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

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In the Matter of	)	
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Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands	)	WT Docket No. 03-66 RM-10586
	)	
Part 1 of the Commission's Rules - Further Competitive Bidding Procedures	)	WT Docket No. 03-67
	)	
Amendment of Parts 21 and 74 to Enable Multipoint Distribution Service and the Instructional Television Fixed Service Amendment of Parts 21 and 74 to Engage in Fixed Two-Way Transmissions	)	MM Docket No. 97-217
	)	
Amendment of Parts 21 and 74 of the Commission's Rules With Regard to Licensing in the Multipoint Distribution Service and in the Instructional Television Fixed Service for the Gulf of Mexico	)	WT Docket No. 02-68 RM-9718
	)	
Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets	)	WT Docket No. 00-230

REPORT AND ORDER AND FURTHER NOTICE OF PROPOSED RULEMAKING

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By the Commission: Chairman Powell and Commissioners Abernathy, Copps, Martin, and Adelstein issuing separate statements.

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I. INTRODUCTION

1. In this *Report and Order (R&O)*, we take important steps to transform our rules and policies governing the licensing of the Instructional Television Fixed Service (ITFS), the Multipoint Distribution Service (MDS), and the Multichannel Multipoint Distribution Service (MMDS) (collectively, the Services) in the 2500-2690 MHz band.[1] The actions taken in this order initiate a fundamental restructuring of the band that will provide both existing ITFS and MDS licensees and potential new entrants with greatly enhanced flexibility in order to encourage the highest and best use of spectrum domestically and internationally, and the growth and rapid deployment of innovative and efficient communications technologies and services.[2] By these actions, we make significant progress towards the goal of providing all Americans with access to ubiquitous wireless broadband connections, regardless of their location.[3]

2. A hallmark of our national communications policy is to encourage the provision of new

[1] The terms MDS and MMDS are often used interchangeably. The Commission coined the term "MDS" at a time when it was making only two channels available for the service, at 2150-2162 MHz. The Commission began using the term "MMDS" when formulating rules making additional channels for the service available in the 2500-2690 MHz band. For the purposes of this *Report and Order and Further Notice of Proposed Rulemaking (R&O and FNPRM as appropriate)*, we will use the term "MDS" to signify both services.

[2] Federal Communications Commission, Strategic Plan FY 2003-FY 2008 at 5 (2002) (*Strategic Plan*).

[3] *Id.* at 14.

technologies and services to the public.[4] The actions taken herein will foster the development of the 2500-2690 MHz band by enabling licensees to migrate to more technologically and economically efficient uses of the spectrum. The record in this proceeding overwhelmingly supports our tentative conclusion that providing 2500-2690 MHz licensees with additional flexibility of use serves the public interest and allows licensees to provide new and innovative services, consistent with the requirements of Section 303(y) of the Communications Act.[5]

3. In recent years, there has been steadily increasing demand for mobile telephone and mobile data services. In 2002, the mobile telephony sector generated more than $76 billion in revenues, increased subscribership from 128.5 million to 141.8 million (from the prior year), and produced a nationwide penetration rate of roughly forty-nine percent.[6] Estimates of the number of mobile Internet users at the end of 2001 ranged from approximately eight to ten million, up from 2 to 2.5 million at the end of 2000.[7] Also in recent years, the MDS industry has invested several billion dollars to develop broadband fixed wireless data systems in this band, including high-speed access to the Internet for residential customers, small and medium businesses, and educational institutions.[8] Such systems offer a significant opportunity to provide competition to cable and digital subscriber line (DSL) services in the provision of broadband services in all areas.[9] Additionally, these spectrum-based services will improve the ability of educators to serve America's students thereby facilitating educators' use of our national spectrum resource. This accomplishes our goal of ensuring that educational and medical institutions continue to have access to spectrum.

4. Our actions today also respond to proposals from the ITFS and MDS industries for major revision of current regulations so that these services will no longer be hindered by outdated and overly restrictive regulation. The restructured band plan we adopt will provide ITFS and MDS licensees with contiguous spectrum to deploy both existing and emerging technologies, and provides for both high and low-power operations in the band, thereby preserving the opportunity for incumbents to maintain existing operations. We also adopt a transition mechanism that will enable incumbents on a region-by-region basis to negotiate the transition to new spectrum assignments in the restructured band plan, with safeguards to ensure that all relocating incumbents are treated equitably. We also propose an alternative

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[4] See 47 U.S.C. §§ 157(a), 309(j)(4)(C)(iii).

[5] 47 U.S.C. § 303(y). *See, e.g.,* Ad Hoc MMDS Licensee Consortium (AHMLC) Comments at 3; ArrayComm Comments at 1; School Board of Broward County (SBBC) Comments at 1; Cellular Telecommunications & Internet Association (CTIA) Comments at 3; Information Technology Industry Council (ITIC) Comments at 2-3.

[6] Federal Communications Commission, *Eighth Annual CMRS Competition Report* (FCC 03-150, rel. Jul. 14, 2003) at 11.

[7] *Id.*

[8] A Proposal for Revising the MDS and ITFS Regulatory Regime, submitted by the Wireless Communications Association International, Inc. (WCA), the National ITFS Association (NIA) and the Catholic Television Network (CTN), RM-10586 (filed Oct. 7, 2002) at 4 (Coalition Proposal or White Paper). WCA is the trade association of the wireless broadband industry. NIA is a non-profit, professional organization of ITFS licensees, applicants and others interested in the ITFS. CTN is an association of Roman Catholic archdioceses and dioceses that operate many of the largest parochial school systems in the United States. These entities represent that the proposals contained in the paper reflect a consensus among the organizations concerning rule changes for the 2500-2690 MHz band. *See* Coalition Proposal at 1, n.1.

[9] Spectrum Study of 2500-2690 MHz Band: The Potential for Accommodating Third Generation Mobile Systems, (rel. March 30, 2001) at 13 (*3G Final Report).*

market-based transition mechanism that would take effect after three years for any areas where a negotiated transition has not occurred. We will be monitoring the transition closely through the proponents' filing of Initiation Plans with the Commission and notifications of the completion of the transition in given markets, as well as through reports prepared by the Wireless Telecommunications Bureau (Bureau) for the Commission.

5. In addition to the broader objectives described above, our decisions in this proceeding have also been guided by the desire to accomplish these additional spectrum management objectives: (1) promoting availability of broadband to all Americans, including broadband technologies for educators; (2) encouraging increased competition in wireless broadband through the creation of new opportunities for new entrants; (3) promotion of the economic viability of services in this band by ensuring that the spectrum is as fungible, tradable, and marketable as possible; (4) facilitating the highest valued use of radio licenses; (5) facilitating speed of transition and deployment in the band; (6) providing incumbents with a reasonable opportunity to continue their current uses of the spectrum; and (7) the continued promotion of spectrum-based education services.

II. EXECUTIVE SUMMARY

6. In this *Report and Order*, we:

- Adopt a band plan that restructures the 2500-2690 MHz band into upper and lower-band segments for low-power operations (UBS and LBS, respectively), and a mid-band segment (MBS) for high-power operations. By grouping high and low-power spectrum uses into separate portions of the band, this band plan creates opportunities for spectrum-based systems or devices to migrate to compatible bands based on marketplace forces, and reduces the likelihood of interference caused by incompatible uses. The new band plan also provides new incentives for the development of low-power cellularized broadband uses of the 2500-2690 MHz band, which have been thwarted by the legacy band structure.

- Designate the 2495-2500 MHz band for use in connection with the 2500-2690 MHz band.

- Rename the MDS service as the "Broadband Radio Service" (BRS). This new designation connotes a more accurate description of the services we anticipate will develop in the band.

- Rename the ITFS service as the "Educational Broadband Service" (EBS), which more accurately describes the kinds of the services that we anticipate will develop in the band.

- Implement geographic area licensing for all licensees in the band. This will give licensees increased flexibility while greatly reducing administrative burdens on both licensees and the Commission

- Adopt a transition mechanism that enables incumbent licensees to develop regional plans for moving to new spectrum assignments in the restructured band plan. Under this mechanism, licensees have a three-year period during which they can initiate the transition process in their regional area and negotiate a transition plan with other regional licensees. Transition plans must conform to certain safeguards to ensure a smooth transition and equitable treatment of incumbents.

- Consolidate licensing and service rules for the Educational Broadband Service and Broadband Radio Services. This action promotes regulatory parity, and clarifies and stabilizes the regulatory treatment of similar spectrum-based services.
- Allow spectrum leasing for BRS and EBS under our secondary market spectrum leasing policies and procedures.
- Retain eligibility restrictions for licensing in the EBS band, while removing all non-statutory eligibility restrictions applicable to cable and DSL operators for the BRS.
- Set the signal strength limits for the low-power bands at the boundaries of the geographic service areas to 47 dBμV/m.
- Restrict the transmitter output power of response stations to 2.0 watts.
- Modify emission limits for stations that would operate on the LBS and UBS channels and measure out-of-band emissions.
- Provide licensees with the flexibility to employ the technologies of their choice in the band.
- Refrain from allowing high-power unlicensed operations in the 2500-2690 MHz band, but allow unlicensed operation under our existing Part 15 rules in the 2655-2690 MHz band.
- Apply the Part 1 Wireless Telecommunications Bureau rules to the BRS/EBS spectrum.
- Dismiss pending mutually exclusive applications for new ITFS stations.
- Consolidate the new rules for the band into Part 27.
- Take other actions to streamline the rules and eliminate unnecessary regulatory burdens.

7. In MM Docket No. 97-217, we address a minor issue concerning response stations that are not engaged in communications with their associated hubs to restrict their field strengths.[10]

8. In the Further *Notice of Proposed Rulemaking* (*FNPRM*), we seek comment on alternative methods to transition licensees to the extent that licensee-negotiated transitions do not occur within the three-year transition period. Specifically, we seek comment on utilizing a system whereby existing licenses would be exchanged for a tradable instrument. Upon completion of such exchange, the entire band will be auctioned, and entities can utilize these tradable instruments in this or any other Commission auction. We seek comment on other transition methods that can be utilized to transition licensees to the new band plan. We also seek further comment on issues relating to the Gulf of Mexico service area, performance requirements for licensees in the band, grandfathered ITFS stations on the E and F channel groups, limitations on the holdings of ITFS stations, the "wireless cable" exception to the ITFS eligibility

[10] Amendment of Parts 1, 21 and 74 to Enable Multipoint Distribution Service and Instructional Television Fixed Service Licensees to Engage in Fixed Two-Way Transmissions, MM Docket No. 97-217, *Report and Order on Further Reconsideration and Further Notice of Proposed Rulemaking*, 15 FCC Rcd 14566 (2000) (*Two-Way FNPRM*).

rules, issues relating to regulatory fees, methods of streamlining our review of transactions involving these services, and continuing our review of rules relating to these services.

III. BACKGROUND

A. Establishment and Evolution of the Services

9. The Commission has sought for several decades to develop regulatory policies in the 2500-2690 MHz band that would tap this band's great potential to host a variety of services. As discussed more fully below, however, the regulatory history of the band has been marked by changing and sometimes conflicting policy goals, which have tended to suppress investment, innovation, and responsiveness to changes in wireless technology and demand for services. In light of this history, our actions today represent a major step towards unleashing the unrealized potential of this spectrum. Below, we summarize the history of the establishment and evolution of this band.

10. In 1963, the Commission established ITFS in the 2500-2690 MHz band,[11] envisioning that it would be used for transmission of instructional material to accredited public and private schools, colleges, and universities for the formal education of students.[12] The Commission also permitted ITFS licensees to use the channels to transmit cultural and entertainment material to educational institutions, and to transmit instructional material to non-educational institutions such as hospitals, nursing homes, training centers, clinics, rehabilitation centers, commercial and industrial establishments, and professional groups. ITFS licensees were also allowed to use their systems to perform related services directly concerned with formal or informal instruction and training, and to carry administrative traffic when not being used for educational purposes.[13]

11. In 1974, the Commission established MDS as a new common carrier service and allotted the 2150-2160 MHz band for such use.[14] The Commission anticipated that the MDS spectrum would be used for wireless cable, a common carrier service for distribution of television programming from a central location to fixed points selected by the common carrier's subscribers.[15] The Commission allotted two 6 megahertz channels (2150-2162 MHz) in fifty of the largest metropolitan areas (referred to as MDS Channel Nos. 1 and 2).[16] In the rest of the country, only 10 megahertz of spectrum was allotted to MDS in

[11] *See* Educational Television, Docket No. 14744, *Report and Order*, 39 FCC 846 (1963) (*MDS R&O*), *recon. denied*, 39 FCC 873 (1964) (*ETV Decision*).

[12] *See* Amendment of the Commission's Rules With Regard to the Instructional Television Fixed Service, the Multipoint Distribution Service, and the Private Operational Fixed Microwave Service; and Applications for an Experimental Station and Establishment of Multi-Channel Systems, *Report and Order*, 48 Fed. Reg. 33873, 33875 ¶ 9 (1983) (*1983 R&O*) *citing ETV Decision*, 39 FCC 846, 853 ¶ 25.

[13] *Id.*

[14] Amendment of Parts 1, 2, 21, and 43 of the Commission's Rules and Regulations to Provide for Licensing and Regulation of Common Carrier Radio Stations in the Multipoint Distribution Service, *Report and Order*, Docket No. 19493, 45 FCC 2d 616 (1974), *recon. denied*, 57 FCC 2d 301 (1975) (*1974 R&O*). *See also 1983 R&O*, 48 Fed. Reg. at 33873 ¶ 5. Amendment of Parts 2 and 74 of the Commission's Rules to Establish a New Class of Educational Television Service for the Transmission of Instructional and Cultural Material to Multiple Receiving Locations on Channel in the 2500-2690 MHz Frequency Band, Docket No. 14744, *Second Report and Order*, 30 FCC 2d 197 ¶ 8 (1971) (*1971 R&O*).

[15] *Id.*

this band —namely, Channel No. 1 (2150-2156 MHz) and Channel No. 2A (2156-2160 MHz).[17]

12. In 1983, in response to the demand for additional spectrum for delivery of video entertainment programming to subscribers, the Commission re-allotted eight ITFS channels (the E and F channel blocks) and associated response channels for use by MDS.[18] The Commission determined that the ITFS spectrum was underutilized given that there were a substantial number of unused ITFS channels in many areas of the country, with several states having no ITFS licensees whatsoever.[19] At the same time, in an effort to encourage more intensive use of the spectrum and to help ITFS licensees generate needed revenue, the Commission began to relax use restrictions on ITFS licensees so that they could lease excess capacity on their facilities to commercial entities.[20] Following that decision, there was a significant increase in the number of applications filed for new ITFS facilities.[21] In 1985, the Commission further relaxed restrictions governing the leasing of excess capacity to commercial providers,[22] allowing ITFS operators to lease up to 95 percent of their capacity for non-educational purposes.[23] In 1987, the Commission allowed MDS operators to elect non-common carrier (and non-broadcast) status, leaving them subject to regulation pursuant to Part 21 of the Commission's Rules and the general provisions of Title III of the Communications Act of 1934, which apply to all radio station licensees.[24] That same year, the Commission eliminated the time-of-day restrictions on leasing ITFS spectrum and authorized operators to use automatic switching equipment.[25] In this same general timeframe, the Commission continued to relax requirements concerning ITFS licensees leasing spectrum for MDS operations.[26]

(Continued from previous page)

[16] Amendment of Part 21.703(g), and (h) of the Commission's Rules, *Memorandum Opinion and Order*, 47 FCC 2d 957 (1970).

[17] *Id.*

[18] Amendment of Parts 2, 21, 74 and 94 of the Commission's Rules and Regulations in regard to frequency allocation to the Instructional Television Fixed Service, the Multipoint Distribution Service, and the Private Operational Fixed Microwave Service, Gen Docket No. 80-112 and CC Docket No. 80-116, *Report and Order*, 94 FCC 2d 1203 (1983) (*First Leasing Decision*).

[19] *Id.* at 1203 ¶ 4.

[20] *First Leasing Decision*, 94 FCC 2d at 1203.

[21] *See* section IV.C.3, *infra*, for further discussion of leasing practices and issues.

[22] Amendment of Part 74 of the Commission's Rules and Regulations in Regard to the Instructional Television Fixed Service, MM Docket No. 83-523, *Second Report and Order*, 101 FCC 2d 50, 87 ¶ 95 (1985) (*1985 R&O*).

[23] *See* Amendment of Parts 21 and 74 to Enable Multipoint Distribution Service and Instructional Television Fixed Service Licensees to Engage in Fixed Two-Way Transmissions, *Report and Order*, 13 FCC Rcd 19112, 19157 ¶¶ 86-87 (1998) (*Two-Way R&O*).

[24] Multipoint Distribution Service Regulatory Classification, CC Docket No. 86-179, *Report and Order*, 52 Fed. Reg. 27553 (1987) (summarizing FCC 87-210, released July 16, 1987).

[25] Amendment of Parts 21, 43, 74, 78, and 94 of the Commission's Rules Governing Use of the Frequencies in the 2.1 and 2.5 GHz Bands Affecting: Private Operational-Fixed Microwave Service, Multipoint Distribution Service, Multichannel Multipoint Distribution Service, Instructional Television Fixed Service, & Cable Television Relay Service, GN Docket No. 90-54, *Order on Reconsideration*, 6 FCC Rcd 6764, 6774 (1991), *recon. denied*, 7 FCC Rcd 5648 (1992) (*1991 R&O*).

[26] For example, the Commission eliminated the requirement that ITFS licensees fulfill their minimum educational usage obligations by transmitting such content on their own stations, allowing them the option of transmitting it on other licensees' ITFS or MDS stations. *See Two-Way R&O*, 13 FCC Rcd at 19165-66 ¶¶ 100-101.

13. In 1991, in an effort to provide more spectrum for multichannel video operations, the Commission re-allotted three additional channels in the 2500-2690 MHz band (the H channel block) from the Private Operational-Fixed Microwave Service[27] (OFS) to MDS.[28] This resulted in the current division of spectrum in the 2500-2690 MHz band between ITFS and MDS. Of the 190 megahertz of total spectrum, 122.5 megahertz is allocated to ITFS, including 20 6-megahertz main station video channels, while 66.5 megahertz is allocated to MDS, including 11 main station video channels.

14. Over the past decade, the Commission has taken a number of steps to increase the technical flexibility afforded to both ITFS and MDS licensees in the 2500-2690 MHz band. In 1993, the Commission granted ITFS licensees flexibility to use channel loading to shift their required educational programming onto a subset of their authorized number of channels by channel loading, e.g.., an ITFS licensee could move all of its ITFS programming on to one of its four channels and lease the remaining three channels on a twenty-four-hour basis to a wireless cable operator.[29] In 1996, the Commission permitted MDS and ITFS licensees to employ digital technologies,[30] and in 1998, it expanded the existing allocation for one-way video service to allow MDS and ITFS licensees to construct digital two-way systems capable of providing high-speed, high-capacity broadband service, including two-way Internet service via cellularized communication systems.[31] Finally, in 2001, the Commission added a mobile allocation to the 2500-2690 MHz band (excluding aeronautical mobile) to make it potentially available for advanced mobile wireless services, including IMT-2000 and future generations of wireless systems.[32]

B. Current Uses of the Band

15. System operators in the 2500-2690 MHz band (both licensees and lessees) are generally

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[27] Prior to its allocation to ITFS, the 2500-2690 MHz band was allocated to shared use by Private Operational Fixed Microwave Service (OFS) stations and international control stations. The traditional Fixed Service use of this band was primarily private microwave communications uses such as multichannel voice and data circuits. *See 1983 R&O*, 48 Fed. Reg. at 33873 ¶ 8.

[28] *1991 R&O*, 6 FCC Rcd at 6792. In the first *R&O* in this proceeding, the Commission made MDS operators eligible to use microwave frequencies in the Cable Television Relay Service (CARS). Amendment of Parts 21, 43, 74, 78 and 94 of the Commission's Rules Governing Use of the Frequencies in the 2.1 and 2.5 GHz Bands Affecting Private Operational-Fixed Microwave Service, Multipoint Distribution Service, Multi-Channel Multipoint Distribution Service, Instructional-Television Fixed Service, and Cable Television Relay Service, *Report and Order*, 5 FCC Rcd 6411, 6423 (1990) (*1990 R&O*). CARS is primarily a service for carrying video. Amendment of Eligibility Requirement in Part 78 Regarding 12 GHz Cable Television Relay Service, *Report and Order*, 17 FCC Rcd 9930, 9945-6 (2002) (*CARS R&O*). ITFS operators are currently not eligible for CARS licenses, except in very limited circumstances. 47 C.F.R. § 78.13(e).

[29] Amendment of Part 74 of the Commission's Rules Governing Use of the Frequencies in the Instructional Television Fixed Service, MM Docket 93-106, *Report and Order*, 9 FCC Rcd 3360 ¶ 2 (1994) (*1994 R&O*). *See also* 47 C.F.R. § 74.931(e)(9).

[30] *See* Use of Digital Modulation by Multipoint Distribution Service and Instructional Television Fixed Service Stations, *Declaratory Ruling and Order*, 11 FCC Rcd 18839 (1996) (*Digital Modulation Declaratory Ruling and Order*).

[31] *Two-Way NPRM*, 15 FCC Rcd at 14566.

[32] *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, *First Report and Order and Memorandum Opinion and Order*, 16 FCC Rcd 17222 (2001) (*3G R&O*).

providing four categories of service offerings today: (1) downstream analog video; (2) downstream digital video; (3) downstream digital data; and (4) downstream/upstream digital data.[33] Licensees and lessees have deployed or sought to deploy these services via three types of system configuration: high-power video stations, high-power fixed two-way systems and low-power, cellularized two-way systems.[34] We noted in the *NPRM* that most MDS operators and a substantial proportion of ITFS operators are particularly interested in using low-power, cellularized two-way systems, because they are more spectrally efficient than high-power systems, can support provision of high-data-rate services to a large number of subscribers, can help overcome obstacles to line-of-sight service, and can more readily support mobile or portable services.[35] We also noted our concern that interference issues created by the distribution of high-power systems throughout the existing band plan have severely limited the ability of licensees and lessees to deploy low- power services.

