

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

In the Matter of)
)
WIRELESS BROADBAND ACCESS TASK)
FORCE SEEKS PUBLIC COMMENT ON ISSUES)
RELATED TO COMMISSION'S WIRELESS) GN Docket No. 04-163
BROADBAND POLICIES)
)
To the Commission:)
)

Via the ECFS

COMMENTS OF IEEE 802.18

IEEE 802.18¹ hereby respectfully offers its Comments² in the above-captioned Proceeding.

The members of the IEEE 802.18 that participate in the IEEE 802 standards process are interested parties in this proceeding. IEEE 802, as a leading consensus-based industry standards body, produces standards for wireless networking devices, including wireless local area networks (“WLANs”), wireless personal area networks (“WPANs”), and wireless metropolitan area networks (“Wireless MANs”).

IEEE 802.18 is an interested party in this Proceeding and we appreciate the opportunity to provide these comments to the Commission.

¹ The Radio Regulatory Technical Advisory Group (“RR-TAG”) within the IEEE 802 Local and Metropolitan Area Networks Standards Committee (“IEEE 802” or the “LMSC”)

² This document solely represents the views of IEEE 802.18 and does not necessarily represent a position of either the IEEE or the IEEE Standards Association.

IEEE 802.18 COMMENTS ON THE FCC'S BROADBAND ACCESS TASK FORCE QUESTIONS

(Throughout this document, the questions asked by the Task Force will be in *italics* and the response will be in normal font and indented.)

“1. *To what extent are both licensed and unlicensed wireless broadband networks providing an alternative facilities-based platform to other broadband services, including cable and DSL?”*

Wireless Broadband Networks provide service in areas where cable and DSL is not available. Where cable and DSL services are available, both licensed and unlicensed wireless networks are providing competitive alternatives and even being used by the cable and DSL providers to extend the footprint of their existing services.

As spectrum becomes more crowded – choices are made to use licensed spectrum for point to point and backhaul as alternative to unlicensed spectrum where interference must be accepted. However, more widespread adoption of wireless access technology has been hampered by a lack of affordable backhaul particularly in rural areas.

“To what extent have wireless broadband service providers increased broadband access and competition in rural and underserved areas? If so, are regulatory changes needed to promote or advance these trends?”

Wireless broadband service providers have made great strides in providing broadband access in rural underserved areas. As far as competition, these networks are more commonly an alternative where cable and DSL broadband is not available. Regulatory developments should also consider and address the needs of the broadband wireless access providers for affordable, high capacity backhaul.

The competition between wireless and Cable/DSL providers is less likely in rural areas than competition between wireless broadband providers. The setting for increasing competition between wired and wireless services could be predominately in suburban and urban areas.

“2. Does the Commission currently provide sufficient spectrum suitable for wireless broadband networks? Is the relative availability of spectrum for licensed services or unlicensed devices appropriate? If not, how so?”

The currently available spectrum is suitable for use primarily in Urban and Suburban areas. However, the propagation characteristics of the current license exempt spectrum bands and power limits are not sufficient to economically cover rural areas. Additionally, there is likely to be an exponential increase in the use of wireless broadband equipment as the price decreases and the technology becomes more mainstream.

As additional spectrum is considered for broadband wireless networks, worldwide harmonization should be sought for economies of scale and global utilization of wireless equipment. Nationally unique allocations normally result in higher costs to the consumer and lead to lengthy international sharing discussions.

Recent developments in the spectrum reform have greatly increased the availability of unlicensed spectrum but in isolation this may not be sufficient. Access to unlicensed spectrum minimizes entry barriers for potential operators. The availability of unlicensed spectrum should be balanced with licensed spectrum. Therefore, more spectrum for licensed services would be beneficial.

“3. Do the services offered using unlicensed devices and those using licensed networks complement each other? If so, how?”

Advancements are being made by industry to take advantage of ultimate compliments, a few examples are:

- Devices may be able to make decisions on which spectrum (licensed or unlicensed) is best for the current application and the required availability. The device could then make the change automatically. E.g., a deterministic guarantee for QoS is one such application with additional bandwidth being accessed in an “as available” manner.

