Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C.

In the Matter of	)	
	)	
The 4.9 GHz Band Transferred from	)	WT Docket No. 00-32
Federal Government Use	)	

REPLY COMMENTS OF MOTOROLA

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Motorola Inc. (hereinafter Motorola) submits these reply comments in response to the *Notice of Proposed Rule Making* in the above-captioned proceeding to adopt service rules for the 4940-4990 MHz (4.9 GHz) band.[1] As further discussed in these comments, the response to the Commission's Notice of Proposed Rule Making for the 4.9 GHz band reveals very sparse interest from the commercial-user segment. Interest from the public safety community, first voiced four years ago, continues unabated. The types of applications envisioned for commercial users can be, and are being, readily deployed in already available spectrum bands, particularly the unlicensed bands at 5 GHz. The unlicensed bands are, however, inappropriate for mission critical public safety uses. Therefore, Motorola recommends that the Commission consider fully the public safety community request to allocate this 50 MHz of spectrum specifically to public safety users. In any event, however, Motorola believes that the FCC would be ill advised to rush to auction this spectrum in the face of such a lack of interest by potential commercial spectrum users. Responsible spectrum management in this case requires a reconsideration of the Commission's proposal. The band should certainly not be licensed

without a better public record detailing potential uses. Rather than attempt to meet an arbitrary licensing deadline, Motorola recommends that the Commission further explore the most appropriate rules for this valuable spectrum, possibly through a Further NPRM.

I. Interest in Commercial Use of the GWCS Spectrum is Very Limited

As discussed in the Notice, the original auction of General Wireless Communications Service (GWCS) spectrum scheduled for May 27, 1998 was postponed due to an apparent lack of interest in the band.[2] The two years that have elapsed since that time do not appear to have made much of a difference in terms of the interest level of the commercial community.

The FCC's web site that makes available comments in its proceedings shows only 13 entries filed in the comment round of the 4.9 GHz proceeding. Of those 13 filings, only five of them represent operators who might wish to deploy a commercial service using the spectrum available in this band. These five are Global Frontiers, Inc. ("Global"), Coloma Partners, LLC ("Coloma"), The Fixed Wireless Communications Coalition ("FWCC"), The Rural Telecommunications Group ("RTG"), and the Advanced Telcom Group ("ATG").

II. Commercial Applications are Enabled in Alternate Spectrum

The main reason for the limited interest from the carrier community is most likely due to the fact that there is currently no shortage of spectrum available in which to deploy the kinds of consumer services discussed in the comments. The primary consumer

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[1] *The 4.9 GHz Band Transferred from Government Use*, WT Docket No. 00-32, *Notice of Proposed Rule Making*, FCC 00-63, released February 29, 2000 [*hereinafter Notice*].

[2] Notice at ¶ 8.

service for this spectrum described in the comments is high-speed data access for Internet applications. Global is an Internet Service Provider interested in using the spectrum to provide "a simple, economical and rapid means of downloading large files from the Internet."[3] Coloma offers proposals in its filing to make the spectrum useful "to realize the Commission's goal of enabling broadband wireless applications to serve rural and other areas that cable and DSL have thus far ignored."[4] RTG explains that its "members are eager to acquire this spectrum to expand their service offerings and coverage areas by offering voice, high speed data and wireless Internet access to rural areas of the country,"[5] and ATG is a "local Internet and telephone company."[6]

It is the feeling of at least some of the commenters, however, that the Internet access application is disadvantaged because "a service has not been available that will accommodate transmissions in the frequency range and with the bandwidths that are required."[7] In Motorola's view, the Internet access application, and other applications for the majority of commercial users, can be, and is, well accommodated in existing spectrum. This statement is supported by ample industry activity, as will be demonstrated below.

As discussed in our Comments in this proceeding, Motorola believes that the most effective use of this spectrum will take advantage of the research and development energy

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[3] Petition for Rule Making of Global Frontiers, Inc., filed November 24, 1999, page 3.

[4] Comments of Coloma, page 4.

[5] Comments of RTG, page ii.

[6] Comments of ATG, page 1.

[7] Comments of Global, page 4.

that is being devoted to the 5 GHz unlicensed bands.[8] Not only can the 5 GHz technologies be leveraged for the 4.9 GHz band, but also the 5 GHz spectrum itself, as well as other unlicensed and licensed spectrum, appears to be entirely appropriate for the types of commercial applications discussed in the comments.

In January of 1997, around the time that the original GWCS auction was postponed, the Commission made available 300 MHz of spectrum in the 5 GHz band for unlicensed use.[9] Each of the three 100 MHz segments has different antenna and power provisions, making the various segments appropriate for different services, including wireless Internet connectivity. The Commission's UNII rules also focus use primarily on broadband operations, as bandwidths below 20 MHz are penalized by power reductions.

