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

In the Matter of	)	
	)	
Amendment of Part 101 of the Commission's Rules to Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees	)	WT Docket No. 10-153
	)	
Petition for Rulemaking filed by Fixed Wireless Communications Coalition to Amend Part 101 of the Commission's Rules to Authorize 60 and 80 MHz Channels in Certain Bands for Broadband Communications	)	RM-11602

REPORT AND ORDER, FURTHER NOTICE OF PROPOSED RULEMAKING, AND MEMORANDUM OPINION AND ORDER

Adopted: August 9, 2011 **Released: August 9, 2011**

By the Commission: Chairman Genachowski and Commissioners Copps, McDowell, and Clyburn issuing separate statements.

Comment Date: **October 4, 2011**
Reply Comment Date: **October 25, 2011**

TABLE OF CONTENTS

I. INTRODUCTION

1. Broadband is indispensable to our digital economy, and wireless technology is an increasingly important source of broadband connectivity. A leading example of the role of wireless technology in connecting the nation to broadband is the impact and potential of point-to-point microwave systems. An essential component of many broadband networks – particularly in mobile wireless networks – microwave backhaul facilities are often used to transmit data between cell sites, or between

cell sites and network backbones. Service providers' use of microwave links as a cost-effective alternative to traditional copper circuits and fiber optic links has been increasing.[1] In certain rural and remote locations, microwave is the only practical high-capacity backhaul solution available.

2. A robust broadband ecosystem therefore relies, at least in part, on access to adequate and cost-efficient backhaul. In this *Report and Order, Further Notice of Proposed Rulemaking, and Memorandum Opinion and Order*, we continue our efforts to increase flexibility in the use of microwave services licensed under our Part 101 rules. The steps we take will remove regulatory barriers that today limit the use of spectrum for wireless backhaul and other point-to-point and point-to-multipoint communications. We also make additional spectrum available for wireless backhaul – as much as 650 megahertz – especially in rural areas, where wireless backhaul is the only practical middle mile solution. By enabling more flexible and cost-effective microwave services, the Commission can help accelerate deployment of fourth-generation (4G) mobile broadband infrastructure across America.

II. EXECUTIVE SUMMARY

3. In this *Report and Order, Further Notice of Proposed Rulemaking, and Memorandum Opinion and Order*, we remove regulatory barriers to make additional spectrum available for Fixed Service (FS) use and provide additional flexibility to enable FS licensees to reduce operational costs, increase reliability, and facilitate the use of wireless backhaul in rural areas. We also seek comment on additional ways to increase the flexibility, capacity, and cost-effectiveness of the microwave bands, while protecting incumbent licensees in these bands. Specifically, we take the following actions:

Report and Order:

- *Permits FS Operations in Certain BAS and CARS Frequencies*: We allow FS operators to share the 6875-7125 MHz and 12700-13100 MHz bands currently used for Fixed and Mobile Broadcast Auxiliary Service (BAS) and Cable TV Relay Service (CARS). We eliminate regulatory impediments to permit FS operations in rural areas where the band is not currently licensed to TV mobile pickup stations used in newsgathering operations and adopt rules to protect BAS and CARS operations.

- *Eliminates Final Link Rule:* We grant broadcasters greater access to microwave spectrum by eliminating the "final link" rule that prohibits broadcasters from using FS stations as the final radiofrequency (RF) link in the chain of distribution of program material to broadcast stations.

- *Permits Adaptive Modulation:* The Part 101 rules contain a minimum payload capacity rule, 47 CFR § 101.141(a)(3), intended to ensure that FS links are operated efficiently. We permit temporary operations below the minimum capacity under certain circumstances, which will enable FS links to maintain critical communications during periods of fading.

- *Declines to Permit "Auxiliary" Fixed Stations*: We decline to permit FS licensees to coordinate and deploy "auxiliary" links, which would effectively allow point-to-multipoint operations under the point-to-point rules.

[1] In 2005, 8.7 percent of backhaul traffic was sent by fixed wireless. *See 14th CMRS Competition Report* at 160 ¶ 294. By 2009, that figure increased to 12.3 percent. *Id.*

Further Notice of Proposed Rulemaking:

- *Allowing Smaller Antennas in Certain Part 101 Antenna Standards:* The Part 101 rules establish directional antenna standards designed to maximize the use of microwave spectrum while avoiding interference between operators. Based on the record received in response to the *NOI*, the *FNPRM* seeks comment on whether we may liberalize our rules to allow smaller antennas in the 6, 18, and 23 GHz bands without materially increasing interference.

- *Exempting Licensees in Non-Congested Areas from Efficiency Standards:* Currently, FS links are subject to the same capacity requirements whether they are in rural or more densely populated urban areas. Lower traffic volumes on rural networks and greater distances between microwave links often make meeting these minimum capacity requirements much more costly in rural areas. Based on engineering analysis showing that allowing lower efficiency standards in rural areas could allow operators to substantially increase link length, the *FNPRM* proposes to exempt licensees in non-congested areas from the efficiency standards and to allow licensees in other areas to seek relief from the standards upon making a special showing.

- *Allowing Wider Channels in 6 and 11 GHz Bands:* The *FNPRM* seeks comment on allowing microwave operators to create higher capacity links by licensing 60 and 80 megahertz channels in the 6 and 11 GHz microwave bands, respectively.

- *Revising Waiver Standard for Microwave Stations Near the Geostationary Arc:* To prevent interference to geostationary satellites, the Commission's Rules require microwave stations that point near the geostationary arc to obtain a waiver. We propose to revise the rule to limit the circumstances where a waiver is necessary by conforming our rule to International Telecommunications Union (ITU) regulations.

- *Updating Definition of Payload Capacity:* We propose to modify the definition of payload capacity in our Part 101 rules to account for Internet protocol radio systems.

Memorandum Opinion and Order:

- We address various proposals offered in response to the *NOI* that either lack specificity, are outside the scope of this proceeding, or are not yet ripe for consideration.

III. BACKGROUND

4. The Commission has licensed spectrum for microwave uses for most of its history.[2] In 1996, the Commission consolidated its rules for most microwave point-to-point and point-to-multipoint services into a new Part 101 of the Commission's Rules.[3] Two specialized microwave services in particular – the Broadcast Auxiliary Service (BAS) and the Cable TV Relay Service (CARS) – have not

[2] For an extensive discussion of issues the Commission faced in allotting microwave spectrum, see Allocation of Frequencies in the Bands Above 890 Mc., Docket No. 11866, *Report and Order*, 27 FCC 359 (1959).

[3] Reorganization and Revision of Parts 1, 2, 21, and 94 of the Rules to Establish a New Part 101 Governing Terrestrial Microwave Fixed Radio Services, WT Docket No. 94-148, *Report and Order*, 11 FCC Rcd 13449 (1996).

been consolidated into Part 101. Part 101 includes the point-to-point Private Operational Fixed Service (POFS)[4] and the Common Carrier Operational Fixed Service.[5] The Commission's licensing regime for these two services requires frequency coordination and the filing of an application for each microwave link or path containing detailed information concerning the proposed operation.[6]

5. In order to complete frequency coordination, an applicant must give prior notice to nearby licensees and other applicants for licenses of the proposed applicant's operations, make reasonable efforts to avoid interference and resolve conflicts, and certify to the Commission that the proposed operation has been coordinated.[7] Once the applicant has completed frequency coordination, the applicant must file an application for authorization with the Commission, specifying the latitude and longitude of the transmitter to be used to an accuracy of one second.[8] The applicant must coordinate each operation[9] and modify the license and coordinate any change in the location of the transmitter of more than five seconds in latitude or longitude or both.[10] Thus, if the applicant adds additional transmitters, the Commission's current rules require additional coordination and modification of the license.[11]

6. In general, spectrum below 13 GHz is preferred for long-link backhaul because signals can overcome the rain fading effects that limit transmission distances at higher frequencies. Over time, a considerable amount of spectrum in this range that had been allotted for microwave use has been reallotted for mobile wireless services.[12] Microwave operations have an extensive history of sharing spectrum with other services.[13]

7. On August 5, 2010, the Commission commenced this proceeding "to remove regulatory barriers to the use of spectrum for wireless backhaul and other point-to-point and point-to-multipoint communications."[14] In the *NPRM*, the Commission sought comment on allowing FS to share the 6875-

---

[4] *See* Part 101, Subpart H.

[5] *See* Part 101, Subpart I. Part 101 also includes services licensed on a geographic area basis that allow both point-to-point and point-to-multipoint operations. *See* Part 101, Subparts G (24 GHz Service and Digital Electronic Messaging Service); L (Local Multipoint Distribution Service), and M (38.6-40.0 GHz Band). Part 101 also includes the Local Television Transmission Service (Part 101, Subpart J), the Multiple Address Service (Part 101, Subpart O), the Multichannel Video Distribution and Data Service (Part 101, Subpart P), and service rules for the 70/80/90 GHz Bands (Part 101, Subpart Q).

[6] *See* 47 C.F.R. §§ 101.21(f), 101.103.

[7] *See* 47 C.F.R. § 101.21(f).

[8] 47 C.F.R. § 101.103(d)(2)(ii).

[9] *Id*.

[10] 47 C.F.R. § 1.929(d)(1)(i).

[11] 47 C.F.R. §§ 1.929(d)(1)(i), 1.947(a).

[12] *See* 47 C.F.R. §§ 101.69-101.83, 101.85-101.97. Bands formerly used by microwave include the 1850-1990 MHz, 2110-2150 MHz, and 2160-2200 MHz bands.

[13] A chart showing FS bands and the services that share spectrum with FS is in the *NPRM*, 25 FCC Rcd at 11253.

[14] Amendment of Part 101 of the Commission's Rules to Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees, *et al.*, WT Docket No. 10-153, *et al.*, *Notice of Proposed Rulemaking and Notice of Inquiry*, 25 FCC Rcd 11246, 11247 ¶ 1 (2010) (*Wireless Backhaul NPRM/NOI*). When referring specifically to the *Notice of Proposed* (continued….)

7125 MHz and 12700-13200 MHz bands currently used by BAS and CARS.[15] The Commission also proposed to eliminate the "final link" rule that prohibits broadcasters from using FS stations as the final radiofrequency (RF) link in the chain of distribution of program material to broadcast stations.[16] The Commission further proposed to modify the Part 101 minimum payload capacity rule to allow temporary operations below the minimum capacity under certain circumstances, which would enable FS links – particularly long links in rural areas – to maintain critical communications during periods of fading.[17] In the final portion of the *NPRM*, the Commission sought comment on permitting FS licensees to coordinate and deploy multiple links – a primary link and "auxiliary" links.[18] In the *NOI*, the Commission asked about relaxing efficiency standards in rural areas,[19] permitting FS licensees to use smaller antennas,[20] and other possible modifications to the Part 101 rules, or other policies or regulations, to promote flexible, efficient and cost-effective provisions of wireless backhaul service.[21]

8. Comments on the *Wireless Backhaul NPRM/NOI* were due October 25, 2010, and reply comments were due November 22, 2010.[22] In addition, on June 7, 2011, the Wireless Telecommunications Bureau issued a Public Notice that provided additional analysis of the existing BAS and CARS operations in the 7 and 13 GHz bands and requested supplemental comment on issues relating to FS sharing in the 6875-7125 MHz and 12700-13200 MHz bands.[23] Supplemental comments were due on June 27, 2011.[24]

IV. REPORT AND ORDER

A. Making 6875-7125 MHz and 12700-13150 MHz Available for Part 101 FS Operations

9. In this Section, we permit Fixed Service (FS) operators to share the 6875-7125 MHz and 12700-13150 MHz bands currently used for Fixed and Mobile Broadcast Auxiliary Service (BAS) and Cable TV Relay Service (CARS) and adopt rules to protect BAS and CARS operations. This action will make 650 megahertz of additional backhaul spectrum available in rural areas where the band is not

(Continued from previous page)
Rulemaking portion of the document, we will refer to the *NPRM*. When referring specifically to the *Notice of Inquiry* portion of the document, we will refer to the *NOI*.

[15] *NPRM*, 25 FCC Rcd at 11251-11256 ¶¶ 11-20.

[16] *NPRM*, 25 FCC Rcd at 11256-11258 ¶¶ 21-27.

[17] *NPRM*, 25 FCC Rcd at 11260-11261 ¶¶ 36-40.

[18] *NPRM*, 25 FCC Rcd at 11265-11269 ¶¶ 50-58.

[19] *NOI*, 25 FCC Rcd at 11269-11270 ¶¶ 60-63.

[20] *NOI*, 25 FCC Rcd at 11270-11272 ¶¶ 64-67.

[21] *NOI*, 25 FCC Rcd at 11272-11273 ¶ 68.

[22] *See* Use of Microwave for Wireless Backhaul; Provision for Additional Flexibility To Broadcast Auxiliary Service and Operational Fixed Microwave Licensees; *Proposed Rule*, 75 FR 52185 (Aug. 24, 2010). A list of commenters is attached as Attachment E.

[23] Wireless Backhaul - Further Inquiry into Fixed Service Sharing of the 6875-7125 MHz and 12700-13200 MHz Bands, WT Docket No. 10-153, *Public Notice*, 26 FCC Rcd 7953 (WTB 2011) (*7 and 13 GHz Comment Public Notice*).

[24] A list of the supplemental comments is included in Attachment E.

currently licensed to TV mobile pickup stations used in newsgathering operations.

1. Background

10. BAS stations, which are licensed under Part 74 of the Commission's rules,[25] make it possible for television and radio stations and networks to transmit program material from the sites of breaking news stories or other live events to television studios for inclusion in broadcast programs, to transmit programming material from studios to broadcasting transmitters for delivery to consumers' televisions and radios, and to transmit programs between broadcast stations.[26] CARS stations, licensed under Part 78 of the Commission's Rules, enable cable operators to distribute programming to microwave hubs where it is impossible or too expensive to run cables and to cover live events.[27]

11. In the bands shared with Part 101 fixed services,[28] licensees of fixed BAS and CARS stations are required to engage in the same frequency coordination process required of Part 101 services.[29] That includes the filing of an application for each microwave link or path containing detailed information concerning the proposed operation.[30] Additionally, in several bands, Part 101 licensees share spectrum with the Fixed Satellite Service (FSS) licensed under Part 25 of the Commission's Rules.[31] Both FSS and Part 101 licensees use frequency coordination to prevent interference.[32] By contrast, BAS and CARS mobile and temporary fixed facilities may coordinate using less formal procedures, including using local frequency coordination committees.[33] The Society of Broadcast Engineers (SBE) runs a local frequency coordination program for BAS and CARS spectrum.[34] Some Part 101 frequencies are shared by federal and non-federal users, and use of those frequencies must be coordinated with the National Telecommunications and Information Administration.[35]

12. In the *NPRM*, the Commission proposed to allow FS operations to share spectrum in two bands that are currently assigned to BAS and CARS, 6875-7125 MHz (the 7 GHz Band) and 12700-

---

[25] 47 C.F.R. § 74.631(a). *See* Revisions to Broadcast Auxiliary Service Rules in Part 74 and Conforming Technical Rules for Broadcast Auxiliary Service, Cable Television Relay Service and Fixed Services in Parts 74, 78 and 101 of the Commission's Rules, ET Docket No. 01-75, *Notice of Proposed Rulemaking*, 16 FCC Rcd 10556, 10557 ¶ 1 (2001).

[26] *Id.*

[27] 47 C.F.R. § 78.11. *See* Revisions to Broadcast Auxiliary Service Rules in Part 74 and Conforming Technical Rules for Broadcast Auxiliary Service, Cable Television Relay Service and Fixed Services in Parts 74, 78 and 101 of the Commission's Rules, ET Docket No. 01-75, *Report and Order*, 17 FCC Rcd 22979, 22980 n.1 (2002) (*BAS Service Rules Update R&O*).

[28] A chart showing the various FS bands and services that share spectrum with FS is in the *NPRM*, 25 FCC Rcd at 11253.

[29] *See* 47 C.F.R. §§ 74.638, 78.36.

[30] *See supra* ¶¶ 4-5. *See also* 47 C.F.R. §§ 74.638, 78.36, 101.21(e), (f), 101.103.

[31] *See* 47 C.F.R. § 101.101.

[32] *See* 47 C.F.R. §§ 25.203(c), 101.103.

[33] *See* 47 C.F.R. § 74.638(d), 78.36(d).

[34] Comments of The Society of Broadcast Engineers, Incorporated (filed Oct. 25, 2010) (SBE Comments) at 4.

[35] *See* 47 C.F.R. § 2.106 (United States Table of Frequency Allocations).

13200 MHz (the 13 GHz Band).[36] It proposed to permit FS operations in the 7 GHz Band because it is adjacent to existing FS operations in the 6525-6875 MHz band (Upper 6 GHz Band) and is otherwise well suited for backhaul and other microwave applications.[37] In particular, the Commission sought comment on sharing between fixed mobile operations and fixed operations in the 7 GHz Band, where frequency coordination has not been as formal as it is in the Upper 6 GHz band,[38] and whether it should require BAS licensees to identify in the Universal Licensing System (ULS) the receive sites associated with their TV pickup stations, a process that is currently voluntary.[39] The Commission also proposed to introduce FS systems into the 12700-13200 MHz band (13 GHz Band) because these frequencies are well suited for short- to medium- length backhaul microwave applications.[40] Our records appeared to indicate that the 13 GHz Band was used primarily by cable systems to deliver both video and broadband services,[41] but that the band seemed to be used mostly by less urban and smaller cable systems.[42] Though records indicated that the band is not used as extensively as it was previously, the Commission acknowledged that it is still critical to those systems that employ it.[43] The Commission sought comment on whether introduction of FS operations into this band, with the additional latitude proposed in this proceeding, would have an adverse impact on existing or future cable system operations.[44]

13. In the *NPRM*, the Commission emphasized that it was not proposing to modify existing licenses and that any new licenses in the band would need to be frequency-coordinated with existing licensees.[45] The Commission expressed optimism that these uses could be made compatible with FS operations if frequency coordination were carefully implemented.[46] To the extent that any commenters might believe that relying on our existing frequency coordination processes would not adequately address all necessary requirements, the Commission asked that they propose modifications to that process or alternative processes.[47]

14. In the *NPRM*, the Commission also sought comment on the best approach to channelization for the various bands under consideration and noted that existing operations in the 7 and 13 GHz Bands use 25 megahertz bandwidth channels.[48] The Commission suggested that applying the rules currently applicable to the Upper 6 GHz Band to the 6875-7125 MHz band could facilitate

[36] *NPRM*, 25 FCC Rcd at 11253-11254 ¶¶ 15-16.

[37] *NPRM*, 25 FCC Rcd at 11253-11254 ¶ 15.

[38] *NPRM*, 25 FCC Rcd at 11254 ¶ 15. *See* 47 C.F.R. § 74.638(d).

[39] *NPRM*, 25 FCC Rcd at 11254 ¶ 15. In this item, the term "TV pickup" shall refer collectively to BAS TV pickup stations as defined in 47 C.F.R. § 74.601(a), as well as CARS pickup station as defined in 47 C.F.R. § 78.5(d).

[40] *NPRM*, 25 FCC Rcd at 11254 ¶ 16. *See* 47 C.F.R. §101.147(a) n.22. The Commission also noted that, prior to 1988, the band was available to certain relocated FS systems. *NPRM*, 25 FCC Rcd at 11254 ¶ 16.

[41] *NPRM*, 25 FCC Rcd at 11254 ¶ 16. *See* 47 C.F.R. § 78.11 for permissible uses of CARS stations.

[42] Based on staff review of COALS Electronic Filing System data.

[43] *NPRM*, 25 FCC Rcd at 11254 ¶ 16.

[44] *NPRM*, 25 FCC Rcd at 11254 ¶ 16.

[45] *NPRM*, 25 FCC Rcd at 11254 ¶ 17.

[46] *NPRM*, 25 FCC Rcd at 11254 ¶ 17.

[47] *NPRM*, 25 FCC Rcd at 11254 ¶ 17.

[48] *NPRM*, 25 FCC Rcd at 11254 ¶ 18. *See* 47 C.F.R. §§ 74.602(a), 78.18(a)(7).

equipment development and provide consistency to FS licensees.[49] Specifically, the Commission proposed to apply : (1) a maximum frequency tolerance of 0.005 percent;[50] (2) a maximum transmitter power of +55 dBw;[51] (3) the antenna standards currently applicable to Upper 6 GHz Band stations authorized after June 1, 1997 to the 6875-7125 MHz band;[52] (4) the capacity and loading requirements contained in Section 101.141(a)(3) of the Commission's Rules to this band;[53] and (5) the 17 kilometer minimum path length requirement of Section 101.143 of the Commission's Rules.[54] The Commission proposed to retain the rules that are already applicable to the 13 GHz Band,[55] with one exception.[56] Given that there is no minimum payload capacity applicable to the 13 GHz band, the Commission proposed to apply the minimum payload capacity and loading requirements that currently apply to the 11 GHz band to the 13 GHz band.[57] It sought comment on these proposals and any possible alternatives to them.[58] It also sought comment on any special technical rules that might be necessary in that band.[59]

15. As noted, on June 7, 2011, the Wireless Telecommunications Bureau (Bureau) issued a Public Notice that provided additional analysis of the existing BAS and CARS operations in the 7 and 13 GHz bands and requested supplemental comment on issues relating to FS sharing in these bands.[60] The Bureau's analysis appeared to indicate that, even if FS operations were totally excluded from the service areas of TV pickup stations and CARS facilities, there would be considerable areas where FS facilities could be licensed.[61] Therefore, the Bureau sought comment on allowing FS stations in the 7 and 13 GHz bands while prohibiting FS stations from locating paths within the service area of a co-channel TV pickup station.[62] The Bureau also noted that the Commission could require FS operators to coordinate any new fixed links with TV pickup stations within the appropriate coordination zone of any new fixed link.[63] In addition, the Bureau asked whether the Commission should continue to reserve a portion of these bands

[49] *NPRM*, 25 FCC Rcd at 11254 ¶ 20.

[50] *See* 47 C.F.R. § 101.107(a).

[51] *See* 47 C.F.R. § 101.113(a).

[52] *See* 47 C.F.R. §101.115(b)(2).

[53] 47 C.F.R. § 101.141(a)(3).

[54] 47 C.F.R. § 101.143.

[55] We note that prior to September 9, 1988, the 12700 – 13200 MHz band was available to the POFS service to accommodate stations that were licensed in the 12200 – 12700 MHz band prior to September 9, 1983. Part 101 already contains technical rules with respect to the 12700 – 13200 MHz band, and we do not propose to alter those rules. We also note that private cable operators who use FS spectrum are also eligible to obtain CARS licenses in the 12700-13200 MHz band. *See* Amendment of Eligibility Requirements in Part 78 Regarding 12 GHz Cable Television Relay Service, CS Docket No. 99-250, *Report and Order*, 17 FCC Rcd 9930 (2002).

[56] *NPRM*, 25 FCC Rcd at 11255 ¶ 20.

[57] *NPRM*, 25 FCC Rcd at 11255-11256 ¶ 20.

[58] *NPRM*, 25 FCC Rcd at 11256 ¶ 20.

[59] *NPRM*, 25 FCC Rcd at 11256 ¶ 20.

[60] *7 and 13 GHz Comment Public Notice*.

[61] *7 and 13 GHz Comment Public Notice*, 26 FCC Rcd at 7955 ¶ 5.

[62] *7 and 13 GHz Comment Public Notice*, 26 FCC Rcd at 7955 ¶ 6.

[63] *7 and 13 GHz Comment Public Notice*, 26 FCC Rcd at 7955 ¶ 6.

exclusively for BAS and CARS operations, to enhance the ability of BAS and CARS to coexist with FS and facilitate nationwide use of BAS and CARS services.[64] The Bureau also sought further comment on channelization plans, coordination procedures, and capacity and loading requirements.[65]

2. Discussion

16. After a careful review of the comments, we conclude that it is feasible to authorize Part 101 fixed stations in 650 megahertz in the 7 and 13 GHz bands, so long as we ensure that these operations do not conflict with TV pickup stations that support important electronic newsgathering functions. As we explain in further detail below, we will therefore permit FS facilities only in areas where TV pickup operations are not licensed. As discussed below, our actions will permit additional FS stations in areas covering more than half of the nation's land mass, where they may be used to provide additional service to about 10 percent of the population.

17. BAS and CARS stations fall into one of two categories: those that remain in one place (fixed) and those that move among different locations (mobile or temporary fixed). Mobile BAS and CARS include television pickup stations, which are authorized to transmit program material, orders concerning such program material and related communications from the scenes of events that occur in places other than a television studio to associated television stations.[66] Under current rules, which were adopted in 2002, all FS and fixed BAS and CARS stations above 2110 MHz use the prior coordination notice procedure described in Section 101.103(d) of the Commission's Rules,[67] but mobile and temporary fixed BAS and CARS may use faster informal coordination procedures.[68] TV pickup stations in these bands are usually licensed either for a specified radius around a set of coordinates or for a television market.

18. The record indicates that it is not feasible to allow FS to share spectrum with mobile and temporary fixed TV pickup operations in areas where mobile and temporary fixed TV pickup operations are licensed. While BAS fixed and mobile operations share spectrum in the same geographic areas, the sharing that exists today would not be practicable if it were not guided by informal agreements among local market participants. Mobile TV pick-up operations share the 7 and 13 GHz bands with fixed BAS and CARS operations under rules that accord TV pick-up operations secondary status with respect to fixed BAS stations, including studio-to-transmitter (STL) and inter-city relay (ICR) stations.[69] If STL and ICR stations had proliferated without restraint, our rules would have allowed them to preempt all of the available spectrum and crowd out TV pickup operations. STL and ICR licensees are motivated to preserve spectrum availability for TV pickup operations because the same entities use both types of facilities. [70] The Engineers for Integrity of Broadcast Auxiliary Service Spectrum (EIBASS) says that broadcasters in some markets have reserved portions of the 7 GHz TV BAS band for TV pick-up

[64] *7 and 13 GHz Comment Public Notice*, 26 FCC Rcd at 7955 ¶ 7.

[65] *7 and 13 GHz Comment Public Notice*, 26 FCC Rcd at 7956-7959 ¶¶ 10-17.

[66] *See* 47 C.F.R. § 74.631(a).

[67] *See* 47 C.F.R. §§ 74.638(b), 78.36(b), 101.103(d).

[68] *See* 47 C.F.R. §§ 74.638(d), 78.36(d).

[69] *See* 47 C.F.R. § 74.604(c).

[70] *See, e.g.,* Comments of the Engineers for Integrity of Broadcast Auxiliary Service Spectrum (filed Oct. 25, 2010) (EIBASS Comments) at 2-4.

operations on an informal basis, by mutual agreement.[71] In addition, EIBASS asserts that, in many markets, broadcasters have informally reserved the 13 GHz band for temporary reception sites for electronic news trucks receiving transmissions from nearby mobile cameras.[72] EIBASS says that this process of informal sub-channelization has worked well among broadcasters, and can continue to work well among broadcasters, because they have an incentive to participate in mutually agreed shared coordination.[73]

19. Part 101 FS operators do not have the same incentive to accommodate the needs of TV pick-up operations, however, as few of them are involved in video newsgathering or video coverage of other live events.[74] For that reason, if they were granted the same formal priority over TV pick-up operations that broadcasters' STL and ICR stations are entitled to claim under existing rules, FS operators could apply for spectrum that is presently used by TV pick-up operations – potentially precluding new TV pick-up operations and forcing existing operations to shut down.[75]

20. The National Spectrum Management Association (NSMA) points out that in bands that are already shared by BAS, CARS, and Part 101 licensees, the bands are generally used for either fixed or mobile operations, but not both. It acknowledges that the 6425-6525 MHz band is shared among BAS, CARS, and Part 101 licensees, for example, but observes that it is reserved for mobile and temporary fixed licensees.[76] Moreover, says NSMA, in the bands where there is sharing between BAS, CARS, and FS, local coordinators for all of these bands have a limited number of fixed links to consider and are able to manage channel use informally on short notice with a small community of users.[77] It says that allowing additional Part 101 licensees to seek licenses in the 7 and 13 GHz bands would add significant complexity to this type of time-sensitive coordination and would not provide adequate protection from interference for FS operators.[78] We therefore conclude that unconstrained band-sharing between TV pickup operations and Part 101 FS would not be practicable.