- Licensed exempt equipment is likely to be closer to the consumer. And licensed equipment is often the choice for backhaul. This creates a complementary economic relationship between the consumer and the provider.

- For an operator wanting to provide service differentiation to address varying market requirements then operation under a combination of licensed and license exempt paradigms may be appropriate. This would allow for a variety of service “grades.”

“4. There are several different regulatory approaches that determine access to the spectrum for wireless broadband service providers. Service providers using networks composed of unlicensed devices do not pay for access to the spectrum, but must not cause interference and must share the spectrum with other operators of unlicensed devices, whereas access to other spectrum is obtained through licensing after successful bidding at auction. In addition, some spectrum has been made available on a first come, first served basis. Has the method for access to spectrum affected the development of wireless technologies and the provisioning of wireless broadband services? If so, how?”

There is a specific dynamic character that needs to be addressed for wireless broadband to be successful. Potential operators must have access to spectrum when they need it and in a way that is consistent with their growing network needs and evolving services.

Unlicensed devices have made great advances due to the affordability of the solutions. The success of unlicensed WLAN/WMAN is an exemplary demonstration of the desirability and viability of license exempt service. This is largely due to the interoperability and spectrum friendliness of standards-based devices operating in unlicensed spectrum. As new spectrum becomes available some requirements should be placed on the operation of devices in terms of interoperability and spectrum friendliness with other unlicensed devices and incumbent users.

Auctioning frequencies has been the prevalent model in licensed services, e.g., the cellular phone services model, and in areas where wireless backhaul has to provide a guaranteed level of service. Broadband access through these services may be accelerated by reduced or eliminated spectrum acquisition costs.

In some cases, auctions have led to legal complications resulting in delays providing service to the public. Auctions can also lead to purchasers speculatively “banking” spectrum. These circumstances can lead to non-optimal or delayed spectrum access for new operators or the introduction of new services or technology.

First come first served licensed services may well be effective at the onset, however squatters may hold on to the rights after their services have transitioned to other means and the spectrum becomes fallow. There should be a mechanism for re-use, if not a time limit for non-use, to avoid the speculative pitfalls.

“5. Wireless broadband offers clear advantages over other broadband alternatives in terms of both portability and mobility. Do the Commission’s rules effectively provide for or account for these capabilities? Could these rules be more flexible?”

Wireless Broadband provides many benefits, especially in the area of portability and mobility. Many of the Commission’s rules and spectrum management arrangements still reflect legacy distinctions between indoor and outdoor, Fixed and Mobile, etc. Moving forward wireless technologies will blur many of these distinctions. It is important that new allocations do not carry unnecessary constraints.

“6. Are there regulatory incentives that would foster continued investment in and deployment of state-of-the-art technologies? If so, what are they? Are the incentives different for licensed services as compared with services offered using unlicensed devices?”

Rules promoting good coexistence behavior in unlicensed spectrum would provide an incentive that would foster the development of those characteristics and increase the efficiency of spectrum utilization.

The Commission should consider establishing a limited number of access rights categories to allow for different levels of regulatory protection. One example could be a lighter regulation protecting incumbents while affording a degree of protection and regulatory certainty to certain types of applications/uses relative to others with a lower regulatory status.

Allowing unlicensed devices to operate in fallow licensed spectrum, if capable of some control mechanism to protect incumbents, will further investment in cognitive radio designs.

Investment in state of the art technologies will continue to be stimulated if additional unlicensed spectrum allocations are created and higher power operation in existing unlicensed spectrum are allowed in rural settings, subject to affording appropriate protection to licensed services in any shared bands.

The regulatory framework should facilitate access to spectrum with the appropriate propagation characteristics for the intended wireless broadband services. This would provide incentives for the development and standardization of new wireless technologies in the appropriate RF spectrum region.

“7. We seek comment on the extent and nature of the deployment of wireless broadband services. For example, we are interested in data regarding market penetration rates; the geographic distribution of wireless broadband services; the extent of competition in the areas in which wireless broadband is deployed; and whether licensed services, unlicensed devices, or a combination of both licensed service and unlicensed devices are used; and the types of technologies used in the networks deployed.”

