

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

In the Matter of)	
)	
Allocations and Service Rules for the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands	)	WT Docket No. 02-146
)	
Loea Communications Corporation Petition for Rulemaking)	RM-10288
)	

NOTICE OF PROPOSED RULE MAKING

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I. INTRODUCTION AND EXECUTIVE SUMMARY

1. With this *Notice of Proposed Rulemaking (Notice)*, we examine methods to promote the commercial development and growth of the "millimeter wave" spectrum in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands under Parts 15 and 101 of our Rules.¹ This action follows an initiative by our Office of Engineering and Technology concerning possible development of these bands. We also take this action pursuant to our mandate under Sections 7(a) and 303(g) of the Communications Act of 1934, as amended, "to encourage the provision of new technologies and services to the public" and "encourage the larger and more effective use of radio in the public interest."² We also seek comment on a proposal by Loea Communications Corporation (Loea) to establish service rules for the licensed use of the 71-76 GHz and 81-86 GHz bands. We seek to develop a flexible and streamlined regulatory framework that will encourage innovative uses of the spectrum; accommodate future developments in technology and equipment; promote competition in the communications services, equipment and related markets; and advance the potential sharing between non-Federal Government and Federal Government³ systems.⁴ Additionally, we anticipate that our proposals will encourage the use of technologies developed in military and scientific applications in a broad range of new products and services, such as high-speed wireless local area networks and broadband access systems for the Internet.

2. In July 2000, the Commission held a public forum on possible new uses of the 92-95 GHz band.⁵ Several speakers at the forum indicated that due to recent technological developments, new uses of this band are approaching practicality. In addition, in July 2001, Loea experimented with technology it developed for use of the 71-76 GHz and 81-86 GHz bands.⁶ As a result, Loea filed a petition requesting the establishment of service rules for the licensed use of the 71-76 GHz and 81-86 GHz bands on September 10, 2001.⁷ Accordingly, we seek comment on our proposed rules to allow use of the 71-76 GHz, 81-86 GHz, 92-94 GHz and 94.1-95 GHz bands for a broad range of new fixed and mobile services. These proposals include allocation changes to the bands as well as provisions to ensure that new non-Federal Government operations can share the available frequencies with Federal Government operations in the same bands and protect operations in adjacent bands. Specifically, we seek comment on the following issues regarding use of the 71-76 GHz, 81-86 GHz and 92-95 GHz bands:

¹ The term "millimeter wave" derives from the wavelength of radio signals on frequencies between 30 GHz and 300 GHz, which ranges between 1 and 10 millimeters.

² 47 U.S.C. §§ 7(a), 303(g).

³ In the context of spectrum management, "Federal Government" refers to use by the Federal Government and "non-Federal Government" refers to use by private entities and state and local governments. In the past, the Commission has sometimes used the terms "Government" and "non-Government" for this same dichotomy, but we feel these longer terms are more descriptive and thus, are phasing in the more descriptive terms.

⁴ 47 U.S.C. §§ 7(a), 303(g).

⁵ See Office of Engineering and Technology to Host Forum on 90 GHz Technologies, *FCC Public Notice*, DA 00-1191 (May 31, 2000).

⁶ See Loea Communications Corporation, Petition for Rulemaking at 4 (filed Sept. 10, 2001) (Loea Petition).

⁷ See Loea Petition.

- Reallocating the 71-76 GHz, 81-86 GHz and 92-95 GHz bands to update the current allocations, which were established at the World Administration Radio Conference (Geneva, 1979) (WARC-79);
- Developing an appropriate band plan for the 71-76 GHz, 81-86 GHz and 92-95 GHz bands;
- Providing for unlicensed use of the 92-95 GHz band;
- Authorizing the new licensed services under Part 101 of our Rules and the new unlicensed devices under Part 15 of our Rules;
- The appropriate means of licensing spectrum for these bands (*e.g.*, geographic service areas or site-based licenses);
- Whether to permit licensees to select licensing as a band manager or as a regular non-band manager licensee; and
- Developing an appropriate eligibility standard for potential licensees.

II. BACKGROUND

3. The use of wireless frequencies by entities regulated by the Commission is subject to two primary types of regulatory oversight: an allocation of spectrum and rules to govern the operations in the band.⁸ Spectrum allocations are set forth in the United States Table of Allocations (U.S. Table) in Section 2.106 of our Rules.⁹ The U.S. Table now extends up to 300 GHz and specifies the types of services for which each band may be used. Service rules describe the specific technical standards and licensing criteria to be used for licensed services or the technical standards that apply to unlicensed devices.¹⁰ At present, the highest frequencies for which we authorize licensed services are in the 48.2-50.2 GHz band and the highest frequencies in which unlicensed devices may operate is the 76-77 GHz band.¹¹ Thus, currently, radio technology that operates above 50.2 GHz may not be licensed except on an experimental basis under Part 5 of our rules,¹² and devices for operation above 77 GHz on either a licensed or unlicensed basis may not be marketed.¹³

⁸ For licensed services, these rules are called “service rules.”

⁹ 47 C.F.R. § 2.106.

¹⁰ Unlicensed devices that intentionally emit radio frequency energy are regulated under Part 15 of our Rules. The Part 15 rules specify limits on the power and operating characteristics of these devices that are designed to avoid the potential for such devices to cause interference. These rules also provide that unlicensed devices may not cause interference and must accept interference from other radio transmitters. *See generally*, 47 C.F.R. Part 15.

¹¹ 47 C.F.R. §§ 15.253, 25.202(a)(1). Consistent with their class of licenses, Amateur licensees are permitted to use various bands allocated to the Amateur Service without authorization for specific frequencies. Therefore, it is unclear as to whether the 75.5-76 GHz Amateur Radio band is currently being used.

¹² 47 C.F.R. § 5.01 *et seq.* These rules permit simplified licensing of spectrum for experiments that would not otherwise be permitted under our Rules. In general, equipment may not be marketed in connection with such (continued....)

4. On September 10, 2001, Loea requested that the Commission commence a rulemaking proceeding to adopt service rules governing the licensing and point-to-point use of the 71-76 GHz and 81-86 GHz bands. Nine parties filed comments in response to Loea's Petition.¹⁴

5. The Commission is aware of the advances in microchip development, and of the special propagation characteristics of the 71-76, 81-86, and 92-95 GHz frequency bands that provide a new environment for the development and marketing of new applications in these bands. Current uses of the millimeter wave bands include radio astronomy, spaceborne cloud radars, and military applications. There also is the potential to use the spectrum for other applications such as passive imaging of airport runways (when obscured by fog or smoke), imaging to display hidden contraband, weapons and nonmetal objects, point-to-point communications, and point-to-multipoint communications. These special uses are possible because of the shorter wavelengths, which are about three to five millimeters, and because of other technical characteristics that differentiate the 71-76, 81-86, and 92-95 GHz bands from other frequency bands.¹⁵ Loea, for example, reports successful experiments in transmitting video and teleconferencing information in Maui, Hawaii over separate channels at 71.0-72.75 GHz and 73.0-74.75 GHz.¹⁶ Loea points out the possibility of creating and offering terrestrial broadband services and applications in these bands, which would lead to rapid and wider deployment of broadband capacity.¹⁷

6. Because of shorter wavelengths, the 71-76, 81-86, and 92-95 GHz bands permit the use of smaller antennas than would be required for similar circumstances in the lower bands, to achieve the same high directivity and high gain.¹⁸ The immediate consequence of this high directivity, coupled with the high free space loss at these frequencies, is the possibility of a more efficient use of the spectrum for point-to-multipoint applications. Since a greater number of high directive antennas can be placed than less directive antennas in a given area, the net result is higher reuse of the spectrum, and higher density of users, as compared to lower frequencies. Furthermore, due to the fact that one can place more voice channels or broadband information using a higher frequency to transmit the information, this spectrum could potentially be used as a replacement for or supplement to fiber optics.

(Continued from previous page) _____

experiments and service may not be provided for commercial use. However, there are provisions for "limited marketed studies" that permit marketing on a small scale. *See* 47 C.F.R. § 5.93.

¹³ No licensed service rules address frequency use above 50.2 GHz. The highest frequency specifically authorized for unlicensed use is 77 GHz, which is used for vehicular radar systems, 47 C.F.R. § 15.253.

¹⁴ *See* Appendix C.

¹⁵ By contrast, the wavelengths in the UHF-TV band are about half a meter and wavelengths in the AM broadcast band are hundreds of meters. The wavelength (expressed in meters) for a given frequency can be found by dividing 300 by the frequency (expressed in MHz).

¹⁶ *See* Loea Petition at 4.

¹⁷ *Id.*

¹⁸ For a given beamwidth (directivity), the required antenna size scales inversely with frequency. Thus a 45 GHz antenna would be twice as large as a 90 GHz antenna with the same beamwidth and a 22.5 GHz antenna would be four times as large as a 90 GHz antenna with the same diameter.

7. Another important propagation characteristic of the millimeter wave bands is its particular behavior under certain atmospheric conditions.¹⁹ While free space loss is proportional to the distance between the two points in a link, and the frequency used in the link, losses due to atmospheric absorption are dependent on the frequency, distance and weather conditions. Most notable is how the loss due to the presence of oxygen or water vapor in the path varies greatly with frequency and increases exponentially with distance. Under certain circumstances, it can be much greater than the free space loss that is the main factor at lower frequencies. For example, attenuation below 30 GHz due to the atmosphere absorption is about 0.4 dB/km for the worse case of atmospheric conditions graphed. With the same conditions, a 40 GHz signal was shown to be attenuated at about 0.7 dB/km, and signals between 92-95 GHz were shown to be attenuated at the rate of about 2-3 dB/km.²⁰ Near 60 GHz, the signal loss due to absorption by oxygen molecules shows a dramatic jump in signal loss to a peak of about 15 dB/km.²¹

8. One can take advantage of the peculiar behavior of different frequencies within the Extremely High Frequency (EHF) band²² in the presence of oxygen or water vapor. Around 60 GHz the oxygen absorption produces so much loss, compared to other parts of the EHF band, that it makes this part of the spectrum less suitable for fixed point-to-point or point-to-multipoint links, but more suitable for applications requiring the re-use of the spectrum. However, above 60 GHz, oxygen absorption decreases. In the 92-95 GHz frequencies, oxygen absorption in dry air is comparable to the oxygen absorption at 40 GHz, thus making these frequencies more desirable for fixed applications. We also note that while absorption by oxygen of radio energy at 92-95 GHz is relatively low, absorption of such energy by water molecules is much higher at these frequencies. As a result, in non-desert conditions the limiting factor in achievable range is usually governed by humidity and precipitation conditions. High humidity and rain increase path absorption by increasing the number of water molecules in the air.²³ This increased absorption, in turn, affects the range/channel reliability tradeoff.²⁴ An engineer designing a telecommunications system for this band can choose to achieve increased communication range at the expense of reliability due to weather-related absorption or can seek shorter ranges with higher reliability. We also note that the propagation characteristics of the 71-95 GHz band suggest applications in conjunction with other types of communications systems that can increase reliability of the overall communications system. For example, fog has less impact on millimeter wave propagation than it does on optical propagation²⁵ because the wavelength of millimeter wave signals in the 71-95 GHz spectrum is much larger than the size of the fog particles. Therefore, the radio signal only has minimal interaction with fog particles, thus making EHF spectrum potentially a good choice as a wireless back-up for an optical laser communications link.

¹⁹ See Millimeter Wave Propagation: Spectrum Management Implications, [OET Bulletin No. 70](#) (July 1997).

²⁰ See Loea Petition, Attachment A, Loveberg Paper at 3.

²¹ See Millimeter Wave Propagation: Spectrum Management Implications, [OET Bulletin No. 70](#) (July 1997) at 6.

²² The EHF frequencies are between 30 GHz and 300 GHz.

²³ Fog absorption can be about 1 dB/km. Heavy rain, approximately 10 mm/hr, can increase fog absorption to 5 dB/km.

²⁴ That is, the longer the telecommunications path, the higher the possibility of weather related outages, and the lower the reliability of the microwave path.

²⁵ Optical propagation refers to the propagation of visible electromagnetic waves carrying intelligence such as voice, data, or video.

9. Although the generation and experimental use of millimeter wave frequencies goes as far back as the work of Dr. J. C. Bose about 100 years ago in India, practical and affordable technology for the use of such frequencies has been generally lacking.²⁶ However, a variety of development efforts in the 1990s in millimeter wave device technology, such as the Defense Advanced Research Project Agency's Monolithic Microwave Integrated Circuit (MIMIC) program and Microwave and Analog Front End Technology (MAFET) program, have led to the development of practical designs of components in the millimeter wave area, such as in the 92-95 GHz band.²⁷ Currently, such devices are produced only in small quantities for experimental use in the 70-90 GHz bands and limited Federal Government applications and are, therefore, very costly. The creation of markets for 70, 80 and 90 GHz technology, which could result from the adoption of rules by this agency, could reduce the costs of such equipment by increasing production quantities and "learning curve" efficiencies. Such increased production may also benefit Federal Government users of this band because most millimeter wave component production facilities would serve both military and private sector markets.

III. DISCUSSION

10. As noted previously, this region of the spectrum is essentially undeveloped and available for new uses. It has been our experience that opening new regions of the spectrum to new applications and technologies fosters the development of new communications products and services for the public and the concomitant economic growth and jobs.²⁸ For example, opening certain bands to spread spectrum technology on an unlicensed basis in 1985 stimulated rapid private sector development of that technology. Today, numerous businesses and other entities use millions of spread spectrum devices for such diverse applications as remote meter reading, utility load management, voice-secure cordless telephones, and radio local area networks.²⁹ Similarly, we believe that opening portions of the millimeter wave spectrum could stimulate new applications of radio technology, facilitate technology transfer from the military sector, and create opportunities for economic growth and jobs. This action will also promote United States competitiveness internationally by enabling the development of technology for potential international use.

²⁶ John F. Ramsay, "Microwave Antenna and Waveguide Techniques Before 1900", *Proc. IRE*, February 1958, p. 405-415.

²⁷ These two programs spent about \$700,000,000 on developing component technology for millimeter wave frequencies. See Chapter 7.4 Monolithic Microwave Integrated Circuit Technology in *The RF and Microwave Handbook*, Mike Golio, Ed., CRC Press, 2001 for a discussion of the component technologies involved.

²⁸ See Redevelopment of Spectrum to Encourage Innovation in the Use of New Telecommunications Technologies, *First Report and Order and Third notice of Proposed Rule Making*, 7 FCC Rcd 6886 (1992) (reallocating portions of the 2 GHz from fixed microwave services to emerging technology systems, including personal communications services (PCS)); See Authorization of Spread Spectrum and Other Wideband Emissions not Presently Provided for in the FCC Rules and Regulations, *First Report and Order*, GEN Docket No. 81-413, 101 FCC 2d 419 (1985) (*Spread Spectrum First R&O*) (adopting rules in Part 15 for low power spread spectrum devices).

²⁹ *Spread Spectrum First R&O*, 101 FCC 2d 419 (1985). In 1989, the Commission recodified and clarified the Part 15 spread spectrum rules. Revision of Part 15 of the Rules Regarding the Operation of Radio Frequency Devices without an Individual License, *First Report and Order*, GEN Docket No. 87-389, 4 FCC Rcd 3493 (1989). See also Amendment of Parts 2 and 15 of the Rules with Regard to the Operation of Spread Spectrum Systems, *Report and Order*, GEN Docket No. 89-354, 5 FCC Rcd 4123 (1990) (amending Parts 2 and 15 of the Rules with regard to operation of spread spectrum systems). See 47 C.F.R. § 15.247.

A. Allocation Proposals

1. Overview

11. All of the current domestic allocations for the 71-76 GHz, 81-86 GHz, and 92-95 GHz bands were established at WARC-79 and were codified in the Commission’s Rules in January 1984.³⁰ All 13 gigahertz of this spectrum is allocated to satellite services (specifically, the broadcasting-satellite (BSS), fixed-satellite (FSS), mobile-satellite (MSS), and amateur-satellite (AMSAT) services) and nearly all of this spectrum (12.5 GHz) is allocated to the fixed and mobile services. Satellite services in the 71-75.5 GHz and 92-95 GHz bands are to transmit in the Earth-to-space direction (uplinks) and satellite services in the 81-86 GHz band are to transmit in space-to-Earth direction (downlinks). Portions of this spectrum are also allocated to the broadcasting, radiolocation, and amateur services. All of these allocations are on a primary basis. In addition, small portions of this spectrum are available to the radio astronomy service (RAS).³¹ Table 1 provides an overview of the WARC-79 and current United States allocations for the 71-76 GHz, 81-86 GHz, and 92-95 GHz bands.

Table 1: Overview of WARC-79 and Current United States Allocations

FSS uplinks			Amateur & AMSAT	Changes not considered	FSS downlinks	BSS	No changes to consider	FSS uplinks		
MSS uplinks		MSS downlinks			Broadcasting	Radiolocation				
RAS						RAS				
Fixed & mobile					Fixed & mobile			Fixed & mobile		
71 GHz	72.91 72.77	74 GHz	75.5	76 GHz	81 GHz	84 GHz	86 GHz	92 GHz	93.27 93.07	95 GHz

12. The World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (Malaga-Torremolinos, 1992) (WARC-92) allocated the 74-84 GHz band to the space research service (space-to-Earth) (SRS downlinks) on a secondary basis throughout the world in order to provide 10 gigahertz of contiguous spectrum for space Very Long Baseline Interferometry (VLBI) purposes.³² The World Radiocommunication Conference (Geneva, 1997) (WRC-97) allocated the 94-94.1 GHz band to the Earth exploration-satellite service (EESS) and SRS for active sensor operations (EESS (active) and SRS (active)) and limited the use of these allocations to spaceborne cloud

³⁰ See Amendment of Part 2 of the Commission’s Rules Regarding Implementation of the Final Acts of the World Administrative Radio Conference, Geneva, 1979, General Docket No. 80-739, Second Report and Order, 49 FR 2357 (January 19, 1984).

³¹ Radio astronomy is astronomy based on the reception of radio waves of cosmic origin. See 47 C.F.R. § 2.1. The status of these RAS allocations are discussed in detail in paragraphs 15, 16, and 35.

³² See Final Acts of the World Administrative Radio Conference for Dealing with Frequency Allocations in Certain Parts of the Spectrum (WARC-92) at p. 92.

radars.³³ In order to provide spectrum for the spaceborne cloud radars, WRC-97 deleted the fixed, mobile, and FSS uplink allocations from the 94-94.1 GHz band.³⁴

13. Many technological and scientific advances and discoveries pertaining to radio waves of natural (including cosmic) origin have occurred since the passive allocations (RAS, EESS (passive), and SRS (passive)) were made at WARC-79.³⁵ At the World Radiocommunication Conference (Istanbul, 2000) (WRC-2000), the frequency bands above 71 GHz were realigned to reflect present and foreseeable future requirements for the passive services.³⁶ This realignment essentially reshuffled the allocations in the 71-275 GHz frequency range to account for a better understanding of how spectrum in this range might be used. While numerous allocations were moved to different frequency bands, generally the amount of spectrum available for specific services did not change. The most significant WRC-2000 change to the frequency bands at issue in this proceeding was that the 81-86 GHz, 92-94 GHz, and 94.1-95 GHz bands were allocated to the radio astronomy service (RAS) on a primary basis. The RAS can not share the same spectrum with satellite downlinks. Thus, it was necessary to change the 81-86 GHz band from a downlink band to an uplink band. This was achieved by interchanging the directional indicators of the FSS and MSS allocations in the 71-74 GHz and 81-84 GHz bands.³⁷ Likewise, the BSS allocation was moved from the 84-86 GHz band to the 74-76 GHz band in order to protect the new RAS allocation. In particular, we observe that these and other WRC-2000 actions together have provided the FSS with 5 gigahertz of downlink spectrum (71-76 GHz) that can be paired with 5 gigahertz of uplink spectrum (81-86 GHz). However, WRC-2000 also provided that this very same spectrum can be used for fixed applications, which is the focus of this proceeding. In contrast, there are no co-frequency satellite sharing issues in the 92-94 GHz and 94.1-95 GHz bands because WRC-2000 deleted the FSS uplink allocations from these bands.

14. In this proceeding, we will consider only those allocation changes that concern the 71-76 GHz, 81-86 GHz, and 92-95 GHz bands because we have requests before us to use that spectrum. Domestically, the 71-75.5 GHz, 81-86 GHz, and 92-95 GHz bands are shared between Federal and non-Federal Government users on an equal basis.³⁸ The 75.5-76 GHz band is currently non-Federal Government exclusive spectrum. We will consider the remaining WRC-2000 realignments in the 76-81

³³ An active sensor is an EESS or SRS measuring instrument by means of which information is obtained by transmission and reception of radio waves. See 47 C.F.R. § 2.1.

³⁴ See *Final Acts of the World Radiocommunication Conference (WRC-97)* at p. 71.

³⁵ A passive sensor is an EESS or SRS measuring instrument by means of which information is obtained by reception of radio waves of natural origin. See 47 C.F.R. § 2.1.

³⁶ See *Final Acts of the World Radiocommunication Conference (WRC-2000)* at pp. 43-46. See also United States Proposals for the Work of the Conference, Document 12-E, dated January 12, 2000. at pp. 31-67.

³⁷ Directional indicators specify the direction in which satellites or earth stations would be authorized to transmit. For example, FSS uplinks mean that fixed earth stations would be authorized to transmit to satellites. Another frequency band would be used for FSS downlinks, wherein satellites would be authorized to transmit to fixed earth stations.