21. We also conclude that it is not feasible at this time to adopt a formal band segmentation plan to separate fixed and mobile operations into designated sub-bands of the 7 and 13 GHz bands, as requested by the Fixed Wireless Communications Coalition (FWCC) and Vislink, Inc.[79] The several bands allocated for BAS and CARS today support a mix of fixed, temporary fixed, and mobile services, including airborne mobile, and comments submitted in this proceeding confirm that BAS and CARS users coordinate these services on an individual market basis, without benefit of a formal nationwide plan, to assign the different types of service (fixed, mobile, airborne) to specific band segments.[80] A portion of

[71] EIBASS Comments at 2. EIBASS implies that Chicago, Houston, Los Angeles, New York City, Phoenix, San Francisco, and Washington, DC, are examples of such markets.

[72] EIBASS Comments at 3.

[73] EIBASS Comments at 3-4.

[74] *See* EIBASS Comments at 3-4.

[75] EIBASS Comments at 3-4, *citing* 47 C.F.R. § 74.604(c).

[76] Comments of the National Spectrum Management Association (filed Oct. 25, 2010) (NSMA Comments) at 4.

[77] NSMA Comments at 4.

[78] NSMA Comments at 4.

[79] FWCC Public Notice Comments at 3, Comments of Vislink Inc., DBA Microwave Radio Communications in response to Public Notice DA 11-1011 (filed Jun. 27, 2011) (Vislink Public Notice Comments) at 1.

[80] *See, e.g.,* NSMA Comments at 3-4.

the band used in one market for fixed operation may commonly be used for mobile operation in another. Thus, to avoid disrupting those arrangements, we would need to tailor any band segmentation approach that we adopted to the needs and conditions of individual markets. Since we could not adopt a uniform band plan throughout the nation and provide the same spectrum to FS throughout the nation, the value of such band segmentation would be quite limited.

22. For areas where TV pickup licenses are not authorized, however, we conclude that sharing between Part 101 FS and fixed BAS operations is feasible. WTB staff conducted additional analysis to determine whether it would be feasible for those services to share spectrum if they were separated geographically. The analysis appears to indicate that, even if FS operations were totally excluded from the service areas of TV pickup stations and CARS facilities, there would be considerable areas where FS facilities could be licensed – 54 percent of the land area in the 7 GHz band and 64 percent of the land area in the 13 GHz band – largely located in more rural areas, especially in the midwestern and western regions.[81] For each band, FS facilities could serve about 10 percent of the population.[82] Thus, opening the 7 and 13 GHz bands to FS operations could be of particular benefit in rural areas, where spectrum in the 7 and 13 GHz bands is largely vacant.

23. To avoid interference between FS operations and TV pickup operations, we prohibit FS paths from crossing the service areas of TV pickup authorizations and require FS to coordinate with all relevant licensees, including TV pickup authorizations, pursuant to the formal Part 101 coordination procedures. EIBASS, the National Association of Broadcasters (NAB), and the Wireless Internet Service Providers Association (WISPA) believe that such an arrangement would be workable.[83] We also note the presence of co-primary fixed satellite services (FSS) in these bands. FS applicants will be required to coordinate with and protect FSS licensees and applicants pursuant to the Part 101 rules.[84]

24. The FWCC and SBE remain concerned about potential interference issues, particularly given the ability of broadcasters to operate short-term without a license.[85] Under our rules, broadcasters can operate certain BAS facilities on a short-term basis without prior authorization for up to 720 hours a year subject to various limitations, including the fact that such short-term operation is secondary to regularly authorized facilities.[86] We believe that such operations can be accommodated by excluding FS from two 25-megahertz channels each in the 7 GHz band (6975-7025 MHz) and the 13 GHz band (13150-13200 MHz). Excluding FS from that spectrum nationwide will accommodate TV pickup stations covering events that occur outside the license areas of local BAS and CARS operations. For the 7 GHz Band, we choose to exclude the 6975-7025 MHz segment because excluding the middle of the

[81] *7 and 13 GHz Comment Public Notice*, Attachment A (7 GHz) and Attachment B (13 GHz).

[82] *Id*.

[83] *See* Comments of EIBASS (filed Jun. 27, 2011) (EIBASS Public Notice Comments), Comments of the National Association of Broadcasters (filed Jun. 27, 2011) (NAB Public Notice Comments), Comments of the Wireless Internet Services Providers Association (filed Jun. 27, 2011) (WISPA Public Notice Comments).

[84] *See* Comments of Sirius XM Radio, Inc. (filed Oct. 25, 2010) (Sirius XM Comments) at 2-3, Comments of Sirius XM Radio, Inc. (filed Jun. 27, 2010), Comments of the Satellite Industry Association (filed Jun. 27, 2011). *See also* 47 C.F.R. § 101.103(d).

[85] Comments of the Fixed Wireless Communications Coalition (filed Jun. 27, 2011) (FWCC Public Notice Comments) at 2-3, SBE Public Notice Comments at 4-5.

[86] *See* 47 C.F.R. § 74.24.

band will allow for greater separation between FS transmit and receive frequencies.[87] For the 13 GHz Band, we exclude 13150-13200 MHz because that spectrum is already reserved for television pickup operations in the top 100 markets.[88] Furthermore, since such short-term operation is by definition secondary to other operations, broadcasters operating pursuant to Section 74.24 have no right to claim interference protection from regularly authorized operations.[89]

25. EIBASS and NAB propose additional conditions that we do not believe are necessary or appropriate. EIBASS asks that the Commission impose a requirement that the newcomer POFS station cannot degrade the noise threshold of any existing ENG-RO site by more than 0.5 dB.[90] Although EIBASS's proposal may be an appropriate standard for evaluating a proposed FS facility,[91] we decline to adopt it as part of our rules. Generally, in lieu of mandating specific interference criteria in our rules, we expect applicants and licensees to work out interference issues in the frequency coordination process. In addition, NAB asks that the Commission impose secondary status on FS operations in the 7 and 13 GHz Bands with respect to both existing and future BAS operations.[92] We find that the rules we adopt fully protect existing BAS operations. With respect to future BAS operations, FS, BAS, and CARS will all be co-primary services required to protect pre-existing operations. We agree with NAB that there is an important public interest in broadcasters being able to report on breaking news events and emergency situations;[93] but we also find there to be important public interests in the support that FS provides to vital broadband, public safety, and critical infrastructure uses.

26. We also find that FS operations would be compatible with fixed BAS operations. In 2002, the Commission amended Parts 74 and 78 of its rules to harmonize many of the rules governing BAS and CARS with rules that already applied to FS licensees under Part 101, allowing the use of digital transmissions, and requiring all fixed station applicants, except for those proposing operations in the 1990-2110 MHz band, to provide affected licensees and contemporaneous applicants with 30-day prior notifications and an opportunity to participate in frequency coordination before filing their applications with the Commission.[94] It applied Part 101 frequency coordination procedures to fixed BAS and CARS, and it did so with wide support from the affected industries.[95] It rejected the request of one participant,

[87] *See* FWCC Public Notice Comments at 5.

[88] *See* 47 C.F.R. § 74.602(a) n.2.

[89] *See* 47 C.F.R. § 74.24(c).

[90] EIBASS Public Notice Comments at 3.

[91] EIBASS correctly notes that the Commission used that standard in evaluating interference to BAS TV pickup facilities. *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 al.*, ET Docket No. 00-258, *et al.*, *Seventh Report and Order*, 19 FCC Rcd 21350, 21364-21365 n.63 (2004).

[92] NAB and MSTV Comments at 7-8, NAB and MSTV Reply Comments at 6-8, NAB Public Notice Comments at 5.

[93] *See* NAB Public Notice Comments at 5.

[94] *BAS Service Rules Update R&O*, *supra*. The prior coordination procedures of Part 101 are now mirrored in Part 74 for BAS and Part 78 for CARS. *Compare* 47 C.F.R. §§ 101.103(d), 74.638 and 78.36.

[95] *BAS Service Rules Update R&O*, *supra*, at 17 FCC Rcd at 23001-23002 ¶ 55. MST, NAB, NSMA, PBS, the Association of Public Television Stations, and the Telecommunications Industry Association (TIA) supported the Commission's action.

SBE, that fixed BAS and CARS be allowed to continue relying upon informal coordination procedures.[96] The subsequent ongoing shift from analog to digital transmission has accelerated the erosion of technical distinctions between BAS, CARS, and Part 101 FS, and the use of consistent procedures for fixed stations in all of those services has played a vital role in the Commission's efforts to accommodate the increasing demand for closely-packed microwave links in urban areas.

27. We will allow mobile TV pickup licensees to continue to use informal coordination procedures within their service areas.[97] Given the urgency of electronic newsgathering operations and the long history of successful real-time frequency coordination provided by local coordinators, the Commission previously found that there was little potential that interference would result from its continued function without imposing the formality of Section 101.103(d) procedures.[98] In light of our decision not to allow FS within the service areas of mobile BAS/CARS stations, there is no reason to require those stations to use formal coordination procedures.

28. The rules we adopt today will open most of the 7 and 13 GHz bands to FS over more than half of the nation's land mass where 10 percent of the population lives, while applying geographic restrictions on FS in those bands to minimize the potential for interference between FS facilities and TV pickup stations. Specifically, as reflected in the rules in Appendix A, we will allow Part 101 FS stations to share the 7 and 13 GHz bands subject to the following conditions:

(1) We will not allow FS stations in the 7 and 13 GHz bands to locate their paths within the service areas of any previously licensed co-channel TV pickup stations.

(2) We will require FS operators to coordinate any new fixed links with TV pickup stations within the appropriate coordination zones of any new fixed links.

(3) As we require in other bands that fixed BAS and CARS share with Part 101 fixed services, we will require all fixed BAS, fixed CARS and Part 101 FS stations in the 7 and 13 GHz bands to engage in the same frequency coordination process that we require of all Part 101 services.[99]

(4) We will also reserve two 25-megahertz channels for BAS and CARS in the 7 GHz band (6975-7125 MHz) and two 25-megahertz channels in the 13 GHz band (13150-13200 MHz) nationwide to accommodate TV pickup stations covering events that occur outside the license areas of local BAS and CARS operations.[100]

29. Regarding the various alternative channelization plans proposed in the *NPRM* and the *7 and 13 GHz Public Notice*, we have decided to retain the 25 megahertz bandwidth that presently applies to the

---

[96] *See BAS Service Rules Update R&O*, *supra*, 17 FCC Rcd at 23002 ¶ 56. We reject SBE's current attempt to relitigate that issue and allow fixed BAS to use informal coordination procedures. *See* SBE Comments at 10-14. We note that no other party supports SBE's position. *See*, *e.g.*, Reply Comments of the National Cable & Telecommunications Association (filed Nov. 22, 2010) at 2, Reply Comments of the National Spectrum Management Association (filed Nov. 22, 2010) (NSMA Reply Comments) at 15-16. Furthermore, informal coordination procedures work best when there are a relatively small number of parties that are familiar with each other, as is often true in bands licensed solely to broadcasters. In situations where there could be a large number of licensees with no affiliation, we continue to believe that the more formal Part 101 coordination procedures are appropriate.

[97] *BAS Service Rules Update R&O*, *supra*, 17 FCC Rcd at 23004 ¶ 62.

[98] *BAS Service Rules Update R&O*, *supra*, 17 FCC Rcd at 23004 ¶ 62.

[99] *See* 47 C.F.R. §§ 74.638, 78.36, 101.103(d). FS licensees will be required to coordinate with co-primary Fixed Satellite Service licensees operating in those bands.

[100] *See* 47 C.F.R. § 74.602(a) n.2.

7 and 13 GHz bands, as this channel-width best conforms to existing operations in the band. We recognize that FWCC recommends a mix of 10, 20, and 30 megahertz channels similar to those available in other FS bands and asserts that such alignment will result in more readily available equipment.[101] As FWCC and others have recognized, however, allowing 10 and 30 megahertz channels in a band with many pre-existing 25 megahertz channels would preclude operation on multiple 25 megahertz channels, resulting in wasted spectrum.[102] Many commenters recommend retaining a band plan based on the 25 megahertz channel bandwidth in order to prevent such wasted spectrum.[103] To provide for a mix of larger and smaller channel-widths, we adopt an alternative proposal suggested by FWCC[104] and permit FS to utilize 5, 8.33, and 12.5 megahertz channels.[105]

30. We also adopt WISPA's proposal to allow 50 megahertz channels in the 13 GHz Band.[106] Since the 50 megahertz channels will be created from two 25 megahertz channels, we do not see any inefficiency that would result from 50 megahertz channels. We do not authorize 50 megahertz channels in the 7 GHz Band because of the limited amount of spectrum available in that band. Finally, we agree with FWCC that, for FS operations, the specific channels for each bandwidth should be listed, consistent with our normal practice for FS operations.[107]

31. In addition, as proposed in the *NPRM,* we apply the existing FS minimum capacity and loading requirements to FS operators in the 6875-7125 and 12700-13200 bands.[108] We do not propose to apply those requirements to operations that are authorized under Parts 74 and 78, and we maintain the existing exemption from the capacity and loading requirements of Part 101 for transmitters carrying digital video motion material.[109] With respect to the remaining proposed technical rules for FS operation, we shall apply the same technical parameters that currently apply in the Upper 6 GHz band to the adjacent 6875-7125 MHz band, as proposed in the *NPRM*, because those bands are contiguous and should be able to use similar equipment. As noted above, we believe that applying the rules currently applicable in the Upper 6 GHz band to the 6875-7125 MHz band will facilitate equipment development and provide consistency to FS licensees. Specifically, we will apply: (1) a maximum frequency tolerance of 0.005

[101] FWCC Public Notice Comments at 5.

[102] *See* FWCC Comments at 6, Comsearch Comments at 22.

[103] *See* EIBASS Public Notice Comments at 3-4, NAB Public Notice Comments at 3-4, WISPA Public Notice Comments at 4, Vislink Public Notice Comments at 2.

[104] FWCC Public Notice Comments at 6.

[105] The National Translator Association asks that the Commission incorporate into its rules its members' typical practice of operating television translator relay facilities with bandwidths of six, 12, and 18 megahertz. *See* Statement of the National Translator Association Regarding TV Translators using BAS Frequencies (filed Nov. 16, 2010). We decline to make this rule change because we are not modifying our rules to formally recognize operation at different bandwidths for other BAS licensees.

[106] WISPA Public Notice Comments at 4.

[107] *See* FWCC Public Notice Comments at 4.

[108] *NPRM*, 25 FCC Rcd at 11255-11256 ¶ 20.

[109] 47 C.F.R. § 101.141(a)(5) of the Commission's Rules exempts transmitters carrying digital video motion material from the capacity and loading requirements of 47 C.F.R. §§ 101.141(a)(2) and (3), provided that at least 50 percent of the payload is digital video motion material and the minimum bit rate specified in 47 C.F.R. § 101.141(a)(1) is met, i.e., that the bit rate, in bits per second, is equal to or greater than the bandwidth measured in Hertz.

percent;[110] (2) a maximum transmitter power of +55 dBw;[111] (3) the antenna standards currently applicable to Upper 6 GHz Band stations authorized after June 1, 1997, to the 6875-7125 MHz band;[112] (4) the capacity and loading requirements contained in Section 101.141(a)(3) of the Commission's Rules;[113] and (5) the 17 kilometer minimum path length requirement of Section 101.143.[114] We retain the rules that are already applicable to the 12700 - 13000 MHz band, with the exception of applying the minimum payload capacity and loading requirements that currently apply in the 11 GHz band to the 12700-13150 MHz band.[115] Finally, with the addition of Part 101 fixed services in the BAS bands, we believe it is necessary for our ULS database to include all fixed receive locations. We therefore will require BAS TV pickup licensees to record their stationary receive-only sites in ULS.[116]

32. Allowing FS to operate in the 7 and 13 GHz bands will not impair existing BAS and CARS operations because we are adopting rules designed to fully protect those operations. Moreover, we do not believe that allowing FS sharing in these bands will inhibit geographic expansion of BAS and CARS operations because, as a practical matter, these services have not been expanding geographically in recent years. Only one new BAS TV pickup license has been granted in the 7 GHz and 13 GHz bands in the past two years.[117] Moreover, FWCC reports that BAS and CARS path and channel licensing, respectively, in the 13 GHz band have dropped sharply in the last decade.[118] Furthermore, 50 megahertz of spectrum in each band will remain exclusively for BAS and CARS use, and BAS and CARS applicants will have co-primary status and the ability to apply for new facilities in the shared portions of the bands. We also note that development of new technologies could provide broadcasters with new mechanisms to

[110] *See* 47 C.F.R. § 101.107(a).

[111] *See* 47 C.F.R. § 101.113(a).

[112] *See* 47 C.F.R. § 101.115(b)(2).

[113] 47 C.F.R. § 101.141(a)(3). We will not apply the capacity and loading requirements to BAS licensed under Part 74. EIBASS suggests that those requirements could apply to BAS, except for BAS involved in the transmission of digital video programming, intercity relay links providing backhauls from ENG-RO sites, and studio-to-transmitter links. EIBASS Public Notice Comments at 4. FWCC also supports that idea. FWCC Public Notice Comments at 3-4. Given the proposed exceptions, however, it is not clear how much applicability the rule would have to BAS operations. Furthermore, since we are seeking comment on limiting the applicability of the capacity and loading requirements in the *FNPRM*, we are not convinced it is appropriate at this time to expand those requirements by applying them to a subset of BAS facilities.

[114] 47 C.F.R. § 101.143.

[115] Our efficiency rules usually were not imposed on frequency bands above 12 GHz because of the higher amounts of fading on these frequencies compared to the lower bands, mostly due to oxygen and water vapor. However, in other parts of this rulemaking, we are allowing flexible modulation schemes during anomalous weather events. We believe that the relaxation of the efficiency standards we are proposing due to anomalous weather events, such as rain fade, therefore, make it reasonable to impose the same efficiency standards for the 12.7-13.2 GHz band that we have for the 11 GHz frequency bands.

[116] *See* Wireless Telecommunications Bureau Announces ULS Upgrade, Licensees of Television Pick-Up Stations Now Have the Option of Identifying Their Stationary, Receive-Only Sites on ULS to Aid Coordination with Other Services, *Public Notice*, RM-11308, 23 FCC Rcd 6521 (WTB 2008).

[117] *See* License for Station WQLG694 (granted Jan. 14, 2010).

[118] *See* Letter from Mitchell Lazarus and Christine E. Goepp, Counsel for the Fixed Wireless Communications Coalition to Marlene H. Dortch, Secretary, Federal Communications Commission, WT Docket No. 10-153 (filed Apr. 29, 2011) (*FWCC April 29 Ex Parte*) at 4. According to FWCC, in 2000, there were 131,761 operational channels on 3,686 paths. By 2010, there were 35,849 operational channels on 2,638 paths. *Id.*

support of their electronic newsgathering functions in the future.[119] In light of this record, we reject SBE's argument that FS should not be allowed in the 7 and 13 GHz Bands because of a need to preserve spectrum for geographic expansion of BAS and CARS.[120]

33. We find that permitting fixed microwave operations in the 7 and 13 GHz bands will benefit operators and consumers alike and that these benefits outweigh any potential costs, which our rules have been designed to eliminate. Our actions today will enable these spectrum bands to be used more intensively for wireless backhaul, public safety, and other critical uses supported by microwave without limiting their use for BAS or CARS. With this additional spectrum available for their use, fixed microwave operators can establish more links in a given geographic area and increase the capacity of existing links, which in turn will facilitate deployment of wireless broadband services. Although it would be difficult to quantify with precision the benefits of opening the 7 and 13 GHz bands to FS, we find that those benefits outweigh the at most minimal cost of our actions.

34. As a final matter, we reject SBE's allegation that we prejudged the decision to allow FS operations in these bands.[121] We have carefully considered the issues raised concerning sharing between FS and mobile and temporary fixed BAS and CARS, analyzing the record received in response to the NPRM, as well as the record received in response to the Bureau's *7 and 13 GHz Comment Public Notice*. As discussed in detail above, the rules we adopt today are clearly responsive to issues and concerns raised in this record.

B. Elimination of Final Link Rule

35. In this section, we grant broadcasters greater access to microwave spectrum by eliminating the "final link" rule that prohibits broadcasters from using FS stations as the final radiofrequency (RF) link in the chain of distribution of program material to broadcast stations.

1. Background

36. In the *NPRM*, the Commission sought comment on eliminating the "final link" rule, which prohibits broadcasters from using Part 101 stations as the final radiofrequency (RF) link in the chain of distribution of program material to broadcast stations.[122] In other words, the rule prevents private FS stations from transmitting one type of content (program material) to one type of business (broadcasters) at one particular point in the transmission chain (the final RF link). The Commission questioned the sense of maintaining regulatory restrictions based on content as broadcasters and other microwave users move to digital-based systems.[123] It expressed the belief that other existing rules would ensure productive use of spectrum and prevent broadcasters from crowding other FS licensees out of the

[119] *See*, *e.g.*, Nomad Innovations, LLC *Ex Parte* (filed May 24, 2011) (describing technology that would support reliable broadcast-quality video newsgathering for live news using Verizon Wireless's 4G LTE network).

[120] SBE Public Notice Comments at 3-4.

[121] Comments of the Society of Broadcast Engineers, Inc. in Response to the Further Inquiry Public Notice (filed Jun. 27, 2011) (SBE Public Notice Comments) at 3.

[122] *NPRM*, 25 FCC Rcd at 11256-11258 ¶¶ 21-27. *See* 47 C.F.R. § 101.603(a)(7).

[123] *NPRM*, 25 FCC Rcd at 11257 ¶ 24.

band.[124] The Commission also asked whether there were alternatives that could facilitate broadcaster access to FS spectrum while retaining the prohibition under certain circumstances.[125]

2. Discussion

37. As proposed in the *NPRM*, we herein eliminate the "final link" rule. Our action removes from our rules an artificial distinction based solely on the type of content provided and directed solely at one type of business and is consistent with our decision to allow FS to share in the 7 and 13 GHz BAS and CARS bands.[126] We believe it makes little sense to maintain restrictions based on content as both FS licensees and broadcasters move to digital technologies. Furthermore, FS licensees do not object to elimination of the rule so long as FS is granted access to BAS and CARS spectrum in the 7 and 13 GHz bands,[127] an action we are also taking in this *Report and Order*.[128] Although AT&T expresses concern about the effect of eliminating the rule on spectrum availability, it does not object to legitimate broadcaster use of FS spectrum that is compatible with existing uses.[129] While broadcasters have different opinions about the value of eliminating the rule, they support doing so.[130]

38. We find that there are significant benefits, and no costs, to eliminating the final link rule. We note that no commenter has identified any cognizable harm that would result from eliminating the rule. With increasing adoption of digital technologies, the final link rule has become an outdated regulation that imposes unnecessary costs on broadcasters. In some instances, it may have required broadcasters to build two different, largely redundant, systems: one system to carry program material to the transmitter site and a separate system to handle other data. Eliminating the rule will provide tangible benefits to broadcasters by reducing unnecessary duplication of systems and facilities and enabling them to operate more efficiently. We therefore find the benefits of eliminating the final link rule to be significant.

C. Adaptive Modulation

39. The Commission's Part 101 rules contain a minimum payload capacity rule intended to ensure that FS links are operated efficiently. In this section, we permit temporary operations below the

[124] *NPRM*, 25 FCC Rcd at 11257 ¶ 26.

[125] *NPRM*, 25 FCC Rcd at 11258 ¶ 27.

[126] In response to EIBASS's request, we confirm that broadcasters would be able to access the 932.5–935 MHz and 941.5–944 MHz FS bands. *See* EIBASS Comments at 5. Broadcasters would apply for Part 101 authorizations and would be subject to the applicable Part 101 technical rules.

[127] Comments of AT&T Inc. (filed Oct. 25, 2010) (AT&T Comments) at 9, Comments of Aviat Networks (filed Oct. 25, 2010) (Aviat Networks Comments) at 2, Comments of Ceragon Networks (filed Oct. 25, 2010) (Ceragon Comments) at 3-4, Comments of Fixed Wireless Communications Coalition (filed Oct. 25, 2010) (FWCC Comments) at 7-8, NSMA Comments at 5-6, SBE Comments at 3, Comments of T-Mobile USA, Inc. (filed Oct. 25, 2010) (T-Mobile Comments) at 7-8, Comments of United States Cellular Corporation (filed Oct. 25, 2010) (U.S. Cellular Comments) at 4; Comments of Wireless Strategies, Inc. (filed Oct. 25, 2010) (WSI Comments) at 2-3.

[128] *See supra* at Section I.A.2, *supra*.

[129] AT&T Comments at 9.

[130] *Compare* EIBASS Comments at 1 (eliminating final link rule would be a reasonable *quid pro quo* for allowing sharing in the 7 and 13 GHz bands) and SBE Comments at 3 (taking contrary position).

minimum capacity under certain circumstances, which will enable FS links to maintain critical communications during periods of fading.

1. Background

40. Section 101.141(a)(3) of the Commission's Rules establishes minimum payload capacities (in terms of megabits per second) for various channel sizes in certain Part 101 bands.[131] The underlying purpose of the rule is to promote efficient frequency use.[132] Requiring links to carry a set amount of traffic (expressed in megabits/second) ensures that licensees will actually use facilities they apply for. Although the Commission has never quantified the time period over which licensees must comply with those standards, the industry has generally construed the payload requirements as applying whenever the link is in service.[133]

41. On May 8, 2009, Alcatel-Lucent; Dragonwave, Inc.; Ericsson, Inc.; Exalt Communications; FWCC; Harris Stratex Networks; and Motorola (Petitioners) filed a request for interpretation of the Commission's Rules.[134] Petitioners asked the Bureau to interpret Section 101.141(a)(3) of the Commission's Rules to permit data rates to drop for brief periods below the minimum payload capacity specified in the rules, so long as the values mandated by the rules were maintained both in normal operation and on average.[135] Petitioners asserted that fixed service links, especially long links, are subject to atmospheric fading, which is a temporary drop in received power caused by changes in propagation conditions.[136] According to Petitioners, one way to combat fading is by briefly reducing the data rate, which requires a temporary change in the type of modulation, a process called "adaptive modulation."[137] Petitioners argued that a reduced transmission rate is better than having no transmission at all, because many systems require a resynchronization that would interrupt communications for several minutes during a fade.[138] Petitioners further alleged that, in a properly designed system, fading conditions occur less than one percent of the time, so that, even under pessimistic assumptions, a system employing adaptive modulation will comfortably achieve the minimum payload capacity on average.[139] They asserted that this interpretation of the rule would fully maintain the rule's

[131] 47 C.F.R. § 101.141(a)(3).

[132] *See* Reorganization and Revision if Parts 1, 2, 21 and 94 of the Rules to Establish a New Part 101 Governing Terrestrial Microwave Fixed Radio Service, *Report and Order*, WT Docket No. 94-148, 11 FCC Rcd 13449, 13476 ¶ 77 (1996).

[133] *See* Request of Alcatel-Lucent, et al. for Interpretation of 47 C.F.R. §101.141(a)(3) To Permit Use of Adaptive Modulation Systems, WT Docket No. 09-106 (May 8, 2009) (FWCC Request) at 2.