C. The Coalition Proposal

16. On October 7, 2002, the Coalition submitted a paper entitled "A Proposal for Revising the MDS and ITFS Regulatory Regime" ("Coalition Proposal" or "White Paper"), which recommended fundamentally changing the rules governing the 2500-2690 MHz band.[36] In general, the Coalition argued that the band was not being used to the fullest extent possible[37] and that rule changes were necessary to allow new services to develop. The Coalition envisioned this band being used to provide new wireless two-way broadband services (e.g., provide commercial service to portable, nomadic and mobile laptops, Personal Digital Assistants (PDAs), and other non-stationary devices) where the network architecture is based on a low-power cellular concept. The Coalition contended that the explosive growth of 802.11b-compliant "hot spots" demonstrated the demand for this sort of service and that this band could be used to provide ubiquitous service, not just at hot spots. It pointed out that several MDS licensees were currently test marketing this new two-way broadband service.[38] It asserted, however, that a "radical reworking of the MDS and ITFS regulatory structure [wa]s needed" for such new services to develop and flourish in this band.[39] The Coalition focused primarily on engineering issues – accommodating the needs of two

[33] Amendment of Parts 1, 21, 73, 74 and 101 of the Commission's Rules to Facilitate the Provision of Fixed and Mobile Broadband Access, Educational and Other Advanced Services in the 2150-2162 and 2500-2690 MHz Bands; Part 1 of the Commission's Rules - Further Competitive Bidding Procedures; Amendment of Parts 21 and 74 to Enable Multipoint Distribution Service and the Instructional Television Fixed Service Amendment of Parts 21 and 74 to Engage in Fixed Two-Way Transmissions; Amendment of Parts 21 and 74 of the Commission's Rules With Regard to Licensing in the Multipoint Distribution Service and in the Instructional Television Fixed Service for the Gulf of Mexico; WT Docket Nos. 03-66, 03-67, 02-68, MM Docket No. 97-217, *Notice of Proposed Rulemaking and Memorandum Opinion and Order*, 18 FCC Rcd 6722, 6734 ¶ 23 (2003) (*NPRM*).

[34] *Id.*

[35] *Id.*

[36] *See generally* Coalition Plan.

[37] For example, the Coalition contends that it has become clear that the growth of direct broadcast satellite (DBS) and cable systems has "closed the window of opportunity for wireless cable" in all but a relatively few markets where wireless cable has gained a foothold. Coalition Proposal at 2. In regard to two-way services, the Coalition states that because of problems associated with first generation two-way technology, many in the industry have decided to halt deployment of additional first generation systems until those problems can be resolved. Coalition Proposal at 4.

[38] Coalition Proposal at 5-7.

[39] *See* Letter from the Coalition to Thomas J. Sugrue, Chief, Wireless Telecommunications Bureau, Federal Communications Commission dated Oct. 7, 2002 (accompanied the Coalition Proposal).

incompatible types of users that presently share a single band: one-way, relatively high-powered stations and operators that seek to maximize spectral efficiency by deploying low-powered cellular systems.

17. To this end, the Coalition proposed establishing a new band plan to facilitate advanced low-power two-way broadband systems while at the same time protecting existing high-power systems (e.g., video operations). The Coalition proposed dividing the band into three segments, consisting of the LBS, MBS, and UBS.[40] Low-power operations would utilize the LBS and UBS while high-power video operations would operate in the MBS. The Coalition also proposed (1) eliminating unnecessary regulatory burdens imposed by site-by-site licensing,[41] (2) simplifying the technical rules to facilitate operations in the band,[42] (3) establishing a market-by-market mechanism for transitioning to the new band plan and (4) eliminating outdated regulations. On October 17, 2002, the Commission released a Public Notice detailing the Coalition's proposal.[43]

18. On April 2, 2003, we released the Notice of Proposed Rule Making (*NPRM*) in this proceeding.[44] In the Notice, we sought comment on the Coalition Proposal as well as other potential alternatives for restructuring the 2500-2690 MHz band. We noted that this proceeding provided an opportunity to help meet our statutory duty to "encourage the deployment on a reasonable and timely basis of advanced telecommunications capability to all Americans (including, in particular, elementary and secondary schools and classrooms). . ."[45] We also noted the potential for this band to be used for broadband technologies, including high-speed digital technologies that provide consumers integrated access to voice, high-speed data, video-on-demand, and interactive delivery services. We sought comment on how best to further our goal of promoting competition, innovation, and investment in broadband services and facilities while monitoring progress toward the deployment of broadband services in the

[40] The Coalition narrowed the channels in the LBS and UBS to 5.5 megahertz in order to provide room for the J and K bands to separate high-power and low-power services. The Coalition explains that "[a]lthough the channels in the LBS and the UBS will be 5.5 MHz wide rather than 6 MHz wide and the channels in the Transition Band will be 1.5 MHz wide, no change in the current rules affording licensees the flexibility to subchannelize and superchannelize is proposed. Therefore, even after the transition licensees can continue to utilize 6 MHz channels in the LBS, the UBS, and the Transition Bands, provided that appropriate consents are achieved." Coalition Proposal at 13 n.32.

[41] For example, the Coalition contends that under the current licensing model, it will take substantially more applications to license a populated market for second generation MDS service (*e.g.*, low-power, two-way broadband service). It estimates that it could take close to two thousand applications under the current licensing approach to fully license the band for a second generation system in just one major market. This licensing model, according to the Coalition, results in substantial transaction costs and delays of providing service. *See* Coalition Proposal at 7-8.

[42] For example, the Coalition argues that "an applicant is required by the complex 'Appendix D' interference-prediction methodology to assume in conducting analyses that each and every one of its subscribers is located at the very point most likely to cause interference to a neighbor. In other words, an applicant proposing to provide service on a given channel to 1000 subscribers simultaneously is required to assume that all 1000 subscribers will be at the very spot most likely to cause interference. Unfortunately, these hypothetical assumptions, for all practical purposes, preclude system operators from serving substantial portions of their authorized territories. *See* Coalition Proposal at 3.

[43] Wireless Telecommunications Bureau Seeks Comment of Proposal to Revise Multichannel Multipoint Distribution Service and the Instructional Television Fixed Service Rules, DA 02-2732, *Public Notice* (rel. Oct. 17, 2002) *(MDS/ITFS Public Notice)*. Fifty-three entities filed comments and eight filed reply comments.

[44] *See NPRM*, 18 FCC Rcd at 6722.

[45] *See* Telecommunications Act of 1996, Pub. L. 104-104, § 706(a), 110 Stat. 56 (1996); 47 U.S.C. § 157.

United States and abroad.[46]

19. We noted in the *NPRM* that both the Coalition's analysis of the problems in the 2500-2690 MHz band and its proposed solutions were broadly consistent with the conclusions articulated in the Commission's 2001 3G Final Report.[47] Of particular importance is the Commission's conclusion therein that traditional MDS/ITFS stations and third generation (3G) cellular systems are not compatible with each other when they are operating on the same frequencies. Their service area borders must be separated by distances exceeding 100 miles to ensure that MDS/ITFS transmitters will not cause harmful interference to 3G receivers.[48] We further noted the report's conclusion that existing MDS/ITFS systems preclude operation of 3G systems in forty-nine of the fifty largest cities in the U.S., because all thirty-one of the MDS and ITFS channels in the 2500-2690 MHz band are licensed within 100 miles of those forty-nine cities.[49] In the 3G Final Report, the Commission concluded that it would not be feasible to move the incumbent licensees to a different band. Instead, it recommended segmenting the band into separate high- and low-power segments and requiring both incumbents and new applicants to conform with the new technical rules.[50] While the 3G Final Report focused on one particular type of new technology, its conclusions may apply with respect to any low-powered two-way service that seeks to achieve spectral efficiencies through a cellular-style configuration.

20. In the *NPRM*, we acknowledged that the Coalition's proposal was a major step forward to examination of this band. However, we also believed that significant progress would also require a discussion of ownership and eligibility issues, transition timetables, and, perhaps, a more thorough resolution of engineering issues as well. In this regard, we sought comment on the possibility of eliminating eligibility and use criteria for ITFS spectrum and the possibility of merging MDS and ITFS into a single Broadband Communications Service. We also sought comment on the best manner in which to accomplish the transition process, and whether we should establish a timetable for conversion of the entire 2500-2690 MHz band to low-power operations compatible with two-way, broadband cellular services. We emphasized that we did not propose to reclaim licenses from any incumbent operators that have complied with our existing rules and continue to comply with our new rules.

IV. DISCUSSION

A. Changes to 2500-2690 MHz Band Plan

21. *Background.* The 2500–2690 MHz band is currently comprised of twenty 6 megahertz ITFS channels and eleven 6 megahertz MDS channels. The channels in this band are licensed in groups of four (except for the MDS H block, consisting of three channels), but the channels in each group are interleaved rather than contiguous. As discussed in detail in the *NPRM*, this band plan, designed primarily to promote wireless cable and educational television services, was established in the early 1960s when television technology precluded the use of adjacent channels.[51] This channelization framework, which has remained

[46] *Id.*

[47] *See NPRM*, 18 FCC Rcd at 6743 ¶ 45.

[48] *See* Principles for Promoting Efficient Use of Spectrum By Encouraging the Development of Secondary Markets, Policy Statement, 15 FCC Rcd 24178, 24191 ¶ 31 (2000) (*2000 Spectrum Policy Statement).*

[49] *Id.* at 24191 ¶ 32.

[50] *Id.* at 24194 ¶ 40.

[51] *See NPRM*, 18 FCC Rcd at 6744-45 ¶ 47-48.

essentially unchanged since that time, was appropriate for when the Commission created ITFS and MDS, but is not optimal for digital two-way services. Additionally, there is no longer a technical rationale for the interleaved band plan, because MDS and ITFS systems have been technically able to use adjacent channels for the past 20 years. Moreover, the interleaved channelization scheme is particularly problematic when one licensee seeks to operate at low-power while the adjacent licensee operates at high power, because low-power services are especially susceptible to interference from high-power transmissions on adjacent channels.

22. The current interleaved band plan, coupled with the current adjacent channel interference protection rules, effectively precludes any licensee from providing broadband service unless consent is received from the licensee of the interleaved channel group (e.g., the licensee of the A Group cannot deploy two-way services without consent from the licensee of the B Group, and vice versa). This hampers the ability of individual MDS and ITFS licensees to deploy broadband services by giving adjacent channel licensees veto power over any such offering. Another consideration is that when using spread-spectrum techniques to avoid interference, service providers can operate more efficiently when they have access to large blocks of contiguous spectrum. Thus, we noted in the *NPRM* that any plan we adopt should address the need to provide a means by which licensees could consolidate their channels into contiguous blocks while resolving the incompatibility between high-power one-way services and low-power cellular services.

23. Additionally, MDS Channels 1 and 2 were allotted the 2150-2160 MHz band and operated with corresponding channels in the 2500-2690 MHz band.[52] In fifty of the largest metropolitan areas, the Commission allotted an extra megahertz for MDS Channels 1 and 2 to create two 6 MHz channels (2150-2162 MHz).[53] Because of their frequency separation from the rest of the MDS spectrum, these channels were not as extensively used. Therefore, in order to accommodate a new 90 megahertz allocation for advanced wireless services (AWS), the Commission, in ET Docket No. 00-258, reallocated the 1710-1755 MHz and 2110-2155 MHz bands to the fixed and mobile services for AWS.[54] That action, however, deferred on the relocation of MDS Channels that were impacted to a later proceeding.

24. Contemporaneously with the adoption of this item, we have, in IB Docket No. 02-364 (Big Leo Spectrum Sharing R&O proceeding) added a co-primary fixed and mobile (except aeronautical mobile) service allocation to the 2495-2500 MHz band.[55] That allocation is intended to facilitate the

[52] Amendment of Parts 1, 2, 21, and 43 of the Commission's Rules and Regulations to Provide for Licensing and Regulation of Common Carrier Radio Stations in the Multipoint Distribution Service, Docket No. 19493, *Report and Order*, 45 FCC 2d 616 (1974), *recon. denied*, 57 FCC 2d 301 (1975) (*1974 R&O*). *See also 1993 R&O*, 48 Fed. Reg. at 33873 ¶ 5; *1971 R&O*, 30 FCC 2d at 197 ¶ 8. As noted above, in the top fifty markets, MDS Channel 2 is 2156-2162 MHz. Unless the context requires us to specifically discuss the top fifty markets, we will refer to MDS Channel 2 as 2156-2160 MHz.

[53] Amendment of Part 21.703(g), and (h) of the Commission's Rules, *Memorandum Opinion and Order*, 47 FCC 2d 957 (1970).

[54] *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, *Second Report and Order*, 17 FCC Rcd. 23193 (2002) (*3G 2nd R&O*).

[55] *See* Review of the Spectrum Sharing Plan Among Non-Geostationary Satellite Orbit Mobile Satellite Service Systems in the 1.6/2.4 GHz Bands, IB Docket No. 02-364 (*Big LEO R&O*); 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, FCC 04-134, *Report and Order, Fourth Report and Order, and Further Notice of Proposed Rulemaking* (adopted June (continued....)

relocation of MDS Channels 1 and 2 to spectrum embedded with other MDS operations that we address herein. The actions within the Big Leo Spectrum Sharing R&O proceeding combined with the new band plan for the band will increase the efficient utilization of the 2496-2690 MHz spectrum and resolves the relocation of MDS Channels 1 and 2 by integrating these licensees with similar operations.[56] The details of the new band plan will be discussed below.

1. Addition of the 2495-2500 MHz band

25. As indicated above, in the Big Leo Spectrum Sharing R&O proceeding, we allocated the 2495-2500 MHz band to the fixed and mobile, except aeronautical mobile, services in order to provide additional spectrum to the 2500-2690 MHz band to accommodate the relocation of MDS Channels 1 and 2. We note that in the AWS *2nd Report and Order*, parties suggested a variety of potential relocation options for MDS Channels 1 and 2, including: 1) shifting the MDS channels up in frequency by five megahertz to the 2155-2165 MHz band;[57] 2) moving the MDS channels to spectrum within or adjacent to the MDS spectrum at 2500-2690 MHz;[58] 3) moving the channels to share the mobile satellite service (MSS) spectrum at 2010-2025 MHz;[59] and 4) considering whether replacement spectrum for MDS is even needed considering market forces, and if so, considering spectrum in the 2385-2400 MHz band, abandoned MSS spectrum below 2025 MHz, or 700 MHz spectrum bands.[60]

26. WCA, however, argues that each of these options poses difficulties for MDS operations. With respect to moving MDS to the 2155-2165 MHz band, it notes that in 50 markets, MDS licensees may use up to 12 megahertz which must be accommodated, that such relocation would eliminate the *de facto* guard band between MDS and MSS,[61] and that such a transition would have to be accomplished without disrupting service to customers and all costs must be reimbursed.[62] WCA further states that

(Continued from previous page)
10, 2004).

[56] MDS Channels 1 & 2 are located at 2150-2156 MHz and 2156-2162 MHz respectively. Some licensees are authorized to use the 2156-2160 MHz portion of the band, known as "Channel 2A." The Office of Engineering and Technology has designated MDS 1 and 2 for reallocation. *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 (2002) (*3G 3rd R&O & NPRM*).

[57] AT&T Wireless Comments to the *3G 3rd R&O & NPRM* at 12.

[58] Verizon Comments to the *3G 3rd R&O & NPRM* at 15.

[59] Cingular Comments to the *3G 3rd R&O & NPRM* at 11.

[60] Ericsson Comments to the *3G 3rd R&O & NPRM* at 10-11.

[61] WCA notes that it has filed a Petition for Reconsideration of the *Report and Order* in IB Docket No. 99-81 seeking to revise the MSS spectral mask to limit the power flux density into the MDS band. WCA Reply Comments at 32.

[62] *See id.* at 31-33.

moving MDS into the MSS bands is problematic because it would reduce the size of the MSS spectrum.[63] Additionally, WCA states that the 2385-2400 MHz band is not suitable for MDS relocation because the 2385-2390 MHz band is not readily available and there is a likelihood of adjacent channel interference from Federal Government airborne telemetry operations and co-channel interference to amateur operations in the 2390-2400 MHz band.[64] WCA does, however, offer a relocation solution, stating that in the event the Commission deems relocation necessary, an acceptable compromise would be to relocate MDS Channels 1 and 2/2A to the 1910-1916/1990-1996 MHz bands and allow fixed or mobile use.[65]

27. We find that spectrum within the 2500 MHz band is the optimal location to relocate existing MDS licensees because it will allow the creation of an optimal band plan with contiguous spectrum, and integrate these licenses into the new BRS instead of orphaning MDS operations such that they would be part of a different service. Therefore, we find the allocation actions taken in the Big Leo Spectrum Sharing R&O proceeding produce the optimal situation for the relocation of MDS Channels 1 and 2. In order to promote sharing in the 2495-2500 MHz portion, we took the following actions in the Big Leo Spectrum Sharing R&O proceeding: 1) shifted mobile satellite service (MSS) ancillary terrestrial component (ATC) operations down from the 2492.5-2498 MHz band to the 2487.5-2493 MHz band;[66] 2) dictated that MSS receive operations in the 2495-2500 MHz portion will not be able to claim interference protection from new fixed and mobile operations;[67] and 3) designated the 2495-2496 MHz portion as a guard band to separate new BRS operations and incumbent operations below 2495 MHz. While these actions will allow the licensing of new terrestrial operations in the 2496-2500 MHz band, certain sharing constraints will be required.

28. We note that currently, there are 108 grandfathered terrestrial licenses for broadcast auxiliary service (BAS) and private radio services that are protected by primary status.[68] New licensees in this spectrum could share the spectrum through coordination efforts, which should be successful given the limited number of licensees. Nevertheless, we will explore in a future proceeding possible relocation steps for these operations. Indeed, because we are establishing a low-power BRS, we believe it would be appropriate to consider moving BAS at this time. Further, the entire 2400-2500 MHz band is available for

[63] *See WCA Letter*, *supra* n.19. This letter was sent jointly by WCA, Bellsouth, Nucentrix, Sprint, and Worldcom. WCA is the trade association of the MDS industry. The other parties to the letter hold the majority of licenses in the 2150-2160 MHz band.

[64] *Id.* at 8-9.

[65] *Id.* at 2.

[66] This action will reduce the potential for interference conflicts between new terrestrial services and ATC terrestrial deployments.

[67] Because MSS receive units can operate globally, this action is needed to ensure new terrestrial services can deploy without having to protect globally roaming devices. We also note that the MSS downlink allocation goes down to 2483.5 MHz, so the majority of the MSS channels will be unencumbered by new terrestrial use of the 2496-2500 MHz band. The MSS allocation is maintained however in the upper portion, so MSS can make use of these channels prior to deployment of the new BRS operations in the band, and in geographic areas, such as remote areas where new terrestrial services are not likely to deploy.

[68] See 47 C.F.R. §2.106 NG147. Specifically, these operations include: 1 local television transmission license, 12 point-to-point microwave, private-industrial business licenses, 4 conventional public safety pool licenses, 12 TV intercity relay licenses, 78 TV pickup licenses, and 1 TV translator relay license.

Industrial, Scientific, and Medical (ISM) operations which use electromagnetic energy to perform a function other than communications, such as heating substances in a microwave oven.[69] We anticipate that BRS operations will be able to coexist with ISM operations because ISM operations use frequencies closer to the center of the band and in a controlled environment.

29. We also note that non-geostationary MSS space station downlink operations in the 2495-2500 MHz portion have a downlink power flux density (pfd) limit of -144 dBW/m^2 per 4 kilohertz or -126 dBW/m^2 per 1 megahertz reference bandwidth, depending on the angle of arrival.[70] This limit was designed to accommodate multiple MSS systems using code division multiple access (CDMA) techniques which is a form of spread spectrum modulation that can facilitate spectrum sharing. The limit was specifically designed to protect analog fixed relay systems and the ITU radio regulations indicate that they should be adequate to protect most digital fixed systems. These limits were not designed to protect mobile services. However, we believe there are some factors that could enable mobile services in this band should licensees take this approach. For example, the ITU limits were designed under conservative assumptions and were designed for multiple MSS systems overlapping in the same spectrum. Currently, however, the MSS in this band is only being used by one licensee, so the actual interference potential from satellite operations is much lower than the limit would indicate. Furthermore, mobile systems, such as cellular telephone and PCS systems, often utilize fairly strong signals throughout their coverage area in order to provide adequate capacity within each cell. Therefore, we conclude that the pfd limit does allow sharing with various terrestrial operations. New terrestrial entrants in the band should be aware of the MSS downlink emissions in the design of their systems.

2. Band Plan Alternatives

30. In the *NPRM*, we sought comment on several band plans that could potentially resolve the incompatibility between high-power one-way services and low-power cellular services. As previously noted, the Coalition's approach involved dividing the 2500-2690 MHz into three larger and three smaller segments, with the MBS reserved for high-power MDS and ITFS stations and the UBS and LBS reserved for low-power operations. The LBS would be designated as the mobile station transmit band while the UBS would be designated as the base station transmit band. The three minor segments would consist of the I band at 2686-2690 (narrowband auxiliary channels) and two transition or guard bands, the J band, located between the LBS and MBS at 2566-2572 MHz, and the K band located between the MBS and the UBS at 2614-2620 MHz. Under the Coalition's proposed band plan, a licensee that currently has four interleaved 6-megahertz channels and four interleaved 0.125 megahertz channels would be assigned 16.5 megahertz of contiguous spectrum in either the LBS or UBS, 6 megahertz of spectrum in the MBS, .5 megahertz of contiguous spectrum in the I band, and 1.5 megahertz of contiguous spectrum in bands that the Coalition refers to as the J and K bands after transitioning to the new band plan. Because there is no pairing of bands pursuant to this approach, a licensee who wishes to deploy Frequency Division Duplex (FDD) technology must assemble paired blocks through a white space auction or secondary market transactions.[71] Assuming that paired blocks can be acquired, however, this band plan allows for either

[69] *See* 47 C.F.R. Part 18.

[70] *See* International Telecommunication Union (ITU) Radio Regulations, Appendix 5, Table 5-2.

[71] Frequency Division Duplex (FDD) provides simultaneous communications between two devices through the use of two different bands. The forward band refers to the spectrum used by base stations and the reverse band refers to the spectrum used by the subscriber. In FDD systems, frequency separation between the forward band and the reverse bands remains constant among each subscriber-base station communication.