³⁸ Frequency assignments in bands shared by Federal and non-Federal Government services are subject to coordination between NTIA and the FCC. No priority is recognized unless the terms of such priority are specifically defined in the U.S. Table or unless they are subject to mutually agreed arrangements in specific cases.

GHz band and in the 95-400 GHz frequency range and the WARC-92 SRS downlink allocation in the 76-81 GHz band in a separate proceeding.

2. 71-76 GHz

15. Prior to WRC-2000, the 71-75.5 GHz band was allocated to the fixed, mobile, and FSS uplink services on a primary basis throughout the world. The 71-74 GHz band was also allocated for MSS uplinks on a primary basis throughout the world. Footnote 5.556 stated that radio astronomy observations could be carried out under national arrangements in the 72.77-72.91 GHz band and, in making assignments to stations of other services, footnote 5.149 urged administrations to take all practical steps to protect the RAS in this band from harmful interference.³⁹ The 74-76 GHz band was allocated for SRS downlinks on a secondary basis throughout the world. The 75.5-76 GHz band was allocated to the amateur and AMSAT services on a primary basis throughout the world.

16. In the United States, these pre-WRC-2000 allocations have been implemented, except that the secondary allocation for SRS downlinks made at WARC-92 has not yet been considered.⁴⁰ Additionally, the Commission adopted footnote US270, which states that the 72.77-72.91 GHz band is also allocated to the RAS, in lieu of international footnotes 5.149 and 5.556.⁴¹ The Commission also adopted footnote US297, which states that a portion of the FSS uplink allocation (74-75.5 GHz) is available to be used as BSS feeder links. The 75.5-76 GHz band has been allocated to the Amateur Radio Service under Part 97 of our Rules.⁴²

17. At WRC-2000, the 81-86 GHz band was allocated to the RAS on a primary basis. In order to avoid having satellite downlinks in the 81-84 GHz band, which would cause harmful interference to the new primary RAS allocation, the MSS and FSS uplink allocations in the 71-74 GHz band were interchanged with the MSS and FSS downlink allocations in the 81-84 GHz band. WRC-2000 also deleted the 72.77-72.91 GHz band from footnotes 5.149 and 5.556 and added RAS allocations above 76 GHz.

18. WRC-2000 shifted the primary amateur and AMSAT allocations from 75.5-76 GHz to 77.5-78 GHz.⁴³ However, footnote 5.559A states that stations in the amateur and AMSAT services in the 75.5-76 GHz band may operate on a primary basis until 2006. In its comments on the Loea petition, ARRL, the National Association for Amateur Radio (ARRL), states that it has only a limited interest in this proceeding, due to a “legacy” allocation in the 75.5-76 GHz band for the amateur and AMSAT services.⁴⁴

³⁹ See 47 C.F.R. § 2.106, footnotes 5.149, 5.556. In the 2001 Edition of the ITU Radio Regulations, the “S” has been dropped from the footnote numbering. We will employ the new convention throughout this Notice in order to minimize confusion. See International Telecommunication Union Radio Regulations, Edition of 2001.

⁴⁰ The amateur and AMSAT services are regulated solely by the Commission and thus, these allocations were added only to the non-Federal Government Table.

⁴¹ See 47 C.F.R. § 2.106, footnote US270.

⁴² See 47 C.F.R. § 97.301(a).

⁴³ The Commission has already raised the allocation status of the amateur and AMSAT services to primary in the 77.5-78 GHz band.

⁴⁴ See ARRL Comments at 1.

ARRL requests that we, in any rules adopted in this proceeding, note that the amateur service is, until 2006, entitled to operate on a primary basis in the 75.5-76 band.⁴⁵

19. WRC-2000 relocated the BSS allocation, which was at 84-86 GHz, to the 74-76 GHz band in order to protect RAS observations above 76 GHz. The FSS uplink allocation at 74-75.5 GHz was moved to 84-86 GHz, and the 74-76 GHz band was allocated for FSS downlinks. Footnote 5.561 was modified to recognize the change in the BSS allocation and now reads as follows:

5.561 In the band 74-76 GHz, stations in the fixed, mobile and broadcasting services shall not cause harmful interference to stations of the fixed-satellite service or stations of the broadcasting-satellite service operating in accordance with the decisions of the appropriate frequency assignment planning conference for the broadcasting-satellite service.

20. Proposal. We propose to implement the *WARC-92 Final Acts* and most of the *WRC-2000 Final Acts* with respect to the 71-76 GHz band. Specifically, we propose to change the FSS directional indicator in the 71-75.5 GHz band and the MSS directional indicator in the 71-74 GHz band from uplinks to downlinks. As a consequence of the proposal to change the FSS directional indicator in the 74-75.5 GHz band, we propose to revise footnote US297 in order to state that 81-82.5 GHz (instead of 74-75.5 GHz) is available for BSS feeder links. We propose to delete the RAS allocation from the 72.77-72.91 GHz band by removing footnote US270 from the Table. We also propose to allocate the 74-76 GHz band to the BSS and broadcasting service on a primary basis and for SRS downlinks on a secondary basis.⁴⁶ Further, we propose to allocate the 75.5-76 GHz band to the fixed, mobile, and FSS downlink services on a primary basis and to delete the amateur and AMSAT allocations from the 75.5-76 GHz band.

21. In order to protect future Federal Government use, NTIA requests that footnote 5.561 be adopted domestically, which would require that the fixed, mobile, and broadcasting services not cause harmful interference to FSS or BSS reception in the 74-76 GHz band.⁴⁷ NTIA alternatively requests that the requirements contained in this international footnote be placed in the Federal Government Table of Frequency Allocations.⁴⁸ Given NTIA's stated need for future Federal FSS operations, we propose to adopt the following United States footnote:

USwww In the band 74-76 GHz, stations in the fixed, mobile and broadcasting services shall not cause harmful interference to stations of the Federal Government fixed-satellite service.

22. We request comment on this proposal and on whether similar protection should be provided to non-Federal FSS and BSS operations. If both satellite and terrestrial allocations are implemented in the 71-76 GHz band, technical and regulatory guidelines will be necessary to allow spectrum sharing. We

⁴⁵ *Id.* at 3.

⁴⁶ The BSS and broadcasting service are regulated solely by the Commission and thus, these allocations will be added only to the non-Federal Government Table.

⁴⁷ See Letter from Associate Administrator, Office of Spectrum Management, NTIA, U.S. Department of Commerce, to Acting Chief, Office of Engineering and Technology, FCC, dated July 18, 2001.

⁴⁸ See Letter from Associate Administrator, Office of Spectrum Management, NTIA, U.S. Department of Commerce, to Chief, Office of Engineering and Technology, FCC, dated May 28, 2002.

seek comment on what requirements would be necessary to facilitate sharing between the various services, such as coordination requirements and power flux-density (PFD) limits for satellite operations in the 71-76 GHz band. We also request comment on whether any coordination requirements adopted to facilitate sharing would eliminate the need for the footnote to protect future FSS use, thus placing all allocations on equal footing. PFD limits are the normal means by which FSS downlinks and fixed point-to-point operations share the same spectrum. We also request comment on the appropriate PFD limit for the 71-76 GHz band.

23. We propose to permit the amateur and AMSAT services in the 75.5-76 GHz band to continue on a secondary basis until January 1, 2006, rather than to adopt footnote 5.559A, which would allow these services to operate on a primary basis until 2006. We believe that this proposal provides the best transition mechanism from amateur use to new licensed fixed and mobile services. It is unclear to us how extensively the amateur community is using the 75.5-76 GHz band, but we tentatively find that the impact would be minor, especially since the nearby primary amateur and AMSAT allocation at 77.5-78 GHz has been available for nearly four years.⁴⁹ Moreover, since it is unlikely that there will be any fixed or mobile users for several years, amateur users will continue to have the band to themselves until fixed licensed systems begin their service rollout. Accordingly, we propose to adopt a United States footnote that would read as follows:

USyyy The band 75.5-76 GHz is also allocated to the amateur and amateur-satellite services on a secondary basis until January 1, 2006.

24. In order to implement this proposal in the Commission’s Rules for the Amateur Radio Service, we propose to add a new frequency sharing requirement to Section 97.303, which would read as follows:

No amateur or amateur-satellite station transmitting in the 75.5-76 GHz segment shall cause interference to, nor is protected from interference due to the operation of, stations in the fixed service. After January 1, 2006, the 75.5-76 GHz segment is no longer allocated to the amateur service or to the amateur-satellite service.

25. We request comment on all of the above proposals for the 71-76 GHz band. Table 2 summarizes our proposals for the 71-76 GHz band.

Table 2: 71-76 GHz (All allocations are on a primary basis unless otherwise stated)		
Existing U.S. Allocations	Proposed U.S. Allocations	Summary of Major Changes
71-74 GHz Fixed Mobile FSS uplinks MSS uplinks US270 (RAS)	71-74 GHz Fixed Mobile FSS downlinks MSS downlinks	In 3 gigahertz of MSS & FSS spectrum, change transmission direction from uplink to downlink. Delete RAS from 140 megahertz.

⁴⁹ See *Amendment of Parts 2, 15, and 97 of the Commission’s Rules to Permit Use of Radio Frequencies Above 40 GHz for New Radio Applications*, ET Docket No. 94-124, *Third Report and Order*, 13 FCC Rcd 15074 (1998). The amateur and AMSAT services are regulated solely by the Commission and thus, these allocation changes were made only to the non-Federal Government Table.

74-75.5 GHz Fixed Mobile FSS uplinks US297 (74-75.5 GHz available for BSS feeder links)	74-76 GHz Fixed Mobile FSS downlinks Broadcasting BSS	In 1.5 gigahertz of FSS spectrum, change transmission direction from uplink to downlink. Delete 500 megahertz from amateur & AMSAT services, but permit these services to be used on a secondary basis until 2006. Allocate 500 megahertz for fixed, FSS downlink & mobile services. Allocate 2 gigahertz for BSS & broadcasting service on primary basis & for SRS downlinks on secondary basis.
75.5-76 GHz Amateur AMSAT	Secondary SRS downlinks USwww (In the band 74-76 GHz, stations in the fixed, mobile and broadcasting services will not cause harmful interference to stations of the Federal FSS.) USyyy (secondary amateur & AMSAT allocations in the 75.5-76 GHz band until 2006)	

3. 81-86 GHz

26. Prior to WRC-2000, the 81-86 GHz band was allocated to the fixed and mobile services on a primary basis throughout the world. The 81-84 GHz band was also allocated throughout the world for FSS downlinks and MSS downlinks on a primary basis and for SRS downlinks on a secondary basis. The 84-86 GHz band was also allocated to the BSS and the broadcasting service on a primary basis throughout the world. Footnote 5.561 stated that, in the 84-86 GHz band, stations of the fixed, mobile, and broadcasting services may not cause harmful interference to the BSS stations operating in accordance with the decisions of the appropriate BSS frequency assignment planning conference.

27. In the United States, these pre-WRC-2000 allocations have been implemented, except that the SRS downlink allocation, which was established at WARC-92, has not yet been considered.⁵⁰ Additionally, the Commission adopted footnote US211, which urges applicants for airborne or space station assignments in the 84-86 GHz band to take all practicable steps to protect RAS observations in adjacent bands from harmful interference.

28. At WRC-2000, the 81-86 GHz band was allocated to the RAS on a primary basis. The addition of this RAS allocation satisfies the requirements for radio astronomy spectral line and wideband continuum observations from remote locations worldwide. WRC-2000 also revised footnote 5.149 to add the 81-86 GHz band to the list of frequency bands wherein administrations are urged to take all practicable steps to protect the RAS from harmful interference when making assignments to stations of other services.

29. As previously stated, the MSS and FSS downlink allocations in the 81-84 GHz band were interchanged with the MSS and FSS uplink allocations in the 71-74 GHz band. WRC-2000 relocated the BSS, which is currently allocated to the 84-86 GHz band, to the 74-76 GHz band. WRC-2000 took these actions because co-frequency satellite downlinks would cause interference to the new primary RAS allocation. Footnote 5.560A, which allocates the 81-81.5 GHz band to the amateur and AMSAT services on a secondary basis, was added to maintain the current amount of secondary amateur and AMSAT spectrum. Footnote 5.561 is no longer relevant to the 84-86 GHz band; it was appropriately modified to apply to the 74-76 GHz band.

⁵⁰ The BSS and broadcasting service are regulated solely by the Commission and thus, these allocations were only added to the non-Federal Government Table.

30. Proposal. We propose to implement the *WARC-92 Final Acts* and most of the *WRC-2000 Final Acts* with respect to the 81-86 GHz band. Specifically, we propose to allocate the 81-86 GHz band to the RAS on a primary basis, to change the directional indicators on the FSS and MSS allocations in the 81-84 GHz band from downlinks to uplinks, to allocate the 84-86 GHz band for FSS uplinks, and to delete the BSS and broadcasting allocations from the 84-86 GHz band. We propose to revise footnote US297 in order to state that 81-82.5 GHz (instead of 74-75.5 GHz) is available for BSS feeder links. We also propose to revise footnote US211 by deleting the 84-86 GHz band from those bands in which applicants for airborne or space station assignments are urged to take all practicable steps to protect RAS observations in adjacent bands from harmful interference because the 81-86 GHz band has been proposed to be allocated to the RAS on a primary basis.

31. Consistent with international footnote 5.149, we propose to revise footnote US342 in order to add the 81-86 GHz band to the list of frequency bands wherein all practicable steps are to be taken to protect the RAS from harmful interference when assignments to stations of other services are made.

32. We request comment on whether footnote 5.560A, which would allocate the 81-81.5 GHz band to the amateur and AMSAT services on a secondary basis, should be adopted domestically. The Commission has previously allocated the 77.5-78 GHz band to the amateur and AMSAT services on a primary basis. We therefore seek comment on whether these secondary allocations are needed. Further, we request comment on whether amateur and AMSAT services in the 81-81.5 GHz band would be compatible with primary commercial operations.

33. If both satellite and terrestrial allocations are implemented in the 81-86 GHz band, technical and regulatory guidelines will be necessary to allow spectrum sharing. We seek comment on what requirements would be necessary to facilitate sharing between the various services, such as coordination and terrestrial station antenna pointing requirements in the 81-86 GHz band.

34. We request comment on all of the above proposals for the 81-86 GHz band. Table 3 summarizes our proposals for the 81-86 GHz band.

Existing U.S. Allocations	Proposed U.S. Allocations	Summary of Major Changes
81-84 GHz Fixed Mobile FSS downlinks MSS downlinks	81-84 GHz Fixed Mobile FSS uplinks US297 (81-82.5 GHz available for BSS feeder links) MSS uplinks Radio astronomy Secondary SRS downlinks US342 (take all practicable steps to protect RAS in the 81-84 GHz band from harmful interference)	In 3 gigahertz of MSS & FSS spectrum, change transmission direction from downlink to uplink. Specify that 1.5 gigahertz of FSS uplink spectrum is available for BSS feeder links. Allocate 3 gigahertz for RAS on a primary basis. Allocate 3 gigahertz for SRS downlinks on a secondary basis.
84-86 GHz Fixed Mobile Broadcasting BSS 5.561 (fixed, mobile & broadcasting must not cause	84-86 GHz Fixed Mobile FSS uplinks Radio astronomy US342 (take all practicable steps to protect RAS in the	Allocate 2 gigahertz to RAS & FSS uplinks. Delete 2 gigahertz from broadcasting & broadcasting-satellite services. Remove requirement in 2 gigahertz that fixed, mobile & broadcasting can not cause harmful interference to BSS.

harmful interference to BSS) US211 (protect RAS in the adjacent 86-92 GHz band)	84-86 GHz band from harmful interference)	
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4. 92-95 GHz

35. Prior to WRC-97, the 92-95 GHz band was allocated to the fixed, mobile, FSS uplink, and radiolocation services on a primary basis throughout the world. Footnote 5.556 stated that radio astronomy observations could be carried out under national arrangements in the 93.07-93.27 GHz band and, in making assignments to stations other services, footnote 5.149 urged administrations to take all practical steps to protect the RAS in this band from harmful interference.⁵¹ In the United States, these pre-WRC-97 allocations have been implemented.⁵²

36. In the United States' proposals for WRC-97, the 94-94.1 GHz band was proposed for use by spaceborne cloud radars to determine the vertical profile of clouds and their global distribution.⁵³ The allocation would be limited to 100 megahertz because it could be coupled with the primary spaceborne active sensor allocations in the 78-79 GHz band, which are provided for in footnote 5.560. The EESS and SRS allocations in 94-94.1 GHz band would be limited to use by spaceborne cloud radars because the 78-79 GHz band is suitable for use by active spaceborne sensors other than cloud radars. The 94-94.1 GHz band was proposed because it is of less interest to the RAS (it has relatively few spectral lines) and because it has adequate frequency separation from the 86-92 GHz band, which is allocated for passive use. At the 1997 Conference Preparatory Meeting (CPM-97), it was determined that cloud radars and the radiolocation service are compatible in the 92-95 GHz band. However, because studies indicated compatibility problems between cloud radars and both the fixed and FSS uplink services in the 92-95 GHz band, these allocations were proposed to be deleted.

37. At WRC-97, the 94-94.1 GHz band was allocated to the EESS (active) and the SRS (active) on a primary basis; the radiolocation allocation in the 94-94.1 GHz band was maintained; and the fixed, mobile, and FSS uplink allocations were deleted from the 94-94.1 GHz band. WRC-97 added footnote 5.562, which states that the use of the 94-94.1 GHz band by the EESS (active) and SRS (active) is limited to spaceborne cloud radars. Recently, we agreed that the Air Force could operate its "Cloudsat" system at 94.045 GHz on a non-interference basis, pending the outcome of this allocation proceeding. Cloudsat is a spaceborne radar that will collect high resolution vertical profile data in thick clouds.

38. At WRC-2000, the 92-94 GHz and 94.1-95 GHz bands were allocated to the RAS on a primary basis and the 94-94.1 GHz band was allocated to the RAS on a secondary basis. The addition of these RAS allocations satisfies the requirements for radio astronomy spectral line and wideband continuum observations from remote locations worldwide. Consequently, the RAS band at 93.07-93.27 GHz was deleted from footnote 5.556. The FSS uplink allocations in the 92-94 GHz and 94.1-95 GHz band, which were no longer needed to balance the FSS allocation at 102-105 GHz, were deleted.

⁵¹ See 47 C.F.R. § 2.106, footnotes 5.149, 5.556.

⁵² We observe that footnote 5.556 has been inadvertently deleted from the U.S. Table.

⁵³ See United States Proposals for the Work of the Conference, Document 30-E, dated September 4, 1997, Proposals for Agenda Item 1.9.2, at p.120.

39. WRC-2000 added footnote 5.562A, which states that EESS transmissions that are directed into the main beam of a RAS antenna have the potential to damage some RAS receivers and that space agencies operating these transmitters and the RAS observatories should mutually plan their operations so as to avoid such occurrences to the maximum extent possible. WRC-2000 revised footnote 5.149 to replace the 93.07-93.27 GHz band with the 92-94 GHz and 94.1-95 GHz bands in the list of frequency bands wherein administrations are urged to take all practicable steps to protect the RAS from harmful interference when making assignments to stations of other services.

40. Proposal. We propose to implement the *WRC-97 Final Acts* and *WRC-2000 Final Acts* with respect to the 92-95 GHz band. Specifically, we propose to allocate the 92-94 GHz and 94.1-95 GHz bands to the RAS on a primary basis; to allocate the 94-94.1 GHz band to the EESS (active) and SRS (active) on a primary basis for Federal Government use, limited to cloud radars; to allocate the 94-94.1 GHz band to the RAS on a secondary basis; to delete the FSS uplink allocation from the 92-95 GHz band; and to delete the fixed and mobile allocations from the 94-94.1 GHz band.

41. Consistent with international footnote 5.149, we propose to revise footnote US342 in order to add the 92-94 GHz and 94.1-95 GHz bands to the list of frequency bands wherein all practicable steps are to be taken to protect the RAS from harmful interference when assignments to stations of other services are made.

42. We request comment on all of the above proposals for the 92-95 GHz band. Table 4 summarizes our proposals for the 92-95 GHz band.

Table 4: 92-95 GHz (All allocations are on a primary basis unless otherwise stated)		
Existing U.S. Allocations	Proposed U.S. Allocations	Summary of Major Changes
92-95 GHz Fixed Mobile FSS uplinks Radiolocation 5.149 (in making assignments to stations of other services to which the 93.07-93.27 GHz band is allocated, administrations are urged to take all practicable steps to protect RAS from harmful interference)	92-94 GHz Fixed Mobile Radiolocation Radio astronomy US342 (take all practicable steps to protect RAS in the 92-94 GHz band from harmful interference)	Allocate 2 gigahertz to the RAS on a primary basis. Delete FSS uplinks from 2 gigahertz.
	94-94.1 GHz Radiolocation Federal Government EESS (active) Federal Government SRS (active) Secondary radio astronomy 5.562 (EESS & SRS limited to cloud radars) 5.562A (EESS & RAS should mutually plan their operations)	Allocate 100 megahertz to the EESS (active) and SRS (active) on a primary basis for Federal Government use, limited to cloud radars. Allocate 100 megahertz to the RAS on a secondary basis. Delete fixed, mobile & FSS uplinks from 100 megahertz.
	94.1-95 GHz Fixed Mobile Radiolocation Radio astronomy US342 (take all practicable steps to protect RAS in the 94.1-95 GHz band from harmful interference)	Allocate 900 megahertz to the RAS on a primary basis. Delete FSS uplinks from 900 megahertz.