[134] *Id.*

[135] *Id. at* 2.

[136] *Id.* at 3. Because water vapor is one of the primary causes of atmospheric fading, the fading is often referred to as "rain fading."

[137] *Id.*

[138] *Id.*

[139] *Id.*

purpose by enhancing spectrum efficiency.[140] Finally, Petitioners also stated that the interpretation would allow for the continued handling of critical traffic when the link would otherwise be inoperative.[141]

42. In the *NPRM*, the Commission determined that a rule change was needed to implement the policy interpretation sought in the FWCC Request because the policy interpretation was inconsistent with the plain language of the current rule, which has been interpreted to require compliance with the minimum payload capacity at all times when a system is in operation.[142] The Commission concluded that it would be in the public interest to commence a rulemaking proceeding to facilitate the use of adaptive modulation.[143] It noted that "[a]llowing carriers to operate below the current efficiency standards for short periods when it is necessary to maintain an operational link, without a need for waiver, could enable carriers to save on costs and enhance reliability of microwave links."[144] The Commission also recognized the benefits of allowing carriers to maintain communications during adverse propagation conditions.[145]

43. The Commission expressed a concern that the standard proposed in the FWCC Request, *i.e.*, requiring compliance with the efficiency standards "on average" and "during normal operation," would give licensees too much latitude to deploy inefficient systems.[146] It tentatively rejected a proposal by Verizon to require restrictions on equipment in order to enforce the limitations on adaptive modulation because of the potential to increase equipment prices.[147] The Commission proposed a rule under which "the minimum payload capacity requirements must be met at all times, except during anomalous signal fading, when lower capacities may be utilized in order to maintain communications."[148] Finally, the Commission asked whether it should specify a minimum amount of time a link should be operational or a minimum efficiency standard below which an FS station may not fall.[149]

2. Discussion

44. We conclude that it is in the public interest to amend our rules to facilitate the use of adaptive modulation. Most commenters agree that allowing the use of adaptive modulation will have significant benefits, including: (1) maintaining data throughput better than the zero rate that would otherwise be caused by a fade; (2) continuing to handle critical traffic when the link would otherwise cease to operate; and (3) maintaining network synchronization without the need for a time-consuming reboot.[150] EIBASS, the only party that opposes allowing adaptive modulation, argues that any attempt to

[140] *Id.* at 4.

[141] *Id*.

[142] *NPRM*, 25 FCC Rcd at 11260 ¶ 35.

[143] *NPRM*, 25 FCC Rcd at 11260 ¶ 36.

[144] *NPRM*, 25 FCC Rcd at 11260 ¶ 36.

[145] *NPRM*, 25 FCC Rcd at 11260 ¶ 37.

[146] *NPRM*, 25 FCC Rcd at 11261 ¶ 38.

[147] *NPRM*, 25 FCC Rcd at 11261 ¶ 38.

[148] *NPRM*, 25 FCC Rcd at 11261 ¶ 39. The Commission also sought comment on requiring applicants who propose to use modulations below the minimum payload capacity to state that fact in their prior coordination notices. *Id*.

[149] *NPRM*, 25 FCC Rcd at 11261 ¶ 39.

[150] FWCC Comments at 8. *See also* AT&T Comments at 10, Aviat Networks Comments at 2, Ceragon Comments at 4-5, Comments of Cielo Networks, Inc. (filed Oct. 25, 2010) (Cielo Comments) at 1, Comments of Clearwire (continued….)

define by rule the conditions that justify adaptive modulation would open "a Pandora's box."[151] As discussed below, however, we believe that it is possible to craft rules that allow use of adaptive modulation while maintaining spectrum efficiency.[152]

45. Parties disagree about the protections that will be necessary to ensure that adaptive modulation will not be abused by operators that might seek to save money by operating inefficient links. Supporters of adaptive modulation recognize that there is a potential for abuse and offer a variety of proposals to address that problem. Several of them support the Commission's proposed rule language.[153] FWCC opposes specifying a minimum percentage availability as a prerequisite for adaptive modulation because writing a minimum number into the rules will allegedly limit the freedom of link designers to specify parameters appropriate to a particular objective.[154] It asks the Commission to impose one of several general conditions designed to maximize licensee flexibility.[155] On the other hand, Aviat Networks, Comsearch, Motorola, Sprint, and Verizon argue that the rules should specify a minimum percentage of time when the link would be available, in order to allow use of modulations below the minimum payload capacity.[156] Several parties propose a requirement that paths using adaptive modulation be designed to be available 99.995% or 99.999% of the time while complying with the minimum payload capacity,[157] while FWCC and Motorola propose using a 99.95% standard.[158]

(Continued from previous page)
Corporation (filed Oct. 25, 2010) (Clearwire Comments) at 9, Comments of Comsearch (filed Oct. 25, 2010) (Comsearch Comments) at 17, Comments of FiberTower Corporation (filed Oct. 25, 2010) (FiberTower Comments) at 7, Comments of Kasian Franks, Chief Executive & Visionary Officer, Mimvi, Inc. (filed Sep. 15, 2010) (Mimvi Comments) at 6-7, NSMA Comments at 6-8, Comments of OEM Comments, LLC (filed Oct. 13, 2010) (OEM Comments) at 2, Comments of Sierra Telecom, Inc. (filed Oct. 25, 2010) (Sierra Telecom Comments) at 1-2, Comments of Sprint Nextel Corporation (filed Oct. 25, 2010) (Sprint Comments) at 5, Comments of the Telecommunications Industry Association (filed Oct. 25, 2010) (TIA Comments) at 3-5, U.S. Cellular Comments at 5, Comments of Verizon and Verizon Wireless on the Notice of Proposed Rulemaking and Notice of Inquiry (filed Oct. 25, 2010) (Verizon Comments) at 4-5 (explaining that Verizon's support is contingent on the adoption of appropriate enforceable safeguards designed to prevent misuse of adaptive modulation and minimize the amount of operation below the minimum payload capacity), Comments of Agape Church Inc, dba VTN (filed Oct. 20, 2010) (VTN Comments) at 1, WSI Comments at 3, Comments of The Wireless Internet Service Providers Association (filed Oct. 25, 2010) (WISPA Comments) at 3-4.

[151] EIBASS Comments at 7.

[152] The Satellite Industry Association (SIA) does not oppose adaptive modulation in principle but suggests that adaptive modulation might be limited to bands without other co-primary services, such as the Fixed Satellite Service. Comments of the Satellite Industry Association (filed Oct. 25, 2010) (SIA Comments) at 12-14.

[153] AT&T Comments at 10-13, Ceragon Comments at 4-5, Clearwire Comments at 9, OEM Comments at 2, TIA Comments at 5, U.S. Cellular Comments at 4-6.

[154] FWCC April 29 *Ex Parte* at 1-2.

[155] The conditions FWCC proposes, in order of decreasing preference, are: (1) links may operate below the minimum specified payload for short periods of time in order to maintain link continuity when the microwave link is experiencing a deep fade condition; (2) the average payload must be maintained at or above the minimum specified in the rules; and (3) links designed to operate temporarily below the minimum specified payload must be designed to high availability in accordance with good engineering practice. *See* FWCC April 29 *Ex Parte* at 2.

[156] Aviat Networks Comments at 2-3, Comsearch Comments at 19, Comments of Motorola, Inc. (filed Oct. 25, 2010) (Motorola Comments) at 7-8, Sprint Comments at 5, Verizon Comments at 9-10.

[157] Aviat Networks Comments at 2-3 (99.999%), Comsearch Comments at 19 (99.999%, except 99.995% for links using Category A antennas), EIBASS Reply at 8 (supports Comsearch proposal), Verizon Comments at 9-10 (99.999%).

46. In an *ex parte* filing, Verizon argues that a 99.95% standard would undermine the Commission's goal in this proceeding to maximize the opportunity for fixed services to share existing bands.[159] In particular, Verizon asserts that a 99.95% standard would create improper incentives to use smaller and lower performance antennas, which would significantly decrease spectral efficiency and increase the deployment costs and interference to future microwave licensees.[160] Verizon also contends that a lower standard would "increase the potential for interference conflicts among wireless backhaul licensees."[161]

47. We determine that applying a 99.95% standard strikes the appropriate balance between providing operators with the flexibility to address anomalous fading conditions while maintaining spectral efficiency. Specifically, we will require applicants seeking permission to use modulations below the minimums established in Section 101.141(a)(3) of the Commission's Rules to design their paths to be available at modulations compliant with the minimum payload capacity at least 99.95% of the time. In other words, applicants will have to design their paths to operate in full compliance with the capacity and loading requirements for all but 4.38 hours out of the year. A quantitative standard will provide an objective means for determining compliance with the rules and eliminate some disputes. We are concerned that under FWCC's proposal, as well as the Commission's proposal in the *NPRM*, there would be insufficient safeguards to prevent the deployment of inefficient systems. While we understand FWCC's concern about providing sufficient flexibility to applicants, we do not believe that a 99.95% standard would be overly restrictive, because most paths are designed to a standard of at least 99.95% availability.[162]

48. We decline to apply the 99.999% standard, as Verizon and others advocate, because it would not provide meaningful relief, as it would only anticipate 5.26 minutes a year of impaired operations for a link. With a 99.999% standard, an applicant would be required to build a more expensive system designed to operate through severe weather, which could make deployment cost-prohibitive in some instances. By way of hypothetical, consider a single link in the 6 GHz band that would require 10-foot antennas with a 99.999% standard instead of 6-foot antennas under the 99.95% standard. The total cost increase over a ten-year period in this hypothetical example could exceed $100,000.[163] Furthermore, most systems use multiple links. We believe that the increased reliability and cost savings adaptive modulation will make possible under a 99.95% standard outweigh the marginal costs of a small temporary reduction in spectral efficiency. Therefore, we find the 99.95% standard to be in the public interest.

(Continued from previous page)

[158] Motorola Comments at 7-8, FWCC April 29 *Ex Parte* at 2. While FWCC does not support a quantitative standard, it would recommend the 99.95% standard if the Commission decides to adopt such a standard. *Id.*

[159] Letter from Leora Hochstein, Executive Director, Federal Regulatory, Verizon to Ms. Marlene H. Dortch, Secretary, Federal Communications Commission (filed Aug. 2, 2011) (Verizon August 2 *Ex Parte*) at 2.

[160] *Id.* at 3.

[161] *Id.*

[162] *See* Motorola Comments at 7.

[163] Aviat Networks explains that the typical cost of renting space for an antenna on a tower is $400 + $100 per foot (diameter) each month. Aviat Networks Comments at 3. Increasing antenna size at each end of a link from 6 feet to 10 feet would increase site rental expenses by $800/month (2 links X 4 feet X $100/foot), or $9,600 each year, which equals $96,000 over a ten year period. When the increased cost of the larger, higher performance antenna is taken into account, the increased expenses could be over $100,000.

49. We reject Verizon's arguments that a 99.95% design standard will lead to increased interference or provide improper incentives to deploy inefficient systems. A temporary drop in a data rate, by itself, does not increase interference to other operators. Furthermore, we adopt a series of safeguards designed to protect existing systems. We adopt the *NPRM*'s proposal to require licensees that plan to use adaptive modulation to indicate their intent in prior coordination notices. We agree with FWCC and AT&T that such a requirement will help the industry catch possible abuses[164] and address any potential issues through the coordination process before the facilities are authorized. We will also require applicants to apply for all modulations they intend to use as part of their authorizations. Under the rule we adopt today, adaptive modulation can only be used during periods of anomalous signal fading, and the use must be necessary to allow licensees to maintain communications. Furthermore, systems must be designed to operate in full compliance with our existing capacity and loading requirements for all but 4.38 hours out of the year. Finally, we require applicants to use good engineering practice in determining the percentage of time a system can operate in compliance with the capacity and loading requirements. As suggested by FWCC, we will not dictate the use of a specific engineering model to determine availability but presume that use of Telecommunications Industry Association Bulletin TSB 10-F to determine availability is consistent with good engineering practice.[165]

50. To the extent Verizon is concerned about the increased use of smaller antennas,[166] we note that our rules already contain protections designed to minimize interference from smaller antennas. Section 101.115(b) of the Commission's Rules establishes directional antenna standards designed to maximize the use of microwave spectrum while avoiding interference between operators.[167] More specifically, the Commission's Rules set forth certain requirements, specifications, and conditions pursuant to which FS stations may use antennas that comply with either the more stringent performance standard in Category A (also known as Standard A) or the less stringent performance standard in Category B (also known as Standard B).[168] In general, the Commission's Rules require a fixed microwave operator using a Category B antenna to upgrade if its antenna causes interference problems that would be resolved by the use of a Category A antenna.[169] Thus, if adaptive modulation allows a licensee to use a Category B antenna, but that antenna would cause interference to (or receive interference from) another operation, the other operator can require the licensee to upgrade to a Category A antenna if the upgrade would resolve the interference issue. This rule applies even when the use of the Category B antenna precedes use by the other licensee.

51. Further, we decline to grant Verizon's request that we establish additional equipment-based restrictions on adaptive modulation – including requiring all licensees to operate at no less than two-thirds of the minimum payload capacity values established in Section 101.141(a)(3).[170] We believe that the time-based design standard for link availability, along with the other safeguards in the rule we adopt today, will adequately prevent the proliferation of inefficient systems and find that imposing additional requirements would limit licensee flexibility and place undue regulatory burdens on licensees.

---

[164] *See* FWCC Comments at 13, AT&T Comments at 13.

[165] *See* FWCC April 29 *Ex Parte* at 3.

[166] *See* Verizon August 2 *Ex Parte* at 3.

[167] 47 C.F.R. § 101.115(b).

[168] *See* 47 C.F.R. § 101.115(b).

[169] *See* 47 C.F.R. § 101.115(c).

[170] *See* Verizon Comments at 7-9, 10-12.

Finally, we reject Verizon's proposal to limit the transmit power and power spectral density when using non-compliant modulations to no more than 3 dB greater than the values of the worst-case (highest total signal power, highest power density) values of the available compliant modulations.[171] An applicant can specify multiple emissions/modulation schemes, but they all must have the same EIRP unless they license separate paths. The gains realized from the use of adaptive modulation are related to the lower receiver threshold with lower order modulation schemes, not by using higher power with lower order modulation.

52. We will not require licensees to log instances when they use adaptive modulation or to include that information in station records.[172] We are establishing the minimum availability standard as a path design requirement, not as an operational requirement. We believe that the best time to enforce the rule is before equipment is deployed, not after. Once an operator has made the investment required to deploy adequate equipment in a well-designed link, it should have every incentive to operate that equipment consistent with the design standard. It is possible, of course, that unusual weather conditions could require some operators to use adaptive modulation for longer intervals than our design standard specifies. However, we see no reason to penalize operators for events that are beyond their control. In that context, we believe that the burden imposed by requiring the logging of adaptive modulation episodes would outweigh any potential benefit of the information.

53. We conclude that allowing licensees to use adaptive modulation will confer substantial benefits on operators and their customers, while imposing minimal, if any, cost. Adaptive modulation will allow operators to maintain critical links during fade conditions, decreasing the number of microwave service outages they experience and the detrimental impacts that these outages may cause for consumers. Furthermore, by reducing service outages, use of adaptive modulation may permit operators to avoid costs and delays associated with reinitializing service. The rules we adopt today are designed to appropriately restrict use of adaptive modulation to provide fixed microwave operators additional flexibility to deal with adverse conditions while ensuring that their systems continue to be operated efficiently.

D. Auxiliary Stations

54. In this Section, we decline to permit FS licensees to coordinate and deploy "auxiliary" links within the coordinated service contour of primary links, because we lack a sufficient basis for concluding that auxiliary stations could coexist with primary FS stations without causing interference.

1. Background

55. In the *NPRM*, the Commission sought comment on a proposal to permit greater reuse of scarce microwave resources by permitting FS licensees to coordinate and deploy multiple links – a primary link and "auxiliary" links.[173] The idea had its origin in a petition filed by Wireless Strategies, Inc. (WSI) asking the Commission to issue a declaratory ruling "confirming that a Fixed Service licensee is permitted to simultaneously coordinate multiple links whose transmitter elements collectively comply with the Commission's antenna standards and frequency coordination procedures."[174] Although the

[171] *See* Verizon Comments at 10-11.

[172] *NPRM*, 25 FCC Rcd at 11261 ¶ 39.

[173] *See NPRM*, 25 FCC Rcd at 11261-11269 ¶¶ 41-58.

[174] Request for Declaratory Ruling filed by Wireless Strategies, Inc., WT Docket No. 07-121 (filed Feb. 23, 2007) at 1. WSI describes itself as a "carrier's carrier" whose "mission is to engineer, provision, operate, lease and/or sell (continued….)

Commission denied WSI's petition for declaratory ruling, determining that WSI's requested interpretation was inconsistent with its current rules,[175] it found WSI's concept to be "worthy of further consideration."[176]

56. Generally, the concept of auxiliary stations rests on the fact that a point-to-point microwave transmitter typically radiates energy outward in a keyhole-shaped signal pattern.[177] This signal pattern precludes other stations from sharing the same spectrum in that area, if placement of the new transmitter would interfere with the original licensee's ability to receive its signal at its downlink station.[178] The auxiliary stations proposal contemplates placement of multiple smaller transmitters within the signal pattern of the main link.

57. The Commission sought to clarify debate on the merits of the proposal by proposing specific rule changes intended to capture WSI's underlying concept, while preserving existing Part 101 practices, policies, and expectations to the greatest extent possible. Accordingly, the Commission sought comment on allowing FS licensees to deploy auxiliary stations under the following conditions, among others:[179]

- Each auxiliary station would be required to operate on the same frequencies as the main licensed link.
- Auxiliary stations would not be allowed to cause any incremental interference to other primary links, *i.e.*, they would not be allowed to cause any more interference to other primary stations than the main link would cause.
- Auxiliary stations would be secondary in status and would have no right to claim protection from interference from any primary stations.
- Auxiliary stations would have to be coordinated in advance with other licensees and applicants pursuant to the frequency coordination process specified in Section 101.103 of the Commission's Rules.
- Auxiliary stations would not be subject to the loading, antenna standards, or minimum path length requirements that apply to main links.[180]

58. In seeking comment on those proposals, we asked commenters to provide: (1) estimates of how many systems they contemplated operating with auxiliary stations; (2) information on whether such systems would typically be deployed in urban or rural areas; (3) the types of uses to which such systems would be put; (4) the distances they contemplated between the auxiliary stations and their main

(Continued from previous page)
Concurrently Coordinated licensed microwave networks in every city and town across the United States." *See* http://www.wirelessstrategies.net (last visited Jun. 14, 2011).

[175] *NPRM*, 25 FCC Rcd at 11264-11265 ¶¶ 48-49.

[176] *NPRM*, 25 FCC Rcd at 11265 ¶ 50.

[177] *See NPRM*, 25 FCC Rcd at 11266 ¶ 51.

[178] *Id.*

[179] *See NPRM*, 25 FCC Rcd at 11266-11267 ¶ 52.

[180] *See* 47 C.F.R. §§ 101.115, 101.141(a)(3), 101.143.

links; and (5) the relative amounts of traffic that they expected to carry on main links versus the auxiliary links.[181] We also asked commenters to discuss the possibility that services where geographic area licensing already exists – such as the Local Multipoint Distribution Service, the 24 GHz Service, or operations in the 38.6-40.0 GHz band (39 GHz band) – might provide a more reasonable way of accommodating any need for auxiliary stations.[182]

2. Discussion

59. Most commenters oppose the proposal to allow auxiliary stations. They argue that auxiliary stations will increase congestion, cause greater interference, and create opportunities for gaming/manipulation that would be detrimental to competition and efficient deployment of microwave facilities.[183] Supporters contend that auxiliary stations could result in more efficient use of spectrum and could support a variety of innovative uses.[184]

60. As explained in greater detail below, we decline to adopt at this time our proposal to allow use of auxiliary stations in FS bands. We lack a sufficient basis for concluding that auxiliary stations could coexist with FS stations without causing interference to primary FS stations. Moreover, we are concerned that adopting the auxiliary stations proposal would create a perverse incentive for applicants to propose excessive power for their primary transmitters, wasting spectrum in an effort to stake out as much territory as possible for auxiliary stations. Finally, using upper microwave bands such as LMDS, 24 GHz, and 39 GHz appears to be a viable alternative for the type of operations contemplated under the auxiliary station proposal.

61. Proponents of auxiliary stations largely operate on the premise that FS spectrum is "wasted," particularly in urban areas.[185] We disagree with this premise because there is already extensive reuse of FS spectrum. It is even possible to re-use a frequency at exactly the same location, under existing procedures. To illustrate how closely point-to-point microwave transmitters can be packed in congested areas, Comsearch submits a map that depicts the microwave links in the Los Angeles area in

[181] *NPRM*, 25 FCC Rcd at 11268 ¶ 54.

[182] *NPRM*, 25 FCC Rcd at 11268 ¶ 55.

[183] AT&T Comments at 17-20, Comsearch Comments at 3-17, Comments of the law firm of Blooston, Mordkofsky, Dickens, Duffy & Prendergast, LLP (filed Oct. 25, 2010), Ceragon Comments at 6-14, Cielo Comments at 1, Clearwire Comments at 9-10, EIBASS Comments at 7-10, FWCC Supplemental Comments, Comments of Gary R. Gray, Radio Systems Manager, City of Fort Lauderdale (filed Oct. 22, 2010) at 1-2, Comments of Holy Cross Electric Association, Inc. (filed Oct. 21, 2010) at 1, NSMA Comments at 8-14, Comments of The Rural Telecommunications Group, Inc. (filed Oct. 25, 2010) (RTG Comments), Comments of Stratos Offshore Services Company (filed Oct. 25, 2010) (Stratos Comments), T-Mobile Comments at 10-11, U.S. Cellular Comments at 6-7, Verizon Comments at 13-20.

[184] Reply Comments of Doctors Telehealth Network Inc. (filed Nov. 8, 2010), Comments of Exalt Communications, Inc. (filed Nov. 22, 2010) (Exalt Comments), Letter from David L. Renaud, Vice President, Corporate Affairs and General Counsel, Proxim Wireless, Inc. (filed Feb. 17, 2011), Mimvi Comments at 7, New America Foundation's Open Technology Initiative *Ex Parte* (filed Mar. 16, 2011), Sprint Comments at 5-7, WISPA Comments at 4, WSI Comments.

[185] Exalt Comments at 3 (eliminating antenna standards and minimum path requirements for auxiliary stations would encourage technological innovation and make use of otherwise wasted spectrum); WSI *Ex Parte* (filed Dec. 9, 2010) at 6-7 (purporting to show that one FS link could block over one million paths).

the Lower 6 GHz (5925-6425 MHz) and Upper 6 GHz (6525-6875 MHz) bands.[186] It is reproduced as Figure 1.

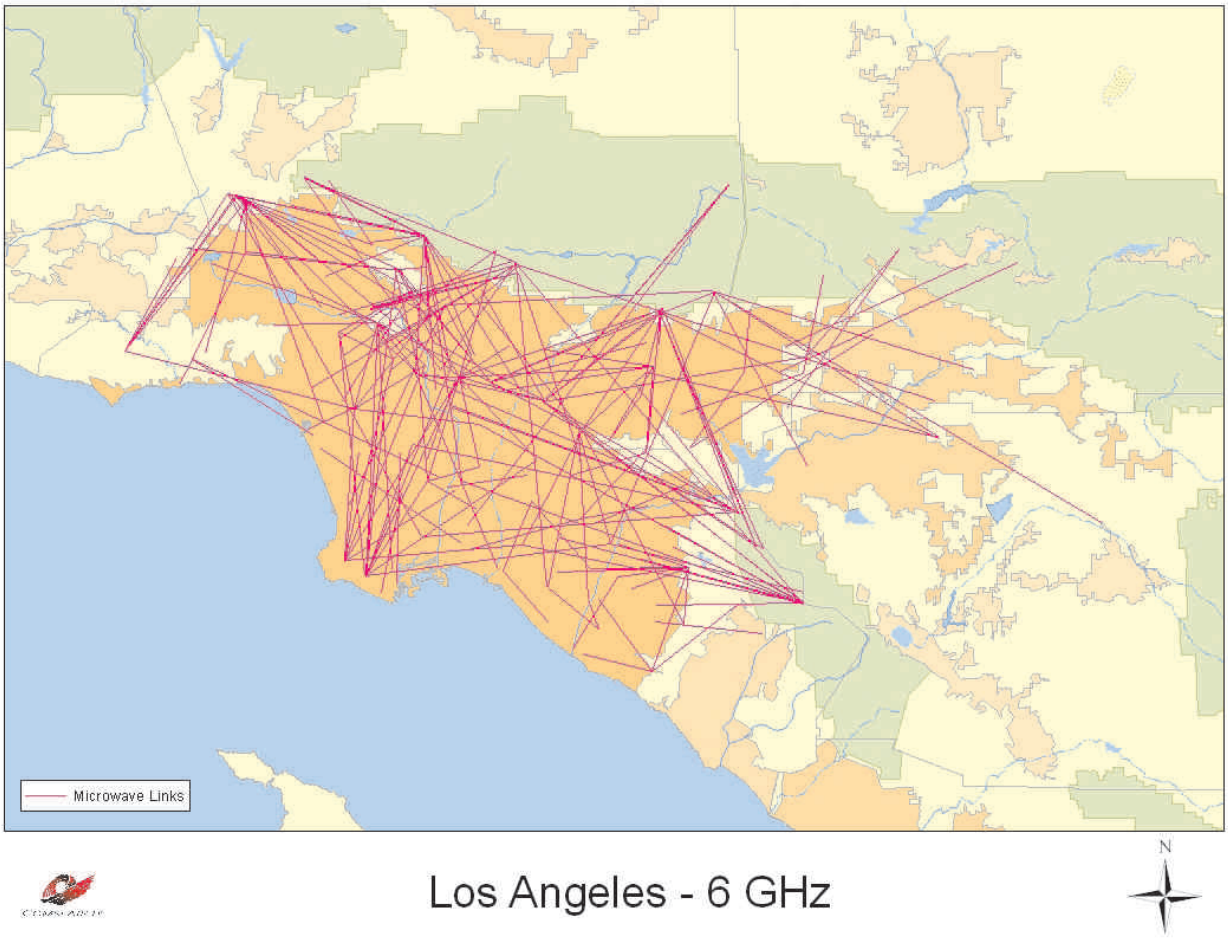

Figure 1: 5,925-6,425 MHz and 6,525-6,875 MHz Links in Los Angeles (Comsearch Data; October, 2010)

62. Comsearch and Ceragon provide additional data showing extensive reuse of FS spectrum in the same geographic area. Comsearch reports that there are approximately 1,500 licensed stations in the 6 GHz band that transmit two or more beams on the same frequency, by pointing them in different directions.[187] Ceragon says that its database search yielded more than 1,400 call signs where multi-way junction sites are transmitting on co-channel frequencies in the Lower 6 GHz band alone.[188] That, it says, illustrates how the signal pattern of a transmitting facility does not preclude sharing the same spectrum with other operators at the same location.[189]

[186] Comsearch Comments at 7.

[187] Comsearch Comments at 6-7.

[188] Ceragon Comments at 6.

[189] Ceragon Comments at 6.

63. As mentioned above, there is an insufficient record for us to conclude that auxiliary stations can coexist with existing microwave operations without causing interference. We reject, however, the argument that auxiliary stations should not be allowed solely because authorizing them would cause further congestion to spectrum that is already congested. If auxiliary stations could coexist with other microwave operations, we would view the ability to use spectrum more intensively as a positive development.

