



September 8, 2010

Julius Genachowski, Chairman
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

Re: *Unlicensed Operation in the Television Broadcast Bands, ET Docket No. 04-186; Amendment of Parts 15, 74, and 90 of the Commission's Rules Regarding Low Power Auxiliary Stations, ET Docket No. 10-24, WT Docket Nos. 08-166, 08-167; Fostering Innovation and Investment in the Wireless Communications Market, GN Docket No. 09-157*

Dear Chairman Genachowski:

The Wireless Internet Service Providers Association (“WISPA”) writes to memorialize and confirm its positions regarding changes to the TV white space rules the Commission is considering to promote fixed broadband services. WISPA also asks the Commission to reject the proposal of FiberTower Corporation and others (the “FiberTower Group”) to allocate white space spectrum for licensed backhaul services because the proposal’s legal and technical infirmities would limit if not preclude broadband access by reducing the amount of useable white space spectrum available for unlicensed point-to-multipoint services.

Access to white space spectrum for affordable fixed point-to-multipoint broadband service is extremely important if the goals of ubiquitous broadband are to be realized. Wireless ISPs (“WISPs”) have the experience, technical know-how and commitment to expeditiously launch point-to-multipoint broadband services on white spaces to promote these goals. Over the years, WISPA has participated in the Commission’s public process that opened up the white spaces and, on reconsideration, urges the Commission to adopt needed changes to the rules to ensure that the regulatory environment is conducive to affordable, efficient and flexible point-to-multipoint deployment.¹

¹ See Petition for Reconsideration of WISPA, ET Docket Nos. 04-186 & 02-380, filed March 19, 2009 (“WISPA Petition”); Consolidated Opposition to Petitions for Reconsideration of WISPA, ET Docket Nos. 04-186 and 02-380, filed May 8, 2009 (“WISPA Opposition”); Consolidated Reply to Opposition to Petitions for Reconsideration of WISPA, ET Docket Nos. 04-186 & 02-380, filed May 18, 2009 (“WISPA Reply”).

WISPA is pleased that the Commission's tentative agenda for September 23, 2010 includes adoption of a memorandum opinion and order in this proceeding. By adopting the rule changes proposed in this letter, and rejecting the FiberTower Group's ill-conceived scheme, the Commission can foster meaningful and robust deployment of broadband services to rural, Tribal, unserved and underserved areas of the country, consistent with the Commission's objectives and recommendations described in the National Broadband Plan.

The Commission Should Modify the Height and Power Rules for Fixed Devices to Promote Affordable Use of White Space Spectrum.

Base Station Antenna Height

In petitions for reconsideration, WISPA, Motorola and the IEEE urged the Commission to relax its base station antenna height restrictions to enable WISPs to serve larger areas – particularly rural and Tribal lands – by increasing the maximum permissible base station height from 30 meters to at least 100 meters.² Standing alone, and without taking into account any increase in power above the 4 Watts EIRP maximum set out in the current rules, Motorola estimates that this increase would increase the area a fixed wireless broadband provider could serve by about 350 percent.³ With the ability to cover dramatically more area with significantly less infrastructure, equipment and tower site acquisition costs, broadband service could be provided at more affordable prices, a key Commission policy objective. The proposals, as summarized below, also would ensure that incumbent stations continue to enjoy the same level of interference protection as specified in the existing rules.

As currently written, Section 15.709(a)(2) of the Commission's Rules establishes a 30-meter maximum height for base station antennas. In their petitions for reconsideration and in a recent *ex parte* letter that Motorola submitted,⁴ WISPA and Motorola proposed the following additions to the table included in Section 15.712(a) that demonstrate how the increase in base station antenna height can be implemented while continuing to provide the current level of interference protection for incumbents:

² See WISPA Petition at 13-15; WISPA Opposition at 9-10; Petition for Reconsideration of Motorola, Inc., ET Docket Nos. 04-186 and 02-380, filed March 19, 2009 ("Motorola Petition"), at 4; Petition for Reconsideration of IEEE 802.18, ET Docket Nos. 04-186 and 02-380, filed March 16, 2009 ("IEEE Petition") at 3.

³ See Motorola Petition at 4-5.

⁴ See Letter from Robert D. Kubik, Motorola, to FCC, ET Docket Nos. 04-186, *et al.*, dated August 18, 2010, at 2.