FDD or Time Division Duplex (TDD) technology.[72] Pursuant to the Coalition's proposal, every MDS and ITFS licensee would be assigned a geographic service area (GSA).[73] Existing circular protected service areas (PSAs) would be converted to GSAs with signal strength limits applied at their boundaries.[74]

31. In the *NPRM*, we also sought comment on two other types of band segmentation plans.[75] The first type, outlined in the 3G Final Report, involves alternating bands for low and high-power services, respectively, with guard bands in between the two 45 megahertz frequency blocks for low-power services. The *NPRM* noted that this approach might be beneficial because it would allow both types of operations to provide frequency separation between paired channel blocks for 3G and ITFS/MDS operations and would permit both FDD and TDD operations. Another band plan option proposed in the *NPRM* involved separating the band into one block for low-power operations and one block for high-power operations, separated by a guard band. We noted that such a band plan would provide a large block of contiguous spectrum for both types of operations and is particularly well suited to TDD technology.[76]

32. The other basic approach presented in the *NPRM* involved avoiding any segmentation of the band by applying an across-the-board limit on signal strengths sufficient to accommodate low-power cellularized operations on all channels throughout the 2500-2690 MHz band. We noted that the Coalition Proposal, or any other band segmentation plan, would require extensive, mandatory re-shuffling of channel assignments to avoid leaving high-power channels adjacent to low-power channels, in order to avoid adjacent channel interference.[77] By contrast, applying an across-the-board limitation on signal strengths could make de-interleaving a less urgent necessity and, perhaps, make it possible for acquisitions, channel trades, and other voluntary market processes to effectuate any needed consolidation of channels. We sought comment on the extent to which such a rule would reduce the need to apply mandatory channel reassignments or whether it would interfere with future uses of this spectrum by educators.

33. From a broader perspective, the *NPRM* stated that Coalition members appear to believe that the predominant future use of this band will be low-power mobile services. On that basis, we sought comment on whether it would be necessary to reserve a portion of this band in the long term to accommodate high-power services. We expressed particular interest in hearing from licensees who are engaging in high-power operations as to their long-term plans for the spectrum. We sought comment on the technical feasibility of this approach and the cost involved in complying with technical rules that may require licensees to substantially lower their signal strength outside their PSAs.

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[72] Time Division Duplex (TDD) provides communications between two devices sharing the same band by dynamically allocating short duration time intervals for transmitting and receiving. In TDD systems, a subscriber's device will operate in a transmit mode while the corresponding base station operates in a receive mode and vice versa, eliminating the need for duplex filters, as in FDD systems.

[73] A GSA is defined as a protected service area (PSA) that is bounded by political and/or geographical boundaries. *See* para. *53, infra.* A PSA is a land area over which an approved licensee is allowed to operate transmitting equipment.

[74] *See* para. 55, *infra.*

[75] *3G Final Report* at 37-57.

[76] *Id.* at 42.

[77] We address the complex transitional issues implicated by that process in section IV.A.5.

34. We note that the Coalition's band plan received support from a majority of commenters.[78] For example, Alvarion supports the plan because it allows flexible use of the band, supports both TDD and FDD technologies, permits both current commercial and ITFS licensees to continue operations using the MBS, maintains the location of the I channels, and permits the band to lend itself to mass production of equipment, thereby serving as a catalyst to launch the wireless broadband market into the same realm served by cable modem and DSL broadband solutions today.[79]

35. Not all commenters, however, support the Coalition's band plan. Some commenters maintain that the Coalition's band plan, with only seven high-power channels, has too few high-power channels to support their needs. MDS providers further maintain that it would be too expensive for them to serve their customers using low-power network configurations.[80] ITFS providers argue that one MBS channel will not be able to accommodate their current or planned systems.[81] For instance, Stanford and Northeastern indicate that they have tested 5:1 compression and found it is not adequate for instructional programming because the quality is unsatisfactory and the delay unacceptable. Consequently, they contend, the loss of high-power channels would prevent them from expanding their systems from the present four channels to eight or even sixteen video programming channels and could[82] result in significant costs for purchasing new equipment for low-power operations, if these costs are not covered by the transition process. NAF urges that the 2500-2590 MHz portion of the band be redesignated for primary unlicensed use.[83]

36. *Discussion.* As previously noted, our main goals in this proceeding include: (1) promoting availability of broadband to all Americans, including broadband technologies for educators; (2) promoting innovation by maximizing flexibility in the service rules; (3) facilitating speed of transition and deployment in the band; and (4) providing incumbents with a reasonable opportunity to continue their current uses of the spectrum. In order to accomplish these goals, we believe that the optimal band plan

[78] Specifically, commenters, such as Alvarion Ltd. (Alvarion), California Amplifier, Celplan Technologies, Inc. (Celplan), ComSpec Corporation (ComSpec), Ericsson, Inc. (Ericsson), Flarion Technologies, Inc. (Flarion), Illinois Institute of Technology (IIT), Intel Corporation (Intel), Lucent Technologies (Lucent), Mississippi Ednet Institute, Inc. (Mississippi Ednet), Navini Networks, Inc. (Navini), The North Carolina Community College System (NCCCS), SBC Communications, Inc. (SBC), Sioux Valley Wireless, SOMA Networks, Inc. (SOMA), South Carolina Educational Television (SCETV), Blake Twedt & John Dudeck (Twedt & Dudeck) and the University of Arizona (UA) support the Coalition's band plan proposal. *See also* Alvarion Reply Comments at 3; IIT Comments at 15-16; California Amplifier Reply Comments at 1-2; Celplan Reply Comments at 2; ComSpec Comments at 2; Flarion Reply Comments at 2; Intel Comments at 6; Lucent Comments at 3; Mississippi Ednet Reply Comments at 1; Navini Reply Comments at 2; NCCCS Reply Comments at 1; SBC Communications, Sioux Valley Wireless Reply Comments at 1; SOMA Reply Comments at 1; SCETV Comments at 1; Twedt & Dudeck Reply Comments at 2; UA Reply Comments at 1. SCETV adds that the separation of the two low-power bands is necessary to support both FDD and TDD technologies. SCETV Comments at 6. SCETV also believes that PSA overlap should be equally divided among the respective licensees to create non-overlapping GSA's, but existing receivers outside the new GSA should receive grandfathered protection. SCETV Comments at 6.

[79] Alvarion Reply Comments at 3-5.

[80] *See* Joint commenters Adams Telecom, Inc., Central Texas Communications, Inc., and Leaco Rural Telephone Cooperative, Inc. (Adams et. al.) Comments at 5. *See also* Teton Wireless Television, Inc. (Teton) Comments at 9-10.

[81] *See* Stanford and Northeastern Comments at 8.

[82] Stanford and Northeastern Comments at 7.

[83] New America Foundation, et. al. (NAF) Comments at 4.

must: (1) provide for low-power operations while maintaining some spectrum for high-power services; (2) promote consistent regulatory treatment with similar wireless broadband services;[84] and (3) offer flexibility through technological neutrality. We conclude that it is in the public interest to adopt the band plan described below because it best accomplishes the goals of this proceeding.

37. The following chart shows the band plan we are adopting:

Commission Band Plan				
Channel Designation	Lower Frequency	Upper Frequency		
N/A	2495	2496	Guard Band	
BRS 1	2496	2502		
A1	2502	2507.5		
A2	2507.5	2513		
A3	2513	2518.5		
B1	2518.5	2524		
B2	2524	2529.5		
B3	2529.5	2535		
C1	2535	2540.5		LBS
C2	2540.5	2546		
C3	2546	2551.5		
D1	2551.5	2557		
D2	2557	2562.5		
D3	2562.5	2568		
J	2568	2572	Guard Band	
A4	2572	2578		
B4	2578	2584		
C4	2584	2590		
D4	2590	2596		MBS
G4	2596	2602		
F4	2602	2608		
E4	2608	2614		
K	2614	2618	Guard Band	
BRS 2	2618	2624		
E1	2624	2629.5		
E2	2629.5	2635		
E3	2635	2640.5		

[84] Consistent regulatory treatment among similar services entails establishing similar technical and other rules among similar services. With respect to the band plan channel widths, 5 MHz is the least common multiple in the Personal Communications Systems band (PCS) (47 C.F.R § 24.1 et. seq.) and the Advanced Wireless Services band(AWS) (47 C.F.R § 27.1 et. seq.). Also, 5 MHz appears to be the most desired current wideband channel size, for FDD (specifically CDMA2000) and TDD technologies. The 5.5-megahertz-wide, low-power channels in our adopted band plan can easily accommodate a 5-megahertz-wide channel with 0.5 MHz of spectrum for a guard band, thereby enhancing a channel's capacity when considering adjacent channel use. We believe that common minimum channel allocations among similar services will readily lend the LBS and UBS to current as well as future equipment technology standards, thereby substantially lowering the cost of deployment.

F1	2640.5	2646		UBS
F2	2646	2651.5		
F3	2651.5	2657		
H1	2657	2662.5		
H2	2662.5	2668		
H3	2668	2673.5		
G1	2673.5	2679		
G2	2679	2684.5		
G3	2684.5	2690		

38. Specifically, we adopt a three segment band plan, consisting of: the LBS, extending from 2496-2572 MHz, and comprised of twelve 5.5-megahertz-wide channels, one 6-megahertz-wide channel, and one 4-megahertz-wide guard band; the MBS, extending from 2572-2614 MHz, and comprised of seven 6-megahertz wide channels; and the UBS, extending from 2614-2690 MHz, and comprised of twelve 5.5-megahertz wide channels, one 6-megahertz-wide channel, and one 4-megahertz-wide guard band. MDS channel 1 will be relocated from 2150-2156 MHz to 2496-2502 MHz, the LBS, and MDS channel 2 will be relocated from 2156-2162 MHz to 2618-2624 MHz, the Upper Band Segment.

39. The plan we adopt today incorporates a number of key elements from the Coalition proposal that received broad support from commenters. Dividing the band into high and low-power segments resolves the problems created by the current interleaved configuration of the band which inhibits the development of low-power cellularized broadband uses of the band.[85] In addition to creating an environment for development of low-power systems, the plan reserves some spectrum for high-powered use for both EBS and rural licensees who have a continued need to deploy high-power systems. Like the Coalition proposal, the plan we adopt is also technologically neutral, affording licensees the flexibility to deploy either FDD or TDD technology anywhere in the 2.5 GHz band.

40. However, the band plan we adopt departs in some respects from the Coalition's proposed band plan. As noted above, we have expanded the overall bandwidth of the existing BRS-EBS band by reallocating 2495-2500 MHz to fixed and mobile except aeronautical mobile services. Moreover, the Commission band plan will make full use of the 4 megahertz of spectrum (I band) located at the end of the band at 2686-2690 MHz.[86] Finally, whereas the Coalition proposes to create 6-megahertz-wide guard bands in the low-power LBS and UBS (referred to as the J and K bands, respectively) the Commission's plan designates the J and K bands as 4-megahertz-wide bands. The use of 4-megahertz J and K bands is consistent with conclusions in the *3G Final Report* that 4 megahertz was sufficient to separate low-power and high-power uses.[87] Furthermore, reducing the guard band increases the amount of spectrum available for low-power and high-power use. As discussed below, these changes will accommodate the relocation of incumbents to new spectrum assignments in the band that will give them substantially greater flexibility than the current band plan, while also facilitating the relocation of MDS Channels 1 and 2.

[85] Although power restrictions in both the low-power segments (UBS and LBS) are identical, low-power, mobile operations at 2496-2572 MHz and 2614-2690 MHz will be protected through the transition plan and transmitting antenna height requirements.

[86] Presently, the response band is largely unused as there are only six licenses in this band in the entire U.S.

[87] *3G Final Report* at 49.

41. Adoption of the Coalition's proposed 16.5 megahertz-wide LBS and UBS blocks provides ample capacity for existing MDS and ITFS licensees to develop low-power broadband services of the type contemplated by the Coalition. These blocks will enable licensees to deploy any possible combination of the most current FDD and TDD standard channel sizes, which are based on channelizing in 5 megahertz increments.[88] Basing the LBS and UBS band plan on a minimum channel width of 5 megahertz is also consistent with our band plans for other wireless services such as broadband PCS and the 1710-1755/2110-2155 MHz AWS band, which utilize 5 megahertz multiples as the basis for their frequency blocks. In addition, the assignment of 5.5 megahertz-wide channels throughout the band promotes consistency between commercial wireless services and provides licensees the opportunity to take advantage of existing and future technologies thereby substantially lowering the cost of deployment. Furthermore, as discussed later in this text, the BRS/EBS technical rules we are adopting for the low-power bands are similar to those of both the PCS and AWS rules, thus making all three services similar.[89]

42. The LBS and UBS will also contain two smaller segments, the J and K bands, which will serve primarily as guard bands. The J band will be located between the LBS and MBS at 2568-2572 MHz, and the K band will be located between the MBS and UBS at 2614-2618 MHz. The new channel assignments will be assigned on a pro rata basis to existing licensees in the other channel groups.

43. Under the band plan we adopt in this order, a licensee that presently has four interleaved 6 megahertz channels and four associated 0.125 megahertz response channels will receive 16.5 megahertz of contiguous spectrum in either the LBS or UBS, a 6 megahertz channel in the MBS, and 1 megahertz of contiguous spectrum in either the J or K guard bands after the transition. A licensee presently assigned one channel in the band, will receive one 5.5 megahertz channel in either the LBS or UBS or one 6 megahertz channel in the MBS.[90] The provision of contiguous spectrum, combined with the deployment of compressed digital signals, will provide incumbents with the opportunity to maintain their current level of analog operations. At the same time, the relocation of MDS Channels 1 and 2 to the band will make these channels more useful as part of a contiguous broadband service band and may foster competition and new service options. These additional competitive opportunities will, in turn, promote the public interest. Incumbents will enjoy the benefit of spectrum with increased flexibility and utility while the public benefits from the likely innovation and cost savings that will result from increased competition.

44. The MBS portion of the band plan also addresses concerns of commenters who seek to continue providing high-power video services. The MBS will continue to be divided into 6 megahertz channels, consistent with the existing band plan. Through use of digital technology, this should provide ample capacity for most EBS incumbents to continue providing existing instructional programming if they wish to do so. In addition, to the extent that EBS incumbents must find funding for new equipment to make up for the loss of additional high-power channels, we note that under the transition plan we adopt today, EBS licensees' conversions will be fully funded.[91] Thus, this does not prohibit channel expansion at a later date. Although MDS licensees currently providing competitive video services in rural areas will

[88] FDD code division multiple access (CDMA) channel widths are currently 1.25 MHz, 3.75MHz and 5 MHz. TDD standard channel sizes are currently 5, 10 and 15 MHz.

[89] For discussion on technical rules *see* section IV.B, *infra*. For PCS and AWS technical rules and frequency assignments *see* 47 C.F.R. Parts 24 and 27 respectively.

[90] If a licensee currently has only the fourth channel in a group, they will receive one 6 megahertz channel.

[91] *See* discussion on Transition, see section IV.A.5, *infra*.

most likely have to alter their systems, they will be afforded ample opportunity to do so.[92] Hence, although the new band plan may result in some inconveniences, the long term benefits of the new band plan will ultimately benefit most licensees and the public. We also note that conversion of the band to provide for low-power operations will allow for more diversity in services that can be offered.[93]

45. Commenters, such as Grand Alliance, FWH, and Spectrum Market favor across-the-board power reductions in signal strength limits to resolve the issue of the incompatibility between high and low-power systems.[94] Grand Alliance states that uniform low-power operations are the most efficient way to use the spectrum, permitting the provision of new, advanced services in order to keep the United States at the forefront of technology development. Grand Alliance further states that "despite billions of dollars of investment, the existing high-power services have failed to establish any clear value."[95] FWH adds that this approach would be consistent with the approach the Commission has taken with respect to the other bands allocated for flexible use.[96] Similarly, Spectrum Market suggests that both public and private interest, short and long term, will be served if the Commission requires conversion of the entire MDS/ITFS band for low-power two-way services, and that it is essential for educators to transition ITFS use to broadband, interactive educational technologies.[97]

46. While we see merit to the arguments presented by commenters who support across-the-board power reductions, we are nonetheless persuaded by commenters such as IIT, IPWireless, BellSouth, OWTC and Teton Wireless Television (Teton), who convincingly argue that there remains a continued need for high-power operations in the band. Furthermore, commenters such as Teton convincingly argue that high-power operations allow use of spectrum in rural areas where low-power systems are not as effective. Teton and other rural MDS commenters have also expressed concern that the inability to engage in high-power operations will effectively shut down their operations. Moreover, we are concerned by comments presented by the Diocese of Brooklyn, the Archdiocese of New York and Region 10 who argue that an across-the-board reduction in power would jeopardize and disrupt the important services they offer via high-powered operations.[98] Similarly, MDS operators such as Digital TV One assert that commenters such as FWH do not take into account the spectrally efficient digital MDS/ITFS multi-channel video systems operated by entities such as itself and WATCH TV.[99] Likewise, Digital TV One criticizes Spectrum Market for not discussing how its suggestions will benefit customers who rely on

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[92] *Id.*

[93] The Coalition originally proposed placing Channel G4 next to the K band. It later proposed switching Channels E4 and G4 so that Channel E4, an MDS channel, would be located next to the K band. Coalition Ex Parte Presentation, June 3, 2004. We adopt this proposal because it prevents ITFS licensees from having to address interference issues that might arise if ITFS were located adjacent to a low-power band.

[94] Fixed Wireless Holdings (FWH) Comments at 6.

[95] Grand Alliance Comments at 6.

[96] FWH Comments at 6 (referencing Reallocation and Service Rules for the 698-746 MHz Spectrum Band (Television Channels 52-59), GN Docket No. 01-74, Report and Order, 17 FCC Rcd 1022, 1063-63 ¶ 102, 1068-69 ¶ 119, and 1069-70 ¶ 122 (2002) (*Lower 700 MHz R&O*)).

[97] Spectrum Market Reply Comments at 5, quoting SCETV Comments at 5.

[98] Diocese of Brooklyn Comments at 1-2; Archdiocese of New York Comments at 1.

[99] Digital TV One Reply Comments at 4.

Digital TV One and other MDS/ITFS operators as a source of multi-channel video programming.[100] Similar arguments have also been convincingly presented by Teton, which argues that those who advocate this approach have no regard to what these important services mean to rural families, and no appreciation for the technical reality of providing service in such rural areas, because a low-power cellular architecture is not financially feasible in rural markets.[101] We agree with Teton that the expenses involved in deploying multiple cell sites to serve sparse populations may make it impractical to continue most services offered over high-power systems.[102] Finally, we agree with BellSouth's assertions that the former regulatory regime, ill equipped to accommodate nationwide deployment of TDD and FDD technologies, is largely responsible for the slowed deployment of low-power systems.[103] For these reasons, we conclude that we should not adopt across-the-board power reductions in the band. We note that the question of whether high-power operations are still needed in this band can be reassessed in the future when low-power BRS/EBS systems provide substantial service over large areas.

47. We also reject NAF's proposal to reallocate 2500-2590 MHz to unlicensed use and leave 2590-2690 MHz for licensed use. NAF argues that creating a primary unlicensed band would offer an opportunity to expand on existing Wi-Fi technology and provide an incentive for others to develop new communications technologies.[104] The NAF proposal, however, would not leave sufficient room for viable high-power and low-power licensed operations. The record does not demonstrate that there is a need for the 2500-2590 MHz band to be designated for unlicensed use. We note that the Commission is considering authorizing unlicensed use in several other bands.[105] Indeed, we believe that authorizing licensed spectrum for wireless broadband access is a strong complement to our existing and proposed unlicensed allocations. The volume of comments we have received in this proceeding demonstrates that there is a strong interest in having licensed spectrum available for use in wireless broadband applications.

a. Response Channels

48. In 1991, we allocated the seven 125 kHz response channels (part of the R channels under the Coalition band plan) associated with MDS channels E3, E4, F3, F4, H1, H2, and H3 to the OFS.[106] The Coalition proposed to return these channels for MDS use.[107] In the *NPRM*, we stated that we believed the Coalition's proposal was meritorious because there are no OFS licensees currently on these channels,

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[100] Digital TV One Reply Comments at 4-5.

[101] Teton Wireless Television (Teton) Reply Comments at 5.

[102] Teton Reply Comments at 5.

[103] BellSouth Reply Comments at 12.

[104] NAF Comments at 4.

[105] *See* Unlicensed Operation in the TV Broadcast Bands; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band, (ET Docket Nos. 02-380, 04-186, *Notice of Proposed Rule Making*, FCC 04-113 (rel. May 25, 2004); In the Matter of Unlicensed Operation in the Band 3650 – 3700 MHz; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band; Amendment of the Commission's Rules With Regard to the 3650-3700 MHz Government Transfer Band; ET Docket Nos. 04-151, 02-380, 98-237, *Notice of Proposed Rulemaking*, FCC 04-100 (rel. Apr. 23, 2004) (*Unlicensed NPRM*).

[106] *1991 R&O*, 6 FCC Rcd at 6795.

[107] Coalition Proposal at 12, n.30.

[109] MMDS Licensee Coalition Comments at 8.

probably because they are too narrow to be usable by themselves. We sought comment on this proposal. We also sought comment on whether we should automatically give the channels to the geographic area licensee of the corresponding 6-megahertz main channel, or implement some other method of assignment such as licensing the channels on a geographic area basis and allowing any eligible entity to apply for these channels. Inasmuch as there were no objections to the Coalition's proposal, we conclude that we will return the 2686-2690 MHz response channel band to BRS/EBS use as described in the adopted band plan.

49. In the *NPRM*, we sought comment on the Coalition's recommendation that operation on the response channels be secondary to operation on the LBS, MBS, and UBS channels. The MMDS Licensee Coalition opposes this recommendation and states that response channels should receive equal status.[109] We believe affording 2686-2690 MHz spectrum secondary status to the LBS, MBS, and UBS is a moot issue at this point because we are adopting a band plan that absorbs the I band into the BRS/EBS spectrum in order to allow for 5.5-megahertz-wide channels as well as the reallocation of MDS 1 and 2 to the lower and upper bands. With proper planning, these types of operations should be able to operate adjacent channel to other operations and there is no justifiable reason to relegate licensed services in the 2686-2690 MHz spectrum to secondary status relative to the LBS, MBS and UBS operations. In a related matter, we believe that the recently revised footnote US269 in the Table of Frequency Allocations affords sufficient protection of the passive services in the 2690-2700 MHz band.[110] Thus, with proper coordination, operations on channel G3 will be reasonably possible while sufficiently protecting the 2690-2700 MHz band.

