPRM*, 17 FCC Rcd at 24152 ¶ 40 (citing 2000 Biennial Regulatory Review: Spectrum Aggregation Limits for Commercial Mobile Radio Services, WT Docket No. 01-14, *Report and Order*, 16 FCC Rcd 22668 (2001) (*recon. pending*) (*Spectrum Cap Order*).

[162] *Id*. at 24152 ¶ 40 (citing *Spectrum Cap Order*, 16 FCC Rcd at 22679 ¶ 26 n.71 (citing Implementation of Sections 3(n) and 332 of the Communications Act—Regulatory Treatment of Mobile Services, GN Docket No. 93-252, *Third Report and Order*, 9 FCC Rcd 7988, 8105 ¶ 251 (1993))).

[163] *Id*. at 24152 ¶ 40 (citing *Spectrum Cap Order*, 16 FCC Rcd at 22693-94 ¶ 50).

[164] *Id.* at 24152 ¶ 40 (citing *Spectrum Cap Order*, 16 FCC Rcd at 22696 ¶ 54).

[165] *Id*. at 24152 ¶ 41.

[166] *Id*.

[167] *Id*.

[168] *Id*. at 24152-53 ¶ 42. For example, the Commission limited eligibility for the PCS A and B blocks to entities that were not licensees of cellular systems in the same area. *See* Amendment of the Commission's Rules to Establish New Personal Communications Services, GEN Docket No. 90-314, *Second Report and Order*, 8 FCC Rcd 7700, 7744-45 ¶ 105 (1993). In granting the Commission authority in section 309(j) of the Communications Act to auction wireless spectrum and to impose eligibility requirements as appropriate, Congress also directed the (continued….)

state of competition in the CMRS industry, we did not believe that such restrictions were necessary for the 1710-1755 and 2110-2155 MHz bands and sought comment on this view.[169] We also inquired as to whether there should be any set-asides for new entrants or other types of applicants or whether there should be any restrictions barring entities (such as incumbent cellular or PCS providers) from acquiring licenses in these bands, other than the foreign ownership requirements set forth in section 310 of the Communications Act.[170]

67. *Discussion*: We agree with those commenters who oppose a spectrum aggregation limit for the 1710-1755 and 2110-2155 MHz bands,[171] and we will impose no specific aggregation limitations on this spectrum. We do not agree with U.S. Cellular and RCA, who argued in favor of restricting the initial aggregation of spectrum by any winning bidder to 20 or 30 megahertz in the same geographic licensing area.[172] We believe that entities should have the unrestricted flexibility to aggregate spectrum in these bands. Parties should be afforded the flexibility at auction and in the secondary market to aggregate sufficient unencumbered spectrum for them to make available new and innovative service to the public. As we recently recognized in the *Eighth Annual CMRS Competition Report,* the CMRS industry continues to experience "increased service availability, lower prices for consumers, innovations, and a wider variety of service offerings,"[173] and thus we concluded that there is effective competition in the CMRS market.[174] We also concluded that competition for mobile data products is developing successfully, as evidenced by the "multitude of mobile data services, service providers, pricing plans and devices available to consumers."[175] Given the robust state of competition in the CMRS market, we do not feel it is necessary to impose an initial aggregation limit on these spectrum bands. We prefer to provide potential licensees with maximum flexibility in these allocations.

68. We also will not set aside spectrum for designated entities or other categories of bidders. Our objectives of ensuring both efficient use of spectrum and diversity of licensees can best be achieved by adopting a variety of license areas and spectrum block sizes, and ensuring the ability of licensees to partition and disaggregate their licenses and fully participate in the secondary spectrum markets. The adoption of spectrum leasing policies with respect to this spectrum should facilitate the ability of wireless licensees to lease spectrum usage rights to third parties.[176] In addition, by adopting some smaller geographic licensing areas and some smaller spectrum block sizes, we believe we will

(Continued from previous page)
Commission to exercise that authority so as to "promot[e] . . . economic opportunity and competition." *See* 47 U.S.C. § 309(j)(3).

[169] *Id*.

[170] *Id*.

[171] *See* AT&T Wireless Comments at 12; CTIA Comments at ii, 7-8; Ericsson Comments at 5; AT&T Wireless Reply Comments at 3-4; Cingular Reply Comments at 8.

[172] *See* US Cellular Comments at 3, 10-12; RCA Comments at 5.

[173] 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, WT Docket No. 02-379, *Eighth* Report, at ¶ 17, FCC 03-150, rel. July 14, 2003 (*Eighth Annual CMRS Competition Report*).

[174] *Id.* at ¶ 12.

[175] *Id*. at ¶ 219.

[176] *See supra* ¶ 26 for a discussion of the application of spectrum leasing policies adopted in the *Secondary Markets Report and Order*.

encourage participation by smaller and rural entities, without the necessity of adopting set-asides or eligibility restrictions, because such licenses will be less expensive and should more closely mirror such bidders needs. We do not see a need to supplement the incentives for small business participation provided elsewhere in this order by foreclosing any of the licenses to other bidders. As we stated in the *AWS Service Rules NPRM*, "opening these bands to as wide a range of applicants as possible would encourage entrepreneurial efforts to develop new technologies and services, while helping to ensure efficient use of this spectrum."[177] We also believe that the bidding credits that we are adopting below will encourage participation by small businesses and entities intending to serve rural areas (including tribal lands), and that these bidding credits further mitigate the need for adopting set-asides or eligibility restrictions.[178]

3. License Term; Renewal Expectancy

69. *Background*: In the *AWS Service Rules NPRM*, we proposed a 10-year license term for licensees in the 1710-1755 and 2110-2155 MHz bands, with a renewal expectancy similar to that afforded PCS, cellular, and Part 27 licensees.[179] We stated that a 10-year license term, combined with a renewal expectancy, would help to provide a stable regulatory environment that would be attractive to investors, and thereby encourage development of these frequency bands. We sought comment, however, on whether a license term of longer than 10 years would be appropriate to achieve these goals and better serve the public interest.

70. *Discussion*: Based on the record in this proceeding, we will establish an initial license term for licensees in the 1710-1755 and 2110-2155 MHz bands of 15 years and subsequent renewal terms of 10 years, and will modify section 27.13 of our rules to reflect this determination.[180] AT&T Wireless, Cingular, CTIA, Ericsson, RCA, and Verizon Wireless argue that given the relocation and band clearance issues associated with these bands, it makes sense to adjust our usual ten-year license term.[181] We agree with these commenters that the circumstances surrounding the future development and deployment of services in these bands warrant an initial license term longer than 10 years in order to encourage the investment necessary to develop these bands. We believe that an initial 15-year license term followed by 10-year renewal terms will provide investors with the necessary assurances that a sufficient amount of time will be available to recoup the initial costs of developing and deploying advanced wireless networks in the these bands.[182]

71. We also agree with the commenters that licensees in the 1710-1755 and 2110-2155 MHz bands should have the right to the same renewal expectancy as other Part 27 licensees and, therefore, will apply the renewal expectancy provisions of section 27.14 of our rules applicable to these licensees.[183] This section provides that a renewal applicant receives a preference or renewal

[177] *AWS Service Rules NPRM*, 17 FCC Rcd at 24153 ¶ 42.

[178] *See infra* ¶¶ 144-149.

[179] *AWS Service Rules NPRM*, 17 FCC Rcd at 24153-54 ¶ 43.

[180] 47 C.F.R. § 27.13.

[181] CTIA Comments at 8-9; Ericsson Comments at 5; RCA Comments at 8; Verizon Wireless Comments at 4-5; AT&T Wireless Reply Comments at 6-7; Cingular Reply Comments at 6. *See also supra* ¶¶ 47-56.

[182] Since the relocation process is expected to be completed over the next few years, the 15-year license term will only apply to initial licenses issued before December 31, 2009. After this date the reason for having an initial license term longer than the usual 10-year license term will no longer be valid.

[183] CTIA Comments at 8-9; Ericsson Comments at 5; RCA Comments at 8; Cingular Reply Comments at 6.

expectancy if the applicant has provided substantial service during its past license term and has complied with the Communications Act and applicable Commission rules and policies.[184] According to this section, substantial service is defined as "service which is sound, favorable, and substantially above a level of mediocre service which just might minimally warrant renewal."[185] An initial 15-year license term, with subsequent 10-year license renewal periods, combined with the renewal expectancy provisions of section 27.14, will help to provide a stable regulatory environment that will be attractive to investors, and thereby encourage development of these frequency bands.

72. In the event that a license in the 1710-1755 and 2110-2155 MHz bands is partitioned or disaggregated, any partitionee or disaggregatee will be authorized to hold its license for the remainder of the partitioner's or disaggregator's license term, and will be eligible for a renewal expectancy on the same basis as other licensees. This approach is similar to the partitioning provisions the Commission adopted for MDS,[186] for the Upper 700 MHz licensees,[187] and for broadband PCS licensees.[188] Specifically, we do not believe that a licensee, by partitioning or disaggregation, should be able to confer greater rights than it was awarded under the terms of its license grant.

4. Performance Requirements

73. *Background*: In the *AWS Service Rules NPRM*, we sought comment on whether licensees in the 1710-1755 and 2110-2155 MHz bands should be subject to any performance requirements in addition to a substantial service requirement at license renewal.[189] We noted that in some services the Commission has imposed minimum coverage requirements on licensees to ensure that spectrum is used effectively and service is implemented promptly, and in other services the Commission has identified specific coverage criteria as meeting a substantial service requirement, but has allowed licensees to make alternative showings of substantial service if they do not meet these criteria.[190] We therefore sought comment on whether specific coverage requirements should be established for these bands, or whether coverage criteria should be adopted as one means, but not the exclusive means, of meeting a substantial service requirement.[191] We also sought comment on whether licensees should be subject to interim performance requirements prior to the end of the license term.[192]

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[184] 47 C.F.R. § 27.14.

[185] 47 C.F.R. § 27.14(a).

[186] *See* Amendment of Parts 21 and 74 of the Commission's Rules With Regard to Filing Procedures in the Multipoint Distribution Service and in the Instructional Television Fixed Service, MM Docket No. 94-131, *Report and Order,* 10 FCC Rcd 9589, 9614 ¶ 46 (1995).

[187] Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, WT Docket No. 99-168, *First Report and Order*, 15 FCC Rcd 476, 506-08 ¶ 73-78 (2000) (*Upper 700 MHz First Report and Order)*.

[188] *See* Geographic Partitioning and Spectrum Disaggregation by Commercial Mobile Radio Services Licensees and Implementation of Section 257 of the Communications Act—Elimination of Market Barriers, WT Docket No. 96-1148, *Report and Order and Further Notice of Proposed Rulemaking,* 11 FCC Rcd 21831, 21870 ¶¶ 76-77 (1996).

[189] *AWS Service Rules NPRM*, 17 FCC Rcd at 24154 ¶ 47.

[190] *Id*. at 24154 ¶ 47.

[191] *Id*.

[192] *Id*.

74. With respect to partitioned or disaggregated licenses, we sought comment on whether a partitionee or disagregatee should be bound by the standard the Commission adopts in this proceeding. We further asked for comment on whether an adjustment to either a substantial service requirement or a minimum coverage requirement must be made in order to account for the Federal government's continued use of the 1710-1755 MHz band until 2004, or its operation of certain in-band facilities after that date.[193] We sought the views of commenters as to what action the Commission should take if a licensee does not comply with the adopted performance requirements. We proposed to apply Section 1.946(c),[194] which provides for the automatic termination of an authorization if a licensee fails to commence service or operations by the expiration of its license term. Lastly, in discussing the consequences that would flow from a licensee's failure to comply with its coverage requirements, we sought comment on whether the licensee should be prohibited from bidding on the geographic area license for the same territory in the future.[195]

75. *Discussion*: We will apply the substantial service requirement in section 27.14(a) of the Commission's rules to the 1710-1755 and 2110-2155 MHz bands.[196] According to that provision, by the end of its license term a licensee must provide "substantial service," that is, service that is sound, favorable and substantially above the level of mediocre service that just might minimally warrant renewal. Compared to a construction standard, Section 27.14(a)'s substantial service requirement will provide licensees greater flexibility to determine how best to implement their business plans based on criteria demonstrating actual service to end users. This requirement provides the flexibility required to accommodate the new and innovative services that we believe will be forthcoming in these bands.

76. Furthermore, this substantial service standard is particularly appropriate here because the incumbency of federal and other current licensees in these bands would make specific benchmarks for all new licensees inequitable. In contrast, the standard we adopt today provides us with the flexibility to consider the particular circumstances of each licensee and how the level of incumbency has had an impact on a particular licensee's ability to build-out and commence service in its licensed area.[197]

77. With respect to interim performance requirements, we agree with RCA, who was the sole commenter on this issue, and determine that a mid-license term requirement is not needed.[198] RCA points out that in many instances, licensees may meet an interim population coverage requirement by installing a small number of cell sites in a urban market, with few cell sites in rural markets. RCA argues that the public is not well served under such scenarios.[199] Therefore, in keeping with our desire to provide flexibility to licensees to implement their business plans, we will not adopt interim performance requirements.

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[193] *Id*. at 24155 ¶ 48.

[194] *Id*. at 24155 ¶ 49.

[195] *Id*.

[196] 47 C.F.R. § 27.14(a).

[197] *See* Facilitating the Provision of Spectrum-Based Services to Rural Areas and Promoting Opportunities for Rural Telephone Companies To Provide Spectrum-Based Services, WT Docket No. 02-381, *Notice of Proposed Rulemaking*, FCC 03-222, ¶ 38, rel. Oct. 6, 2003 (*Rural Services NPRM*) (if new wireless services are licensed using geographical areas, the Commission will examine the appropriateness of adopting a substantial service or alternative construction requirement for the new service at that time).

[198] *See* RCA Comments at 5-6.

[199] *See id*. at 5.

78. Only one commenter responded to the Commission's request for comments on applying section 1.946(c) to those licensees who fail to meet their performance requirement. We agree with Petrocom and find that such a failure to meet the performance requirements should result in the automatic termination of the license.[200] This will serve the public interest by providing a clear and expeditious procedure for dealing with such licenses. In the event that a licensee loses its license for failure to comply with the Commission's performance requirements, in addition to forfeiting the license, the licensee will be ineligible to regain it. The adoption of such a rule is in the public interest and is consistent with the rules we have adopted for other services.[201]

79. Finally, having received no comments on this issue, we adopt our proposal that in the event a license is partitioned or disaggregated, the partitionee or disagregatee should also be bound by the substantial service requirement we adopt today. We will apply Section 27.15 of the Commission's rules, under which parties to partitioning or disaggregation agreements are provided with options as to how they may satisfy the requirements set forth in Section 27.14.[202]

5. Disaggregation and Partitioning of Spectrum

80. *Background*: In the *AWS Service Rules NPRM*, we noted that geographic partitioning and spectrum disaggregation is a tool utilized by the Commission that is intended to promote efficient spectrum use and economic opportunity for a wide variety of applicants, including small business, rural telephone, minority-owned, and women-owned applicants.[203] We sought comment on whether licensees in the 1710-1755 and 2110-2155 MHz bands should be able to partition their service areas and disaggregate their spectrum and, if so, whether the partitioning and disaggregation provisions of section 27.15 of the Commission's rules should apply to these licensees.

81. *Discussion*: We determine that licensees in the 1710-1755 and 2110-2155 MHz bands should have the same ability to partition their service territories and disaggregate their spectrum as other wireless licensees and, therefore, we will allow them to partition their service territories and disaggregate their spectrum to the extent permitted by section 27.15 of our rules.[204] Section 27.15(a)(2) provides that licensees may apply to partition their licensed geographic service areas or disaggregate their licensed spectrum at any time following the grant of their licenses.[205] In addition, this section provides, among other obligations, that the partitioning licensee must include with its request a description of the partitioned service area and a calculation of the population of the partitioned service area and the licensed geographic service area.[206] This section also contains provisions against unjust enrichment.[207]

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[200] *See* Petrocom Comments at 9.

[201] *See* 47 C.F.R. §§ 24.103(h), 24.203(b), and 27.14(a).

[202] 47 C.F.R. § 27.15.

[203] *AWS Service Rules NPRM*, 17 FCC Rcd at 24155 ¶ 50. "Partitioning" is the assignment of geographic portions of a license along geopolitical or other boundaries. "Disaggregation" is the assignment of discrete portions of "blocks" of spectrum licensed to a geographic licensee or qualifying entity. Disaggregation allows for multiple transmitters in the same geographic area operated by different companies on adjacent frequencies.

[204] CTIA Comments at 11-12; Cingular Reply Comments at 9-10; TDD Coalition Reply Comments at 19.

[205] 47 C.F.R. § 27.15(a)(2); s*ee also Part 27 Report and Order*, 12 FCC Rcd at 10836-39 ¶¶ 96-103.

[206] 47 C.F.R. § 27.15(b)(1).

[207] 47 C.F.R. § 27.15(c)(1)(2); *see also* 47 C.F.R. § 1.2111.

82. The comments the Commission received on this issue support allowing licensees in the 1710-1755 and 2110-2155 MHz bands to partition and disaggregate. Cingular states that "the Commission should allow partitioning and disaggregation so that licensees may fine-tune their licenses to satisfy their individual spectrum needs."[208] CTIA states that it "strongly supports permitting partitioning and disaggregation in the AWS bands."[209] CTIA asserts that "partitioning and disaggregation will allow licensees to use spectrum more efficiently, speed service to underserved areas, stimulate competition, provide increased flexibility to licensees and facilitate the acquisition of spectrum by a wide variety of entities, both large and small."[210] As the commenters recognize, the Commission has permitted partitioning and disaggregation in other wireless services, including both Broadband and Narrowband PCS,[211] Multipoint Distribution Service (MDS),[212] 800 and 900 MHz Specialized Mobile Radio Service (SMR),[213] 39 GHz fixed point-to-point microwave,[214] Local Multipoint Distribution Service (LMDS),[215] Maritime Services,[216] and paging.[217] In addition, the Commission has permitted other Part 27 licensees, including 700 MHz and 2.3 GHz licensees, to partition and disaggregate.[218] Allowing licensees in the 1710-1755 and 2110-2155 MHz bands to have the same partitioning and disaggregation rights as other wireless licensees, including other Part 27 licensees, ensures regulatory parity among licensees.

83. While the comments support allowing licensees in the 1710-1755 and 2110-2155 MHz bands to partition and disaggregate, RCA expresses concern that small rural carriers have insufficient bargaining power when negotiating partitioning and disaggregation agreements.[219] Our band plan, however, should make it easier for small businesses and rural carriers to acquire spectrum. Specifically, we meet the needs of these types of providers by utilizing small licensing areas (*i.e.*, RSAs and MSAs) and by including small blocks of spectrum. We shall also make every effort, in future allocation decisions, to establish a home for TDD systems. We remain concerned about ensuring that small businesses and rural carriers have access to spectrum. At the end of last year, we released a *Notice of Inquiry* that, among other issues, examined the effectiveness of our current regulatory tools, including partitioning and disaggregation, in facilitating delivery of wireless service

[208] Cingular Reply Comments at 9-10.