Many local government entities and private organizations are making efforts to stimulate broadband band deployment in rural and underserved and un-served areas. Wireless is often the preferred technology because of ease and timeliness of installation, relatively inexpensive deployment, and client mobility. In these cases it is often a mixed system with unlicensed internet access utilizing primitive elements of cognitive radio techniques and licensed backhaul.

“8. With the continued development of new technologies and network configurations, including mesh networks and integrated wireless broadband networks and devices that use both licensed and unlicensed spectrum, are there any rules that require review for updating or increased flexibility?”

Regulations that, for a given maximum transmit power, allow devices to take advantage of higher EIRP through the use of highly directional antennas, will allow for spectrum efficiencies by promoting frequency reuse. Additionally, in rural areas with limited spectrum usage higher powered operations may be appropriate to allow increased range.

“9. We also seek comment on the types of applications associated with wireless broadband deployment.

a. What types of applications are or will be offered over wireless broadband networks? Are they similar to the applications of the wired Internet (email and web surfing), or are other, more personalized, niche applications being developed? Do the applications differ between licensed and unlicensed networks?”

The Internet is primarily an IP based system and handles all content as data packets whether the access is wired or wireless. Given sufficient spectrum, all of the applications offered over wired internet can be made available over wireless connections. Additionally, some applications will be enhanced through the mobility offered by wireless. Wireless has a clear advantage in rural or underserved areas as it can cover relatively large areas economically with less infrastructure. Wireless can provide the same types of applications as wired broadband in these rural areas such as distance learning, e-health, e-government, as well as other services that would not be otherwise available to these communities. Wireless will also provide a competitive alternative to wired networks in urban areas with the added benefit of fast deployment, low cost and mobility.

“What is the relationship between network operators and content providers?”

Local or regional network providers can also be content providers of local and regional information. These network providers will also link to the Internet for global content.

“b. What are typically available data rates, and at what pace are they increasing?”

There is a wide range of data rates depending on applications and technologies. The demand for higher bit rates from enhanced services and applications is expected to continue increasing. Additionally, technological advances allowing such advanced services are becoming available in shorter development cycles.

“c. Is the traffic associated with wireless broadband more typically symmetric or asymmetric? Does the relative distribution of these traffic patterns affect the required bandwidth for wireless broadband systems? If so, how?”

Usage patterns for applications on wireless systems are generally similar to wired broadband. Most applications are asymmetrical, although there are applications such as VoIP and video conferencing which are symmetrical. Therefore, flexible regulations should allow for development of efficient products to maximize spectrum usage.

“d. What is the distribution of wireless broadband between fixed, mobile, and portable installations?”

The distribution of broadband access between fixed, mobile and portable installations is evolving following the natural preference for mobility. An example of this trend is telephony’s migration from fixed to predominately mobile subscribers in many parts of the world. A lack of available spectrum will be the main restraint to this trend toward mobility.

“10. While we are interested in these deployment data across larger geographic regions and on an aggregate basis, we are also interested in information about wireless broadband deployment in specific communities -- rural or urban, large or small, and in varied geographic regions. With a view toward using successful deployments as models or examples for other service providers or communities, have there been pilot or full-scale programs that have been particularly innovative or successful in terms of increasing access to broadband through wireless facilities?”

- IEEE 802.18 does not compile statistics that would permit us to respond to this question.

“11. Are there ways in which federal wireless broadband policies could facilitate better available policy options for states and municipalities? If so, how?”

- As part of a professional engineering society, IEEE 802.18 does not have a position on this.

“12. What barriers (information, infrastructure) to entry remain for WISP entrepreneurs particularly for unlicensed services? To the extent identified, how can government address these issues?”

- Backhaul infrastructure to access the Internet backbone can be cost prohibitive although wireless infrastructures are reducing these barriers through technological developments. Additionally, the cost of the actual backbone connection to the Internet is a cost barrier. In an area where wireline carriers may not be offering cable or DSL, they can still be remiss in affording other network providers access to the Internet at reasonable rates.

- The limit on power level of wireless operation in rural areas, and other unserved and underserved locations is a barrier to economical broadband service.

- Lack of spectrum with favorable propagation characteristics to support rural area coverage is a barrier. Additional spectrum should be made available under license exempt conditions.

Respectfully submitted,

/s/

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