5. RAS Protection in the 81-86 GHz, 92-94 GHz, and 94.1-95 GHz Bands

43. In order to avoid interference to 18 RAS observatories that currently receive in the 81-86 GHz, 92-94 GHz, and 94.1-95 GHz bands, National Science Foundation (NSF) requests that we require licensees of all other allocated services in these bands to coordinate with these RAS sites.⁵⁴ NSF states that coordination radii on the order of 150 kilometers (93 miles) around the 8 single dish observatories and 25 kilometers (15.5 miles) around the 10 Very Long Baseline Array (VLBA) stations appear to be sufficient to ensure protection of these RAS facilities.

44. In paragraphs 30 and 40, above, we propose to allocate the 81-86 GHz, 92-94 GHz, and 94.1-95 GHz bands to the RAS on a primary basis. These RAS allocations were made at WRC-2000 as result of U.S. proposals and NTIA has requested their implementation.⁵⁵ We recognize that radio astronomers must observe radio waves of cosmic origin at frequencies over which they have no control.⁵⁶ We note, however, that the 86-92 GHz band is already allocated to the RAS on a primary basis. In light of this adjacent 6 gigahertz primary allocation, we request comment on whether the 81-86 GHz, 92-94 GHz, and 94.1-95 GHz bands should also be allocated to the RAS on a primary basis. Is this quantity of spectrum necessary for RAS purposes and would such a large allocation hinder effective use of spectrum needed for other applications? If not all of this spectrum is needed by the RAS, which portions are most essential or, alternatively, should certain portions be on a secondary or unprotected basis?

45. The customary means of protecting RAS reception is through coordination around RAS observatories. We tentatively propose to adopt a new United States footnote (footnote USzzz) that would specify the maximum coordination distances requested by NSF at the 18 indicated observatories with regard to RAS reception in the 81-86 GHz, 92-94 GHz, and 94.1-95 GHz bands.⁵⁷ However, we request comment on means to minimize any coordination burden on relevant parties. For example, are the coordination distances proposed by NSF appropriate? Further, we believe that terrain shielding, pointing directions when narrow beam antennas are used, and other factors could be taken into account in order to reduce unnecessary coordination requirements. We note that the radio telescope in Owens Valley, California is shielded from radio frequency interference (RFI) by high mountains in the direction of Fresno, California, which is an urban area within the 150 kilometer maximum coordination radius. We

⁵⁴ See NSF letter to Convener, Ad Hoc 212, dated March 1, 2002.

⁵⁵ See United States of America Proposals for the Work of the Conference, Document 12-E, dated January 12, 2000, Proposals for agenda item 1.16, entitled "A proposal to modify the allocations above 71 GHz," at pp. 31-67. See also Letter from Associate Administrator, Office of Spectrum Management, NTIA, U.S. Department of Commerce, to Acting Chief, Office of Engineering and Technology, FCC, dated July 18, 2001.

⁵⁶ The radio frequencies of interest for the RAS depend on the characteristics of the object studied. Celestial radio sources radiate radio waves varying with time and frequency, with intensity and with the polarization determined by their physical conditions. Each part of the radio spectrum gives specific information about a source. Radio astronomers have to follow the constraints on frequency selection imposed by nature. A similar situation holds for atmospheric studies based on observations of atmospheric gases. These gases generate radio emissions at one or more discrete frequencies—such a discrete frequency is called a spectral line. These spectral lines are often of interest for Radio astronomers. In addition, various RAS projects depend on measurements of broadband or continuum emission. See CRAF [Committee on Radio Astronomy Frequencies] handbook for frequency management, dated February 2002, at p. 6.

⁵⁷ See Appendix A for the text of proposed footnote USzzz, which contains the list of RAS telescopes that would be protected under this proposal.

also note that the Haystack Observatory in Westford, Massachusetts is within 150 kilometers of most of the western suburbs of Boston and that NSF's request would require coordination of pencil beam antennas within this distance even if they were pointed away from radio telescope. Therefore, in order to minimize unnecessary coordination, while fully protecting the new RAS allocations, we request comment on whether RAS observatories should be required to operate a web site where fixed point-to-point licensees can input end points of links, power, and antenna characteristics and receive back promptly whether coordination is required. This process would take into account the observatory sensitivity, terrain shielding, and the azimuth of the path relative to the observatory. This approach is similar to the coordination method that was developed for the 1670-1675 MHz Government transfer band, where the National Oceanic and Atmospheric Administration (NOAA) agreed to maintain a web site to assist in coordination near two of its receive earth stations.⁵⁸

46. We also seek comment on whether we should geographically limit the scope of these RAS allocations in a similar fashion to the RAS allocation in the 10.6-10.68 GHz band, which provides that the RAS will not receive protection from stations in other allocated services that are licensed to operate in the one hundred most populous urbanized areas as defined by the U.S. Census Bureau.⁵⁹ This would facilitate commercial deployment in areas where spectrum demands are most intense.

B. Band Plan

47. As we examine methods to promote development and growth of the 71-76 GHz, 81-86 GHz and 92-95 GHz bands, we must consider the current and projected uses of these bands, and the current use of adjacent bands, such as the 86-92 GHz band. We are aware of a variety of military research and development projects that are in progress in the 71-76 GHz, 81-86 GHz and 92-95 GHz band. As all of these bands (except for the amateur band at 75.5-76 GHz) are shared on a co-primary basis between Federal and non-Federal Government services, our rules must provide for equitable sharing with Federal Government users, especially those with national security implications.

48. We recognize that there may be Federal installations where existing and planned uses in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands require high confidence protection from FCC licensees for national security reasons. We propose to include in the final rules specific areas proposed by NTIA during this proceeding which will require coordination with the Frequency Assignment Subcommittee (FAS) of the Interdepartment Radio Advisory Committee (IRAC) for frequency assignments and licensing. We seek comment on this proposal. We also ask commenters how we can limit the administrative burdens for the Commission, NTIA and potential licensees while still requiring IRAC coordination. For example, rather than specifying a simple geographic area, we might require all licensees within a certain distance of these sites to verify that the predicted power flux density at a reference point is less than a specified value. Any potential assignment exceeding the specified value would require coordination.

⁵⁸ See *Reallocation of the 216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz Government Transfer Bands*, ET Docket No. 00-221, *Report and Order and Memorandum Opinion and Order*, 17 FCC Rcd 368 (2002) at Appendix C, Section 1.924(f)(1) of the Commission's Rules.

⁵⁹ This approach would parallel footnote US277 where the 10.6-10.68 GHz band is allocated to the RAS on a primary basis. However, the RAS does not receive protection from fixed stations that are licensed to operate in the one hundred most populous urbanized areas as defined by the U.S. Census Bureau. See 47 C.F.R. § 2.106, footnote US277.

1. 92-95 GHz Band

49. Given that we are aware of where the Federal Government is operating in the 92-95 GHz band, we are able to propose specific band plans for the 92-95 GHz band. However, as we noted earlier, the 92-95 GHz band is shared between Federal and non-Federal Government services.⁶⁰ We also believe the adjacent passive allocation in the 86-92 GHz band will have an impact on the use of the 92-95 GHz band because the 86-92 GHz band is shared among several passive services.⁶¹ Specifically, the aeronautical community has been considering use of the passive band for aircraft-based 86-92 GHz imaging systems that would allow aircraft to view runways during landings in inclement weather.⁶² Thus, there may be future safety-related passive aeronautical systems in the 86-92 GHz band. Consequently, we must consider adequate protection of such systems as we examine commercial development and growth in the 92-95 GHz band. We seek comment on this tentative conclusion. We also seek comment on whether we must consider adequate protection in adjacent 95-100 GHz band, which is currently licensed to the mobile, MSS, radionavigation and radionavigation-satellite services on a primary basis and to the radiolocation service on a secondary basis. We observe that WRC-2000 added primary fixed and RAS allocations to the 95-100 GHz band, raised the secondary radiolocation allocation to primary status, and deleted the MSS allocation from the 95-100 GHz band.⁶³

50. In light of the considerations mentioned above, we request comment on three band plans for the 92-95 GHz band. Band Plan I provides for three 900-megahertz segments and one 300-megahertz segment. Under this plan, we would license the 92.3-93.2 GHz and 94.1-95 GHz spectrum blocks for commercial use. That is, non-Federal licensees would have access to two 900-megahertz segments that are separated by 900 megahertz. Primary Federal assignments would be made in the 92.3-93.2 GHz and 93.2-94.1 GHz spectrum blocks throughout the nation. In the licensed non-Federal bands (92.3-93.2 GHz and 94.1-95 GHz), primary Federal assignments could be authorized at designated military installations. Thus, under this option, Federal users would have access to the entire 92-95 GHz band on a primary basis at designated military installations. Outside the designated military installations, we propose that Federal assignments would be authorized in the licensed non-Federal bands on a secondary basis. These secondary Federal allocations would permit Federal use in areas of low population density, as well as permitting other uses such as ground-based Federal radar in rural areas. Band Plan I would also make the 92-95 GHz band available for unlicensed Part 15 use.

⁶⁰ *Id.*

⁶¹ These passive services are earth exploration satellite (passive), radio astronomy, and space research (passive), which use highly sensitive receivers for signals from outer space. These devices are not used for transmitting.

⁶² See M. Shoucri, G.S. Do, S. Fornaca, B. Hauss, L. Yujiri, J. Shannon and L. Summers, "Passive Millimeter Wave Camera for Enhanced Vision Systems," Proceedings of the SPIE Conference on Enhanced and Synthetic Vision, 2736, pp. 2-8, 1996; S. Fornaca, M. Shoucri and L. Yujiri, "Passive Millimeter Wave Video for Aviation Applications," Proceedings of the SPIE Conference on Enhanced and Synthetic Vision 1998, 3364, pp. 20-25, 1998. This region of the spectrum has some of the characteristics of infrared radiation. Objects such as runways and vehicles spontaneously emit low levels of 90 GHz power based on their composition and temperature. A scanning receiver can use this emitted power to image an area. While fog, rain and clouds affect emissions in this band, the emissions are affected significantly less than visual light waves. Hence the possibility of imaging airports from an airplane in adverse weather is attractive to the aeronautical community if the technology can be commercialized.

⁶³ See *WRC-2000 Final Acts* at p. 45.

51. Band Plan II would provide Federal and non-Federal users with the same amount of spectrum as in Band Plan I. However, the Federal bands would now be equal in size, that is, two 600-megahertz channel blocks. Another option, Band Plan III, would provide Federal and non-Federal licensees with access to 2,900 megahertz of spectrum on a shared basis. Additionally, we encourage commenters to propose alternative band plans that will stimulate growth in the 92-95 GHz band and to submit rationale supporting adoption of their proposed alternative band plans.

52. We tentatively conclude that Band Plan I will stimulate growth in the 92-95 GHz band without hindering growth in the adjacent 86-92 GHz band. Additionally, we believe these segments provide sufficient capacity for licensees to utilize and provide new innovative services to the public. Accordingly, we propose to adopt Band Plan I for use in the 92-95 GHz band.⁶⁴ We tentatively conclude that the mixture of licensed and unlicensed use in Band Plan I will satisfy the needs of most potential users of this band while facilitating sharing with Federal Government users. We seek to maximize the opportunities for new 90 GHz services and technologies, avoid interference to passive services operating in the lower adjacent band at 86-92 GHz, protect the 94.0-94.1 GHz cloud sensing radar allocation, and maximize sharing potential for Federal Government systems in the same band.

53. In order to codify the nature of the Federal/non-Federal Government sharing in the 92-95 GHz band, we propose to add a new United States footnote to the U.S. Table, which would read as follows:

USxxx In the band 92-95 GHz, Federal and non-Federal users may operate low power, unlicensed devices. In the band 92-92.3 GHz and 93.2-94.1 GHz, Federal assignments shall operate on a primary basis. In the bands 92.3-93.2 GHz and 94.1-95 GHz, non-Federal licensed systems shall operate on a primary basis and Federal assignments may operate on a secondary basis, except that Federal assignments at the following military installations shall operate on a primary basis: . . .⁶⁵

54. We believe that Band Plan I would simplify duplexer design for full duplex bidirectional systems. Non-Federal use of the 300-megahertz segment that is adjacent to the 86-92 GHz passive band would be limited to unlicensed Part 15 devices. This placement minimizes the likelihood that out-of-band emissions would cause harmful interference to passive band receivers. We also believe that it would be more economically feasible for manufacturers to build low power unlicensed devices to meet the necessarily restrictive out-of-band emission limits for protection of passive band receivers than it would be for them to meet those limits for higher power equipment for licensed use. The 93.2-94.1 GHz unlicensed band includes the cloud sensing radar allocation. We tentatively conclude that sharing between these two types of operations is possible without harmful interference to systems operating under the radar allocation. We seek comment on this tentative conclusion. The unlicensed segments also provide possible locations for Federal Government systems that may not be able to share with licensed systems. We request comment on whether to provide two licensed portions of 900-megahertz each or to further divide the licensed portions. We also seek comment whether unlicensed devices can share the 94-94.1 GHz band with cloud sensing radars without causing harmful interference to Cloudsat and other such systems. Finally, we seek comment on whether it would be appropriate for non-Federal licensees to operate on a secondary basis in the 92.0-92.3 GHz and 93.2-94.1 GHz bands. Table 5 summarizes our band plan proposal for the 92-95 GHz band.

⁶⁴ See Appendix B for proposed rules.

⁶⁵ NTIA will supply the list of large military installations prior to the adoption of the Report and Order.

Band	Bandwidth	Type of Use (Federal and non-Federal unlicensed use permitted throughout the 92-95 GHz band)	
		Federal Government	non-Federal Government
92.0-92.3 GHz	300 MHz	Primary assignments	No licensed use
92.3-93.2 GHz	900 MHz	Secondary assignments, except on specified military installations where assignments are on a primary basis	Licensed on a primary basis
93.2-94.0 GHz	800 MHz	Primary assignments	No licensed use
94.0-94.1 GHz	100 MHz	Cloudsat and primary radiolocation assignments	No licensed use
94.1-95.0 GHz	900 MHz	Secondary assignments, except on specified military installations where assignments are on a primary basis	Licensed on a primary basis

55. Band Plan II shares many of the favorable characteristics of Band Plan I as it also divides the licensed spectrum from the unlicensed spectrum. However, the segmentation of the band is different. Under Band Plan II, commercial users have full access to the 92-95 GHz band for unlicensed Part 15 use and two 900-megahertz licensed bands. This band plan also provides additional interference protection to the passive band receivers in the 86-92 GHz passive band. However, this band plan results in licensed non-Federal Government users having only a 600-megahertz wide separation rather than a 900-megahertz separation between paired bands.⁶⁶ Table 6 summarizes the Band Plan II option for the 92-95 GHz band.

Band	Bandwidth	Type of Use (Federal and non-Federal unlicensed use permitted throughout the 92-95 GHz band)	
		Federal Government	non-Federal Government
92.0-92.6 GHz	600 MHz	Primary assignments	No licensed use
92.6-93.5 GHz	900 MHz	Secondary assignments, except on specified military installations where assignments are on a primary basis	Licensed on a primary basis
93.5-94.0 GHz	500 MHz	Primary assignments	No licensed use
94.0-94.1 GHz	100 MHz	Cloudsat and primary	No licensed use

⁶⁶ This separation might complicate the isolation of transmit and receive antennas that are closely spaced and require duplexers.

		radiolocation assignments	
94.1-95.0 GHz	900 MHz	Secondary assignments, except on specified military installations where assignments are on a primary basis	Licensed on a primary basis

56. Band Plan III, proposed by Boeing, provides licensees in the 92-95 GHz band with access to 2,900 megahertz of spectrum, which is all of the 92-95 GHz band that can be allocated to the fixed and mobile services.⁶⁷ It does not make any spectrum available for unlicensed use and thus, may not provide adequate protection for Federal operations in the 92-95 GHz band or for receivers in the adjacent 86-92 GHz passive band. However, Boeing argues that in order to provide very high, fiber-like data transmissions rates, the entire band must be made available.⁶⁸ Boeing claims that any segmentation of the band would deny potential licensees the ability to realize fiber-like data transmission rates that are possible in this band.⁶⁹ We seek comment on Boeing's proposed band plan for the 92-95 GHz band. Commenters supporting Boeing's proposal should address how its proposal could accommodate and address the concerns raised above with the Federal Government operations and operations in adjacent bands. Table 7 summarizes the Band Plan III option for the 92-95 GHz band

Band	Bandwidth	Type of Use	
		Federal Government	Non-Federal Government
92.0-94.0 GHz	2,000 MHz	Primary assignments	Licensed on a primary basis
94.0-94.1 GHz	100 MHz	Cloudsat and primary radiolocation assignments	None
94.1-95.0 GHz	900 MHz	Primary assignments	Licensed on a primary basis

2. 71-76 GHz and 81-86 GHz Bands

57. Similarly, in developing a band plan for the 71-76 GHz and 81-86 GHz bands, we must consider that the 71-76 GHz and 81-86 GHz bands are allocated on a co-primary basis for Federal Government services.⁷⁰ Although Loea claims that the Federal Government is not using these bands,⁷¹ we believe that any band plan proposal must consider the possibility that the Federal Government is currently operating or in the future will be operating in those bands and thus will require protection. We also must consider the proposed satellite allocations for these bands. Loea correctly states that there are no satellite

⁶⁷ See Comments of The Boeing Company to Petition for Rulemaking at 4 (filed Oct. 29, 2001) (Boeing Comments). We observe that Boeing requested the entire 3,000 megahertz between 92 GHz and 95 GHz, but that the fixed and mobile allocations in the 94-94.1 GHz band have been proposed for deletion. See para. 40, *supra*.

⁶⁸ *Id.*

⁶⁹ *Id.* at 5.

⁷⁰ 47 C.F.R. § 2.106.

⁷¹ See Loea Petition at 9.

services currently operating in these bands.⁷² Nonetheless, we believe that we must address the issue of protection for these co-primary services in the event Federal Government or satellite operators seek to use these bands in the future. Finally, we believe that the bands adjacent to the 71-76 GHz and 81-86 GHz bands, especially the 86-92 GHz passive band, may require protection.

58. In the 36-51 GHz proceeding, the Commission addressed similar issues when it proposed a band plan for non-Government operations in the 36.0-51.4 GHz band. Prior to the commencement of the 36-51 GHz proceeding, the band was allocated on a co-primary basis to the fixed, mobile, FSS and MSS services for Federal and non-Federal Government use.⁷³ Therefore, the Commission had to consider the feasibility of sharing between the satellite and wireless services while sharing with the Federal Government.⁷⁴ The Commission concluded that the public interest would be best served by providing separate primary designations for the satellite and wireless services, as well as the Federal Government services, because of the technical difficulties in sharing.⁷⁵ In 2001, the Commission proposed a new band plan to reflect the decisions reached at WRC-2000.⁷⁶ The Commission sought to provide satellite and terrestrial operators with greater certainty about the scope of operations in the band and also proposed specific PFD limits on satellite operations in specific portions of the band.⁷⁷ In certain portions of the band where both wireless and satellite services share a co-primary allocation, the Commission proposed some sharing criteria.⁷⁸ For example, in the 37.5-42.5 GHz band, the Commission proposed specific PFD limits for the satellite services in order to provide adequate protection for the wireless services in the band.⁷⁹ We seek comment on whether this type of sharing criteria is appropriate for the 71-76 GHz and 81-86 GHz bands⁸⁰ and whether it provides adequate protection for the co-primary services.

⁷² *Id.*

⁷³ See Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands, *Report and Order*, 13 FCC Rcd 24649, 24650 ¶ 1(1998) (*36-51 GHz R&O*).

⁷⁴ See *id.* at 24656 ¶ 13.

⁷⁵ *Id.* The Commission had considered to allow “underlay” licenses, *i.e.*, the licensing of a second service in the bands designated for satellite services, but it concluded that underlay licenses could make it more difficult to administer the various services and could increase the potential for interference between satellite and wireless services. See *id.* at 24651 ¶ 3.

⁷⁶ See Allocation and Designation of Spectrum for Fixed-Satellite Services in the 37.5-38.5 GHz, 40.5-41.5 GHz and 48.2-50.2 GHz Frequency Bands, *Further Notice of Proposed Rulemaking*, 16 FCC Rcd 12244 (2001) (*36-51 GHz FNPRM*).

⁷⁷ *Id.* at 12245 ¶ 1.

⁷⁸ *Id.* at 12258 ¶ 39.

⁷⁹ *Id.* at 12258-60 ¶¶ 39-50.

⁸⁰ We note that PFD limits were utilized in downlink (space-to-Earth) bands. The current US Table shows this band to be 81-86 GHz. WRC-2000 reallocated the satellite allocation at 81-86 GHz into an uplink (Earth-to-space) band, while also changing the satellite band at 71-75.5 GHz band from an uplink into a downlink allocation.

59. In its Petition, Loea asks the Commission to authorize licensees use of the entire bandwidth of the 71-76 GHz and 81-86 GHz bands.⁸¹ Loea claims that a service provider will need all ten-gigahertz of available spectrum in these bands in order to provide point-to-point access with sufficient throughput to meet local backhaul requirements beyond a three-year time horizon.⁸² Loea also claims that because the systems will use narrow “pencil-beams” transmission, it will be difficult to interfere with them.⁸³ Loea, therefore, argues that with the low likelihood of interference there is no impetus for the Commission to subdivide the bands into channels.⁸⁴ In further support of its request for the entire ten gigahertz of spectrum, Loea contends that leaving the bands undivided provides equipment developers with the greatest amount of flexibility to design systems.⁸⁵ Loea also contends that there would be little to no advantage to a “spectrum grab” here because new competitors could enter a geographical location at any time and connect new points without causing, or being affected by, harmful interference from existing service providers in the same location.⁸⁶ Boeing, Endwave and the Fixed Wireless Communications Coalition (FWCC) all filed comments supporting Loea’s proposal to allow licensees in the band access to the entire ten gigahertz of available spectrum in these bands.⁸⁷ Boeing notes, however, that interservice compatibility should be required, and it expresses its belief that sharing criteria should be easier to develop in these bands because of the nature of propagation in these bands.⁸⁸

60. We seek comment on Loea’s proposal to authorize the entire 71-76 GHz and 81-86 GHz bands for fixed use.⁸⁹ We specifically seek comment on whether Loea’s band plan proposal for the 71-76 GHz and 81-86 GHz bands provides adequate protection for the Federal Government and non-Federal Government services that share the bands on a co-primary basis.⁹⁰ We also seek comment on the extent to which we can implement sharing criteria between fixed services and other services authorized for the bands. We also seek comment on whether Loea’s proposed band plan for the 71-76 GHz and 81-86 GHz bands provides adequate protection for the adjacent bands, especially the passive 86-92 GHz band.