A brief survey of industry activity confirms that parts of the U-NII band are appropriate for the applications envisioned by comments in this proceeding. Adaptive Broadband Corporation[10] discusses on their web site their "AB-Access" product, which they describe as "a broadband fixed wireless access network for Internet, data, video, and voice applications."[11] The operating specifications for the 5 GHz U-NII product show that it operates in the middle and upper U-NII bands, has a throughput of 25 Mbps per

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[8] Comments of Motorola, Section I.

[9] The U-NII band is made up of 300 MHz of spectrum at 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.725-5.825 GHz. *See* 47 C.F.R. §15.401 *et seq.*

[10] See the Adaptive Broadband site on the World Wide Web at http://www.adaptivebroadband.com

[11] An overview of the Adaptive Broadband products is located at http://www.adaptivebroadband.com/products/overview.htm

sector, and can accommodate up to 254 simultaneous users per cell sector.[12] Clearwire has what it calls "the first carrier-class fixed wireless local access product to operate in a license free spectrum."[13] The Clearwire technology operates in the 2.4 GHz unlicensed band and the radios are specified to operate over 25 miles.[14] This example demonstrates that the type of technologies and services envisioned by commenters can be, and are being, offered in other spectrum. There is no apparent reason why Clearwire, or others, could not follow this model in the 5 GHz U-NII bands as well.

To the extent that the commercial wireless Internet access services envisioned require licensed broadband spectrum, we note that there is spectrum already available or pending availability which may be deployed. For example, another 50 MHz of spectrum in the 3.5 GHz band transferred from NTIA is still pending and available for reallocation by the Commission.[15]

III. Public Safety Uses Are Not Enabled in Unlicensed Bands

Unlike the tepid interest shown by the commercial community, interest in the GWCS band on the part of the public safety community has been consistent. As recognized by the Commission in the Notice, the public safety community expended

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[12] The AB-Access U-NII product specifications are detailed at http://www.adaptivebroadband.com/products/specs/5unii.htm

[13] This statement is located at the page of the Clearwire site on the World Wide Web at which its products are described, http://www.clearwire.com/our_products.html

[14] This statement is also located at the page of the Clearwire site on the World Wide Web at which its products are described, http://www.clearwire.com/our_products.html

[15] *Amendment of the Commission's Rules with Regard to the 3650-3700 MHz Government Transfer Band*, ET Docket No. 98-237, *Notice of Proposed Rule Making and Order*, FCC 98-337, released December 18, 1998.

considerable time and expense to comply with the request from the Commission and the National Telecommunications and Information Agency (NTIA) to prepare a report on operational, technical, and spectrum requirements of Federal, State, and local public safety entities through the year 2010. Almost four years ago the Public Safety Wireless Advisory Committee (PSWAC) submitted its final report in which it recommended that "[t]he 4635-4685 MHz band should be allocated for public safety systems . . . ."[16] In the current proceeding, two of the major groups representing public safety communications interests, the Association of Public Safety Communications Officers ("APCO") and the Federal Law Enforcement Wireless Users Group ("FLEWUG") both indicated that public safety interest in the GWCS spectrum is still very much alive.

It is reasonable to explore why the public safety community is so consistently interested in this band, and why public safety applications cannot be accommodated within the existing U-NII bands. The reason is a familiar one – the mission-critical aspect of public safety communications. Unlike most commercial-user scenarios, it is often unacceptable for the public safety end-user to be subjected to a service interruption. Most commercial applications tend to focus on downloading large data files from the Internet. In such an application scenario, a severed communication link resulting from spectrum interference or congestion would be perceived as nothing more than a reduction in the average download speed. Even for a streaming video application, a severed link resulting in a pause in the video stream would be no more than an annoyance for the end user. For public safety end users, however, the consequences of a broken link can be dire. The

[16] NPRM at ¶ 25.

FLEWUG comments point to a number of public safety applications that the 4.9 GHz spectrum might be used to support. These include "imaging and real-time video…to monitor critical public safety incidents such as criminal surveillance, major fires, and prison riots."[17] In addition, "fire and emergency medical services (EMS) personnel revealed that their use of wireless data applications would increase over the next two years by as much as 400 percent."[18] In none of these applications would the expectation of a temporary loss of service be acceptable.

Users of unlicensed spectrum, however, must be prepared to cope with just such service outages due to spectrum congestion and interference. The U-NII bands in the US are secondary to government and non-government radionavigation uses, radiolocation uses, industrial, scientific and medical (ISM) uses, and, for some portions of the band, amateur radio uses. Any of these users, therefore, has priority in the spectrum over the unlicensed users. Despite this, the unlicensed bands are attracting more and more attention. If the Bluetooth technology and the applications enabled by the developers of that technology become as popular and pervasive as anticipated, spectrum congestion in the existing unlicensed bands will be even more of a concern. Because of interference resulting from primary spectrum users and anticipated widespread deployment of unlicensed devices, the unlicensed spectrum bands are simply inappropriate for public safety applications.