[209] CTIA Comments at 11.

[210] *Id*. at 11; *see also* TDD Coalition Reply Comments at 19 (stating support for CTIA's position).

[211] 47 C.F.R. § 24.104 (Narrowband PCS); 47 C.F.R. § 24.714 (Broadband PCS).

[212] *See* Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Use of the Universal Licensing System in the 2150-2162 and 2500-2690 MHz Bands, WT Docket No. 03-66, *Notice of Proposed Rule Making and Memorandum Opinion and Order*, 18 FCC Rcd 6722 (2003) (proposing 47 C.F.R. § 101.1506).

[213] 47 C.F.R. § 90.813 (900 MHz SMR); 47 C.F.R. § 90.911 (800 MHz SMR).

[214] 47 C.F.R. § 101.56.

[215] 47 C.F.R. § 101.1111.

[216] 47 C.F.R. § 80.60.

[217] 47 C.F.R. § 22.513.

[218] 47 C.F.R. § 27.15.

[219] RCA Comments at 6-7.

to rural areas.[220] Based on the record developed in that proceeding, we have recently released a *Notice of Proposed Rulemaking* seeking comments on various proposals to effectuate service to rural areas and communities.[221] In addition, we have recently adopted the *Secondary Markets Report and Order*.[222] These proceedings should help ensure that small businesses and rural carriers can acquire spectrum to meet their business needs.

6. Other Operating Requirements

84. *Background*: In the *AWS Service Rules NPRM*, we cautioned that even though licenses for the 1710-1755 and 2110-2155 MHz bands may be issued pursuant to one rule part, licensees in these bands may be required to comply with rules contained in other parts of the Commission's rules by virtue of the particular services that they offer.[223] We sought comment on any provisions in existing, service-specific rules that may require specific recognition or adjustment to comport with the supervening application of another rule part, as well as any provisions that may be necessary in this other rule part to fully describe the scope of covered services and technologies.

85. *Discussion*: As we stated above, even though licenses for spectrum in the 1710-1755 and 2110-2155 MHz bands will be issued pursuant to Part 27 of the our rules, the licensees in these bands will be required to comply with other rule parts.[224] Section 27.3 of our rules lists some of the other rule parts that maybe applicable to licensees in the 1710-1755 and 2110-2155 MHz bands. Some of these rule parts will be applicable by virtue of the fact that they apply to all licensees and others will apply depending on the type of service these licensees provide. For example:

- All applicants and licensees in the 1710-1755 and 2110-2155 MHz bands will be subject to the application filing procedures for the Universal Licensing System, set forth in Part 1 of our rules.[225]

- Licensees in the 1710-1755 and 2110-2155 MHz bands will be required to comply with the practices and procedures listed in Part 1 of our rules for license applications, adjudicatory proceedings, etc.

- Licensees in the 1710-1755 and 2110-2155 MHz bands will be required to comply with the Commission's environment provisions, including section 1.1307.[226]

- Licensees in the 1710-1755 and 2110-2155 MHz bands will be required to comply with the antenna structure provisions of Part 17 of our rules.

- To the extent a licensee in the 1710-1755 and 2110-2155 MHz bands provides a Commercial Mobile Radio Service (CMRS), such service would be subject to the provisions of Part 20 of

[220] Facilitating the Provision of Spectrum-Based Services to Rural Areas and Promoting Opportunities for Rural Telephone Companies To Provide Spectrum-Based Services, WT Docket No. 02-381, *Notice of Inquiry*, 17 FCC Rcd 25554 (2002).

[221] *Rural Services NPRM*, *supra* n.197.

[222] *See Secondary Markets Report and Order*, *supra* n.59.

[223] *AWS Service Rules NPRM*, 17 FCC Rcd at 24156 ¶ 52.

[224] *See supra* ¶ 17.

[225] *See* 47 C.F.R. Part 1, Subpart F.

[226] 47 C.F.R. § 1.1307.

the our rules, along with the provisions in Part 27.[227] Part 20 applies to all CMRS providers, even though the stations may be licensed under other parts of our rules.

- The application of general provisions of Part 27 includes rules related to equal employment opportunity, 911 service, etc.

86. In the *AWS Service Rules NPRM*, we sought comment on whether there are any specific provisions in Part 101 of the Commission's rules[228] that should apply to licensees in the 1710-1755 and 2110-2155 MHz bands if they provided fixed services even though their stations would be licensed under Part 27.[229] In response to this question, CTIA notes that "CMRS licensees (like PCS licensees) are permitted to provide fixed services without being subject to additional Part 101 requirements."[230] CTIA expresses concern "that imposing additional Part 101 requirements on licensees offering fixed services in the AWS bands will subject those licensees to disparate regulatory treatment."[231] While as discussed above licensees in the 1710-1755 and 2110-2155 MHz bands will be subject to rules of general applicability and certain other rule parts depending on the services that they offer, these licensees will not be subject to the provisions contained in Part 101. The Part 101 rules are service specific rules and apply to licenses issued under that rule part.

E. Technical Rules

87. Under the United States Table of Frequency Allocations, both Mobile Service and Fixed Service operations are permitted for the 1710-1755 and 2110-2155 MHz bands. While we do not know the specific nature of the communications services that will ultimately be offered in this spectrum, our intent is to craft technical rules that will enable a broad range of services to be provided. In so doing we must also have rules that will minimize interference to incumbent co-channel and adjacent channel Government and non-Government users. With these considerations in mind, we establish, in the following sections, the technical rules for operations in the 1710-1755 and 2110-2155 MHz bands.

1. Co-Channel Interference Between AWS Licensees Operating in Adjacent Regions

88. *Background*: We must provide a means for limiting potential interference between AWS systems operating on the same spectrum in different geographic areas. In the *AWS Service Rules NPRM*, we tentatively concluded that either the "boundary limit"[232] or "coordination"[233] approaches could be used to satisfy this requirement.[234] We noted that both approaches have advantages and disadvantages. Coordination, for example, would likely minimize the potential for interference to

[227] 47 C.F.R. Part 20; *see also* 47 C.F.R. § 27.3(g).

[228] 47 C.F.R. Part 101.

[229] *AWS Service Rules NPRM*, 17 FCC Rcd at 24156 ¶ 52.

[230] CTIA Comments at 12-13.

[231] *Id*. at 13.

[232] With this method, licensees would be required to limit the field strength of their station's transmissions to some prescribed level at their geographic border.

[233] Under this approach, licensees operating on the same spectrum in adjacent areas would coordinate the location of their stations to control interference.

[234] *AWS Service Rules NPRM*, 17 FCC Rcd at 24157 ¶ 56.

coordinated stations; but it could also impose unnecessary costs in coordinating facilities that have a low potential for interference, and could result in undesirable strategic or anti-competitive behavior on the part of competing licensees. The use of a boundary limit would establish an accepted standard, which would enable licensees to deploy facilities in boundary areas without the need for coordination; but this approach could still require some planning between licensees to ensure that spectrum is used efficiently and that potential interference does not occur.[235] If a boundary limit methodology is used, we sought comment as to what signal level should be allowed at the border.[236] We also asked whether, if the boundary limit method is adopted, we should permit licensees operating in adjoining areas to employ alternative, agreed-upon signal limits at their common border.

89. *Discussion*: We conclude that the boundary limits should be used to address co-channel interference. Both CTIA and Motorola favor the use of boundary limits, with Motorola noting that the use of boundary limits has "proven to be effective in the deployment of PCS service."[237] Ericsson, on the other hand, suggests "a cooperative approach to the resolution of in-band interference issues" and contends that agreements between licensees, independent of the Commission "are a particularly effective tool that allows adjacent operators to set appropriate emission limits" and "facilitate the highest and best use of the spectrum."[238] We believe that the use of boundary limits is the best approach for limiting interference in border areas of AWS licensees operating on common spectrum bands.[239] It is a method that we have adopted and employed in other wireless services, and it is an approach that we believe satisfies the requirement in Section 337(d)(1) that we establish "interference limits at the boundaries of the spectrum block and service area."[240] The coordination method also has merit because it could, as Ericsson points out, allow carriers to agree to signal limits, which could lead to more efficient use of the spectrum.[241] We feel, however, that the most effective way of ensuring protection to co-channel licensees in adjoining areas is to adopt a standard signal limit for all licensees, at all geographic borders. But we shall also permit licensees operating in adjoining areas to agree to alternative signal limits at their common borders, if they choose to do so. In this way, while a standard signal limit will provide a default interference level in the absence of specific agreements between parties, alternative limits could enable a higher level of service to areas near their borders, which will enable licensees to make most efficient use of their spectrum.

90. As to the particular signal limit that should apply under our rules, those commenting on this issue favor the use of a 47 dBμV/m field strength limit. Motorola, for example, suggests that the 47 dBμV/m limit used under Part 24 for Broadband PCS is more appropriate than the 40 dBμV/m limit prescribed for the 700 MHz band "because it would generally allow for more reliable communications

[235] For example, if the base stations of two licensees provide the same signal level at a particular location along the border, interference could result to the receiving stations of both licensees operating at that location. Conversely, if a licensee is required to limit its signal to a prescribed level along the border and its neighboring licensee does not offer service to that particular location, then the level of service the licensee could provided in that area could be restricted unnecessarily.

[236] We noted that a 40 dBμV/m field strength limit is used in the 700 MHz services, and that a 47 dBμV/m field strength limit is used in Broadband PCS and WCS. *See* 47 C.F.R. §§ 24.236 and 27.55.

[237] *See* CTIA Comments at 13-14; Motorola Comments at 10.

[238] Ericsson Comments at 7.

[239] No commenters indicated a concern that the boundary limit approach would lead to anti-competitive behavior among licensees, and we are confident that under this approach such behavior will not occur.

[240] 47 U.S.C. § 337(d)(1).

[241] Ericsson Comments at 7.

in boundary regions."[242] We agree. Because the types of services that will be provided in the AWS band are likely to be similar to the services offered in the nearby PCS band, we see no reason to deviate from the field strength that has been adopted for that service. We conclude that the appropriate field strength limit for the Advanced Wireless Service is 47 dBμV/m. We therefore require AWS licensees to limit the signals from their base and fixed stations operating in the 2110-2155 MHz band to a predicted[243] or measured[244] field strength level of 47 dBμV/m at their geographic border.

2. Adjacent Channel Interference Between AWS Licensees

91. *Background*: In the *AWS Service Rules NPRM*, we sought comment on whether AWS licensees should be required to protect adjacent block AWS systems through the use of an out-of-band emission (OOBE) limitation.[245] We noted that the OOBE limit that requires licensees to attenuate power levels (P) by at least $43 + 10 \log_{10}(P)$ dB at the edges of their spectrum blocks is commonly employed in other wireless services, and it has generally been found to be adequate in preventing adjacent channel interference.[246] No commenters disagreed with the adoption of this out-of-band emission limit to protect adjacent AWS operations.[247]

92. *Discussion*: We conclude that the $43 + 10 \log_{10}(P)$ out-of-band emission limit is appropriate for protecting wireless systems that will operate in the AWS bands. We anticipate that AWS systems will be similar in design to cellular and PCS systems, and the $43 + 10 \log_{10}(P)$ limit has been used effectively in these services in limiting adjacent channel interference. We therefore adopt this out-of-band emission limit for all transmitters operating in the AWS bands. In the event that, once individual systems are deployed and operational, it is determined that this limitation does not prevent an AWS transmitter from causing harmful interference, we shall, at our discretion, require the licensee of that transmitter to provide greater emission attenuation.

93. Lucent agrees with the use of the $43 + 10 \log_{10}(P)$ OOBE limit to protect adjacent channel operations. However, Lucent proposes a modification to the way we traditionally measure out-of-band emissions. Lucent refers to its comments to the Commission's *Year 2002 Biennial Review* proceeding, where it noted that our rule in Part 24 describing the procedure for measuring out-of-band emissions states that "in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed."[248]

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[242] Motorola Comments at 10.

[243] Licensees should calculate the 47 dBμV/m field strength at their border using a predictive model that is appropriate to the environment and terrain that exists in their geographic area. Appendix D contains a sampling of predictive models that could be used in this calculation.

[244] Licensees will be allowed to satisfy the required field strength limitation by providing a measured 47 dBμV/m signal at their borders. They could elect to use this approach in areas where, for example, extreme terrain blockage could enable base or fixed stations to be located closer to a geographic border than indicated by a predictive model.

[245] *AWS Service Rules NPRM*, 17 FCC Rcd at 24160 ¶ 64.

[246] *See* 47 C.F.R. § 27.53(a)(3); *see also Part 27 Report and Order*, 12 FCC Rcd at 10857 ¶ 144 (citing 47 C.F.R. §§ 22.359(iii), 22.917(e), 24.238).

[247] AT&T Wireless Comments at 9-10; CTIA Comments at 13-14; Ericsson Comments at 7; Lucent Comments at 3-4; Motorola Comments at 14.

[248] Lucent Comments at 4.

94. Lucent had sought modification to rule 24.238(b) in the context of the Wireless Telecommunications Bureau's recent periodic review of its rules.[249] The Bureau considered the proposal at that time, but declined to modify rule 24.238(b).[250] We continue to believe that the existing rule, as adopted in the recent *Cellular Biennial Review First Report and Order*,[251] provides the most appropriate way of measuring out-of-band emissions into adjacent spectrum. Our goal in developing out-of-band emission standards is to provide for a minimal and predictable level of interference into adjacent spectrum. Our existing rule serves that purpose. The modification proposed by Lucent, however, could enable licensees with emission bandwidth greater than 1.25 MHz to potentially place greater amounts of energy into adjacent bands.[252] We therefore decline to adopt this proposal to modify our rules.

3. Power Limits

95. *Background*: In the *AWS Service Rules NPRM*, we sought comment on what power limits should be established for AWS transmitters.[253] The Commission observed that transmitters used in the private land mobile service, cellular radio service, and fixed microwave services typically employ substantially different transmitter power levels. The Commission also noted that the output powers of potential Government co-channel users could range much higher than typical non-Government users. Accordingly, the Commission invited comment as to what these limits should be and the basis for the suggested limits. The Commission also solicited views as to whether we should establish power limits for all transmitters, or just mobile equipment, or just base station equipment.

96. *Discussion*: We shall adopt the same 1640 watts peak equivalent isotropically radiated power (EIRP) limit for AWS base stations in the 2110-2155 MHz band that is currently provided for base stations operating in broadband PCS under Part 24 of our rules. For AWS mobile stations operating in the 1710-1755 MHz band, however, we shall adopt a power limit of 1 watt peak EIRP, which is lower than the 2 watt peak EIRP limit currently prescribed for mobile stations operating in broadband PCS. Most commenters support the application of the same power limits for AWS that currently apply to broadband PCS. AT&T Wireless, for example, states that "[s]ince current CMRS carriers will almost certainly be the primary initial licensees in the AWS bands, and since the AWS spectrum will most likely be used to augment existing wireless offerings, applying the Part 24 [PCS] rules would promote the most efficient and rapid utilization of newly available spectrum by allowing

[249] In its comments in the *Year 2002 Biennial Review* proceeding (WT Docket No. 02-310), Lucent proposed that Section 24.238(b) be modified to state that "in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of ether 12.5 kHz or one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed." *See* Lucent Comments at 3 (unpaginated).

[250] In its decision the Bureau found that "Lucent [did] not argue that the underlying purpose of the rules (to provide an adequate measure of interference protection to other licensees) no longer exists or is not necessary in the public interest . . ." *See* Federal Communications Commission 2002 Biennial Review, Staff Report of the Wireless Telecommunications Bureau (WT Docket No. 02-310, GC Docket No. 02-390), December 31, 2002, at p. 57, Appendix IV.

[251] *See* Year 2000 Biennial Review – Amendment of Part 22 of the Commission's Rules to Modify or Eliminate Outdated Rules Affecting the Cellular Radiotelephone Service and other Commercial Mobile Radio Services, WT Docket No. 01-108, *Report and Order*, 17 FCC Rcd 18401, 18410-11 ¶ 46 (2002) (*Cellular Biennial Review First Report and Order)*.

[252] That is, licensees with emission bandwidths greater than 1.25 MHz could meet specified emission limits within the first 12.5 kHz of adjacent spectrum, but could potentially place greater emissions into the spectrum beyond 12.5 kHz than a licensee employing a lesser emission bandwidth.

[253] *AWS Service Rules NPRM*, 17 FCC Rcd at 24160-61 ¶ 65.

carriers to utilize existing infrastructure, technologies, and expertise."[254] Cingular, however, proposes that the output power for AWS mobile stations should be measured at the radiofrequency port, rather than based on EIRP. Cingular argues that this "would create harmonization between the Commission's rules and the ETSI, which, in turn, would facilitate research regarding, and deployment of, directive antennas at the mobile station."[255]

97. Although the goals of creating harmonization between our rules and those used in Europe and of improving directive antenna technology are laudable, we decline to adopt this proposal. A more important goal in this proceeding is to, to the extent possible, try to provide the same technical criteria for AWS equipment as currently exist for broadband PCS. We therefore find that it would be best to establish the same method for measuring power in the AWS bands that we currently use for measuring power in the broadband PCS bands.[256]

98. In determining the appropriate EIRP limit for the 1710-1755 MHz band we must be mindful of the presence of incumbent Government operations in that band.[257] While the majority of the Government systems will be relocated to other spectrum, there will continue to be Government operations at 16 military facilities for some time, including two sites indefinitely. In analyzing the potential for interference to the continued Government operations, coordination processes would be simplified if mobiles operate with a maximum power of 1 watt EIRP. While this is lower than the power currently authorized for broadband PCS mobiles, we note that most PCS mobiles operate at substantially less power than one watt and thus this limit should not be a hindrance to AWS operations. We therefore establish the power limit for base and fixed stations operating in the 2110-2155 MHz bands as 1640 watts peak EIRP and 100 watts peak output power. Fixed, mobile and portable stations operating in the 1710-1755 MHz band shall be limited to 1 watt EIRP peak power, and mobile and portable stations must employ a means for limiting power to the minimum necessary for successful communications.[258]

99. Motorola in its comments notes that under our broadband PCS rules, power limits for PCS base stations "are applied irrespective of the bandwidth utilized by the licensee's deployed technology."[259] This, according to Motorola, allows technologies using narrower bandwidths to "radiate a higher power per unit bandwidth."[260] Motorola therefore suggests that we adopt power limits for the AWS bands that are associated with a transmitter's emission bandwidth. Specifically, Motorola proposes that for base stations operating in the AWS bands with bandwidths less than 1 MHz, our adopted EIRP limit would apply. But for base stations with operating bandwidths greater than 1 MHz, the EIRP limit would be applied to a 1 MHz bandwidth -- *i.e.*, for bandwidths greater than 1 MHz, the power limit would be 1640 w/MHz EIRP. Motorola indicates that this would "ensure

[254] AT&T Wireless Comments at 9. AT&T Wireless indicates as well that if we were to adopt substantially different technical rules for AWS, it would force carriers, in areas where both CMRS and AWS spectrum is used, to "construct and maintain two parallel radio interface networks, including cell sites, towers, and antennas, in order to maintain the same level of service coverage and quality." *Id.* at 10.