61. We also invite commenters to propose alternative band plans for this spectrum. We seek band plan proposals that will provide flexibility and efficient spectrum usage while providing adequate protection for the co-primary users described above. We also ask commenters to consider the bands

⁸¹ See Loea Petition at 10.

⁸² *Id.* at 11.

⁸³ *Id.* at 12.

⁸⁴ *Id.*

⁸⁵ *Id.* at 13.

⁸⁶ *Id.*

⁸⁷ See Boeing Comments at 4-6, Comments of Endwave Corporation at 3 (filed Oct. 29, 2001) (Endwave Comments), Comments of the Fixed Wireless Communications Coalition at 2 (filed Oct. 29, 2001) (FWCC Comments).

⁸⁸ Boeing Comments at 3.

⁸⁹ See para. 94 for discussion of a channelization plan in the 71-76 and 81-86 GHz bands.

⁹⁰ *Id.*

adjacent to the 71-76 GHz and 81-86 GHz bands. Such a proposal may resemble our 92-95 GHz band plan proposal, in which adequate protection to the co-primary services described above and the adjacent bands is provided by dividing the spectrum into licensed and unlicensed use bands. Another possibility is a band plan resembling the 36-51 GHz proposal, in which the Commission provided PFD limits to protect co-primary users in certain portions of the band. Commenters may also consider proposing strict emission limitations to provide the necessary protection. Commenters are requested to provide detailed support for any band plan proposal.

C. Proposed Service Rules for Unlicensed Bands

62. As stated above, we have proposed to make the 92-95 GHz band available for unlicensed use. We are proposing rules for unlicensed operation in the 92-95 GHz band in Appendix B that are based on our existing regulations for the 57-64 GHz band.⁹¹ We believe that power levels for 57-64 GHz unlicensed operation are also appropriate for 92-95 GHz since they were based primarily on safety issues with respect to power densities.⁹² The proposed rules are structured to be as flexible as possible with no restrictions on the types of modulation or applications, except that these devices may not be used in aircraft or satellites.⁹³ The prohibition on airborne and spaceborne use is necessary to protect in-band RAS observations.

63. We also seek comment on providing for operation of unlicensed devices in the 71-76 GHz and 81-86 GHz bands. We believe that unlicensed use of this spectrum could provide additional bandwidth for high capacity, short-range communications and other new and unique communications applications. One approach would be to permit unlicensed operation in these bands under the same rules (including technical parameters) that we are proposing for unlicensed operation in the 92-95 GHz. We request comment on this option and ask that commenting parties specifically address the operating parameters that should be specified for unlicensed devices in the 71-76 GHz and 81-86 GHz bands.

D. Proposed Rules for Licensed Bands

1. Introduction

64. With the increasing demand for radio spectrum, our spectrum management activities must focus on promoting more efficient use of the spectrum and increasing the amount of spectrum available for new services while continuing to ensure access to adequate spectrum for essential incumbent services. With these goals in mind, we hereby propose new service rules that we believe provide a flexible and efficient approach to spectrum management. We believe a flexible approach will allow licensees freedom to determine the services to offer and the technologies to use in providing these services. We also believe that any approach we take must be consistent with our responsibility to promote provision of communications services to all Americans in all parts of the United States and to promote diverse ownership of communications service providers via a variety of platforms. We seek an approach that will

⁹¹ 47 C.F.R. § 15.255.

⁹² As shown in Appendix B, the proposed power levels are 9 $\mu\text{W}/\text{cm}^2$ average power and 18 $\mu\text{W}/\text{cm}^2$ peak power, both measured 3 meters from the radiating structure.

⁹³ This flexibility follows the precedent set in 47 C.F.R. § 15.407(e) for the Unlicensed National Information Infrastructure band.

allow licensees to make the most efficient use of their assigned spectrum in response to market forces and that will advance the public interest.

2. Operational Rules

a) Geographic Area Licensing

65. Loea and the other commenters favor a site-by-site-only licensing scheme in these bands.⁹⁴ Loea contends that geographic area licensing would only succeed in keeping competing providers out of an area.⁹⁵ Under Loea's proposal, potential applicants would send applications to coordinators prior to filing an application.⁹⁶ If interference were predicted, the application would be amended at the coordination stage.⁹⁷ Loea believes that there is little likelihood of interference because the point-to-point systems operating in these bands would use very narrow "pencil-beams" to transmit data.⁹⁸ These pencil-sized beams will allow licensees to be located closely together.⁹⁹ Therefore, Loea argues that a site-by-site-only licensing scheme would enable an infinite number of providers to be authorized in the spectrum.¹⁰⁰ We seek comment on this proposal.

66. Alternatively, we seek comment on whether to define licenses in the licensed portions of the 71-76 GHz, 81-86 GHz, 92-94 GHz and 94.1-95 GHz bands on the basis of geographic areas. Our experience has been that geographic area licensing affords licensees substantial flexibility to respond to market demand and may result in significant improvements in spectrum utilization.¹⁰¹ We believe that geographic area licensing allows licensees to coordinate usage of the spectrum across an entire geographic area to maximize the use of spectrum in areas of highest demand. Geographic area licenses also provide the flexibility to dynamically adjust spectrum usage depending upon market demands. Such adjustments may be significantly more difficult under a site-by-site licensing regime, where prior Commission approval is needed before a licensee can address growth or changes in demand.

⁹⁴ See Loea Petition at 19; see also Boeing Comments at 6-8; Endwave Comments at 3; FWCC Comments at 2; PCIA Comments at 2; Reply Comments of the Wireless Communications Association International at 3 (filed Nov. 13, 2001) (WCIA Comments).

⁹⁵ *Id.*

⁹⁶ *Id.* at 16.

⁹⁷ *Id.*

⁹⁸ *Id.* at 19.

⁹⁹ See Boeing Comments at 7.

¹⁰⁰ See Loea Petition at 19.

¹⁰¹ See, e.g. Amendment of Part 90 of the Commission's Rules to Facilitate Future Development of SMR Systems in the 800 MHz Frequency Band, PR Docket No. 93-144, *First Report and Order, Eighth Report and Order, and Second Further Notice of Proposed Rule Making*, 11 FCC Rcd 1463 (1995) (restructuring licensing framework of 800 MHz Specialized Mobile Radio Service and adopting wide-area licensing); See also Gregory L. Rosston & Jeffery S. Steinberg, *Using Market-Based Spectrum Policy to Promote the Public Interest*, 50 Fed. Comm. L.J. 87, 94 (1997).

67. We note that the 71-76 GHz, 81-86 GHz and 92-95 GHz bands are allocated to Federal Government services on a co-primary basis. However, we believe that any government use in these bands would be limited in both area and frequency. Therefore, we ask whether it would be appropriate to use a geographic area licensing scheme in the 71-76 GHz, 81-86 GHz, 92-94 GHz and 94.1-95 GHz bands, except in a limited number of defined frequencies or areas where, upon successful coordination with the Federal Government, licensees would use a site-by-site licensing scheme. We seek comment on whether this hybrid approach would provide the flexibility of geographic licensing while ensuring protection for the Federal Government services where necessary. We also ask commenters for alternative licensing schemes. For example, licensing by geographic area except in frequencies where the Federal Government is operating. In the limited spectrum where the Federal Government is operating, we then would require a geographic area licensee to apply for an individual station license.¹⁰² We also seek comment on whether allowing unlicensed use of any part of this band would allow even more flexibility and promote more innovation than either geographic area or site-by-site licensing.¹⁰³

68. We believe that an exclusive site-by-site-only licensing scheme could impose administrative burdens on the Commission and applicants for the spectrum. In each of these bands, the path lengths will be so short that site-by-site licensing may require an entity to obtain hundreds or thousands of authorizations in a given area to effectuate a business plan. Moreover, Section 8 of the Act¹⁰⁴ requires an application fee for each application, and Section 9 of the Act¹⁰⁵ requires a regulatory fee for each license. Under these circumstances, requiring a separate license for each path could impose substantial expenses on licensees and reduce the flexibility that licensees would need in order to respond rapidly to changing market conditions. Conversely, we believe geographic area licensing could reduce the administrative burdens by reducing the number of authorizations licensees must obtain to operate a system. Geographic area licensing would also allow licensees to establish new links without obtaining prior Commission approval (except in those areas where coordination with the Federal Government would be required).

69. Loea argues that administrative burdens could be reduced if we delegated a significant portion of the licensing process to an independent third-party coordinator.¹⁰⁶ In support of this argument, Loea provides an economic study by HAI Consulting, Inc. (HAI).¹⁰⁷ The HAI Paper provides that this third party would be part of a joint venture of the licensees and would provide spectrum management services and contract with the licensees to do so.¹⁰⁸ HAI claims that by making the coordinator the creature of the potential users of the spectrum, the Commission avoids having to regulate them.¹⁰⁹ Even if we did agree that delegating a significant portion of the licensing process to a third party could resolve the Commission's administrative burden, it may not resolve the substantial and costly burdens that site-by-

¹⁰² There is a discussion of individual station licenses in para. 58.

¹⁰³ See ¶¶ 62-63, *supra*.

¹⁰⁴ 47 U.S.C. § 158.

¹⁰⁵ 47 U.S.C. § 159.

¹⁰⁶ *Id.* at 16.

¹⁰⁷ See Loea Petition, Appendix B (HAI Paper) at 14.

¹⁰⁸ *Id.*

¹⁰⁹ *Id.*

site licensing imposes on potential licensees. In addition, a coordinator would have to function in accordance with the technical licensing criteria codified in our Rules.¹¹⁰ In order to change any criteria in our Rules, we would have to institute a rulemaking proceeding as technology evolves. We seek comment on the costs and burdens associated with site-by-site licensing.

70. Loea and the commenters also argue that geographic area licensing would unduly restrict the number of providers who could provide service in the market. Specifically, they argue because of the ability to reuse the spectrum a very large number of times in a given area, licensing the spectrum to a single licensee in a given area would create an “artificial scarcity” that would create an undue “tax” on the users of the spectrum.”¹¹¹ This argument, however, ignores possible licensing mechanisms such as band managers that can be used to provide service to a greater possible number of users. We also note that Loea and the other commenters are seeking at least 10,000 MHz of spectrum. We believe that it could be more efficient to license such a large amount of spectrum on a geographic area basis. In light of these considerations, we seek comment on whether using a site-by-site licensing scheme exclusively would be appropriate for the 71-76 GHz, 81-86 GHz and 92-95 GHz bands.

71. In the event we license the vast majority of this spectrum on the basis of geographic areas, we request comment on the most appropriate geographic area licensing scheme for the 71-76 GHz, 81-86 GHz and 92-95 GHz bands. When establishing geographic service areas, we must balance the competing concerns of those entities that desire large service areas with those entities that seek small service areas. Large service areas, such as nationwide licenses, EAs, REAs,¹¹² and EAGs,¹¹³ can achieve certain economies of scale and increased efficiencies compared to smaller service areas.¹¹⁴ However, small

¹¹⁰ 47 C.F.R. § 101.103.

¹¹¹ See Loea Petition at 17-18 and HAI Paper at 10. See also Comments of DMC Stratex Networks, Inc. at 2-3 (filed Oct. 29, 2001) (DMX Comments); Comments of The Personal Communications Industry Association, Inc. at 2-3 (filed Nov. 13, 2001) (PCIA Comments); Endwave Comments at 3-4; Boeing Comments at 6-10.

¹¹² The Commission uses Economic Areas (“EAs”) for 24 GHz and 39 GHz band, and Regional Economic Area Groupings (“REAs”) and the 52 Major Economic Areas (“MEAs”) for the 2.3 GHz band. There are 172 EAs, as defined by the U.S. Department of Commerce, and three additional Commission-defined EA-like areas. The three additional EA-like services areas are: (1) Guam and the Northern Mariana Islands (combined as one service area); (2) Puerto Rico and the United States Virgin Islands (combined as one service area); and (3) America Samoa. See Amendments to Part 1, 2, 87 and 101 of the Commission’s Rules to License Fixed Services at 24 GHz, WT Docket 99-327, *Report and Order*, 15 FCC Rcd 16934, 16942-16944 ¶¶ 13-18 (2000). See 47 C.F.R. § 101.64. See also Amendment of the Commission’s Rules regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands, *Memorandum Opinion and Order*, 14 FCC Rcd 12428, 12452 ¶ 46 (1999). At the time of the 2.3 GHz auction, REAs were defined as Regional Economic Area Groupings (“REAGs”). See 47 C.F.R. § 27.6. See also Amendment of the Commission’s Rules to Establish Part 27, the Wireless Communications Service (WCS), 12 FCC Rcd at 10785, 10814-10816 ¶¶ 54-60 (1997) (*WCS R&O*).

¹¹³ See Service Rules for the 746-764 and 776-794 MHz Bands and Revision to Part 27 of the Commission’s Rules, *First Report and Order*, 15 FCC Rcd at 476, 500 (2000).

¹¹⁴ 2000 Biennial Regulatory Review Spectrum Aggregation Limits For Commercial Mobile Radio Services, WT Docket No. 01-14, *Report and Order* (2001); Implementation Of Section 6002(B) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, *Fourth Report*, 14 FCC Rcd 10145, 10154 ¶¶ 18-19 (Major operational trends) (1999).

service areas, such as MSAs, RSAs, and CEAs,¹¹⁵ may encourage rapid service deployment to less populated and rural regions of the nation. We also believe that in some cases, smaller service areas could permit additional opportunities for small businesses to provide service in the bands and thus, more varied groups of service providers. Moreover, the use of small service areas may permit the meaningful participation of small businesses in the bands better than through the use of nationwide or regional service areas because the smaller service areas will likely require a lower minimum investment. Thus, smaller service areas may permit the dissemination of licenses among a wide variety of applicants.¹¹⁶ We seek comment on whether small service areas would permit the efficiencies necessary to support the cost of providing fixed wireless service.

72. Alternatively, we seek comment on whether we should adopt a licensing plan where the geographic service areas vary in size. As explained in the Band Plan section, we could adopt a segmented band plan. If such a band plan were adopted, we seek comment on whether adoption of a large service area for one licensed segment of the band and a smaller service area for the remaining licensed segment(s) of the band would be appropriate. Commenters supporting a licensing plan where the geographic service areas vary in size should indicate their reasons for such an approach as well as the amount of spectrum that would be appropriate for the service area designation.

73. We ask commenters to consider service areas that will promote efficient spectrum usage and flexibility. We wish to ensure service to rural areas¹¹⁷ and to promote investment in and rapid deployment of technologies and services to all underserved areas.¹¹⁸ Commenters that support licensing based on service areas other than those discussed above should explain why other types of service areas are more appropriate for this band.

b) Eligibility

(1) Foreign Ownership

74. Sections 310(a) and 310(b) of the Act, as modified by the Telecommunications Act of 1996, impose foreign ownership and citizenship requirements that restrict the issuance of licenses to certain applicants.¹¹⁹ Licensees in the 71-76 GHz, 81-86 GHz and 92-95 GHz will be subject to section 310(a) and, depending upon the rules established in this proceeding, may be subject to Section 310(b).¹²⁰ An

¹¹⁵ The Commission uses Metropolitan and Rural Service Areas (“MSAs” and “RSAs”) for Cellular. There are 734 MSAs and RSAs. *See* Public Notice Report No. CI-92-40 “Common Carrier Public Mobile Services Information, Cellular MSA/RSA Markets and Counties,” dated January 24, 1992, DA 92-109, 7 FCC Rcd 742 (1992). *See also* 47 C.F.R. § 22.909. The Commission has licensed MVDDS using the 348 Component Economic Areas (CEAs). *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, *Memorandum Opinion and Order, Second Report and Order and Second Further Notice of Proposed Rulemaking*, ET Docket No. 98-206, FCC No. 02-116, (May 23, 2002).

¹¹⁶ *See* 47 U.S.C. §§ 309(j)(3)(B), (4)(c).

¹¹⁷ *See* 47 U.S.C. § 309(j)(3)(B).

¹¹⁸ *See* 47 U.S.C. § 309(j)(4)(c)(iii).

¹¹⁹ 47 U.S.C. §§ 310(a), 310(b).

¹²⁰ *Id.*

applicant requesting authorization only for non-common carrier or non-broadcast services would be subject to Section 310(a) but not to the additional prohibitions of Section 310(b). An applicant requesting authorization for broadcast or common carrier services would be subject to both Sections 310(a) and 310(b).

75. Further, we note that in response to the commitments under the World Trade Organization (WTO) Basic Telecommunications Agreement, the Commission liberalized its policy for applying its discretion with respect to foreign ownership of common carrier radio licensees under Section 310(b)(4).¹²¹ Under our new policy, the Commission now presumes that ownership by entities from countries that are WTO members serves the public interest.¹²² Ownership by entities from countries that are not WTO members continues to be subject to the "effective competitive opportunities" potential established earlier by the Commission.¹²³

76. In the filing of an application under the proposed service rules, we seek to require common carriers and non-common carriers to comply with similar reporting obligations. In order to foster regulatory parity and transparency, we believe we should require all applicants to file changes in foreign ownership information to the extent required by Part 101 of our Rules. In light of the ability of Part 101 licensees to provide both common carrier and non-common carrier services, our Rules require all licensees to report alien ownership on a consistent basis, to better enable the Commission to monitor compliance.¹²⁴ By establishing parity in reporting obligations, however, we do not propose a single, substantive standard for compliance. Thus, by way of example, we do not believe we should disqualify an applicant requesting authorization exclusively to provide non-common carrier services from obtaining a license simply because its citizenship information would disqualify it from a common carrier or broadcast license. We request comment on this proposal.

(2) Eligibility Restrictions

77. We believe that opening the 71-76 GHz, 81-86 GHz and 92-95 GHz bands to as wide a range of applicants as possible will encourage entrepreneurial efforts to develop new technologies and services, while helping to ensure efficient spectrum use. Nevertheless, in addressing this eligibility issue, we seek to determine whether open eligibility imposes a significant likelihood of substantial competitive harm in specific markets, and, if so, whether eligibility restrictions are an effective way to address that harm. We believe we should rely on competitive market forces to guide license assignment absent a compelling showing that regulatory intervention to exclude potential participants is necessary. When granting the Commission authority in Section 309(j) of the Act to auction wireless spectrum, Congress acknowledged our authority to "[specify] eligibility and other characteristics of such licenses."¹²⁵ However, Congress

¹²¹ The commitments are incorporated into the General Agreement of Trade in Services (GATS) by the Fourth Protocol to the GATS. See Fourth Protocol to the General Agreement on Trade in Services (WTO 1997), 36 I.L.M. 366 (1997).

¹²² See Rules and Policies on Foreign Participation in the U.S. Telecommunications Market and Market Entry and Regulation of Foreign-Affiliated Entities, *Report and Order and Order on Reconsideration*, 12 FCC Rcd 23891, 23935-47, ¶¶ 97-132 (1997).

¹²³ *Id.*

¹²⁴ See Service Rules for the 746-764 and 776-794 MHz Bands, and Revisions to Part 27 of the Commission's Rules, *First Report and Order*, 15 FCC Rcd 476, 502-3 ¶ 64 (2000).

¹²⁵ See 47 U.S.C. § 309(j)(3).

specifically directed the Commission to exercise that authority so as to “promot[e] . . . economic opportunity and competition.”¹²⁶ Congress also emphasized this pro-competitive policy in Section 257, where it articulated a “national policy” in favor of “vigorous economic competition” and the elimination of barriers to market entry by a new generation of telecommunications providers.¹²⁷

78. Toward that end, the Commission has created a standard for determining whether an eligibility restriction is warranted for certain services.¹²⁸ Specifically, this standard demands that an eligibility restriction be imposed only when there is significant likelihood of substantial harm to competition in specific markets and when the restriction will be effective in eliminating that harm.¹²⁹ The effective competition standard involves much more than examining market power. In addition, the test entails examining other relevant market facts and circumstances: economic incentives, barriers to entry, and potential competition.¹³⁰ Because we are unsure of the exact type of services that will operate in the subject bands, we are unable to conclude whether open eligibility poses a significant likelihood of substantial competitive harm in specific markets or whether eligibility restrictions are an effective way to address substantial competitive harm. Accordingly, we seek comment on whether any eligibility restrictions are appropriate for the 71-76 GHz, 81-86 GHz and 92-95 GHz bands. Commenters advocating imposition of eligibility restrictions should specify the level of restrictions that would address any perceived harm.¹³¹

(3) Band Managers

79. We also seek comment, in the event we adopt a geographic area licensing scheme, on whether licensing to band managers¹³² would be appropriate. In the *BBA Report and Order*, the Commission

¹²⁶ *Id.*

¹²⁷ *See* 47 U.S.C. § 257.

¹²⁸ *See* Amendment of the Commission’s Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands, *Report and Order and Second Notice of Proposed Rule Making*, 12 FCC Rcd 18600, 18617-18619 ¶¶ 30-33 (39 GHz R&O).