Antenna Height of Unlicensed Device	Required separation distance (km) from Digital or Analog TV (Full Service or Low Power) Protected Contour	
	Co-Channel	Adjacent Channel
Less than 3 m	6.0 km	0.1 km
3 m – Less than 10 m	8.0 km	0.1 km
10 m – Less than 30 m	14.4 km	0.74 km
30 m – Less than 50 m	20.0 km	1.3 km
50 m – Less than 75 m	24.6 km	1.7 km
More than 75m – 100 m	28.1 km	1.9 km

The benefits associated with allowing increased base station antenna height are clearly shown by the results of an actual field trial conducted by Spectrum Bridge, Inc. (“Spectrum Bridge”), which observed that:

In rural areas the antenna height rules seem unreasonable and unnecessary. Specifically, the maximum height of the base station antenna is very restrictive. Analysis of our Claudville deployment shows that with a higher antenna height, not only could a significantly greater area be covered but the link budgets (reducing NLOS situations) would have improved the overall data rates. This would have dramatically improved the cost effectiveness of using TV White Spaces for rural broadband applications (less infrastructure) by a factor of 3.⁵

Both Shure and MSTV allege that Spectrum Bridge did not provide sufficient data to determine whether its trial operations caused harmful interference.⁶ Neither of these parties, however, considered the specific rule changes proposed by WISPA and Motorola which, among other things, contain distance separation criteria that preserve the current interference protection limits for TV stations and other incumbents. Moreover, as WISPA pointed out, the Commission can adopt similar distance separation criteria to ensure protection of cable headends.⁷ WISPA urges adoption of its proposal to allow greater flexibility in base station antenna heights.

⁵ Spectrum Bridge, Inc., “Observations and conclusions from experimental deployment of TV White Space networks, June 10, 2010 (“Spectrum Bridge Report”), at 14.

⁶ See Ex Parte Comments of Shure, ET Docket Nos. 04-186 and 02-380, filed July 13, 2010; Ex Parte Comments of the Association of Maximum Service Television, Inc., ET Docket Nos. 04-186 and 02-380, filed July 16, 2010 (“MSTV Ex Parte Comments”), at 2.

⁷ See WISPA Reply at 9. WISPA stated that a similar sliding scale could be incorporated into the rule to protect cable headends from receiving unacceptable interference, a solution preferred to simply establishing a blanket protection rule predicated on 100 meters that does not account for interim base station antenna heights between 30 and 100 meters. WISPA has no objection to reducing the size of cable headend protection zones.

Subscriber Antenna Height

WISPA, Motorola and the IEEE also asked the Commission to amend Section 15.709(b)(2) to remove or reduce the minimum height for customer antennas from 10 meters to three meters.⁸ The existing rule is unnecessary and would, if maintained, add substantial cost to customer premises installation. As WISPA stated:

WISPs provide service to residences, most of which are one- or two-story dwellings that are several feet less than 10 meters above ground level and, to satisfy the height minimum, would require an estimated \$400 per location for a mast, guy wires or other supports, extra cabling and additional installation labor costs, without adding anything to the level of protection provided to incumbent spectrum users. In many cases, these costs could be entirely avoided because the best place to locate the fixed TVBD antenna system would be three meters above ground level at the roofline for a one-story residence and between three and 10 meters above ground for a two-story residence.⁹

In addition, in reversing its earlier position on which the Commission's rules were predicated, the IEEE supported reducing in the minimum height, stating that, with the use of a geolocation database to protect incumbent TV stations, "there is no longer a need for a 10-meter minimum receive antenna height requirement."¹⁰ From its trial, Spectrum Bridge found that "[i]n most cases the appropriate place to mount the antenna was on the side of a building."¹¹ WISPA observes that there does not appear to be any objection in the record to the requested reduction in the minimum CPE height limit. Moreover, if the Commission eliminates the spectrum sensing requirements altogether, the underlying basis for any height restriction also is eliminated.

Increased Power

The Commission also can afford greater deployment flexibility by increasing the maximum authorized power for fixed white space devices to 20 Watts transmitter power, subject to compliance with specified safeguards to protect incumbent stations from harmful interference. As originally proposed by WISPA:

For every 6 dB increase in power above 4 watts EIRP (+36 dBm), the TVBD transmitter would need to be twice as far from the applicable protected contour in the case of TV stations, twice as far from the "keyhole" boundary in the case of headends and twice as far from the

⁸ See WISPA Petition at 7-9; Motorola Petition at 27-28; IEEE 802 Petition at 3.