64. Most opponents of the auxiliary stations concept argue that it would be inefficient to intermix frequency division duplex (FDD) currently used in the microwave bands and time division duplex (TDD) operations, as WSI proposes.[190] Comsearch points out that intermixing FDD and TDD increases the types of potential interference that may occur, including direct interference between sites, co-site interference, and reflective interference.[191] In response, WSI relies on the ability of smart antennas to adapt an antenna pattern and use spectrum more efficiently.[192] As noted by EIBASS, however, WSI has not provided any detailed information concerning the physically small, phased-array microwave antenna that it asserts would be suitable for auxiliary stations.[193] Indeed, WSI has allegedly ignored requests from SBE and NSMA for credible proof of the performance that WSI ascribes to that antenna.[194]

65. Furthermore, while WSI has repeatedly claimed that TDD-style auxiliary station operations would use spectrum more efficiently than existing FDD-style microwave operations,[195] it has offered insufficient analysis of how auxiliary stations would co-exist with existing microwave operations. In the *NPRM*, the Commission had emphasized its intention to avoid interference to existing operations and to maintain "the reliability and integrity of existing systems."[196] Furthermore, the proposal to require prior coordination for auxiliary stations and to make auxiliary stations secondary to existing primary links does not adequately address the potential for interference but instead could result in situations where incumbent microwave licensees could face the costly and time-consuming process of identifying and resolving complex interference issues.[197]

66. An additional consideration is that adopting the auxiliary stations proposal could create a perverse incentive for applicants to propose excessive power for their primary transmitters, creating a more diffuse antenna pattern, and thus precluding other microwave operators from coordinating spectrum or operating in that larger area. In the *NPRM*, the Commission sought comment on that issue.[198] EIBASS, San Mateo, and Verizon point to a prior coordination notice submitted by OEM as an example

[190] Ceragon Comments at 11, Clearwire Comments at 2-3, 9, Comments of Consolidated Spectrum Services (filed Oct. 13, 2010), FWCC Supplemental Comments at 10, NSMA Comments at 10-11, RTG Comments at 2, Stratos Comments at 7.

[191] *Ex Parte* of Comsearch (filed Mar. 14, 2011) at 25-30.

[192] *Ex Parte* of Wireless Strategies, Inc. (filed Apr. 6, 2011) at 19-22.

[193] EIBASS Comments at 7.

[194] EIBASS Comments at 7.

[195] *See* WSI Reply Comments at 4; WSI December 9 *Ex Parte*.

[196] *NPRM*, 25 FCC Rcd at 11268 ¶ 53.

[197] *See* FWCC Supplemental Comments at 7-8; Comsearch Comments at 15-16.

[198] *NPRM*, 25 FCC Rcd at 11268 ¶ 57.

of how auxiliary stations could result in an inefficient use of spectrum and preclude frequency sharing.[199] OEM proposed an equivalent isotropic radiated power (EIRP) of 84.7 dBm (near the maximum authorized under the rules) for an extremely short path (9 kilometers).[200] We disagree with WSI that the arguments raised against the OEM notices are a "diversion."[201] WSI's claim that higher power was not necessary for that license is not consistent with the prior coordination notice submitted by OEM.[202] Furthermore, several licenses issued to WSI proposed the same very high EIRP level of 84.7 dBm.[203] The proponents of auxiliary stations have not adequately explained these circumstances or proposed any ways in which the Commission could prevent or counteract manipulation of the auxiliary stations mechanism in this manner. Thus, we remain concerned about the compatibility of auxiliary stations with existing operations.

67. We also decline to authorize auxiliary stations in FS bands because such operations can be accommodated in several upper microwave bands for which the Commission has issued geographic area licenses, including Local Multipoint Distribution Service (LMDS) 24 GHz, and 39 GHz, in which licensees may freely deploy links as they see fit. Moreover, many of the commenters that support the auxiliary station concept say that they would use such stations primarily for short-range applications. For example, Mimvi contends that auxiliary stations would provide cost-effective telecommunications support for small intelligent data centers that would be able to cache information and cloud software applications close to end users, improving the efficiency of national data networks and maintaining local connectivity in rural areas when their long, vulnerable links to the national grid are compromised.[204] Sprint contends that auxiliary stations would be especially useful in dense urban environments, where they could enable each primary link to support multiple cell sites where landline alternatives are absent or prohibitively expensive.[205] These types of short range applications are exactly the kinds of uses for which these higher frequency upper microwave bands should be most useful. In addition, FiberTower, which has extensive license holdings in the 24 GHz and 39 GHz bands, believes that auxiliary stations would work well within those bands and is willing to work with operators to support such deployments.[206] In response, WISPA asserts that auxiliary stations may be a lower cost alternative in rural areas because LMDS and similar bands were auctioned by the Commission but does not provide analysis in support of its contention.[207] It is also unclear whether WISPA has taken into account the cost of individually coordinating and applying for each auxiliary station.

68. While we do not authorize auxiliary stations in existing FS bands today, we encourage proponents of the auxiliary stations concept to continue working with other interested stakeholders to develop it. We note that proponents of the auxiliary stations concept believe that auxiliary stations would support such varied uses as the provision of backhaul, telecommunications support for small intelligent

[199] EIBASS Comments at 8-9; Comments of San Mateo County (filed Oct. 25, 2010) (filed Oct. 25, 2010) (San Mateo Comments) at 2-3, Verizon Comments at 18-19.

[200] *See* San Mateo Comments at Attachment (submitting OEM's prior coordination notices).

[201] WSI April 6 *Ex Parte* at 23-24.

[202] *See* San Mateo Comments at Attachment (submitting OEM's prior coordination notices).

[203] *See* licenses for Stations WQGH695, WQGH696, and WQGH697.

[204] Mimvi Comments at 2.

[205] Sprint Comments at 6-7.

[206] Reply Comments of FiberTower Corporation (filed Nov. 22, 2010) (FiberTower Reply) at 8-9.

[207] WISPA Comments at 4.

data centers, and rural telemedicine applications.[208] We believe proponents of auxiliary stations should take advantage of the opportunities presented by 24 GHz, LMDS, and 39 GHz bands to develop and deploy auxiliary stations. To the extent parties believe further testing is needed to develop the auxiliary stations concept,[209] we encourage those parties to cooperate in testing and development efforts, to develop a better factual record regarding the interaction of potential auxiliary station configurations with existing incumbent microwave systems and with microwave applicants yet to come.

V. FURTHER NOTICE OF PROPOSED RULEMAKING

69. In this *FNPRM*, we seek more targeted comment on proposals originally discussed in the *NOI* for increasing the flexibility of our Part 101 rules to promote wireless backhaul. We also address a petition for rulemaking filed by FWCC. Finally, we seek comment on certain proposals offered by parties in response to the *NOI* that we believe warrant further consideration.

A. Review of Part 101 Antenna Standards

1. Background

70. As noted above, Section 101.115(b) of the Commission's Rules[210] establishes directional antenna standards designed to maximize the use of microwave spectrum while avoiding interference between operators.[211] More specifically, the Commission's Rules set forth certain requirements, specifications, and conditions pursuant to which FS stations may use antennas that comply with either the more stringent performance standard in Category A (also known as Standard A) or the less stringent performance standard in Category B (also known as Standard B).[212] In general, the Commission's Rules require a Category B user to upgrade if the antenna causes interference problems that would be resolved by the use of a Category A antenna.[213] The rule on its face does not mandate a specific size of antenna. Rather, it specifies certain technical parameters – maximum beamwidth, minimum antenna gain, and minimum radiation suppression – that, depending on the state of technology at any point in time, directly affect the size of a compliant antenna.[214] The Commission adopts antenna specifications based on the technical sophistication of the communications equipment and the needs of the various users of the band at the time.[215] Indeed, the Commission adopted similar technical specifications that effectively limited

[208] Mimvi Comments at 2, Sprint Comments at 6-7, WSI Comments at 6, Reply Comments of Doctors Telehealth Network Inc. (filed Nov. 8, 2010).

[209] AT&T Comments at 18, Motorola Comments at 8.

[210] 47 C.F.R. § 101.115(b).

[211] *Id*.

[212] *See* 47 C.F.R. § 101.115(b).

[213] *See* 47 C.F.R. § 101.115(c).

[214] We may herein refer to those antennas that comply with the Category A standard as either compliant antennas or Category A antennas and those antennas that do not comply with the Category A standard as non-compliant antennas or Category B antennas.

[215] *See* Amendment of Part 101 of the Commission's Rules to Modify Antenna Requirements for the 10.7 – 11.7 GHz Band, WT Docket No. 07-54, *Report and Order*, 22 FCC Rcd 17153, 17156 ¶ 3 (2007) (*11 GHz R&O*); Reorganization and Revision of Parts 1, 2, 21, and 94 of the Rules to Establish a New Part 101 Governing Terrestrial Microwave Fixed Radio Services, *Report and Order*, WT Docket No. 94-148, 11 FCC Rcd 13449 (1996). The Commission declined to consider significant changes to the proposed rule at that time because commenting parties did not sufficiently address the issue in the record. *See id.* at 13474-13475 ¶¶ 67-71; *see also* Reorganization and (continued….)

the size of antennas used in other bands.[216] Periodically, the Commission has since reconsidered some of those antenna specifications in light of the technological evolution of communications equipment.[217]

71. In the *NOI,* the Commission solicited proposals for allowing FS licensees to use smaller antennas.[218] The National Broadband Plan recognized the importance of ensuring that the Commission's antenna standards are up to date "to maximize the cost-effectiveness of microwave services."[219] The *NPRM* noted that smaller antennas may be cheaper, easier to install, and generate fewer objections in the zoning process than antennas specified by the current requirements.[220] The *NOI* noted that tower siting costs and scarcity of desirable antenna positions may constitute significant entry barriers to new telecommunications providers.[221] However, the *NOI* also recognized that smaller antennas have increased potential to cause interference because smaller antennas "result in more radiofrequency energy being transmitted in directions away from the actual point-to-point link."[222] Therefore, the *NOI* generally inquired whether smaller antennas can be accommodated in any FS band without causing interference to other users in the band.[223]

72. In the *NOI*, the Commission asked whether it should review our antenna standards in any particular band due to the sharp increase in demand for FS facilities for backhaul and other purposes. Accordingly, in the *NOI*, we asked commenting parties to: (1) identify specific FS bands where they believe the Commission should review its antenna standards; (2) offer specific proposals for new standards; (3) describe the technological or other changes that they believe support new antenna standards; (4) describe how new antenna standards would facilitate deployment in that band; (5) discuss the impact such new antenna standards would have on other licensees in the band, including both FS licensees and other services that share the band; and (6) discuss whether the proposed standards should apply only to rural areas or to all geographical areas.[224]

(Continued from previous page)
Revision of Parts 1, 2, 21, and 94 of the Rules to Establish a New Part 101 Governing Terrestrial Microwave Fixed Radio Services, *Notice of Proposed Rule Making,* WT Docket No. 94-148, 10 FCC Rcd 2508, 2515 ¶ 19 (1994) (*Part 101 NPRM*).

[216] *See, e.g., 11 GHz R&O*, 22 FCC Rcd at 17156 ¶ 3; Reorganization and Revision of Parts 1, 2, 21, and 94 of the Rules to Establish a New Part 101 Governing Terrestrial Microwave Fixed Radio Services, *Memorandum Opinion and Order and Notice of Proposed Rulemaking*, WT Docket 94-148, 15 FCC Rcd 3129 (2000) (*Part 101 MO&O and NPRM*) (seeking comment on permitting smaller antennas in the 10 GHz band).

[217] *See, e.g. 11 GHz R&O* (adopting rules allowing smaller antennas in the 11 GHz band); Amendment of Part 101 of the Commission's Rules to Streamline Processing of Microwave Applications in the Wireless Telecommunications Services, WT Docket 00-19, *Report and Order*, 17 FCC Rcd 15040 (2002) (*2002 Part 101 R&O*) (adopting rules allowing smaller antennas for 10 GHz and 23 GHz bands); Procedures to Govern the Use of Satellite Earth Stations on Board Vessels in the 5925-6425 MHz / 3700-4200 MHz Band and 14.0-14.5 GHz / 11.7-12.2 GHz Bands, IB Docket No. 02-10, *Report and Order*, 20 FCC Rcd 674 (2005) (*ESV R&O*).

[218] *NOI*, 25 FCC Rcd at 11270-11272 ¶¶ 64-67.

[219] National Broadband Plan, Section 5.5, Recommendation 5.10 at 94.

[220] *NOI*, 25 FCC Rcd at 11271 ¶ 64.

[221] *NOI*, 25 FCC Rcd at 11272 ¶ 66 (*citing 14th CMRS Competition Report*, 25 FCC Rcd at 158-159 ¶¶ 287-292).

[222] *NOI*, 25 FCC Rcd at 11272 ¶ 66 (*citing 11 GHz R&O*, 22 FCC Rcd at 17159 ¶ 9).

[223] *NOI*, 25 FCC Rcd at 11271 ¶ 64.

[224] *NOI*, 25 FCC Rcd at 11272 ¶ 67.

2. Discussion

73. Based on the record received in response to the *NOI*, we seek additional comment on modifying the antenna standards set forth in the Commission's Rules to permit the use of smaller antennas in the 5925-6875 MHz band (6 GHz band), 17700-18820 and 18920-19700 MHz bands (18 GHz band), and 21200-23600 MHz band (23 GHz band). Several parties expressed general support for modifying the antenna standards on the basis that smaller antennas are cheaper to manufacture, install, and maintain.[225] They also contend that smaller antennas allow existing towers to accommodate more antennas and allow installations at sites that would not otherwise be able to accommodate larger antennas.[226] A number of parties argue that fixed service licensees can also reduce their deployment costs by using smaller antennas because tower space costs are often based significantly on the size and weight of the antenna being placed on the tower.[227] AT&T and EIBASS expressed general opposition to allowing smaller antennas because permitting the use of smaller antennas, without technical restrictions, could produce harmful interference and decrease spectral efficiency.[228]

74. The most extensive discussion offered by parties focused on allowing smaller antennas in the 6, 18, and 23 GHz bands.[229] With respect to the 6 GHz band, Cielo and Sprint recommend that the minimum antenna size be reduced from six feet to four feet.[230] While Comsearch originally also supported allowing four foot antennas in the 6 GHz band,[231] it later recommended that the Commission revise the antenna standards in Section 101.115 for this band to allow for use of 3-foot antennas.[232] For the 18 GHz band, Ceragon, Cielo, and Comsearch recommend that the minimum antenna size be reduced from two feet to one foot,[233] while Sprint recommends a minimum diameter of 18 inches.[234] In the 23 GHz band, commenters offered varying minimum antenna sizes. For example, Comsearch, Sprint, and

[225] FiberTower Comments at 13, Sprint Comments at 8, Motorola Comments at 10.

[226] *See, e.g.,* FiberTower Comments at 13, Motorola Comments at 10, PCIA Comments at 3.

[227] Aviat Networks Comments at 3, FiberTower Comments at 13, Motorola Comments at 10, Sprint Comments at 8.

[228] AT&T Comments at 16, EIBASS Comments at 10.

[229] No parties specifically recommend that antenna standards be relaxed in the 7 GHz or 11 GHz bands. With respect to the 7 GHz Band, SBE opposes the relaxation of antenna standards because BAS and CARS operate in those bands, and any size reductions in FS antennas would result in a greater likelihood of interference to electronic newsgathering operations and STL reception sites. SBE Comments at 8. Sprint is the only party to specifically address the 13 GHz band, where it sees particular value in adopting antenna standards that would be similar to the current antenna standards in the 11 GHz band to allow for smaller, less expensive Category B antennas that would have to be upgraded to larger, more robust Category A antennas if that becomes necessary to mitigate interference. Sprint Comments at 8. We decline to reconsider antenna standards for the 13 GHz band because of the presence of BAS and CARS and because of the limited nature of FS operations in that band in recent years.

[230] Cielo Comments at 2, Sprint Comments at 8.

[231] Comsearch Comments at 25.

[232] *See Ex Parte* Letter from Christopher R. Hardy, Vice President, Comsearch, to Marlene H Dortch, Secretary, FCC (filed Apr. 14, 2011) (Comsearch April 14 *Ex Parte*).

[233] Ceragon Comments at 16, Cielo Comments at 2, Comsearch Comments at 25. With the exception of the 18 GHz band, Ceragon opposes any broad relaxation of Part 101 antenna standards. Ceragon Comments at 16.

[234] Sprint Comments at 8.

Cielo proposed, respectively, that the Commission permit the use of antennas eight inches, six inches, and less than 1 foot in diameter.[235] FWCC supports Comsearch's proposals.[236]

75. With respect to the 6 GHz band, we seek comment on Comsearch's submitted antenna standards that would permit the use of 3-foot antennas.[237] If such a change can be made without causing harmful interference to existing users, that change would maximize the benefits of allowing smaller antennas. For the 18 GHz band, we propose to adopt the standards Comsearch has offered to allow one-foot antennas. For the 23 GHz band, we propose to allow eight-inch antennas consistent with the standards proposed by Comsearch. We note that for each of those bands, we propose changes only to the standards for Category B antennas.

76. We ask that parties specifically discuss each standard in offering further comments on the proposed modifications. To the extent that commenters propose the use of alternative antenna sizes in the 6, 18, or 23 GHz bands, we ask that they specify the technical parameters (*i.e.*, maximum beamwidth, minimum antenna gain, and minimum radiation suppression) to allow for the use of those antennas.[238] In particular, we seek comment on whether the proposed amendments would facilitate the efficient use of those bands by affording FS licensees the flexibility to install smaller antennas in those bands while appropriately protecting other users in the bands from interference.

77. We recognize that the proposed use of smaller, lower-gain antennas will result in more radiofrequency energy being transmitted in directions away from the actual point-to-point link and that the potential for interference is a concern for several parties.[239] We therefore wish to ensure that any proposed changes to the Commission's Rules appropriately protect other users in the bands from interference due to the operation of these smaller antennas. We seek comment on whether the use of smaller antennas pursuant to the proposed modifications will adversely affect other users in the specific bands by increasing the risk of interference. If so, do the potential benefits of using smaller antennas outweigh the potential risks of interference? We ask proponents of allowing smaller antennas to provide specific information quantifying how much money licensees could save in antenna, tower-siting, and deployment costs if the Commission authorized the use of smaller antennas as proposed in this *FNPRM*. Comments should be specific to a proposed antenna standard for a particular band.

78. We also seek comment on other ideas for changes to our antenna standards. Are additional options to mitigate interference needed if we modify the antenna standards in a specific band? For example, Comsearch suggested that the Commission could consider a power or EIRP tradeoff.[240] Clearwire asks the Commission to examine its rules and consider changes to Category A (also known as Standard A) and Category B (also known as Standard B) to account for technology advancements and more sophisticated band sharing techniques and permit the deployment of different antenna geometries

[235] Cielo Comments at 2, Comsearch Comments at 25, Sprint Comments at 8.

[236] *See* FWCC April 29 *Ex Parte* at 8.

[237] For each band, the technical parameters of the specific standards we are proposing are contained in the proposed rules contained in Attachment C. We note that Comsearch was the only party to offer specific proposed standards.

[238] We note that Comsearch has proposed specific standards for four foot dishes in the 6 GHz band. *See* Comsearch April 14 *Ex Parte*.

[239] *See* AT&T Comments at 16, EIBASS Comments at 10, FWCC Comments at 14-15.

[240] Comsearch Comments at 26-27. We invite Comsearch or other parties to expand on this suggestion.

and smaller diameter antennas.[241] Clearwire further urges the Commission to foster the development of different antenna geometries in addition to developing radio pattern envelope (RPE) standards for smaller diameter antennas using current parabolic geometries.[242] We seek comment on Clearwire's suggestion and on the advantages and disadvantages of other ideas for changes in our antenna standards.

B. Revising Efficiency Standards in Rural Areas

1. Background

79. In the *NOI*, the Commission sought comment on whether relaxing the current efficiency standards in rural areas would benefit rural licensees without diminishing the availability of already increasingly scarce backhaul spectrum.[243] As discussed above in the *Report and Order*, pursuant to Section 101.141(a)(3) of the Commission's Rules, Fixed Service operators must establish minimum payload capacities (in terms of megabits per second) and minimum traffic loading payload (as a percentage of payload capacity) to promote efficient frequency use for various channel sizes in certain Part 101 bands.[244] Under the current rules, the requirements apply equally to stations in urban areas and to stations in rural areas. However, the Wireless Telecommunications Bureau has historically granted waivers to licensees in rural and remote areas where operation of microwave facilities at the required efficiency standards would cause financial hardship and to the extent that the underlying purpose of the rule would not be frustrated.[245]

80. The Commission requested comment on whether lowering the current efficiency standards in rural areas would reduce the costs associated with wireless backhaul and thereby increase investment in broadband deployment.[246] The Commission asked proponents of changing the standards to explain how changes would provide more flexibility and facilitate deployment of backhaul and other facilities in rural areas while still being consistent with the underlying purpose of Section 101.141(a)(3), which is to promote efficient utilization of the spectrum.[247] In addition, the Commission asked commenters to discuss the impact such changes would have on existing licensees, including licensees in other services that share spectrum with Fixed Services.

---

[241] *See., e.g.,* Clearwire Comments at 8.

[242] Clearwire Comments at 8. Clearwire explains that the gain of an antenna is determined by the intended area of coverage and that the gain at a given wavelength is achieved by appropriately choosing the size of the antenna. *Id.* Therefore, Clearwire believes that developing different antenna geometries provides the most deployment flexibility while promoting higher performance, lower profile antennas. *Id.*

[243] *NOI*, 25 FCC Rcd at 11269 ¶ 60.

[244] 47 C.F.R. §101.141(a)(3). We also note that we are seeking comment on Comsearch's proposal to revise the payload capacity requirements of Section 101.141(a)(3). *See* Section V.E, *infra*.

[245] See, e.g., Kentucky Power Company d/b/a American Electric Power, Order, 17 FCC Rcd 453, 455 ¶ 6 (WTB PSPWD 2002) (allowing operation in remote area with transmitter purchased before efficiency standards were adopted); Wilderness Valley Telephone Company, *Order*, 15 FCC Rcd 11751, 11752 ¶ 6 (WTB PSPWD 2000) (allowing operation in remote area, when no model of compliant transmitter would withstand the weather conditions at the proposed site); Alcatel Network Systems, Inc., *Order*, 11 FCC Rcd 22407 (WTB PSPWD 1996).

[246] *NOI*, 25 FCC Rcd at 11270 ¶ 62.

[247] *NOI*, 25 FCC Rcd at 11270 ¶ 62.

81. The Commission also sought comment on how to define "rural" under a revised rule that relaxes the efficiency standards in rural areas.[248] The Commission noted that it had established a presumption to define "rural areas" as "those counties (or equivalent) with a population density of 100 persons per square mile or less, based upon the most recently available Census data."[249]

2. Discussion

82. We find that in some instances, the lower traffic volume on rural networks and greater distances between microwave links may make it financially prohibitive to meet these minimum capacity requirements when conducting backhaul operations with wireless fixed links.[250] We therefore propose to revise our application of the efficiency standards to reduce the cost of deploying microwave backhaul facilities and thereby spur deployment of broadband in rural areas. Sprint states that "relaxed minimum payload capacities and minimum traffic loading payloads . . . [could] reduce the costs of deployment and [] allow for more microwave backhaul deployment in rural areas."[251] Cielo Networks concurs, arguing that lowering the efficiency standards can "lower deployment costs, which improves the businesses case for deploying microwave networks in typically underserved rural markets."[252] Similarly, Aviat Networks supports the proposal to allow lower spectrum efficiency in rural areas because it "will drive the roll out of broadband in rural areas."[253] Relaxing efficiency standards could also substantially increase the possible path length,[254] which could dramatically improve the business case for deploying microwave backhaul facilities in certain rural areas.[255]

83. We are sensitive to the concerns of commenters that argue that lowering efficiency standards would result in less efficient use of spectrum and discourage innovation.[256] In heavily congested areas, those concerns are valid, and we do not propose a general elimination of efficiency standards. In rural areas, however, relaxing efficiency standards could make microwave backhaul affordable by allowing operators to use longer links or reduce costs in other ways. Our goal is to facilitate the use of microwave in remote areas where microwave may be the only feasible means of providing backhaul.

84. Our proposal for modifying the efficiency standards rule is based on our antenna standards rule, which is well known to microwave licensees. Under that rule, a licensee is permitted to use antennas meeting performance Standard B if the environment is not congested with other licensees.[257]

---

[248] *NOI*, 25 FCC Rcd at 11270 ¶ 63.

[249] *NOI*, 25 FCC Rcd at 11270 ¶ 63, *citing* In the Matter of Facilitating the Provision of Spectrum-Based Services to Rural Areas and Promoting Opportunities for Rural Telephone Companies To Provide Spectrum Based Services, *Report and Order*, WT Docket No. 02-381, et al., 19 FCC Rcd 19078, 19087 ¶ 11 (2004).

[250] *NOI*, 25 FCC Rcd at 11269 ¶ 60.

[251] Sprint Comments at 7.

[252] Cielo Comments at 2.

[253] Aviat Networks Comments at 3.

[254] For a detailed analysis of the relationship between modulation and path length, see FWCC April 29 *Ex Parte* at Appendix.

[255] *See*, *e.g.*, Motorola Comments at 9-10.

[256] *See* AT&T Comments at 16, Ceragon Comments at 15, Sierra Telecom Comments at 2, U.S. Cellular Comments at 8.

[257] See 47 C.F.R. § 101.115.

Under our proposal, licensees would not be required to comply with the efficiency standards of Section 101.141(a)(3) if the environment allows for the use of antennas meeting performance Standard B.[258] By definition, there should be fewer concerns about congestion and availability of spectrum in those areas. In contrast, in the more congested areas where an antenna meeting performance Standard A is required, the licensee would be required to comply with the efficiency standards unless it made a detailed showing in its application that: (1) the efficiency standards prevent the deployment of the requested link for economic or technical reasons; (2) the applicant does not have any reasonable alternatives (*e.g.*, use of different frequency bands, use of fiber); and (3) relaxing the efficiency standards would result in tangible and specific public interest benefits. If a formerly non-congested area becomes congested such that use of a Standard A antenna is required, future applicants in that area would need to comply with the efficiency standards, absent a showing along the lines described above.

85. We seek comment on this proposed rule, as well as alternative ideas for providing relief from the efficiency standards in rural areas. We ask commenters to provide specific examples of instances in which relief from the efficiency standards could promote broadband deployment. We also seek comment on how much our proposal to modify the efficiency standards rule or any alternative ideas would reduce deployment costs. Are there benefits to our proposal or any alternative ideas beyond encouraging broadband deployment in rural areas and improving the business case for deploying microwave backhaul facilities in rural areas? Parties that oppose the idea should cite specific harms that they believe would result from changing the rule. We also seek comment on various means of implementing relief. Is it appropriate to base relief on the ability to use Category B antennas, or should the rule be based on another factor, such as the number of existing microwave links in a geographic area?[259] If the rule is based on the number of links, how many links should be permitted and what is the appropriate geographic area for measuring the number of links? If relief is appropriate, should the Commission establish a new, lower efficiency requirement (*e.g.*, a percentage of Section 101.141(a)(3)'s existing requirements) in addition to the Section 101.141(a)(1) minimum bit rate requirement? In instances where an operator must use a Category A antenna, are the proposed standards for seeking relief from the efficiency standards appropriate, or should we adopt different or additional standards? Should relief from the efficiency standards be granted as a waiver requiring specific Commission action prior to operation, or should the Commission structure the relief in such a manner as to allow conditional authority?

