

Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D. C. 20554

In the Matter of)
))
Unlicensed Operation in the Band 3650 – 3700 MHz) ET Docket
No. 04-151)
))
Additional Spectrum for Unlicensed Devices) ET Docket No. 02-380
Below 900 MHz and in the 3 GHz Band)
))
Amendment of the Commission’s Rules With) ET Docket No. 98-237
Regard to the 3650-3700 MHz Government)
Transfer Band)

PETITION FOR RECONSIDERATION OF WiMAX FORUM

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I. EXECUTIVE SUMMARY

In the *Notice of Proposed Rulemaking* in this proceeding¹ the Commission sets forth its intentions to rapidly facilitate low cost access to the 3650 MHz band to enable service providers to introduce “a variety of new wireless broadband services and technologies, such as WiMAX”² to the American public, especially in rural areas. In the recently published Rulemaking, the FCC proposes new rules to “provide for nationwide, non-exclusive licensing of terrestrial operations, utilizing technology with a contention-based protocol, in the 3650 MHz band.”³ The proposed rules for this band impose upon all licensees “the mutual obligation to cooperate and avoid harmful interference to one another.”⁴

The WiMAX Forum supports and commends the objectives that the FCC seeks to accomplish in the 3650 MHz Band Order. Specifically, the WiMAX Forum supports the Commission’s recommendations in application to Rural Services Areas (RSA) and other “less congested” areas to license on a non-exclusive but registered basis. However, the Forum believes that in these areas there is no need to specify a contention-based protocol and that such a protocol will be problematic and spectrally inefficient when applied across multiple, non-interoperable technologies (including WiMAX and other.)

¹ In the Matter of Unlicensed Operation in the Band 3650 – 3700 MHz; Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz Band; and Amendment of the Commission’s Rules With Regard to the 3650-3700 MHz Government Transfer Band, ET Docket Nos. 04-151, 02-380, 98-237, *Notice of Proposed Rulemaking*, rel. Apr. 23, 2004 (“*3650 MHz Band NPRM*”).

² *3650 MHz Band Order* at 2.

³ *3650 MHz Band Order* at 2.

⁴ *3650 MHz Band Order* at 7, 11. Section 90.1319(a) of FCC’s new rules provides: “Channels in this band are available on a shared basis only and will not be assigned for the use of any licensee.” *Id.* at 44.

II. INTRODUCTION

The WiMAX Forum™ applauds the efforts of the Federal Communications Commission (FCC) to promote the deployment of broadband services by allocation of 50 MHz of spectrum from 3650-3700 MHz for wireless broadband services.⁵ As the world's leading organization promoting global standardization for, and adoption of, metro-scale wireless broadband, the WiMAX Forum shares the FCC's appreciation and acknowledgement that wireless broadband is a fast and effective means for communities and organizations, whether private or public, to bridge the "Digital Divide."

Recent research shows that the U.S. is making great strides in terms of broadband penetration, now up to 56.29% among active Internet users as of February 2005.⁶ However, this positive data is tempered by a recent study by the ITU indicating that, in global rankings, the U.S. has fallen to 16th place in terms of subscribers per 100 inhabitants.⁷ This represents a fall from the widely reported 11th position in 2004. These are numbers that should concern each and every American, since broadband access and adoption is central to economic development and competitiveness in today's global marketplace. It is not hyperbolic to assert that lack of high quality broadband access, much less choice between multiple providers, puts individual communities at great risk with direct negative effect on education, local industries, and the tax base.

Furthermore, rural Americans are less likely to have broadband access than their suburban and urban peers. The WiMAX Forum, like the FCC, is actively and aggressively working to improve broadband availability,

⁵ *In the Matter of Unlicensed Operation in the Band 3650 - 3700 MHz*, Report and order and Memorandum opinion and order, ET Docket No. 04-151, FCC 05-56 (March 10, 2005) ("*R&O*").

⁶ Ipsos Insight, "Face of the Web Survey," March 2, 2005.

⁷ ITU New Broadband Statistics for January 2005.

<http://www.itu.int/osg/spu/newslog/ITUs+New+Broadband+Statistics+For+1+January+2005.aspx>

services, and options for residential, business, and civic entities in these areas. It is in this spirit that we offer this Petition for Reconsideration.