¹²⁹ *Id.* at 18619 ¶ 32.

¹³⁰ Rule Making to Amend Parts 1, 2, 21, and 25 of the Commission’s Rules to Redesignate the 27.5-29.5 GHz Frequency Band, to Reallocate the 29.5-30.0 GHz Frequency Band, to Establish Rules and Policies for Local Multipoint Distribution Services and for Fixed Satellite Services, *Third Order on Reconsideration*, 13 FCC Rcd 4856, 4861 ¶ 7, 4863 ¶ 12 (1998).

¹³¹ In LMDS and the commercial mobile radio service (CMRS) Spectrum Cap, the Commission employed an attributable interest percentage.

¹³² Band managers are “a class of licensees that are specifically authorized to lease their licensed spectrum usage rights for use by third parties through private, contractual agreements, without having to secure prior approval by the Commission.” Promoting Efficient Use of Spectrum Through Eliminating Barriers to the Development of Secondary Markets, *Notice of Proposed Rule Making*, WT Docket No. 00-230, 15 FCC Rcd 24203, 24209 ¶ 17 (2000).

recognized band managers as a future option for spectrum licensing.¹³³ Because the technology for these bands is new and developing, we believe a flexible regulatory approach is necessary to allow development of applications for the optimal public benefit. In this connection, we seek comment on whether permitting an entity to hold a license in these bands as a band manager would be appropriate.

80. We note that Loea made comments opposing the band manager concept.¹³⁴ Specifically, Loea contends that the technological applications in the Upper Millimeter Wave band require “large vertical slices” of spectrum thereby reducing the number of viable spectrum managers.¹³⁵ Loea further argues that giving a band manager exclusive use of the spectrum in a geographic area gives it a monopoly in the area.¹³⁶ We seek comment on whether, on the other hand, a band manager could actually enhance accessibility by third parties interested in providing service using this spectrum. In this regard, we seek comment on whether a band manager could perform many of the functions that Loea proposes be delegated to a coordinator. We seek comment generally on the feasibility, if we decide on geographic area licensing, of providing licensees in these bands with the option of electing to operate either as a band manager or as a regular non-band manager licensee.¹³⁷

81. If we allow band manager licensees in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands, we seek comment on the rules that should apply to band managers in these bands. Additionally, we seek comment on how rules for band managers should differ from the rules applicable to 700 MHz Guard Band Managers.¹³⁸ For example, we ask whether we should also implement safeguards, similar to those in Part 27 of our Rules, to ensure that a band manager’s core function remains focused on leasing.¹³⁹ We also seek comment on whether it is necessary to provide additional safeguards to prevent a band manager from discriminating among spectrum users.¹⁴⁰ We note that in the *27 MHz Report and Order*, we declined to apply several rules to band managers in those bands that do apply to 700 MHz Guard Band

¹³³ See Implementation of Sections 309(j) and 337 of the Communications Act of 1934 as Amended, WT Docket No. 99-87, *Report and Order and Further Notice of Proposed Rule Making*, WT Docket 99-87, 15 FCC Rcd 22709, 22727-22735 (2000) (*BBA Report and Order*).

¹³⁴ See *id.*

¹³⁵ See Loea Petition at 16.

¹³⁶ *Id.*

¹³⁷ We note that the Commission is exploring ways to promote leasing in its Secondary Markets proceeding. See Promoting Efficient Use of the Spectrum through Elimination of Barriers to the Development of Secondary Markets, WT Docket No. 00-230, *Notice of Proposed Rule Making*, 15 FCC Rcd 24203 (rel. Nov. 27, 2000); see also Promoting Efficient Use of the Spectrum through Elimination of Barriers to the Development of Secondary Markets, *Policy Statement*, 15 FCC Rcd 24178 (rel. Dec. 1, 2000).

¹³⁸ See generally 47 C.F.R. Part 27 – Miscellaneous Wireless Communications Services (Subpart G).

¹³⁹ See *700 MHz Guard Band Second Report and Order*, *supra*, note 137 (limiting band managers and affiliated spectrum use).

¹⁴⁰ See *700 MHz Guard Band Second Report and Order*, 15 FCC Rcd at 5327-5328 ¶¶ 63-67; see also *BBA Report and Order*, 15 FCC Rcd 22733 ¶ 47.

Managers.¹⁴¹ We seek comment on which Part 27 Rules relating to band managers should apply to band managers in these bands. In addition, we request comment on the type of information to include in agreements between band managers and spectrum users.¹⁴² Finally, we seek comment on whether we should require band managers to file annual reports on their spectrum usage with the Commission.¹⁴³ The annual reports would enable the Commission to ensure that spectrum is not being warehoused or otherwise not being made available despite existing demand.¹⁴⁴

c) Canadian and Mexican Coordination

82. Section 2.301 of our Rules requires stations using wireless frequencies to identify their transmissions with a view to eliminating harmful interference and generally enforcing applicable wireless treaties, conventions, regulations, arrangements, and agreements.¹⁴⁵ At this time, there are no international agreements between and among the United States, Mexico and Canada concerning the reallocation of the 71-76 GHz, 81-86 GHz and 92-95 GHz spectrum. We believe we should adopt interim requirements for licensees along these borders. Additionally, we believe we should require these licensees to comply with the provisions contained within future agreements between and among the three countries. Until such time as agreements between the United States, Mexico and Canada become effective, we propose to apply the same technical restrictions at the border that we adopt for operation between the geographic service areas.¹⁴⁶ Generally, operations must not cause harmful interference across the border. We note that further modification might be necessary in order to comply with future agreements with Canada and Mexico regarding the use of this band. We seek comments on these issues. Additionally, we request comment on alternative interim requirements that would eliminate harmful interference to countries along our borders.

d) License Term and Renewal Expectancy

83. We seek comment on the appropriate license term for licensees in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands. We note that licenses authorized under Part 101 of our Rules are licensed for a period of ten years.¹⁴⁷ In addition, if we adopt a licensing scheme under which a licensee obtains the exclusive right to use spectrum, we seek comment on creating a renewal expectancy similar to that afforded to licensees in the Local Multipoint Distribution Service (LMDS). For LMDS licensees, we concluded that a renewal applicant shall receive a preference or renewal expectancy if the applicant has

¹⁴¹ See Amendments to Parts 1, 2, 27 and 90 of the Commission's Rules to License Services in the 216-220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz and 2385-2390 MHz Government Transfer Bands, WT Docket 02-8, *Report and Order*, ¶ 39 (rel. May 24, 2002).

¹⁴² For example, under Part 27 of our Rules, a spectrum user must specify, in detail, the operating parameters of the proposed system including power, maximum antenna heights, frequency(s) of operation, base station locations and area of operations. See 47 C.F.R. Part 27, Subpart G.

¹⁴³ See 47 C.F.R. § 27.607.

¹⁴⁴ See *700 MHz Guard Band Second Report and Order*, 15 FCC Rcd at 5333 ¶ 79.

¹⁴⁵ See 47 C.F.R. § 2.301.

¹⁴⁶ See 47 C.F.R. § 101.105.

¹⁴⁷ See 47 C.F.R. § 101.67.

provided substantial service during its past license term and has complied with the Act and applicable Commission rules and policies.¹⁴⁸ We believe that a ten-year license term, combined with a renewal expectancy, could help to provide a stable regulatory environment that will be attractive to investors and, thereby, encourage development of this frequency band.

84. If we adopt a renewal expectancy, we propose that the renewal application of a licensee in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands must include, at a minimum, the following showings in order to request a renewal expectancy:

- A description of current service in terms of geographic coverage and population served or links installed and a description of how the service complies with the substantial service requirement.
- A description of the licensee's investments in its system(s).
- Copies of any Commission Orders finding the licensee to have violated the Communications Act or any Commission rule or policy, and a list of any pending proceedings that relate to any matter described by the requirements for the renewal expectancy.¹⁴⁹
- If applicable, a description of how the licensee has complied with the build-out requirement.

85. Under our proposal, in the event that a licensee partitions or disaggregates¹⁵⁰ its license, a partitionee or disaggregatee may only hold its license for the remainder of the partitioner's or disaggregator's original license term.¹⁵¹ Further, applications requesting approval for partitioning or disaggregation must include a certification by each party that it will satisfy the construction requirements established in this proceeding. This approach is similar to the partitioning provisions the Commission adopted for licensees in the 39 GHz band,¹⁵² 24 GHz band,¹⁵³ and LMDS.¹⁵⁴ We provide these provisions because we do not believe that a licensee, by partitioning or disaggregating, should be able to confer

¹⁴⁸ See 47 C.F.R. § 101.1011.

¹⁴⁹ Cf. Section 22.940(a)(2)(i) through Section 22.940(a)(2)(iv) of the Commission's Rules, 47 C.F.R. §§ 22.940(a)(2)(i)-(iv); see also Amendment of Part 22 of the Commission's Rules Relating to License Renewals in the Domestic Public Cellular Radio Telecommunication Service, *Report and Order*, 7 FCC Rcd 719, 719-722 ¶¶ 3-18 (1992).

¹⁵⁰ "Partitioning" is the assignment of geographic portions of a license along the geopolitical or other boundaries. "Disaggregation" is the assignment of discrete portions of "blocks" of spectrum licensed to a geographic licensee or qualifying entity. Disaggregation allows for multiple transmitters in the same area operated by different companies (thus, the possibility of harmful interference increases).

¹⁵¹ See Partitioning and Disaggregation discussion at para. 91.

¹⁵² See 47 C.F.R. §§ 101.56(g)-(h).

¹⁵³ See 47 C.F.R. §§ 101.535(d)-(e).

¹⁵⁴ See 47 C.F.R. §§ 101.1111(d)-(e).

greater rights than it was awarded under the terms of its license grant. We seek comment on this approach.

e) Construction and Coverage Requirements

86. We seek comment on what, if any, construction and/or minimum coverage requirements should apply to licensees in these bands. If we allow licensees to acquire exclusive use of spectrum in an area, we seek comment on whether we should require licensees to satisfy a substantial service requirement or a minimum coverage requirement in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands as a condition of license renewal. We have imposed such requirements on licensees in other services to ensure effective and efficient spectrum use and prompt implementation of service.¹⁵⁵ We seek comment on whether we should require licensees to provide “substantial service” to the geographic license area within the license term that we adopt for this service. We have defined substantial service as “service which is sound, favorable, and substantially above a level of mediocre service which just might minimally warrant renewal.”¹⁵⁶ Further, we seek comment on whether there should be an alternative, safe harbor standard. We ask commenters supporting a safe harbor standard to specify the type of safe harbor standard we should provide. We also seek comment on whether such a safe harbor standard should apply to band managers as well as traditional licensees or whether we need to apply a different safe harbor to band managers. In addition, we seek comment on whether a partitionee or disaggregatee should be bound by the standard, either substantial service or a construction requirement, for its partitioned or disaggregated license. Finally, we propose that licensees who fail to comply with the adopted standard will not have their licenses renewed.¹⁵⁷ These standards promote efficient spectrum usage and maximize opportunities for new services and technologies in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands. Moreover, we propose that any exclusive licensee who loses its license for failure to comply with the adopted standard, will be prohibited from holding that same license for the same territory in the future.¹⁵⁸ We seek comment on these proposals.

87. If we decide to license the spectrum in these bands on a site-by-site basis, we seek comment on whether to apply the construction requirements set forth in Section 101.63 of our Rules. Section 101.63 provides, *inter alia*, that licensees authorized under Part 101 of our Rules must be in operation within 18 months from the initial date of grant.¹⁵⁹ Section 101.63 further provides that failure to timely begin operation of the station will result in the automatic cancellation of that authorization.¹⁶⁰ We seek comment on this construction requirement, as well as alternative construction requirements, for site-based licenses in these bands.

¹⁵⁵ Cf. 47 C.F.R. §§ 22.940(a)(2)(i)-(iv).

¹⁵⁶ See *e.g.*, 47 C.F.R. § 22.940(a)(1)(i).

¹⁵⁷ See, *e.g.* 47 C.F.R. §§ 101.17(b), 101.1011(a).

¹⁵⁸ See, *e.g.* 47 C.F.R. § 101.1011(a).

¹⁵⁹ See 47 C.F.R. § 101.63(a).

¹⁶⁰ See 47 C.F.R. § 101.63(b).

f) Individual Station Licenses

88. In the event we adopt a geographic area licensing scheme for the 71-76 GHz, 81-86 GHz and 92-95 GHz bands, we seek comment on circumstances under which such licensees would be required to obtain individual station licenses within its geographic area. Under geographic area licensing, the licensee has exclusive use of its assigned spectrum to operate within its original geographic service area. Ordinarily, licensees may operate without filing an application for each individual station within its service area. Nonetheless, we believe there are situations in which we will require licensees to obtain an individual station license for a particular station within its geographic service area. We believe those instances include: (1) applications requiring submission of an Environmental Assessment,¹⁶¹ (2) international coordination,¹⁶² (3) operation in quiet zones,¹⁶³ or (4) coordination through the Commission with IRAC.¹⁶⁴ We believe the applicant, in the first instance, is in the best position to determine the nature of its operations and whether those operations impact environmental rules, quiet zone rules, etc. Accordingly, we tentatively conclude that the licensee must determine whether its proposed operations and location require an individual station license for which it must file an individual application. We further propose to apply this requirement to both new stations and station modifications. We request comment on this tentative conclusion and proposal.

g) Application of Title II Requirements to Common Carriers

89. We also seek comment on whether we should forbear from applying certain obligations on common carrier licensees in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands pursuant to Section 10 of the Act.¹⁶⁵ In the case of CMRS providers, the Commission concluded that it was appropriate to forbear from Sections 203, 204, 205, 211, 212, and most applications of Section 214.¹⁶⁶ The Commission, however, declined to forbear from enforcing other provisions, including Sections 201 and 202.¹⁶⁷ The

¹⁶¹ See 47 C.F.R. § 1.1307.

¹⁶² See, e.g. 47 C.F.R. § 1.928 (regarding frequency coordination arrangements between the U.S. and Canada).

¹⁶³ 47 C.F.R. § 1.924.

¹⁶⁴ This coordination may be necessary depending on the final rules adopted in this proceeding, near a limited number of Federal Government installations that require protection from FCC licensed stations in these bands.

¹⁶⁵ See 47 U.S.C. § 160(a)(1-3). This section provides the Commission with authority to forbear from application of virtually any regulation or any provision of the Act to a telecommunications carrier or telecommunications service, or a class of carriers or services. But, the Commission may not forbear from applying the requirements of 47 U.S.C. §§ 251(c) and 271 until the Commission determines that those requirements have been fully implemented. See 47 U.S.C. § 160(d).

¹⁶⁶ See Implementation of Sections 3(n) and 332 of the Communications Act, Regulatory Treatment of Mobile Services, *Second Report and Order*, 9 FCC Rcd 1411, 1463-93, 1478-80 (1994) (*CMRS Second Report and Order*).

¹⁶⁷ See *CMRS Second Report and Order*, 9 FCC Rcd at 1478; Personal Communications Industry Association's Broadband Personal Communications Services Alliance's Petition for Forbearance for Broadband Personal Communications Services, Forbearance from Applying Provisions of the Communications Act to Wireless Telecommunications Carriers, WT Docket No. 98- 100, *Memorandum Opinion and Order and Notice of Proposed Rulemaking*, 13 FCC Rcd 16857, 16914 (1998) (declining to forbear from applying Section 20.12(b) of (continued....))

Commission also has exercised its forbearance authority in permitting competitive access providers and competitive local exchange carriers to file permissive tariffs.¹⁶⁸ We seek comment on whether it is appropriate to forbear from enforcing any provisions of the Act or the Commission's Rules in these bands.

90. Before forbearing from applying any section of Title II, Section 10(a) requires the Commission to find each of the following conditions:

- Enforcement of such regulation or provision is not necessary in order to ensure that the charges, practices, classifications, or regulations by, for or in connection with that telecommunications carrier or telecommunication service are just and reasonable and are not unjustly or unreasonably discriminatory;¹⁶⁹
- Enforcement of such regulation or provision is not necessary for the protection of consumers;¹⁷⁰ and
- Forbearance from applying such regulation or provision is consistent with the public interest.¹⁷¹

Accordingly, any proposal to forbear from enforcing any provisions of the Act or our Rules must address the conditions announced in Section 10(a) of the act.

h) Partitioning and Disaggregation

91. We propose to allow licensees to partition their service areas and to disaggregate their spectrum. We seek comment on whether geographic partitioning and spectrum disaggregation could result in efficient spectrum use. We note that we allow partitioning and disaggregation in other microwave services, such as the 39 GHz Service¹⁷² and LMDS.¹⁷³ We also seek comment on whether our proposed approach will provide a means to overcome entry barriers through the creation of smaller licenses that require less capital, thereby facilitating greater participation by rural telephone companies and smaller entities, many of which are owned by minorities and women.¹⁷⁴ We are mindful of the

(Continued from previous page) _____

the Commission's Rules (resale rule) and Sections 201 and 202 of the Communications Act). *See also* RegioNet Wireless License, LLC, *Order*, 15 FCC Rcd 16,119 (2000).

¹⁶⁸ *See* Hyperion Telecommunications, Inc. Petition Requesting Forbearance, Time Warner Communications Petition for Forbearance, Complete Detariffing for Competitive Access Providers and Competitive Exchange Carriers, *Memorandum Opinion and Order and Notice of Proposed Rulemaking*, 12 FCC Rcd 8596, 8608-10 (1997).

¹⁶⁹ *See* 47 U.S.C. § 160(a)(1).

¹⁷⁰ *See* 47 U.S.C. § 160(a)(2).

¹⁷¹ *See* 47 U.S.C. § 160(a)(3).

¹⁷² *See* 47 C.F.R. § 101.56.

¹⁷³ *See* 47 C.F.R. § 101.1111.

¹⁷⁴ *See* Geographic Partitioning and Spectrum Disaggregation by Commercial Mobile Radio Services Licensees, *Report and Order*, 11 FCC Rcd 21831, 21843-44 ¶¶ 13-17.

concerns of the rural telecommunications community concerning the effectiveness of partitioning and disaggregation in facilitating service to rural areas. We intend to develop a more current and substantial record on the Commission's mandate to ensure that rural telecommunication companies are given the opportunity to participate in the provision of spectrum-based services pursuant to Section 309(j)(4)(d) of the Act.¹⁷⁵ Accordingly, we plan to initiate a Notice of Inquiry regarding a number of topics related to the provision of spectrum-based service to rural areas.¹⁷⁶

92. We seek comment on the advantages and disadvantages of allowing partitioning and disaggregation in these bands. In addition, we seek comment on our proposal to apply the unjust enrichment provisions of Section 1.2111 of our Rules in the event a licensee that received a bidding credit chooses to partition its license or disaggregate its spectrum to an entity that is not eligible for such a bidding credit.

3. Technical and Operational Rules

a) Regulation Under Part 101

93. Loea and the commenters propose that we regulate these bands under Part 101 of our Rules.¹⁷⁷ We tentatively conclude that regulation under Part 101 of our Rules is appropriate. As noted by the commenters, there are similarities between the services contemplated in these bands and existing fixed microwave services such as the 39 GHz service, which is regulated under Part 101 of our Rules. We seek comment on whether we should regulate primary fixed uses in this band pursuant to Part 101 of our Rules,¹⁷⁸ as we have traditionally done for fixed, point-to-point, and point-to-multipoint microwave operations. We ask commenters to discuss the advantages and disadvantages of regulating this service pursuant to Part 101. We also solicit suggestions on other methods to regulate the band, along with the advantages and disadvantages thereof. We also seek comment on whether certain technical rules would be unnecessary in the event we allow band managers to be licensees.

94. We note that none of the commenters discussed mobile operations in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands. However, as stated above, this spectrum is allocated for fixed and mobile services. In accordance with our goal of providing maximum practicable flexibility, we seek comment on whether it would be appropriate to establish rules to regulate mobile operation in the spectrum. We ask commenters to discuss the advantages and disadvantages of establishing rules to regulate mobile service in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands. We also ask commenters that support service rules for mobile service to propose specific technical and operational rules for mobile service.

¹⁷⁵ 47 U.S.C. § 309(j)(4)(C).

¹⁷⁶ See Amendment to Parts 1, 2, 27 and 90 of the Commission's rules to License Services in the 216-200 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz 1670-1675 MHz and 2385-2390 MHz Government Transfer Bands, WT Docket No. 02-8, *Report and Order*, FCC 02-152 (rel. May 24, 2002) at ¶ 20.

¹⁷⁷ Loea Petition at 9-10, DMC Comments at 2, Boeing Comments at 6 n.8, Letter from Robert Volker, President of Pacific LightNet to Magalie Roman Salas, Secretary, Federal Communications Commission at 1-2 (filed Nov. 7, 2001) (Pacific LightNet Comments).

¹⁷⁸ Part 101 of the Commission's Rules governs the Fixed Microwave Services.

b) Technical Rules

95. As stated above, we propose to apply our Part 101 rules to govern the use of new services in the 71-76, 81-86 and 92-95 GHz bands, except as they may be modified as a result of this proceeding. Because we do not exactly know the type of services that will use the 71-76, 81-86 and 92-95 GHz bands, we believe it is appropriate to solicit comments on possible technical requirements for operations on these bands. While it is our tentative view that most technical issues are addressed by the current rules, there are several rules discussed below that should be considered. We solicit comments, however, on all technical parameters that should apply to operations at 71-76, 81-86 and 92-95 GHz.