[255] Cingular Reply Comments at 7 (ETSI is the European Telecommunications Standards Institute).

[256] *See* 47 C.F.R. § 24.232.

[257] *See infra* ¶¶ 117-123.

[258] When the relocation of DOD operations from the 1710-1755 MHz band is completed, we may consider raising the power limit for fixed, mobile, and portable stations in that band to 2 W EIRP peak power.

[259] Motorola Comments at 14.

[260] *Id*.

that all wideband systems would radiate the same power per unit bandwidth, regardless of the technology utilized."[261]

100. We do not favor the adoption of this proposal. As an initial matter, we are concerned that adopting a rule that permits greater power levels for systems using wider bandwidths would create an inconsistency between our AWS rules and those of wireless mobile services on nearby spectrum, such as PCS and ATC, with the result being a loss of regulatory parity among these different services. We continue to believe that our focus should be toward decreasing power levels whenever possible.[262] Such efforts will enable us to better manage, and make more efficient use of the spectrum.

101. While we do not adopt this proposal in this proceeding, we recognize that, as wideband technologies become more prevalent in wireless systems, analyzing and determining appropriate power levels for such technologies could be a worthwhile undertaking. We believe, however, that this issue is more appropriately considered in the context of petition for rulemaking, where its impact could be considered in the context of not just the AWS band, but other wireless bands as well. We therefore invite Motorola, or any other interested party, to seek additional consideration of this matter through such a petition.

102. We also sought comment on whether to permit higher power limits in rural areas than in urban areas, and if so, what those limits might be. Motorola recommended that base stations located in rural areas be exempted from power limits. In support of this proposal, Motorola argues that in exempting rural base stations from power limits, we would enable licensees to provide greater geographic coverage with fewer base station transmitters, which would "[reduce] the cost of building out systems in [rural] areas."[263] Motorola suggests that this would enable faster deployment of 3G services in rural America, which would be "consistent with Congress's statutory directive to promote 'the development and rapid deployment of new technologies, products, and services for the benefit of the public, including in rural areas.'"[264] We believe that the power limits we have established are sufficient to enable licensees operating in rural areas to provide coverage throughout their service areas. The power limit of 1640 EIRP has been used effectively for base stations in PCS and furthermore, any excessive power level could cause potentially harmful overload interference to nearby, adjacent band receivers. We therefore find that it is appropriate to limit the power levels to base stations as described above, regardless of their location; and thus decline to exempt rural stations from our power limit requirement.[265]

103. Finally, in addition to limiting the power of base stations, we must also consider imposing an antenna height limit for such stations. A base station's antenna height, in combination with its EIRP, quantifies the signal level produced by the station at a specific location. In other

[261] *Id*.

[262] It should also be noted that this proposal would be in conflict with our Spectrum Policy Task Force recommendation to "investigate rule changes that enable the lowering of permitted power in urban areas . . ." *Spectrum Policy Task Force Report* at 64.

[263] Motorola Comments at 14-15.

[264] *Id.* at 15.

[265] We note, however, that in our recently-adopted *Rural Services NPRM*, we seek comment on whether to increase the rural power limits for PCS and other licensed services. *Rural Services NPRM* at ¶¶ 47-58. Given that AWS network operations and configurations are likely to be similar to PCS, if a finding is made that rural power limits for PCS should be increased, we could, in the future, explore the possibility of similar power increases for AWS.

wireless services, which were initially licensed on a site-by-site basis,[266] it was important to place a limit on the coverage area of base stations to limit co-channel interference. However, in a service such as AWS, which will be licensed from the outset on a geographic area basis, we do not believe that, with the requirement to limit signal strength at a licensee's geographic border, it is necessary to place a limit on the coverage area produced by individual base stations. We therefore do not impose antenna height limits on base or fixed stations operating in the 2110-2155 MHz band.

4. Spectrum Location of Base and Mobile Transmissions

104. *Background*: In the *AWS Service Rules NPRM*, we sought comment on whether base and mobile transmitters should be allowed to operate in both the lower (1710-1755 MHz) and upper (2110-2155 MHz) AWS bands or whether, alternatively, we should restrict base station transmissions to one band and mobile transmissions to the other band.[267] We noted that NTIA, in reaching its conclusion that 3G systems were not likely to cause interference to Government operations, had assumed that non-Government base stations would not operate in the lower AWS band.[268] We also observed that in other land mobile systems we have generally provided for mobile channels in one band paired with base channels in a different band.[269]

105. *Discussion*: Commenters generally oppose allowing base and mobile transmissions in the same band and specifically favor the mandatory placement of base stations in the 2110-2155 MHz band and mobile stations in the 1710-1755 MHz band. These parties believe that permitting base and mobile transmissions in the same band will result in interference among AWS users. For example, NTIA states that if base stations were allowed in the 1710-1755 MHz band, then the conclusions reached in the *NTIA AWS Assessment* regarding the sharing of the band by Government and non-Government entities would no longer be valid, and that a new assessment of this issue would be necessary.[270] Lucent asserts that permitting "operator choice" in locating base and mobile transmissions in the AWS bands could result in the potential for interference that "would likely demand the use of more stringent out of band energy requirements, the use of lower power transmitters, and the designation of guard bands."[271] Verizon Wireless observes that though the Commission did not clearly define the PCS base and mobile transmit bands, PCS carriers agreed among themselves to locate mobile stations in one band and base stations in the other band. Verizon Wireless contends that the Commission cannot necessarily "rely on private incentives to ensure the type of interference protection that results from establishing clearly in advance that one set of frequencies will be used for mobile transmit and the other for base transmit."[272] Motorola indicates that the Commission "should clearly" designate the lower band for mobile transmissions and the upper band for base transmissions, claiming that "harmful interference to adjacent channel users" would result if this base and mobile transmissions were permitted in the same bands. [273]

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[266] *See, e.g.,* 47 C.F.R. Part 90, Subpart S (the 800 and 900 MHz bands).

[267] *AWS Service Rules NPRM*, 17 FCC Rcd at 24161 ¶ 66.

[268] *NTIA AWS Assessment* at 6.

[269] *AWS Service Rules NPRM*, 17 FCC Rcd at 24161 ¶ 66.

[270] NTIA Comments at 3-4.

[271] Lucent Comments at 3.

[272] Verizon Wireless Comments at 5.

[273] Motorola Comments at 3. CTIA, Nokia, and AT&T agree with this assertion, citing the findings of ITU-R Working Party 8F Report ITU-R M.1036 (draft recommendation on "Frequency Arrangements for (continued….)

106. In favoring the mandatory placement of mobile transmissions in the 1710-1755 MHz band and base transmissions in the 2110-2155 MHz band, various parties also observe that this action would be consistent with international use of this spectrum and would enable U.S. consumers to realize the benefits of economies of scale and international roaming, which would result from such global harmonization. Nokia, for example, points out that, consistent with the recommendations of ITU-R M.1036, several countries are now using the 2110-2170 MHz band for downlink transmissions in IMT-2000 networks, and Motorola observes that the 1710-1785 MHz band is currently used for mobile transmissions in DCS-1800 spectrum in Europe.[274]

107. The TDD Coalition, however, argues that limiting the lower band to mobile transmissions and the upper band to base transmissions would prevent TDD-based services from being implemented in either band, and that such an action would go "against the FCC's policy of flexible allocations to promote advanced wireless communications service."[275] The TDD Coalition points out further that, while ITU-R Working Party 8F indicated 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, a "follow-up" ITU report is being developed which, according to the TDD Coalition, will show that the "interference between TDD and FDD systems can 'easily' be mitigated through the use of various techniques."[276]

108. We are concerned about the possibility that certain interference conditions could occur if base and mobile stations were permitted to operate in the same AWS bands. One such condition is the "base-to-base" interference scenario, which occurs when transmissions from one base station cause interference to another base station attempting to receive on an adjacent channel. When base transmit and base receive frequencies (*i.e.*, mobile transmit frequencies) are far enough apart from one another, as they are in most land mobile radio services, this type of interference does not take place.[277] However, if base transmit and receive frequencies are spectrally close to one another, then base-to-base interference can occur. Similarly, if mobile transmit and mobile receive frequencies are close by, then "mobile-to-mobile" interference can take place (*i.e.*, where a transmitting mobile causes interference to another mobile receiving on an adjacent channel).

109. Clearly, these types of interference scenarios are of concern to both Government and non-Government users. From the Government users' standpoint, the placement of AWS base stations in the 1710-1755 MHz band could result in base-to-base interference to their systems that currently operate below, within, and above that band.[278] Because the Government's assessment of how

(Continued from previous page)
Implementation of International Mobile Telecommunications-2000 (IMT-2000) in the Bands 806-960 MHz, 1710-2025 MHz, 2110-2200 MHz and 2500-2690 MHz," Doc. 8F/TEMP/330r2). The ITU-R Report recommends that the 1.7 GHz band should be used only for mobile transmissions and that the 2.1 GHz band should be used only for base transmissions. CTIA Comments at 14; Nokia Comments at 1-2 (unpaginated); and AT&T Comments at 8.

[274] Nokia Comments at 3 (unpaginated); Motorola Comments at n.19 and 20; *see also* Ericsson Comments at 9; Lucent Comments at 3 (unpaginated); AT&T Wireless Comments at 9.

[275] TDD Coalition Reply Comments at 11. PetroCom also opposes restricting one type of transmission in one band and the other type of transmission in the other band. PetroCom Comments at 8.

[276] TDD Coalition Reply Comments at 24.

[277] When there is sufficient frequency separation, our traditional out-of-band emission limit, *i.e.*, the 43 + 10log P limit, and our limits on base station power are sufficient to prevent such interference from occurring.

[278] Even after the relocation of Government spectrum from the 1710-1755 MHz band is completed, there will continue to be Government operations in the spectrum above 1755 MHz and below 1710 MHz.

Government and non-Government entities will share this spectrum is based on the assumption that only mobile stations would operate in the 1710-1755 MHz band, the Government might have to re-evaluate this assessment if we allow base stations in that band. Non-Government users are concerned that mixing base and mobile transmissions in the 1710-1755 and 2110-2155 MHz bands would either directly result in interference or could require the implementation of costly measures to *prevent* interference. For example, if we permitted base stations transmissions in the 1710-1755 MHz band, we would likely have to impose tighter out-of-band emission (OOBE) limits and lower power levels, and possibly even require guard bands and interference zones. 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.

110. We therefore conclude that base station transmissions will not be allowed in the 1710-1755 MHz band and will only be permitted in the 2110-2155 MHz band.[279] This decision eliminates any concern about excessive potential interference between AWS and Government users and enables the transfer of Government spectrum to occur without any unnecessary impediments. The decision also allows future AWS licensees to operate on AWS spectrum without having to satisfy unnecessary technical or operational restrictions, which could limit their ability to make efficient use of the spectrum. And finally, this decision, as various commenters note, enables the United States to remain consistent with global use of the 1710-1755 MHz and 2110-2155 MHz bands; this will facilitate international roaming and will enable base and mobile equipment to be manufactured at lower cost.

111. While we determine that it is best not to permit base and mobile stations to operate in the same AWS bands -- which effectively prevents TDD systems from operating in those bands -- we continue to believe that one of our primary goals in managing the spectrum is to facilitate the development of new and different technologies, including TDD.[280] Therefore, as discussed in paragraph 46 above, if 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, we would be prepared to revisit this issue. We will also make every effort to provide spectrum

[279] The 1710-1755 and 2110-2155 MHz bands are allocated for the Mobile and Fixed Services. The Mobile Service consists of base stations communicating with mobile stations. The Fixed Service consists of fixed stations communicating with other fixed stations. In developing our rules for AWS, we must determine how and where these various stations shall be permitted to operate within the AWS bands. Mobile stations will be allowed in the 1710-1755 MHz band and base stations will be permitted in the 2110-2155 MHz band. The question is where fixed stations shall and shall not be allowed to operate. A fixed station with a relatively high transmitting antenna is, with regard to the out-of-band emissions it can place into an adjacent band receiver, indistinguishable from a base station operating at the same antenna height -- and as we have indicated, the *NTIA AWS Assessment* was based on not permitting base stations in the 1710-1755 MHz band because of concerns about interference to Government systems operating within, above, and below that band. So in order to prevent interference to adjacent band Government operations, we shall place a special limit on the fixed stations that will be permitted to operate in the 1710-1755 MHz band. Specifically, we shall limit the antenna of any fixed station operating in the 1710-1755 MHz band to a height of no more than 10 meters above ground. As indicated in paragraph 103 above, the height of antennas of fixed stations operating in the 2110-2155 MHz band, however, shall be unrestricted.

[280] Significantly, one of the access technologies indicated by the ITU in its IMT-2000 standard provides for TDD/CDMA transmissions.

opportunities for TDD systems in allocation and spectrum decisions affecting other bands, such as in the *AWS Allocation* proceeding.[281]

5. Protecting Incumbent Systems from Interference

(a) The 2110-2155 MHz Band

112. As we indicated in the *AWS Service Rules NPRM*, some fixed point-to-point microwave systems authorized under Part 101 of our rules will continue to operate in the 2110-2155 MHz band after AWS licensing begins.[282] We therefore asked how such systems should be protected from interference from co-channel and adjacent channel AWS operations. In particular, we asked whether the TIA Telecommunications Service Bulletin (TSB) 10-F should be used to provide guidelines for the protection of incumbent systems. Also, Multipoint Distribution Service (MDS) systems under Part 21 are licensed in the 2110-2155 MHz band.[283] While we are currently exploring the possibility of relocating MDS operations to other spectrum, until such time as those operations are relocated, they must be protected from interference from AWS systems.[284]

(i) Protection of Part 101 Systems

113. Motorola indicates that the TIA TSB 10-F procedures have been effective in determining potential interference to incumbent fixed microwave receivers operating in the 1850-1990 MHz band, and should similarly be used to protect microwave systems in the 2110-2155 MHz band.[285] API agrees that TSB 10-F "sets forth appropriate criteria to determine what constitutes an intolerable level of interference" to an incumbent user,[286] but also suggests that the coordination procedures developed by the National Spectrum Managers Association (WG20.94.045) be allowed to be used to evaluate the interference potential to incumbent systems.[287] In addition, API asks us to confirm that the obligation to relocate an incumbent licensee "should be triggered by a demonstration of a potential interference under the applicable technical standard, rather than a showing that any actual interference has occurred."[288]

114. We conclude that AWS licensees should be required to coordinate, prior to initiating operations from any base or fixed station, their frequency usage with co-channel and adjacent channel

[281] *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, *Third Report and Order, Third Notice of Proposed Rulemaking and Second Memorandum Opinion and Order*, 18 FCC Rcd 2223 (2003).

[282] *AWS Service Rules NPRM*, 17 FCC Rcd at 24158 ¶ 61. In the *Emerging Technologies* relocation procedures, we indicated that incumbent fixed point-to-point links would be moved on an as-needed basis.

[283] MDS operations are confined to the 2150-2155 MHz portion of the 2110-2155 MHz band.

[284] *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, *Third Report and Order, Third Notice of Proposed Rulemaking and Second Memorandum Opinion and Order*, 18 FCC Rcd 2223 (2003).

[285] Motorola Comments at 11. *See also* Ericsson Comments at 8.

[286] API Comments at 7.

[287] *Id*. API points out that these procedures have been used in the context of the introduction of PCS operations into the 1.9 GHz band.

[288] *Id*. at 7-8.

incumbent Part 101 fixed-point-to-point microwave licensees operating in the 2110-2155 MHz band. We therefore apply to the AWS bands the provisions of Section 24.237 of our rules, which details the coordination requirements for the protection of incumbent fixed microwave systems in the PCS bands.[289] The procedures described in this rule rely on the use of predictive methods for determining interference. Thus, in response to API's inquiry regarding the triggering mechanism for relocation of fixed microwave systems, we find that relocation of such systems may be based on a prediction of potential interference and need not be triggered by an occurrence of actual interference. Finally, in paragraph (g) of the current rule 24.237, we indicate that we would accept the procedures developed by any "recognized authority" in determining appropriate interference criteria.[290] The procedures developed by the National Spectrum Managers Association would appear to fall into this category and could therefore, as API suggests, be used for this purpose.

(ii) Protection of Part 21 Systems

115. As noted above, MDS operations in the 2110-2155 MHz band may eventually be relocated to other spectrum.[291] However, until that occurs, we must protect MDS systems from interference from AWS operations. We shall therefore require AWS licensees, prior to initiating operations from any base or fixed station, to coordinate their frequency usage with co-channel and adjacent channel incumbent Part 21 MDS licensees.[292]

(iii) Goldstone, California Facility

116. The 2110-2120 MHz band is allocated on a primary basis for earth-to-space (deep space) communications in the Space Research service used by the National Aeronautics and Space Administration (NASA).[293] Operations in this service in the United States are limited to deep space communications at the NASA Goldstone Deep Space Network (DSN) facility in Goldstone, California. AWS licensees will be permitted to operate in the area around Goldstone without having to provide protection to the facility. However, operation of AWS systems will be affected by transmissions from Goldstone. In the *AWS Allocation Order*, we concluded that because of the nature of operations at Goldstone, a significant amount of interference should not occur to AWS systems operating in the 2110-2120 MHz band in the vicinity of Goldstone.[294] However, AWS licensees using the 2110-2120 MHz band should be aware that this facility may operate at any time at a nominal EIRP of 105.5 dBW,[295] along any azimuth, and at elevations as low as 10 degrees above the horizon. During these transmissions, AWS systems operating in the vicinity of Goldstone may become unavailable. AWS licensees cannot claim protection from interference due to these transmissions. We thus note that

[289] 47 C.F.R. § 24.237. Included in the rule shall be the requirement that, unless AWS and fixed microwave licensees agree on an alternative method, TIA TSB 10-F must be used as the guideline for determining the co-channel and adjacent channel fixed microwave facilities to be coordinated.

[290] 47 C.F.R. § 24.237(g).

[291] *See supra* ¶ 112.

[292] In the event that AWS and MDS licensees cannot reach agreement in coordinating their facilities, they may seek the assistance of the Commission, and the Commission may then, at its discretion, impose requirements on either or both parties.

[293] *See* February 15, 1961 letter from FCC Secretary Waple to Director of Telecommunications Executive Office of the President.

[294] *AWS Allocation Order*, 17 FCC Rcd at 23208 ¶ 33.