3. Border Regions

50. On June 25, 2002, the Commission and Industry Canada entered into an interim sharing arrangement concerning the use of the frequency bands 2150 – 2162 MHz and 2500 – 2690 MHz near the Canada/United States of America border.[111] That interim sharing arrangement replaced the General FCC/Industry Canada Understanding.[112] The interim sharing arrangement requires licensees to coordinate their operations with each other for their respective service areas on both sides of the border and does not apply to stations in the mobile service.[113] The current agreement with Mexico generally requires coordination of facilities within 80 km of the United States/Mexico border along with consideration of other technical criteria such as power flux density at the border and antenna polarization, and does not take into account the use of stations in the mobile service.[114]

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[110] *See* In the Matter of Amendment of Parts 2, 25, and 87 of the Commission's Rules to Implement Decisions from World Radiocommunication Conferences Concerning Frequency Bands Between 28 MHz and 36 GHz and to Otherwise Update the Rules in this Frequency Range, ET Docket No. 02-305, *Order*, 19 FCC Rcd 4653 ¶¶ 1-2 (2004) (*36 GHz Order*).

[111] 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 (dated Jun. 25, 2002) (Interim Sharing Arrangement).

[112] General FCC/Industry Canada Understanding Concerning the Coordination of the 2500-2686 MHz Band within 80 km (50 Miles) of the United States of America/Canada Border (dated December 5, 1997).

[113] Interim Sharing Arrangement, ¶ 22.

[114] Agreement between the Government of the United States of America and the Government of the United Mexican States Concerning the Assignment of Frequencies and Usage of the 2500-2686 MHz Band along the United States-(continued....)

51. We are in the process of reviewing our existing agreements with Canada and Mexico in order to ensure that we can fully implement the band plan and other provisions we have adopted today. To the extent necessary, we will engage in negotiations to effect appropriate revisions to those agreements with the Mexican and Canadian governments. Our principal goal of these discussions will be to allow full implementation of our new rules in the border regions and full utilization of the 2495-2690 MHz band in all three countries. Until revised border agreements are reached, however, BRS and EBS licenses in the border area will be conditioned on compliance with existing international agreements.

4. Geographic Area Licensing for Current Licensees

a. Adoption of Geographic Service Areas based on existing service areas

52. *Background.* Under current Commission rules, MDS auction winners are granted licenses for Basic Trading Areas (BTAs), but do not have the same flexibility to operate under those licenses as geographic licensees in other services. Under the current rules, a BTA authorization holder may not provide service within those portions of its BTA that encompass the PSA of incumbent stations and previously proposed MDS and ITFS facilities.[115] In addition, a BTA authorization holder must apply for an individual station license for each transmitter within its BTA.[116]

53. In the *NPRM*, we proposed the full implementation of geographic area licensing for MDS and ITFS licensees, noting that such licensing could increase the intensity and efficiency of use of this spectrum.[117] We noted that in other bands where we contemplated the development of mobile or other wide-area services, we concluded that geographic licensing based on predefined service areas has significant advantages over site-based licensing because of the greater operational flexibility it gives licensees and the greater ease of administration for consumers, licensees, and regulators.[118] We also noted that geographic area licensing reduces administrative burdens and operating costs by allowing licensees to modify, move, and add to their facilities within specified geographic areas without prior Commission approval. Our experience has been that such licensing affords licensees substantial flexibility to respond to market demand and may hence result in significant improvements in spectrum utilization. Based upon these observations, we sought comment on our proposal to implement geographic area licensing in the band, while protecting incumbent operations.

54. *Discussion.* We conclude that all BRS and EBS licensees will be licensed on a geographic area basis.[119] Accordingly, BRS and EBS authorization holders will be allowed to place transmitters anywhere within their defined service area without prior authorization so long as the licensee's operations

(Continued from previous page)
Mexico Border (dated Aug. 11, 1992, as amended by exchange of Diplomatic Notes dated October 1, 1998 and October 23, 1998).

[115] 47 C.F.R. § 21.924(c).

[116] 47 C.F.R. § 21.925(b).

[117] *See NPRM*, 18 FCC Rcd at 6756 ¶¶ 83-89.

[118] *See* 47 C.F.R § § 90.663 (800 MHz SMR), 101.525(a) (24 GHz), and 101.1009 (LMDS). *See also NPRM*, 18 FCC Rcd at 6756 ¶ 83.

[119] A geographic area licensing scheme will be implemented for all the band segments in the MDS and ITFS services, which includes the low-power LBS and UBS, as well as the high-power MBS.

comply with the applicable service rules, do not affect radio-frequency quiet zones, or require environmental review or international coordination. Implementing geographic area licensing will allow licensees to rapidly deploy and modify facilities within their geographic licensing areas to provide ubiquitous service without the regulatory burdens of notifying and securing Commission approval. Geographic area licensing for BRS and EBS will also have the benefit of eliminating inefficient, administratively burdensome site-by-site licensing rules, the transaction costs of which are too high to permit competitive businesses to flourish using next generation technology. As part and parcel of geographic area licensing, we also adopt our tentative conclusion, stated in the *NPRM*, that where an existing license is canceled or forfeited, the right to operate in that area automatically reverts to the licensee that holds the corresponding BTA license,[120] which is consistent with the approach we have taken in other wireless services.[121]

55. In addition, as proposed in the *NPRM*, we will require geographic area licensees to protect the operations of both EBS incumbents[122] and BRS site-based incumbents within the incumbent's GSA as defined by this order.[123] For incumbent BRS and EBS site-based licensees, the GSA will be based upon the licensee's current PSA as provided in Sections 21.902(d)[124] or 74.903(d)[125] of the Commission's rules. For BRS BTA authorization holders, the boundaries of the GSA will be exactly the same as the current PSA pursuant to Section 21.933(a).[126] Except with respect to situations where MDS and ITFS PSAs

[120] *See NPRM*, 18 FCC Rcd at 6756 ¶ 86.

[121] *See, e.g.*, In the Matter of Amendment of the Commission's Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz bands, ET Docket No. 95-183, *Report and Order and Second Notice of Proposed Rule Making*, 12 FCC Rcd 18600, 18637-8 ¶ 79 (1997) *(39 GHz R&O)*.

[122] *See* 47 C.F.R. §§ 74.903(d), 21.902(d). Beginning on September 15, 1995, the initial service boundaries were frozen, *i.e.*, the circular PSA boundaries were not to be changed regardless of whether the licensee subsequently moved its transmitter. *Id.* An ITFS licensee's PSA includes the area within a 35-mile radius of its transmitter site plus any reception sites beyond that radius that were registered with the Commission as of September 17, 1998.

[123] We note that MDS incumbents that obtained their licenses prior to our 1996 MDS BTA auction have 35-mile PSAs around their main stations. *See* 47 C.F.R. §§ 21.902(d), 21.933(a).

[124] Section 21.902(d) provides that (1) .... each MDS station licensee shall be protected from harmful electrical interference, as determined by the theoretical calculations, within a protected service area of which the boundary will be 56.3255 kilometers *(35 miles) from the transmitter site*. (2) As of September 15, 1995, the location of these protected service area boundaries shall become fixed. The center of the circular area shall be the geographic latitude and longitude of the transmitting antenna site specified in station authorizations or previously proposed applications filed at the Commission before September 15, 1995. Subsequent transmitter site changes will not change the location of the 56.3255 kilometers (35 mile) protected service area boundaries. 47 C.F.R. § 21.902(d) (emphasis added).

[125] Section 74.903(d) provides that each authorized or previously-proposed applicant, or licensee must be protected from harmful electrical interference at each of its receive sites registered previously as of September 17, 1998, and within a protected service area as defined at § 21.902(d) of this chapter and in accordance with the reference receive antenna characteristics specified at § 21.902. 47 C.F.R. § 74.903(d).

[126] Section 21.933(a) provides that stations licensed to the holder of a BTA authorization shall have a protected service area that is coterminous with the boundaries of that BTA, subject to the exclusion of the 56.33 km (35 mile) protected service area of incumbent MDS stations and of previously proposed and authorized ITFS facilities within that BTA, even if these protected service areas extend into adjacent BTAs. The protected service area also includes registered receive sites. 47 C.F.R. § 21.933(a).

overlap (discussed below), we did not receive many significant expressions of concern over interference resulting from this approach. Indeed, we note that many commenters such as BellSouth and SCETV support the implementation of geographic area licensing in the band.[127] Additionally, AHMLC and IMLC also support establishing the new GSAs by reference to the present transmitter location, reasoning that new filers and incumbents alike can make interference analyses by reference to present site data.[128] Moreover, Teton,[129] the Rural Commenters, and VCI[130] support the proposal to allow BTA holders to place transmitters anywhere within their service area without prior authorization so long as the operation complies with the applicable service rules, does not affect radiofrequency quiet zones or require environmental review or international coordination.[131] We agree with these commenters and will thus provide incumbents with a GSA based on their existing PSAs, subject to the exceptions discussed below.

56. In apparent misunderstanding of the geographic licensing proposal, Grand Wireless argues that expanding the current service areas for incumbent MDS and ITFS licensees to conform to the BTA system of geographical allocation intrudes upon the rights of successful MDS BTA authorization holders who obtained rights in the band through the auction process.[133] We disagree with Grand Wireless. Permitting BRS and EBS incumbents who were previously licensed using a site-by-site scheme to now use a geographic area licensing scheme which is based on the current PSA, neither extends an incumbent's service area nor impacts BTA authorization holders.

57. We note that the Coalition only advocates geographic area licensing for the low-power LBS and UBS and proposes to keep site-based licensing for high-power operations in the MBS.[134] The only justification that the Coalition offers for imposing site-based licensing requirements in the MBS channels is the "belief" that a site-based licensing requirement affords protection to site-based systems and that the protection is worth the costs of site-based licensing.[135] However, the Coalition fails to point to any unique feature of the MBS that would make geographic area licensing unworkable in that band. Furthermore, we conclude that adopting geographic area licensing would provide MBS operators with additional flexibility to coordinate spectrum usage, and allow operators to quickly adjust and react to market changes independently without Commission action. Accordingly, we adopt geographic area licensing for all operations in, and all segments of the band.

58. In light of our decision to institute geographic area licensing for BRS and EBS, we direct the Wireless Telecommunications Bureau to dismiss all pending applications to modify MDS or ITFS stations, except for modification applications that could change an applicant's PSA, or applications for facilities that would have to be separately applied for under the rules we adopt today. In light of the fact that we are initiating geographic area licensing immediately, we see no public interest in processing

[127] *See* BellSouth Comments at 10-13; SCETV Comments at 1, 6.

[128] *See* AHMLC Comments at 16; Independent MMDS Licensee Coalition (IMLC) Comments at 11-12.

[129] *See* Teton Comments at 15-16.

[130] *See* Rural Commenters Reply at 3.

[131] *See* Virginia Communications Comments at 2.

[133] *See* Grand Wireless Comments at 7.

[134] *See* Coalition Proposal at 19-22, 33-34.

[135] Coalition Proposal at 33-34.

modification applications that are no longer necessary. We note WCA's concern that the Commission should not freeze the processing of modification applications because of possible delays in instituting service, but we believe that WCA's concern, premised on the possibility of the rules we adopt today not becoming effective until early 2005, is misguided.[136] We will entertain requests for special temporary authority in instances where operators make the necessary showing and require authority to operate prior to the effective date of the new rules.

b. Splitting of Overlapping GSAs and Out of GSA Receive Sites

59. *Background.* In recent years, the rules defining protected areas have changed or otherwise been modified in a manner that has resulted in overlapping PSAs being assigned to co-channel incumbent BRS and EBS licensees.[137] The Coalition argues that these overlap areas result in a major operational barrier to anyone operating in these areas because none of the licensees with service areas that overlap can satisfy the interference protection criteria in the overlap area.[138] According to the Coalition, the MDS and ITFS industry developed an informal method for handling this problem by drawing a boundary line through a "football"-shaped area where the PSAs intersect, with each licensee agreeing to limit the interference it generates across the boundary.[139] The Coalition urged that if we adopted the proposal to base GSAs under the new rules on licensees' existing PSAs, we formally adopt this method of handling potential interference issues where GSAs would overlap. We sought comment on the Coalition's proposal.

60. *Discussion-- Receive sites within a PSA but outside a GSA.* We conclude that the Coalition's proposed "splitting the football" approach is the best compromise to remedying the difficulties associated with overlapping GSAs. This approach is supported by many commenters in the record. HITN supports geographic area licensing and bifurcation of overlapping areas between current incumbent PSAs in order to create new, discrete geographical service areas.[140] Likewise, IMWED argues that the region within overlapping PSAs has become a "no man's land" where neither licensee is able to secure authorizations without the other's consent and this creates a prescription for gridlock and spectrum inefficiency that is cured by the GSA concept.[141] The IMLC agrees that splitting the football is an appropriate way to handle overlapping PSAs, stating that there is a real value in establishing clearly who has the rights to operate in which territories. Both AHMLC and IMLC take the pragmatic view that splitting the difference, while not

[136] Coalition Ex Parte (filed Jun. 4, 2004).

[137] Effective September 15, 1995, the Commission expanded the PSAs of incumbent site-based MDS and ITFS licensees from fifteen miles to thirty-five miles. *See* Amendment of Parts 21, 43, 74, 78, and 94 of the Commission's Rules Governing Use of the Frequencies in the 2.1 and 2.5 GHz Bands Affecting: Private Operational-Fixed Microwave Service, Multipoint Distribution Service, Multichannel Multipoint Distribution Service, Instructional Television Fixed Service, & Cable Television Relay Service, *Second Report and Order*, Gen. Docket Nos. 90-54 and 80-113, 10 FCC Rcd 7074 (1995) (*1995 R&O*). In doing so, it created a number of overlaps between licensees whose PSAs had not overlapped before the standard PSA radius was increased.

[138] Coalition Proposal at 20-21.

[139] *See* Coalition Proposal Appendix C for a detailed explanation. This approach is commonly referred known as "splitting the football."

[140] Hispanic Information and Telecommunications Network, Inc. (HITN) Comments at 10.

[141] The ITFS/2.5 GHz Mobile Wireless Engineering & Development Alliance (IMWED) Comments at 18.

ideal, provides a rough-justice solution.[142] We concur.

61. Some commenters point out that adopting the Coalition's approach could result in some incumbent facilities in overlap areas being "marooned" without protection because they are on the wrong side of the dividing line. Region 10 asserts that many incumbent ITFS licensees, including itself, will have marooned receive sites. [143] The Rural Commenters and NTCA argue that both existing transmit and receive sites must be protected against harmful interference.[144] Similarly, Stanford and Northeastern believe that "splitting the football" does not necessarily take into account the service base that a station might have developed for its programming business.[145] Additionally, SCETV believes that while the Coalition approach could apply prospectively, existing receivers within the current PSAs that would not be protected under the new rules should be grandfathered to allow continued service by the original license holder.[146]

62. On balance, we conclude that reception sites that fall on the "wrong" side of the boundary as described above should not be protected. Generally, we have not protected sites outside established PSAs in other services where we have implemented geographic area licensing.[147] Moreover, mandating protection of these sites could be unduly disruptive to those licensees who have a GSA that encompasses an out-of-area receive site. Given the increasing use of low-power cellularized systems that will be serving a broader area, we believe that requiring protection of out-of-area receive sites will inhibit the development of broadband service and could make it more difficult for licensees to deploy systems. Nonetheless, we agree with IPWireless's suggestion that licensed facilities may continue to serve receive sites lying outside the GSA boundary as of the effective date of the rules on a secondary non-interference basis.[148] We further agree with AMHLC and IMLC that the Commission should also recognize voluntary agreements among parties to be protected in defining their GSAs.[149] Accordingly, we will allow marooned receive sites to be served on a secondary non-interference basis.

63. Furthermore, as explained above, we believe this is the best compromise to remedy the difficulties associated with overlapping GSAs and receive sites that fall outside a GSA. The Coalition argues that its proposal merely sustains the status quo with respect to the protection of receive sites either outside the GSA or caught on the wrong side of the chord when the football is split and the adoption of a rule that does not protect these sites will result in the loss of existing service to operators.[150]

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[142] *See* AMHLC Comments at 16; IMLC Comments at 11-12.

[143] *See* Education Service Center Region 10 (Region 10) Comments at iii, 3-4, 9.

[144] Rural Commenters Reply Comments at 4.

[145] *See* Joint Comments of Stanford and Northeastern Universities at 20.

[146] *See* SCETV Comments at 1, 6.

[147] Examples of services where service areas are defined exclusively on the basis of signal strength limits at geographic borders include the lower 700 MHz band (47 C.F.R. § 27.55(a)(2)), broadband PCS (47 C.F.R. § 24.236), Part 27 services in the 2305-2320 and 2345-2360 MHz bands (47 C.F.R. § 27.55(a)(1)), and Part 27 services in the 1390-1395 and 1432-1435 MHz bands (47 C.F.R. § 27.55(a)(3)).

[148] *See* IP Wireless Comments at 11.

[149] *See* AHMLC Comments at 16; IMLC Comments at 12.

[150] *See* Coalition Comments at 59-60.

64. To avoid future conflicts between licensees as to the actual location of the overlap area dividing line, Comspec recommends that the Commission either define the method to be utilized when calculating such boundaries, or provide a public database of the boundaries for all incumbent PSAs.[151] We conclude that neither approach is necessary. As noted above, the industry has informally resolved these boundary issues on its own for years without federal regulation. Indeed, as the Coalition explains, "the contemplated protections are merely a continuation of existing protection relationships between licensees [that] the MDS/ITFS industry has been living for two decades with rules requiring protection to both GSAs and to individual receive sites, and has done so without any of the confusion feared by the *NPRM*."[152] Comspec fails to explain why it is necessary for the Commission to micromanage this process when the record indicates that parties will continue to be able to resolve these issues on a voluntary basis.

65. We recognize that splitting the football is not a perfect solution. Rather, we agree with the Coalition that it is the best available alternative where parties are unable to reach voluntary agreements. Indeed, as noted above, we strongly encourage parties to work together on a voluntary basis and believe that such participation will ultimately result in receive site protection outside the GSA in many cases. In this regard, if incumbent licensees can reach agreements with operators on the other side of the chord, they will be permitted to provide service on the outside of their respective chords after the operating lines have been drawn. We strongly encourage such participation and are optimistic that the cooperation the MDS and ITFS industries have shared for years will persist and serve to facilitate amicable solutions to any potential difficulties.

66. *Discussion – Grandfathered receive sites outside a PSA.* Although the Coalition's states that "[t]here is no current ITFS receive site protection outside of the current PSA,"[153] we disagree. Under our current rules, all receive sites registered as of September 17, 1998 are entitled to interference protection, including registered receive sites located outside existing thirty-five mile PSAs.[154] Accordingly, we believe that we must address the issue of whether we will continue to grant interference protection to grandfathered receive sites located outside the PSA.

67. We conclude that we should not continue to provide interference protection to receive sites located outside the PSAs. As noted above, we believe that providing interference protection to receive sites outside the new GSAs could be unduly disruptive to those licensees who have a GSA that encompasses an out-of-area receive site and could hinder the deployment of new services. However, as with receive sites located inside the former PSA but outside the new GSA, we will allow continued service of such receive sites on a secondary, non-interference basis.

5. Transition to New Band Plan

a. Background

[151] *See* ComSpec Comments at 2.

[152] *See* Coalition Comments at 61.

[153] *See* Coalition Proposal at 59 n. 118.

[154] 47 C.F.R. § 74.903(d). We note that the Coalition asserts that there is no current ITFS receive site protection outside the PSA. *See* Coalition Proposal at 59 n. 118. The Coalition is incorrect. Although 47 C.F.R. § 74.903(a)(5) states that "[n]o receive site more than 35 miles from the transmitter shall be entitled to interference protection," this provision must be read in conjunction with the latter occurring provision in 47 C.F.R. § 74.903(d), which under certain instances allows receive site protection outside of the 35 mile PSA.

68. Generally, the Coalition recommends that we adopt a rather complex market-by-market four-phased transition approach. Although the Coalition's transition plan is described in detail in the *NPRM* of this proceeding, a brief overview of the Coalition's transition plan follows.[155] Under the Coalition's plan, the first phase of the transition involves identifying the parties that must participate in the transition.[156] To determine whether a licensee is a required party,[157] the proponent[158] seeks information by serving a "pre-transition data request" on licensees.[159] Under the second phase, planning the transition, the proponent starts the 90-day transition planning period by serving "transition notices" on licensees that are required to transition.[160] After serving the transition notice, the proponent must provide the required participants with a written plan for transitioning a given market no later than 30 days before the end of the transition planning period.[161] In response to the proponent's offer, the required participants may submit a counter proposal no later than 10 days before the end of the transition planning period.[162] Under the third phase, the proponent physically shifts educational ITFS programming tracks to spectrum in the MBS and outfits eligible ITFS receive sites with improved downconverters designed to limit the reception of signals from outside the MBS.[163] Under the fourth phase, licensees terminate existing operations in transitioned markets that do not comply with the new rules.[164] The Coalition's Plan further provides for dispute resolution procedures should the parties fail to agree on the terms of the transition.[165] In addition, the Coalition's plan contains nine safe harbors; if a proponent's offer falls into one of those nine safe harbors, it would be deemed "reasonable" in the event of a dispute between the proponent and a required participant.[166] The Coalition's plan also allows certain MVPD providers to "opt-out" of the transition.[167] Under the Coalition's plan the proponent would pay the costs for replacement downconverters for eligible ITFS receive sites, the relocation costs of ITFS licensees that wish to continue to operate downstream high-power, high-site educational video programming,[168] and the expenses of MVPD providers that elect

[155] *See NPRM,* 18 FCC Rcd at 6842-55, Appendix C.

[156] Coalition Proposal, Appendix B at 4, 12.

[157] Generally, under the Coalition's plan the following are required participants: (1) every licensee that has not previously been transitioned and that has a transition impact area (TIA) that overlaps the GSA in which the contemplated base station will be located; (2) every non-transitioned licensee with a TIA to which any of the contemplated facility's transmission antennas will have an unobstructed transmission path calculated assuming receive antenna heights of 9.1 meters above ground level employing a smooth earth with 413 earth curvature propagation model; and (3) every non-transitioned licensee with a GSA that overlaps the GSA of a licensee being transitioned pursuant to (1) or (2). *Id.* at 12-13.