IV. Public Safety Needs Nationwide Access to the Spectrum

In its Petition for Rule Making, Global states that it is initially interested in the 4.9

[17] Comments of FLEWUG, ¶ 7.

GHz spectrum so that it can offer its proposed service to its customers in the Portland (Oregon) area.[19] The Rural Telecom Group and Coloma, as mentioned earlier, are interested in this spectrum to provide services to rural areas of the country.[20] ATG advocates in its comments for small license areas in order to facilitate the provision of wireless services to "less densely populated areas."[21] While these are fine goals, it appears that the only commercial plans to use the 4.9 GHz spectrum are primarily aimed at very specific geographical areas. Licensing spectrum across the US for use only in a very localized and sparsely populated geography makes little sense.

Public safety applications, however, have no such geographical restriction to their usage. While some of the proposed applications are fixed applications, like high-speed local area networks, other applications are nomadic in that they are transported either with an individual user or a group of users. For example, personal area networks ("PANs") will be used to connect public safety radios with wireless headsets, earpieces, microphones, video display devices, printers, speakers, etc. These PANs will move with each user, and will, therefore, go wherever a public safety officer must go. Wireless local area networks ("WLANs") will also be enabled in this spectrum, and such WLANs will be deployed not only in police stations, fire stations, etc., but also on the site of major disasters (earthquakes, bombings, fires, etc.) and at other incident sites, such as medical emergencies. The public safety applications, therefore, are truly unrestricted by

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[18] Comments of FLEWUG, ¶ 8.

[19] Petition for Rule Making of Global Frontiers, Inc., filed November 24, 1999, page 3.

[20] Comments of RTG, page ii, Comments of Coloma, page 4.

[21] Comments of ATG, page 3.

geography and will be used across the United States. Public safety responders must go wherever an emergency incident occurs to discharge their duty to serve and protect the entire American public.

V. Broadband Public Safety Systems are an Area of Active Discussion

There is international recognition of the importance of delivering high data rate services to public safety entities in a uniform, cost-effective manner. The most visible reflection of this fact is the formation of the new Public Safety Partnership Project which will examine how to bring "mobile broadband services to serve the public safety needs of more than 800 million citizens in North America and in the European Union (EU)." (See *Appendix I.*) This Partnership Project will be comprised initially of the US Telecommunications Industry Association (TIA), the European Telecommunications Standardization Institute (ETSI), and APCO. The Partnership Project Agreement signing is scheduled for May 22, 2000 in Washington, D.C.

In addition to this Partnership Project, there is activity currently underway at the World Radio Conference (WRC) 2000 in Istanbul, Turkey, which may lead to a future agenda item to identify globally harmonized spectrum for mobile public safety needs. This identification could include broadband, as well as narrowband and wideband applications and spectrum requirements.

VI. The Accumulated Record and Current Activity Indicate that Further Input is Needed Rather than Rushing to Auction the 4.9 GHz Band

Of utmost importance among the FCC's responsibilities is its responsibility to manage the radiofrequency spectrum. This responsibility involves weighing all available evidence in order to allocate spectrum so that the maximum benefit to society will be

achieved by its use.

It is not always the case that all available spectrum should be allocated sooner rather than later. Rather, it is best to allocate spectrum when all constituencies have had a chance to consider and debate the alternative uses of and technologies appropriate for the spectrum. More and more, the considerations that need to be taken into account are of a global nature. Manufacturers invest in technology development to enable worldwide markets. Nations and regions confer on spectrum allocations to enable these worldwide deployments in order to achieve global usage and roaming, and economies of scale for operators and consumers.

The FCC often has no choice about when it will license a particular spectrum band. It is an unfortunate reality that all too often the Commission is required by law to license spectrum before it has had the chance to perform diligently its spectrum management obligation. Fortunately, that is not the case for the 4.9 GHz GWCS spectrum. It would be very unwise, therefore, for the FCC to tie its own hands by rushing to auction in an attempt to meet an arbitrary licensing deadline when so many issues remain outstanding. Those issues include:

- What is the commercial application for the 4.9 GHz band that cannot be met in the existing unlicensed spectrum bands? Are there, as Motorola has suggested, commercial customers who require U-NII kinds of technologies for whom unlicensed spectrum could not be used? If so, what is the compelling distinction between those services and operations already allowed in other commercial bands?
- Given the interest expressed by the public safety community, what would be the most appropriate rules if 4.9 GHz spectrum were allocated for public safety use?
- What spectrum needs in terms of frequency and bandwidth will be identified by the newly formed Public Safety Partnership Project? Is the 4.9 GHz band

an appropriate spectrum target?