[295] The DSN, under emergency conditions, transmits with EIRP up to 119.5 dBW.

future AWS licensees operating in spectrum in the 2110-2120 MHz band in the area surrounding Goldstone, California should consider this potential for interference in developing their systems.

(b) The 1710-1755 MHz Band

117. This spectrum is used extensively by the Federal Government for both military (Army, Air Force, and Navy) and non-military (Department of Agriculture (USDA), Department of Energy (DOE), Department of Justice (DOJ), Federal Aviation Agency (FAA), Department of Interior (DOI), Tennessee Valley Authority (TVA), U.S. Coast Guard (USCG), Federal Power Administration (FPA), and Department of the Treasury) operations.[296] The following is a description of Department of Defense (DOD) and non-DOD operations in the band and a discussion of the types of protection that shall be provided to such operations by AWS licensees.

(i) Department of Defense Operations

118. There are 16 military facilities in the country that are classified as "protected facilities," and there are various types of systems operating at these locations. These include: airborne telemetry and video systems; ground operations, including tactical radio relay and fixed microwave systems; precision guided munitions (PGM) systems; and others.[297] According to the *NTIA AWS Assessment* and subject to the availability of reimbursement funds, DOD is expected to relocate all airborne operations at these facilities by December, 2008, but until that time, these systems must be protected from non-Government operations in the 1710-1755 MHz band.[298] Ground-based systems at the 16 sites shall be converted from exclusive Government use to mixed use as of January 1, 2004. Ground-based operations will continue on a secondary basis with respect to non-Government systems at 14 of those 16 sites. At the remaining two locations -- in Yuma, Arizona and in Cherry Point, North Carolina -- ground-based systems shall continue to operate on a primary basis indefinitely and such systems must therefore be protected indefinitely from non-Government operations. PGM systems, which operate in the 1710-1720 MHz band, shall continue on a primary basis at all 16 sites until inventory is exhausted, or until the expected clearance date of December 31, 2008, whichever is earlier; such systems must therefore be protected from non-Government operations during this period of time.[299] The "other" military systems[300] will relocate to spectrum in other bands when such spectrum becomes available.

119. *Protection of the 16 DOD Facilities*: AWS must protect systems operating at the 16 DOD facilities from interference until such systems are relocated to other spectrum.[301] In order to protect these facilities, AWS licensees will be required to restrict the operations of their stations in the 1710-1755 MHz band. The February 1995 Spectrum Reallocation Final Report (*1995 Reallocation Final Report*), Appendix F, Figure F-3 provides a table indicating the "radius of operation" for each of

[296] According to the Government Master File (GMF) of January, 2001, there are 1,825 Federal frequency assignments in the 1710-1755 MHz band.

[297] These include unmanned ground robotic systems, range timing distribution systems, and target scoring devices.

[298] *See supra* ¶ 7.

[299] *See NTIA AWS Assessment* at 12.

[300] *See supra* n. 297.

[301] TRR operations will continue indefinitely and on a primary basis at the Cherry Point and Yuma facilities.

the 16 facilities.[302] AWS licensees shall therefore be prohibited from situating their base and fixed stations at any locations that could potentially permit mobile, fixed, and portable stations transmitting in the 1710-1755 MHz band to cause interference to government systems operating within the radii of operation of the 16 facilities. Thus, AWS licensees shall be required to coordinate any operations that could permit mobile, fixed, and portable stations as specified in Section 27.1134(a) of the adopted rules.[303] Except for Yuma, Arizona and Cherry Point, North Carolina, these various restrictions shall apply until such time as the relocation of the Federal systems has been completed.[304] Furthermore, AWS licensees will be required to accept any interference received from operations at the 16 facilities. Such interference could occur at large distances outside the operating radii due to airborne operations within those radii.

120. Motorola, in its comments, expresses concern that aeronautical systems operating at the DOD sites will have a significant impact on AWS operations.[305] Specifically, Motorola notes that because aircraft can operate at altitudes of up to 50,000 feet, interference could be caused to AWS operations more than 400 kilometers away. We are sympathetic to Motorola's concerns. However, there is little that can be done to prevent such interference from occurring on occasion. Aeronautical operations at these facilities are expected to cease by 2008.[306] Until that time, we encourage Government users at the 16 installations and AWS licensees operating in nearby areas to work together to try to minimize interference to AWS operations, to the extent possible.

121. *The Yuma, Arizona and Cherry Point, North Carolina Facilities*: As noted above, protection of ground systems at the Cherry Point and Yuma installations shall continue on a primary basis indefinitely. Motorola therefore suggests that the Commission develop mandatory coordination procedures between AWS licensees and DOD operations at the Cherry Point and Yuma locations.[307] We disagree with this proposal. Because of the critical nature of the operations being conducted at these facilities, formal interference criteria are needed to protect these sites. Coordination procedures will not ensure necessary protection to the military systems operating at these locations. Thus, in order to provide appropriate protection to DOD operations at these installations, AWS licensees must satisfy defined interference-protection criteria. We therefore decline to adopt a coordination approach, and shall require AWS licensees to provide permanent protection to the Yuma and Cherry Point facilities in accordance with the protection measures described in paragraph 119, above.

122. *Precision Guided Munitions Systems*: As noted above, PGM systems will continue to use the 1710-1720 MHz band on a primary basis until all PGM inventory is exhausted, or the expected clearance date of December 31, 2008, whichever is earlier. Motorola asks that PGM operations be

[302] The information from the table has been included in rule section 27.1134.

[303] *See* Appendix C final rule section 47 C.F.R. § 27.1134(a). This coordination will be accomplished between the AWS licensee and the Commander of the affected DoD facility. Notwithstanding this local coordination, all parties must recognize that the FCC and NTIA maintain the authority to enforce the coordination requirement and correct interference (*i.e.*, in the event of an interference complaint from DoD, the Commission working with NTIA and the AWS licensee will rectify the situation).

[304] *See supra* ¶ 7 (describing the circumstances and conditions for the relocation of Federal systems).

[305] Motorola Comments at 12.

[306] As discussed above, this date may change. *See supra* ¶ 7.

[307] Motorola Comments at 11.

protected through coordination procedures developed between DOD and AWS licensees.[308] We disagree with this suggestion as well. The only reliable way to protect these important military systems is to require AWS licensees to comply with specified interference protection criteria, and we therefore decline to adopt the proposal set forth by Motorola. Rather, AWS licensees will be required to protect PGM operations at each of the 16 facilities in accordance with the protection measures described in paragraph 119 above until PGM inventory at each facility is exhausted, or the expected clearance date of December 31, 2008, whichever is earlier.

123. *Unmanned Ground Robotic Systems, Range Timing Distribution Systems, and Target Scoring Devices*: These systems are located at military test ranges at the 16 protected DOD sites. Until such time as these systems are relocated to other spectrum, they shall be protected in accordance with the protection measures described in paragraph 119 above. No timeline has been established for the relocation of these systems.

(ii) Non-Department of Defense Operations

124. These are the fixed systems of the remaining Federal agencies (*i.e.*, DOI, USDA, DOJ, DOE, FAA, FPA, and Department of the Treasury), which are to be relocated, subject to the availability of relocation funds. According to the *NTIA AWS Assessment*, all systems subject to relocation are anticipated to vacate the 1710-1755 MHz band within 2 years of such funds becoming available.[309] However, because relocation may not occur until well after the auction of AWS spectrum, Government and AWS systems could operate simultaneously in the 1710-1755 MHz band for some time. We must therefore provide protection to Government stations from interference from co-channel and adjacent channel AWS systems during this time period. Therefore, until such time as AWS licensees have reimbursed affected Government licensees and the Government licensees have relocated to other spectrum, AWS operators shall be required to protect Government fixed systems in accordance with the provisions set forth in TIA TSB 10-F, "Interference Criteria for Microwave Systems," or its successor.[310]

(c) Below 1710 MHz

125. The 1675-1710 MHz spectrum is used by both the Federal Government and non-Federal Government in the Meteorological-Satellite Service (space-to-earth communications) and from 1675 to 1700 MHz by the Federal Government alone in the Meteorological Aids Service (radiosonde). It is anticipated that AWS stations operating in the 1710-1755 MHz band should not cause interference to meteorological operations. We therefore impose no general restriction on AWS systems to protect such operations. However, there is a potential scenario that could result in interference to meteorological systems. This would be the condition where a meteorological receiver is pointed at a low angle toward the horizon and an AWS fixed station (at a height of up to 10 meters above ground) is operating nearby and pointing in the direction of the radiosonde ground station or the meteorological-satellite earth station.[311] If interference to a meteorological receiver were to occur under this scenario and the affected licensee were to notify the AWS operator that interference was

[308] Motorola Comments at 12. Motorola also suggests that PGM operations be limited to lower altitudes and/or night-time use and that AWS licensees be given some advance notification of such operations. *Id*.

[309] *See supra* ¶ 7.

[310] TIA TSB 10-F provides standards for protecting fixed, microwave stations from co-channel and adjacent channel operations.

[311] Satellite receivers may not be registered in FCC or NTIA databases.

occurring, the operator would be required to modify its station location and/or technical parameters as necessary to eliminate the interference.

(d) Above 1755 MHz

126. There is considerable Government usage of the spectrum between 1755 and 1842 MHz, and Government operations in this spectrum shall continue after AWS systems are licensed. Government systems must therefore be protected from interference from AWS stations operating in the 1710-1755 MHz band. The Government has identified the following types of operations in the spectrum above 1755 MHz: non-DOD systems operating in the 1755-1761 MHz band; DOD operations in the 1755-1761 MHz band, which include tactical radio relay and airborne telemetry systems located at the 16 protected DOD sites; and Space-Ground Link Subsystem (SGLS) and Aircrew Combat Training Systems (ACTS) systems operating in the 1761-1842 MHz band at the 16 sites. In protecting the 16 DOD facilities from co-channel interference in accordance with the distance separations indicated in the *1995 Reallocation Final Report*, Appendix F, Figure F-3,[312] AWS licensees operating in the 1710-1755 MHz band will effectively provide necessary protection to the DOD systems operating at those facilities on adjacent spectrum. Thus, no further protection of these operations is required by AWS licensees. However, AWS licensees will be required to protect non-DOD operations above 1755 MHz; and shall provide such protection by satisfying the appropriate provisions prescribed in TIA TSB 10-F.

(e) Below 2110 MHz

127. The 2025-2110 MHz band is used by Government and non-Government entities for Earth-to-space transmissions in the Space Operation, Space Research, and Earth-Exploration Satellite services. Recently, the ITU performed a study of potential interference to satellite services from co-channel 3G systems.[313] In February, we released our 2 GHz MSS/ATC Order,[314] in which we considered the ITU study in assessing the likelihood for adjacent channel interference from 1990-2025 MHz ATC operations to space receivers operating in the 2025-2110 MHz band. In our analysis, we concluded that neither base nor mobile ATC stations operating under our Part 24 out-of-band emission standards would cause interference to adjacent band satellite receivers.[315] Given that the potential for interference from AWS operations above 2110 MHz to 2025-2110 MHz space systems should be no different than interference to such systems from ATC operations below 2025 MHz, we find that no special requirements are needed to protect space systems operating in the 2025-2110 MHz band from AWS systems operating in the 2110-2155 MHz band.

128. The Earth-Exploration Satellite Service (EESS) stations operating in the 2025-2110 MHz band are uplink terminals. As such, they could potentially cause interference to AWS mobile or fixed receivers operating in the adjacent 2110-2155 MHz band. US footnote 347 in the Table of Frequency Allocations grants the non-Government Earth-to-space allocation to the EESS in the 2025-2110 MHz

[312] *See supra* ¶ 119.

[313] See ITU-R Study Group 7 Recommendation SA.1154, "Provisions To Protect The Space Research (SR), Space Operations (SO) And Earth-Exploration Satellite Services (EES) And To Facilitate Sharing With The Mobile Service In The 2025-2110 MHz And 2200-2290 MHz Bands."

[314] 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, IB Docket No. 01-185, *Report and Order and Notice of Proposed Rulemaking*, 18 FCC Rcd 1962 (2003) (*ATC Report and Order*).

[315] *Id*. at 2131-32 (App. C1).

band with the condition that EESS uplink stations do not cause interference to stations operating in accordance with the Table of Frequency Allocations. Currently, there are four non-Government licensees operating in this band. Due to their limited number, and the fact that AWS stations are not yet in operation, we find that the four incumbent Earth-to-space EESS stations operating in the 2025-2110 MHz band will not be required to protect AWS stations. However, any non-Government EESS stations authorized after the adoption date of this Order shall be required to protect future AWS operations. The criteria for protecting AWS operations from future EESS uplink stations will be established in a future proceeding.

129. The 2025-2110 MHz band is also used by the Broadcast Auxiliary Service (BAS) under Part 74 of our rules, and by the Cable Television Relay Service (CARS) under Part 78 of our rules.[316] Both fixed and mobile TV BAS stations and mobile CARS stations are authorized in this band, and they are used for Electronic News Gathering (ENG) operations, transmitting TV programming material to TV studios from wherever news events may be happening.[317] We are concerned that base or fixed stations operating in the 2110-2155 MHz band, if situated too close to BAS/CARS receive stations, could cause interference to such stations. This interference could be due to out-of-band emissions falling in the 2025-2110 MHz BAS band or due to overload of the receivers operating in that band. We do not believe, however, that tightening the out-of-band emission standard for AWS base stations would be the most appropriate way to address this potential problem. As an initial matter, one of our goals in this proceeding is to, to the extent possible, try to provide the same technical criteria for AWS equipment as currently exist for PCS. Maintaining our $43 + 10 \log_{10}(P)$ OOBE standard for AWS serves this purpose. Secondly, because of the nature of the potential interference scenario at issue, *i.e.,* one where a fixed station may cause interference to another fixed station, the particular stations can be situated far enough from one another to prevent interference from occurring. In addition, the technical parameters of the stations (*e.g.*, the orientation of directional antennas, the filters in transmitters and receivers) can be adjusted so as to minimize interference.

130. We therefore conclude that the best way to deal with the possibility of AWS base stations causing interference to BAS and CARS stations is to require AWS and BAS/CARS licensees to coordinate the location and technical parameters of their stations. This approach toward mitigating interference to BAS and CARS operations was similarly adopted in the ATC proceeding, where we decided that: "ATC operators will be required to protect all existing licensees in the adjacent bands."[318] We shall therefore require AWS licensees to coordinate the location of any base or fixed stations operating in the 2110-2155 MHz band with BAS/CARS licensees operating in their area. Before constructing and operating a base or fixed station, AWS licensees shall be required to determine the location and licensee of any BAS or CARS station authorized in their area of operation, and coordinate their planned stations with that licensee.[319] We shall expect BAS/CARS and AWS licensees to work together to develop ways to mitigate interference, whether it be through locating their stations as far as possible from one another or by implementing one or more technical solutions. In the event that mutually satisfactory coordination agreements cannot be reached, licensees may seek the assistance of the Commission, and we may, at our discretion, impose requirements on one or both

[316] 47 C.F.R. Part 74 and Part 78.

[317] ENG mobile units, for example, capture programming material in the field and transmit the material to fixed ENG receive stations, often located on building rooftops. ENG stations may relay programming either directly to a TV studio or to the TV studio via additional fixed ENG links.

[318] *See ATC Report and Order*, 18 FCC Rcd at 2061-62 ¶ 203 (2003).

[319] Information regarding BAS and CARS stations can be obtained by consulting local SBE coordination committees.

parties. While we conclude that interference can be avoided through coordination, AWS operators will be required to protect previously licensed BAS and CARS operations in the adjacent 2025-2110 MHz band.

(f) Above 2155 MHz

131. The 2155-2160 MHz band is allocated for use by the Multipoint Distribution Service (MDS) under Part 21 and by the Fixed Microwave Service under Part 101.[320] In a future proceeding, we will decide whether MDS operations in this band should be relocated to other spectrum.[321] Until that decision is made, however, we must continue to protect MDS systems operating in the 2155-2160 MHz band. In the *AWS Service Rules NPRM*, we sought comment on how MDS operations should be protected from interference.[322] Although WCAI expressed concern about potential interference to MDS operations, it proposed no specific protection criteria, nor did it formally seek special protection measures for MDS.[323] We thus have no basis upon which to make a decision as to how MDS should be protected. We therefore do not adopt any such special measures to protect MDS operations at this time, and will simply require AWS licensees operating in the 2110-2155 MHz band to satisfy the same protection criteria to protect MDS licensees that they must employ to protect adjacent band AWS licensees (*i.e.*, our $43 + 10 \log_{10}(P)$ OOBE standard).

6. RF Safety

132. *Background*: In the *AWS* Service *Rules NPRM*, we stated that our rules implementing the National Environmental Policy Act of 1969 are intended to prevent human exposure to potentially unsafe levels of radiofrequency (RF) radiation.[324] To that end, we noted that section 1.1307(b) of our rules requires preparation of Environmental Assessments when licensees propose to construct fixed transmission facilities that exceed specified parameters.[325] We indicated that exposure guidelines for the 2.3 GHz Wireless Communications Services (WCS) band are the same as those for spectrum at

[320] 47 C.F.R. Parts 21, 101. There are no Part 101 systems currently licensed in this spectrum.

[321] *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, *Third Report and Order, Third Notice of Proposed Rulemaking and Second Memorandum Opinion and Order*, 18 FCC Rcd 2233 (2003).

[322] *AWS Service Rules NPRM*, 17 FCC Rcd at 24159-60 ¶ 63.

[323] WCAI Comments at 5. WCAI in its comments indicates that it will "review with great interest the comments from the AWS community" with regard to technical measures that community would provide to protect MDS operations. *Id*. at 6. WCAI states, however, that "as a preliminary observation it appears that the Commission likely will have to impose far more rigorous limitations on AWS out-of-band emissions into any relocated MDS channels in the 2155-2180 MHz band than the Commission imposes on AWS out-of-band emissions within the AWS band." *Id*.

[324] *AWS Service Rules NPRM*, 17 FCC Rcd at 24161 ¶ 68; *see also* 47 C.F.R. §§ 1.1310, 2.1093.

[325] 47 C.F.R. § 1.1307(b). Similarly, sections 2.1091 and 2.1093 require environmental evaluation of certain mobile and portable transmitters prior to equipment authorization or use. *See* 47 C.F.R. §§ 2.1091, 2.1093. The Commission provides guidance on acceptable methods of evaluating compliance with exposure limits in OET Bulletin No. 65. OET Bulletin No. 65 (Edition 97-01) was issued on August 25, 1997, and is available for downloading at the FCC Web Site: <http://www.fcc.gov/oet/rfsafety>. Copies of OET Bulletin No. 65 also may be obtained by calling the FCC RF Safety Line at (202) 418-2464. Other circumstances may also trigger an Environmental Assessment. *See generally* 47 C.F.R. § 1.1307(a).