96. Loea's proposed technical rules are supported by FWCC and Pacific LightNet.¹⁷⁹ Generally, DMC Stratex Networks also supported Loea's proposed technical rules but believes further study is needed before any final values are set in the rules.¹⁸⁰ Boeing, however, contends that the parameters Loea proposed only reflect Loea's proposed system and were likely not designed in order to maximize compatibility with other systems and services.¹⁸¹ Boeing states that the Commission should adopt technical rules that are independent and neutral, thus permitting the licensing of competing and diverse systems and services.¹⁸²

97. *Channelization Plan.* As provided above, we propose segmentation of the 92-95 GHz band in order to provide adequate protection to users in the adjacent spectrum and to the co-primary Federal Government and non-Federal Government users in the band.¹⁸³ However, at this time we do not propose segmentation of the 71-76 GHz and 81-86 GHz bands. The commenters argue that we should not impose a channelization plan on these bands because licensees will need access to the entire spectrum in order to obtain the very high throughput they will need to provide fiber-like services.¹⁸⁴ In particular, Boeing states that the entire available bandwidth must be made available "if true equivalence and compatibility with fiber is to be achieved."¹⁸⁵ We seek comment on whether a channelization plan would impede the flexibility of licensees to provide innovative services in these bands. We also seek comment on assertions that a channelization plan is unnecessary because of the ability to have high reuse of these bands in a limited area.¹⁸⁶ We seek comment on whether a channelization plan would enhance competition by allowing multiple licensees to effectively operate in the same area.

¹⁷⁹ See FWCC Comments at 2; LightNet Comments at 2.

¹⁸⁰ See DMC Comments at 4.

¹⁸¹ See Boeing Comments at 10.

¹⁸² *Id.*

¹⁸³ See paras. 47-51.

¹⁸⁴ See Loea Petition at 11; Boeing Comments at 4; Endwave Comments at 3; WCA Comments at 3. We note that only Boeing included the 92-95 GHz band in its comments regarding a channelization plan. Boeing Comments at 4.

¹⁸⁵ Boeing Comments at 5. We note that Boeing included the 92-95 GHz band in its comments regarding channelization plans. *Id.*

¹⁸⁶ *Id.*

98. *Interference Protection Criteria.* In the 24 GHz band, where we licensed spectrum in geographic areas,¹⁸⁷ we concluded that licensees must be assured reasonable and effective use of their own areas, while equally protecting the interests of other licensees.¹⁸⁸ Accordingly, we created an interference protection criteria to ensure cooperation among licensees to minimize and resolve potential interference problems while obtaining the most efficient and effective use of the spectrum and authorized facilities.¹⁸⁹ We prohibited all harmful interference to other users of co-channel and adjacent channel use in the same or adjacent geographical area.¹⁹⁰ In addition, we require licensees in the 24 GHz band to coordinate their facilities whenever the facilities have optical line-of-sight into other licensees' areas or are within the same geographic area.¹⁹¹ However, we provided a flexible approach in which the relevant licensees were allowed to mutually resolve their coordination problems with as little input from the Commission as possible.¹⁹² To the extent we use geographic area licensing, we propose to create a similar flexible approach for the 71-76 GHz, 81-86 GHz and 92-95 GHz bands. We seek comment on the proposed interference protection criteria. To the extent we use site-by-site licensing in these bands, we also seek comment on the applicable interference protection criteria that should be used. In particular, we seek comment on whether any of the criteria in Section 101.105 of our Rules¹⁹³ could be applied to these bands.

99. *Frequency Tolerance.* Loea proposes a frequency tolerance of 0.03 percent for all fixed and mobile stations.¹⁹⁴ Although Loea provides no basis for this proposal, we note that this is the same frequency tolerance we applied in the 31.3-40.0 GHz band. We believe that this frequency tolerance should provide the flexibility necessary for manufacturers to develop equipment in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands.¹⁹⁵ We seek comment on the frequency tolerance proposed by Loea and other possible frequency tolerance criteria. For example, we could specify tight transmitter filter requirements to minimize transmissions of undesired harmonics, instead of specifying tight transmitter frequency tolerance.

100. *Restrictions on Total Radiated Power and Antenna Directionality.* Loea proposes to adopt a maximum EIRP of +55 dBW.¹⁹⁶ Loea notes that this proposal is consistent with the EIRP

¹⁸⁷ See e.g. Amendments to Parts 1, 2, 87 and 101 of the Commission's Rules to License Fixed Services at 24 GHz, *Report and Order*, 15 FCC Rcd 16935, 16965 ¶ 70 (2000).

¹⁸⁸ *Id.* at 16963 ¶¶ 65-67.

¹⁸⁹ *Id.*

¹⁹⁰ See 47 C.F.R. § 101.509(b).

¹⁹¹ See 47 C.F.R. § 101.509(c).

¹⁹² *Id.* at 16693 ¶ 66.

¹⁹³ 47 C.F.R. § 101.105.

¹⁹⁴ See Loea Petition, Appendix C at 4.

¹⁹⁵ See 47 C.F.R. § 101.107. We note that 39 GHz licensees are exempt from the frequency tolerance requirements set forth in Section 101.107 of the Commission's Rules. *Id.*

¹⁹⁶ See Loea Petition at 14.

limitation in the 39 GHz band and several other bands.¹⁹⁷ While this proposal is consistent with the EIRP limits set for 39 GHz licensees, we ask commenters, to the extent we adopt geographic area licensing, if there is a need for EIRP limitations in a band occupied only by geographic area licensees.¹⁹⁸ If there is such a need, we seek comment on whether the proposed EIRP values are appropriate for the intended services in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands. We also ask whether the proposed EIRP values provide adequate power for stations to transmit over typical distances for various types of applications, or whether the proposed maximum has the potential to produce harmful interference due, for instance, to scattering, when a large number of microwave paths criss-cross each other.

101. Loea also requests that the Commission specify a minimum 50 dBi gain and, consistently, a 0.6 degree half power beamwidth for the antennas used in the 71-76 and 81-86 GHz bands.¹⁹⁹ Loea claims that instituting such a requirement will result in a gain that is 12 dB higher than the other Part 101 regulated bands, thus regulating the sharing of spectrum by spatially narrowing the beams used to provide service.²⁰⁰ We seek comment on this proposal. Endwave argues that Loea has requested antenna specifications that are difficult to meet using available fabrication processes.²⁰¹ Endwave contends that a minor relaxation of certain parameters proposed by Loea will reduce the antenna cost sharply, without degrading the characteristics that support the licensing approaches.²⁰² Specifically, Endwave proposes that manufacturers should have the option of reducing antenna gain, so long as they cut maximum EIRP by twice the number of dB by which they reduce antenna gain. For example, it would be permissible to reduce antenna gain by 3 dB and EIRP by 6 dB, or antenna gain by 6 dB and EIRP by 12 dB.²⁰³ WCA supports Endwave's proposal for a minor relaxation of Loea's proposed parameters.²⁰⁴ We seek comment on the radiated power and directionality proposed by Loea and ask whether these parameters should also apply to the 92-95 GHz bands. We seek comment on whether there is a need for antenna gain regulation if we adopt geographic area licensing. To the extent commenters believe a minimum antenna gain requirement is necessary, we seek comment on Endwave's proposal to relax the technical parameters proposed by Loea.

102. *RF Safety.* We propose that licensees and manufacturers be subject to the RF radiation exposure requirements specified in Sections 1.1307(b), 2.1091 and 2.1093 of our Rules,²⁰⁵ which list the services and devices for which an environmental evaluation must be performed. We seek comment on

¹⁹⁷ *Id.*

¹⁹⁸ We note that an EIRP limitation was necessary in the 39 GHz service because of incumbents and overlays in the spectrum. *See 39 GHz R&O*, 12 FCC Rcd at 18632-18634 ¶¶ 66-69.

¹⁹⁹ *Id.*

²⁰⁰ *Id.*

²⁰¹ *See* Endwave Comments at 5.

²⁰² *Id.*

²⁰³ *Id.*

²⁰⁴ *See* WCIA Comments at 4.

²⁰⁵ 47 C.F.R. §§ 1.1307(b), 2.1091, 2.1093.

requiring routine environmental evaluations for RF exposure²⁰⁶ in the case of fixed operations, including base stations in cases where there is a possible safety risk if the installation of the transmitter antenna is not properly designed. We propose to do this by amending Table 1 of Section 1.1307 of our Rules²⁰⁷ to require an evaluation if the ratio is $4P/A$ is greater than 1 mW/cm^2 , where A is the area of the antenna in cm^2 and P is the power of the transmitter in mW . While other fixed transmitter evaluation requirements are based on an effective isotropic radiated power threshold, we believe that this ratio is a better indicator of health risk and will minimize the number of evaluations needed and hence decrease administrative burdens.

4. Licensing Rules and Procedures

a) Incorporation by Reference of Part 1 of the Wireless Telecommunications Services Application and Procedural Rules

103. We propose to license portions of the 71-76 GHz, 81-86 GHz and 92-95 GHz bands in conformity with the general application and procedure rules for wireless telecommunications set forth in Part 1, Subpart F, of our Rules.²⁰⁸ We seek comment on whether any of our Part 1 Rules would be inappropriate for the licensed portion of these bands.

b) Competitive Bidding

(1) Assignment of Licenses

104. As discussed above, if we adopt a licensing mechanism that could result in the filing of mutually exclusive applications, we will resolve any mutually exclusive initial applications for licenses for the 71-76 GHz, 81-86 GHz and 92-95 GHz bands through the use of competitive bidding. Loea and its supporters are opposed to the concept of assigning licenses in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands via competitive bidding.²⁰⁹ Loea's provides three main reasons for its opposition. First, Loea argues that mutual exclusivity will not exist in these bands and therefore auctions are neither appropriate nor necessary.²¹⁰ Loea claims there will be no mutual exclusivity because of the point-to-point nature of these paths and the nature of the propagation of the Upper Millimeter Wave bands.²¹¹ Specifically, Loea contends that in the Upper Millimeter Wave bands, harmful interference can be eliminated by reorientation of the antenna by tenths of degrees or relocation of the antenna by tenths of meters.²¹²

²⁰⁶ See "Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields," OET Bulletin No. 65 (August 1997).

²⁰⁷ 47 C.F.R. § 1.1307.

²⁰⁸ See 47 C.F.R. §§ 1.901-1.981.

²⁰⁹ See Loea Petition at 17; see also Boeing Comments at 6-8; Endwave Comments at 3; FWCC Comments at 2; PCIA Comments at 2; WCIA Comments at 3.

²¹⁰ Loea Petition at 17.

²¹¹ *Id.*

²¹² *Id.*

Therefore, Loea concludes that even if two entities want to provide service over the same path, harmful interference can be avoided by judiciously routing the second path around the first.²¹³

105. Second, Loea argues that assignment of licenses via competitive bidding is not always beneficial to the consumer.²¹⁴ In its paper, HAI concludes that an auction of the spectrum will, in effect, be an inefficient tax.²¹⁵ HAI claims that such a tax increases the prices consumers pay and discourages investment in telecommunications and may conflict with other public policy goals, such as increasing competition.²¹⁶ HAI also concludes that auctions have the potential to raise monopoly problems. Based on the HAI Paper, Loea argues that auctions reduce the ability of new service providers to enter the market, impairs the Commission's ability to reach spectrum goals and makes it less likely that consumers will be able to enjoy a variety of innovative services at reasonable cost.²¹⁷ Boeing supports this conclusion and further argues that competitive bidding would only impose additional and unnecessary costs, both in terms of real dollars and delay, in the deployment of new services.²¹⁸

106. Finally, Loea argues that Section 309(j)(6) of the Act mandates that the Commission employ coordination or other services, rather than auctions, to avoid the potential for mutual exclusivity.²¹⁹ It further contends that mutual exclusivity can be avoided by using a site-by-site licensing scheme.²²⁰ Accordingly, Loea concludes that there is no reason to assign the licenses by competitive bidding.

107. We nevertheless seek comment on competitive bidding rules for the 71-76 GHz, 81-86 GHz and 92-95 GHz bands in case we adopt a licensing mechanism that could result in the filing of mutually exclusive applications. We note that Congress has mandated that we auction spectrum in order to resolve mutual exclusivity. The Balanced Budget Act of 1997 (BBA-97) revised the Commission's auction authority.²²¹ Specifically, it amended Section 309(j) of the Act to require the Commission to grant licenses through the use of competitive bidding when mutually exclusive applications for initial licenses are filed, unless certain specific statutory exemptions apply.²²² The BBA-97 also incorporated in Section 309(j)(1) a reference to the Commission's obligation to avoid mutual exclusivity under Section 309(j)(6)(E) to use engineering solutions, negotiation, threshold qualifications, service regulations, or

²¹³ *Id.* at 18.

²¹⁴ *Id.*

²¹⁵ See Loea Petition, Appendix B, HAI Paper at 9.

²¹⁶ *Id.*

²¹⁷ See Loea Petition at 18.

²¹⁸ See Boeing Comments at 7.

²¹⁹ See Loea Petition at 18; see also Boeing Comments at 9.

²²⁰ *Id.*

²²¹ See 47 U.S.C. § 309(j)(1), (2) (as amended by Balanced Budget Act, § 3002).

²²² *Id.* 47 U.S.C. § 309(j)(2) exempts from auctions licenses and construction permits for public safety radio services, digital television service licenses and permits given to existing terrestrial broadcast licensees to replace their analog television service licenses, and licenses and construction permits for noncommercial educational broadcast stations and public broadcast stations.

other means to avoid mutual exclusivity where it is in the public interest to do so.²²³ BBA-97 did not amend Section 309(j)(3)'s directive to consider certain public interest objectives in identifying classes of licenses and permits to be issued by competitive bidding.²²⁴

108. In the *BBA Report and Order*, the Commission established a framework for exercise of the Commission's auction authority, as expanded by the Balanced Budget Act.²²⁵ The *BBA Report and Order* affirmed that, in identifying which classes of licenses should be subject to competitive bidding, the Commission must pursue the public interest objectives set forth in Section 309(j)(3).²²⁶ The *BBA Report and Order* also affirmed that, as part of this public interest analysis, the Commission must continue to consider alternative procedures that avoid or reduce the likelihood of mutual exclusivity.²²⁷ The Commission has concluded, however, that its obligation to avoid mutual exclusivity does not preclude it from adopting licensing processes in the non-exempt services that result in the filing of mutually exclusive applications where it determines that such an approach would serve the public interest.²²⁸

109. In determining whether to assign licenses through competitive bidding in this proceeding, we intend to follow the approach set forth in the Balanced Budget Act proceeding regarding the exercise of our auction authority. We note, too, that subsequent to the adoption of Balanced Budget Act, the U.S. Court of Appeals for the D.C. Circuit concluded that the Section 309(j)(6)(E) obligation does not foreclose new licensing schemes that are likely to result in mutual exclusivity.²²⁹ The court stated that if the Commission finds such schemes to be in the public interest, it may implement them "without regard to Section 309(j)(6)(E) which imposes an obligation only to minimize mutual exclusivity 'in the public interest' and 'within the framework of existing policies.'"²³⁰

110. As stated earlier, we seek comment on whether to adopt a geographic area licensing scheme for the proposed licensed portion of the 71-76 GHz, 81-86 GHz and 92-95 GHz bands. We also seek comment on appropriate licensing approaches for these bands and whether such schemes would promote the objectives of Section 309(j)(3), including promoting economic opportunities and competition by disseminating licenses among a wide variety of applicants.²³¹ If we find that it would serve the public interest to implement a geographic area licensing scheme, under which mutual exclusivity is possible, then we must resolve mutually exclusive applications for initial licenses in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands through competitive bidding.

²²³ See 47 U.S.C. §§ 309(j)(1), 309(j)(6)(E).

²²⁴ See 47 U.S.C. §§ 309(j)(3).

²²⁵ See *BBA Report and Order*, 15 FCC Rcd 22709.

²²⁶ *Id.* at 22718-22723.

²²⁷ *Id.*

²²⁸ *Id.*

²²⁹ See *Benkelman Telephone Co. et al v. FCC*, 220 F.3d 601,606 (D.C. Cir 2000), *petition for rehearing on other grounds pending*.

²³⁰ *Id.* (citations omitted) (citing *DIRECTV, Inc. v. FCC*, 110 F.3d 816, 828 (D.C. Cir. 1997)).

²³¹ See *supra* paras. 61-69; 47 U.S.C. § 309(j)(3).

(2) Incorporation by Reference of the Part 1 Standardized Auction Rules

111. If we adopt a licensing mechanism that could result in mutually exclusive applications, we propose to conduct any auction of initial licenses in the licensed portion of the 71-76 GHz, 81-86 GHz and 92-95 GHz bands in conformity with the general competitive bidding rules set forth in Part 1, Subpart Q, of our Rules, and substantially consistent with the bidding procedures that we have employed in previous auctions.²³² Specifically, we propose to employ our Part 1 Rules governing competitive bidding design, designated entities, application and payment procedures, reporting requirements, collusion issues, and unjust enrichment.²³³ Under this proposal, we propose to employ our Part 1 competitive bidding rules, as they may be modified in future Part 1 proceedings.²³⁴ In addition, consistent with current practice, the Wireless Telecommunications Bureau (“Bureau”) would determine matters such as the appropriate competitive bidding design for the auction of these licenses, as well as minimum opening bids and reserve prices, pursuant to its delegated authority.²³⁵ We seek comment on whether any of our Part 1 Rules or other auction procedures would be inappropriate in an auction of licenses in these bands.

(3) Designated Entity Provisions

112. In authorizing the Commission to use competitive bidding, Congress mandated that the Commission “ensure that small businesses, rural telephone companies, and businesses owned by members of minority groups and women are given the opportunity to participate in the provision of spectrum-based services.”²³⁶ In addition, Section 309(j)(3)(B) of the Act provides that in establishing eligibility criteria and bidding methodologies the Commission shall promote “economic opportunity and competition . . . by avoiding excessive concentration of licenses and by disseminating licenses among a wide variety of applicants, including small businesses, rural telephone companies, and businesses owned by members of minority groups and women.”²³⁷ The Commission defines small business eligibility requirements on a service-specific basis taking into account the capital requirements and other characteristics of each particular service in establishing the appropriate threshold.²³⁸

²³² See 47 C.F.R. Section 1.2101 *et. seq.* (Part 1, Subpart Q). In 2000, the Commission clarified and amended its general competitive bidding procedures for all auctionable services. See Amendment of Part 1 of the Commission's Rules -- Competitive Bidding Procedures, WT Docket No. 97-82, *Order on Reconsideration of the Third Report and Order, Fifth Report and Order, and Fourth Further Notice of Proposed Rule Making*, 15 FCC Rcd 15293 (2000) (*modified by* Erratum, 15 FCC Rcd 21520 (2000)) (*pet. for recons. pending*).

²³³ *Id.*

²³⁴ *Id.*

²³⁵ See *Amendment of Part 1 of the Commission's Rules - Competitive Bidding Procedures, Third Report and Order and Second Further Notice of Proposed Rule Making*, 13 FCC Rcd 374, 448-49, 454-55 (¶¶ 125, 139) (directing the Bureau to seek comment on specific mechanisms relating to auction conduct pursuant to the Balanced Budget Act) ("*Part 1 Third Report and Order*").

²³⁶ See 47 U.S.C. § 309(j)(4)(D).

²³⁷ See 47 U.S.C. § 309(j)(3)(B).

²³⁸ See Implementation of Section 309(j) of the Communications Act – Competitive Bidding, PP Docket No. 93-253, *Second Memorandum Opinion and Order*, 9 FCC Rcd 7245, 7269 (¶ 145) (1994) (*Competitive Bidding* (continued....))

113. In this *Notice*, we propose rules for the 71-76 GHz, 81-86 GHz and 92-95 GHz bands to allow their use for a broad range of purposes. We do not know precisely the types of services that licensees may seek in these bands or the business models that such entities may pursue which makes it difficult to forecast the capital requirements for these particular services. Nevertheless, we note that Loea promotes gigabit wireless access as a complement or supplement to optical fiber in urban, suburban, and even rural areas for a range of uses such as internet access or backhaul to cellular or PCS towers.²³⁹ To accomplish these goals, Loea envisions the deployment of highly directional, fixed point-to-point, high millimeter wave systems that would transmit narrow beams (typically less than 0.5 degrees beamwidth) with large bandwidths (of 5 GHz) along straight paths to cover relatively short distances (of 10 miles or less).²⁴⁰ Loea also contends that the technical characteristics of such systems allow for the operation of a vast number of users and paths in any given geographical area.²⁴¹ Further, Endwave contends that high millimeter wave systems would be more cost effective than fiber, which typically costs approximately \$250,000 to \$ 1 million per mile to install in urban areas.²⁴² The record suggests that proposed fixed services provided in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands may be somewhat similar to the fixed services provided in the 39 GHz Band, and thus, we believe the capital requirements associated with these bands will be similar to the capital requirements associated with the 39 GHz band. Because of this similarity, we propose to use the same small business standards that the Commission applied in the 39 GHz proceeding.²⁴³ In the 39 GHz proceedings, we defined a “very small business” as an entity with average annual gross revenue not exceeding \$15 million for the preceding three years and a “small business” as an entity with average annual gross revenues not exceeding \$40 million for the preceding three years.²⁴⁴ We seek comment on whether it is appropriate to use the same small business standards that were used in the 39 GHz proceeding or whether a different standard should be applied. We ask that any commenters proposing different small business standards to support their proposal with specific details.

114. If we ultimately adopt our proposed small business definitions we further propose to provide small businesses with a bidding credit of fifteen percent, and very small businesses with a bidding credit of twenty-five percent. Our proposed bidding credits are set forth in the standardized schedule in Part 1

(Continued from previous page) _____
Second Memorandum Opinion and Order); see *Part 1 Third Report and Order*, 13 FCC Rcd at 388 ¶ 18 (Commission will continue a service-by-service approach to defining small businesses.).