[158] The Coalition's plan does not specify who is permitted to be a proponent.

[159] Coalition Proposal, Appendix B at 14-15.

[160] *Id.* at 16.

[161] *Id.* at 18.

[162] *Id.* at 20.

[163] *Id.* at 4.

[164] *Id.*

[165] *Id.* at 21.

[166] *Id.* at 21-27.

[167] *Id.* at 16-18.

[168] *Id.* at 4.

not to participate in the transition, but whose facilities must be modified to prevent interference to licensees that are transitioning.[169] MDS licensees pay their own costs of transitioning under the Coalition's plan.[170]

69. The Coalition's plan received both favorable and unfavorable comments. Commenters who favored the Coalition's transition plan stated that it would enable the transition to occur quickly,[171] permit multichannel video programming distributors to "opt-out" of the transition process,[172] fund the migration of ITFS licensees to the MBS,[173] and prevent "unscrupulous licensees from green mailing system operators."[174]

70. Commenters who opposed the Coalition's transition plan argue that the Coalition's transition plan would be too lengthy, too regulatory, and would invite litigation.[175] Moreover, they state that the Coalition's plan does not specify the requisite financial ability of the proponent and does not address what would happen if the proponent withdraws.[176] One commenter maintains that the Coalition's plan potentially puts in the hands of one entity the potential power to dictate to all other entities in a market how their operations must be structured.[177] One of the most significant issues, according to some commenters, is that the Coalition's transition plan would lead to "daisy chains."[178] In this connection, Spectrum Market indicates that it has performed a case study which analyzes all GSAs, the center coordinates of which are in the 28 BTAs in the Washington, D.C.-New York City Corridor. Spectrum Market's study finds, based on GSA overlap, that under the Coalition's transition plan, any proponent that desires to transition any GSA in this corridor will have to transition all of them.[179] This would be particularly difficult, Spectrum Market notes, because this corridor has a population of approximately 43 million people and 96 separate licensees with a total of 172 stations.[180] Spectrum Market asserts that its case study demonstrates that a proponent would be required to follow the Coalition's complicated procedure of obtaining information from each licensee concerning their respective facilities, developing and submitting a transition plan to all licensees, waiting, then responding to any objections, and if all objections are rectified, implementing the plan and paying the transition costs of all ITFS licensees.[181] Spectrum Market adds that if a proponent withdraws from the plan, the conversion process will be stalled. Other commenters agree with Spectrum Market. MMDS Licensees, an ad hoc coalition of MDS

[169] *Id.* at 18.

[170] *Id.* at 5.

[171] *See* Earthlink Comments at 8.

[172] *See* Teton Reply Comments at 4.

[173] Sprint Comments at 7.

[174] *Id.*

[175] *See* Grand Alliance Comments at 8; NAF Reply Comments at 30

[176] *See* Grand Alliance Comments at 9.

[177] *See* IMLC Comments at 13-14.

[178] *See* Grand Alliance Comments at 9.

[179] *See* Spectrum Market Comments at 5 and Appendix 1 at 5-8, Exhibits 3-13.

[180] *See* Spectrum Market Comments, Engineering Statement of Carl T. Jones, Jr., Appendix 1, Exhibit 2.

[181] Spectrum Market Comments at 6.

licensees, views the Coalition's transition plan as requiring complex reimbursement schemes, 150-mile daisy chains and other complications resulting from the voluntary market-by-market approach.[182] They assert that the net result of adopting the Coalition Plan would be to delay the transition rather than to expedite it because the parties would be embroiled in constant bickering over the terms of transition and who should be responsible for what costs.[183]

71. Other commenters supported other options mentioned in the *NPRM*. For instance, several commenters supported the adoption of a three-phase transition plan, which involves a voluntary negotiation period, a mandatory negotiation period, and a mandatory relocation.[184] IP Wireless supports either the three-phase transition plan or mandatory negotiation with a two-year deadline to complete the transition.[185] IMLC recommended that the transition plan should be based on the top 30-markets, with a deadline imposed.[186] Intel stressed the need for the transition process to be predictable to create an attractive environment for innovation and investment, thus offsetting the long lead times that are needed for research and development of new technologies.[187]

b. Discussion

72. We adopt the Transition Plan, detailed below, which we believe will enable us to achieve our goal of transitioning the band quickly and will be fair and equitable to all parties concerned. In this regard, we emphasize that under the plan we adopt today, EBS licensees will receive spectrum in the new band plan that is comparable to the spectrum they currently hold in terms of throughput and therefore we believe that they will not be negatively affected by reduced capacity. Moreover, we further emphasize that licensees that have four interleaved 6-MHz channels and four interleaved 125 kHz "I" channels will, under the new band plan, receive 16.5 MHz of contiguous spectrum in either the LBS or UBS, a 6-MHz channel in the MBS, and 1 MHz of contiguous spectrum in either the "J" or "K" bands. Thus, for instance, a licensee on the interleaved "A" group channels will receive 16.5 MHz of spectrum from 2502 to 2518.5 in the LBS and a 6-MHz channel in the MBS, whereas a licensee on the interleaved "E" group channels will receive 16.5 MHz of contiguous spectrum from 2624 to 2640.5 MHz in the UBS and a 6-MHz channel in the MBS. We further note that the new band plan provides space for MDS 1 and MDS 2 licensees, thus co-locating all MDS licensees. The spectrum assignments for the remaining channels are detailed above.[188] We recognize that during the transition process, in addition to being relocated from their current channel locations to their new spectrum blocks, licensees may, for a variety of reasons, wish to transfer, assign, partition, disaggregate, or lease their spectrum to meet the needs of their customers and/or to facilitate the transition of a particular Major Economic Area (MEA).[189] In the *FNPRM* attached

[182] MMDS Licensee Coalition ("MMDS Licensees") Comments, filed November 14, 2002, at 3.

[183] *Id.*

[184] *See* Rural Commenters Comments at 4.

[185] IP Wireless Comments at 12.

[186] IMLC Comments at 16.

[187] Intel Comments at 7.

[188] *See* paras. 37-44, *supra*.

[189] There are fifty-two MEAs, which are comprised of one or more Economic Areas. Additionally, there are three EA-like areas: Guam and Northern Mariana Islands; Puerto Rico and the U.S. Virgin Islands; and American Samoa. *See* 47 C.F.R. § 27.6(a)

to this *Report and Order*, we seek comment on ways to streamline our administrative processes to further facilitate the transition of the 2.5 GHz band in an effective and efficient manner. Also in connection with the transition, we emphasize that there is a relationship between the transition, the new band plan, and the technical rules for EBS and BRS licensees. Generally, the LBS and the UBS will be used for low-power cellularized services whereas the MBS will be used for high-powered services. The rules provide, however, that licensees may offer low-power service in the MBS and high-power service in the LBS and UBS if the licensee can reach an agreement with neighboring licensees. For instance, in a particular market where an MVPD provider uses the entire BRS/EBS spectrum, it may seek consent agreements with licensees in neighboring Major Economic Areas (MEAs) to continue their high-powered operation in the LBS and UBS. Similarly, the rules allow low-power operations in the MBS if the licensee can reach an agreement with other licensees concerning interference from high-powered operations. Thus, the rules we adopt today permit licensees the flexibility to meet the demands of a particular market. The Transition Plan we adopt also requires the proponent to ensure that incumbents occupying the spectrum designated for MDS 1 and 2 in the 2.5 GHz band be relocated to provide space for MDS 1 and 2 licensees in the 2.5 GHz band. Lastly, the Transition Plan provides for the replacement of comparable facilities for EBS licensees.

73. In light of the comments that the Coalition's plan would be too lengthy, too regulatory, and would invite litigation if adopted,[190] we adopt the Transition Plan that we believe, retains the essential framework of the Coalition's proposal and provides flexibility to both the proponent and incumbent licensee. Ultimately, we conclude that the Transition Plan we adopt is in the public interest because it will create an attractive environment for innovation and investment in the 2496-2690 MHz band. We also believe that the transition represents an efficient means of managing the transition and managing the spectrum.

74. The Transition Plan we adopt has five phases, as follows: (1) initiating the transition process by filing a Initiation Plan with the Commission; (2) planning the transition; (3) reimbursing the costs of the transition; (4) terminating existing operations in transitioned markets; and (5) filing the post-transition notification. In the first phase, initiating the transition, a proponent, through a pre-transition data request, gathers information from BRS and EBS licensees in a given MEA, which the proponent uses to draft a Transition Plan. Under the first phase, a proponent initiates a transition by filing specified information in a document called an Initiation Plan with the Commission. Also during the first phase, a proponent notifies the BRS and EBS licensees in the MEA that the proponent will initiate a transition. During the second phase, planning the transition, the proponent sends each BRS and EBS licensee a proposal, called the Transition Plan, which not only identifies all of the licensees that will be transitioned and explains the details of the transition, but also marks the start of the phase of the transition where the proponent and the individual licensees negotiate over the details of the transition. Because disputes may arise during this phase, we have adopted two safe harbors in which we indicate that we believe that the proponent's offer is reasonable. After the proponent has reached an agreement with individual licensees, the third phase begins. During this phase, the proponent physically shifts the EBS programming tracks to new channels and outfits eligible EBS reception sites with improved downconverters. During the fourth phase, the licensees cease their current service offerings. During the fifth phase, the proponent and affected BRS and EBS licensees file a notification with the Commission that the transition has been completed. These phases are further discussed in detail below. We note that licensees may continue to operate under the current rules until the transition occurs.

75. *Exclusions.* Before addressing the particulars of our Transition Plan, however, we note that

[190] *See* n.175, *supra*.

we have concluded not to adopt the Coalition's recommendation to allow certain licensees to "opt-out" of the transition.[191] Under the Coalition's Plan, an MVPD licensee is permitted to "opt-out" of the transition if it certifies within 30 days of the effective date of the rules that it or its affiliate is a multichannel video programming distributor ("MVPD") as defined in Section 522 of the Act and, as of the date of its certification, it provides MVPD service to five percent or more of the households within its GSA, and must certify again at the start of the transition that it still provides service to five percent or more of the households within its GSA. The Coalition's plan also allows any MDS or ITFS licensee that is collocated with any qualified MVPD licensee that elects to opt-out may also opt-out the transition.

76. While we note the successful deployment of MVPD service by licensees such as W.A.T.C.H. T.V.[192]and Sioux Valley Wireless,[193] we believe that adopting the Coalition's proposal to allow MVPD licensees that meet the requirements detailed above to "opt-out" of the transition needlessly complicates the transition process and is unnecessary to protect MVPD licensees, especially those that are currently using the entire BRS/EBS spectrum. We are particularly concerned, moreover, that the adoption of a blanket "opt-out" for high-powered MVPD licensees may result in interference to licensees in neighboring population centers, which would prevent these neighboring locales from receiving wireless broadband services under the rules adopted today. Moreover, we believe that existing MVPD providers could be accommodated under the Transition Plan we have adopted today. An MVPD provider would be free to be a proponent in its MEA. To the extent an MVPD provider was only interested in transitioning a portion of an MEA, it could become a joint proponent with other entities that were interested in transitioning other portions of the MEA.

77. Notwithstanding our decision not to adopt the Coalition's proposed opt-out for MVPD providers, we are sympathetic to the predicament of those MVPD licensees that developed successful businesses under the old rules, and to their customers that receive both video and broadband services from those MVPD licensees. We are also sympathetic to those BRS licensees that have a viable business for high-powered operations, but who need more that seven digitized MBS channels to deliver service to their customers, which would constitute all of the high-power spectrum in the 2.5 GHz band. Therefore, we find that it is in the public interest to consider waivers on a case-by-case basis for those operators or their affiliates that meet the definition of a multichannel video programming distributor as defined in Section 522 of the Communications Act of 1934, as amended and that provide MVPD service to five percent or more of the households within their respective GSAs, the calculation made in accordance with the requirements Section 76.905(c) of the Commission's Rules.[194] We further find that it is in the public interest to consider waivers for any BRS or EBS licensee that is co-located with any qualified MVPD licensee that elects to opt-out may also opt-out the transition. We further find that it is in the public interest to consider waivers for those BRS licensees that have a viable business for high-powered operations, but who need more than seven digitized high-powered MBS channels to deliver their service to

[191] *See* Coalition Proposal, Appendix B at 17-18.

[192] WATCH T.V. Company (WATCH TV) provides over 200 channels of digital video and audio service to over 13,000 subscribers by using and reusing every megahertz available to it in the 2150-2162 MHz band and in the 2500-2690 MHz band in Lima, Ohio. WATCH T.V. Company *Ex Parte*, filed June 1, 2004 at 1.

[193] Sioux Valley Wireless uses 33 MDS and ITFS channels in the Sioux Falls, South Dakota Basic Trading Area to deliver a combination of video and broadband wireless internet services to over 6000 mostly rural subscribers. Sioux Valley Wireless, *Ex Parte*, filed June 1, 2004.

[194] 47 CFR § 76.905(c).

their customers. In reviewing requests to waive the rules adopted today, we will consider the actions taken by MVPD or BRS licensees to minimize the affect of interference on neighboring markets, as well as the licensee's explanation as to why it cannot work within the transition rules we have adopted. Waivers will be granted if it is shown that: (i) the underlying purpose of the rules(s) would not be served or would be frustrated by application to the instant case, and that a grant of the requested waiver would be in the public interest; or (ii) in view of the unique or unusual factual circumstances of the instant case, application of the rule(s) would be inequitable, unduly burdensome or contrary to the public interest, or the applicant has no reasonable alternative.[195]

(i) Initiating the Transition Process

78. Under the rules we adopt today, the first phase of the transition consists of initiating the transition process. This phase begins on the effective date of the rules adopted in this *Report and Order* and lasts for a maximum of three years. During this three-year period, a proponent or multiple proponents, BRS or EBS licensees or EBS lessees, initiate a transition by filing an Initiation Plan with the Commission. Furthermore, the proponent or multiple proponents must transition the 2.5 GHz band by MEA. During this phase of the transition and before filing the Initiation Plan with the Commission, the proponent or multiple proponents must send a pre-transition data request and a transition notice to all affected licensees in a given MEA. We emphasize that the three-year deadline is a maximum deadline and that a proponent or joint proponents may shorten the duration of this phase of the transition process. These requirements are explained in more detail below.

79. As mentioned above, a transition is initiated by a proponent, which will generally be either a current BRS or EBS licensee or EBS lessee. To enable the 2500-2690 MHz band to be transitioned in an efficient manner and to give flexibility to proponents, however, we have concluded to permit more than one proponent to initiate a transition in a given MEA. Moreover, when a BTA-holder is a proponent and the BTA is in more than one MEA, the BTA-holder may elect to be the proponent of only one MEA or may elect to transition two or more MEAs that overlap the proponent's BTA.

80. We stress that more than one proponent may transition a particular MEA. Thus we do not believe that our decision to transition by MEA would be burdensome to proponents. On the contrary, we believe our decision strikes a balance between the goals of a proponent to transition by GSA or Transition Impact Area (TIA) (defined as a station's GSA, plus in the case of ITFS licensees, the specific location of ITFS reception sites that are certified as eligible to receive a new downconverter under the transition rules)[196] and our goals to ensure the efficient utilization of spectrum and the development of new and innovative wireless services throughout the United States. Moreover, we believe that our decision to allow multiple proponents to transition a given MEA promotes flexibility by allowing proponents to team up to transition a given MEA. We note that BRS and EBS licensees and EBS lessees have several options. Under the first option, they can become a proponent and take primary control of transitioning the MEA. Under the second option, they can become a proponent and seek other proponents to assist in transitioning a particular MEA, which will reduce costs to each individual proponent. Under the second option, the multiple proponents must agree on how they will transition a particular MEA and this agreement must occur before the proponents file the Initiation Plan with the Commission. Multiple proponents may divide the MEA in any manner that suits their needs. At the end of the transition, however, the entire MEA must be transitioned to the new band plan or consents received from

[195] 47 C.F.R. § 1.925(b)(3).

[196] *See* Coalition Proposal, Appendix B at 12-13 n.34.

neighboring licensees. Under the third option, the BRS or EBS licensee or EBS lessee may wait for another licensee to step forward as the proponent. A licensee that selects the third option would wait to receive the Transition Plan from the proponent and then either accept the Transition Plan or make a counteroffer.

81. Licensees operating in MEAs for which an Initiation Plan has not been filed with the Commission within three years, may continue to operate until they are transitioned by another method determined as a result of the *FNPRM* attached to this *R&O*. In markets where no transition plan is filed, we will not require licensees to cease existing operations until at least eighteen months after the deadline for proponents to file initiation plans. Under any alternative transition scenario we adopt, we contemplate that it would take most or all of the 18-month period to institute the transition mechanism we adopt, conduct any necessary auctions, and have any new licensee ready to offer service. We believe that establishing this date will provide a measure of certainty to licensees and allow licensees to plan for the future. Beyond that date, licensees will know that they face the possibility of having to discontinue operations.

82. We believe that transitioning the band by MEA, instead of by market area, will enable a proponent or proponents to transition large areas of the country at once, which will ensure that the 2500-2690 MHz band is transitioned quickly and will enable the provision of new and innovative services for all Americans, including those in rural areas. We therefore decline to adopt the first phase of the Coalition's plan, which they called "identifying the parties to the transition process." We believe that the adoption of the first phase of the Coalition's plan where a single proponent would transition an area based on a station's GSA and/or TIA, would result in a haphazard transition on a nationwide basis. Under the Coalition's plan, which does not propose a time frame for initiating a transition, some areas of the country might not be transitioned for many years. We conclude that transitioning the band by MEA instead of on a market-by-market basis selected by the proponent will result in a quicker and more even transition of the band throughout the nation and enable the development of new and innovative wireless services. We further conclude that transitioning the band by MEA will lead to the development of a rational market for spectrum in the 2500-2690 MHz band, thus allowing prospective licensees and lessees to develop a predictable business strategy. We note that there are fifty-two MEAs, which are comprised of one or more Economic Areas. Additionally, there are three EA-like areas: Guam and Northern Mariana Islands; Puerto Rico and the U.S. Virgin Islands; and American Samoa, which will also be transitioned to the band plan. We further note that we incorporated the docket of an ongoing Commission proceeding regarding possible BRS and EBS service in the Gulf of Mexico.[197] At this time, we have concluded to defer any consideration of transitioning the MEA associated with the Gulf of Mexico, because we are seeking comment on a variety of issues concerning the Gulf of Mexico service area in the *Further Notice of Proposed Rulemaking* attached to the *Report and Order*.

83. Thus, in light of the record on this point, and in conjunction with our decisions to transition the 2500-2690 MHz band by MEA and to allow more than one proponent to transition a given MEA, we further conclude to require a proponent(s) to initiate a transition within three years of the effective date the rules adopted in the *Report and Order*. We believe that three years is an adequate amount of time to distribute a pre-transition data request and a transition notice and to determine whether to transition a

[197] Amendment of Parts 21 and 74 of the Commission's Rules With Regard to Licensing in the Multipoint Distribution Service and in the Instructional Television Fixed Service for the Gulf of Mexico, WT Docket No. 02-68, *Notice of Proposed Rulemaking*, 17 FCC Rcd 8446 (2002) (*Gulf Notice* or *Gulf of Mexico MDS NPRM* or *Gulf NPRM*). That proceeding was incorporated alongside the *NPRM* in this proceeding. *NPRM*, 18 FCC Rcd at 6759 ¶ 91.

particular MEA. Although we believe that three years is ample time for a proponent(s) to initiate a transition, we believe that a transition will not be initiated for all MEAs within this time frame. Consequently, if a transition is not initiated within three years of the effective date of the rules, we conclude that we will use another method of transitioning an MEA. We note that we are seeking comment on alternative methods in the *NPRM* attached to this *Report and Order* for transitioning these MEA(s).

84. *The Pre-Transition Data Request.* To assist potential proponents in assessing whether to transition an MEA, and in light of the fact that all of the necessary information is not publicly available in the Commission's records, we believe that it is necessary for licensees within an MEA to provide certain information to a potential proponent(s). In this connection, we conclude that prior to commencing a transition, a potential proponent(s) of a given MEA may request information from EBS and BRS licensees. Before requesting this information from BRS and EBS licensees, the proponent(s) must provide the following information to the recipients of the Pre-Transition Data Request: the proponent(s)'s full name, postal mailing address, contact person, e-mail address, and phone and fax number. A recipient of a Pre-Transition Data Request must provide the following information to the potential proponent(s): (1) a listing that identifies the location (by street address and geographic coordinates) of every constructed EBS receive site that, as of the date of receipt of the Pre-Transition Data Request is entitled to a replacement downconverter upon transition (see discussion of eligibility for a replacement downconverter below); (2) whether the downconverter is mounted on a structure attached to the building or on a free-standing structure; (3) the approximate height above ground level of the downconverter; (4) the adjacent channel D/U ratio that can be tolerated by any receiver(s) at the receive site, if known; and (5) the number of EBS video programming or data transmission tracks the EBS licensee is entitled to receive in the MBS and whether the EBS licensee will accept fewer tracks in the MBS. A proponent(s) must file an Initiation Plan after it has assessed the information in the pre-transition data request and decides to transition an MEA.

85. *The Transition Notice.* The next step in the transition for a given MEA occurs when the proponent(s) serves Transition Notices to all BRS/EBS licensees within a given MEA. Accordingly, the proponent(s) must serve Transition Notices on EBS licensees before the proponent files the Initiation Plan with the Commission. The proponent(s) must include in the Transition Notice, the proponent(s)'s full name, postal mailing address, contact person, e-mail address, and phone and fax numbers, identify the other BRS/EBS licensees that will be transitioned, and provide copies of the most recent response to a Pre-Transition Data Request for each participant in the process. The Transition Notice must contain a certification by the proponent(s) to the recipient and to the Commission that it has the funds available to pay the reasonably expected costs of the transition based on the information contained in the Pre-Transition Data Request responses. These requirements are consistent with the Coalition's recommendations and we believe are necessary to ensure the orderly and rapid transition of the 2500-2690 MHz band in a given MEA.