1710-1755 MHz and 2110-2155 MHz.[326] For WCS, we stated that the threshold for environmental review is an effective radiated power (ERP) greater than 1,000 watts.[327]

133. *Discussion*: With regard to RF safety requirements, the Commission adopted the 1,000 watts ERP threshold for 2.3 GHz to recognize the flexibility with respect to use, power, location, and other factors that was accorded licensees operating in that band, and determined that this power limit was appropriate to ensure compliance with the Commission's RF exposure standards for most situations.[328] Moreover, the Commission found the 1,000 watts ERP threshold consistent with its existing rules for transmitters and devices of comparable use and similar operating frequencies. For the same reasons, we adopt the 1,000 watts ERP safety threshold for fixed operations in the 1710-1755 and 2110-2155 MHz bands. We therefore will modify sections 1.1307(b), 2.1091, and 2.1093 of our rules[329] to include services and devices applicable to the 1710-1755 and 2110-2155 MHz bands. We note, however, that the standard we adopt today is subject to change.[330]

7. Canadian and Mexican Coordination

134. *Background*: In the *AWS Service Rules NPRM*, we noted that section 2.301 of our rules requires stations using radio frequencies to identify their transmissions with a view to eliminate harmful interference and generally enforce applicable radio treaties, conventions, regulations, arrangements, and agreements.[331] With respect to Canada, we noted that coordination of frequency assignments in the 1710-1755 MHz band is presently subject to the provisions of Arrangement D of the *Agreement between the United States of America and Canada concerning Coordination and Use of Radio Frequencies Above 30 Megacycles per Second*, October 24, 1962, as amended. Additionally, we indicated that coordination of assignments in the 2110-2155 MHz band is subject to Arrangement A of this Agreement, and assignments in the 2150-2155 MHz band are also subject to the *Interim Arrangement Concerning the Use of the Frequency Bands 2150-2162 MHz and 2500-2690 MHz by MCS and MDS Stations Near the Canada/United States of America Border*, June 25, 2002.

135. *Discussion*: At this time, changes to international agreements between and among the United States, Mexico and Canada concerning the reallocation of this spectrum are not complete. Until such time as agreements between the United States, Mexico and Canada become effective, we will require the same technical restrictions at the border that we adopt for operation between geographic service areas, to the extent they are not in violation of current bilateral agreements and arrangements. Operations in the 1710-1755 and 2110-2155 MHz bands must not cause harmful interference across the border. When agreements between the United States, Mexico and Canada are final and become effective, licensees in the 1710-1755 and 2110-2155 MHz bands will be expected to

[326] *See* 47 C.F.R. § 1.1310.

[327] 47 C.F.R. §§ 1.1307(b), 27.52; *see also* 47 C.F.R. § 24.52 (PCS).

[328] *Part 27 Report and Order*, 12 FCC Rcd at 10862 ¶ 154 n.345, noting that in a pending petition for reconsideration of the RF Guidelines Report and Order, the Commission was considering whether to revise the threshold for requiring routine evaluation of mobile devices above 1.5 GHz from 1.5 watts to 3 watts. This change was made in Procedures for Reviewing Requests for Relief from State and Local Regulations Pursuant to Section 332(c)(7)(B)(v) of the Communications Act of 1934, WT Docket No. 97-192, *Second Memorandum Opinion and Order and Notice of Proposed Rulemaking*, 12 FCC Rcd 13494, 13541 ¶ 51 (1997).

[329] 47 C.F.R. §§ 1.1307(b), 2.1091, 2.1093.

[330] *See* Proposed Changes in the Commission's Rules Regarding Human Exposure to Radiofrequency Electromagnetic Fields, ET Docket No. 03-137, *Notice of Proposed Rulemaking*, 18 FCC Rcd 13187 (2003).

[331] *AWS Service Rules NPRM*, 17 FCC Rcd at 24162 ¶ 71; *see also* 47 C.F.R. § 2.301.

comply with these agreements. In addition, if these agreements are modified in the future, licensees in the 1710-1755 and 2110-2155 MHz bands will be expected to comply with these modifications.

F. Competitive Bidding

136. As discussed above, section 3002 of the Balanced Budget Act of 1997 requires the Commission to assign licenses for the majority of the AWS bands through competitive bidding pursuant to section 309(j) of the Communications Act.[332] In the *AWS Service Rules NPRM*, we tentatively concluded that it serves the public interest to license all portions of the AWS bands, including the 2150-2155 MHz portion of the 2110-2155 MHz band, by the same mechanism.[333] Because we have adopted a geographic licensing scheme for all portions of the AWS bands that permits the filing of mutually exclusive applications, consistent with both statutory obligations, we must resolve such applications for licenses in these bands through competitive bidding.[334]

1. Incorporation by Reference of the Part 1 Standardized Auction Rules

137. *Background*: In the *AWS Service Rules NPRM*, we requested comment on a number of issues relating to the competitive bidding procedures for the 1710-1755 MHz and 2110-2155 MHz bands.[335] We proposed to conduct the auction of initial licenses in these bands in conformity with the general competitive bidding rules set forth in Part 1, Subpart Q, of the Commission's rules and substantially consistent with the bidding procedures that have been employed in previous auctions.[336] Specifically, we proposed to employ the Part 1 rules governing competitive bidding design, designated entities, application and payment procedures, reporting requirements, collusion issues, and unjust enrichment.[337] Under this proposal, such rules would be subject to any modifications that the Commission may adopt in our Part 1 proceeding.[338] We also sought comment on whether any of our Part 1 rules or other auction procedures would be inappropriate or should be modified for an auction of licenses in these bands.

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[332] *See supra* ¶ 24. The Balanced Budget Act of 1997 identified the 1710-1755 MHz band for competitive bidding in section 3002(c) and the 2110-2150 MHz band in section 3002(b). Pub. L. No. 105-33, 111 Stat. 251 (1997). The timing requirements applicable to both these bands were rescinded. Auction Reform Act of 2002, Pub. L. No. 107-195, 116 Stat. 715 (2002).

[333] *AWS Service Rules NPRM*, 17 FCC Rcd at 24163 ¶ 72.

[334] *See supra* ¶ 30-34.

[335] *AWS Service Rules NPRM*, 17 FCC Rcd at 24163-24165 ¶¶ 72-80.

[336] *See, e.g.,* Amendment of Part 1 of the Commission's Rules—Competitive Bidding Procedures, WT Docket No. 97-82, *Order, Memorandum Opinion and Order and Notice of Proposed Rule Making,* 12 FCC Rcd 5686 (1997); *Third Report and Order and Second Further Notice of Proposed Rule Making*, 13 FCC Rcd 374 (1997) (*Part 1 Third Report and Order)*; *Order on Reconsideration of the Third Report and Order, Fifth Report and Order, and Fourth Further Notice of Proposed Rule Making*, 15 FCC Rcd 15293 (2000) (*Part 1 Recon Order/ Fifth Report and Order* and *Fourth Further Notice of Proposed Rule Making*); *Seventh Report and Order*, 16 FCC Rcd 17546 (2001); *Eighth Report and Order,* 17 FCC Rcd 2962 (2002); *Second Order on Reconsideration of the Third Report and Order* and *Order on Reconsideration of the Fifth Report and Order*, 18 FCC Rcd 10180 (2003), recons. pending.

[337] *AWS Service Rules NPRM*, 17 FCC Rcd at 24163 ¶ 73; 47 C.F.R. § 1.2101 *et seq*.

[338] *See Fourth Further Notice of Proposed Rule Making*, 15 FCC Rcd 15293 (2000); *see also Part 1 Recon Order/Fifth Report and Order*, 15 FCC Rcd 15293 (*recon. pending*).

138. *Discussion*: As explained below, we conclude that our Part 1 rules and other auction procedures are appropriate for an auction of licenses in these bands. While commenters did not specifically address whether we should use the general competitive bidding rules set forth in Part 1, Subpart Q, of the Commission's rules, commenters raised a variety of arguments regarding bidding design and other aspects of our auction procedures. For example, CTIA suggests that the Commission study whether a package or combinatorial bidding design would be appropriate for some of the larger spectrum blocks.[339] U.S. Cellular, however, advocates the use of simultaneous multiple round auction methodologies for all EA or MSA/RSA licenses without package bidding features.[340] As we have indicated previously, combinatorial (or "package") bidding is an auction methodology that may take many forms.[341] We note that the Wireless Telecommunications Bureau ("WTB"), consistent with statutory obligations,[342] will seek comment on auction-related procedural issues, including auction design, prior to the start of the AWS auction pursuant to WTB's existing delegated authority.[343] This will provide WTB with an opportunity to weigh the benefits and disadvantages of any particular bidding design, among other auction-specific issues (*e.g.* minimum opening bids), prior to the start of the auction. CTIA, U.S. Cellular, all potential auction applicants and other interested parties are encouraged to participate in this process and submit comments on such auction-related procedural issues.

139. One Commenter, RCA, urges the Commission to modify its competitive bidding procedures and to allow initial licensees the option of returning portions of the license, effectively disaggregating or partitioning the license back to the Commission, in exchange for a monetary credit toward future auction purchases.[344] In support of its proposal, RCA argues that where spectrum is licensed in larger areas, only large companies are able to purchase the licenses because rural licensees lack the necessary capital.[345] RCA also asserts that such large companies do not consistently make full use of the licenses in rural areas resulting in the existence of "unused spectrum."[346] In those instances, RCA also believes that rural licensees are impeded in their ability to obtain spectrum through partitioning and disaggregation because large companies may dictate the terms for partitioning and

[339] *See* CTIA Comments at 15.

[340] *See* U.S. Cellular Corporation Comments at 12-13.

[341] Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59), *Notice of Proposed Rule Making*, 16 FCC Rcd 7278, 7302-03 ¶ 50, n.120.

[342] *See* 47 U.S.C. § 309(j)(3)(E)(i)(obligation to permit notice and comment on proposed auction procedures before issuance of bidding rules).

[343] *See* 47 C.F.R. §§ 0.131(c) (functions of WTB); 0.331 (authority delegated to WTB); 0.332 (actions taken under WTB's delegated authority); 1.2103 (competitive bidding design options, including simultaneous multi-round and combinatorial bidding auctions, among others); 1.2104 (competitive bidding mechanisms). *See also* Amendment of Part 1 of the Commission's rules—Competitive Bidding Procedures, *Order, Memorandum Opinion and Order, and Notice of Proposed Rule Making*, 12 FCC Rcd 5686, 5697-98 ¶ 16 (1997). *See, e.g.,* Auction of Regional Narrowband PCS Licenses Scheduled for September 24, 2003, Comment Sought on Package Bidding Procedures, Reserve Prices or Minimum Opening Bids, and Other Auction Procedures, 18 FCC Rcd 6366 (2003).

[344] *See* RCA Comments at 6-7. In a footnote, RCA also appears to suggest that such a credit should be transferable. *Id*. at n. 7. AT&T Wireless Reply Comments at 3.

[345] *See* RCA Comments at 6 (urging the Commission to license available spectrum "according to MSAs and RSAs rather than by other county groupings such as EAs or MEAs.").

[346] *See id*.

disaggregation and may also decline to deal with rural licensees.[347] RCA contends that its proposal would help to achieve the dual goals of avoiding spectrum warehousing and promoting the use of spectrum in rural areas because large companies would have a financial incentive to return "unused spectrum" from individual licenses, presumably in rural areas, to the Commission for reassignment.[348]

140. As a preliminary matter, we decline to adopt RCA's proposal because it would increase the likelihood that the winning bidder in an auction is not the party with the highest valued use, thus undermining the integrity of the auction system. Under RCA's proposal, a party whose plans are more speculative might be encouraged to enter into the auction because the Commission would, in effect, partially insure auction participants against the risk of future loss through the existence of the credit option.[349] Obviously, the Commission does not wish to encourage such behavior. Furthermore, as discussed elsewhere in this order, other market driven flexible policies are in place that should address many of the concerns raised by RCA.[350]

141. Under RCA's proposal, a licensee would be able to retain a portion of the spectrum or a geographic area of a license for a given market and return the remainder to the Commission.[351] We believe that permitting the return of a portion of a license in exchange for an auction credit as suggested by RCA may result in the licensee partitioning spectrum or disaggregating a geographic area that is not an optimal geographic area or size.[352] This, in turn, would decrease the likelihood that the new licensee would be able to develop innovative services that will allow it to compete in the marketplace.[353] In contrast, if a licensee and a third party can identify applications for which disaggregation, partitioning, or spectrum leasing is practical, our rules allow and we would encourage such a transaction because it would promote the rapid development of the full license. This is particularly true in light of the new flexibility provided to wireless licensees by our recent *Secondary*

[347] *See* RCA Comments at 6-7; AT&T Wireless Reply Comments at 3 (supports RCA's proposal).

[348] *See* RCA Comments at 6-7.

[349] The Commission has consistently indicated that it would not insure winning bidders against the risk of loss. Requests for Refunds of Down Payments Made in Auction No. 35, *Order*, 17 FCC Rcd 6283 (explaining that changes in the market value of licenses after the close of an auction do not affect a winning bidder's obligations), *reversed on other grounds*; Disposition of Down Payment and Pending Applications By Certain Winning Bidders in Auction No. 35, *Order and Order on Reconsideration*, 17 FCC Rcd 23354 (2002).

[350] *See supra* ¶ 83.

[351] RCA Comments at 7.

[352] Previously, the Commission has found that "cherry- picking" of spectrum in this manner is contrary to the public interest. *See* Amendment of the Commission's Rules Regarding Installment Payment Financing For Personal Communications Services (PCS) Licensees, WT Docket No. 97-82, *Second Report and Order and Further Notice of Proposed Rulemaking*, 12 FCC Rcd 16436, 16455, 16463, 16469 ¶¶ 38 ("These provisions prevent licensees from selectively surrendering spectrum for which they may believe they paid too much, or otherwise discarding spectrum in markets that may be more difficult to serve (commonly referred to as 'cherry-picking' of licenses or spectrum)"), 57, 67.

[353] *See, e.g.*, Amendment of Part 95 of the Commission's Rules to Provide Regulatory Flexibility in the 218-219 MHz Service, WT Docket No. 98-169, *Second Order on Reconsideration of the Report and Order and Memorandum Opinion and Order*, 15 FCC Rcd 25020, ¶ 19 (rejecting a licensee's request to provide disaggregation as part of a financial restructuring plan).

Markets Report and Order.[354] We note, however, that in certain limited circumstances, the public interest might be served by the Commission recovering previously licensed spectrum, *e.g*. when spectrum must be cleared in order to be reallocated for new uses.

142. Further, we note that a fundamental assumption of RCA's proposal is that the AWS band plan will favor larger licensees. However, as we explained above, the AWS band plan adopted here includes licenses with a variety of geographic sizes that will provide licensees with flexibility to implement their business plans and ensure that licenses are disseminated to a wide variety of applicants. Accordingly, the balance struck in our selection of geographic license areas, coupled with our existing partitioning and disaggregation procedures and the new flexibility provided by the *Secondary Markets Report and Order*, obviates the need to devise a new mechanism as proposed by RCA and AT&T Wireless, which, we believe, is inappropriate under the band plan that we have adopted. Thus, at this time, we decline to adopt the return credit option suggested by RCA in the absence of a record demonstrating that the public interest is best served by the adoption of such a proposal. We further note, however, that we are continuing to examine ways of amending our regulations and policies governing the electromagnetic spectrum and facilities-based commercial and private wireless services that rely on spectrum, in order to promote digital migration and rapid and efficient deployment of these services in rural and underserved areas. [355]

143. Consistent with our proposals, we will use the general competitive bidding rules set forth in Part 1, Subpart Q, of the Commission's rules to conduct the auction of initial licenses in the 1710-1755 MHz and 2110-2155 MHz bands.[356] Our decision to apply the Part 1 rules is consistent with our ongoing effort to streamline our general competitive bidding rules for all radio services that are subject to competitive bidding.[357] As we stated in the *AWS Service Rules NPRM*, application of the general competitive bidding rules will be subject to any modifications that the Commission may subsequently adopt.[358]

2. Provisions for Designated Entities

144. *Background*: In the *Competitive Bidding Second Memorandum Opinion and Order*, the Commission stated that it would define eligibility requirements for small businesses on a service-specific basis, taking into account the capital requirements and other characteristics of each particular

[354] The Commission has recently adopted a *Report and Order* in the secondary markets proceeding that is designed to facilitate the ability of Wireless Radio Service licensees to lease spectrum usage rights to third parties seeking access to spectrum. *Secondary Markets Report and Order*, *supra* n.59.

[355] *Rural Services NPRM* ¶ 1.

[356] *See* 47 C.F.R. § 1.2101 *et. seq.* (Part 1, Subpart Q -- Competitive Bidding Proceedings).

[357] In the Part 1 proceeding, the Commission has engaged in an ongoing effort to clarify and amend its general competitive bidding rules for all auctionable services. *See* Amendment of Part 1 of the Commission's Rules — Competitive Bidding Procedures, *Part 1 Recon Order/ Fifth Report and Order* and *Fourth Further Notice of Proposed Rule Making*, 15 FCC Rcd 15293 (2000) *recons. pending*; *Part 1 Third Report and Order*, 13 FCC Rcd 374, 376 ¶ 1. The Commission has previously observed that continual changes and improvements "advance our auction program by reducing the burden on the Commission and the public of conducting service-by-service auction rule makings." *Id*.

[358] *AWS Service Rules NPRM*, 17 FCC Rcd at 24163 ¶ 73.

service in establishing the appropriate threshold.[359] In the *AWS Service Rules NPRM*, we proposed to adopt the same small business size standards that the Commission adopted for broadband PCS[360] because comments received suggested that similar services might be provided in AWS.[361] We also noted that certain commenters, in response to the *AWS Allocation NPRM,* the *AWS Allocation Further NPRM,* and the *NTIA AWS Assessment,* had suggested a variety of advanced wireless services, including, but not limited to, voice, video, internet, and high speed data services for the 1710-1755 MHz and 2110-2155 MHz bands.[362] We acknowledged that we did not know precisely the type of services that a licensee may seek to provide in these bands. Nonetheless, we anticipated that the services that will be deployed in these bands may have capital requirements comparable to those in the broadband PCS service. We also believed that the licensees in these bands will be presented with issues and costs similar to those presented to broadband PCS licensees, including those involved in relocating incumbents, and developing markets, technologies, and services. We also noted that at the time the broadband PCS service was established, it was similarly anticipated that it would facilitate the introduction of a new generation of services.[363]

145. In light of the similarities we identified, we proposed to define a "small business" as an entity with average annual gross revenues for the preceding three years not exceeding $40 million, and a "very small business" as an entity with average annual gross revenues for the preceding three years not exceeding $15 million.[364] We also proposed to provide "small businesses" with a bidding credit of 15 percent and "very small businesses" with a bidding credit of 25 percent. The bidding credits we proposed were those set forth in the standardized schedule in Part 1 of our Rules.[365] Accordingly, we sought comment on the use of these standards and associated bidding credits for applicants to be licensed in the 1710-1755 MHz and 2110-2155 MHz bands, with particular focus on the appropriate

[359] Implementation of Section 309(j) of the Communications Act—Competitive Bidding, PP Docket No. 93-253, *Second Memorandum Opinion and Order*, 9 FCC Rcd 7245, 7269 ¶ 145 (1994) (*Competitive Bidding Second Memorandum Opinion and Order*); 47 C.F.R. § 1.2110(c)(1).