C. Allowing Wider Channels in 6 GHz and 11 GHz Bands

1. Background

86. On May 14, 2010, FWCC filed a petition for rulemaking requesting that the Commission allow Fixed Service operators to combine adjacent 30 and 40 megahertz channels in the 5925-6425 MHz (Lower 6 GHz band) and 10700-11700 MHz band (11 GHz band) to increase the link capacity and

[258] The licensee would still be required to comply with the bit rate requirement of 47 C.F.R. § 101.141(a)(1).

[259] Although the Commission has established a presumption to define "rural areas" as "those counties (or equivalent) with a population density of 100 persons per square mile or less, based upon the most recently available Census data," we believe that this distinction is inappropriate in this instance because some rural areas may have a concentration of facilities in a particular area that is not related to its population (*e.g.*, near an interstate highway). *See* In the Matter of Facilitating the Provision of Spectrum-Based Services to Rural Areas and Promoting Opportunities for Rural Telephone Companies To Provide Spectrum Based Services, *Report and Order*, WT Docket No. 02-381, *et al.*, 19 FCC Rcd 19078, 19087 ¶ 11 (2004). In addition, licensees of these bands are familiar with the regulations governing Standard A and Standard B antennas, so it should minimize any confusion in implementing this new rule.

simplify emerging backhaul operations.[260] Currently, the maximum authorized channel bandwidths in the Lower 6 GHz band and 11 GHz band are 30 and 40 megahertz, respectively.[261] FWCC contends that the current 30 and 40 megahertz channels have a "practical maximum on a single polarization of about 180-200 Mb/s" per channel, which is adequate for voice and low-speed data services (text and e-mails) but not for high-speed data (video and web browsing).[262] FWCC anticipates that "strong growth in mobile broadband . . . will soon push backhaul requirements . . . toward[s] 360/Mb/s per channel."[263] Although FWCC acknowledges that it is possible to achieve the higher speeds by running separate signals on separate 30 or 40 MHz channels, it requires "complex electronics to coordinate the transmissions, with the additional disadvantage of intermodulation products due to multiple RF signals sharing the same antenna."[264] FWCC argues that by allowing Fixed Service operators to utilize 60 and 80 megahertz channels, it will simplify the electronics, lowers costs, improve reliability, eliminate intermodulation issues, and increase spectrum utilization.[265]

87. NSMA states that the FWCC petition "has merit and would benefit users" but that the Commission should implement appropriate regulatory constraints to assure efficient use of the spectrum.[266] Specifically, NSMA suggests that the Commission should consider: (1) "requiring a showing of necessity and availability for applications planning use of more than one or two 60/80 MHz wide channels on any one path";[267] (2) designating certain slots as "preferred" slots for wider bandwidth channels (*e.g.*, starting at one of the band edges, so all licensees would first attempt use of these channels on the same frequencies);[268] (3) adjusting the minimum payload requirements to account for the higher capacity capabilities of the wider bandwidth channels;[269] and (4) adopting methods to better assure high utilization with more tightly drawn regulations.[270] FWCC concurs with NSMA's suggestions.[271]

88. Conterra Ultra Broadband, LLC (Conterra) opposes the petition because of concern that increasing the channel bandwidth will further limit the overall availability of channels for use in the Lower 6 and 11 GHz bands as Fixed Service operators begin to license adjacent channels to create 60 and 80 megahertz "super channels."[272] Conterra argues that the "initiative set forth in the FWCC's petition should not move forward unless there is a concurrent increase in available spectrum in these bands or a

[260] Petition for Rulemaking, Fixed Wireless Communications Coalition, RM-11602 (filed May 14, 2010) (FWCC Petition).

[261] *See* 47 C.F.R. § 101.109(c), Table.

[262] FWCC Petition at 2.

[263] FWCC Petition at 2-3.

[264] FWCC Petition at 3.

[265] FWCC Petition at 3.

[266] NSMA Comments at 1.

[267] NSMA Comments at 3.

[268] NSMA Comments at 3.

[269] NSMA Comments at 3-4.

[270] NSMA Comments at 4.

[271] Reply Comments of FWCC, RM-11602 (filed Jul. 21, 2010) at 2.

[272] Conterra Comments at 2.

requirement to release unused allocations."[273] FWCC replies that the availability of 60 and 80 megahertz channels will improve efficiency by putting into productive use the frequency space near adjacent channel edges, where signals must otherwise be attenuated.[274]

2. Discussion

89. We seek comment on FWCC's proposal to allow 60 megahertz channels in the Lower 6 GHz band and 80 megahertz channels in the 11 GHz band. The proposal has the potential to allow backhaul operators to handle more capacity and offer faster data rates. The record on this issue is quite limited, however, and we therefore seek additional information on this proposal.

90. Initially, we invite commenters to provide data on the anticipated demand for wider channels in these bands in different geographies. As the Commission has recently recognized, the Lower 6 GHz band is increasingly congested, and in some locations, it can be impossible to coordinate even a 30 megahertz link in that band.[275] We seek comment on whether there are some areas, such as pockets of rural communities, where it is possible to use wider channels in the 6 and 11 GHz bands. Given the increasing use of these bands, to what extent can wider channels be accommodated? Would the primary benefit be in rural areas, or is there sufficient capacity to support use of wider channels in more urbanized areas?

91. In support of its proposal, FWCC claims that allowing wider channels would result in a number of benefits, including lower costs, improved reliability, elimination of intermodulation issues, and increased spectrum utilization?[276] We ask supporters of the proposal to provide specific data corroborating and quantifying the cost savings and other benefits claimed by FWCC. We also seek comment on any conditions that should limit the ability to seek such wider channels, including the conditions proposed by NSMA. To what extent would NSMA's suggestions alleviate the concerns raised by Conterra? Would combining adjacent channels simplify emerging backhaul operations, and if so, by how much? We also seek comment on concerns that combining adjacent links would unnecessarily deplete the spectrum and possibly encourage speculative licensing by applicants seeking more spectrum than they need for their own operational purposes.

92. In addition, we seek comment on how the Commission should adjust the minimum payload requirements to account for the increased capacity that is available with wider bandwidth channels, should the Commission permit wider bandwidth channels.[277] Given that the licensee will be utilizing twice as much spectrum, should the minimum payload requirements be doubled? Or should the Commission require an even greater increase in the payload requirements because combining the two channels would allow productive use of the frequency space in the middle of the now larger channel where the signal would otherwise have had to be attenuated if it were divided into two channels? Or should the Commission adopt an alternative approach? What are the potential advantages and disadvantages of adjusting the minimum payload requirements?

---

[273] Conterra Comments at 2.

[274] Reply Comments of FWCC, RM-11602 (filed Jul. 21, 2010) at 3.

[275] *See 6/23 GHz R&O*, 25 FCC Rcd at 7761 ¶ 4.

[276] FWCC Petition at 3.

[277] *See also* Section V.E, *infra*, concerning a proposal to establish minimum payload capacity across all channel widths in terms of bits/second/hertz.

D. Geostationary Orbital Intersections

1. Background

93. To protect receivers on geostationary satellites from the potential for interference from FS transmitters, Section 101.145 of the Commission's Rules requires a waiver filing for: (1) FS transmitters in the 2655-2690 MHz[278] and 5925-7075 MHz bands with an antenna aimed within 2º of the geostationary arc; and (2) FS transmitters in the 12700-13250 MHz range with an antenna aimed within 1.5º of the geostationary arc.[279] To be approved, a waiver request must show, among other things, that the transmitter EIRP is below listed limits.[280] In contrast, Article 21 of the ITU Radio Regulations places the 2º restriction on the pointing azimuth of antennas of FS transmitters in the 1-10 GHz band only if the EIRP is greater than 35 dBW, and the 1.5º restriction on the azimuth of antennas in the 10-15 GHz band only if the EIRP is greater than 45 dBW.[281]

94. Comsearch asks that the Commission amend Section 101.145 of the Commission's Rules to require a waiver filing for FS facilities pointing near the geostationary arc only if the EIRP is greater than the values listed in the ITU Radio Regulations.[282] Comsearch contends that the requirement primarily protects satellites located over Europe, Africa, or the Atlantic or Pacific Oceans.[283] Comsearch believes that because the ITU has determined that FS transmitters with EIRPs below the values listed in Article 21 are unlikely to cause interference to geostationary satellites, amending the Commission's Rules would improve the administrative efficiency of licensing FS links for backhaul without any corresponding harm.[284]

2. Discussion

95. We seek comment on amending Section 101.145 of the Commission's Rules to limit the circumstances under which FS transmitters must obtain a waiver in order to point near the geostationary arc. This action could facilitate microwave deployments by allowing affected licensees to deploy more quickly. The Commission's rules provide many applicants with conditional authority to begin service immediately, without waiting for final approval from the Commission, once they complete frequency coordination, with the stipulation that they must take their stations down if the Commission later rejects their applications.[285] Conditional authority is not available, however, to applicants that must request waivers of existing rules.[286] To the extent we can reduce the number of applicants that seek waivers, we can expedite deployment. Furthermore, the proposed change would harmonize our regulations with

[278] The 2655-2690 MHz band is currently allotted to the Broadband Radio Service and Educational Broadband Service. *See* 47 C.F.R. § 27.5(i). Accordingly, the Commission will not accept any new FS applications in that band.

[279] *See* 47 C.F.R. § 101.145.

[280] *See* 47 C.F.R. § 101.145(b), (c).

[281] ITU Radio Regulations, Article 21.

[282] Comsearch Comments at 29.

[283] Comsearch Comments at 32-33.

[284] Comsearch Comments at 33.

[285] 47 C.F.R. § 101.31(b)(1).

[286] 47 C.F.R. § 101.31(b)(1)(iii).

international regulations. It also appears that we can make a change without any increased risk of interference to satellite services. Under our proposal, we would require a waiver only if the EIRP is greater than 35 dBW for the 5925-7075 MHz band and is greater than 45 dBW in the 12700-13250 MHz band. Should the Commission adopt this or an alternative proposal? What are the potential advantages and disadvantages of adopting this or an alternative proposal?

E. Revising Definitions for Efficiency Standards

1. Background

96. Currently, Section 101.141(a)(3) of the Commission's Rules lists a "minimum payload capacity" for various nominal channel bandwidths.[287] The term "payload capacity" is not defined. According to Comsearch, data that is transmitted over a radio link includes both capacity that is available to carry traffic, as well as overhead generated by the radios such as coding and forward error correction information.[288] Comsearch also states that IP radio systems use header compression techniques that result in repetitive overhead bits of data that are not transmitted over the radio link.[289] As a result, the data rate at the Ethernet interfaces is higher than the rate at which data traverses the over-the-air radio path.[290] In light of this difference, Comsearch argues that the payload capacity required by the rule should include the over-the-air capacity available for user traffic but exclude all overhead data.[291] Accordingly, Comsearch asks the Commission to define "payload capacity" as "the bit rate available for transmission of data over a radiocommunication system, excluding overhead data generated by the system."[292]

97. The same rule also defines "typical utilization" of the required payload capacity for each channel bandwidth as multiples of the number of voice circuits a channel can accommodate.[293] Comsearch recommends revising Section 101.141(a)(3) to de-emphasize these legacy voice-based TDM data rates and instead emphasize a consistent efficiency requirement in terms of bits-per-second-per-Hertz ("bps/Hz").[294] Comsearch argues that while these examples were typical when the rule was written, they are becoming outdated as systems support other interfaces such as Internet Protocol.[295] In addition, Comsearch believes that the rule should be changed because the bandwidth efficiency requirements vary (from 2.46 to 4.47 bps/Hz) based on channel bandwidth rather than having a uniform requirement for all channel bandwidths.[296] Comsearch asks the Commission to obtain input from equipment manufacturers

[287] 47 C.F.R. § 101.141(a)(3), Table.

[288] Comsearch Comments at 34.

[289] Comsearch Comments at 34.

[290] Comsearch Comments at 34.

[291] Comsearch Comments at 35.

[292] Comsearch Comments at 35.

[293] 47 C.F.R. § 101.141(a)(3), Table.

[294] Comsearch Comments at 35.

[295] Comsearch Comments at 35.

[296] Comsearch Comments at 35.

and other interested parties to develop an appropriate efficiency rate in terms of bits-per-second-per-Hertz.[297]

2. Discussion

98. We seek comment on Comsearch's proposals. Is the suggested definition of payload capacity appropriate, or should we adopt an alternative definition or leave the term undefined? Are there alternative ways of resolving the problems Comsearch identifies? What are the advantages and disadvantages of defining payload capacity as Comsearch requests? We ask commenters to identify advantages and disadvantages to defining the efficiency requirement in terms of bits-per-second-per-hertz or in terms of some other metric. We seek input on an appropriate benchmark value for defining the efficiency requirement in terms of bits-per-second-per-hertz if we decide to define the efficiency requirement in terms of bits-per-second-per-hertz. Should the value be the same across all frequency bands? Related to our inquiry on efficiency standards in rural areas, should there be a different benchmark value in rural areas? We also seek comment on whether there is any need to consider how the definition should be applied to legacy systems. Is there a need for any grandfathering provisions for equipment that is currently installed or equipment that is currently on the market?

VI. MEMORANDUM OPINION AND ORDER

99. In this *MO&O*, we address various other proposals offered in response to the *NOI* that we do not intend to consider further at this time, either because the proposals lack specificity, are better considered in other proceedings, were previously considered by the Commission, or are not ripe for consideration at this time.

A. Local Multipoint Distribution Service

100. TIA recommends that the Commission consider harmonizing its approach to the 27.5-28.35 GHz Local Multipoint Distribution Service (LMDS) band with recent proposals by the Radio Advisory Board of Canada (RABC).[298] TIA says that Canada has designated that band for Local Multipoint Communications Systems (LMCS), a service similar to LMDS.[299] In an effort to maximize use of the currently underutilized LMCS spectrum, the RABC has proposed to apply site-based licensing in the band, with technical rules that favor frequency division duplex operations on bandwidths ranging from 10 to 50 megahertz.[300] TIA argues that harmonizing U.S. rules with Canada's would establish a broader market for equipment and services, thus improving the band's market potential through economies of scale.[301] NSMA also supports this proposal.[302]

101. We decline to take any action on this proposal at this time. No current LMDS licensee supports the proposal. Furthermore, most LMDS licensees have received an extension until June 1, 2012

[297] Comsearch Comments at 35.

[298] TIA Comments at 7-8.

[299] TIA Comments at 7.

[300] TIA Comments at 7.

[301] TIA Comments at 8.

[302] NSMA Reply Comments at 9-12.

to demonstrate buildout.[303] While LMDS licensees can deploy point-to-point services, the majority of deployments that have been reported to the Commission at this time have involved point-to-multipoint services.[304] We believe it would be premature to undertake the type of review contemplated by TIA and NSMA before current licensees have had an opportunity to build out their systems under the existing rules.

B. Wireless Communications Service

102. Sirius XM suggests that the Commission encourage use of the 2.3 GHz Wireless Communications Service (WCS) band for wireless backhaul operations because it would present substantially fewer interference concerns to adjacent licensees than mobile operations.[305] In 2010, the Commission adopted technical rules for the 2.3 GHz band that would allow WCS licensees to offer mobile broadband services while limiting the potential for harmful interference to incumbent services operating in adjacent bands such as Sirius XM.[306] In response, Sirius XM and other parties filed petitions for reconsideration asking, among other things, that the Commission reconsider several technical rules that were adopted.[307] Given that the issue of the appropriate technical rules for the 2.3 GHz band is currently pending in WT Docket No. 07-293, we decline to consider it in the instant proceeding.

C. Multichannel Video and Data Distribution Service

103. DTV Norwich, LLC (DTV Norwich), a licensee in the Multichannel Video Distribution and Data Service (MVDDS), asks the Commission to allow MVDDS licensees to utilize higher power to provide point-to-point services.[308] MVDDS is a fixed wireless terrestrial service at 12.2-12.7 GHz that may be used to provide one-way digital fixed non-broadcast service, including one-way direct-to-home/office wireless service.[309] MVDDS is authorized on a co-primary, non-harmful interference basis with incumbent Direct Broadcast Satellite Service[310] (DBS) providers and on a co-primary basis with non-geostationary satellite orbit fixed-satellite service (NGSO FSS) stations.[311] MVDDS is licensed on a

[303] Applications filed by Licensees in the Local Multipoint Distribution Service (LMDS) Seeking Waivers of Section 101.1011 of the Commission's Rules and Extensions of Time to Construct and Demonstrate Substantial Service, *Memorandum Opinion and Order*, 23 FCC Rcd 5894 (WTB 2008).

[304] *See*, *e.g.*, notifications of completion of construction submitted by Nextlink Wireless, Inc. (File No. 0003587593, *et al.*) and Broadband One (File No. 0003627810, *et al.*).

[305] Sirius XM Comments at 3-5.

[306] *See* Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band, Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, IB Docket No. 95-91, WT Docket No. 07-293, *Second Report and Order*, 25 FCC Rcd 11710 (2010).

[307] *See*, *e.g.*, Petition for Partial Reconsideration and Clarification of Sirius XM Radio Inc., WT Docket No. 07-293 (filed Sep. 1, 2010) at 2-4.

[308] Comments of DTV Norwich, LLC (filed Oct. 25, 2010) (DTV Norwich Comments).

[309] *See* 47 C.F.R. § 101.1407 (two way services can be provided using spectrum in other bands for the return link).

[310] *See* 47 C.F.R. § 25.201.

[311] *See, e.g.*, Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range, ET Docket No. 98-206, *First Report and Order and Further Notice of Proposed Rule Making*, 16 FCC Rcd 4096, 4099-4100 ¶ 2 (2000) (*MVDDS First R&O)*; *see also* 47 C.F.R. § 2.106.

geographic area basis according to Nielsen's 2002 Designated Market Areas and several FCC-defined areas.[312]

104. DTV Norwich argues that it may be possible MVDDS point-to-point services to operate at higher power levels without causing interference to DBS and NGSO FSS.[313] According to DTV Norwich, however, "at existing power levels, the point-to-point path 'hops' would simply be too short to be economically viable."[314]

105. DTV Norwich's proposal lacks sufficient specificity to be worthy of further consideration at this time. The Commission adopted rules for MVDDS based on the extensive record in the MVDDS rulemaking proceeding,[315] which included a congressionally mandated independent analysis[316] of potential MVDDS interference to DBS.[317] These rules include detailed frequency coordination procedures, interference protection criteria, and limitations on signal emissions, transmitter power levels, and transmitter locations.[318] The rules limit the EIRP for MVDDS stations to 14.0 dBm per 24 megahertz (−16.0 dBW per 24 megahertz).[319] To accommodate co-primary DBS earth stations, an MVDDS licensee may not begin operation unless it can ensure that the equivalent power flux density (EPFD)[320] from a

[312] *See* 47 C.F.R. § 101.1401. Designated Market Area (DMA®) is a registered trademark of Nielsen Media Research, Inc. (Nielsen). Although Nielsen revises DMAs periodically, the MVDDS license areas remain fixed to the boundaries of the 2002 DMAs. To avoid confusion with Nielsen's current DMAs, MVDDS license areas are designated as "MVDs" in the Universal Licensing System.

[313] DTV Norwich Comments at 4.

[314] DTV Norwich Comments at 4.

[315] *See* Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operations of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band with Frequency Range; Amendment of the Commission's Rules to Authorize Subsidiary Terrestrial Use of the 12.2-12.7 GHz Band by Direct Broadcast Satellite Licensees and Their Affiliates; and Applications of Broadwave USA, PDC Broadband Corporation, and Satellite Receivers, Ltd. to Provide A Fixed Service in the 12.2-12.7 GHz Band, *Memorandum Opinion and Order and Second Report and Order*, ET Docket No. 98-206, 17 FCC Rcd 9614 (2002) (*MVDDS Second R&O*).

[316] *See* Prevention of Interference to Direct Broadcast Satellite Services, Pub. L. No. 106-553, App. B. Tit. X, § 1012(a), 114 Stat. 2762, 2762A-128, 2762A-141 (2000) (LOCAL TV Act).

[317] *See, e.g., Second R&O,* 17 FCC Rcd at 9635 ¶ 56 (*citing* MITRE Corporation, "Analysis of Potential MVDDS Interference to DBS in the 12.2-12.7 GHz Band" (Apr. 18, 2001) (MITRE Report)).

[318] *See, e.g., Second R&O,* 17 FCC Rcd at 9634-9664 ¶¶ 53-125; 9690-9695 ¶¶ 196-209; 47 C.F.R. §§ 25.139 (NGSO FSS coordination and information sharing between MVDDS licensees in the 12.2 GHz to 12.7 GHz band); 25.208(k) (Power flux density limits); 101.103 (Frequency coordination procedures); 101.105 (Interference protection criteria); 101.111 (Emission limitations); 101.113 (Transmitter power limitations); 101.129 (Transmitter location); 101.1409 (Treatment of incumbent licensees); 101.1440 (MVDDS protection of DBS).

[319] *See* 47 C.F.R. §§ 101.113(a) note 11; 101.147(p).

[320] The EPFD is the power flux density produced at a DBS receive earth station, taking into account shielding effects and the off-axis discrimination of the receiving antenna assumed to be pointing at the appropriate DBS satellite(s) from the transmitting antenna of a MVDDS transmit station. 47 C.F.R. § 101.105(a)(4)(ii)(A).

proposed transmitting antenna does not exceed the applicable[321] EPFD limit at any DBS subscriber location.[322]

106. Under these circumstances, DTV Norwich's proposal is far too general to warrant further consideration. The Commission found that the power limits and other technical requirements applicable to MVDDS service providers would ensure that any interference caused to DBS customers will not exceed a level that is considered permissible.[323] The Commission also contemplated that MVDDS service providers might petition for waiver(s) of the technical rules[324] and required that the petitioning party "submit an independent technical demonstration of its equipment and technology."[325] In denying petitions to reconsider the power limits,[326] the Commission reiterated that MVDDS providers may seek waivers of the general MVDDS limits.[327] DTV Norwich's proposal, if considered as a waiver request, would not meet that standard because it does not provide any technical analysis to support its claims.[328] Indeed, DTV Norwich does not identify the power levels it wishes to use. For the reasons listed above, we decline to consider DTV Norwich's proposal.

D. Revising Technical Rules in Bands Above 15 GHz

107. Sprint recommends that the Commission develop more specific technical rules governing the use of spectrum masks above 15 GHz, which would allow for less variance in the interpretation of the

[321] The Commission established different EPFD limits in four regions of the U.S., *see* 47 C.F.R. § 101.105(a)(4)(ii)(B), mainly due to differences in rainfall in each region. *See, e.g., Second R&O*, 17 FCC Rcd at 9691 ¶ 197.

[322] *See* 47 C.F.R. § 101.105(a)(4)(ii) (referencing the procedures listed in 47 C.F.R. § 101.1440). Among other things, an MVDDS licensee must conduct a survey of the area around its proposed transmitting antenna site to determine the location of all DBS customers of record that may potentially be affected by the introduction of its MVDDS service and must coordinate with the DBS operator. *See* 47 C.F.R. § 101.1440(a)-(d).

[323] *See, e.g., MVDDS Second R&O,* 17 FCC Rcd at 9640-9663 ¶¶ 67-125; 9691-9692 ¶ 198; *see also* 47 C.F.R. Part 2 (defining harmful interference).

[324] *See MVDDS Second R&O,* 17 FCC Rcd at 9704 ¶ 236. The Commission stated that it would seek public comment on such waiver requests. *Id*.

[325] *MVDDS Second R&O,* 17 FCC Rcd at 9704 ¶ 236. The Commission adopted this independent testing requirement to ensure that terrestrial services deployed in this band would not cause harmful interference to existing operations in accordance with Section 1012(a) of the LOCAL TV Act while still allowing the flexible use of the spectrum without limiting current and future innovations for terrestrial deployment of wireless technologies in this band. *Second R&O,* 17 FCC Rcd at 9704 ¶ 236.

[326] *See* Amendment of Parts 2 and 25 of the Commission's Rules to Permit Operation of NGSO FSS Systems Co-Frequency with GSO and Terrestrial Systems in the Ku-Band Frequency Range, ET Docket No. 98-206, *Fourth Memorandum Opinion and Order,* 18 FCC Rcd 8428, 8468-8469 ¶¶ 86-88 (2003) (*MVDDS Fourth MO&O*).

[327] *See MVDDS Fourth MO&O*, 18 FCC Rcd at 8469 ¶¶ 87-88.

[328] DTV Norwich submits that, at a minimum, the Commission should be open to authorizing MVDDS licensees to conduct field tests to confirm their ability to operate at higher power levels to provide point-to-point backhaul services while protecting others authorized to use the band from impermissible interference. *See* DTV Norwich Comments at 5. The Commission has been and is open to authorizing MVDDS licensees to operate at higher power levels under experimental authority to conduct field tests that can provide data to support waiver requests for specific, proposed MVDDS operations. *See* MDS Operations Inc., Request for Waiver of Certain Multichannel Video Distribution and Data Service Technical Rules for One Station in Sandia Park, New Mexico, WT Docket No. 07-255, *Order*, 25 FCC Rcd 7963 (WTB 2010).

Commission's rules by equipment vendors and enable more frequencies to be used while also reducing interference.[329] Sprint also asks that the Commission establish maximum power limits based on the link distance for the bands above 15 GHz.[330] No other commenter responded to this suggestion. We decline to take action at this time because: (1) Sprint has not made a concrete showing that there is a problem requiring Commission intervention; and (2) Sprint does not offer specific proposals for changes to our rules. We reserve the right to consider the matter further if additional information is brought to our attention.

E. Modification of Existing Licensing Practices and Procedures

108. XO Communications (XO) expresses concern "that substantial portions of spectrum are made available to the public in a manner that neither promotes . . . efficient spectrum use nor captures the value of this spectrum for the United States Treasury."[331] XO contends that making "these frequencies available to interested parties at virtually no cost on a first-come, first-served basis . . . undercut[s] the value of existing LMDS spectrum licenses."[332] XO suggests that the Commission should consider changing its procedures for licensing point-to-point services to promote more efficient spectrum use by implementing a licensing regime under which mutually exclusive applications would be accepted and resolved through competitive bidding, or alternatively, applying spectrum usage fees, and by making changes to the Universal Licensing System (ULS) database.[333] XO argues that adopting competitive bidding or spectrum fees would give licensees greater economic incentives to use their spectrum fully and efficiently.[334] XO also states that the microwave link information provided in the ULS database for LMDS spectrum relative to the more extensive technical information provided for common carrier point-to-point microwave links may discourage customers from seeking to lease LMDS spectrum and that we should make changes to the ULS to place users of LMDS and common carrier microwave spectrum on an equal footing.[335]

109. We are not persuaded that we should adopt XO's proposed changes to our licensing procedures for point-to-point services at this time. XO has provided no factual basis upon which to decide that the existing frequency coordination-based licensing regime, under which we accept applications for each microwave link or path, leads to inefficient use of this spectrum or is otherwise no longer in the public interest. While we recognize that accepting mutually exclusive applications that are resolved through competitive bidding is often an efficient way to assign licenses, we do not believe that the spectrum coordination regime for point-to-point services currently in effect, which does not result in the acceptance of mutually exclusive applications, has failed thus far either to promote efficient spectrum use or capture its value. We note, further, that the Commission may continue to use licensing schemes

[329] Sprint Comments at 9.

[330] Sprint Comments at 10.

[331] XO Comments at 2.

[332] XO Comments at 2. Currently, under the Part 101 rules, the Commission's licensing regime requires frequency coordination and the filing of an application for each microwave link or path. *See* 47 C.F.R. §§ 101.21(e), (f), 101.103.

[333] XO Comments at 2-4.

[334] XO Comments at 3.