86. *Initiation Plan.* To determine when a transition has been initiated and to determine if it has been initiated within three years of the effective date of the rules, we have concluded to require a proponent(s) to file an Initiation Plan with the Commission. An Initiation Plan consists of the following information. First, the proponent(s) must identify the MEA or MEAs that will be transitioned. Second, the proponent(s) must identify, by call sign, all of the BRS and EBS licensees that are being transitioned. Third, the proponent(s) must have concluded an engineering analysis on transitioning all BRS and EBS licensees in a given MEA. Fourth, the proponent(s) must indicate when the transition will be completed. Fifth, if the engineering analysis indicates that licensees in an adjoining or adjacent MEA must be transitioned to avoid interference with licensees being transitioned, the proponent(s) must indicate that an agreement with the proponent(s) of the adjoining or adjacent MEA has been reached on transitioning those licensees. Instead of reaching an agreement with the proponent(s) of the adjacent or adjoining MEA, the proponent(s) may indicate an alternative means of transitioning these licensees in the adjoining

or adjacent MEA.[198] Sixth, when there are two or more proponents that are transitioning the same MEA, the proponent(s) must indicate that they have reached an agreement on how a given MEA will be transitioned. Seventh, the proponent(s) must certify that it has the funds to pay the reasonably expected costs of the transition based on the information contained in the Pre-Transition Data Request (see below for a discussion of the Pre-Transition Data Request). Eighth, the proponent(s) must indicate that it has sent Transition Notices to all of the BRS and EBS licensees in the MEA (See discussion below or Transition Notices.) Once all of this information is filed, the proponent(s) or proponents have initiated a transition in a given MEA on the date the information is filed with the Commission.

87. As mentioned above, the Initiation Plan must be filed with the Commission within three years of the effective date of the *Report and Order*. A proponent or proponents may withdraw from the Initiation Plan by formally informing all of the BRS and EBS licensees that were included in the Initiation Plan that the proponent(s) will no longer transition the MEA, and by amending the Initiation Plan filed with the Commission. A proponent(s) that decides to withdraw an Initiation Plan may not then seek to transition that MEA at a future time. Should a proponent(s) withdraw from the Initiation Plan and there is no other proponent(s) to take its place or no proponent(s) seeks to transition a given MEA within the three-year initiation period, the Commission may use another method to transition a given MEA. In the *Further Notice of Proposed Rulemaking* attached to this *Report and Order*, the Commission seeks comment on other methods to transition a given MEA.

(ii) The Transition Plan

88. *The Transition Plan.* The Transition Planning Period is the ninety-day period that commences on the day after the proponent(s) files the Initiation Plan with the Commission. No later than thirty days prior to the conclusion of the Transition Planning Period, the proponent(s) must provide a Transition Plan to all the licensees in a given MEA. The Transition Plan must identify the call signs of the stations that will transition to the new band plan, the specific channels that each will receive following the transition,[199] the receive sites at which replacement downconverters will be installed, the video programming and data transmission tracks that will be migrated to the MBS, the technical configuration of the MBS facilities, and the approximate time line for effectuating the transition and ceasing operations pursuant to the current band plan. The Transition Plan must include plans for relocating the EBS and BRS incumbents from spectrum that has been redesignated for MDS 1 and 2 under the rules adopted today. We note that the Transition Plan may provide for interruptions of EBS transmissions, so long as those interruptions are limited to a period of less than seven days at any reception site and that the proponent must coordinate with each EBS licensee to minimize the extent of any disruption. The timeline for completing the transition may not exceed 18 months from the conclusion of the Transition Planning Period or, in the event that the transition is delayed pending dispute resolution, the resolution of any dispute. The Transition Plan must also provide for the establishment of an escrow or other appropriate mechanism for ensuring completion of the transition in accordance with the Transition Plan. These requirements are generally consistent with the recommendations of the Coalition and will enable the parties to the transition be to fully informed of the overall effect of the transition on their operations and on the operations of their neighbors.

[198] In those instances where there is no proponent in an adjoining MEA, and operations in that adjoining MEA would cause interference in the proponent's MEA, the proponent must also transition the interfering facilities in the adjoining MEA to resolve the interference problem.

[199] Under § 27.5(i)(2) of the rules we adopt today, we identify post-transition frequency assignments for licensees.

89. *Counterproposals to the Transition Plan.* No later than ten days before the conclusion of the Transition Planning Period, affected licensees may submit a counterproposal to the proponent(s) if they believe that the Transition Plan is unreasonable. If a timely filed counterproposal is received, the proponent(s) may accept the counterproposal and modify the Transition Plan accordingly or invoke dispute resolution procedures for a determination of whether the Transition Plan is reasonable. We note that the proponent would have two options should it decide to seek dispute resolution. First, the proponent(s) could take no action to transition the MEA until the dispute is resolved. Second, the proponent(s) could continue to transition the MEA while it awaits the results of the dispute resolution process. If a proponent(s) modifies a Transition Plan based on the counterproposal of a BRS or EBS licensee, the proponent(s) must send the modified Transition Plan to all affected BRS and EBS licensees in the MEA. In this connection, we encourage the use of Alternative Dispute Resolution procedures to resolve disputes that may arise in an equitable and fair manner. While we expect that parties will be able to work out disputes amongst themselves, we reserve the right to determine whether transition plans comply with our rules.

90. *Safe harbors.* To establish an orderly and quick transition of the 2500-2690 MHz band, we adopt two safe harbors. If a proponent(s)'s offer falls under either of these safe harbors it shall be deemed reasonable in the event of a dispute. We decline, however, to adopt all nine safe harbors[200] that were recommended by the Coalition. Several of the proposed safe harbors proposed by the Coalition are designed to meet the conditions of specific markets. Because these safe harbors would not be generally applicable throughout the nation, we conclude that they are inappropriate to be included in our rules. We have limited the adoption of safe harbors to those that we believe are of general applicability, which are the Coalition's safe harbors numbers 1 and 2. Rather than adopt safe harbors numbers 6 and 7, we have incorporated the key principle of these safe harbors into the Transition Plan (see Transition Plan discussion above) and subject to negotiation between the proponent(s) and the licensees being transitioned. We, however, do not adopt, whether explicitly or implicitly, the Coalition plan's safe harbors numbers 3, 4, 5, 8, and 9, because they are not of general applicability.

91. *Safe Harbor # 1.* This safe harbor may apply when the default high-power channel assigned each channel group is authorized to operate after the transition with the same transmission parameters (coordinates, antenna pattern, height of center of radiation, EIRP, etc.) as the current downstream facilities authorized for the channel group. We agree with the Coalition that there may be situations that arise where minor changes to the operating parameters are necessary to accomplish the transition. Thus a neighboring co-channel or adjacent channel licensee may not object to any change from the default configuration if: (1) the change is not a major modification; or (2) the change is a major modification and the Transition Plan calls for the appropriate application for Commission consent to be filed, for it to be processed in accordance with the procedures assuring public notice and an opportunity to object, and for it to be granted prior to implementation. The EBS licensee being migrated may not object to a Transition Plan that proposes affording the EBS licensee with post-transition operating equipment that is as good as or better than that used before the transition. Provided that the proponent(s) is not proposing a change in the geographic coordinates of the facilities (other than as necessary to conform the actual location with the Commission's Antenna Survey Branch database) and provided further that the minimum D/U benchmarks discussed above will be achieved, the proponent(s) may in the Transition Plan propose:

- An increase in the height of the center of radiation of the transmission antenna or a decrease in such height of no more than 8 meters (provided that such change does not result in an increase in antenna support structure lease costs to the EBS licensee and the

[200] *See* Coalition's Proposal, Appendix B at 21-27, for a description of the Coalition's nine safe harbors.

consent of the owner of the antenna support structure is obtained).

- A change in the EIRP of the transmission system of up to 1.5 dB in any direction.
- Digitization, precision frequency offset, or other upgrades to the EBS transmission or reception systems that allow the proponent(s) to invoke more advantageous interference protection requirements applicable to upgraded systems.[201]

92. *Safe Harbor # 2.* This safe harbor may apply when an EBS licensee has channel-shifted its single video programming or data transmission track to spectrum licensed to another licensee. Under the transition rules, that track must be on the high-power channel licensed to the EBS licensee upon completion of the transition. For example, the A Group licensee might have shifted its EBS video programming to channel C1. If one of the A Group channels is currently licensed with technical parameters substantially similar to those of channel C1, we should allow a Transition Plan to call for high-power channel A4 to be licensed with the same technical parameters as current channel C1. However, if the current A Group channels are licensed to operate with technical parameters materially different from those of channel C1, the proponent(s) has two options. First, it may arrange a channel swap with the licensee of the C Group so that the A Group licensee will receive high-power channel C4 (which will automatically be licensed with the same transmission parameters as current channel C1) in exchange for channel A4. Second, the proponent(s) may arrange for high-power channel A4 to operate with transmission parameters substantially similar to those of current channel C1 (see Safe Harbor # 1).[202]

(iii) Reimbursement Costs of Transitioning

93. Although several commenters recommend that both MDS and EBS incumbents should pay their own transition costs, we conclude that given the difficulties EBS licensees face in obtaining funding to transition their services, it is in the public interest for a proponent(s) to pay the costs of transitioning EBS licensees and providing comparable facilities.[203] Thus, we agree with the Coalition that the proponent(s) must bear the costs of protecting EBS licensees that choose to continue to operate high-power high-site downstream video and data distribution systems against interference from LBS and UBS cellularized operations. In this connection, we note that there are two responsibilities toward these licensees, which are discussed below. We further conclude that BRS licensees must bear their own expenses in transitioning to the new band plan and complying with the new rules. We disagree with the Coalition, however, that the proponent(s) should pay the costs to modify the facilities of MVPD providers that opt-out[204] because we have not adopted the Coalition's proposal to allow MVPD providers to opt-out of the transition.

(a) Replacement Downconverters for former ITFS licensees

94. To protect against interference from cellularized services in the LBS and UBS, the

[201] Coalition Proposal, Appendix B at 21-22.

[202] *Id.*, Appendix B at 22-23.

[203] *See* IP Wireless Comments at 12.

[204] Under the Coalition's Plan the proponent pays for the costs to modify the facilities of MVPD providers that elect not to transition if a modification is necessary to protect other licensees that are transitioning. *See* Coalition's Proposal, Appendix B at 18.

proponent(s) must install at every eligible EBS receive site a downconverter designed to minimize the reception signals from outside the MBS. As part of the transition process, a proponent(s) must replace an EBS receive site if (1) a reception system was installed at that site on or before the date the EBS licensee receives its Pre-Transition Data Request (see discussion above); (2) the reception system was installed by or at the direction of the EBS licensee; and (3) that reception system is either actually used to receive EBS programming that comports with former Section 74.931(a)(1) of the Rules or is located at a cable television system headend and the cable system relays such EBS programming. Only EBS receive sites within the licensee's thirty-five mile radius PSA circle are eligible to receive replacement downconverters. The details of the replacement of the downconverters will occur during the Transition Planning Period, which is discussed above.

95. The replacement downconverters must satisfy the following minimum technical characteristics:

- The downconverter's input frequency range (the "in-band frequencies") must be 2572 MHz to 2614 MHz and output frequency range must be 294 MHz to 336 MHz;
- The downconversion process must not invert frequencies;
- The nominal gain of the downconverter must be 32 dB, or greater;
- The downconverter must include filtering prior to the first amplifier that attenuates frequencies below 2500 MHz and above 2705 MHz by at least 25 dB;
- The downconverter must have an out-of-band input 3rd order intercept point (input IP3) of at least +9 dBm, where out-of-band is defined as all frequencies below 2566 MHz and all frequencies above 2620 MHz;
- The downconverter must have a typical noise figure of no greater than 3.5 dB and a worst case noise figure of no greater than 4.5 dB cross all in-band frequencies and across its entire intended operating temperature range;
- The downconverter must not introduce a delta group delay of more than 20 nanoseconds for digital operations or 100 nanoseconds for analog operations over any individual six megahertz MBS channel.

(b) Migration of Video Programming and Data Transmission Track for former ITFS licensees

96. The proponent(s) must provide, at its cost, to each former EBS licensee that intends to continue downstream high-power, high-site educational video programming or data transmission services with one programming track on the MBS channels for each EBS video programming or data transmission track the licensee is currently transmitting on a simultaneous basis. To be eligible for migration, a program track must contain EBS programming that complies with former Section 74.931(a)(1) of the Commission's Rules. Only programming tracks being transmitted on December 31, 2002 or within six months prior thereto should be migrated at the proponent(s)'s cost. Each eligible programming track must be migrated to spectrum in the MBS that will be licensed to the affected EBS licensee at the conclusion of the transition. The proponent(s)'s Transition Plan must provide for the MBS channels to be authorized to operate with transmission parameters that are substantially similar to those of the licensee's current operation. In addition, after the transition, the desired-to-undesired signal level ratio at each of the receive sites securing a replacement downconverter must satisfy the following criteria:

97. *Co-channel D/U Ratio.* In cases where the post-transition desired signal is transmitted using analog modulation, the actual co-channel D/U ratio measured at the output of the reception antenna must be at least the lesser of (i) 45 dB; or (ii) the actual pre-transmission D/U ratio less 1.5 dB. In cases where the post-transition desired signal will be transmitted using digital modulation, the actual co-channel D/U

ratio measured at the output of the reception antenna must be at least the lesser of (i) 32 dB; or (ii) the pre-transition D/U ratio less 1.5 dB. Where in implementing the Transition Plan the proponent(s) deploys precise frequency offset in an analog system, the minimum co-channel D/U ratio is reduced to 38 dB, provided that the transmitters have, or are upgraded pursuant to the Transition Plan to have, the appropriate "plus," "zero," or "minus" 10,010 Hertz precision frequency offset with a ± 3 Hz (or better) stability.

98. *Adjacent Channel D/U Ratio.* The actual adjacent channel D/U must equal or exceed the lesser of 0 dB or the actual pre-transmission D/U ratio. However, in the event that the receive site uses receivers, or is upgraded by the proponent(s) as part of the Transition Plan to use receivers, that can tolerate negative adjacent channel D/U ratios, the actual adjacent channel D/U ratio at such receive site must equal or exceed such negative adjacent channel D/U ratio.

(c) BRS Costs

99. To prevent a proponent(s) from incurring all of the costs associated with transitioning an MEA, we conclude that former MDS licensees must pay the costs of their own transition. We believe that the cost-sharing rules we adopt are not only equitable but will promote the rapid transition of the 2500-2690 MHz band.

(d) MVPD Costs

100. As we noted above, we do not require the proponent(s) to pay the expenses of MVPD providers.

(iv) Terminating existing operations in transitioned markets.

101. In the process of transitioning from the old band plan to the new band plan, licensees will be required to cease their current service offerings before they are in a position to begin new services under the new band plan. In light of our decision to eliminate the discontinuance of service rules, licensees that are subject to transition will not be in jeopardy of losing their licenses during the transition period. We note that in the *Further Notice of Proposed Rulemaking* attached to this *Report and Order*, we seek comment on the performance requirements that we should adopt for the 2500-2690 MHz band once it is transitioned. We emphasize, however, the licensees should minimize disruption of service to their customers and should notify their customers when service will be disrupted and for how long.

(v) Filing the post-transition notification.

102. The proponent(s) and the affected licensees must jointly file a notification with the Commission providing information that the transition has been completed and that the licensees are operating according to the rules adopted today. Specifically, the notification must provide the identification of the licensees that have transitioned to the band plan adopted today and the specific frequencies on which each licensee is operating. In addition, for each MBS station, the notification must provide the following information: the station coordinates, the make and model of each antenna, the horizontal and vertical pattern of the antenna, the EIRP of the main lobe, orientation and height of antenna center of radiation, transmitter output power, and all line and combiner losses. The proponent(s) must provide copies of the post-transition notice to all parties to the transition. As mentioned above, consistent with the eligibility restrictions on EBS spectrum, we believe that licensees operating in the same geographic area may wish to "swap" or "trade" spectrum with another licensee to be able to create paired spectrum or for some other reason. In essence, we believe that many licensees will seek to transfer, assign, partition, disaggregate, or lease their spectrum to meet the needs of a particular area. In order for

the Commission to facilitate these transactions and the transition of the 2.5 GHz band to the new band plan, we seek comment on ways to streamline administrative procedures in the *FNPRM* attached to this *Report and Order*.

(vi) Bureau Reports

103. As noted above, our goal is a swift transition to the new band plan so that consumers can receive the benefits of new and modified wireless broadband services to be offered in the revised band. We will monitor closely the transition of this band and will take additional action if the rules and procedures set forth in this *Report and Order* are not sufficient to facilitate this transition. To that end, we direct the Bureau to report to the Commission on the status of the transition of the 2.5 GHz band at eighteen months, three years and five years after the effective date of the rules adopted in this *Report and Order*. The reports at this timeframe will take into account the Initiation Plans filed by the proponents with the Commission, up to the three-year deadline for proponents to initiate the transition process, and we look forward to the initiation of transition plans in a substantial number of markets. The five year report will take into account the notification information filed by affected licenses after the transitions are complete.

B. Technical Issues

104. In this section, we address technical proposals to enhance the Services. We sought comments on these issues as well as suggestions concerning other technical rule changes that may be of benefit to the Services.

1. Signal Strength Limits at Geographic Service Area Boundaries

a. Power Limits in the LBS and UBS

105. In the *NPRM*, we sought comment on the signal strength limits to apply at geographic area boundaries. We noted that we recently reallocated forty-eight megahertz in the lower 700 MHz band (broadcast television channels 52-59) to fixed and mobile services while allowing continued provision of broadcast services in the band on a secondary basis, and limited the permissible signal strength at service area boundaries to 40 dBμV/m, the same signal strength limit that we adopted earlier for the upper 700 MHz band and the 800-MHz EA-based and 900-MHz MTA-based SMR services.[205] By comparison, our rules apply a somewhat higher 47 dBμV/m limit at the GSA boundaries for broadband PCS,[206] and for Part 27 services in the 1390-1395, 1432-1435, 2305-2320 and 2345-2360 MHz bands.[207] In all of those cases, the allowed signal strengths are compatible with the provision of low-powered cellular services in adjacent service areas. We tentatively concluded to follow the same general standard in this proceeding but sought comments on any unique characteristics of the 2500-2690 MHz band that might warrant a different approach.

106. After reviewing the comments in this proceeding, we adopt our tentative conclusion to limit signal strengths to 47 dBμV/m in the LBS and UBS, at the geographical service area boundaries. Imposing a signal strength maximum at a licensee's service area boundary is a tried and true mechanism

[205] *See Lower 700 MHz Band R&O*, 17 FCC Rcd at 1070 ¶ 119. This limit is codified at 47 C.F.R. § 27.55(a)(2).

[206] 47 C.F.R. § 24.236.

[207] 47 C.F.R. § 27.55(a)(1) and (3).

for managing and limiting co-channel interference as well as defining rights, obligations and expectations of all licensees in the band. This boundary signal strength will also facilitate coordination between co-channel licensees in adjacent areas. Furthermore, as discussed above, this limit is consistent with other signal limits for other similar services.

107. Fixed Wireless Holdings and Nextnet Wireless oppose the 47 dBμV/m limit and suggest that we retain the current -73.0 dBW/m² limit at the PSA. FWH argues that the incompatibility between high-power and low-power, cellular type systems, sharing the same EBS and BRS frequencies is undisputed. Therefore the Commission should resolve this issue by adopting a uniform signal strength limit for all stations across-the-spectrum. They further argue that retaining the -73.0 dBW/m² limit would offer licensees the needed flexibility to deploy high-speed services, and further suggest that licensees can coordinate and agree on alternative signal strengths at the boundaries of the licensee's GSA. With regard to the LBS and UBS, we are not persuaded by FWH and Nextnet's arguments because they have not demonstrated that low-power stations in these band segments could not provide an adequate service with the proposed 47 dBμV/m signal.

108. However, we do agree that we should retain the -73.0 dBW/m² limit for operations in the MBS where we expect high-power operations to continue. Accordingly, the -73.0 dBW/m² limit in the MBS will be retained because it provides adequate service for high-power stations operating in the MBS.[208] Therefore, we will adopt the 47 dBμV/m limit at the boundaries of the licensee's GSA for the LBS and UBS as proposed by the Coalition, and we will retain the -73.0 dBW/m² limit at the PSA boundaries for stations operating in the MBS.

109. We are, however, sensitive to FWH and Nextnet's concerns about providing adequate service to customers and students near a GSA border. In certain circumstances, a licensee may need to exceed the prescribed power levels at its GSA boundary in order to efficiently serve customers or students near the border. Given the importance of ensuring the ubiquitous availability of broadband services, and the fact that many licensees will want to be able to provide service as soon as possible in order to gain a competitive advantage, we will grant limited relief of the power limits at the GSA border. Specifically, in those instances where there is no neighbor licensee that is constructed and providing service to customers or students,[209] we will allow a licensee to exceed the prescribed power limit at the GSA boundary until there is a licensee providing service that would be affected by the higher power level. Once an affected licensee is providing service, the original licensee will be required to take whatever steps are necessary to comply with the applicable power level at its GSA boundary. Licensees taking advantage of this provision are placed on notice that once an affected licensee is providing service, they will be required to promptly do whatever is necessary to comply with the power limit at the GSA boundary. Of course, if a license obtains the consent of all affected licensees, it may continue to exceed the applicable power limit.

110. In a related matter, the Coalition suggests that the 47 dBμV/m limit be measured 1.5 meters above the ground over 5.5 MHz bandwidth (i.e., the bandwidth of the LBS/UBS channels as

[208] In light of our decision to institute geographic area licensing in the MBS, we will not require applicants to demonstrate compliance with co-channel and adjacent-channel desired-to-undesired signal ratios, as proposed by the Coalition. Coalition Proposal at 36-38. Since licensees will be free to place facilities throughout their GSA, applicants will not necessarily know where the facilities of other licensees will be located. Moreover, we believe the power limits and out-of-band emission limits we have adopted will provide sufficient protection.

[209] We will require that the neighbor licensee be providing actual service to internal or third parties. A licensee that is merely testing or transmitting data not being received by any party would not be entitled to require a licensee to reduce power.

proposed by the Coalition). The Coalition states that 1.5 meters above ground is appropriate because this height represents the approximate height at which handheld devices and other likely customer equipment would be located. We agree. Therefore, in view of the band plan that we are adopting, we will require that the signal strength, when measured, shall be taken over the channel bandwidth (i.e., each 5.5 MHz channel in the LBS and UBS for licensees that hold a full channel block, and for the 5.5 MHz channel in the LBS and UBS for licensees that only hold individual channels) at 1.5 meters above ground where most handheld devices are likely to be operated.