The WiMAX Forum believes the reconsideration defined herein represents a common sense approach that will most expeditiously satisfy the goal of the Report and Order, which is to advance “rapid expansion of broadband services -- especially in America’s rural heartland.”⁸ Based upon the long-standing relationships of our equipment supplier members with U.S.-based Wireless ISPs (WISPs), the Forum regards WISPs as the most willing service providers to fill the broadband void in rural markets where there are limited – and sometimes no -- choices for broadband access.

The WiMAX Forum does not, in its reconsideration, make recommendations as to how to handle the “more congested” urban and high density suburban areas. That said, we welcome future interaction with the FCC to expeditiously develop recommendations for these areas. We will comment that in more congested areas, broadband availability largely exists (albeit with gaps), with most consumers facing one or two wireline (DSL or cable) broadband service provider choices. Any new entrant to these markets must be able to provide service levels as good or somehow differentiated from the existing wireline offerings. The WiMAX Forum asserts that for these areas, any new operators must be able to offer reasonable quality of service (QoS) in order to be competitive. We do not believe that a contention protocol can provide this required QoS.

Finally, the WiMAX Forum wishes to emphasize that our proposed reconsideration is entirely technology neutral, and as such it does not promote or reward any standard or proprietary approach over another, including WiMAX Forum Certified™ solutions. It does, however, leverage the expertise, experience, and opinions of the WiMAX Forum members, whose supplier members constitute over 80% of all last mile wireless

⁸ FCC Report and Order, FCC 05-56. Section III, paragraph 15.

broadband equipment installed into today's marketplace and whose operators represent wireless broadband market leaders.⁹ We believe the views of our members are relevant for consideration since the Report and Order made it clear that the Commission is looking for the broadband wireless industry to collaborate on a solution.

III. COMMENTS AND RECONSIDERATION

In the following sections, we provide comments on the Report and Order for the following topics:

- 1) registration requirements,
- 2) licensing, and
- 3) power limits.

A. Fixed and Base Station Registration Benefits

The WiMAX Forum favors a number of aspects of the Report and Order. In particular, we enthusiastically support the registration requirement in its entirety. We find the benefits of Fixed and Base Station registration to be several fold:

- It enables the FCC to track operators and transmitters to ensure that the incumbent fixed satellite earth stations are protected.
- It removes the burden of consumer devices, such as cordless phones, thus eliminating a major source of potential interferers. This alone will improve the performance environment for operators.
- It promotes compliance to the rules (e.g. power limitations) since operators will be compelled to make an auditable record of their presence.
- It allows operators to identify each other, providing efficient opportunity for non-exclusive operators to cooperate.
- It provides the FCC and academia with a simple means of accurately tabulating and analyzing deployments by region, by subscriber uptake,

⁹ A full list of current WiMAX Forum members can be viewed at www.wimaxforum.org.

and other important metrics that today are largely left to educated guesswork.

While the details of the actual registration mechanisms and process were not defined in the Report and Order, the registration requirement alone represents a major improvement for operators, and hence, consumers in light of unlimited, non-exclusive licensees. It promotes an environment of professionalism and cooperation.

B. Licensing

1. Less Congested Areas

The WiMAX Forum supports the FCC's non-exclusive license approach for rural markets and less congested areas. For the purposes of this reconsideration, the Forum defines "Less Congested Areas" and "More Congested Areas" as follows:

Less Congested Areas – Rural Services Areas (RSAs) plus Metropolitan Statistical Areas (MSAs)¹⁰ which fall below a certain straight population measure. We would be hesitant to use average population density, for example, as our members have noted some potential issues with using such a density measure. For example, RSA 204 only has a population of 190,000 but due to small land area, it has a density of 724 people per square mile and would be the 23rd ranked MSA/RSA by a measure of population density. Similarly, MSA 2 has a population of over 15 million and is the 2nd highest ranked MSA/RSA when ranked by population; however, when ranked in terms of population density is 59th. The Forum will not, at this time, recommend a specific straight population measure as further analysis of MSA population characteristics is warranted.

More Congested Areas -- in our discussions, we considered a definition of "More Congested Areas" as the top N MSAs where $50 < N < 100$. With such a possible definition, "Less Congested Areas" would be defined to be the remaining areas.

¹⁰ DA 92-109 (January 24, 1992), 7 FCC Rcd 742 (1992).