- What action will be taken at the ongoing WRC as regards a global public safety band?
- What are the possibilities for regional, international, or even global harmonization of the 4.9 GHz band for public safety or commercial applications?
- Assuming valid needs by both commercial and public safety users, can rules be crafted which would allow both groups to access the spectrum, or are the usage models truly mutually exclusive?

In our opinion, the most rational course of action at this time is to admit that additional information is required before allocating and licensing this band. Since no Congressionally mandated licensing deadline exists, the FCC should decline to set rules for the use of this band until that information is obtained.

VII. Summary

The 50 MHz of spectrum that is available at 4.9 GHz is potentially very useful. The limited response that the Commission received to its recent NPRM should not be taken as an indication that this spectrum is of limited use. Rather, this response reflects the fact that many outstanding questions remain about how this band should best be used. While many of the potential commercial uses can be accommodated in existing unlicensed spectrum or alternative licensed bands, some classes of use such as mission critical broadband applications cannot. The best course of action at this time would be a complete vetting of the 4.9 GHz issue, possibly through a Further NPRM.

Respectfully Submitted

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Appendix I: Public Safety Partnership Project[22]

Public Safety Partnership Project for Mobile Broadband Moves Forward

A new trans-Atlantic Public Safety Partnership Project (PSPP) for mobile broadband services in excess of 2 Mbps is on a fast track for a May 22 signing in Washington, D.C.

At the January meeting of the TIA Private Radio Section (PRS) and the TR-8 Committee on Private Land Mobile Radio, Steffen Ring, chairman of the European Telecommunications Standards Institute, Digital Advanced Wireless System (ETSI DAWS), gave a presentation. He proposed the formation of a trans-Atlantic PSPP for mobile broadband services to serve the public safety needs of more than 800 million citizens in North America and in the European Union (EU).

One of the drivers of the project is the fact that criminal activities are aided by communications technologies more advanced than those currently available to law enforcement and other public safety purposes. Critical uses include multimedia applications such as two-way imaging, real-time mobile full-motion video and wireless telemedicine (remote patient monitoring). Such applications require a large data pipe for delivery, well in excess of what is currently being developed for third-generation (3G) mobile standards.

The anticipated initial participants of the partnership include ETSI, TIA and the Association of Public-Safety Communications Officials-International, Inc. (APCO) Project 25/Project 34.

The presentation was well received by the PRS and TR-8, and on January 18 the PRS formed an Ad Hoc Public Safety Partnership Project Committee, which met by teleconference five times during the following three months.

APCO Project 34 has produced an excellent statement of requirements regarding future high-speed applications and services which ETSI DAWS reviewed and found to have a very high degree of commonality with the European requirements. Because the PSPP will be formed prior to the development of any standards on either side of the Atlantic, no technology or spectrum for the PSPP has yet been identified.

The trans-Atlantic PSPP will produce common requirements specifications and common technical specifications that in turn will be transposed into regional standards (initially ETSI and TIA standards). One result will be a harmonized standard for broadband terrestrial mobility applications and services driven by common scenarios and spectrum allocations. The Partnership Project Agreement (PPA) and Working Procedures Document (WPD) are currently being edited on both sides of the Atlantic and are patterned after the highly successful models of the Third Generation Partnership Projects (3GPPs).

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[22] http://www.tiaonline.org/pulse/text/pspp.htm

The ETSI Board of Directors approved the PSPP in principle at its March 29-30 meeting, and the ETSI General Assembly, at its April 4-5 meeting, empowered the ETSI Board to approve a final draft PPA with TIA. The PSPP was also well received by the TIA Wireless Communications Division at its March 15 meeting, with guidance given to ensure that PSPP funding was fully considered from the beginning, in light of some of the unforeseen challenges presented by funding the 3GPPs.

A well-received PSPP presentation was also made at the meeting of the Telecommunications Standards Advisory Council of Canada (TSACC) on March 15. Canada expects initially to participate in PSPP as an observer. Although the initial standards development organization (SDO) partners of PSPP will be ETSI and TIA, the door will be open for other SDOs from regions such as Asia and the Americas to join PSPP in the future.

The signing of the PPA has been tentatively scheduled for the TIA Washington office on Monday, May 22, which precedes the Washington, D.C, American National Standards Institute-EU meetings, May 23-25. ETSI Director-General Karl-Heinz Rosenbrock is expected to be a part of the EU delegation. A PSPP conference, primarily targeted toward public safety entities in the greater Washington, D.C. area, is being scheduled for Thursday, May 25, 2000. Other educational events will be subsequently scheduled on both sides of the Atlantic to ensure that all public safety participants are fully aware of and involved in the PSPP.