[335] XO Comments at 3-4.

and other means to avoid mutual exclusivity if public interest goals are met.[336] Moreover, we decline to implement XO's proposal to impose fees for the use of this spectrum. As the Commission has previously noted in other proceedings, we may lack the authority to impose certain user fees.[337] Finally, to the extent that XO seeks to eliminate what it sees as an "economic disparity" between common carrier microwave spectrum and existing LMDS spectrum,[338] we observe as an initial matter that there are significant differences between these spectrum bands. To the extent that XO's proposals regarding possible changes to the ULS are motivated by its desire to lease its LMDS spectrum for point-to-point uses, we are unaware of any obstacles that would prevent an LMDS licensee such as XO from making additional detailed technical information available to potential users seeking to lease spectrum for point-to-point use.

F. Siting Issues

1. OTARD

110. PCIA states that "local regulations continue to be a significant barrier to the collocation of antennas on existing towers" and recommends that the Commission examine its authority to streamline the collocation review process by restricting the ability of local authorities to review the placement of wireless antennas.[339] We deny PCIA's request. In 2000, the Commission determined that Section 332(c)(7) of the Communications Act provides state and local governments with the authority to regulate the placement, construction, and modification of carrier hub sites and relay antennas.[340] PCIA is asking the Commission to modify this decision. PCIA, however, has not presented any change of circumstances, legal precedent, or statutory authority to support this change, so we see no reason to revisit the Commission's decision in the *2000 OTARD Report and Order*.

---

[336] *See* 47 U.S.C. § 309(j)(6)(E); *see also* Implementation of Sections 309(j) and 337 of the Communications Act of 1934 as Amended: Promotion of Spectrum Efficient Technologies on Certain Part 90 Frequencies; Establishment of Public Service Radio Pool in the Private Mobile Frequencies Below 800 MHz; Petition for Rule Making of the American Mobile Telecommunications Association, WT Docket No. 99-87, RM-9332, RM-9405, RM-9705, *Report and Order and Further Notice of Proposed Rule Making*, 15 FCC Rcd 22709, 22719-22723 ¶¶ 21-27 (2000).

[337] *See* Implementation of Sections 309(j) and 337 of the Communications Act of 1934 as Amended; Promotion of Spectrum Efficient Technologies on Certain Part 90 Frequencies; Establishment of Public Service Radio Pool in the Private Mobile Frequencies Below 800 MHz, WT Docket No. 99-87, RM-9332, RM-9405, *Notice of Proposed Rulemaking*, 14 FCC Rcd 5206, 5244 ¶ 76 (1999).

[338] XO Comments at 3.

[339] PCIA Comments at 3, 5.

[340] In the Matter of Promotion of Competitive Networks in Local Telecommunications; Markets Wireless Communications Association International, Inc. Petition for Rulemaking to Amend Section 1.4000 of the Commission's Rules to Preempt Restrictions on Subscriber Premises Reception or Transmission Antennas Designed to Provide Fixed Wireless Services; Implementation of the Local Competition; Provisions in the Telecommunications Act of 1996, WT. Docket No. 99-217; CC Docket Nos. 96-98 and 88-57; *First Report and Order and Further Notice of Proposed Rulemaking in WT Docket No. 99-217, Fifth Report and Order and Memorandum Opinion and Order in CC Docket No. 96-98, and Fourth Report and Order*, 15 FCC Rcd 22983, 23028, 23032 ¶¶ 99, 109 (2000) (*2000 OTARD Report and Order*). While the Commission's over-the-air reception device rule does not apply to carrier hub and relay antennas, the rule does apply to 'customer-end' antennas that also relay or route signals to other customers so long as the antenna is used to provide service to the customer at that location. *See* In the Matter of Promotion of Competitive Networks in Local Telecommunications, WT Docket No 99-217, *Order on Reconsideration*, 19 FCC Rcd 5637, 5643-5644 ¶¶ 16-17 (2004).

2. Colocation of Microwave Facilities

111. XO states that some carriers violate Section 251(c)(6) of the Communications Act by hindering XO's efforts to expand its collocation facilities at incumbent LEC central offices to include microwave transmission equipment.[341] XO contends that "the Commission should expressly confirm that the collocation of microwave transmission facilities as proposed by XO was one of the arrangements contemplated by Section 251(c)(6) of the [Communication] Act."[342] We find that the limited information provided by XO on this issue does not provide us with a sufficient basis upon which to act at this time. This decision does not preclude XO from filing a more complete submission as it deems appropriate.

G. Universal Service

112. FiberTower suggests that the Commission utilize the Universal Service Fund to make wireless backhaul available to qualifying areas and for qualifying purposes.[343] In February of 2011, the Commission proposed to revise the Universal Service Fund.[344] In that item, the Commission asked whether it should modify the universal service rules to provide additional support for middle mile costs and what effect middle mile support would have on incentives for small carriers to develop regional networks that provide lower cost, higher capacity backhaul capability.[345] Given that the issue of providing Universal Service funding for wireless backhaul service is currently pending in the Universal Service proceeding, we decline to address this issue in this proceeding but are incorporating FiberTower's comments into the record of WC Docket No. 10-90.

H. Upper Microwave Substantial Service

113. NSMA argues that in determining whether 24 GHz, 39 GHz, and LMDS licensees have offered substantial service, the Commission fails to positively consider "basic and important steps that lead to successful band utilization."[346] It gives the following examples of such activity: (1) spending significant resources producing Requests for Proposals (RFPs) to develop equipment in its band; (2) utilizing the Secondary Markets rules to offer spectrum leases throughout the license area; (3) submitting proposals to carrier, government, or enterprise customers that rely on utilizing the wide-area license; and/or (4) building several links, but not yet meeting the safe harbor criterion (typically four links per million of population).[347] NSMA asks the Commission to "track and credit" such activities.[348]

---

[341] XO Comments at 4-5.

[342] XO Comments at 5.

[343] FiberTower Comments at 15.

[344] Connect America Fund; A National Broadband Plan for Our Future, Establishing Just and Reasonable Rates for Local Exchange Carriers, High-Cost Universal Service Support, Developing an Unified Intercarrier Compensation Regime, Federal-State Joint Board on Universal Service, Lifeline and Link-Up, WC Docket No. 10-90, GN Docket No. 09-51, WC Docket No. 07-135, WC Docket No. 05-337, CC Docket No. 01-92, CC Docket No. 96-45, WC Docket No. 03-109, *Notice of Proposed Rulemaking and Further Notice of Proposed Rulemaking*, 26 FCC Rcd 4554 (2011) (*Universal Service NPRM and FNPRM*).

[345] *Universal Service NPRM and FNPRM*, 26 FCC Rcd at 4676 ¶ 395.

[346] NSMA Reply Comments at 12.

[347] NSMA Reply Comments at 13.

[348] NSMA Reply Comments at 14.

114. We see no need to modify our substantial service rules and policies. NSMA's arguments ignore one of the Commission's overriding purposes of buildout requirements: providing "a clear and expeditious accounting of spectrum use by licensees to ensure that service is indeed being provided to the public."[349] The Wireless Telecommunications Bureau has correctly rejected substantial service showings based on preparatory activities of the type described by NSMA where there is no actual service being provided to the public.[350] We emphasize, however, that safe harbors are merely one means of demonstrating substantial service, and given an appropriate showing, a level of service that does not meet a safe harbor may still constitute substantial service.[351] Furthermore, we will evaluate all substantial service showings that do not meet an established safe harbor on a case-by-case basis.

I. Other Pending Matters

115. We recognize that there are other pending matters and proceedings relating to wireless backhaul that are not addressed in this item. Those matters and proceedings include: (1) A petition for rulemaking asking that the 7125-8500 MHz band be allocated for non-federal use and allotted for FS use,[352] (2) a petition for rulemaking asking that conditional authority be authorized throughout the 23 GHz band and seeking change to the mechanism for coordinating operation with the National Telecommunications and Information Administration (NTIA);[353] and (3) a request made in this proceeding to revise the Commission's policy of allowing a satellite earth station to coordinate for the full 360-degree azimuth range of the earth station even when it is communicating with only one satellite in a limited segment of the band.[354] We will address these issues separately or in future orders in this proceeding.[355]

---

[349] *See* Amendment of the Commission's Rules Regarding the 37.0 – 38.6 GHz and 38.6 – 40 GHz Bands, *Report and Order and Second Notice of Proposed Rulemaking*, ET Docket No. 95-183, 12 FCC Rcd 18600, 18623 ¶ 42 (1997) (*39 GHz R&O*); *see also id.* at 18625 ¶ 46 ("This approach will permit flexibility in system design and market development, while ensuring that service is being provided to the public."); *id.* at 18626 ¶ 46 ("This revised performance standard should ensure that meaningful service will be provided without unduly restricting service offerings."); *id.* at 18625 ¶ 47 ("[A]pplying a similar performance requirement to all licensees at the license renewal point will help establish a level playing field without compromising the goals of ensuring efficient spectrum use and expeditious provision of service to the public."); Renewal of Licenses to Provide Microwave Service in the 38.6-40.0 GHz Band, *Memorandum Opinion and Order*, 17 FCC Rcd 4404, 4407 ¶ 11 (WTB PSPWD 2002) ("The Commission's overarching purpose behind adopting the substantial service standard for renewal was to ensure that the spectrum was being used to provide service to the public.").

[350] *See*, *e.g.*, IDT Spectrum, LLC, *Order on Reconsideration and Memorandum Opinion and Order*, 23 FCC Rcd 12005, 12013-12016 ¶¶ 19-23 (WTB 2008).

[351] *See*, *e.g.*, *39 GHz R&O*, 12 FCC Rcd at 18625 ¶ 46 (building four links per million population is an example of substantial service, and a "finding of substantial service will depend upon the particular type of service offered by the licensee").

[352] *See Petition for Rulemaking of the Fixed Wireless Communications Coalition In the Matter of Amendment of Parts 2 and 101 of the Commission's Rules to Provide for Federal and Non-Federal Sharing in the 7125-8500 MHz Band,* RM-11605 (filed Mar. 16, 2010).

[353] *See Petition for Rulemaking of the Fixed Wireless Communications Coalition Petition to Amend Part 101 of the Commission's Rules for Automated Government Frequency Coordination and Conditional Licensing in the 23 GHz Fixed Service Band,* RM-11610 (filed Jul. 26, 2010).

[354] AT&T Comments at 14-15, FWCC Comments at 15-16, EIBASS Reply Comments at 9-10.

[355] We also recognize the interest expressed by certain commenters in using television white spaces in rural areas for point-to-point backhaul. *See* FiberTower Comments at 7-10, Comments of Wireless Communications Association (continued….)

VII. PROCEDURAL MATTERS

A. *Ex Parte* Rules – Permit-But-Disclose

116. The proceeding shall be treated as a "permit-but-disclose" proceeding in accordance with the Commission's *ex parte* rules.[356] Persons making *ex parte* presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the *ex parte* presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter's written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during *ex parte* meetings are deemed to be written *ex parte* presentations and must be filed consistent with rule 1.1206(b). In proceedings governed by rule 1.49(f) or for which the Commission has made available a method of electronic filing, written *ex parte* presentations and memoranda summarizing oral *ex parte* presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (*e.g.*, .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize themselves with the Commission's *ex parte* rules.

B. Comment Period and Procedures

117. Pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS). *See Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: http://fjallfoss.fcc.gov/ecfs2/.

- Paper Filers: Parties who choose to file by paper must file an original and one copy of each filing. If more than one docket or rulemaking number appears in the caption of this proceeding, filers must submit two additional copies for each additional docket or rulemaking number.

  Filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's

(Continued from previous page)

International (filed Oct. 25, 2010), Reply Comments of Sprint Nextel Corporation (filed Nov. 22, 2010) at 3. In the TV white spaces proceeding, the Commission declined to set aside TV channels for fixed licensed backhaul use as requested by FiberTower, Sprint Nextel, and others. *See* Unlicensed Operation in the TV Broadcast Bands, *et al.*, ET Docket No. 04-186, *et al.*, *Second Memorandum Opinion and Order*, 25 FCC Rcd 18661, 18718 (2010). The Commission, however, expressed interest in pursuing whether it could accommodate licensed rural backhaul in the television white spaces and directed further evaluation of the idea by Commission staff. *Id.* While there is not currently any request pending for use of television white spaces for point-to-point backhaul, Commission staff have met with interested parties to discuss the filing and review of such requests.

[356] 47 C.F.R. §§ 1.1200 *et seq.*

Secretary, Office of the Secretary, Federal Communications Commission.

- All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St., SW, Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes and boxes must be disposed of before entering the building.

- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.

- U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street, SW, Washington DC 20554.

People with Disabilities: To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (tty).

C. Final Regulatory Flexibility Analysis of the Report and Order

118. The Regulatory Flexibility Act (RFA)[357] requires that an agency prepare a regulatory flexibility analysis for notice and comment rulemakings, unless the agency certifies that "the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities."[358] Accordingly, we have prepared a Final Regulatory Flexibility Analysis concerning the possible impact of the rule changes contained in the *Report and Order* on small entities. The Final Regulatory Flexibility Analysis is set forth in Appendix B.

D. Initial Regulatory Flexibility Analysis

119. As required by the Regulatory Flexibility Act of 1980 (RFA),[359] the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on small entities of the policies and rules proposed in the *Further Notice of Proposed Rulemaking*. The analysis is found in Appendix D. We request written public comment on the analysis. Comments must be filed in accordance with the same deadlines as comments filed in response to the *FNRPM* and must have a separate and distinct heading designating them as responses to the IRFA. The Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, will send a copy of this *BRS/EBS 5th FNPRM*, including the IRFA, to the Chief Counsel for Advocacy of the Small Business Administration.

E. Paperwork Reduction Analysis

120. This document contains new information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. While we did not seek comment on the information collection requirements in the *NPRM*, we are seeking comments now. The information

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

[358] 5 U.S.C. § 605(b).

[359] *See* 5 U.S.C. § 603.

collection will be submitted to the Office of Management and Budget (OMB) for review under Section 3507(d) of the PRA. OMB, the general public, and other Federal agencies are invited to comment on the new or modified information collection requirements contained in this proceeding. In addition, we note that pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C. 3506(c)(4), we seek specific comment on how the Commission might further reduce the information collection burden for small business concerns with fewer than 25 employees.

F. Further Information

121. For further information, contact John Schauble of the Wireless Telecommunications Bureau, Broadband Division, at 202-418-0797 or John.Schauble@fcc.gov.

VIII. ORDERING CLAUSES

122. Accordingly, IT IS ORDERED, pursuant to Sections 1, 2, 4(i), 7, 201, 301, 302, 303, 307, 308, 309, 310, 319, 324, 332, 333 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 152, 154(i), 157, 201, 301, 302, 303, 307, 308, 309, 310, 319, 324, 332, and 333, and Section 706 of the Telecommunications Act of 1996, as amended, 47 U.S.C. § 1302, that this *Report and Order* is hereby ADOPTED.

123. IT IS FURTHER ORDERED, pursuant to Sections 1, 2, 4(i), 7, 201, 301, 302, 303, 307, 308, 309, 310, 319, 324, 332, 333, and 706 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 152, 154(i), 157, 201, 301, 302, 303, 307, 308, 309, 310, 319, 324, 332, and 333, and Section 706 of the Telecommunications Act of 1996, as amended, 47 U.S.C. § 1302, that this *Further Notice of Proposed Rulemaking* is hereby ADOPTED.

124. IT IS FURTHER ORDERED that the rules adopted herein WILL BECOME EFFECTIVE 30 days after the date of publication in the *Federal Register*, except for Section 74.605, which contains new or modified information collection requirements that require approval by the Office of Management and Budget (OMB) under the Paperwork Reduction Act (PRA) and WILL BECOME EFFECTIVE after the Commission publishes a notice in the *Federal Register* announcing such approval and the relevant effective date.

125. IT IS FURTHER ORDERED that the Comments of FiberTower Corporation filed on October 25, 2010 SHALL BE INSERTED into the record of WC Docket No. 10-90.

126. IT IS FURTHER ORDERED that NOTICE IS HEREBY GIVEN of the proposed regulatory changes described in this *Further Notice of Proposed Rulemaking* and that comment is sought on these proposals.

127. IT IS FURTHER ORDERED that the Commission SHALL SEND a copy of this *Report and Order* to Congress and the Government Accountability Office pursuant to the Congressional Review Act, *see* 5 U.S.C. 801(a)(1)(A).

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

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A

Final Rules

For the reasons discussed in the preamble, the Federal Communications Commission hereby amends 47 CFR parts 74 and 101 as follows:

PART 74 – EXPERIMENTAL RADIO, AUXILIARY, SPECIAL BROADCAST AND OTHER PROGRAM DISTRIBUTIONAL SERVICES

1. The authority citation for Part 74 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 303, 307, 336(f), 336(h) and 554.

§ 74.602 by revising paragraph (a) introductory text to read as follows:

§ 74.602 Frequency assignment

(a) The following frequencies are available for assignment to television pickup, television STL, television relay and television translator relay stations. The band segments 17,700-18,580 and 19,260-19,700 MHz are available for broadcast auxiliary stations as described in paragraph (g) of this section. The band segment 6425-6525 MHz is available for broadcast auxiliary stations as described in paragraph (i) of this section. The bands 6875-7125 MHz and 12700 – 13200 MHz are co-equally shared with stations licensed pursuant to Parts 78 and 101 of the Commission's Rules. Broadcast network-entities may also use the 1990-2110, 6425-6525 and 6875-7125 MHz bands for mobile television pickup only.

* * * * *

2. Add § 74.605 to read as follows:

§ 74.605 Registration of stationary TV pickup receive sites

Licensees of TV pickup stations in the 6875-7125 MHz and 12700-13200 MHz bands shall register their stationary receive sites using the Commission's Universal Licensing System.

* * * * *

PART 101 – FIXED MICROWAVE SERVICES

AUTHORITY: 47 U.S.C. 154, 303.

3. Amend § 101.31 by revising paragraph (b)(1) introductory text to read as follows:

§ 101.31 Temporary and conditional authorizations.

* * * * *

(b) *Conditional authorization.* (1) An applicant for a new point-to-point microwave radio station(s) or a modification of an existing station(s) in the 952.95-956.15, 956.55-959.75, 3,700-4,200;

5,925-6,425; 6,525-6,875; 6,875-7,125; 10,550-10,680; 10,700-11,700; 11,700-12,200; 12,700-13,150; 13,200-13,250; 17,700-19,700; and 21,800-22,000 MHz, and 23,000-23,200 MHz bands (see § 101.147(s) for specific service usage) may operate the proposed station(s) during the pendency of its applications(s) upon the filing of a properly completed formal application(s) that complies with subpart B of part 101 if the applicant certifies that the following conditions are satisfied:

* * * * *

4. Amend § 101.101 by adding the entry "6875-7125" to the table to read as follows:

§ 101.101 Frequency availability.

FREQUENCY BAND (MHz)	RADIO SERVICE				
	COMMON CARRIER (Part 101)	PRIVATE RADIO (Part 101)	BROADCAST AUXILIARY (Part 74)	OTHER (Parts 15, 21, 22, 24, 25, 74, 78, & 100)	NOTES
* *	*	*	*		* *
6875-7125	CC	OFS	TV BAS	CARS	
* *	*	*	*		* *

* * * * *

5. Amend § 101.103 by revising paragraph (d)(2)(ii) to read as follows:

§ 101.103 Frequency coordination procedures.

* * * * *

(d) * * *

(2) * * *

(ii) Notification must include relevant technical details of the proposal. At minimum, this should include, as applicable, the following:

Applicant's name and address.

Transmitting station name.

Transmitting station coordinates.

Frequencies and polarizations to be added, changed or deleted.

Transmitting equipment type, its stability, actual output power, emission designator, and type of modulation(s) (loading). Notification shall indicate if modulations lower than the values listed in the table to § 101.141(a)(3) of the Commission's rules will be used.

Transmitting antenna type(s), model, gain and, if required, a radiation pattern provided or certified by the manufacturer.

Transmitting antenna center line height(s) above ground level and ground elevation above mean sea level.

Receiving station name.

Receiving station coordinates.

Receiving antenna type(s), model, gain, and, if required, a radiation pattern provided or certified by the manufacturer.

Receiving antenna center line height(s) above ground level and ground elevation above mean sea level.

Path azimuth and distance.

Estimated transmitter transmission line loss expressed in dB.

Estimated receiver transmission line loss expressed in dB.

For a system utilizing ATPC, maximum transmit power, coordinated transmit power, and nominal transmit power.

Note: The position location of antenna sites shall be determined to an accuracy of no less than ±1 second in the horizontal dimensions (latitude and longitude) and ±1 meter in the vertical dimension (ground elevation) with respect to the National Spatial Reference System.

* * * * *

6. Amend § 101.107(a), in the table add the entry "6,875 to 7,125[1]" to read as follows:

§ 101.107 Frequency tolerance.

(a) * * *

Frequency (MHz)	**FREQUENCY TOLERANCE (PERCENT)**
***	****
6,875 to 7,125[1]	0.005
***	****

*****

7. Amend § 101.109(c), in the table add the entries "6,875 to 7,125" and "12,700-13,150" to read as follows:

§ 101.109 Bandwidth.

* * * * *

(c) * * *

Frequency Band (MHz)	Maximum Authorized Bandwidth
***	****

Frequency Band (MHz)	Maximum Authorized Bandwidth
***	****
6,875 to 7,125	25 MHz[1]
12,700 to 13,150	50 MHz
***	****

* * * * *

8. Amend § 101.113(a), in the table add the entry "6,875-7,125" to read as follows:

§ 101.113 Transmitter power limitations.

(a) * * *

Frequency Band (MHz)	Maximum allowable EIRP[1, 2]	
	Fixed[1,2] (dBW)	Mobile (dBW)
* * *	* *	* * *
6,875-7,125	+55	
* * *	* *	* * *

* * * * *

9. Amend § 101.115(b), in the table add the entry "6,875-7,125" to read as follows:

§ 101.115 Directional antennas.

* * * * *

(b) * * *

Antenna Standards										
Frequency (MHz)	Category	Maximum beamwidth to 3 dB points[1] (included angle in degrees)	Minimum antenna gain (dBi)	Minimum radiation suppression to angle in degrees from centerline of main beam in decibels						
				5°	10°	15°	20°	30°	100°	140°

				to 10^o	to 15^o	to 20^o	to 30^o	to 100^o	to 140^o	to 180^o
* * *									* * * *	
6,875 to 7,125	A B	2.2 2.2	38 38	25 21	29 25	33 29	36 32	42 35	55 39	55 45
* * *									* * * *	

* * * * *

11. Amend § 101.141 by revising paragraph (a)(3) the introductory text and the table to read as follows:

§ 101.141 Microwave Modulation.

(a) * * *

(3) The following capacity and loading requirements must be met for equipment applied for, authorized, and placed in service after June 1, 1997 in 3700-4200 MHz (4 GHz), 5925-6425, 6525-6875 MHz (6 GHz), 6875-7125 MHz (7 GHz), 10,550-10,680 MHz (10 GHz), 10,700-11700 MHz (11 GHz), and 12,700-13,150 MHz (13 GHz) bands, except during anomalous signal fading. During anomalous signal fading, licensees may adjust to a modulation specified in their authorization if such modulation is necessary to allow licensees to maintain communications, even if the modulation will not comply with the capacity and loading requirements specified in this paragraph. Links that use equipment capable of adjusting modulation must be designed using generally accepted multipath fading and rain fading models to meet the specified capacity and loading requirements at least 99.95% of the time, in the aggregate of both directions in a two-way link.

* * * * *

Nominal channel bandwidth (MHz)	Minimum Payload capacity (MBits/s)[1]	Minimum traffic payload (as percent of payload capacity)	Typical utilization[2]
***	****	****	****
25.0	89.4	[3]50	2 DS-3/STS-1
***	****	****	****

* * * * *

10. Amend § 101.147 by adding the entry "6,875-7,125 MHz " to the table in paragraph (a), amending the entry "12,700-13,200 MHz " in the table in paragraph (a), adding footnote (34) to paragraph (a), redesignating paragraph (l) as paragraph (k), adding a new paragraph (l), redesignating paragraphs (p) and (q) as paragraphs (q) and (r), respectively, and adding a new paragraph (p) to read as follows:

§ 101.147 Frequency assignments.

* * * * *

(a) * * *

* * * * *

6,875-7,125 MHz (10), (34)

* * * * *

12,700-13,200 (22), (34)

* * * * *

(34) In the bands 6,875-7,125 MHz and 12,700-13,150 MHz, links shall not intersect with the service areas of television pickup stations.

* * * * *

(l) *6875 to 7125 MHz*. 25 MHz authorized bandwidth.

(1) 5 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
6877.5	7027.5
6882.5	7032.5
6887.5	7037.5
6892.5	7042.5
6897.5	7047.5
6902.5	7052.5
6907.5	7057.5
6912.5	7062.5
6917.5	7067.5
6922.5	7072.5
6927.5	7077.5
6932.5	7082.5
6937.5	7087.5
6942.5	7092.5
6947.5	7097.5
6952.5	7102.5
6957.5	7107.5
6962.5	7112.5
6967.5	7117.5
6972.5	7122.5

(2) 8.33 MHz bandwidth channels:

Transmit (receive)	Receive (transmit)

(MHz)	(MHz)
6879.165	7029.165
6887.495	7037.495
6895.825	7045.825
6904.155	7054.155
6912.485	7062.485
6920.815	7070.815
6929.145	7079.145
6937.475	7087.475
6945.805	7095.805
6954.135	7104.135
6962.465	7112.465
6970.795	7120.795

(3) 12.5 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
6881.25	7031.25
6893.75	7043.75
6906.25	7056.25
6918.75	7068.75
6931.25	7081.25
6943.75	7093.75
6956.25	7106.25
6968.75	7118.75

(4) 25 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
6887.5	7037.5
6912.5	7062.5
6937.5	7087.5
6962.5	7112.5

* * * * *

(p) *12700 to 13150 MHz.* 50 MHz authorized bandwidth.

(1) 5 MHz channels:

Transmit	Receive

(receive) (MHz)	(transmit) (MHz)
12702.5	12927.5
12707.5	12932.5
12712.5	12937.5
12717.5	12942.5
12722.5	12947.5
12727.5	12952.5
12732.5	12957.5
12737.5	12962.5
12742.5	12967.5
12747.5	12972.5
12752.5	12977.5
12757.5	12982.5
12762.5	12987.5
12767.5	12992.5
12772.5	12997.5
12777.5	13002.5
12782.5	13007.5
12787.5	13012.5
12792.5	13017.5
12797.5	13022.5
12802.5	13027.5
12807.5	13032.5
12812.5	13037.5
12817.5	13042.5
12822.5	13047.5
12827.5	13052.5
12832.5	13057.5
12837.5	13062.5
12842.5	13067.5
12847.5	13072.5
12852.5	13077.5
12857.5	13082.5
12862.5	13087.5
12867.5	13092.5
12872.5	13097.5
12877.5	13102.5
12882.5	13107.5
12887.5	13112.5
12892.5	13117.5
12897.5	13122.5
12902.5	13127.5
12907.5	13132.5
12912.5	13137.5
12917.5	13142.5
12922.5	13147.5

(2) 8.33 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
12704.165	12929.165
12712.495	12937.495
12720.825	12945.825
12729.155	12954.155
12737.485	12962.485
12745.815	12970.815
12754.145	12979.145
12762.475	12987.475
12770.805	12995.805
12779.135	13004.135
12787.465	13012.465
12795.795	13020.795
12804.125	13029.125
12812.455	13037.455
12820.785	13045.785
12829.115	13054.115
12837.445	13062.445
12845.775	13070.775
12854.105	13079.105
12862.435	13087.435
12870.765	13095.765
12879.095	13104.095
12887.425	13112.425
12895.755	13120.755
12904.085	13129.085
12912.415	13137.415

(3) 12.5 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
12706.25	12931.25
12718.75	12943.75
12731.25	12956.25
12743.75	12968.75
12756.25	12981.25
12768.75	12993.75
12781.25	13006.25
12793.75	13018.75
12806.25	13031.25

12818.75	13043.75
12831.25	13056.25
12843.75	13068.75
12856.25	13081.25
12868.75	13093.75
12881.25	13106.25
12893.75	13118.75
12906.25	13131.25
12918.75	13143.75

(4) 25 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
12712.5	12937.5
12737.5	12962.5
12762.5	12987.5
12787.5	13012.5
12812.5	13037.5
12837.5	13062.5
12862.5	13087.5
12887.5	13112.5
12912.5	13137.5

(5) 50 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
12725	12925
12775	12975
12825	13025
12875	13075

* * * * *

11. Amend § 101.603 by revising paragraph (a)(7) to read as follows:

§ 101.603 Permissible Communications.