For Less Congested Areas where broadband availability is comparatively limited, a non-exclusive license strategy keeps barriers to entry for WISPs low. We also believe the likelihood of unmanageable interference is low in these areas as a simple function of economics: the pool of available customers is too small to support many broadband service providers. In fact, the Forum believes the FCC's approach can immediately go forth without contention protocols under the assumption that no more than 2-3 operators would find it commercially attractive to deploy a network in the same Less Congested Area. In addition, operators can resolve possible contention issues by contacting the other operators in the area. The Forum believes that the use of the registration service will allow operators to identify other operators using the same spectrum and then resolve possible interference issues.

Furthermore, the WiMAX Forum agrees with the FCC that non-exclusivity in Less Congested Areas be applied to any number of licenses for any given location with allowances for operators to license any number of locations. Each non-exclusive licensee should have access to the entire 50 MHz of spectrum.

2. More Congested Areas

By definition, these areas have much higher populations, translating into a much higher pool of available customers. This pool increases the likelihood that numerous operators will be attracted to these markets, which results in much higher probabilities for interference in these regions than in Less Congested Areas.

In these areas, typical residential and business consumers have one or two options for broadband access service – more specifically, they can receive broadband service from their local telecom operator (DSL) and/or their local cable provider (cable modem.) Thus, the issue before the FCC is not the base level concern of making broadband access available in the first place, as is

the case in rural America. Rather, the issue before the FCC should be to satisfy the next level priority: competition to foster consumer choices beyond the existing wireline choices and/or wireless augmentation of these wireline services to ensure that consumers have at least two options for broadband access. As stated earlier, the Forum believes that only services that offer reasonable QoS can compete with the existing wireline services which are inherently isolated from potential interferers. That stated, the WiMAX Forum does not believe that a contention protocol, as described in the Report and Order, will result in sufficiently high confidence levels for longer term QoS of services in this band. Such a lack of confidence could negatively impact capital investment for significant deployments.

Also as stated earlier in the Introduction, the WiMAX Forum provides these comments in the absence of a recommendation for how to handle licensing in More Congested Areas.

3. Summary Comments on Licensing

In support of the clear goal of the Commission to promote rural deployments, we see nothing in our reconsideration which conflicts with this goal. Our tailored approach strives to make effective and immediate use of the 3650-3700 MHz band in Less Congested Areas and acknowledges the realities and unique needs of More Congested Areas in an effort to best serve public interests.

C. “Contention-based” Protocol

The WiMAX Forum appreciates what the FCC set out to accomplish by requiring “industry” to implement a protocol that fosters cooperation at the RF level among co-located systems. However, for the reasons articulated in section III.B.1, the WiMAX Forum recommends the elimination of the contention protocol requirement. Consistent with the FCC report, the WiMAX Forum recommends the Less Congested Areas licenses be non exclusive and unlimited in number with the registration requirement adopted within the Report and Order.

Requirement of a protocol in this band could delay operator deployments and incur additional R&D investments by manufacturers. Utilization of the band may be delayed as industry stakeholders define, develop, test, and then implement such protocols. Such a delay runs contrary to the specific intent of the Report and Order to create a quick catalyst for bridging the digital divide. We also note that creation of a U.S.-specific protocol could diminish the ability for U.S. service providers to take advantage of “off the shelf” equipment already available and capable of operating in this band.¹¹

We thus conclude that, under the conditions proposed by this R&O, a regulatory mandated protocol is not an efficient approach to the expeditious and economically viable use of this band.

D. Power Limits and Exclusion Zones

1. Power Limits of End User Devices

¹¹ Outside the U.S., the 3400-3600 MHz band is broadly available for broadband wireless access. As such, there is presently a plethora of equipment designed to operate in this band. In many cases, the radio components integrated into these diverse solutions are capable of ranging up to the 3700 MHz frequency range; thus, minimal system-level changes would be required to enable equipment operation in the 3650-3700 MHz band.