[360] Implementation of Section 309(j) of the Communications Act—Competitive Bidding, PP Docket No. 93-253, *Order on Reconsideration,* 15 FCC Rcd 17384, 17394 ¶ 21 (2000) (summarizing the bidding credits offered in broadband PCS C and F Block auctions); 47 C.F.R. § 24.720 (1994). The Commission also adopted the PCS standards for WCS in the 2.3 GHz band. *Part 27 Report and Order,* 12 FCC Rcd at 10879 ¶ 194 (employing the small business size standards used in broadband PCS because "the advantages of ready availability and familiarity to many small businesses that might be interested in this spectrum").

[361] *AWS Service Rules NPRM*, 17 FCC Rcd at 24164-65 ¶ 77.

[362] Qualcomm Comments at 3, filed on Feb. 22, 2001 in response to the *AWS Allocation NPRM*; Lucent Comments at 1, filed on Aug. 28, 2000 in response to the Office of Engineering and Technology's (OET) request for comment on the petition filed by the Cellular Telecommunications Industry Association (CTIA); and Nokia Comments at 2 filed on Aug. 28, 2000, in response to the Commission's *Public Notice,* DA 00-1673 (rel. July 28, 2000) and the petition filed by CTIA.

[363] Implementation of Section 309(j) of the Communications Act—Competitive Bidding, *Fifth Report and Order*, 9 FCC Rcd 5532, 5534 ¶ 3 (1994) (*Competitive Bidding Fifth Report and Order*).

[364] *AWS Service Rules NPRM*, 17 FCC Rcd at 24164-65 ¶ 77. We are coordinating these proposed small business size standards with the U.S. Small Business Administration.

[365] In the *Part 1 Third Report and Order*, we adopted a standard schedule of bidding credits, the levels of which were developed based on our auction experience. *Part 1 Third Report and Order*, 13 FCC Rcd at 403-04 ¶ 47; *see also* 47 C.F.R. § 1.2110(f)(2).

definitions of small and very small businesses as they relate to the size of the geographic area to be covered and the spectrum allocated to each license.[366]

146. We also noted that although AWS services may have significant advantages in terms of economies of scale compared to other services, the development of AWS services may require an unprecedented investment of capital by prospective licensees. Accordingly, we invited comment on whether there may be any distinctive characteristics to the AWS service or these bands that suggest that the adoption of small business size definitions and the use of bidding credits would be inappropriate in this instance. We also sought comment on whether the small business provisions we proposed were sufficient to promote participation by businesses owned by minorities and women, as well as rural telephone companies.[367]

147. *Discussion*: As explained below, we adopt the small business size standards and accompanying bidding credits proposed in the *AWS NPRM*. Commenters generally supported our proposal to adopt the same small business size standards that the Commission adopted for broadband PCS.[368] Two commenters, Mizelle and RCA, however, suggest that the Commission's attempts to assist designated entities through bidding credits have not been effective to level the playing field for small businesses that are without ties to larger companies.[369] Further, to the extent we adopt bidding credits or eligibility limitations in this service, RCA asserts that the Commission should not provide any special benefits to designated entities such as rural telephone companies that would not also be available to all small businesses.[370]

148. Although a lack of adequate capital is a critical barrier to entering business and successful auction participation by bidders, based upon the Commission's experience, the auction process provides the best opportunity to date for designated entities to acquire licenses. The Commission has long recognized that bidding preferences for qualifying bidders provides such bidders with an opportunity to compete successfully against large, well-financed entities.[371] In the 34 auctions conducted to date that utilize small business bidding credits, 76 percent of the winning bidders were small or very small businesses, 7 percent of the winning bidders were minority-owned business, 6

[366] *AWS Service Rules NPRM*, 17 FCC Rcd at 24164-65 ¶ 77.

[367] We also noted that to the extent that commenters proposed additional provisions to ensure participation by minority-owned or women-owned businesses, they should address how such provisions should be crafted to meet the relevant standards of judicial review. *Adarand Constructors v. Peña*, 515 U.S. 200 (1995) (requiring a strict scrutiny standard of review for Congressionally mandated race-conscious measures); *United States v. Virginia*, 518 U.S. 515 (1996) (applying an intermediate standard of review to a state program based on gender classification).

[368] *See e.g.*, CTIA Comments at 15.

[369] *See* RCA Comments at n.3, 8-9. Mizelle argues that bidding credits only increase the price of a license and ultimately that larger companies will always win the license. Mizelle Comments at 2.

[370] *See* RCA Comments at n.3, 8-9. In support of its position, RCA notes that rural wireless carriers compete with rural telephone companies to offer local access services in rural areas. *Id*. Thus, RCA concludes that it would provide rural telephone companies with an unfair competitive advantage if they were provided special benefits.

[371] *See, e.g.,* Revision of Part 22 and Part 90 of the Commission's Rules to Facilitate Future Development of Paging Systems; Implementation of Section 309(j) of the Communications Act -- Competitive Bidding, WT Docket No. 96-18, PR Docket No. 93-253, *Memorandum Opinion and Order on Reconsideration and Third Report and Order*, 14 FCC Rcd 10030, 10091 ¶ 112 (1999).

percent of the winning bidders were women-owned businesses,[372] and 14 percent of the winning bidders were rural telephone companies.[373] (Some of these entities may fall into more than one category *i.e.*, a women-owned business may also be a small or very small business). In addition, an analysis of the Upper 700 MHz Guard Band auctions (Auction Nos. 33 and 38), which employed identical small business size standards with those we adopt today, indicates that small and very small businesses successfully bid for 28 of the 104 licenses, or 27 percent of the licenses sold.[374] Accordingly, contrary to the suggestions raised by Mizelle and Goldstein, the record amply demonstrates that bidding credits the Commission has offered to small businesses have allowed small businesses to effectively compete against large, well-financed entities.

149. Accordingly, we adopt the same small business size standards for licenses in the 1710-1755/2110-2155 MHz band that the Commission adopted for broadband PCS. Specifically, we define a "small business" in this band as an entity with average annual gross revenues for the preceding three years not exceeding $40 million, and a "very small business" as an entity with average annual gross revenues for the preceding three years not exceeding $15 million. Correspondingly, we will provide "small businesses" with a bidding credit of 15 percent and "very small businesses" with a bidding credit of 25 percent.[375] The small business size standards and corresponding bidding credits that we adopt here will provide a variety of businesses, including rural wireless carriers who are "small businesses" or "very small businesses," with opportunities to participate in the auction of licenses for the AWS bands. These standards will also afford licensees substantial flexibility for the provision of services with varying capital costs.[376] The Commission has also found that the use of tiered or graduated small business definitions is useful in furthering our mandate under Section 309(j) to promote opportunities for and disseminate licenses to a wide variety of applicants.[377] Consequently, the use of small entity definitions for the AWS bands may result in the dissemination of licenses among a wide range of entities, consistent with our obligations under Section 309(j)(3)(B) of the Act.[378]

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[372] We note that this information may be underreported because the Commission does not require women or minority-owned entities to indicate their status.

[373] Auction results and related data may be found on the Commission's Web site at: <http://www.fcc.gov/wtb/auctions>.

[374] *See* "39 GHz Band Auction Closes," *Public Notice*, Report No. AUC-3D-E (Auction No. 30), DA 00-1035 (rel. May 10, 2000). See also< http://www.fcc.gov/wtb/auctions>.

[375] AWS Service Rules NPRM, 17 FCC Rcd at 24164-65 ¶ 77. On October 23, 2003, the U.S. Small Business Administration ("SBA") approved the Commission's request to adopt the proposed small business size standards for the auction of licenses in the 1710-1755 MHz and 2110-2155 MHz band. The SBA confirmed that these small business size standards will provide a beneficial and equitable way to assure small business competition for licenses in these bands. *See* Letter from Hector V. Barretto, Administrator, Office of Size Standards, U.S. Small Business Administration to Margaret W. Wiener, Chief, Auctions and Industry Analysis Division, Wireless Telecommunications Bureau, Federal Communications Commission, dated Oct. 23, 2003.

[376] *Id.*

[377] 47 U.S.C. § 309(j)(3)(B), (4)(C)-(D).

[378] Section 309(j)(3)(B) of the Act provides that in establishing eligibility criteria and bidding methodologies the Commission shall promote "economic opportunity and competition . . . by avoiding excessive concentration of licenses and by disseminating licenses among a wide variety of applicants, including small businesses, rural telephone companies, and businesses owned by members of minority groups and women." *See* 47 U.S.C. § 309(j)(3)(B).

IV. PROCEDURAL MATTERS

A. Regulatory Flexibility Analysis

150. A Final Regulatory Flexibility Analysis has been prepared for this Report and Order and is included in Appendix B.

B. Paperwork Reduction Analysis

151. This Report and Order contains either new or modified information collections. As part of our continuing effort to reduce paperwork burdens, we invite the general public and the Office of Management and Budget (OMB) to take this opportunity to comment on the information collections contained in the Report and Order, as required by the Paperwork Reduction Act of 1995.[379] Comments should address: (a) whether the proposed collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility; (b) the accuracy of the Commission's burden estimates; (c) ways to enhance the quality, utility, and clarity of the information collected; and (d) ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology.

152. Written comments by the public and agencies on the proposed and/or modified information collections are due 60 days after the date of publication in the Federal Register. Written comments by the OMB on the proposed and/or modified information collections are due on or before 120 days after the date of publication in the Federal Register. In addition to filing comments with the Secretary, a copy of any comments on the information collections contained herein should be submitted to Judith Boley Herman, Federal Communications Commission, 445 12th Street, S.W., Room 1-C804, Washington, D.C. 20554, or via the Internet to <Judith-B.Herman@fcc.gov>, and to Kim A. Johnson, Policy Analyst, Office of Information and Regulatory Affairs (OIRA), Office of Management and Budget (OMB), Docket Library, Room 10236, New Executive Office Building (NEOB), 725 17th Street, N.W., Washington, D.C. 20503 or via the Internet at <Kim_A._Johnson@omb.eop.gov>.

153. The public may view the documents filed in this proceeding during regular business hours in the FCC Reference Information Center, Federal Communications Commission, 445 12th Street, S.W., Room CY-A257, Washington, D. C. 20554, and on the Commission's Internet Home Page: <http://www.fcc.gov>. Copies of comments and reply comments are also available through the Commission's duplicating contractor: Qualex International, Portals II, 445 12th Street, S.W., CY-B4202, Washington, D.C. 20554 (telephone 202-863-2893). Accessible formats (computer diskettes, large print, audio recording and Braille) are available to persons with disabilities by contacting Brian Millin, of the Consumer & Governmental Affairs Bureau, at (202) 418-7426, TTY (202) 418-7365, or at <Brian.Millin@fcc.gov>.

C. Further Information

154. For further information concerning this rulemaking proceeding, contact Eli Johnson or John Spencer, at (202) 418-1310, Policy Division, Wireless Telecommunications Bureau, Federal Communications Commission, 445 12th Street, S.W., Room 3-C124, Washington, D.C. 20554; or via the Internet to Eli.Johnson@fcc.gov or <John.Spencer@fcc.gov>.

[379] Pub. L. No. 104-13.

V. ORDERING CLAUSES

155. ACCORDINGLY, IT IS ORDERED, pursuant to sections 1, 2, 4(i), 7, 10, 201, 214, 301, 302, 303, 307, 308, 309, 310, 319, 324, 332, and 333 of the Communications Act of 1934, 47 U.S.C. §§ 151, 152, 154(i), 157, 160, 201, 214, 301, 302, 303, 307, 308, 309, 310, 319, 324, 332, 333, that this Report and Order is hereby ADOPTED.

156. IT IS FURTHER ORDERED that Part 27 of the Commission's Rules ARE AMENDED as specified in Appendix C, effective 60 days after the date of publication in the Federal Register. Information collections contained in these rules will be effective upon OMB approval.

157. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Report and Order, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A: LIST OF COMMENTERS

Commenters:

American Petroleum Institute [API]
ArrayComm, Inc.
AT&T Wireless Services, Inc. [AT&T Wireless]
Cellular Telecommunications & Internet Association [CTIA]
Ericsson Inc
Fred R. Goldstein, Ionary Consulting
Lucent Technologies Inc.
John Mizelle
Motorola, Inc.
National Radio Astronomy Observatory [NRAO]
National Telecommunications and Information Administration [NTIA]
Nokia Inc.
PCIA, the Wireless Infrastructure Association
PetroCom License Corporation [PetroCom]
Rural Cellular Association [RCA]
United Stated Cellular Corporation [U.S. Cellular]
Verizon Wireless
Wireless Communications Association International, Inc. [WCAI]

Reply Commenters:

American Petroleum Institute
ArrayComm, Inc.
AT&T Wireless Services, Inc.
Cingular Wireless LLC
Motorola, Inc.
TDD Coalition
United States Cellular Corporation
Wireless Communications Association International, Inc.

APPENDIX B: FINAL REGULATORY FLEXIBILITY ANALYSIS

As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[1] an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the Service Rules for Advanced Wireless Services in the 1.7 and 2.1 GHz Bands Notice of Proposed Rulemaking (*Notice*).[2] The Commission sought written public comment on the proposal in the Notice, including comment on the IRFA. This present Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.[3]

A. Need for, and Objectives of, the Adopted Rules

In this Report and Order, we adopt service rules for Advanced Wireless Services (AWS) in the 1710-1755 MHz and 2110-2155 MHz bands, including provisions for application, licensing, operating and technical rules, and for competitive bidding. Licensees in these bands will have the flexibility to provide any fixed or mobile service that is consistent with the allocations for this spectrum.[4] We will license this spectrum under our market-oriented Part 27 rules and, in order to accommodate differing needs, our band plan includes both localized and regional geographic service areas and symmetrically paired spectrum blocks with the pairings being composed of different bandwidths. Our licensing plan 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. The licensing framework that we adopt today for these bands will ensure that this spectrum is efficiently utilized and will foster the development of new and innovative technologies and services, as well as encourage the growth and development of broadband services.

Our actions today bring us closer to our goals of achieving the universal availability of broadband access and increasing competition in the provision of such broadband services both in terms of the types of services offered and in the technologies utilized to provide those services. The widespread deployment of broadband will bring new services to consumers, stimulate economic activity, improve national productivity, and advance many other objectives – such as improving education, and advancing economic opportunity for more Americans. By encouraging the growth and development of broadband, our actions today also foster the development of facilities-based competition. We achieve these objectives by taking a market-oriented approach to licensing this spectrum that provides greater certainty, minimal regulatory intervention, and leads to greater benefits to consumers.

B. Summary of Significant Issues Raised by Public Comments in Response to the IRFA

We received no comments directly in response to the IRFA in this proceeding. We did, however, consider the potential impact of our rules on smaller entities. For example, we have adopted a building block approach to the licensing of this spectrum, including some smaller geographic licensing areas and some smaller spectrum block sizes. We have also provided for partitioning and disaggregation of licenses and we have adopted spectrum leasing polices. Finally, we have adopted 15 percent and 25 percent

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[1] *See* 5 U.S.C. § 603. The RFA, *see* 5 U.S.C. §§ 601-612., has been amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

[2] *See* Service Rules for Advanced Wireless Services in the 1.7 and 2.1 GHz Bands Notice of Proposed Rulemaking, WT Docket No. 02-35, *Notice of Proposed Rulemaking*, 17 FCC Rcd 24135, xxxx (2002) (*Notice*).

[3] *See* 5 U.S.C. § 604.

[4] The service rules that we adopt today for this spectrum build on the policy objectives set forth in the Spectrum Policy Task Force Report. Spectrum Policy Task Force, ET Docket No. 02-135, *Report* (rel. Nov. 15, 2002) (*Spectrum Policy Task Force Report*).

"bidding credits" for small and very small businesses, respectively. These policies should provide increased opportunities for small entities to acquire the appropriate amount of spectrum for their particular needs.

C. Description and Estimate of the Number of Small Entities To Which the Adopted Rules Will Apply

The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules, if adopted.[5] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small government jurisdiction."[6] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[7] A small business is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.[8] Nationwide, there are approximately 22.4 million small businesses, total, according to the SBA data.[9]

A small organization is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[10] Nationwide, as of 1992, there were approximately 275,801 small organizations.[11] Last, the definition of "small governmental jurisdiction" is one with populations of fewer than 50,000.[12] The term "small governmental jurisdiction" is defined as "governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand."[13] As of 1997, there were about 87,453 governmental jurisdictions in the United States.[14] This number includes 39,044 county governments, municipalities, and townships, of which 37,546 (approximately 96.2%) have populations of fewer than 50,000, and of which 1,498 have populations of 50,000 or more. Thus we estimate the number of small governmental jurisdictions overall to be 84,098 or fewer.

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[5] 5 U.S.C. § 603(b)(3).

[6] 5 U.S.C. § 601(6).

[7] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in 15 U.S.C.§ 632). Pursuant to the RFA, the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register." 5 U.S.C. § 601(3).

[8] Small Business Act, 15 U.S.C. § 632 (1996).

[9] See SBA, *Programs and Services*, SBA Pamphlet no. CO-0028, at page 40 (July 2002).

[10] 5 U.S.C. § 601(4).

[11] U.S. Department of Commerce, Bureau of the Census, 1992 Economic Census, Table 6 (special tabulation of data under contract to Office of Advocacy of the U.S. Small Business Administration) (1992 Economic Census).

[12] 5 U.S.C. § 601(5).

[13] 5 U.S.C. 601(5).

[14] U.S. Census Bureau, Statistical Abstract of the United States: 2000, Section 9, pages 299-300, Tables 490 and 492.

The rules adopted in the Order affect applicants who wish to provide service in the 1710-1755 MHz and 2110-2155 MHz bands. As discussed in the Order, we do not know precisely the type of service that a licensee in these bands might seek to provide. [15] Nonetheless, we anticipate that the services that will be deployed in these bands may have capital requirements comparable to those in the broadband Personal Communications Service (PCS), and that the licensees in these bands will be presented with issues and costs similar to those presented to broadband PCS licensees. Further, at the time the broadband PCS service was established, it was similarly anticipated that it would facilitate the introduction of a new generation of service. Therefore, the Order adopts the same small business size standards here that the Commission adopted for the broadband PCS service. In particular, the Order defines a "small business" as an entity with average annual gross revenues for the preceding three years not exceeding $40 million, and a "very small business" as an entity with average annual gross revenues for the preceding three years not exceeding $15 million. The Order also provides small businesses with a bidding credit of 15 percent and very small businesses with a bidding credit of 25 percent.