(a) * * *

(7) Licensees may transmit program material from one location to another;

* * * * *

APPENDIX B

Final Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[1] we incorporated an Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities by the policies and rules proposed in the *Notice of Proposed Rulemaking (NPRM)*. No comments were filed addressing the IRFA. Because we amend the rules in this *Report and Order*, we have included this Final Regulatory Flexibility Analysis (FRFA). This present FRFA conforms to the RFA.[2]

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

2. In this *Report and Order*, we adopt three changes to our rules involving microwave stations. First, we allow fixed service (FS) stations to operate in the 6875-7125 MHz and 12700-13150 MHz bands. Second, we eliminate the prohibition on broadcasters using Part 101 stations as the final radiofrequency (RF) link in the chain of distribution of program material to broadcast stations. Third, we amend our minimum payload capacity rule to facilitate the use of adaptive modulation to allow licensees to maintain communications by briefly reducing the rate at which they send data.

3. With respect to the first action, we anticipate that demand for fixed service spectrum will increase substantially as it is increasingly used for wireless backhaul and other important purposes. The 6875-7125 MHz and 12700-13150 MHz bands are currently assigned to television pickup, television studio-transmitter links, television relay stations, television translator relay stations, and mobile-only CARS. Assigning this spectrum to the fixed service will provide additional spectrum that will be used for wireless backhaul and other critical applications, while protecting other existing services in these bands.

4. Second, Section 101.603(a)(7) of the Commission's Rules, commonly known as the "final link" rule, prohibits broadcasters from using Part 101 stations as the final radiofrequency (RF) link in the chain of distribution of program material to broadcast stations. The rule ensures that private operational fixed stations are used for private, internal purposes and prevents broadcasters from causing congestion when Part 74 Broadcast Auxiliary Service (BAS) frequencies are available. In light of the increasing use of digital technologies, we conclude that the "final link" rule may no longer serve its intended purpose and may in fact inhibit the full use of Part 101 spectrum. As broadcasters and other microwave users move to digital-based systems, we conclude it does not make sense to distinguish between program material and other types of content transmitted using digital technologies. Furthermore, the rule may impose additional costs by requiring broadcasters to build two different systems: one system to carry program material to the transmitter site and a separate system to handle other data. In light of the extensive sharing between BAS and FS of the same bands, we believe it is appropriate to provide broadcasters with additional flexibility to use the FS bands. We therefore eliminate this rule.

5. Third, we amend our Part 101 technical rules to facilitate the use of adaptive modulation, which is a process that reduces the data rate of a microwave link in order to maintain

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

[2] *See* 5 U.S.C. § 604.

communications. Section 101.141(a)(3) of the Commission's Rules establishes minimum payload capacities (in terms of megabits per second) for various channel sizes in certain Part 101 bands. The underlying purpose of the rule is to promote efficient frequency use. Although the Commission has never quantified the time period over which licensees must comply with those standards, the industry has generally construed the payload requirements as applying whenever the link is in service. Fixed service links, especially long links, are subject to atmospheric fading: a temporary drop in received power caused by changes in propagation conditions. Fading leads to an increase in errors and sometimes to a complete loss of communications. One way to combat fading is by briefly reducing the data rate, which requires a temporary change in the type of modulation, a process called "adaptive modulation." The use of adaptive modulation may reduce the minimum payload capacity below the value specified in the rule for a short time, although this still represents an increase over the otherwise zero level during the fade. Adaptive modulation has public interest benefits of allowing communications to be maintained during adverse propagation conditions. Given the critical backhaul and public safety applications of fixed service stations, we find this benefit to be significant. By allowing this level of flexibility in our efficiency standards, we hope to provide carriers with a way to lower their costs yet still use the spectrum efficiently. This rule change will allow licensees to take advantage of the benefits of adaptive modulation while ensuring efficient use of the spectrum.

B. Legal Basis

6. The action is authorized pursuant to sections 1, 2, 4(i), 7, 201, 301, 302, 303, 307, 308, 309, 310, 319, 324, 332, and 333 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 152, 154(i), 157, 201, 301, 302, 303, 307, 308, 309, 310, 319, 324, 332, and 333, and Section 706 of the Telecommunications Act of 1996, as amended, 47 U.S.C. § 1302.

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

7. The RFA directs agencies to provide a description of, and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules and policies, if adopted.[3] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[4] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[5] A "small business concern" is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.[6]

8. *Small Businesses, Small Organizations, and Small Governmental Jurisdictions.* Our action may, over time, affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three comprehensive, statutory small entity size standards.[7] First, nationwide,

[3] 5 U.S.C. § 603(b)(3).

[4] 5 U.S.C. § 601(6).

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

[6] 15 U.S.C. § 632.

[7] *See* 5 U.S.C. §§ 601(3)–(6).

there are a total of approximately 27.5 million small businesses, according to the SBA.[8] In addition, a "small organization" is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[9] Nationwide, as of 2007, there were approximately 1, 621,315 small organizations.[10] Finally, the term "small governmental jurisdiction" is defined generally as "governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand."[11] Census Bureau data for 2011 indicate that there were 89,476 local governmental jurisdictions in the United States.[12] We estimate that, of this total, as many as 88, 506 entities may qualify as "small governmental jurisdictions."[13] Thus, we estimate that most governmental jurisdictions are small.

9. *Wireless Telecommunications Carriers (except satellite)*. The appropriate size standard under SBA rules is for the category Wired Telecommunications Carriers. Under that size standard, such a business is small if it has 1,500 or fewer employees.[14] Census Bureau data for 2007, which now supersede data from the 2002 Census, show that there were 3,188 firms in this category that operated for the entire year. Of this total, 3,144 had employment of 999 or fewer, and 44 firms had employment of 1,000 employees or more. Thus under this category and the associated small business size standard, the Commission estimates that the majority of wireless telecommunications carriers(except satellite) are small entities that may be affected by our proposed action.[15]

10. *Fixed Microwave Services*. Microwave services include common carrier,[16] private-operational fixed,[17] and broadcast auxiliary radio services.[18] At present, there are approximately 31,549

[8] *See* SBA, Office of Advocacy, "Frequently Asked Questions," web.sba.gov/faqs (last visited May 6,2011; figures are from 2009).

[9] 5 U.S.C. § 601(4).

[10] INDEPENDENT SECTOR, THE NEW NONPROFIT ALMANAC & DESK REFERENCE (2010).

[11] 5 U.S.C. § 601(5).

[12] U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES: 2011, Table 427 (2007)

[13] The 2007 U.S Census data for small governmental organizations are not presented based on the size of the population in each such organization. There were 89,476 small governmental organizations in 2007. If we assume that county, municipal, township, and school district organizations are more likely than larger governmental organizations to have populations of 50,000 or less, the total of these organizations is 52,125. If we make the same assumption about special districts and also assume that special districts are different from county, municipal, township, and school districts, in 2007 there were 37,381 special districts. Therefore, of the 89,476 small governmental organizations documented in 2007, as many as 89,506 may be considered small under the applicable standard. This data may overestimate the number of such organizations that has a population of 50,000 or less. U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES 2011, Tables 427, 426 (Data cited therein are from 2007).

[14] 13 C.F.R. § 121.201, NAICS code 517110.

[15] *See* http://factfinder.census.gov/servlet/IBQTable?_bm=y&-fds_name=EC0700A1&-geo_id=&-_skip=600&-ds_name=EC0751SSSZ5&-_lang=en

[16] 47 C.F.R. Part 101 *et seq*. (formerly, part 21 of the Commission's Rules) for common carrier fixed microwave services (except MDS).

[17] Persons eligible under Parts 80 and 90 of the Commission's rules can use Private-Operational Fixed Microwave services. *See* 47 C.F.R. Parts 80 and 90. Stations in this service are called operational-fixed to distinguish them from common carrier and public fixed stations. Only the licensee may use the operational-fixed station, and only for communications related to the licensee's commercial, industrial, or safety operations.

common carrier fixed licensees and 89,633 private and public safety operational-fixed licensees and broadcast auxiliary radio licensees in the microwave services. Microwave services include common carrier,[19] private-operational fixed,[20] and broadcast auxiliary radio services.[21] They also include the Local Multipoint Distribution Service (LMDS),[22] the Digital Electronic Message Service (DEMS),[23] and the 24 GHz Service,[24] where licensees can choose between common carrier and non-common carrier status.[25] The Commission has not yet defined a small business with respect to microwave services. For purposes of the IRFA, the Commission will use the SBA's definition applicable to Wireless Telecommunications Carriers (except satellite)—i.e., an entity with no more than 1,500 persons is considered small.[26] For the category of Wireless Telecommunications Carriers (except Satellite), Census data for 2007, which supersede data contained in the 2002 Census, show that there were 1,383 firms that operated that year.[27] Of those 1,383, 1,368 had fewer than 100 employees, and 15 firms had more than 100 employees. Thus under this category and the associated small business size standard, the majority of firms can be considered small. The Commission notes that the number of firms does not necessarily track the number of licensees. The Commission estimates that virtually all of the Fixed Microwave licensees (excluding broadcast auxiliary licensees) would qualify as small entities under the SBA definition.

11. *Radio Broadcasting.* The subject rules and policies potentially will apply to all AM and FM radio broadcasting licensees and potential licensees. A radio broadcasting station is an establishment primarily engaged in broadcasting aural programs by radio to the public.[28] Included in this industry are commercial, religious, educational, and other radio stations.[29] Radio broadcasting stations which

(Continued from previous page)

[18] Auxiliary Microwave Service is governed by Part 74 and Part 78 of Title 47 of the Commission's Rules. Available to licensees of broadcast stations, cable operators, and to broadcast and cable network entities. Auxiliary microwave stations are used for relaying broadcast television signals from the studio to the transmitter, or between two points such as a main studio and an auxiliary studio. The service also includes TV pickup and CARS pickup, which relay signals from a remote location back to the studio.

[19] *See* 47 C.F.R. Part 101, Subparts C and I.

[20] *See* 47 C.F.R. Part 101, Subparts C and H.

[21] Auxiliary Microwave Service is governed by Part 74 of Title 47 of the Commission's Rules. *See* 47 C.F.R. Part 74. Available to licensees of broadcast stations and to broadcast and cable network entities, broadcast auxiliary microwave stations are used for relaying broadcast television signals from the studio to the transmitter or between two points such as a main studio and an auxiliary studio. The service also includes mobile TV pickups, which relay signals from a remote location back to the studio.

[22] *See* 47 C.F.R. Part 101, Subpart L.

[23] *See* 47 C.F.R. Part 101, Subpart G.

[24] *See id.*

[25] *See* 47 C.F.R. §§ 101.533, 101.1017.

[26] 13 C.F.R. § 121.201, NAICS code 517210.

[27] U.S. Census Bureau, 2007 Economic Census, Sector 51, 2007 NAICS code 517210 (rel. Oct. 20, 2009), http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-fds_name=EC0700A1&-_skip=700&-ds_name=EC0751SSSZ5&-_lang=en.

[28] U.S. Census Bureau, 2007 NAICS Definitions, 515111 Radio Stations;

http:// www.census.gov/naics/2007/def/ND515111HTM#N51512

[29] *Id.*

primarily are engaged in radio broadcasting and which produce radio program materials are similarly included.[30] However, radio stations that are separate establishments and are primarily engaged in producing radio program material are classified under another NAICS number.[31] The SBA has established a small business size standard for this category, which is: firms having $7 million or less in annual receipts.[32] According to BIA/Kelsey, MEDIA Access Pro Database on January 13, 2011, 10,820 (97%) of 11,127 commercial radio stations have revenue of $7 million or less. Therefore, the majority of such entities are small entities. We note, however, that many radio stations are affiliated with much larger corporations having much higher revenue. Our estimate, therefore, likely overstates the number of small entities that might be affected by any ultimate changes to the rules and forms.

12. *Television stations.* The SBA defines a television broadcasting station as a small business if such station has no more than $14.0 million in annual receipts.[33] Business concerns included in this industry are those "primarily engaged in broadcasting images together with sound."[34] The Commission has estimated the number of licensed commercial television stations to be 1,390.[35] According to Commission staff review of the BIA Kelsey Inc. Media Access Pro Television Database (BIA) as of January 31, 2011, 1,006 (or about 78 percent) of an estimated 1,298 commercial television stations[36] in the United States have revenues of $14 million or less and, thus, qualify as small entities under the SBA definition. The Commission has estimated the number of licensed noncommercial educational (NCE) television stations to be 391.[37] We note, however, that, in assessing whether a business concern qualifies as small under the above definition, business (control) affiliations[38] must be included. Our estimate, therefore, likely overstates the number of small entities that might be affected by our action, because the revenue figure on which it is based does not include or aggregate revenues from affiliated companies. The Commission does not compile and otherwise does not have access to information on the revenue of NCE stations that would permit it to determine how many such stations would qualify as small entities.

---

[30] *Id.*

[31] *Id.*

[32] 13 C.F.R. § 121.201, NAICS code 515112 (updated for inflation in 2008).

[33] *See* 13 C.F.R. § 121.201, NAICS Code 515120 (2007).

[34] *Id*. This category description continues, "These establishments operate television broadcasting studios and facilities for the programming and transmission of programs to the public. These establishments also produce or transmit visual programming to affiliated broadcast television stations, which in turn broadcast the programs to the public on a predetermined schedule. Programming may originate in their own studios, from an affiliated network, or from external sources." Separate census categories pertain to businesses primarily engaged in producing programming. *See* Motion Picture and Video Production, NAICS code 512110; Motion Picture and Video Distribution, NAICS Code 512120; Teleproduction and Other Post-Production Services, NAICS Code 512191; and Other Motion Picture and Video Industries, NAICS Code 512199.

[35] *See* News Release, "Broadcast Station Totals as of December 31, 2010," 2011 WL 484756 (F.C.C.) (dated Feb. 11, 2011) ("*Broadcast Station Totals*"); also available at http://www.fcc.gov/Daily_Releases/Daily_Business/2011/db0211/DOC-304594A1.pdf.

[36] We recognize that this total differs slightly from that contained in *Broadcast Station Totals*, *supra*, note 15; however, we are using BIA's estimate for purposes of this revenue comparison.

[37] *See Broadcast Station Totals*, *supra*.

[38] "[Business concerns] are affiliates of each other when one concern controls or has the power to control the other or a third party or parties controls or has to power to control both." 13 C.F.R. § 121.103(a)(1).

13. In addition, an element of the definition of "small business" is that the entity not be dominant in its field of operation. We are unable at this time to define or quantify the criteria that would establish whether a specific television station is dominant in its field of operation. Accordingly, the estimate of small businesses to which rules may apply do not exclude any television station from the definition of a small business on this basis and are therefore over-inclusive to that extent. Also, as noted, an additional element of the definition of "small business" is that the entity must be independently owned and operated. We note that it is difficult at times to assess these criteria in the context of media entities and our estimates of small businesses to which they apply may be over-inclusive to this extent.

D. Description of Projected Reporting, Recordkeeping, and other Compliance Requirements

14. This *Report and Order* contains new information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104-13. It will be submitted to the Office of Management and Budget (OMB) for review under Section 3507(d) of the PRA. OMB, the general public, and other Federal agencies are invited to comment on the new or modified information collection requirements contained in this proceeding. In addition, we note that pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, see 44 U.S.C. 3506(c)(4), we seek specific comment on how the Commission might further reduce the information collection burden for small business concerns with fewer than 25 employees.

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

15. The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.[39]

16. As noted above, this *Report and Order* (1) allows fixed service stations to operate in the 6875-7125 and 12700-13150 MHz bands, (2) eliminates the prohibition on broadcasters using Part 101 stations as the final radiofrequency (RF) link in the chain of distribution of the program material to broadcast stations, (3) and amends our minimum payload capacity rule to facilitate the use of adaptive modulation to allow licensees to maintain communications by briefly reducing the rate at which they send data. These actions would provide additional options to all licensees, including small entity licensees. Such actions will serve the public interest by making additional spectrum available for fixed service users, providing additional flexibility for broadcasters to use microwave spectrum, and allowing communications to be maintained during adverse propagation conditions. The rules could therefore open up beneficial economic opportunities to a variety of spectrum users, including small businesses.

17. Generally, the alternative approach would be to maintain the existing rules. If the rules were not changed, the 6875-7125 MHz and 12700-13150 MHz bands would remain unavailable for fixed service use. Given the increasing demand for Part 101 spectrum for backhaul and other uses, not making that spectrum available would make it increasingly difficult to meet the demand for microwave facilities. If the prohibition on broadcasters using Part 101 stations as the final radiofrequency (RF) link in the chain

[39] 5 U.S.C. § 603(c).

of distribution of the program material to broadcast stations is not eliminated, broadcasters will be limited to using Broadcast Auxiliary Service spectrum for that purpose, and may have to build two separate microwave systems using different frequencies. Such an alternative would be inadequate to meet the demands of licensees and is therefore less than ideal. If no BAS spectrum is available, broadcasters will have to pay to prepare a request for waiver to access Part 101 spectrum and await action on that waiver request before they can begin operation. Such expense and delay may be particularly harmful to small businesses.

18. With respect to our proposal to amend our minimum capacity payload rule to facilitate adaptive modulation, if our rules are not amended to facilitate the use of adaptive modulation, licensees will be unable to fully use technology to maintain critical communications during signal fades. An alternative to the adaptive modulation proposal made in the *NPRM* would be to allow compliance with the efficiency standards "on average" and "during normal operation." We believe that standard would give licensees too much latitude to deploy inefficient systems that would be inconsistent with good engineering practices.

F. Federal Rules that May Duplicate, Overlap, or Conflict with the Proposed Rules

19. None.

G. Report to Congress

20. The Commission will send a copy of the *Report and Order*, including the FRFA, in a report to Congress pursuant to the Congressional Review Act.[40] In addition, the Commission will send a copy the *Report and Order*, including FRFA, to the Chief Counsel for Advocacy of the Small Business Administration. A copy of this *Report and Order* and FRFA (or summaries thereof) will be published in the Federal Register.[41]

[40] *See* 5 U.S.C. § 801(a)(1)(A). The Congressional Review Act is contained in Title II, § 251, of the CWAAA, *see* Pub. L. No. 104-121, Title II, § 251, 110 Stat. 868.

[41] *See* 5 U.S.C. § 604(b).

APPENDIX C

Proposed Rules

For the reasons discussed in the preamble, the Federal Communications Commission hereby proposes to amend 47 CFR part 101 as follows:

PART 101 – FIXED MICROWAVE SERVICES

1. The authority citation for Part 101 continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 303.

2. Amend § 101.3 by adding the following::

§ 101.3 Definitions.

* * * * *

Payload Capacity. The bit rate available for transmission of data over a radiocommunication system, excluding overhead data generated by the system.

* * * * *

3. Amend § 101.109(c), in the table revise the entries "5,925 to 6,425" and "10,700 to 11,700" to read as follows: :

§ 101.109 Bandwidth.

* * * * *

(c) * * *

Frequency Band (MHz)	Maximum Authorized Bandwidth
***	****
5,925 to 6,425	60 MHz[1]
***	****
10,700 to 11,700	80 MHz[1]
***	****

4. Amend § 101.115 by revising the introductory text to paragraph (b) and the table in paragraph (b)(2) to read as follows:

§ 101.115 Directional Antennas.

* * * * *

(b) Fixed stations (other than temporary fixed stations and DEMS nodal stations) operating at 932.5 MHz or higher must employ transmitting and receiving antennas (excluding second receiving antennas for operations such as space diversity) meeting the appropriate performance Standard A indicated below, except that in areas not subject to frequency congestion, antennas meeting performance Standard B may be used, subject to the requirements set forth in paragraph (d) of this section. For frequencies with a Standard B1 and a Standard B2, Standard B1 shall apply to stations authorized prior to **[insert effective date of rule]**, and Standard B2 shall apply to stations authorized after **[insert effective date of rule]**. Licensees shall comply with the antenna standards table shown in this paragraph in the following manner:

* * * * *

(2) * * *

Frequency	Category	Maximum beam-width to 3 dB pts	Minimum antenna Gain (dBi)	Minimum radiation suppression to angle in degrees From centerline of main beam in decibels						
				5° to 10°	10° to 15°	15° to 20°	20° to 30°	30° to 100°	100° to 140°	140° to 180°
* * * * *										
5,925 to 6,425[5]	A	2.2	38	25	29	33	36	42	55	55
	B1	2.2	38	21	25	29	32	35	39	45
	B2	4.1	32	15	20	23	28	29	60	60
* * * * *										
6,525 to 6,875[5]	A	2.2	38	25	29	33	36	42	55	55
	B1	2.2	38	21	25	29	32	35	39	45
	B2	4.1	32	15	20	23	28	29	60	60
6,875 to 7,075	A	2.2	38	25	29	33	36	42	55	55
	B1	2.2	38	21	25	29	32	35	39	45

	B2	4.1	32	15	20	23	28	29	60	60
* * * * *										
17,700 to 18,820	A	2.2	38	25	29	33	36	42	55	55
	B1	2.2	38	20	24	28	32	35	36	36
	B2	3.3	33.5	18	22	29	31	35	57	59
18,920 to 19,700[10]	A	2.2	38	25	29	33	36	42	55	55
	B1	2.2	38	20	24	28	32	35	36	36
	B2	3.3	33.5	18	22	29	31	35	57	59
21,200 to 23,600[7, 11]	A	3.3	33.5	18	26	26	33	33	55	55
	B1	3.3	33.5	17	24	24	29	29	40	50
	B2	4.5	30.5	14	19	22	24	29	52	52
* * * * *										

5. Amend § 101.141(a)(3) to read as follows:

§ 101.141 Microwave Modulation.

(a) * * *

(3) When use of an antenna meeting performance Standard A (see § 101.115) is required, the following capacity and loading requirements must be met for equipment applied for, authorized, and placed in service after June 1, 1997 in 3700-4200 MHz (4 GHz), 5925-6425, 6525-6875 MHz, and 6875-7125 MHz (6 GHz), 10,550-10,680 MHz (10 GHz), and 10,700-11700 MHz (11 GHz) bands, except during anomalous signal fading, unless a showing is made in the application that (i) the capacity and loading requirements prevent the deployment of the requested link for economic or technical reasons; (ii) the applicant does not have any reasonable alternative; and (iii) not applying the capacity and loading requirements would result in tangible and specific public interest benefits. During anomalous signal fading, licensees subject to the capacity and loading requirements may adjust to a modulation specified in their authorization if such modulation is necessary to allow licensees to maintain communications, even if

the modulation will not comply with the capacity and loading requirements specified in this paragraph. Links that must comply with the capacity and loading requirements that use equipment capable of adjusting modulation must be designed using generally accepted multipath fading and rain fading models to meet the specified capacity and loading requirements at least 99.95% of the time, in the aggregate of both directions in a two-way link.

* * * * *

6. Amend § 101.145 by revising the introductory text in section (b) and section (c) to read as follows:

§ 101.145 Interference to geo-stationary-satellites.

* * * * *

(b) *2655 to 2690 MHz and 5925 to 7075 MHz.* No directional transmitting antenna utilized by a fixed station operating in these bands with EIRP greater than 35 dBW may be aimed within 2 degrees of the geostationary-satellite orbit, taking into account atmospheric refraction. However, exception may be made in unusual circumstances upon a showing that there is no reasonable alternative to the transmission path proposed. If there is no evidence that such exception would cause possible harmful interference to an authorized satellite system, said transmission path may be authorized on waiver basis where the maximum value of the equivalent isotropically radiated power (EIRP) does not exceed:

* * * * *

(c) *12.7 to 13.25 GHz.* No directional transmitting antenna utilized by a fixed station operating in this band with EIRP greater than 45 dBW may be aimed within 1.5 degrees of the geostationary-satellite orbit, taking into account atmospheric refraction.

* * * * *

7. Amend § 101.147 by revising the introductory text to sections (i) and (o) and adding new sections (i)(9) and (o)(8) to read as follows:

§ 101.147 Frequency assignments.

* * * * *

(i) *5,925 to 6,425 MHz.* 60 MHz authorized bandwidth.

* * * * *

(9) 60 MHz bandwidth channels:

Transmit (receive) (MHz)	Receive (transmit) (MHz)
5964.97	6217.01
6024.27	6276.31
6083.57	6335.61
6142.87	6394.91

* * * * *

(o) *10,700 to 11,700 MHz.* 80 MHz authorized bandwidth.

Transmit (receive) (MHz)	Receive (transmit) (MHz)
10745	11235
10825	11315
10905	11395
10985	11475
11065	11555
11145	11635

* * * * *

APPENDIX D

Initial Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[1] the Commission has prepared this present Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities by the policies and rules proposed in this *Notice of Proposed Rulemaking (NPRM)*. Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines specified in the *NPRM* for comments. The Commission will send a copy of this *NPRM*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).[2] In addition, the *NPRM* and IRFA (or summaries thereof) will be published in the Federal Register.[3]

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

2. In this *Further Notice of Proposed Rulemaking*, we propose five additional changes to our rules involving microwave stations. These changes are described in further detail below. First, we propose to allow the use of smaller antennas in the 5925-6875 MHz band (6 GHz band), 17700-18300 and 19300-19700 MHz bands (18 GHz band), and 21200-23600 MHz band (23 GHz band) fixed service (FS) bands. Second, we propose to exempt microwave stations in non-congested areas from our capacity and loading requirements in order to facilitate the provision of service to rural areas. Third, we propose to widen the permissible maximum channel size in the 5925-6425 GHz Band (Lower 6 GHz Band) (to allow 60 megahertz channels) and in the 10700-11700 MHz band (11 GHz Band) (to allow 80 megahertz channels) to allow faster data rates. Fourth, we propose to revise the criteria under which microwave stations that are pointing in the direction of geostationary satellites must seek a waiver prior to operating to expedite service. Finally, we propose to add a definition of "payload capacity" to our rules, and seek comment on updating our capacity and loading requirements to reflect the increasing use of interfaces such as Internet Protocol.

3. With respect to the first proposal, Section 101.115(b) of the Commission's Rules establishes directional antenna standards designed to maximize the use of microwave spectrum while avoiding interference between operators. The rule on its face does not mandate a specific size of antenna. Rather, it specifies certain technical parameters – maximum beamwidth, minimum antenna gain, and minimum radiation suppression – that, depending on the state of technology at any point in time, directly affect the size of a compliant antenna. Smaller antennas have several advantages. They cost less to manufacture and distribute, are less expensive to install because they weigh less and need less structural support, and cost less to maintain because they are less subject to wind load and other destructive forces. In addition, the modest weight of small antennas makes them practical for installation at sites incapable of supporting large dishes, including many rooftops, electrical transmission towers, water towers, monopoles and other radio towers. Smaller antennas raise fewer aesthetic objections, thereby permitting easier compliance with local zoning and homeowner association rules and generating fewer objections. On the other hand, smaller antennas have increased potential to cause interference because smaller antennas

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

[2] *See* 5 U.S.C. § 603(a).