Whereas the Report and Order allows for significant base station power (as compared to part-15, for example), many of our members have expressed grave concern concerning the power levels for the fixed or mobile subscriber station. We believe these levels must be increased to enable sufficient link budget for indoor or nomadic end user devices to communicate back to a base station located (potentially) several kilometers away. Specifically, that the mobile power limit as indicated in § 90.1321 (c) be increased to 5 watt/25 MHz EIRP. We believe that the existing limit of 40 milliwatts in any one-megahertz slice of spectrum is burdensomely low and not necessary given the addition of the signal strength limit, the existing rules to protect grandfathered satellite earth stations and Federal Government radiolocation facilities, and RF exposure requirements found in Sections 1.1307(b), 2.1091 and 2.1093 of the Commission's Rules.

2. Exceptions for Fixed Point-to-Point (PtP) Devices / Links

We also encourage the FCC to apply rules similar to those found in part-15, § 15.247 (b) 4 ii "Operation Within the band 5.725-5.825 GHz," for fixed point-to-point devices in this band. These rules allow fixed PtP devices to employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

Petitioners also have concerns about the 25Watt/25MHz power limit believing it would unduly restrict PtP links especially in areas where interference concerns are much less significant.

3. Exclusion Zones for Point-to-Point Links

We are concerned that the Report and Order's negotiated entry policy creates onerous transaction costs and imposes unnecessary burdens on fixed station ("FS") operators by requiring them to strike individualized arrangements with earth station licensees absent a clear, objective interference protection framework. On reconsideration, the Commission

should extend the well-established Part 101 coordination rules to this band, thereby providing an accepted procedure and methodology for evaluating whether a fixed station may be operated within the 150 km zone surrounding a grandfathered earth station.

Please also see Appendix A for “Other Technical Comments.”

IV. CONCLUSION

In conclusion, the WiMAX Forum strongly supports and commends the objectives of the FCC for the 3650-3700 MHz band, and offers the following comments in an effort to assist the FCC in achieving them:

- We fully support the fixed and base station registration requirements as a method for improving sharing of this spectrum by operators;
- We would like to see the recommendations in this Reconsideration enable immediate use of the band in Less Congested Areas without the requirement of a contention protocol;
- We are ready to have further discussions with the FCC regarding how to enable use of this band in More Congested Areas, again without what we believe would be a problematic and potentially very spectrally inefficient contention protocol. We are eager to work collaboratively with the industry to expeditiously address this issue based upon the responses during the current reconsideration and following reply periods;
- It is critical for metropolitan (vs. local) area networks that the mobile power limit – which could apply to portable indoor modems and laptops -- as indicated in § 90.1321 (c) be increased to 5 watt/25 MHz EIRP;
- We ask the FCC to explore power limit considerations for Point-to-Point links in general, and in particular within the exclusion zones for FSS Earth Stations.

Respectfully submitted

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The WiMAX Forum is an industry-led, non-profit corporation formed to promote and certify compatibility and interoperability of broadband wireless products. Our membership, comprised of over 300 broadband wireless access service providers, manufacturers, component suppliers and ecosystem players, supports the industry-wide acceptance of the IEEE 802.16* and ETSI HiperMAN* standards for Metropolitan Area Networks (MANs). For more information, please visit www.wimaxforum.org.

Appendix A: Other Technical Comments

In this Appendix, the Forum provides other technical comments as was discussed during our meetings to support the scenario proposed by this Reconsideration.

The following notes relate to non-exclusive licensed use in Less Congested Areas:

- 1) Flexible channel sizes with the assumption that each non-exclusive licensee has access to the entire 50 MHz.
- 2) No maximum antenna height for fixed subscriber stations or fixed base stations.
- 3) Limit of 47 dB μ V/m signal strength limit at MSA boundaries. Different rules may apply in certain exclusion zones and near international borders.
- 4) Spectrum mask: equipment will attenuate the power below the transmitter power (P) by at least 43+log₁₀(P) dB on any frequency outside the edges of the 3650-3700 MHz band.
- 5) Before transmission could occur, a mobile station or a fixed subscriber station -- including those operating in mobile-to-mobile mode, or subscriber to subscriber mode -- would be required to positively receive and decode an enabling signal transmitted by a base station. Airborne operations by mobile/portable stations is prohibited.
- 6) For multiple beam antennas, the aggregate power transmitted simultaneously on overlapping beams will have to be reduced such that the EIRP in the area of overlap does not exceed the limit for a single beam. Systems using multiple beam antennas will be allowed to operate with an aggregate transmit output power transmitted simultaneously on all beams of up to 8 dB above the limit for an individual beam.