We do not yet know how many applicants or licensees in these bands will be small entities. Thus, the Commission assumes, for purposes of this FRFA, that all prospective licensees are small entities as that term is defined by the SBA or by our two special small business size standards for these bands. Although we do not know for certain which entities are likely to apply for these frequencies, we note that the 1710-1755 MHz and 2110-2155 MHz bands are comparable to those used for cellular service and personal communications service.

Wireless Telephony Including Cellular, Personal Communications Service (PCS) and SMR Telephony Carriers. The SBA has developed a small business size standard for wireless small businesses within the two separate categories of **Paging**[16] and **Cellular and Other Wireless Telecommunications**. [17] Under both SBA categories, a wireless business is small if it has 1,500 or fewer employees. According to the Commission's most recent data,[18] 1,387 companies reported that they were engaged in the provision of wireless service. Of these 1,387 companies, an estimated 945 have 1,500 or fewer employees and 442 have more than 1,500 employees.[19] Consequently, the Commission estimates that most wireless service providers are small entities that may be affected by the rules and policies adopted herein.

D. Description of Reporting, Recordkeeping, and Other Compliance Requirements for Small Entities

Applicants for AWS licenses in the 1710-1755 MHz and the 2110-2155 MHz bands will be required to submit short-form auction applications using FCC Form 175.[20] In addition, wining bidders

[15] *See* Report and Order, at ¶ 144.

[16] 13 C.F.R. § 121.201, North American Industry Classification System (NAICS) code 513321 (changed to 517211 in October 2002).

[17] 13 C.F.R. § 121.201, North American Industry Classification System (NAICS) code 513322 (changed to 517212 in October 2002).

[18] FCC, Wireline Competition Bureau, Industry Analysis and Technology Division, "Trends in Telephone Service", Table 5.3, page 5-5 (Aug. 2003). This source uses data that are current as of December 31, 2001.

[19] *Id*.

[20] *See generally,* 47 C.F.R. § 1.2105.

must submit long-form license applications through the Universal Licensing System using Form 601,[21] FCC Ownership Disclosure Information for the Wireless Telecommunications Services using FCC Form 602, and other appropriate forms.[22]

E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

The RFA requires an agency to describe any significant alternatives that it has considered in reaching its adopted approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.[23]

We have taken significant steps to reduce burdens on small entities wherever possible. To provide opportunities for small entities to participate in any auction that is held, we provide bidding credits for small businesses and very small businesses as defined in Section C of this FRFA. The bidding credits adopted are 15 percent for small businesses and 25 percent for very small businesses. We have found that the use of tiered or graduated small business size standards is useful in furthering our mandate under Section 309(j) of the Communications Act to promote opportunities for, and disseminate licenses to, a wide variety of applicants.

Regarding our decision to apply our Part 27 rules to this spectrum, *see* paragraphs 16-21, we do not anticipate any adverse impact on small entities. The flexibility afforded by Part 27 or our rules should benefit large and small entities alike, because licensees will be in a stronger position to meet changes in demand for services. Under this approach, all licensees will have the freedom to determine the services to be offered and the technologies to be used in providing these services. An alternative to this decision would have been to determine specific allowable service in each frequency band and apply the applicable rule part to the licensing of such services. This approach, however, would be unsatisfactory because it is too restrictive, and in any event, it is unclear that this approach would benefit small entities more than the flexible licensing approach we have decided upon today.

Regarding our decision to license this spectrum by geographic area, *see* paragraphs 27-46, we anticipate that on balance small entities will benefit from this licensing approach. Geographic licensing in these bands supports the Commission's overall spectrum management goals in that it allows licensees to quickly respond to market demand. Small entities that acquire spectrum that is licensed on a geographic area basis will benefit from such flexibility. Moreover, we have attempted to strike a balance here by using varying sizes of geographic areas. For example, small entities may be more interested in spectrum licensed by smaller geographic areas rather than in spectrum licensed on a nationwide or large regional basis. Consequently, we have decided to include licensing areas based on MSAs and RSAs. As RCA observes, MSAs and RSAs permit entities who are only interested in serving rural areas to acquire spectrum licenses for these areas alone and avoid acquiring spectrum licenses with high population densities that make purchase of license rights too expensive for these types of entities.[24] These types of service providers could acquire an RSA and create a new service area or they could expand an existing

[21] 47 C.F.R. § 1.913(a)(1).

[22] 47 C.F.R. § 1.2107.

[23] *See* 5 U.S.C. § 603(c)(1)-(4).

[24] RCA Comments at 2-3; *see also* U.S. Cellular Comments at 5-7.

service territory or supplement the spectrum they are licensed to operate in by adding an RSA. They could also combine a few MSAs and RSAs to create a larger but localized service territory. MSAs and RSAs allow entities to mix and match rural and urban areas according to their business plans. By being smaller, these types of geographic service areas provide entry opportunities for smaller carriers, new entrants, and rural telephone companies. Their inclusion in our band plan will foster service to rural areas and tribal lands and thereby bring the benefits of advanced services to these areas.[25] An alternative to our decision to use geographic areas for licensing would have been to employ a site-by-site licensing approach. Site-by-site licensing, however, would be an inefficient licensing method due to a greater strain on Commission resources and less flexibility afforded to licensees.

We have also made the decision to license the spectrum in different bandwidths. We do not believe this will disadvantage small entities, In fact, we have decided that the RSA/MSA license areas will be licensed as paired spectrum at 1735-1740 and 2135-2140 for a total of 734 licenses, thus providing the opportunity for entities to obtain a license encompassing as little as 10 megahertz of spectrum. Other spectrum will be licensed in pairs of 10 and 15 MHz blocks, providing flexibility to licensees in constructing their systems. Our approach provides maximum flexibility for both small and large entities to offer a wide range of communications services.

We have also decided to permit the disaggregation and partitioning of these spectrum blocks, *see* paragraphs 80-83. Licensees will thus be able to increase or decrease the size of their service areas to better meet market demands. Allowing licensees to partition and/or disaggregate their licensed spectrum should improve opportunities for small entities to acquire spectrum for their particular needs. An alternative to his approach would have been to prohibit partitioning and disaggregation; we believe that such an approach could foreclose options for small entities.

In addition, we have decided that this spectrum will also be subject to the rules recently adopted the *Secondary Markets Report and Order*,[26] *see* paragraph 26. In that *Order*, we took action to remove unnecessary regulatory barriers to the development of secondary markets. The Order established new policies and procedures that enable most wireless licensees, including Part 27 licensees, to lease some or all of their spectrum usage rights to third-party spectrum lessees.[27] Application of the new secondary market rules to this spectrum should help ensure that small businesses and rural carriers can acquire spectrum to meet their business needs by allowing more entities access to the AWS spectrum and permit the marketplace, rather than the Commission, to decide what use is made of this spectrum.

We believe our objectives of ensuring both efficient use of spectrum and diversity of licensees can best be achieved by adopting a variety of license areas and spectrum block sizes, and ensuring the ability of licensees to partition and disaggregate their licenses and fully participate in the secondary markets. By adopting some smaller geographic licensing areas and some smaller spectrum block sizes, we believe we will encourage participation by smaller and rural entities, without the necessity of adopting set-asides and eligibility restrictions, because such licenses will be less expensive and should more

[25] While we did not receive any comments from Tribal governments, we remain interested in ensuring that the communication needs of these communities are met. *See AWS Service Rules NPRM*, 17 FCC Rcd at 24146-47 ¶ 25; *see also* Statement of Policy on Establishing a Government-to-Government Relationship with Indian Tribes, *Policy Statement*, 16 FCC Rcd 4078 (2000).

[26] *See* Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets, *Report and Order and Further Notice of Proposed Rulemaking*, WT Docket No. 00-230, FCC 03-113, (rel.Oct. 6, 2003) (*Secondary Markets Report and Order*).

[27] *See id.* at ¶ 84.

closely mirror such bidders' needs. We believe that these same factors support our decision to decline to adopt other suggested alternatives, such as spectrum aggregation limits, in this band.

Finally, regarding our decision to require a showing of "substantial service" at license renewal time, *see* paragraphs 73-79 , we do not anticipate any adverse impact on small entities. An alternative would have been to adopt a "minimal coverage" requirement. We believe, however, that the substantial service standard is better because it will provide both small and large entities the flexibility to determine how best to implement their business plans based on actual service to end users.

F. Report to Congress

The Commission will send a copy of the Order, including this FRFA, in a report to be sent to Congress pursuant to the Congressional Review Act.[28] In addition, the Commission will send a copy of the Order, including the FRFA, to the Chief Counsel for Advocacy of the Small Business Administration. A copy of the Order and FRFA (or summaries thereof) will also be published in the Federal Register.[29]

[28] *See* 5 U.S.C. § 801(a)(1)(A).

[29] *See* 5 U.S.C. § 604(b).

APPENDIX C: FINAL RULES

PART 27 – MISCELLANEOUS WIRELESS COMMUNICATIONS SERVICES

1. The authority citation for Part 27 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 301, 302, 303, 307, 309, 332, 336, and 337 unless otherwise noted.

2. The table of contents for Part 27 is amended by adding subpart L as follows:

* * * * *

Subpart L – 1710-1755 MHz and 2110-2155 MHz Bands

LICENSING AND COMPETITIVE BIDDING PROVISIONS

27.1101 1710-1755 MHz and 2110-2155 MHz bands subject to competitive bidding.
27.1102 Designated Entities.

RELOCATION OF INCUMBENTS

27.1111 Relocation of fixed microwave service licensees in the 2110-2150 MHz band.

PROTECTION OF INCUMBENT OPERATIONS

27.1131 Protection of Part 101 operations.
27.1132 Protection of Part 21 operations.
27.1133 Protection of Part 74 and Part 78 operations.
27.1134 Protection of Federal Government operations.

3. Section 27.1 is amended by adding a subparagraph (8) to paragraph (b) to read as follows:

§ 27.1 Basis and purpose.

* * * * *

(b) * * *

* * * * *

(8) 1710-1755 MHz and 2110-2155 MHz.

* * * * *

4. Section 27.3 is amended by redesignating paragraphs (m) through (p) as paragraphs (n) through (q), and by adding new paragraph (m) to read as follows:

§ 27.3 Other applicable rule parts.

* * * * *

(m) *Part 64, subpart V*. This part sets forth the requirements and conditions applicable to telecommunications carriers under the Communications Assistance for Law Enforcement Act.

* * * * *

5. Section 27.4 is amended by adding a new definition to read as follows:

§ 27.4 Terms and definitions.

Advanced wireless service (AWS). A radiocommunication service licensed pursuant to this part for the frequency bands specified in § 27.5(h).

* * * * *

6. Section 27.5 is amended by adding a new paragraph (h) to read as follows:

§ 27.5 Frequencies.

* * * * *

(h) *1710-1755 MHz and 2110-2155 MHz bands*. The following frequencies are available for licensing pursuant to this part in the 1710-1755 MHz and 2110-2155 MHz bands:

(1) Two paired channel blocks of 10 megahertz each are available for assignment as follows:

Block A: 1710-1720 MHz and 2110-2120 MHz; and
Block B: 1720-1730 MHz and 2120-2130 MHz.

(2) Two paired channel blocks of 5 megahertz each are available for assignment as follows:

Block C: 1730-1735 MHz and 2130-2135 MHz; and
Block D: 1735-1740 MHz and 2135-2140 MHz.

(3) One paired channel block of 15 megahertz each is available for assignment as follows:

Block E: 1740-1755 MHz and 2140-2155 MHz.

7. Section 27.6 is amended by adding a new paragraph (h) to read as follows:

§ 27.6 Service areas.

* * * * *

(h) *1710-1755 and 2110-2155 MHz bands*. AWS service areas for the 1710-1755 MHz and 2110-2155 MHz bands are as follows:

(1) Service areas for Block A (1710-1720 MHz and 2110-2120 MHz) are based on Economic Areas (EAs) as defined in paragraph (a) of this section.

(2) Service areas for Blocks B (1720-1730 MHz and 2120-2130 MHz), C (1730-1735 MHz and 2130-2135 MHz), and E (1740-1755 MHz and 2140-2155 MHz) are based on Regional Economic Area Groupings (REAGs) as defined by paragraph (a) of this section.

(3) Service areas for Block D (1735-1740 MHz and 2135-2140 MHz) are based on cellular markets comprising Metropolitan Statistical Areas (MSAs) and Rural Service Areas (RSAs) as defined by Public Notice Report No. CL-92-40 "Common Carrier Public Mobile Services Information, Cellular MSA/RSA Markets and Counties," dated January 24, 1992, DA 92-109, 7 FCC Rcd 742 (1992), with the following modifications:

(i) The service areas of cellular markets that border the U.S. coastline of the Gulf of Mexico extend 12 nautical miles from the U.S. Gulf coastline.

(ii) The service area of cellular market 306 that comprises the water area of the Gulf of Mexico extends from 12 nautical miles off the U.S. Gulf coast outward into the Gulf.

8. Section 27.11 is amended by adding a new paragraph (i) to read as follows:

§ 27.11 Initial authorization.

* * * * *

(i) *1710-1755 MHz and 2110-2155 MHz bands*. Initial authorizations for the 1710-1755 MHz and 2110-2155 MHz bands shall be for 5, 10 or 15 megahertz of spectrum in each band in accordance with § 27.5(h) of this part.

(1) Authorizations for Block A, consisting of two paired channels of 10 megahertz each, will be based on those geographic areas specified in § 27.6(h)(1).

(2) Authorizations for Block B, consisting of two paired channels of 10 megahertz each, will be based on those geographic areas specified in § 27.6(h)(2).

(3) Authorizations for Block C, consisting of two paired channels of 5 megahertz each, will be based on those geographic areas specified in § 27.6(h)(2).

(4) Authorizations for Block D, consisting of two paired channels of 5 megahertz each, will be based on those geographic areas specified in § 27.6(h)(3).

(5) Authorizations for Block E, consisting of two paired channels of 15 megahertz each, will be based on those geographic areas specified in § 27.6(h)(2).

9. Section 27.13 is amended by adding a new paragraph (g) to read as follows:

§ 27.13 License period.

* * * * *

(g) *1710-1755 MHz and 2110-2155 MHz bands*. Authorizations for the 1710-1755 MHz and 2110-2155 MHz bands will have a term not to exceed ten years from the date of initial issuance or renewal, except that authorizations issued on or before December 31, 2009, shall have a term of fifteen years.

10. Section 27.14 is amended by revising paragraph (a) as follows:

§ 27.14 Construction requirements; Criteria for comparative renewal proceedings.

(a) AWS and WCS licensees must make a showing of "substantial service" in their license area within the prescribed license term set forth in § 27.13. * * *

* * * * *

11. Section 27.15 is amended by revising subparagraph (2) of paragraph (a) as follows:

§ 27.15 Geographic partitioning and spectrum disaggregation.

* * * * *

(2) AWS and WCS licensees may apply to partition their licensed geographic service area or disaggregate their licensed spectrum at any time following the grant of their licenses.

* * * * *

12. Section 27.50 is amended by re-designating paragraph (d) as paragraph (e), and adding a new paragraph (d) to read as follows:

§ 27.50 Power and antenna height limits.

* * * * *

(d) The following power and antenna height requirements apply to stations transmitting in the 1710-1755 MHz and 2110-2155 MHz bands:

(1) Fixed and base stations transmitting in the 2110-2155 MHz band are limited to a peak effective isotropic radiated power (EIRP) of 1640 watts and a peak output power of 100 watts.

(2) Fixed, mobile, and portable (hand-held) stations operating in the 1710-1755 MHz band are limited to a peak EIRP of 1 watt. Fixed stations operating in this band are limited to a maximum antenna height of 10 meters above ground, and mobile and portable stations must employ a means for limiting power to the minimum necessary for successful communications.

* * * * *

13. Section 27.53 is amended by re-designating paragraphs (g), (h), (i), (j), and (k) as paragraphs (h), (i), (j), (k), and (l), respectively, and adding a new paragraph (g) to read as follows:

§ 27.53 Emission limits.

* * * * *

(g) For operations in the 1710-1755 MHz and 2110-2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least $43 + 10 \log_{10}$ (P) dB.

(1) Compliance with this provision is based on the use of measurement instrumentation employing a resolution bandwidth of 1 megahertz or greater. However, in the 1 megahertz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed. The emission bandwidth is defined as the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, outside of which all emissions are attenuated at least 26 dB below the transmitter power.

(2) When measuring the emission limits, the nominal carrier frequency shall be adjusted as close to the licensee's frequency block edges, both upper and lower, as the design permits.

(3) The measurements of emission power can be expressed in peak or average values, provided they are expressed in the same parameters as the transmitter power.

* * * * *

14. Section 27.55 is amended to read as follows:

§ 27.55 Signal strength limits.

(a) *Field strength limits.* For the following bands, the predicted or measured median field strength at any location on the geographical border of a licensee's service area shall not exceed the value specified unless the adjacent affected service area licensee(s) agree(s) to a different field strength. This value applies to both the initially offered service areas and to partitioned service areas.

(i) 2110-2155, 2305-2320 and 2345-2360 MHz bands: 47 dBμ V/m.

(ii) 698-764 and 776-794 MHz bands: 40 dBμ V/m.

(iii) The paired 1392-1395 MHz and 1432-1435 MHz bands and the unpaired 1390-1392 MHz band (1.4 GHz band): 47 dBμV/m.

(b) *Power flux density limit.* For base and fixed stations operating in the 698-746 MHz band, with an effective radiated power (ERP) greater than 1 kW, the power flux density that would be produced by such stations through a combination of antenna height and vertical gain pattern must not exceed 3000 microwatts per square meter on the ground over the area extending to 1 km from the base of the antenna mounting structure.

15. Section 27.57 is amended by adding a new paragraph (c) to read as follows:

§ 27.57 International coordination.

* * * * *

(c) Operation in the 1710-1755 MHz and 2110-2155 MHz bands is subject to international agreements with Mexico and Canada.

16. Section 27.63 is amended to read as follows:

§ 27.63 Disturbance of AM broadcast station antenna patterns.

AWS and WCS licensees that construct or modify towers in the immediate vicinity of AM broadcast stations are responsible for measures necessary to correct disturbance of the AM station antenna pattern which causes operation outside of the radiation parameters specified by the FCC for the AM station, if the disturbance occurred as a result of such construction or modification.

(a) *Non-directional AM stations.* If tower construction or modification is planned within 1 kilometer (0.6 mile) of a non-directional AM broadcast station tower, the AWS or WCS licensee must notify the licensee of the AM broadcast station in advance of the planned construction or modification. Measurements must be made to determine whether the construction or modification would affect the AM

station antenna pattern. The AWS or WCS licensee is responsible for the installation and continued maintenance of any detuning apparatus necessary to restore proper non-directional performance of the AM station tower.