2. Authorization of Mobile Operation

111. Although we have applied both fixed and mobile allocations to the 2500-2690 MHz band, we have required MDS and ITFS licensees to obtain separate authorizations before commencing mobile service. In the *NPRM*, we proposed to authorize MDS and ITFS licensees to engage in mobile operation by blanket-licensing such operation under licensees' GSA authorizations.[210] We sought comment on this proposal and any other requirements we should implement, including but not limited to those discussed throughout the proceeding.

112. The record supports our proposal to blanket license mobile operations in the band pursuant to licensees' GSA authorizations. The Coalition is supportive of this proposal, noting that portable and mobile units will operate at low-power levels and generally will be utilized at relatively low heights above ground level, thus making it unlikely that they will be a source of interference. The Coalition recognizes that a portable unit can be operated at elevated heights (e.g. atop a skyscraper), but believes such instances will be relatively infrequent and should not pose a substantial problem. We agree and adopt our proposal to authorize licensees to engage in mobile operation by blanket licensing such operations under the licensees' geographical service area authorization.

3. Power and Antenna Height Limits

113. *Response Stations*. Our current rules limit response stations operating in the 2500-2690 MHz band to a transmitter output power of 2 watts.[211] The maximum transmitting power for broadband PCS mobile/portable operations in the 1.9 GHz band is 2 watts EIRP.[212] Noting that we adopted the 2-watt limit in the Two-Way Order without any explanation, the Coalition urged in its Proposal that we delete this power limit, arguing that it unduly restricts the flexibility of equipment designers to make the most efficient use of the 2.1 and 2.5 GHz bands.[213] The Coalition emphasized, however, that it was not advocating any change in the restrictions on power contained in Parts 1 and 2 that are designed to assure the protection of human health and safety; in fact, it recommended that we clarify that those limits apply to MDS and ITFS by adding those services to the list of services specifically shown as being subject to the rules.[214]

114. In the *NPRM*, we noted that while the 2-watt EIRP limit on PCS response stations appeared to be a reasonable model to follow when we adopted a similar rule for MDS and ITFS, the

[210] *NPRM*, 18 FCC Rcd at 6777 ¶ 132.

[211] *See* 47 C.F.R. §§ 21.909(g)(2) and 74.939(g)(2).

[212] See 47 C.F.R. § 24.232(b).

[213] Coalition Proposal at 25.

[214] *Id.* at 26.

record of the PCS proceeding indicates that the 2-watt EIRP limit was originally designed to reduce the likelihood of interference with fixed microwave stations in the PCS bands.[215] We sought comment on the extent to which similar concerns should apply for MDS and ITFS, bearing in mind the differences between the incumbent licensees in the MDS/ITFS bands – and their circumstances – as compared with the incumbent licensees in the PCS band. We further pointed out that while compliance with our safety rules may by itself necessitate compliance with a 2-watt limit for portable devices that are normally held close to the user's body, those rules allow higher power levels in circumstances where the response station's transmission antenna is designed to be used at least twenty centimeters away from the body of the user or any nearby persons.

115. In response to our proposal regarding the transmitter output power limitation of 2-watts for response stations, the Coalition commented that it rejects the PCS approach. It notes that the PCS approach was adopted to address a very different sort of problem than is facing MDS and ITFS and should not be considered as a precedent here.

116. We disagree with the Coalition that the PCS approach should be rejected here and the 2-watt limitation should be deleted. We believe that like PCS, BRS and EBS response stations should be designed to reduce the likelihood of interference with BRS and EBS stations and mobile services in the band. Moreover, compliance with our safety rule necessitates compliance with a 2-watt limit for devices that are normally held close to the user's body. The rules allow higher power levels in circumstances where the response station's transmission antenna is designed to be used at least twenty centimeters away from the body of the user or any nearby persons.

117. IPWireless states that the 2-watt limit should be specified on a per channel basis, as is currently done in Parts 21 and 74, so that when partial or multiple channels are employed, the allowable power level is adjusted as per the main station. Moreover, in regards to customer premises equipment (CPE), IPWireless proposes that the Rule be amended to 2-watts EIRP, which is more restrictive than our current Rules for fixed response stations. IPWireless' proposal would require that all subscriber equipment conform to the power limit established for PCS mobile stations. We agree with IPWireless that the 2-watt EIRP level advocated for CPE is appropriate for mobile and portable station operation in these services. Accordingly, all mobile and portable response stations, including CPE devices, will be limited to 2-watts EIRP assuring compliance with our rules. However, we will not amend our rules regarding BRS and EBS fixed response stations.

118. Finally, in the *NPRM*, we sought comment on whether we should establish a maximum antenna height for response stations in view of our proposal to blanket-license such stations. While mobile or portable stations would typically be close enough to the ground that they would be shielded by nearby structures, we noted in the *NPRM* that the rules we were contemplating adopting for these services would also permit the deployment of response stations at fixed locations, where they could be attached to antennas at high elevations. Such transmitters would have a greater potential for generating unwanted electromagnetic interference. We sought comment on whether the signal strength limits that we propose to apply at GSA boundaries would obviate the need for antenna height limits.

119. Upon reflection, we conclude that we will not establish a maximum antenna height for fixed response stations in this band. IPWireless does not believe that a maximum antenna height for response stations can be enforced, given that response stations are permitted to operate in an

[215] Amendment of the Commission's Rules to Establish New Personal Communications Services, *Second Report and Order*, 8 FCC Rcd 7700, 7764-65 ¶ 156 (1993).

uncoordinated fashion under a blanket license. However, in the event that antenna heights and power height limitations are imposed, IPWireless suggests that the PCS antenna height and power limits contained in Section 24.232 should apply.

120. Our current Rules do not limit the height of fixed response stations, which are typically mounted to the roof-top of most buildings for BRS and EBS stations, and we see no reason to change these rules at this time. Mounting response antennas to the roof-tops of existing buildings or side-mounted to an antenna mask (i.e., FAA approved structures) would be more practical and economical than building a supporting tower structure. Therefore, we believe the vast majority of response antennas will be mounted to the roof-top of typical buildings for economic reasons which would restrict the overall height of the antennas. Moreover, our current Rules have not presented any problems, and we agree with IPWireless that such limits may not be enforceable. Accordingly, we will not establish a maximum antenna height for fixed response stations in this band.

121. *Base/Main Stations.* In the *NPRM*, we noted that there is no specific power limit for low-power base stations, nor are there base station transmitting antenna height limits for operations in this band. In view of our proposal to limit signal strength at the borders of licensees' GSAs, we sought comment on whether there would be any benefit to establishing base station power and antenna height limits. In particular, we sought comment on a Coalition proposal to create incentives, but not an absolute requirement, for licensees to limit the height of low-power base stations near their GSA borders.[216] The Coalition proposal stemmed from its concern that a 47 dBμV/m signal strength limit at GSA boundaries might not provide sufficient protection against interference to base station receivers. The Coalition expressed that the most troublesome scenario would arise when the interfering licensee is using a channel for downstream communications from its base stations, and the interfered-with licensee in a contiguous GSA is using the same channel for upstream communications to its base stations. Under these circumstances, the Coalition recommended a safe-harbor requirement that both licensees limit their antenna heights to $D^2/17$, where D is the distance in kilometers between the base station causing the interference and the point where a line connecting the transmitting base station with the neighboring receiving base station intersects the boundary between their respective GSAs. Pursuant to this approach, antenna height would be defined as the height in meters of the antenna's centerline above the average elevation along the line between the two base stations.[217] If a transmitting licensee's antenna is not within the safe-harbor height limit and the receiving licensee's antenna is within the safe harbor, the transmitting operator would be required to take such measures as are necessary to limit the level of the undesired signal at the receiving base station to -107 dBm or less.[218]

122. In contrast to the Coalition's recommendations, our Broadband PCS rules do not impose any direct limit on antenna heights, but they apply a graduated reduction in permissible EIRP output for base station antennas that are more than 300 meters in height.[219] We noted in the *NPRM* that, on first impression, the Coalition's proposal appeared to lack certainty, insofar as the requirements imposed upon a licensee would be dependent upon actions taken by a neighboring licensee. However, we noted that a licensee could ensure its compliance with the recommended safe harbor, regardless of any future actions taken by the neighboring licensee, by drawing a line intersecting the nearest point on the GSA boundary

[216] *See* Second Supplement to the Coalition Proposal at 3-7, filed Feb. 7, 2003.

[217] *Id.* at 5.

[218] *Id.* at 6.

[219] 47 C.F.R. § 24.232(a).

and assuming that the other licensee might someday site a base station somewhere on that line. The recommended formula could then be applied to determine the maximum safe-harbor height for any given distance from the boundary. We concluded that the safe harbor distance formula proposed by the Coalition would not adversely affect the typical 2-5 mile antenna service distance and 150 to 300 feet height above average terrain (HAAT) of base stations in low-power cellular networks. We also concluded that it would have a minimal effect on typical base station design.

123. We believe that it is premature to impose a limit on antenna heights for low-power base stations given that base stations must comply with the 47 dBμV/m signal strength limit at its GSA boundaries as adopted herein. However, we concur with the Coalition that in line-of-sight situations, it is possible for a station to comply with the 47 dBμV/m signal strength limit at its GSA boundary and cause objectionable interference in an adjacent area at the same time. The Coalition has provided a vehicle for licensees to determine if the heights of their transmitting antennas would cause objectionable interference to a receiver in an adjacent GSA. Its proposal, $D^2/17$, mentioned above, would be a voluntary coordination threshold showing with regards to the heights of base station transmitters that would be located near the GSA boundary of an adjacent licensee. There will be no restrictions on the heights of base station antennas, but in certain situations, interference protection will be required. A base station receive antenna less than or equal to the threshold showing will be protected from a transmitting antenna that exceeds the threshold showing. A base station transmitting antenna equal to or less than the threshold showing is unlikely to cause interference; therefore no protection to any base station receive site will be required from such base stations. Finally, a base station transmitting antenna greater than the threshold would not need to protect a base station receive antenna that exceeds the threshold showing. In view of the fact that the ideal location for a base station antenna is in the center of the geographical area in which it provides service, we believe that the 47 dBμV/m signal strength limitation at the geographical service area boundaries is adequate provided the antenna height of the base station does not exceed the above threshold showing. Accordingly, we will not impose a limitation on the antenna heights of base stations located near the GSA border provided they do not cause impermissible interference.

4. Emission Limits

124. The purpose of emission limits, also known as emission masks, is to provide protection against adjacent channel interference (e.g., restrict transmitter emissions on a range of frequencies removed from the licensee's assigned frequency or frequency band). The current rules governing emission limits for MDS and ITFS are set forth in Sections 21.905 and 74.936, respectively. The current rules are based, however, on high-power video operation and vary slightly between the services.

125. In the *NPRM*, we stated that modification of the rules governing out of band emissions was necessitated by our intention to provide for mobile operation in the band. Consequently, we sought comment on the Coalition's recommendation that we require equipment operating on the LBS and UBS channels (both base stations and stations at a customer's premises) to attenuate the power below the transmitter power (P) by at least $43 + 10\log_{10}(P)$ dB on any frequency outside a licensee's authorized spectrum.[220] This recommendation is the same as the general emission mask the Commission adopted for operations in both the upper and lower 700 MHz band.[221] For the Response (R) channels the Coalition suggested requiring an attenuation of at least $80 + 10\log_{10}(P)$ dB. The Coalition also asserted that additional attenuation may be required in special circumstances. For example, the Coalition stated that the

[220] Coalition Proposal at 29.

[221] *Lower 700 MHz Band R&O*, 17 FCC Rcd at 1070 ¶ 122.

rules should be changed to require a licensee to take steps to attenuate out of band emissions by at least 67 + $10\log_{10}(P)$ dB upon written request from an adjacent channel licensee.[222] In response to this suggestion, we noted that we had never required a licensee to reduce its out of band emissions at the request of an adjacent channel licensee. The Coalition also outlined a more restrictive mask for protecting operations on the MBS channels[223] and for licensees of MBS channels to protect operations on LBS and UBS channels.[224] We observed that adopting all the Coalition's recommendations would be inconsistent with our stated goal of simplifying the rules governing this band (e.g., minimize harmful interference without establishing overly burdensome requirements). Nevertheless, we sought comment on whether we should adopt the Coalition's recommendations concerning out of band emissions or different criteria and details on measurement procedures to determine compliance.[225] Further, we sought comment on the appropriate emission mask for mobile operations. In that regard, we noted that we recently adopted out-of-band emission requirements to ancillary terrestrial component (ATC) mobile units in the 2000-2020 MHz band in order to protect adjacent channel PCS operations.[226] Because Mobile Satellite Service (MSS) and ATC units will be operating in the band immediately below 2500 MHz, we sought comment on whether similar limits should apply. We also sought comment on whether any special rules were needed to protect the Earth Exploration Satellite (passive), Radio Astronomy, and Space Research allocations in the 2690-2700 MHz band.[227] Finally, we requested comment on whether we should specify a frequency tolerance or require equipment to maintain its operations fully within the emission mask at all times.

126. After reviewing the record in this proceeding, we now believe that the emission mask proposed by the Coalition for the LBS and UBS reasonably limits adjacent channel interference and maximizes spectral efficiency while remaining technology neutral.[228] We agree with the Coalition which

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[222] According to the Coalition's Proposal, the written request must include a certification from the requesting licensee that it intends to initiate service on the affected adjacent channel group at a date certain (not more than one year after the date of the written request), and that the additional attenuation is required due to the respective technical characteristics of the requesting licensee's planned facilities and those of the party receiving the request. The requesting licensee must also include in the written request currently available information regarding its planned network design comparable in scope to the information required to be filed upon completion of the construction of its facilities. *See* Coalition Proposal at 29.

[223] The Coalition states "[i]n addition to the other requirements imposed on *out of band* emissions by stations operating outside the MBS, the licensee of any transmitter operating in the LBS, UBS, I, J, or K channels shall manage its *out of band* emissions such that the noise power introduced into an MBS channel does not exceed an EIRP of -37 dBm without the consent of the affected MBS channel licensee. Notwithstanding the foregoing, if the licensee of a channel outside the MBS digitizes a channel within the MBS, the noise power introduced into that channel of the MBS shall not exceed an EIRP of -20 dBm without the consent of the affected MBS channel licensee." *See* Coalition Proposal at 30.

[224] *See* Coalition Proposal at 16, nn.39, 41.

[225] For example, the Coalition suggests that we measure *out of band* emissions at the outermost edges of the combined channels where two or more contiguous channels are employed in the same system. *See* Coalition Proposal at 29 n.79. *See also* Coalition Proposal at 30 n.81.

[226] 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*, FCC 03-15, 18 FCC Rcd 1962, 2025-26 ¶ 119 (2003).

[227] *See* 47 C.F.R. § 2.106 n.US246.

[228] As the Commission's Spectrum Policy Task Force has recognized, there is an inherent tension between the dual objectives of affording licensee's flexibility and grouping like systems together; if every licensee is free to choose (continued....)

notes that loose out -of-band emission limits provide perfectly acceptable adjacent channel interference protection when adjacent channel licensees are operating compatible systems, but when adjacent channel systems are not compatible, a more stringent out of band emission limit is necessary to provide an appropriate level of interference protection. The Telecommunications Industry Association (TIA) also supports the Coalition's out-of-band emission limits, which are also imposed in the PCS band. TIA asserts that if flexibility is provided to the licensee to utilize either FDD or TDD, out of band emissions will have to be reduced to a level that will provide reasonable protection to an adjacent channel licensee. TIA further argues that the dual mask approach proposed by the Coalition restricts out-of-band emissions and mitigates potential adjacent channel interference where non-synchronized technologies are deployed.

127. We also agree with the Coalition that equipment on the LBS and UBS channels (both base stations and stations at a customer's premise) should be required to attenuate the power on any frequency outside a licensee's authorized spectrum.[229] Accordingly, we are adopting the Coalition's recommendation that all LBS and UBS channels emissions be attenuated below the transmitter power by at least 43 + 10log(P) dB on any channel outside a licensee's spectrum. We note that this is the same as the general emission mask the Commission adopted for operations on PCS, the 700 MHz band and other services.

128. We note TIA's concerns that requesting more stringent out of band emissions from an adjacent channel licensee, upon written request, is an unworkable solution for further reduction in out-of-band emissions. However, we believe that is appropriate to allow licensees to request stricter out-of-band emission limitations when there is a documented case of interference caused by out-of-band emissions between base stations. We believe that requiring the requesting licensee to document its interference claims will ensure that such requests will address real problems and avoid specious requests. Therefore, the Commission will require a licensee, upon receiving a documented interference complaint from an adjacent channel licensee, to further reduce its out-of-band emissions by at least 67 + 10log(P) dB. We also agree with the Coalition that additional attenuation should be required where base stations are located in close proximity. So we will require additional attenuation when distances between base station are less than 1.5 km. Finally, we also agree with the Coalition's mobile station emission mask which extends the attenuation from 43 + 10lop(P) at the channel's edge to 55 +10log(P) at 5.5 MHz away from the channel's edge.

129. With respect to BRS channel 1, we clarify that adjacent-channel Mobile Satellite Service (MSS) licensees can seek tighter out-of-band emissions limitations on licensees operating on Channel 1 in cases of documented interference. There may be situations where a tighter out-of-band emissions limit is necessary to protect MSS operations below 2495 MHz. MSS licensees operating in the adjacent band will be able to request such additional protection under the same circumstances as adjacent-channel BRS and EBS licensees.[230]

130. With respect to the MBS, we will allow analog television operations to operate pursuant to the existing out-of-band emission limitations currently in our rules. With respect to other operations, we will apply the same rules we are adopting for the LBS and UBS. We note that the Coalition requested

(Continued from previous page)

the services it will offer and the technology it will employ, the Commission cannot possibly assure that technically-disparate systems will be separated.

[229] Coalition Proposal at 29.

[230] Given the difficulties involved in measuring satellite signals, which can operate at very low-power, we will not require MSS licensees seeking adjacent-channel protection to provide actual measurements of satellite signal levels.

no changes in the out-of-band emission limits for the MBS.[231] However, we believe that the rules we are adopting are more workable than the current rules and will provide sufficient protection to existing operations. Moreover, applying the same emission limitations for digital operations throughout the band will encourage the use of common equipment throughout the band, particularly in those areas where cellularized networks can operate in the MBS without interference from high-power operations.

5. Technology

131. In the *NPRM*, we sought comment on the Coalition's request that we not restrict operation in this band to a particular technology and its assertion that our rules should remain technology-neutral to the maximum extent possible.[232] We noted that the Coalition also raised the issue that second-generation equipment employs two different technologies – FDD and TDD -- and that FDD technology requires a separation between the highest frequency used in one direction and the lowest frequency used in the other direction.[233] Thus, to allow for FDD technology, the Coalition proposed that when this technology is employed by a licensee, the LBS be restricted to subscriber-to-base (upstream) communications and the UBS be restricted to base-to-subscriber (downstream communications). According to the Coalition, this framework would simplify adjacent channel coordination and provide the vendor community with a degree of certainty as to the band usage that will translate into lower equipment costs and smaller equipment. We sought comment on whether we should establish formal channel pairings in the form of fixed channel assignments (FCA) to standardize the separation between channels used upstream and downstream.

132. We agree with the Coalition and the overwhelming majority of Commenters who argue that the band should be technology neutral. Allowing the band to be technology neutral is consistent with our goal to make the spectrum as flexible as possible as it permits licensees and the marketplace to determine which technologies should be utilized. As noted by Gryphon, Earthlink, Sprint, and Twedt and Dudeck, not restricting the band to a particular technology allows licensees and systems operators to deploy either FDD or TDD technology, and freely switch between the two as the technology develops and the marketplace demands evolve. Moreover, as noted by Alvarion, technologies such as next generation FDD and TDD would not thrive in a regulatory environment that restricts flexibility and mandates one technology over another.

133. We disagree with Fixed Wireless Holdings' approach which locks in the technology choice made at the time of licensing. To support its position, Fixed Wireless Holdings points to the Coalition's acknowledgement that both FDD and TDD systems on the same frequencies "creates a heightened risk of co-channel interference." However, we agree with Twedt and Dudeck that the current Rules would allow ITFS or MDS operators to safely use either FDD or TDD technology. Providing users with the flexibility to deploy the technologies of their choice is consistent with the Commission's goal of allowing licensees to operate technology independent. Accordingly, we will not mandate any particular technology in the band.

134. Additionally, we conclude that in order to allow the spectrum to be technology-neutral to

[231] Coalition Proposal at 39.

[232] Coalition Proposal at 11, 15.

[233] The Coalition points out that the Commission's *Interim Report* stated that a separation of at least 30 megahertz between upstream (customer to base) and downstream (base to customer) transmissions is needed to provide sufficient isolation of signals in the duplexer. *See* Coalition Proposal at 16. *See also Interim Report* at 54.

the maximum extent possible, channels utilized for FDD in this spectrum will not be paired by fixed channel assignments. Rather, upstream FDD operations will be permitted in the LBS, and paired with channels in the UBS for downstream communications by dynamic channel assignment (DCA). Channels that are DCA paired select any unused channel in the LBS for upstream operation, which eliminate manual channel pairing, thus promoting more flexibility and an efficient use of the spectrum. We are not, therefore, adopting a requirement for the LBS to be used only for remote, response or mobile station transmissions or for the UBS to be used only for base or main station transmissions. However, this does not preclude the industry from adopting its own standard.[234] An operator is free to use TDD in either the LBS or the UBS. Thus, FDD technology will be used in this spectrum without a priori pairing.

6. Unlicensed "Underlay" Operation

135. As we have consistently noted, one of the underlying goals of this proceeding is to promote increased access to spectrum. In this regard, we noted in the *NPRM* that Intel and Microsoft advocated that we create, or at least preserve, the opportunity to create unlicensed "underlay" rights for very low-powered devices on these channels.[235] Recently, we issued a Notice of Inquiry concerning making additional spectrum available for use by unlicensed devices in the television bands and in the 3650-3700 MHz band.[236] In the Unlicensed NOI, we noted that there have been significant advances in technology that may make it feasible to design new types of unlicensed equipment that would not cause interference to existing services.[237] For example, equipment could be designed that could monitor spectrum before transmitting to avoid interference, or equipment could be designed that could use the Global Positioning System to determine its location and whether there are licensed operators in the area.[238] We also noted that allowing unlicensed operation with minimal technical requirements could potentially permit the development of new and innovative types of devices, such as new wireless data networks.[239]

136. In the *NPRM*, we stated that the proximity of the 2500-2690 MHz band to successful unlicensed technologies in the 2.4 GHz band, and our goal of increasing the intensiveness and efficiency of use of the 2500-2655 MHz band, suggests that it may be appropriate to consider enhancing unlicensed use in the band on a secondary, non-interference basis. While we recognized that unlicensed operations under our Part 15 rules are subject to the condition that the transmitter does not cause interference to authorized services, we stated that we were nonetheless mindful in this context that additional measures may be necessary to ensure that unlicensed operations would not cause interference to existing, licensed operations. In that regard, we noted WCA's belief that Microsoft and Intel's proposals were premature. WCA contended that the necessary technology for mass producing affordable devices capable of measuring and reliably adapting to the presence of background noise or "interference temperature" had not been demonstrated.[240]

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[234] All stations, regardless of their use, must comply with the emissions standard specified for LBS and UBS. *See* Appendix C, Section 27.53, Emission Limits.