²³⁹ See Loea Petition at 5-7; Loea Comments at 5-7.

²⁴⁰ See *id.* at 9-14.

²⁴¹ See *id.* at 12.

²⁴² See Endwave Comments at 2.

²⁴³ See Amendment of the Commission’s Rules Regarding the 37.0-38.6 GHz and 38.6-40.0 GHz Bands, *Report and Order and Second Notice of Proposed Rule Making*, 12 FCC Rcd 18600, 18662 ¶ 150 (1997). Currently, these special small business size standards are being coordinated with the U.S. Small Business Administration.

²⁴⁴ *Id.* See also 47 C.F.R. § 101.1209.

of our Rules.²⁴⁵ We believe that these bidding credits will provide adequate opportunities for small businesses to participate in the auction.²⁴⁶

115. In developing these proposals, we acknowledge the difficulty in accurately predicting the market forces that will exist at the time these frequencies are licensed. Thus, our forecasts of types of services that will be offered over the 71-76 GHz, 81-86 GHz and 92-95 GHz bands may require adjustment depending upon ongoing technological developments and changes in market conditions. For these reasons, we invite interested parties to submit detailed information on the factors that may affect the capital requirements of the possible services that could be provided in the band. Such factors include the types of system architectures, equipment availability, and market conditions.

116. We also seek comment on whether these small business proposals are sufficient to promote participation by businesses owned by minorities and women, as well as rural telephone companies. To the extent that commenters propose additional provisions to ensure participation by minority-owned or women-owned businesses, they should address how such provisions should be crafted to meet the relevant standards of judicial review.²⁴⁷

c) Application Processing

117. As noted previously, the 71-76 GHz, 81-86 GHz and 92-95 GHz bands allocation includes fixed and mobile service. Based on the record before us, we believe the technologies that will be employed primarily will be fixed broadband in nature.²⁴⁸ Accordingly, we propose to license these new services under Part 101 of our Rules. We recognize and anticipate that new technology may be developed to utilize these bands. Future technologies may blur both technical and regulatory distinctions resulting in technical and operational regulations that could inadvertently impinge on efficient spectrum use. Consequently, we seek to develop service rules that are not based on a Commission prediction of how the 71-76 GHz, 81-86 GHz and 92-95 GHz bands may ultimately be used, but instead reflect a record that enables us to establish maximum practicable flexibility. In light of these considerations, we seek comment on the following issues. Would the application of our Part 101 Rules to the 71-76 GHz, 81-86 GHz and 92-95 GHz bands be in the public interest by contributing to technological and service innovation and improving the national telecommunications infrastructure?²⁴⁹ Further, we seek comment

²⁴⁵ In the *Part 1 Third Report and Order*, we adopted a standard schedule of bidding credits, the levels of which were developed based on our auction experience. *Part 1 Third Report and Order*, 13 FCC Rcd at 403-04, ¶ 47. See also 47 C.F.R. § 1.2110(f)(2).

²⁴⁶ *Id.*

²⁴⁷ See *Adarand Constructors v. Peña*, 515 U.S. 200 (1995) (requiring a strict scrutiny standard of review for Congressionally mandated race-conscious measures); *United States v. Virginia*, 518 U.S. 515 (1996) (applying an intermediate standard of review to a state program based on gender classification).

²⁴⁸ See Loea Comments at 8-11, Boeing Comments at 1-2.

²⁴⁹ The Commission has recognized that "[f]lexible allocations may result in more efficient spectrum markets." *Spectrum Policy Statement*, 14 FCC Rcd at 19870-71 ¶ 9 (1999). As the Commission observed when it adopted service rules for the 39 GHz bands: "It is in the public interest to afford [] licensees flexibility in the design of their systems to respond readily to consumer demand for their services, thus allowing the marketplace to dictate the best uses for this band." 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*, 12 FCC Rcd 18600, 18616 ¶ 26 (1997).

on the benefits and costs, including potential interference, of such flexibility, and whether application of our Part 101 Rules is in the public interest. We seek comment on this proposal.

118. Additionally, we propose to use our Universal Licensing System (ULS)²⁵⁰ to process 71-76 GHz, 81-86 GHz and 92-95 GHz applications. ULS is the Commission's automated licensing system and integrated database for wireless services. ULS includes consolidated applications forms, which permit licensees and applicants to file applications electronically, thus increasing the speed and efficiency of the application process. All licensees filing applications and other filings using FCC Forms 601 through 605 or associated schedules must make these filings in accordance with ULS.²⁵¹ Use of ULS will permit Commission staff to process filings more efficiently and will enhance the availability of pertinent licensing information to the public. We seek comment on requiring the 71-76 GHz, 81-86 GHz and 92-95 GHz applicants to comply with our ULS processes.

D. PROCEDURAL MATTERS

1. Initial Regulatory Flexibility Analysis

119. As required by Section 603 of the Regulatory Flexibility Act, the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) of the expected impact on small entities of the proposals suggested in this document.²⁵² The IRFA is set forth in Appendix A. Written public comments are requested on the IRFA. In order to fulfill the mandate of the Contract with America Advancement Act of 1996 regarding the Final Regulatory Flexibility Analysis, we ask a number of questions regarding the prevalence of small businesses in the affected industries.

120. Comments must be filed in accordance with the same filing deadlines as comments filed in this *Notice*, but they must have a separate and distinct heading designating them as responses to the IRFA. The Commission's Consumer Information Bureau, Reference Information Center, SHALL SEND a copy of this *Notice*, including the IRFA, to the Chief Counsel for Advocacy of the Small Business Administration in accordance with Section 603(a) of the Regulatory Flexibility Act.²⁵³

2. Paperwork Reduction Analysis

121. This *Notice* contains either a proposed or modified information collection. As part of our continuing effort to reduce paperwork burdens, we invite the general public and the Office of Management and Budget ("OMB") to take the opportunity to comment on the information collections contained in this *Notice*, as required by the Paperwork Reduction Act of 1995.²⁵⁴ Public and agency

²⁵⁰ Biennial Regulatory Review -- Amendment of Parts 0, 1, 13, 22, 24, 26, 27, 80, 87, 90, 95, 97, and 101 of the Commission's Rules to Facilitate the Development and Use of the Universal Licensing System in the Wireless Telecommunications Services, WT Docket No. 98-20, Amendment of the Amateur Service Rules to Authorize Visiting Foreign Amateur Operators to Operate Stations in the United States, WT Docket No. 96-188, RM-8677, *Report and Order*, 13 FCC Rcd 21027 (1998) (*ULS Report and Order*).

²⁵¹ 47 C.F.R. § 1.913(b).

²⁵² 5 U.S.C. § 603 (1996).

²⁵³ *Id.*

²⁵⁴ See Pub. L. No. 104-13.

comments are due at the same time as other comments on this *Notice*; OMB comments are due sixty days from the date of publication of this *Notice* in the Federal Register. Comments should address:

- Whether the proposed collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility;
- The accuracy of the Commission's burden estimates;
- Ways to enhance the quality, utility, and clarity of the information collected; and
- Ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology.

122. Written comments by the public on the proposed and/or modified information collections are due ninety days after the date of publication in the Federal Register. Written comments must be submitted by the OMB on the proposed and/or modified information collections on or before sixty days after the date of publication in the Federal Register. In addition to filing comments with the Secretary, a copy of any comments on the information collections contained herein should be submitted to Judy Boley Herman, Federal Communications Commission, Room 1-C804, 445 12th Street, S.W., Washington, D.C. 20554, or via the Internet to jbherman@fcc.gov, and to Jeannette Thornton, OMB Desk Officer, Room 10236 New Executive Office Building, 725 Seventeenth Street, N. W., Washington, D.C. 20503, or via the Internet to jthornto@mb.eop.gov.

3. *Ex Parte* Rules – Permit-But-Disclose Proceedings

123. This is a permit-but-disclose notice and comment rule making proceeding. *Ex parte* presentations are permitted, except during the Sunshine Agenda period, provided they are disclosed as provided in the Commission's rules. *See generally* 47 C.F.R. §§ 1.1202, 1.1203, 1.2306(a).

4. Comment Dates

124. Pursuant to Sections 1.415 and 1.419 of our Rules, interested parties may file comments on or before **90 days from the date of publication in the Federal Register** and reply comments on or before **135 days from the date of publication in the Federal Register**.²⁵⁵ Comments may be filed using the Commission's Electronic Comment Filing System (ECFS), <http://www.fcc.gov/e-file/ecfs.html>, or by filing paper copies.²⁵⁶

125. Comments filed through the ECFS can be sent as an electronic file via the Internet to <http://www.fcc.gov/e-file/ecfs.html>. Generally, only one copy of an electronic submission must be filed. If multiple docket or rulemaking numbers appear in the caption of this proceeding, however, commenters must transmit one electronic copy of the comments to each docket or rulemaking number referenced in the caption. In completing the transmittal screen, commenters should include their full name, U.S. Postal Service mailing address, and the applicable docket or rulemaking number. Parties may also submit an electronic comment by Internet e-mail. To get filing instructions for e-mail comments, commenters

²⁵⁵ 47 C.F.R. §§ 1.415, 1.419.

²⁵⁶ *See* Electronic Filing of Documents in Rulemaking Proceedings, *Report and Order*, 13 FCC Rcd 11322 (1998).

should send an e-mail to ecfs@fcc.gov, and should including the following words in the body of the message, "get form <your e-mail address.>" A sample form and directions will be sent in reply.

126. Parties who choose to file by paper must file an original and four copies of each filing. If more than one docket or rule making number appear in the caption of this proceeding, commenters 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 (although we continue to experience delays in receiving U.S. Postal Service mail). The Commissioner's contractor, Vistrionix, Inc., will receive hand-delivered or messenger-delivered paper filings for the Commission's Secretary at 236 Massachusetts Avenue, N.E., Suite 110, Washington, D.C. 20002. The filing hours at this location are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes 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 mail, Express Mail, and Priority Mail should be addressed to 445 12th Street, S.W., TW-A325, Washington, D.C. 20554. All filings must be addressed to the Commissioner's Secretary, Office of the Secretary, Federal Communications Commission.

127. Parties who choose to file by paper should also submit their comments on diskette. Such a submission should be on a 3.5-inch diskette formatted in an IBM compatible format using Microsoft Word or compatible software. The diskette should be accompanied by a cover letter and should be submitted in "read only" mode. The diskette should be clearly labeled with the commenter's name, proceeding (including the lead docket number, type of pleading (comment or reply comment), date of submission, and the name of the electronic file on the diskette. The label should also include the following phrase "Disk Copy – Not an Original." Each diskette should contain only one party's pleading, preferably in a single electronic file. In addition, commenters must send diskette copies to the Commission's copy contract, Qualex International, Portals II, 445 12th Street, SW., Room CY-B402, Washington, D.C. 20554, telephone 202-863-2893, facsimile 202-863-2898, or via e-mail qualexint@aol.com.

128. Alternative formats (computer diskette, large print, audio cassette and Braille) are available to persons with disabilities by contacting Brian Millin at (202) 418-7426, TTY (202) 418-7365 or via e-mail to bmillin@fcc.gov/oet. This *Notice* can also be downloaded at <http://www.fcc.gov/oet>.

129. For further information concerning this *Notice of Proposed Rule Making*, contact Michael Marcus, Office of Engineering and Technology, (202) 418-2418, TTY (202) 418-2989, email mmarcus@fcc.gov, or Brian O'Donnell, Policy and Rules Branch, Public Safety and Private Wireless Division, Wireless Telecommunications Bureau, (202) 418-2135, email bodonnell@fcc.gov.

130. The World Wide Web addresses/URLs that we give here were correct at the time this document was prepared but may change over time. They are included herein in addition to the conventional citations as a convenience to readers. We are unable to update these URLs after adoption of this *Notice*, and readers may find some URLs to be out of date as time progresses. We also advise readers that the only definitive text of FCC documents is the one that is published in the FCC Record. In case of discrepancy between the electronic documents cited here and the FCC Record, the version in the FCC Record is definitive.

E. ORDERING CLAUSES

131. IT IS ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this *Notice of Proposed Rule Making*, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration in accordance with Section 603(a) of the Regulatory Flexibility Act, 5 U.S.C. § 603(a).

132. IT IS FURTHER ORDERED, that pursuant to the authority contained in Sections 4, 4(i), 157, 303, 303(g), 303(r), 307 and 332(c)(7) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154, 154(i), 157, 303, 303(g), 303(r), 307, this *Notice of Proposed Rule Making* IS ADOPTED.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A: INITIAL REGULATORY FLEXIBILITY ANALYSIS

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),²⁵⁷ 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 Rule Making (Notice)*. Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments on the *Notice* provided in paragraph 124 of the item. The Commission will send a copy of this *Notice*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).²⁵⁸ In addition, the *Notice* and IRFA (or summaries thereof) will be published in the Federal Register.²⁵⁹

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

2. In this *Notice*, we examine methods to promote the development and growth of the in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands to encourage the provisions of new technologies and services to the public and encourage the larger and more effective use of wireless in the public interest. We believe that this *Notice* will set the framework for the establishment of new wireless services in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands.

3. We seek comment on the following issues under consideration in this *Notice*:

- Reallocating the 71-76 GHz, 81-86 GHz and 92-95 GHz bands in order to more fully comply with the allocations established at the World Administrative Radio Conference;
- Providing licensees in the 71-76 GHz and 81-86 GHz access to the entire spectrum to provide sufficient capacity for licensees to utilize and provide new innovative services to the public;
- Dividing the 92-95 GHz band into licensed use and unlicensed use in order to stimulate growth in the band while providing adequate protection to the Government operations in the band and to operations in the adjacent spectrum;
- Authorizing the 71-76 GHz, 81-86 GHz and portions of the 92-95 GHz under Part 101 of our Rules in order to facilitate investment capital for business;
- Whether to license the new services by geographic service areas or by site-by-site licensing;
- Licensing the spectrum to individual licensees and band managers to optimize the use of the spectrum and to provide maximum flexibility for potential licensees and new services;

²⁵⁷ 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).

²⁵⁸ See 5 U.S.C. § 603(a).

²⁵⁹ See 5 U.S.C. § 603(a).

- Proposing open eligibility, rather than imposing eligibility restrictions, to allow market forces to guide license assignment absent a compelling showing that regulatory intervention to exclude potential participants is necessary;
- Adopting a 10-year license term and providing licensees with a renewal expectancy upon establishing substantial service in order to provide a stable regulatory environment that will be attractive to investors and will thus encourage development of the spectrum; and
- Allowing licensees to partition and disaggregate their spectrum to provide an opportunity for a wide range of applicants, including small business, rural telephone, minority-owned and women-owned applicants.

B. Legal Basis

4. The proposed action is authorized under Sections 4(i), 301, 302, 303(e), 303(f), 303(r), 304 and 307 of the Communications Act of 1934, as amended, 47 U.S.C. §§ 154(i), 301, 302, 303(e), 303(f), 303(r), 304, 307.

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

5. 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.²⁶⁰ The RFA generally defines the term “small entity” as having the same meaning as the terms, “small business,” “small organization,” and “small governmental jurisdiction.”²⁶¹ In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act.²⁶² 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.²⁶³ A small organization is generally “any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.”²⁶⁴ Nationwide, as of 1992, there were approximately 275,801 small organizations.²⁶⁵

6. The Commission has not developed a definition of small entities applicable to Radio Frequency Equipment Manufacturers (RF Manufacturers). Therefore, the applicable definition of small

²⁶⁰ 5 U.S.C. § 603(b)(3).

²⁶¹ 5 U.S.C. § 601(6).

²⁶² 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.” 5 U.S.C. § 601(3).

²⁶³ 15 U.S.C. § 632.

²⁶⁴ 5 U.S.C. § 601(4).

²⁶⁵ 1992 Economic Census, U.S. Bureau of the Census, Table 6 (special tabulation of data under contract to Office of Advocacy of the U.S. Small Business Administration).

entity is the definition under the SBA rules applicable to manufacturers of “Radio and Television Broadcasting and Communications Equipment.” According to the SBA’s regulation, an RF manufacturer must have 750 or fewer employees in order to qualify as a small business.²⁶⁶ Census Bureau data indicates that there are 858 companies in the United States that manufacture radio and television broadcasting and communications equipment, and that 778 of these firms have fewer than 750 employees and would be classified as small entities.²⁶⁷ Therefore, we believe that many of the companies that manufacture RF equipment may qualify as small entities.

7. The Commission has proposed to assign licenses in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands by competitive bidding. The Commission has not yet determined how many licenses will be awarded. Moreover, the Commission does not know how many licensees will partition their license areas or disaggregate their spectrums, if partitioning and disaggregation are allowed.²⁶⁸ Therefore, the exact number of smaller licensees in these bands to which the proposed rules will apply cannot be known precisely at this time.

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

8. Equipment designed for unlicensed use will be subject to the existing requirements of Subpart J of Part 2²⁶⁹ of our Rules, which governs equipment authorization procedures. In addition, winning bidders for licensed use must submit long-form license applications through the Universal Licensing System using FCC Form 601,²⁷⁰ and other appropriate forms.²⁷¹ Licensees will also be required to apply for an individual station license by filing FCC Form 601 for those individual stations that (1) require submission of an Environmental Assessment of the facilities under Section 1.1307 of our Rules;²⁷² (2) require international coordination of the application;²⁷³ or (3) require coordination with the Frequency Assignment Subcommittee (FAS) of the Interdepartment Radio Advisory Committee (IRAC). While these requirements are new with respect to potential licensees in the 71-76 GHz, 81-86 GHz and 92-95 GHz bands, the Commission has applied these requirements to licensees in other bands.

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

9. The RFA requires an agency to describe any significant alternatives that it has considered in

²⁶⁶ See 13 C.F.R. § 121.201, NAICS Code 334220.

²⁶⁷ See U.S. Department of Commerce, 1992 Census of Transportation, Communications and Utilities (issued May 1995), NAICS category 334220.

²⁶⁸ See para. 91.

²⁶⁹ 47 C.F.R. §§ 2.901, 2.1093.

²⁷⁰ 47 C.F.R. § 1.913(a)(1).

²⁷¹ 47 C.F.R. § 1.2107.

²⁷² 47 C.F.R. § 1.1307.

²⁷³ See e.g., 47 C.F.R. § 1.928 (regarding frequency coordination arrangements between the U.S. and Canada).

reaching its proposed approach, which may include the following four alternatives: “(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 such 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.”²⁷⁴

10. We believe that the rules proposed in this *Notice* provide a flexible and efficient approach to spectrum management. To minimize any negative impact on smaller entities, however, we propose certain incentives for small entities that will be to their benefit. For example, we seek comment on licensing the spectrum to band managers that will be authorized to lease portions of their spectrum to all entities, including smaller entities, and to allow partitioning and spectrum disaggregation. These provisions will enable smaller entities, which sometimes may lack sufficient resources to bid in the auction on an equally competitive basis, to acquire smaller portions of the spectrum. The use of smaller licensing areas could also benefit small entities by reducing costs and build out expenses.

11. We also propose bidding credits for smaller entities that participate in auctions of licenses that are conducted pursuant to the rules proposed in this *Notice*. Specifically, we propose to define an “entrepreneur” as an entity with average annual gross revenues not exceeding \$40 million for three preceding years and we propose to define a “small business” as an entity with an average annual gross revenues not exceeding \$15 million for three preceding years. We believe that these small business definitions and bidding credits will help small entities compete in our auctions and acquire licenses.²⁷⁵

12. In addition, we propose to adopt a 10-year license term and provide licensees with a renewal expectancy upon establishing substantial service. We believe these provisions will provide a stable regulatory environment that will be attractive to investors and thus enable smaller entities to acquire the necessary capital to operate in the spectrum.

13. The regulatory burdens we have retained, such as filing applications on appropriate forms, are necessary in order to ensure that the public receives the benefits of innovative new services in a prompt and efficient manner and apply equally to large and small entities, thus without differential impact. We will continue to examine alternatives in the future with the objectives of eliminating unnecessary regulations and minimizing any significant impact on small entities.

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

15. None.

G. Ordering Clause

16. IT IS FURTHER ORDERED that the Commission’s Consumer & Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this *Notice for Proposed Rule Making*, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

²⁷⁴ See 5 U.S.C. § 603(c).

²⁷⁵ Currently, these special small business size standards are being coordinated with the U.S. Small Business Administration.

APPENDIX B**PROPOSED DEFINITIONS AND RULES**

1. For the reasons discussed in the preamble, the Federal Communications Commission proposes to amend 47 CFR Parts 2, 15, 97, and 101 as follows:

PART 2 -- FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

2. The authority citation for part 2 continues to read as follows:

Authority: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

3. Section 2.106, the Table of Frequency Allocations, is amended as follows:

a. Revise pages 81 through 83.

b. In the list of International Footnotes, under I., revise footnotes 5.149, 5.556, and 5.561; and add footnotes 5.559A, 5.560A, 5.561A, and 5.562A.

c. In the list of United States (US) Footnotes, revise footnotes US211, US297, and US342; remove footnote US270; and add footnotes USwww, USxxx, USyyy, and USzzz.

The additions and revisions read as follows:

§ 2.106 Table of Frequency Allocations.