(b) *Directional AM stations.* If tower construction or modification is planned within 3 kilometers (1.9 miles) of a directional AM broadcast station array, the AWS or WCS licensee must notify the licensee of the AM broadcast station in advance of the planned construction or modification. Measurements must be made to determine whether the construction or modification would affect the AM station antenna pattern. The AWS or WCS licensee is responsible for the installation and continued maintenance of any detuning apparatus necessary to restore proper performance of the AM station array.

17. A new subpart L is added to read as follows:

Subpart L – 1710-1755 MHz and 2110-2155 MHz Bands

LICENSING AND COMPETITIVE BIDDING PROVISIONS

§ 27.1101 1710-1755 MHz and 2110-2155 MHz bands subject to competitive bidding.

Mutually exclusive initial applications for 1710-1755 MHz and 2110-2155 MHz band licenses are subject to competitive bidding. The general competitive bidding procedures set forth in 47 C.F.R. Part 1, Subpart Q will apply unless otherwise provided in this subpart.

§ 27.1102 Designated Entities.

(a) Eligibility for small business provisions.

(1) A small business is an entity that, together with its affiliates, its controlling interests and the affiliates of its controlling interests, has average gross revenues that are not more than $40 million for the preceding three years.

(2) A very small business is an entity that, together with its affiliates, its controlling interests and the affiliates of its controlling interests, has average gross revenues that are not more than $15 million for the preceding three years.

(b) Bidding credits.

(1) A winning bidder that qualifies as a small business, as defined in this section, or a consortium of small businesses may use a bidding credit of 15 percent, as specified in § 1.2110(f)(2)(iii), to lower the cost of its winning bid on any of the licenses in this part.

(2) A winning bidder that qualifies as a very small business, as defined in this section, or a consortium of very small businesses may use a bidding credit of 25 percent, as specified in § 1.2110(f)(2)(ii), to lower the cost of its winning bid on any of the licenses in this part.

RELOCATION OF INCUMBENTS

§ 27.1111 Relocation of fixed microwave service licensees in the 2110-2150 MHz band.

Part 101, subpart B of the Commission's rules contains provisions governing the relocation of incumbent fixed microwave service licensees in the 2110-2150 MHz band.

PROTECTION OF INCUMBENT OPERATIONS

§ 27.1131 Protection of Part 101 operations.

All AWS licensees, prior to initiating operations from any base or fixed station, must coordinate their frequency usage with co-channel and adjacent channel incumbent, Part 101 fixed-point-to-point microwave licensees operating in the 2110-2155 MHz band. Coordination shall be conducted in accordance with the provisions of section 24.237 of this title.

§ 27.1132 Protection of Part 21 operations.

All AWS licensees, prior to initiating operations from any base or fixed station, must coordinate their frequency usage with co-channel and adjacent channel incumbent Part 21 MDS licensees operating in the 2150-2155 MHz band. In the event that AWS and MDS licensees cannot reach agreement in coordinating their facilities, either licensee may seek the assistance of the Commission, and the Commission may then, at its discretion, impose requirements on either or both parties.

§ 27.1133 Protection of Part 74 and Part 78 operations.

AWS operators must protect previously licensed Broadcast Auxiliary Service (BAS) or Cable Television Radio Service (CARS) operations in the adjacent 2025-2110 MHz band. In satisfying this requirement AWS licensees must, before constructing and operating any base or fixed station, determine the location and licensee of all BAS or CARS stations authorized in their area of operation, and coordinate their planned stations with those licensees. In the event that mutually satisfactory coordination agreements cannot be reached, licensees may seek the assistance of the Commission, and the Commission may, at its discretion, impose requirements on one or both parties.

§ 27.1134 Protection of Federal Government operations.

(a) *Protection of Department of Defense operations in the 1710-1755 MHz band.* The Department of Defense (DoD) operates communications systems in the 1710-1755 MHz band at 16 protected facilities, nationwide. AWS licensees must accept any interference received from these facilities and must protect the facilities from interference. AWS licensees shall protect the facilities from interference by restricting the operation of their base and fixed stations from any locations that could potentially permit AWS mobile, fixed, and portable stations transmitting in the 1710-1755 MHz band to cause interference to government operations within the radii of operation of the 16 facilities (the radii of operation of each facility is indicated in the third column of Table 1 immediately following paragraph (a)(3) of this section). In addition, AWS licensees shall be required to coordinate any operations that could permit mobile, fixed, and portable stations to operate in the specified areas of the 16 facilities, as defined in paragraph (a)(3) of this section. Protection of these facilities in this manner shall take place under the following conditions:

(1) At the Yuma, Arizona and Cherry Point, North Carolina facilities, all operations shall be protected indefinitely.

(2) At the remaining 14 facilities, airborne and military test range operations shall be protected until such time as these systems are relocated to other spectrum, and precision guided munitions (PGM)

operations shall be protected until such time as these systems are relocated to other spectrum or until PGM inventory at each facility is exhausted, whichever occurs first.

(3) AWS licensees whose transmit operations in the 1710-1755 MHz band consist of fixed or mobile operations with nominal transmit EIRP values of 100 mW or less and antenna heights of 1.6 meters above ground or less shall coordinate their services around the 16 sites at the distance specified in row a) of Table 2, below. AWS licensees whose transmit operations in the 1710-1755 MHz band consist of fixed or mobile operations with nominal transmit EIRP values of 1 W or less and antenna heights of 10 meters above ground or less shall coordinate their services around the 16 sites at the distance specified in row b) of Table 2, below. These coordination distances shall be measured from the edge of the operational distances indicated in the third column of Table 1, and coordination with each affected DoD facility shall be accomplished through the Commander of the facility.

TABLE 1: PROTECTED DEPARTMENT OF DEFENSE FACILITIES.

Location	Coordinates	Radius of Operation (km)
Cherry Point, NC……..	34° 58' N 076° 56' W	100
Yuma, AZ…….....	32° 32' N 113° 58' W	120
China Lake, CA……	35° 41' N 117° 41' W	120
Eglin AFB, FL……...	30° 29' N 086° 31' W	120
Pacific Missile Test Range/Point Mugu, CA	34° 07' N 119° 30' W	80
Nellis AFB, NV……	36° 14' N 115° 02' W	160
Hill AFB, UT……	41° 07' N 111° 58' W	160
Patuxent River, MD……..	38° 17' N 076° 25' W	80
White Sands Missile Range, NM…..……	33° 00' N 106° 30' W	80
Fort Irwin, CA……..	35° 16' N 116° 41' W	50
Fort Rucker, AL……	31° 13' N 085° 49' W	50
Fort Bragg, NC……..	35° 09' N 079° 01' W	50
Fort Campbell, KY……	36° 41' N 087° 28' W	50
Fort Lewis, WA……	47° 05' N 122° 36' W	50
Fort Benning, GA……..	32° 22' N 084° 56' W	50
Fort Stewart, GA……...	31° 52' N 081° 37' W	50

TABLE 2: COORDINATION DISTANCES FOR THE PROTECTED DEPARTMENT OF DEFENSE FACILITIES.

1710-1755 MHz Transmit Operations	Coordination Distance (km)
a) EIRP <= 100 mW, antenna height <= 1.6 m AG	35
b) EIRP <= 1 W, antenna height <= 10 m AG	55

(b) *Protection of non-DoD operations in the 1710-1755 MHz and 1755-1761 MHz bands.* Until such time as non-DoD systems operating in the 1710-1755 MHz and 1755-1761 MHz bands are relocated to other spectrum, AWS licensees shall protect such systems by satisfying the appropriate provisions of TIA Telecommunications Systems Bulletin 10-F, "Interference Criteria for Microwave Systems," May, 1994 (TSB 10-F).

(c) *Protection of Federal Government operations below 1710 MHz.* AWS licensees operating fixed stations in the 1710-1755 MHz band, if notified that such stations are causing interference to radiosonde receivers operating in the Meteorological Aids Service in the 1675-1700 MHz band or a meteorological-satellite earth receiver operating in the Meteorological-Satellite Service in the 1675-1710 MHz band, shall be required to modify the stations' location and/or technical parameters as necessary to eliminate the interference.

(d) *Recognition of NASA Goldstone facility operations in the 2110-2120 MHz band.* The National Aeronautics and Space Administration (NASA) operates the Deep Space Network (DSN) in the 2110-2120 MHz band at Goldstone, California (see Table 3). NASA will continue its operations of high power transmitters (nominal EIRP of 105.5 dBW with EIRP up to 119.5 dBW used under emergency conditions) in this band at this location. AWS licensees must accept any interference received from the Goldstone DSN facility in this band.

TABLE 3: LOCATION OF THE NASA GOLDSTONE DEEP SPACE FACILITY.

Location	Coordinates	Maximum Transmitter Output Power
Goldstone, California	35° 18' N 116° 54' W	500 kW

§ 27.1135 Protection of non-Federal Government Meteorological-Satellite operations.

AWS licensees operating fixed stations in the 1710-1755 MHz band, if notified that such stations are causing interference to meteorological-satellite earth receivers operating in the Meteorological-Satellite Service in the 1675-1710 MHz band, shall be required to modify the stations' location and/or technical parameters as necessary to eliminate the interference.

APPENDIX D: PROPAGATION FORMULAS

Basic Formula for Calculating Field Strength at a Distance

$$FS = 107.2 + Pt + 20 \log f - PL$$

where: *FS* is the field strength at the receiving antenna location, in dBμV/m
Pt is the equivalent isotropically radiated power of the transmitting station, in dBw
(*i.e.*, *Pt* = 10 log EIRP, where EIRP is the equivalent isotropically radiated power, in watts)
f is the transmitter carrier frequency, in MHz
PL is the path loss between isotropic antennas, in dB

Note: The value of *PL* is a function of the distance between the transmitting and receiving antennas and the particular propagation model utilized, which may incorporate factors such as the transmitting and receiving antenna heights, the frequency of the transmitted wave, environmental (building heights, clutter) and/or topographical (terrain) features.

Formulas for Calculating Path Loss Between Isotropic Antennas for Certain Propagation Models

Extended COST231-Hata Model

The Extended COST231-Hata model is appropriate for calculating path loss of the forward link for base stations using antennas above the rooftop levels of adjacent buildings, and transmitting in the 1500 to 2000 MHz frequency range.

$$PL = 46.3 + 33.9 \log f - 13.82 \log Ht - a + (44.9 - 6.55 \log Ht) \log d + C$$

where: *PL* is the median path loss between isotropic antennas, in dB
f is the transmitter carrier frequency, in MHz
Ht is the effective height of the transmitting antenna, in meters
Note: $30 \text{ m} \leq Ht \leq 200 \text{ m}$
d is the distance to the receiving antenna, in kilometers
Note: $1 \text{ km} \leq d \leq 20 \text{ km}$
a is attenuation, in dB, as a function of the receiving antenna height, *Hr*, in meters:
For a small or medium-sized city:
$a = (1.1 \log f - 0.7) Hr - (1.56 \log f - 0.8)$
For a large city:
$a = 3.2 (\log 11.75 Hr)^2 - 4.97$
Note: $1 \text{ m} \leq Hr \leq 10 \text{ m}$
C is a correction factor to account for building and tree density:
C = 0 dB for medium-sized cities and suburban areas
C = 3 dB for metropolitan centers

Plane Earth Model

The plane earth (or two-ray) model is a simple model that is appropriate for calculating path loss between two antennas separated by a few tens of kilometers over flat terrain where ground reflection can be assumed. With this model, the path loss is independent of the transmitting frequency.

$$PL = 119.4 + 40 \log d - 20 \log Ht - 20 \log Hr$$

where: *PL* is the path loss between isotropic antennas, in dB
Ht is the effective height of the transmitting antenna, in meters
Hr is the effective height of the receiving antenna, in meters
d is the distance to the receiving antenna, in kilometers
Note: $d >> Ht, Hr$

Free Space Model

The free space (or geometric spreading) model is a simple model that is appropriate for calculating path loss between two antennas that have an unobstructed line-of-sight and are high enough such that ground reflection is not a significant factor. It is also useful for worst-case analysis.

$$PL = 32.44 + 20 \log d + 20 \log f$$

where: *PL* is the path loss between isotropic antennas, in dB
d is the distance to the receiving antenna, in kilometers
f is the transmitter carrier frequency, in MHz

SEPARATE STATEMENT OF
CHAIRMAN MICHAEL K. POWELL

Re: Report and Order in the Matter of Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands

The 90 MHz of additional licensed spectrum made available today is a key building block for the broadband Internet future of licensed wireless service. Across the country, wireless providers -- from Verizon Wireless in Washington DC to Monet Mobile Networks in the Dakotas -- are increasingly utilizing their licensed spectrum holdings to build infrastructure to support Internet applications. Another ninety megahertz of spectrum will add momentum to that important trend. Wireless broadband internet deployment will bring valuable new services to consumers, stimulate economic activity, improve national productivity, increase investment, create jobs and advance many other worthy objectives – such as improving education and enhancing rural communications.

Our service rules also reflect several key principles for efficient use of spectrum as noted by the Commission's Spectrum Policy Task Force, including:

- maximizing the flexibility of licensees to choose the types and characteristics of the services that they will offer in their licensed spectrum;
- grouping like spectrum uses together so that technically compatible operations remain close to one another; and
- defining spectrum users' rights and responsibilities in the clearest manner possible.

The migration to a more market-oriented approach will not always prove easy. Today's Order, with its emphasis on flexibility, compatibility and clear definitions of rights, demonstrates how better rules can create better, more reliable, more affordable services for American consumers.

Our decision also designates spectrum for smaller license areas that may be particularly useful in rural America. Over the past few months, I have outlined a vision for competition and innovation in rural telecommunications. Central to that vision is increasing the spectrum resources available in rural America – we also advance that goal today.

Finally, I would like to thank the National Telecommunications and Information Administration (NTIA) for their extraordinary leadership and partnership in bringing this proceeding to closure. Without our common commitment and goals, these spectrum resources would never have been made available for commercial use.

SEPARATE STATEMENT OF
COMMISSIONER MICHAEL J. COPPS
Approving in Part, Concurring in Part

Re: Report and Order in the Matter of Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands

Advanced Wireless Services, such as 3G and IMT-2000, obviously hold tremendous potential for consumers. I join my colleagues and the Bureau in hopes that these service rules and the auction process will bring about a robust and efficient use of this spectrum, which is exactly what we are supposed to be encouraging. I also hope that as we design the specifics of the auction, we will work hard to learn from those countries where the 3G rollout is moving ahead successfully and from countries where 3G auctions may have contributed to problems.

While I approve of the majority of this Order, I have serious concern with the Commission's decision to move ahead without consolidation protections in the form of a spectrum aggregation limit. Under the rules we adopt today, one company could apparently end up controlling the entire AWS band in a city or a geographic region, leaving no AWS spectrum for competitors. That's a result I do not like. But we have arrived at this point because the Commission eliminated the overall spectrum cap more than a year ago, in a decision from which I dissented. So the Commission has already crossed the Rubicon. Establishing a limit for one band alone will not fix the larger mistake that we have already made. Consumers benefit from the competition that we enjoy in wireless services today, and we should protect it. So I continue to believe that we would be better served by protection against one company dominating too much spectrum in a particular city or region, and my concurrence instead of approval is intended to make this point.

Thank you.

SEPARATE STATEMENT OF
COMMISSIONER KEVIN J . MARTIN

Re: Report and Order in the Matter of Service Rules for Advanced Wireless Services in the 1.7 and 2.1 GHz Bands

I am pleased to support this item, which adopts service rules for advanced wireless services in the 1.7 GHz and 2.1 GHz bands. The flexible rules we adopt allow the two 45 MHz blocks of contiguous spectrum at issue to be used for a range of advanced wireless services. The wireless industry is already on the forefront in offering innovative new services, and it continues to make advances that will bring exciting new applications to consumers. For example, since we issued the notice of proposed rulemaking in this proceeding, camera phones, which send digital pictures to other phones or computers at the touch of a button, have become widely available. There are also phones that play MP3s, run video games, and connect to the Internet with ease. Better and faster services are becoming available every day.

A crucial ingredient to these services, however, is sufficient spectrum. This Order provides some of that spectrum, allowing a significant amount of spectrum to be used for services such as expanded voice, data, and broadband applications provided over high-speed fixed and mobile networks – applications often called "third generation" or "3G." This item should thus lead to substantial consumer benefits, as new and better quality services develop in the 1.7 GHz and 2.1 GHz bands.

I would like to once again commend all of the different parts of government for working together to make this happen. In particular, the National Telecommunications and Information Administration deserves praise for spearheading this effort. NTIA, working with the Department of Defense, the State Department, the Office of Management and Budget, and the FCC's staff, developed the blueprint for making this spectrum available. They accomplished a major step in ensuring that new and innovative wireless services will be available to American consumers.

SEPARATE STATEMENT OF
COMMISSIONER JONATHAN S. ADELSTEIN

Re: Report and Order in the Matter of Service Rules for Advanced Wireless Services in the 1.7 GHz and 2.1 GHz Bands

Today is a banner day for wireless service in the United States. By adopting service and technical rules for Advanced Wireless Services in the 1.7 and 2.1 GHz bands, we are moving a step closer to seeing a new generation of wireless services in this country, including the so-called third generation or 3G mobile systems. I think our item represents just the right framework for further innovation in the wireless arena by promoting continued industry development while employing a light regulatory touch.

Determining a band plan is an inexact science, at best. I believe that the Commission should continue to improve the availability of spectrum to those providers who want to serve smaller areas. Though, we have been making great strides in this area recently through such work as our rural wireless NPRM and our secondary markets proceeding.

I have been concerned that large license areas raise auction prices so high that many companies that want to serve smaller areas cannot even afford to make a first bid. Large service areas also can have the effect of creating swaths of fallow spectrum in areas outside of our nation's populated service areas. Licensees, no matter how large their service areas are, understandably focus their resources on serving the more-populated metropolitan areas.

I certainly recognize that there is value in offering larger service areas for economies of scale and to facilitate larger scale deployments. Indeed, one of the noteworthy developments of the wireless industry over the past several years is the development of the so-called "nationwide" carriers. However, I believe we should find a balance in developing a band plan, and I am pleased to note that a diverse group of commenters in this proceeding supported different sizes of license areas for different blocks of the spectrum.

I believe we got the balance right here. I am especially pleased that the band plan we adopt today not only provides for several licenses to be available on a Regional Economic Area Grouping basis, but also provides for a 2x5 MHz block of spectrum on a RSA/MSA basis and a 2x10 MHz block of spectrum on an Economic Area basis.

In providing a balance of smaller and larger areas, we hopefully offer something for everyone.

Finally, I also am pleased to support the technical and service rules that are in this item. In combining the flexibility of Part 27, with the proven technical rules of Part 24, I believe that we have put in place just the right regulatory framework. I said back in April that our PCS service rules should prove a model for our future regulatory efforts for licensed mobile services, and am pleased to support this aspect of our item today.