[235] Intel Reply Comments in RM-10586, at 5; Microsoft Reply Comments in RM-10586, at 3-4.

[236] Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band, ET Docket No. 02-380, *Notice of Inquiry*, 17 FCC Rcd 25632 (2002) ("*Unlicensed NOI*").

[237] *Id.* at 25637 ¶ 13.

[238] *Id.*

[239] *Id.* at 25642 ¶ 21.

[240] Coalition Comments in ET Docket No. 02-135, at 10.

137. Based on our discussions in the Unlicensed NOI and the advent of emerging technologies enhancing the feasibility of unlicensed operations, we sought in the *NPRM* comment on the possibility of allowing enhanced unlicensed operations in the 2500-2690 MHz band. Additionally, we sought comment on technical rules that would permit such operations without interfering with primary operations, such as any restrictions on antenna gain or directivity that might be necessary.[241] Furthermore, we sought comment on whether it is feasible to manufacture affordable transceivers that are capable of using underlay rights where, and only where, such access is offered if some but not all licensees on a given channel allow underlay access. Noting that Part 15 transmitters may not operate in certain restricted bands, including 2655-2690 MHz,[242] we asked whether there were any circumstances under which unlicensed operation could be allowed in the 2655-2690 MHz band without adversely affecting passive sensing operations in the 2655-2700 MHz band.

138. Based upon our review of the record, we decline to permit high-power unlicensed operations in the spectrum at this time. We are not necessarily convinced by Motorola's and Sprint's arguments that high-power unlicensed operations would introduce new sources of interference and create a more uncertain interference environment at the expense of licensees in the band seeking to deploy new services.[243] However, given the complex transition we are undertaking in this band, we believe that allowing high-power unlicensed operations in this band could add an additional layer of complexity that could delay deployment in this band by licensed operators. We are also concerned by the Coalition's assertion that allowing unlicensed use of this spectrum could undermine the evolution of the modified band plan, and BellSouth's related comment that because the current state of unlicensed technology does not permit responsible implementation of unlicensed devices in the spectrum, the uncertainty and novelty of unlicensed use would trouble investors, making them less likely to invest in the band.[244] We note that NAF and a series of other Commenters in favor of allowing unlicensed operations did not provide sufficient scientific evidence in support of their position. Moreover, NAF did not submit sufficient evidence to support its claim that unlicensed underlay operations can be operated on a primary basis without causing interference within the spectrum. Furthermore, we believe that the issue of high-power unlicensed operation can and should be considered in the broader context of other proceedings addressing unlicensed operation. Therefore, we decline to permit unlicensed operations in the band except as indicated above and to the extent already permitted by Part 15 of our Rules.

139. However, we will lift the restriction on unlicensed operation in Section 15.205 of our Rules and permit low-power unlicensed devices to operate on frequencies 2655-2690 MHz under our current Part 15 rules. Given the existence of licensed services in this frequency band, and given the ability of licensed operation to co-exist with unlicensed operations in the 2500-2655 MHz band, we see no reason to maintain this restriction in this band.

7. RF Safety

140. The Coalition's proposal for revisions to the 2500-2690 MHz band includes a recommendation that we amend our RF Safety rules. More specifically, the Coalition contends that we

[241] *NPRM,* 18 FCC Rcd at 6781-6782 ¶ ¶ 143-148.

[242] 47 C.F.R. § 15.205.

[243] Motorola Comments at 3-4; Sprint Comments at 9.

[244] Coalition Comments at 67-68; BellSouth Comments at 26.

should amend Sections 1.1307(b)(2), 2.1091(c) and 2.1093(c)[245] to include MDS and ITFS services.[246] These Rules were enacted pursuant to the National Environmental Policy Act in order to assure the protection of human health and safety from radio frequency radiation exposure. The Commission considers RF safety procedures to be essential in protecting human beings from excessive exposure to RF energy.[247] Accordingly, we sought comment on whether and how we should amend the RF safety rules but received little comments on this issue. We agree with the Coalition that Sections 1.1307(b)(2), 2.1091(c) and 2.1093(c) of our Rules should be amended to include MDS and ITFS services. We believe that equipment in this spectrum as in other areas of the spectrum should provide RF safety to consumers. Therefore, applications for equipment operating under this service must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Accordingly, we are amending those sections of the Rules to allow mobile/portable devices in the band.

8. North American Datum (NAD) 83 Coordinate Data

141. Our rules require the submission of different coordinate data for licensing actions. Applicants submit coordinate data using NAD83 protocol for applications filed on FCC Form 331 but in NAD27 for all other MDS/ITFS forms. In the *NPRM*, we sought comment on the Coalition's proposal that we require applicants to use NAD83 coordinate data and update or convert the current database.[248] We further noted that applications filed through ULS are required to provide NAD83 coordinate data. Inasmuch as applications for this service will be processed through ULS, we conclude that these applications should likewise provide NAD83 coordinate data. We agree with the Coalition that the coordinate information in our ULS database should be consistent. Accordingly, we adopt the Coalition's proposal and will require all future applicants filing BRS/EBS applications to submit coordinate data based on NAD83 coordinate data to facilitate ULS processing. Therefore, all applications filed after the effective date of these rules are required to contain coordinate data based on NAD83 coordinate data.

9. BRS Response Station Hubs

142. Our existing rules regard hubs in the same manner as main stations for application processing purposes. For instance, whereas 47 C.F.R. Section 1.1104 contains a special section on the application fee for signal booster applications and for signal booster certification of completion of construction applications ($70.00 in each instance), the rules do not differentiate between requirements for main station applications and certifications and response station hub applications and certifications. At present, the fee for a response station hub on a Form 331 is $210.00, and the fee for the Form 304A is $610.00.[249] Section 21.909 states that an MDS response station hub application must be filed on a Form 331. Licensees of MDS response station hubs must also file a certification of completion of construction application.[250] Response station hubs, signal booster stations and R channels are considered stand-alone

[245] *See* 47 C.F.R. §§ 1.1307(b) (2), 2.1091(c) and 2.1093(c).

[246] *See* Coalition Proposal at 20, nn.26 and 51.

[247] The existing requirements are located in 47 C.F.R. §§ 1.1307(b), 1.1310, 2.1091 and 2.1093.

[248] Coalition Proposal at 56.

[249] *See* 47 C.F.R. §§ 1.1104 and 21.909(c)(1).

[250] 47 C.F.R. § 21.909(h)(i)(2).

stations, and thus have unique facility ID numbers separate from the associated main stations.[251] However, at this time, only signal booster stations are designated for special treatment in the application fee schedule. We do not believe that certifications of completion of construction of two-way hubs will be necessary under the GSA licensing approach that we adopt herein, and accordingly eliminate such filing requirements.

10. Radiation from Stations that are not Engaged in Communications

143. On September 25, 1998, the Commission amended its rules to allow MDS and ITFS licensees to provide a wide range of high-speed, two-way services to a variety of users.[252] On July 29, 1999, the Commission made some additional rule modifications to facilitate the provision of these services.[253] On December 22, 1999, IPWireless requested reconsideration of the Commission's out of band emission limitations.[254] On February 10, 2000, a group of over 100 wireless communications system operators, Commission licensees, equipment manufacturers and consultants who were parties to the Petition for Rulemaking that commenced the Two-Way Proceeding (collectively, Petitioners) did not oppose IPWireless' petition, but sought clarification of Sections 21.909(m) and 74.939(o) of our Rules.[255] The Petitioners indicated that there was some uncertainty within the industry as to the meaning of the language, "Radiation of an un-modulated carrier and other unnecessary transmissions are forbidden."[256]

144. The Petitioners requested clarification that this language requires a response station's transmitter to be biased off so that no RF Gaussian noise is emitted when the station is not engaged in communications.[257] The Petitioners argued that this interpretation assures the protection of the noise floor of adjacent channel and adjacent market licensees against unnecessary emissions from transceivers.[258] On May 11, 2000, the Petitioners and IPWireless notified the Commission that they had reached a compromise concerning the appropriate level of emissions that a response station may generate when not directly engaged in communications with a response hub.

145. The Petitioners and IPWireless requested amendment of Sections 21.909(m) and 74.939(o) of our Rules to provide that when a response station is not in communications with its associated hub, it must restrict its field strength.[259] First, they proposed to set the permissible level of RF

[251] *See* Mass Media Bureau Multipoint Distribution Service and Instructional Television Fixed Service Applications Tendered For Filing, Report No. 148, *Public Notice* (Nov. 29, 2000).

[252] *Two-Way R&O*, 13 FCC Rcd at 19112.

[253] Amendment of Parts 1, 21 and 74 to Enable Multipoint Distribution Service and Instructional Television Fixed Service Licensees to Engage in Fixed Two-Way Transmissions, *Report and Order on Reconsideration*, 14 FCC Rcd 12764 (1999) (*Two-Way R&O on Recon*).

[254] IPWireless, Inc. Petition for Reconsideration, filed Dec. 22, 1999.

[255] Petitioners' Consolidated Comments and Partial Opposition at 5 (Consolidated Comments) filed Feb. 10, 2000. Although the Commission inadvertently indicated that WCA requested clarification, we take this opportunity to correct the record to reflect that the Petitioners requested clarification of this issue. *See Two-Way FNPRM*, 15 FCC Rcd at 14576.

[256] Petitioners' Consolidated Comments at 6.

[257] *Id.*

[258] *Id.*

[259] *Id.* at 1.

Gaussian noise at 10 microvolts/meter per 1 MHz bandwidth at a distance of 3 meters for response stations utilizing antennas with 6 dB or less gain over isotropic. Second, they proposed to set the permissible level of RF Gaussian noise at 10 microvolts/meter x 10exp[(antenna gain - 6 dB) / 20] per 1 MHz bandwidth at a distance of 3 meters for stations utilizing antennas with more than 6 dB gain over isotropic.[260]

146. In the *NPRM*, the Commission agreed to clarify this issue and sought comment[261] on specific issues relating to this matter.[262] Additionally, we sought comment on comprehensive changes to the interference rules that would apply in these services. Noting that other services do not have similar requirements, we asked Commenters who supported imposition of such a requirement to explain the need for such a requirement in light of other changes we proposed to our technical rules.

147. IPWireless now states that its original proposal to amend Sections 21.909(m) and 74.739(o) of the Rules is no longer appropriate. IPWireless explains that its proposal stemmed from the fact that MDS/ITFS licensees were concerned that TDD devices might be prone to transmitting energy during periods of reception. The Coalition supported IPWireless' proposal arguing that absent the adoption of the restrictions on emissions by subscriber units when not engaged in communications with their base stations, interference may result. Subsequently, however, IPWireless has completed more than two years of field trials and commercial deployment of TDD equipment and has obtained FCC certification for several types of base stations and CPE devices. IPWireless' studies led it to conclude that TDD devices are not a potential source of interference as envisioned by MDS and ITFS Petitioners at the time its petition was filed. We are persuaded by IPWireless' extensive studies and findings on this issue, which are further buttressed by the fact that IPWireless has obtained FCC certification for several types of base stations and CPE devices. Thus, we agree with IPWireless that amending Sections 21.909(m) and 74.739(o) of the Rules is not necessary, and the applicable rules will not be amended.

148. In a related matter, we also sought comment on whether we should prohibit subscriber handsets (CPE) from transmitting unless a base station pilot is present, and whether such a rule was necessary in order to avoid interference to existing operations. IPWireless supports our proposal prohibiting CPEs from transmitting unless a base station pilot is present. Moreover, IPWireless states that CPE transmissions must be restricted to locations where the blanket-license devices are operating under the active control and supervision of a licensed base station. We agree with IPWireless that handsets should not transmit unless a base station pilot is present, and that such transmissions must be restricted to locations under the active control and supervision of a licensed base station. Moreover, we believe that handsets should not transmit unless a base station pilot tone is present to preclude any unnecessary radiation "noise" in the spectrum. Accordingly, we will prohibit subscriber handsets from transmitting unless a base station pilot is present.

C. Eligibility Restrictions

1. ITFS Eligibility Restrictions

149. *Background.* The ITFS service was established to provide formal educational and cultural development in aural and visual form to students enrolled in accredited public and private

[260] *Id.*

[261] *Two-Way FNPRM*, 15 FCC Rcd at 14576.

[262] *Id.* at 14576-7 ¶¶ 39-40.

schools, colleges and universities.[263] Our current rules limit eligibility for the 114 megahertz of ITFS spectrum in the 2500-2690 MHz band to: (1) accredited educational institutions, (2) governmental organizations engaged in the formal education of enrolled students, and (3) nonprofit organizations whose purposes are organizational and include providing educational and educational television materials to accredited institutions and governmental organizations.[264]

150. In the *NPRM*, we included a detailed discussion and history demonstrating how, over a fifteen year period, the Commission has progressively relaxed the educational content obligations of ITFS licensees to accommodate the flexibility needs of ITFS providers who have increasingly relied on the leasing revenues provided by commercial spectrum users. As a result, the Commission's ITFS leasing policies now allow ITFS licensees to lease all but a small fraction of their capacity to commercial operators. From 1983 through 1998, the Commission progressively reduced the educational content required of ITFS licensees while expanding the opportunities for ITFS licensees to generate income by leasing out their channels, and substantially increased MDS operators' access to ITFS spectrum. These actions were taken in an effort to encourage more intensive use of the spectrum and to facilitate the generation of revenue for ITFS licensees.

151. In the *NPRM*, we stated that recent events warranted re-examination of the ITFS eligibility restrictions. We noted, for example, that in recent years, the Commission has pursued a general policy of eliminating use restrictions in radio licenses except in circumstances where there are clear and compelling reasons for retaining them.[265] We also noted the increased use of ITFS spectrum capacity by MDS systems as a result of the Commission's liberalization of leasing rules and relaxation of educational content requirements.[266] We also noted the increasing use of the Internet for educational purposes, which appeared to offer comparable and perhaps superior means of delivering educational programming.[267] Moreover, we expressed concern that retention of the ITFS eligibility restrictions could be detrimental to the growth of services on ITFS channels, because the complexity of the contractual relationships that our rules require in the ITFS service might discourage investment and impair the ability of service providers to modify their operations in response to changing technology and market conditions. We further noted that innovation could proceed more smoothly if commercial operators were able to aggregate spectrum in the 2500-2690 MHz band and purchase ITFS facilities, which would allow them to exercise direct ownership control. We suggested that providing existing ITFS licensees with greater flexibility might permit such licensees to capture the increased value of their spectrum, which would yield resources that could be used to enhance their educational programs in the manner that best suited their individual needs. In light of all these concerns, we sought comment on whether we should retain the ITFS eligibility restrictions. Additionally, we sought comment on maintaining ITFS as a separate service requiring educational programming but modifying the eligibility requirements to allow for-profit companies to be eligible licensees. Finally, we invited comment on whether we should eliminate or otherwise change our existing ITFS instructional content origination rules.

[263] 47 C.F.R. § 74.931(a)(1).

[264] *See* 47 C.F.R. § 74.932(a). Under certain circumstances, "wireless cable entities" may obtain access to ITFS channels so long as at least eight other ITFS channels remain available for future ITFS use. *See* 47 C.F.R. §§ 74.990-74.992. In the *FNPRM* portion of this document, we are seeking comment on whether we should retain this restriction. *See* section V.E , *supra*.

[265] *NPRM*, 18 FCC Rcd at 6769 ¶ 111.

[266] 47 C.F.R. § 74.931(d)(1).

[267] *NPRM*, 18 FCC Rcd at 6770 ¶ 114.

152. *Discussion.* After considerable deliberation, we conclude that it is in the public interest to retain EBS eligibility and content restrictions. We believe that the public interest favors preserving this spectrum for licensing to ITFS-eligible entities and that doing so will further the educational objectives that led to the establishment of ITFS. The record demonstrates that the EBS service provides critical educational services such as web-based and streaming video for instruction in adult literacy and basic skills, emergency medical and fire services, law enforcement, and corrections. These services are often provided by community colleges at a variety of locations across the state where such instruction would generally be unavailable.[268] The record also demonstrates that ITFS is used to provide training for citizens whose employment opportunities are limited by the closing of manufacturing plants and continued reduction in agricultural employment. Some EBS services, such as Mississippi Ednet's project with the Mississippi State Department of Health that will connect two hundred hospitals and health departments will even contribute to homeland security.[269]

153. Some commenters argue that important public interest objectives would be fulfilled if ITFS eligibility restrictions were eliminated. For example, BellSouth asserts that under a flexible use approach, licensees of ITFS spectrum may offer services other than fixed broadband and innovators can develop new, spectrally efficient technologies and offer new services in competition with fixed and portable operators.[270] BellSouth further asserts that open eligibility rules would facilitate development of Secondary Markets when DSL providers like it introduce advanced services to areas where wired DSL and cable modem services are not available, and provide facilities-based competition and competitive choice in areas where service is available.[271] Similarly, Network for Instructional Television (NITV) contends that open eligibility will stimulate private investment in new technologies that the education community has neither the budget nor the expertise to bring to the market unilaterally.[272]

154. We agree with BellSouth and NITV that these are all very important public interest objectives, and in particular, that leveraging the potential for wireless technology in the 2496-2690 MHz band to benefit education requires the private sector's investments and expertise. Nonetheless, we also believe that these goals can be attained notwithstanding existing eligibility restrictions. In this regard, we note that investment in the band is not solely dependent on an open eligibility scheme, and our restructuring of the band will go a long way towards encouraging the necessary investments. For example, as discussed earlier, the interleaved band plan has played a significant role in discouraging investment and hampering service. Inasmuch as licensees will now enjoy a band plan that provides contiguous spectrum, a significant obstacle to innovation in broadband deployment has now been rectified, and this enhancement alone will lead to significant changes in the utilization of this spectrum. Of particular importance is that the record does not demonstrate that commercial ownership of ITFS spectrum is a prerequisite to stimulating investment in the band. Indeed, as IMWED points out, that the bulk of commercial entities submitting comments to the *NPRM* did not take a position on ITFS eligibility demonstrates that lifting eligibility restrictions would not have a significant impact on commercial development of the band.[273] Moreover, over the course of this proceeding, several large commercial

[268] NCCCS Reply Comments at 2.

[269] Mississippi Ednet Reply Comments at 8-9.

[270] BellSouth Comments at 23.

[271] BellSouth Comments at 23-24.

[272] Network for Instructional Television (NITV) Reply Comments at 3-4.

[273] IMWED Reply Comments at 8.

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providers such as Clearwire and Nextel have acquired rights to spectrum and developed plans to establish broadband services in this spectrum, even notwithstanding the possibility that ITFS eligibility restrictions would be retained.[274] Therefore, we are not convinced that innovation in the band will be stifled by the continued retention of ITFS eligibility restrictions.

155. A number of ITFS licensees, such as IIT, disagree with assertions made by some commenters that actual educational use of the ITFS band is minimal.[275] IIT states that there are active ITFS operations in all of the top 50 TV markets, its use is robust, and educational institutions have deployed these frequencies for their intended use.[276] Furthermore, IIT asserts that notwithstanding the five percent minimum capacity rule, the majority of ITFS licensees who lease excess capacity retain at least 20 hours per week per channel and regularly reserve at least 25% of "total" capacity for ITFS use.[277] The Catholic Television Network (CTN) and the National ITFS Association (NIA) likewise assert that many ITFS licensees reserve amounts greater than the requisite 5% for their own use, while some do not lease any capacity on their ITFS stations.[278] During the course of this proceeding, a number of EBS licensees have submitted filings or made ex parte presentations to the Commission detailing the robust and critical educational applications they deliver to the public via their EBS spectrum.[279]

156. We recognize that there are a number of ITFS licensees, including some major educational institutions, who use the band more intensively for educational purposes than the rules require, and than other ITFS licensees in general. Because these commenters represent a small proportion of actual ITFS licensees, we must also acknowledge that overall utilization of the EBS spectrum is not optimal at this time. Our records indicate that there are 2,760 active, unexpired EBS licenses and permits (including hub and booster stations), or an average of approximately fifty-five facilities in each state. Given the large number of ITFS licensees, the record does not demonstrate that the ITFS community as a whole is making extensive use of the 114 megahertz allocated to them for educational programming. Nonetheless, we are reluctant to penalize the ITFS licensees who make extensive use of this spectrum and find that such action would be inconsistent with our conclusions on the importance of ITFS to the educational mission. Moreover, we recognize that ITFS entities could legitimately argue that they should have an opportunity to operate under the rules we have adopted today. For years, the band has been plagued by instability, uncertainty, filing freezes and burdensome rules, all of which have played substantial roles in fostering uncertainty and stagnation in the band. Ending the ITFS service without having given licensees the benefit of a stable regulatory environment would neither be fair nor in the public interest. We believe the better approach, and one which has been long overdue, is to provide licensees with a stable regulatory scheme thereby providing them the opportunity for their operations to flourish. We are optimistic that the sweeping changes we make today will ultimately result in significant improvements in the utilization of ITFS spectrum. We encourage ITFS licensees to make the most of these improvements by efficiently utilizing this spectrum, and intend to monitor the progress in this

[274] Clearwire Ex Parte (filed May 28, 2004); Nextel Reply Comments at 4.

[275] IIT Comments at 5.

[276] IIT Comments at 8-9.

[277] IIT Comments at 10-11.

[278] CTN & NIA Comments at 10.

[279] *See, e.g.*, Huntsville City Schools Reply Comments at 1; Archdiocese of New York Comments at Attachment A; SBBC Comments at 2-5; IIT Comments at 5-8; ITFS Parties Comments at Appendix.