* * * * *

65-94.1 GHz (EHF)

Page 81

International Table			United States Table		FCC Rule Part(s)
Region 1	Region 2	Region 3	Federal Government	Non-Federal Government	
65-66 EARTH EXPLORATION-SATELLITE FIXED INTER-SATELLITE MOBILE except aeronautical mobile SPACE RESEARCH			65-66 EARTH EXPLORATION-SATELLITE FIXED MOBILE except aeronautical mobile SPACE RESEARCH	65-66 EARTH EXPLORATION-SATELLITE FIXED INTER-SATELLITE MOBILE except aeronautical mobile SPACE RESEARCH	
5.547					
66-71 INTER-SATELLITE MOBILE 5.553 5.558 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE			66-71 MOBILE 5.553 5.558 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE	66-71 INTER-SATELLITE MOBILE 5.553 5.558 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE	
5.554			5.554	5.554	
71-74 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)			71-74 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE MOBILE-SATELLITE (space-to-Earth)		Fixed Microwave (101)
74-76 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE BROADCASTING BROADCASTING-SATELLITE Space research (space-to-Earth)			74-76 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE Space research (space-to-Earth)	74-76 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE BROADCASTING BROADCASTING-SATELLITE Space research (space-to-Earth)	
5.559A 5.561			US211 USwww USyyy	US211 USwww USyyy	
76-81 RADIOLOCATION Amateur Amateur-satellite Space research (space-to-Earth)			76-81 RADIOLOCATION	76-77 RADIOLOCATION Amateur	RF Devices (15)
				77-77.5 RADIOLOCATION Amateur Amateur-satellite	Amateur (97)

77.5-78 RADIOLOCATION AMATEUR AMATEUR-SATELLITE
--

		78-81 RADIOLOCATION Amateur Amateur-satellite	
5.560	5.560	5.560	
81-84 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY Space research (space-to-Earth)	81-84 FIXED FIXED-SATELLITE (Earth-to-space) US297 MOBILE MOBILE-SATELLITE (Earth-to-space) RADIO ASTRONOMY USzzz Space research (space-to-Earth)		Fixed Microwave (101)
5.149 5.560A	US342		
84-86 FIXED FIXED-SATELLITE (Earth-to-space) 5.561A MOBILE RADIO ASTRONOMY	84-86 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE RADIO ASTRONOMY USzzz		
5.149	US342		
86-92 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive)	86-92 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY US74 SPACE RESEARCH (passive)		
5.340	US246		
92-94 FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION	92-94 FIXED MOBILE RADIO ASTRONOMY USzzz RADIOLOCATION		Fixed Microwave (101)
5.149	US342 USxxx		
94-94.1 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) Radio astronomy	94-94.1 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH (active) Radio Astronomy	94-94.1 RADIOLOCATION Radio astronomy	
5.562 5.562A	5.562 5.562A	5.562A	

94.1-150 GHz (EHF)

International Table			United States Table		FCC Rule Part(s)
Region 1	Region 2	Region 3	Federal Government	Non-Federal Government	
94.1-95 FIXED MOBILE RADIO ASTRONOMY RADIOLOCATION 5.149			94.1-95 FIXED MOBILE RADIO ASTRONOMY USzzz RADIOLOCATION US342 USxxx		Fixed Microwave (101)
95-100 MOBILE S5.553 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE Radiolocation S5.149 S5.554 S5.555			95-100 MOBILE S5.553 MOBILE-SATELLITE RADIONAVIGATION RADIONAVIGATION-SATELLITE Radiolocation S5.149 S5.554		
100-102 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE SPACE RESEARCH (passive) S5.341			100-102 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) S5.341 US246		
102-105 FIXED FIXED-SATELLITE (space-to-Earth) MOBILE S5.341			102-105 FIXED FIXED-SATELLITE (space-to-Earth) S5.341 US211		
105-116 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) S5.340 S5.341			105-116 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY US74 SPACE RESEARCH (passive) S5.341 US246		
116-119.98 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE MOBILE S5.558 SPACE RESEARCH (passive) S5.341			116-119.98 EARTH EXPLORATION-SATELLITE (passive) FIXED INTER-SATELLITE MOBILE S5.558 SPACE RESEARCH (passive) S5.341 US211 US263		

* * * * *

INTERNATIONAL FOOTNOTES

* * * * *

5.149 In making assignments to stations of other services to which the bands:

13360-13410 kHz,	4990-5000 MHz,	94.1-100 GHz,
25550-25670 kHz,	6650-6675.2 MHz,	102-109.5 GHz,
37.5-38.25 MHz,	10.6-10.68 GHz,	111.8-114.25 GHz,
73-74.6 MHz in Regions 1 and 3,	14.47-14.5 GHz,	128.33-128.59 GHz,
150.05-153 MHz in Region 1,	22.01-22.21 GHz,	129.23-129.49 GHz,
322-328.6 MHz,	22.21-22.5 GHz,	130-134 GHz,
406.1-410 MHz,	22.81-22.86 GHz,	136-148.5 GHz,
608-614 MHz in Regions 1 and 3,	23.07-23.12 GHz,	151.5-158.5 GHz,
1330-1400 MHz,	31.2-31.3 GHz,	168.59-168.93 GHz,
1610.6-1613.8 MHz,	31.5-31.8 GHz in Regions 1 and 3,	171.11-171.45 GHz,
1660-1670 MHz,	36.43-36.5 GHz,	172.31-172.65 GHz,
1718.8-1722.2 MHz,	42.5-43.5 GHz,	173.52-173.85 GHz,
2655-2690 MHz,	42.77-42.87 GHz,	195.75-196.15 GHz,
3260-3267 MHz,	43.07-43.17 GHz,	209-226 GHz,
3332-3339 MHz,	43.37-43.47 GHz,	241-250 GHz,
3345.8-3352.5 MHz,	48.94-49.04 GHz,	252-275 GHz
4825-4835 MHz,	76-86 GHz,	
4950-4990 MHz,	92-94 GHz,	

are allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference. Emissions from spaceborne or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. S4.5 and S4.6 and Article S29).

* * * * *

5.556 In the bands 51.4-54.25 GHz, 58.2-59 GHz and 64-65 GHz, radio astronomy observations may be carried out under national arrangements.

* * * * *

5.559A The band 75.5-76 GHz is also allocated to the amateur and amateur-satellite services on a primary basis until the year 2006.

* * * * *

5.560A The 81-81.5 GHz band is also allocated to the amateur and amateur-satellite services on a secondary basis.

* * * * *

5.561 In the band 74-76 GHz, stations in the fixed, mobile and broadcasting services shall not cause harmful interference to stations of the fixed-satellite service or stations of the broadcasting-satellite service operating in accordance with the decisions of the appropriate frequency assignment planning conference for the broadcasting-satellite service.

5.561A In Japan, use of the band 84-86 GHz, by the fixed-satellite service (Earth-to-space) is limited to feeder links in the broadcasting-satellite service using the geostationary-satellite orbit.

* * * * *

5.562A Transmissions from space stations of the Earth exploration-satellite service (active) that are directed into the main beam of a radio astronomy antenna have the potential to damage some radio astronomy receivers. Space agencies operating the transmitters and the radio astronomy stations concerned should mutually plan their operations so as to avoid such occurrences to the maximum extent possible.

* * * * *

United States (US) Footnotes

* * * * *

US211 In the bands 1670-1690, 5000-5250 MHz and 10.7-11.7, 15.1365-15.35, 15.4-15.7, 22.5-22.55, 24-24.05, 31.0-31.3, 31.8-32.0, 40.5-42.5, 102-105, 116-126, 151-164, 176.5-182, 185-190, 231-235, 252-265 GHz, applicants for airborne or space station assignments are urged to take all practicable steps to protect radio astronomy observations in the adjacent bands from harmful interference; however, US74 applies.

* * * * *

US297 The bands 47.2-49.2 GHz and 81-82.5 GHz are also available for feeder links for the broadcasting-satellite service.

* * * * *

US342 In making assignments to stations of other services to which the bands:

13360-13410 kHz,	14.47-14.5 GHz,*	92-94 GHz,
37.5-38.25 MHz,	22.01-22.21 GHz,*	94.1-95 GHz,
322-328.6 MHz,*	22.21-22.5 GHz,	97.88-98.08 GHz,*
1330-1400 MHz,*	22.81-22.86 GHz,*	140.69-140.98 GHz,*
1610.6-1613.8 MHz,*	23.07-23.12 GHz,*	144.68-144.98 GHz,*
1660-1670 MHz,	31.2-31.3 GHz,	145.45-145.75 GHz,*
3260-3267 MHz,*	36.43-36.5 GHz,*	146.82-147.12 GHz,*
3332-3339 MHz,*	42.5-43.5 GHz,	262.24-262.76 GHz,*
3345.8-3352.5 MHz,*	48.94-49.04 GHz,*	265-275 GHz
4825-4835 MHz,*	81-86 GHz,	

are allocated (* indicates radio astronomy use for spectral line observations), all practicable steps shall be taken to protect the radio astronomy service from harmful interference. Emissions from spaceborne or airborne stations can be particularly serious sources of interference to the radio astronomy service (see Nos. 4.5 and 4.6 and Article 29 of the ITU Radio Regulations).

* * * * *

USwww In the band 74-76 GHz, stations in the fixed, mobile and broadcasting services shall not cause harmful interference to stations of the Federal Government fixed-satellite service.

USxxx In the band 92-95 GHz, Federal and non-Federal users may operate low power, unlicensed devices. In the band 92-92.3 GHz and 93.2-94.1 GHz, Federal assignments shall operate on a primary basis. In the bands 92.3-93.2 GHz and 94.1-95 GHz, non-Federal licensed systems shall operate on a primary basis and Federal assignments may operate on a secondary basis, except that Federal assignments at the following military installations shall operate on a primary basis: [NTIA will supply the list of large military installations prior to the adoption of the Report and Order].

USyyy The band 75.5-76 GHz is also allocated to the amateur and amateur-satellite services on a secondary basis until January 1, 2006.

USzzz In the bands 81-86 GHz, 92-94 GHz, and 94.1-95 GHz, the radio astronomy service shall not receive protection from other allocated services, except within the maximum coordination distances listed for the following radio astronomy observatories.

Telescope and site	150 kilometer (93 mile) radius centered on:	
	North Latitude	West Longitude
National Radio Astronomy Observatory (NRAO), Robert C. Byrd Telescope, Green Bank, WV	38° 25' 59"	79° 50' 24"
NRAO, Very Large Array, Socorro, NM	34° 04' 44"	107° 37' 06"
University of Arizona 12-m Telescope, Kitt Peak, AZ	31° 57' 10"	111° 36' 50"
BIMA Telescope, Hat Creek, CA	40° 49' 04"	121° 28' 24"
Caltech Telescope, Owens Valley, CA	37° 13' 54"	118° 17' 36"
Five Colleges Observatory, Amherst, MA	42° 23' 33"	72° 20' 40"
Haystack Observatory, Westford, MA	42° 37' 23"	71° 29' 19"
James Clerk Maxwell Telescope, Mauna Kea, HI	19° 49' 33"	155° 28' 20"
NRAO, Very Long Baseline Array Stations	25 kilometer (15.5 mile) radius centered on:	
	North Latitude	West Longitude
Brewster, WA	48° 07' 52"	119° 41' 00"
Fort Davis, TX	30° 38' 06"	103° 56' 41"
Hancock, NH	42° 56' 01"	71° 59' 12"
Kitt Peak, AZ	31° 57' 23"	111° 36' 45"
Los Alamos, NM	35° 46' 31"	106° 14' 44"
Mauna Kea, HI	19° 48' 05"	155° 27' 19"
North Liberty, IA	41° 46' 17"	91° 34' 27"
Owens Valley, CA	37° 13' 54"	118° 16' 37"
Pie Town, NM	34° 18' 04"	108° 07' 09"
Saint Croix, VI	17° 45' 24"	64° 35' 01"

* * * * *

4. Part 15 of Title 47 of the Code of Federal Regulations is proposed to be amended as follows:

PART 15 – RADIO FREQUENCY DEVICES

5. The authority citation continues to read as follows:

AUTHORITY: 47 U.S.C. 154, 302, 303, 304, 307, 336 and 544A

6. Section 15.257 is added to Subpart C to read as follows:

§ 15.257 Operation within the band 92–95 GHz.

(a) Operation under the provisions of this section is not permitted for equipment used on aircraft or satellites.

(b) Within the 92-95 GHz band, emission levels shall not exceed the following:

(1) The average power density of any emission, measured during the transmit interval, shall not exceed $9 \mu\text{W}/\text{cm}^2$, as measured 3 meters from the radiating structure, and the peak power density of any emission shall not exceed $18 \mu\text{W cm}^2$, as measured 3 meters from the radiating structure.

(2) Peak power density shall be measured with an RF detector that has a detection bandwidth that encompasses the band being used and has a video bandwidth of at least 10 MHz, or using an equivalent measurement method.

(3) The average emission limits shall be calculated, based on the measured peak levels, over the actual time period during which transmission occurs.

(c) Limits on spurious emissions:

(1) The power density of any emissions outside the band being used band shall consist solely of spurious emissions.

(2) Radiated emissions below 40 GHz shall not exceed the general limits in Sec. 15.209.

(3) Between 40 GHz and 200 GHz, the level of these emissions shall not exceed 90 pW/cm² at a distance of 3 meters.

(4) The levels of the spurious emissions shall not exceed the level of the fundamental emission.

(i) The total peak transmitter output power shall not exceed 500 mW.

(ii) Fundamental emissions must be contained within the frequency bands specified in this section during all conditions of operation. Equipment is presumed to operate over the temperature range -20 to +50 degrees celsius with an input voltage variation of 85% to 115% of rated input voltage, unless justification is presented to demonstrate otherwise.

(iii) Regardless of the power density levels permitted under this section, devices operating under the provisions of this section are subject to the radiofrequency radiation exposure requirements specified in 47 C.F.R. §§ 1.1307(b), 2.1091 and 2.1093, as appropriate. Applications for equipment authorization of devices operating under this section must contain a statement confirming compliance with these requirements for both fundamental emissions and unwanted emissions. Technical information showing the basis for this statement must be submitted to the Commission upon request.

PART 97--AMATEUR RADIO SERVICE

7. The authority citation for Part 97 continues to read as follows:

Authority: 48 Stat. 1066, 1082, as amended; 47 U.S.C. 154, 303. Interpret or apply 48 Stat. 1064-1068, 1081-1105, as amended; 47 U.S.C. 151-155, 301-609, unless otherwise noted.

8. Section 97.303 is revised by adding new paragraph 97.303(r)(3) to read as follows:

§ 97.303 Frequency sharing requirements.

* * * * *

(r) * * *

* * * * *

(3) No amateur or amateur-satellite station transmitting in the 75.5-76 GHz segment shall cause interference to, nor is protected from interference due to the operation of, stations in the fixed service. After January 1, 2006, the 75.5-76 GHz segment is no longer allocated to the amateur service or to the amateur-satellite

Part 101 of title 47 of the Code of Federal Regulations is proposed to be amended as follows:

PART 101 – FIXED MICROWAVE SERVICES

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

AUTHORITY: 47 U.S.C. 154 and 303, unless otherwise noted.

10. Section 101.101 is amended by adding four new entries in numerical order 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
*	*	*	*	*	**
71,000-76,000	CC.....	OFS.....	.....	.....	F/M/TF
81,000-86,000	CC.....	OFS.....	.....	.....	F/M/TF
92,300-93,200	CC.....	OFS.....	.....	.....	F/M/TF.
94,100-95,000	CC.....	OFS.....	.....	.....	F/M/TF.

11. Section 101.107(a) is amended by adding four new entries in numerical order as follows:

§ 101.107 Frequency tolerance

(a)*****

Frequency (MHz)	Frequency Tolerance (percent)		
	All fixed and base stations	Mobile stations over 3 watts	Mobile stations 3 watts or less
*	*	*	****
71,000 to 76,000 \9\	0.03	0.03	0.03
81,000 to 86,000 \9\	0.03	0.03	0.03
92,300 to 93,200 \9\			
94,100 to 95,000 \9\			

9\ Equipment authorized to be operated in the 38,600-40,000 MHz, 71,000-76,000 MHz, 81,000-86,000 MHz, 92,300-93,200 MHz and 94,100-95,000 MHz bands are exempt from the frequency tolerance requirement noted in the above table.

* * * * *

12. Section 101.113(a) is amended by adding four entries in numerical order as follows:

§ 101.113 Transmitter power limitations

(a) * * * * *

Frequency band (MHz)	Maximum Allowable EIRP	
	Fixed (dBW)	Mobile (dBW)
*	*	*****
71,000-76,000	+55	+55
81,000-86,000	+55	+55
92,300-93,200	+55	+55
94,100-95,000	+55	+55

13. Section 101.147(a) is amended by adding four entries in numerical order as follows:

§ 101.147 Frequency assignments

(a) * * * * *

- 71,000-76,000 MHz \4\ \5\ \11\ \17\ \19\
- 81,000-86,000 MHz \4\ \5\ \11\ \17\ \19\
- 92,300-93,200 MHz \17\
- 94,100-95,000 MHz \17\

* * * * *

APPENDIX C
LIST OF COMMENTERS

Comments:

The Boeing Company

DMC Stratex Networks, Inc.

Endwave Corporation

Fixed Wireless Communications Coalition

Kauai Economic Development Board

The National Association of for Amateur Radio (AARL)

Pacific LightNet

The Personal Communications Industry Association, Inc.

Wireless Communications Association International

Reply Comments:

Loea Communications Corporation

**SEPARATE STATEMENT OF
COMMISSIONER KATHLEEN Q. ABERNATHY**

Re: Service Rules for Use of the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands, Notice of Proposed Rulemaking.

As technology advances and the pressure to “find” more spectrum increases, commercial and government research efforts increasingly focus on spectrum in upper bands. There was certainly a time when commercial RF interests looked askance at spectrum at 40 GHz, let alone the 70, 80, and 90 GHz bands we examine today. Innovation, technological change, and increasing encumbrances in the lower bands have driven the regulatory process to open these new bands to commercial operations. Over the past few months I have spoken often about the challenges presented by new technologies and the increasingly encumbered FCC-administered spectrum space, today’s decision is the positive outgrowth of the spectrum draught in the lower bands.

As currently conceived the 70, 80 and 90 GHz bands will use “pencil beams” of radio energy to transmit data relatively short distances between fixed sites. In many cases there could be thousands of these “hops” in a relatively small geographic area – but because of the narrow beam it is believed multiple systems can co-exist without interference. This deployment model is unlike anything we have ever seen and may require new thinking on the appropriate licensing approach.

As I have stated before, spectrum management in our age requires that we consider the full panoply of tools that Congress gave us for spectrum distribution: licensed and unlicensed, site-by-site and geographic, large and small service areas, paired and unpaired. Here I strongly believe that this new technology requires a cautious approach to the licensing question. That is, I am not prepared to tentatively conclude that an auction or even licensing is required. I am pleased that the item reflects this approach and I look forward to a full record on this issue with the type of creative thinking that new technologies may require to succeed.

Commercial operations also must share these new bands with federal government spectrum users. However, we have an obligation to ensure that our new licensees are not ultimately surprised to learn that the nature of the federal government uses in a band preclude commercial development. I understand that some of this information regarding government systems is classified, but we must find a way to protect national security while also developing the commercial spectrum resource. I look forward to working with my colleagues at NTIA to ensure the greatest transparency possible in this and other bands.

* * * * *

Thanks to Loea Communications Corporation – the party that petitioned for the rulemaking we begin today, the other innovators in the bands, and the hard work of OET and the WTB, with today’s Notice we begin to open a new spectrum frontier for the American people.

**STATEMENT OF COMMISSIONER
MICHAEL J. COPPS**

RE: In the Matter of Service Rules for Use of the 71-76 GHz, 81-86 GHz and 92-95 GHz Bands,
Notice of Proposed Rulemaking.

I want to commend the Chairman, the Wireless Bureau and OET for initiating this proceeding. Today's NPRM begins the process of commercializing around 13 GHz – or 13,000 MHz – of spectrum. We may be dealing with apples and oranges in comparing this spectrum with other bands, but that's as much spectrum as currently occupied by all AM and FM broadcasting, all the television channels, all of the CMRS spectrum, all the way up to the DBS bands. That's a lot of room to cover with one NPRM, so good work.

I'm glad that we leave this NPRM open, with few tentative conclusions. These bands are very different than most of our other bands, and we should keep our minds open. I'm particularly glad to see that we seek comments on where unlicensed operations are feasible. Unlicensed service has had great success elsewhere, and we should do our best to explore this option when we encounter new opportunities.

**SEPARATE STATEMENT OF
COMMISSIONER KEVIN J. MARTIN**

Re: Allocations and Service Rules for the 71-76 GHz, 81-86 GHz, and 92-95 GHz Bands; Loea Communications Corporation Petition for Rulemaking, Notice of Proposed Rulemaking, WT Docket No. 02-146, RM-10288

I am pleased to approve this item, which initiates a rulemaking to enable commercial use of the 71-76 GHz, 81-86 GHz, and 92-95 GHz bands. As I have previously discussed, the amount of available spectrum is ultimately limited only by technology. *See generally* Separate Statement of Commissioner Kevin J. Martin, *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*, Memorandum Opinion and Order and Further Notice of Proposed Rulemaking, 16 FCC Rcd 16043 (2001). This item is a perfect illustration of that point. The 71-76 GHz, 81-86 GHz, and 92-95 GHz bands – which have wavelengths of about three to five millimeters – have never before been used commercially, and it was previously unclear how these bands could be used. Now, commercial interests are experimenting with different uses for these bands, and this spectrum may ultimately be used commercially for high-speed wireless local area networks, broadband access systems for the Internet, point-to-point communications, and point-to-multipoint communications. I am glad that, through this rulemaking, we can enable these kinds of commercial uses.

While, at present, the Commission must regard spectrum as a scarce natural resource, I am hopeful that future technological development will reduce this sense of scarcity – by allowing us to use previously unusable spectrum bands and enabling us to use the spectrum we are already using more efficiently. Today's item only increases my optimism.