[3] *See* 5 U.S.C. § 603(a).

result in more radiofrequency energy being transmitted in directions away from the actual point-to-point link. We seek comment on whether we can allow smaller antennas in the 6, 18 and 23 GHz bands without producing harmful interference.

4. Second, pursuant to Section 101.141(a)(3) of the Commission's Rules, Fixed Service operators must comply with minimum payload capacities (in terms of megabits per second) and minimum traffic loading payload (as a percentage of payload capacity) to promote efficient frequency use for various channel sizes in certain Part 101 bands. Under the current rules, the requirements apply equally to stations in urban areas and to stations in rural areas. We seek comment on whether exempting stations in less congested areas from complying with the minimum payload capacity rule could allow licensees to establish longer links, resulting in cost savings and facilitating the use of wireless broadband and other critical services.

5. Third, we propose to allow the use of wider channels in the Lower 6 GHz Band and 11 GHz Band. Specifically, we seek comment on allowing 60 megahertz channels in the Lower 6 GHz Band and 80 megahertz channels in the 11 GHz Band. The proposal has the potential to allow backhaul operators to handle more capacity and offer faster data rates.

6. Fourth, we seek comment on amending Section 101.145 of the Commission's Rules to limit the circumstances under which fixed service transmitters must obtain a waiver in order to point near the geostationary arc. Specifically, we propose to require a waiver only if the EIRP is greater than 35 dBW for the 5925-7075 MHz band and is greater than 45 dBW in the 12700-13250 MHz band. Limiting the circumstances where a waiver is necessary will be beneficial. Once the frequency coordination process is completed, the Commission's rules provide many applicants with conditional authority to begin service immediately, without waiting for final approval from the Commission, and with the stipulation that they must take their stations down if the Commission later rejects their applications. Conditional authority is not available, however, to applicants that must request waivers of existing rules. Accordingly, limiting the circumstances under which a waiver is needed will allow more applicants to rapidly commence service. Furthermore, we tentatively conclude that such a change would be consistent with international regulations and can be made without any increased risk of interference to satellite services.

7. Finally, we propose to add a definition of "payload capacity" to our rules, and seek comment on updating our capacity and loading standards to take into account the increasing use of interfaces such as Internet Protocol. Currently, Section 101.141(a)(3) of the Commission's Rules lists a "minimum payload capacity" for various nominal channel bandwidths. The same rule also defines "typical utilization" of the required payload capacity for each channel bandwidth as multiples of the number of voice circuits a channel can accommodate. These definitions are becoming outdated as systems support interfaces such as Internet Protocol. Accordingly, we propose to update our rules to add a definition of payload capacity. We also seek comment on revising our efficiency requirements to define those requirements in terms of bits-per-second-per-Hertz ("bps/Hz") across all bands. Such changes could make our rules clearer and would be consistent with modern digital technologies.

B. Legal Basis

8. The proposed action is authorized pursuant to sections 1, 2, 4(i), 7, 201, 301, 302, 303, 307, 308, 309, 310, 319, 324, 332, and 333 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 152, 154(i), 157, 201, 301, 302, 303, 307, 308, 309, 310, 319, 324, 332, and 333 and Section 706 of the Telecommunications Act of 1996, as amended, 47 U.S.C. § 1302.

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

9. The RFA directs agencies to provide a description of, and, where feasible, an estimate of the number of small entities that may be affected by the proposed rules and policies, if adopted.[4] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[5] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[6] A "small business concern" is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.[7]

10. *Small Businesses, Small Organizations, and Small Governmental Jurisdictions.* Our action may, over time, affect small entities that are not easily categorized at present. We therefore describe here, at the outset, three comprehensive, statutory small entity size standards.[8] First, nationwide, there are a total of approximately 27.5 million small businesses, according to the SBA.[9] In addition, a "small organization" is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[10] Nationwide, as of 2007, there were approximately 1,621,315 small organizations.[11] Finally, the term "small governmental jurisdiction" is defined generally as "governments of cities, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand."[12] Census Bureau data for 2011 indicate that there were 89,476 local governmental jurisdictions in the United States.[13] We estimate that, of this total, as many as 88, 506 entities may qualify as "small governmental jurisdictions."[14] Thus, we estimate that most governmental

[4] 5 U.S.C. § 603(b)(3).

[5] 5 U.S.C. § 601(6).

[6] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small-business concern" in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

[7] 15 U.S.C. § 632.

[8] *See* 5 U.S.C. §§ 601(3)–(6).

[9] *See* SBA, Office of Advocacy, "Frequently Asked Questions," web.sba.gov/faqs (last visited May 6,2011; figures are from 2009).

[10] 5 U.S.C. § 601(4).

[11] INDEPENDENT SECTOR, THE NEW NONPROFIT ALMANAC & DESK REFERENCE (2010).

[12] 5 U.S.C. § 601(5).

[13] U.S. CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES: 2011, Table 427 (2007)

[14] The 2007 U.S Census data for small governmental organizations are not presented based on the size of the population in each such organization. There were 89,476 small governmental organizations in 2007. If we assume that county, municipal, township, and school district organizations are more likely than larger governmental organizations to have populations of 50,000 or less, the total of these organizations is 52,125. If we make the same assumption about special districts and also assume that special districts are different from county, municipal, township, and school districts, in 2007 there were 37,381 special districts. Therefore, of the 89,476 small governmental organizations documented in 2007, as many as 89,506 may be considered small under the applicable standard. This data may overestimate the number of such organizations that has a population of 50,000 or less. U.S. (continued….)

jurisdictions are small.

11. *Wireless Telecommunications Carriers (except satellite)*. The appropriate size standard under SBA rules is for the category Wired Telecommunications Carriers. Under that size standard, such a business is small if it has 1,500 or fewer employees.[15] Census Bureau data for 2007, which now supersede data from the 2002 Census, show that there were 3,188 firms in this category that operated for the entire year. Of this total, 3,144 had employment of 999 or fewer, and 44 firms had employment of 1,000 employees or more. Thus under this category and the associated small business size standard, the Commission estimates that the majority of wireless telecommunications carriers(except satellite) are small entities that may be affected by our proposed action.[16]

12. *Fixed Microwave Services*. Microwave services include common carrier,[17] private-operational fixed,[18] and broadcast auxiliary radio services.[19] At present, there are approximately 31,549 common carrier fixed licensees and 89,633 private and public safety operational-fixed licensees and broadcast auxiliary radio licensees in the microwave services. Microwave services include common carrier,[20] private-operational fixed,[21] and broadcast auxiliary radio services.[22] They also include the Local Multipoint Distribution Service (LMDS),[23] the Digital Electronic Message Service (DEMS),[24] and the 24 GHz Service,[25] where licensees can choose between common carrier and non-common carrier status.[26]

(Continued from previous page)

CENSUS BUREAU, STATISTICAL ABSTRACT OF THE UNITED STATES 2011, Tables 427, 426 (Data cited therein are from 2007).

[15] 13 C.F.R. § 121.201, NAICS code 517110.

[16] *See* http://factfinder.census.gov/servlet/IBQTable?_bm=y&-fds_name=EC0700A1&-geo_id=&-_skip=600&-ds_name=EC0751SSSZ5&-_lang=en

[17] 47 C.F.R. Part 101 *et seq*. (formerly, part 21 of the Commission's Rules) for common carrier fixed microwave services (except MDS).

[18] Persons eligible under Parts 80 and 90 of the Commission's rules can use Private-Operational Fixed Microwave services. *See* 47 C.F.R. Parts 80 and 90. Stations in this service are called operational-fixed to distinguish them from common carrier and public fixed stations. Only the licensee may use the operational-fixed station, and only for communications related to the licensee's commercial, industrial, or safety operations.

[19] Auxiliary Microwave Service is governed by Part 74 and Part 78 of Title 47 of the Commission's Rules. Available to licensees of broadcast stations, cable operators, and to broadcast and cable network entities. Auxiliary microwave stations are used for relaying broadcast television signals from the studio to the transmitter, or between two points such as a main studio and an auxiliary studio. The service also includes TV pickup and CARS pickup, which relay signals from a remote location back to the studio.

[20] *See* 47 C.F.R. Part 101, Subparts C and I.

[21] *See* 47 C.F.R. Part 101, Subparts C and H.

[22] Auxiliary Microwave Service is governed by Part 74 of Title 47 of the Commission's Rules. *See* 47 C.F.R. Part 74. Available to licensees of broadcast stations and to broadcast and cable network entities, broadcast auxiliary microwave stations are used for relaying broadcast television signals from the studio to the transmitter or between two points such as a main studio and an auxiliary studio. The service also includes mobile TV pickups, which relay signals from a remote location back to the studio.

[23] *See* 47 C.F.R. Part 101, Subpart L.

[24] *See* 47 C.F.R. Part 101, Subpart G.

[25] *See id.*

The Commission has not yet defined a small business with respect to microwave services. For purposes of the IRFA, the Commission will use the SBA's definition applicable to Wireless Telecommunications Carriers (except satellite)—i.e., an entity with no more than 1,500 persons is considered small.[27] For the category of Wireless Telecommunications Carriers (except Satellite), Census data for 2007, which supersede data contained in the 2002 Census, show that there were 1,383 firms that operated that year.[28] Of those 1,383, 1,368 had fewer than 100 employees, and 15 firms had more than 100 employees. Thus under this category and the associated small business size standard, the majority of firms can be considered small. The Commission notes that the number of firms does not necessarily track the number of licensees. The Commission estimates that virtually all of the Fixed Microwave licensees (excluding broadcast auxiliary licensees) would qualify as small entities under the SBA definition.

13. *Satellite Telecommunications and All Other Telecommunications.* Two economic census categories address the satellite industry. The first category has a small business size standard of $15 million or less in average annual receipts, under SBA rules.[29] The second has a size standard of $25 million or less in annual receipts.[30]

14. The category of Satellite Telecommunications "comprises establishments primarily engaged in providing telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications."[31] Census Bureau data for 2007 show that 512 Satellite Telecommunications firms operated for that entire year.[32] Of this total, 464 firms had annual receipts of under $10 million, and 18 firms had receipts of $10 million to $24,999,999.[33] Consequently, the Commission estimates that the majority of Satellite Telecommunications firms are small entities that might be affected by our action.

15. The second category, *i.e.* "All Other Telecommunications"" comprises "establishments primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation. This industry also includes establishments primarily engaged in providing satellite terminal stations and associated facilities connected with one or more terrestrial systems and capable of transmitting telecommunications to, and receiving telecommunications from, satellite systems. Establishments providing Internet services or voice over Internet protocol (VoIP) services via client-supplied telecommunications connections are also included in

(Continued from previous page)

[26] *See* 47 C.F.R. §§ 101.533, 101.1017.

[27] 13 C.F.R. § 121.201, NAICS code 517210.

[28] U.S. Census Bureau, 2007 Economic Census, Sector 51, 2007 NAICS code 517210 (rel. Oct. 20, 2009), http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-fds_name=EC0700A1&-_skip=700&-ds_name=EC0751SSSZ5&-_lang=en.

[29] 13 C.F.R. § 121.201, North American Industry Classification System ("NAICS") code 517410.

[30] 13 C.F.R. § 121.201, NAICS code 517919.

[31] U.S. Census Bureau, 2007 NAICS Definitions, "517410 Satellite Telecommunications."

[32] *See* http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=900&-ds_name=EC0751SSSZ4&-_lang=en.

[33] *See* http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=900&-ds_name=EC0751SSSZ4&-_lang=en

this industry."[34] For this category, Census Bureau data for 2007 show that there were a total of 2,383 firms that operated for the entire year.[35] Of this total, 2,347 firms had annual receipts of under $25 million and 12 firms had annual receipts of $25 million to $49, 999,999.[36] Consequently, the Commission estimates that the majority of All Other Telecommunications firms are small entities that might be affected by our action.

D. Description of Projected Reporting, Recordkeeping, and other Compliance Requirements

16. This FNPRM proposes no new reporting or recordkeeping requirements.

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

17. The RFA requires an agency to describe any significant alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): (1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance or reporting requirements under the rule for small entities; (3) the use of performance, rather than design, standards; and (4) an exemption from coverage of the rule, or any part thereof, for small entities.[37]

18. The actions proposed in the *FNPRM* would provide additional options to all licensees, including small entity licensees. Such actions will serve the public interest by making additional spectrum available for fixed service users; will provide additional flexibility for broadcasters to use microwave spectrum; and will allow communications to be maintained during adverse propagation conditions. The rules will therefore open up beneficial economic opportunities to a variety of spectrum users, including small businesses. Because the actions proposed in the *FNPRM* will improve beneficial economic opportunities for all businesses, including small businesses, a detailed discussion of alternatives is not required.

19. Generally, the alternative approach would be to maintain the existing rules. With respect to the proposal to allow smaller antennas in the 6 GHz band, an alternative approach would be to establish technical criteria that would allow the use of 4-foot antennas, as opposed to the 3-foot antennas proposed. Such an approach would reduce the cost savings FS licensees could realize, including small licensees, but may reduce the potential for interference.

20. With respect to the proposal to relax efficiency standards in rural areas, an alternative would be to modify the requirement in non-congested areas as opposed to exempting non-congested areas from compliance. It is unclear whether such an approach would provide sufficient relief to FS licensees, including small businesses.

---

[34] http://www.census.gov/cgi-bin/sssd/naics/naicsrch?code=517919&search=2007%20NAICS%20Search.

[35] http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=900&-ds_name=EC0751SSSZ4&-_lang=en .

[36] http://factfinder.census.gov/servlet/IBQTable?_bm=y&-geo_id=&-_skip=900&-ds_name=EC0751SSSZ4&-_lang=en.

[37] 5 U.S.C. § 603(c).

F. Federal Rules that May Duplicate, Overlap, or Conflict with the Proposed Rules

21. None.

APPENDIX E

List of Commenters to *Wireless Backhaul NPRM/NOI*

Comments

Agape Church Inc, dba VTN (VTN)
Association for Maximum Service Television, Inc. (MSTV) and the National Association of Broadcasters (NAB)
AT&T, Inc. (AT&T)
Aviat Networks, Inc. (Aviat Networks)
Blooston, Mordkofsky, Dickens, Duffy & Prendergast, LLP (Blooston)
Ceragon Networks, Ltd. (Ceragon)
Cielo Networks (Cielo)
Clearwire Corporation (Clearwire)
Comsearch
Consolidated Spectrum Services
DTV Norwich, LLC (DTV Norwich)
Engineers for the Integrity of Broadcast Auxiliary Services Spectrum (EIBASS)
FiberTower Corporation (FiberTower)
Fixed Wireless Communications Coalition (FWCC)
Gary R. Gray, Radio Systems Manager, City of Fort Lauderdale
Holy Cross Electric Association Inc.
Mimvi, Inc. (Mimvi)
Motorola, Inc. (Motorola)
National Spectrum Management Association (NSMA)
OEM Communications LLC (OEM)
Orion Broadcast Solutions (Orion)
PCIA—The Wireless Infrastructure Association (PCIA)
The Rural Telecommunications Group, Inc. (RTG)
San Mateo County
Society of Broadcast Engineers, Incorporated (SBE)
Satellite Industry Association (SIA)
Sierra Telecom Inc. (Sierra)
Sirius XM Radio Inc. (Sirius XM)
Sprint Nextel Corporation (Sprint)
Stratos Offshore Services Company (Stratos)
Telecommunications Industry Association (TIA)
T-Mobile USA, Inc. (T-Mobile)
United States Cellular Corporation (U.S. Cellular)
Verizon and Verizon Wireless (Verizon)
Washington State Patrol
Wireless Communications Association International
Wireless Internet Service Providers Association (WISPA)
Wireless Strategies, Inc. (WSI)
XO Communications, LLC (XO)

Reply Comments

AT&T
City of Napa, CA

Comsearch
County of Alpine, CA
County of Contra Costa, CA
County of Marin, CA
County of Sacramento, CA
Doctors Telehealth Network Inc. (DTN)
East Bay Regional Parks District, CA
EIBASS
Exalt Communications Inc.
FiberTower
FWCC
MSTV and NAB
National Cable & Telecommunications Association (NCTA)
National Translator Association (NTA)
NSMA
Salt Lake County, UT
San Mateo County
SIA
Sprint
U.S. Cellular
WISPA
WSI
Walt Disney Company (Disney)
Yolo Emergency Communications Agency, CA

Ex Parte
Comsearch
EIBASS
FiberTower
FWCC
NAB
NCTA
New America Foundation
Proxim Wireless Corporation
Robert Klingle
SBE
SmarterBroadband, Inc.
Verizon
WSI
XO

Comments in Response to June 7, 2011 Public Notice
EIBASS
FWCC
NAB
SBE
SIA
Sirius XM
Vislink Inc., DBA Microwave Radio Communications (Vislink)
WISPA

APPENDIX F

List of Commenters to Fixed Wireless Communications Coalition Petition for Rulemaking, RM-11602

Petition for Rulemaking
FWCC

Comments
Conterra Ultra Broadband, LLC (Conterra)
FWCC
NSMA

Reply Comments
FWCC

STATEMENT OF
CHAIRMAN JULIUS GENACHOWSKI

Re: *Amendment of Part 101 of the Commission's Rules to Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees; Petition for Rulemaking filed by Fixed Wireless Communications Coalition to Amend Part 101 of the Commission's Rules to Authorize 60 and 80 MHz Channels in Certain Bands for Broadband Communications;* WT Docket No. 10-153; RM-11602

Today, we implement another key recommendation of our National Broadband Plan by unleashing additional spectrum to help drive our economy. We do so by removing regulatory barriers to efficient spectrum use and rapid broadband build-out.

Today's Order is a trifecta: It's another important step in our spectrum agenda, recognizing the powerful role that wireless communications can play in economic revitalization. It's another important step in our Broadband Acceleration Initiative, recognizing the importance to job creation of accelerating broadband build-out and reducing its costs. And it's another important step in our regulatory reform agenda, recognizing our ongoing commitment to remove or reform outdated regulations.

Let me briefly discuss each.

First, spectrum is the invisible infrastructure that enables mobile communications, and mobile communications are growing more rapidly than ever. There are now more smart phones being sold than PCs, and smart phones use 24 times as much spectrum as traditional feature phones. Tablets, which didn't even exist two years ago, use 122 times as much. Without additional spectrum for mobile broadband, demand will soon exceed supply.

Voluntary incentive auctions would provide a market-based mechanism to address the Nation's rapidly growing need for spectrum; yield many billions of dollars for taxpayers and the construction of a nationwide, interoperable public safety broadband network; and lead to the creation of thousands of jobs and billions of dollars in private investment. That's why the concept enjoys bipartisan support in Congress and is advocated by 112 economists from across the political spectrum.

Incentive auctions aren't the only item on our spectrum agenda. Across the board, we have been working together to remove restrictions that unnecessarily keep spectrum locked up. Today we remove more needless restrictions.

Backhaul is the skeleton supporting broadband, and *wireless* backhaul is often a very efficient means of transmitting data among cell sites, or between cell sites and network backbones. Spectrum, in other words, can be an important part of the "middle mile" of broadband networks.

And indeed, wireless technology is an increasingly important source of backhaul – particularly in rural and remote locations it may be the only practical high-capacity backhaul solution available.

So today, by eliminating unnecessary restrictions on the use of this spectrum, we encourage spectrum efficiency and free up more spectrum to help drive economic and public benefits.

Second, broadband is a bright spot in our economy. Wired and wireless broadband connects people and their communities to the larger economy and opens up new worlds of commerce and

opportunity, promoting innovation, investment, and new jobs. Just last week, I was proud to visit Jeffersonville, Indiana, to announce a broadband-based initiative that will create 100,000 call center jobs over the next two years. That announcement would not have been possible without broadband infrastructure, which is essential for customer service reps at call centers to process transactions; access records; manage accounts and information; and engage in VoIP calls, emailing, and live text chatting.

Making sure broadband infrastructure is everywhere is, plain and simple, a job-creation strategy. That's why we launched our Broadband Acceleration Initiative, focusing on ways to reduce barriers to broadband infrastructure deployment, to speed broadband build-out and reduce costs.

We've already established a shot-clock for the approval process for siting wireless towers and antennas and adopted a comprehensive reform of our pole attachment rules, making it easier and more efficient for wired and wireless broadband providers to attach equipment to telephone and utility poles. I'm pleased that last week, the D.C. Circuit Court of Appeals denied a motion to stay application of our pole attachment rules. This is consistent with our 94% success rate where a direct statutory challenge is made to an FCC order and with our success rate in the D.C. Circuit, where in 3 of every 4 cases the Commission wins on every single issue presented, and we prevail on some or all issues 91% of the time. I thank FCC General Counsel Austin Schlick and his talented staff for their great work on this matter.

Our action today is another important milestone in our Broadband Acceleration Initiative – particularly in accelerating broadband in rural areas covering half the land mass of our country.

And finally, our action today is another important milestone in our regulatory reform agenda. Simply put, today we are lifting unnecessary and outdated regulatory restrictions on spectrum use. As I'll discuss in more detail when we consider our next item, from Day One we have been committed, and we remain committed, to removing unnecessary and outdated regulatory requirements from our books.

While the actions we take in today's wireless backhaul item are somewhat technical in nature – more of the blood and guts of the FCC's doing its job – this Order will help Americans and our economy. It will do so by advancing the agency's spectrum agenda, Broadband Acceleration Initiative, and regulatory reform agenda. By freeing up spectrum for backhaul in rural areas, we're enabling service providers to extend broadband services more efficiently to rural and underserved communities and to improve broadband speeds where service already exists. We're helping rural economies and rural consumers.

There is a public benefit as well. The further step we take today of permitting microwave licensees to take advantage of the latest technology and maintain the reliability of critical links can help make the difference in ensuring that emergency communications – including 9-1-1 calls – are maintained in severe weather.

We recognize that there is potentially more we can do to lift restrictions and free up more spectrum for wireless backhaul – which is why the Further Notice we adopt today explores additional ideas for making microwave communications more flexible and cost-effective.

Thank you to my colleagues on the Commission and to the staff of the Wireless Telecommunications Bureau for their hard work and creative thinking on ways in which we can remove regulatory barriers, make more spectrum available for critical services, and increase spectrum flexibility.

STATEMENT OF
COMMISSIONER MICHAEL J. COPPS

Re: *Amendment of Part 101 of the Commission's Rules to Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees; Petition for Rulemaking filed by Fixed Wireless Communications Coalition to Amend Part 101 of the Commission's Rules to Authorize 60 and 80 MHz Channels in Certain Bands for Broadband Communications;* WT Docket No. 10-153; RM-11602

This is a fine day for rural wireless consumers. We make good on the National Broadband Plan's recommendation for more availability of microwave in rural America, and we set the stage for more action to decrease deployment costs of this technology—something that is becoming increasingly important as we move toward a 4G world. The current spectrum crunch is also a backhaul crunch, and microwave is often the answer in rural areas where it may not be economical to run fiber. The benefits of mobile broadband are at this point obvious; what's equally obvious is that no one should be left behind because of where they happen to live.

This order clears the regulatory way to making greater use of 650 MHz spectrum for microwave, and this will benefit those in approximately half of America's land mass, or 10 percent of our population. At the same time, the item rightfully acknowledges the interests of microwave's spectrum neighbors in the bands - Broadcast Auxiliary Service and Cable TV Relay Service. Today we take appropriate and reasonable steps to make sure these services co-exist. For example, we reserve two nationwide channels for BAS and CARS to accommodate TV pickup stations covering events that occur outside their license areas.

Still, there is more we can do. Today's further notice asks questions about additional steps we can take to encourage greater use of microwave backhaul. To be sure, we must be alert to guard against interference and to promote spectrum efficiency. But examining our current technical standards for antennas, efficiency, and channel size presents additional opportunities to increase the presence of, and competition in, microwave backhaul. As an example, tower siting costs and a lack of desirable antenna positions drive up provider costs; exploring our antenna standards may bring relief. I look forward to hearing from all interested parties on points such as these.

I want to thank the Wireless Telecommunications Bureau and the Chairman for moving us forward on the increasingly important matter of backhaul for rural consumers.

STATEMENT OF
COMMISSIONER ROBERT M. McDOWELL

Re: *Amendment of Part 101 of the Commission's Rules to Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees; Petition for Rulemaking filed by Fixed Wireless Communications Coalition to Amend Part 101 of the Commission's Rules to Authorize 60 and 80 MHz Channels in Certain Bands for Broadband Communications;* WT Docket No. 10-153; RM-11602

I am voting to approve this order and further notice of proposed rulemaking because the actions we take today are consistent with my longstanding commitment to creating meaningful competitive opportunities for cost-efficient backhaul, which ultimately benefits America's consumers. I am pleased that we are removing regulatory barriers that unnecessarily hamper the ability to enter the marketplace for wireless backhaul and other point-to-point and point-to-multipoint communications. We are also making additional spectrum available for this purpose, as well as seeking comment on allowing wider channels and smaller antennas in certain bands. With these actions, the Commission is taking another step to spur the construction of advanced broadband services.

I thank the talented group in the Wireless Telecommunications Bureau for your work in this highly-technical proceeding. I look forward to reviewing the record resulting from the further notice with the hope that we will be able to do more to promote flexible, cost-effective microwave services.

STATEMENT OF
COMMISSIONER MIGNON L. CLYBURN

Re: *Amendment of Part 101 of the Commission's Rules to Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees; Petition for Rulemaking filed by Fixed Wireless Communications Coalition to Amend Part 101 of the Commission's Rules to Authorize 60 and 80 MHz Channels in Certain Bands for Broadband Communications;* WT Docket No. 10-153; RM-11602

The federal government is often criticized by those who believe that pro-consumer regulation automatically harms business development. This item is an example of how the FCC uses its regulatory authority to the benefit of both consumers and businesses.

By adopting the rules in this item, the Commission takes important steps to give mobile service consumers, particularly those living in rural areas, more competitive choices. How? By encouraging businesses to deploy more services. As our past two Mobile Services Reports have demonstrated, backhaul transport is necessary to deploy mobile service. But backhaul imposes significant costs on mobile service providers, especially in rural areas. Providers are increasing their use of microwave communications to reduce those costs. So, by permitting microwave communications in more spectrum bands, these rules enhance the flexibility of service providers to find the most cost effective backhaul transport solutions for their respective business models.
These changes to Part 101 of our Rules could enable as much as 650 megahertz of spectrum, for backhaul transport, in rural areas. Consequently, these rules enhance the ability for rural consumers, to receive more mobile services. They also create new business opportunities for companies, that want to offer more backhaul transport to mobile service providers, and companies that seek to serve mobile wireless consumers.

I was pleased to see, that the item does not stop at adopting rules to permit more use of microwave communications in rural areas. It also adopts a Further Notice on proposals that could further reduce the costs to deploy mobile wireless services. For example, allowing the use of smaller antennas should lower the costs that providers currently incur to manufacture and maintain antennas. This proposal could also allow existing towers to accommodate more antennas. Collocation of antennas tends to streamline the process for obtaining local government approval of siting applications. Therefore, smaller antennas should also reduce the administrative costs associated with network deployment.

The proposal to permit wider channel bandwidths in the 6 and 11 GHz bands is also promising for those rural areas that are hardest to serve. Wider channels, allow providers to build backhaul links that are more reliable and able to accommodate increased demand for broadband services. It is possible, in the least populated rural areas, that there is sufficient spectrum available in the 6 and 11 GHz bands, to allow the use of wider channels, and spur greater deployment of wireless broadband services. I encourage the industry to continue to provide us with creative proposals.

I commend Chairman Genachowski for his leadership in directing the staff to find practical solutions to the challenges facing mobile service providers in rural areas. And I wish to thank Rick Kaplan and his staff at the Wireless Telecommunications Bureau, for their hard work on this important item.