⁹ WISPA Petition at 8. See also Ex Parte Letter from Christopher Smith, CEO-in-Residence, The University of Minnesota, ET Docket No. 04-186, filed July 4, 2010, at 2 (estimating \$400 in added costs for subscriber units at 10-meter minimum and noting safety and environmental concerns with installation of taller rooftop antennas).

¹⁰ IEEE 802 Petition at 11-12. IEEE 802 correctly noted that the 10-meter minimum height "was driven by TV sensing," not wireless microphone sensing. *Id.* at 3, n.5.

¹¹ Spectrum Bridge Report at 14.

“keep-out” zone for licensed wireless microphones. In all cases, the power at which the fixed TVBD transmitter could legally operate would ensure that the same level of interference protection is being provided, meaning there would be no increase in interference to protected facilities.¹²

Thus, under this proposal, as transmitter power increases, the required distance between the white space transmitter and any co-channel incumbent entitled to protection also would increase. The increased separation distances and prohibitions on first-adjacent channel use would ensure that higher-powered unlicensed stations would not transmit near many metropolitan areas. This formula could be combined with any increases in the height of the base station to ensure that protected users enjoy the same level of protection as they receive under the existing rules.¹³

To confirm the benefits that increased power would bring, in its trial, Spectrum Bridge “could easily see that raising the power above 4W could be significant in making the solution cost effective.”¹⁴ Spectrum Bridge suggests that when “a 3rd adjacent channel is unoccupied . . . the power could be raised without increasing the risk of interference (20W seems reasonable based on the current spectral mask).”¹⁵ This is similar to a proposal advanced by the Public Interest Spectrum Coalition, which proposed variable power limits based on the amount of unoccupied spectrum between an incumbent station and the white space channel.¹⁶ Both Spectrum Bridge and PISC support requiring 12 megahertz of white space spectrum between the occupied incumbent station and any white space channel designated for higher power fixed transmission, as shown in the example below:

Ch. 17	Ch. 18	Ch. 19	Ch. 20	Ch. 21	Ch. 22	Ch. 23	Ch.24
Incumbent	No fixed TVBD	4 Watt TVBD	High-power TVBD	High-power TVBD	4 Watt TVBD	No fixed TVBD	Incumbent

The power limit for high-power use on Channels 20 and 21 would correspond to the limits contained in WISPA’s proposal – for every 6 dB increase in power above 4 Watts EIRP, the distance to the nearest co-channel incumbent station would double.¹⁷

¹² WISPA Reply at 7.

¹³ The FiberTower Group has advocated even higher power limits in connection with their proposal to license up to six white space channels for point-to-point use. WISPA’s strong opposition to this proposal is addressed below.

¹⁴ Spectrum Bridge Report at 14.

¹⁵ *Id.*

¹⁶ See Petition for Reconsideration of the Public Interest Spectrum Coalition, ET Docket Nos. 04-186 and 02-380, filed March 19, 2009, at 10-12.

¹⁷ In response to the Spectrum Bridge Report, MSTV argues that the 20 Watt power maximum would “increase the risk of interference to the reception of over-the-air television by viewers (and by multichannel video programming providers’ headends/receive facilities) as well as interference to other spectrum users and uses, such as wireless microphones.” MSTV Ex Parte Comments at 2. This assertion, however, does not account for the distance separation criteria WISPA and Motorola propose.

By incorporating proposals restricting co-channel operations (through distance separation criteria) and out-of-band emissions (through channel separation), incumbent broadcasters and cable operators would retain the full protection levels specified in the current rules. The real benefit of allowing higher power lies in the increased ability of WISPs to provide affordable broadband services to consumers in rural, Tribal, unserved and underserved areas where there is more available white space spectrum and TV stations are further apart from each other. The Commission underscored this point in the National Broadband Plan, recommending that “the FCC should proceed to consider higher-power fixed operations in rural areas, which often include Tribal lands.”¹⁸ In areas where population is sparse, safely allowing operations at increased base station heights and increased power may reduce infrastructure and equipment costs to levels that support broadband deployment.

The Commission Should Eliminate Spectrum Sensing Requirements.

A large number of parties in this proceeding urge the Commission to eliminate spectrum sensing requirements, while others cling to the belief that spectrum sensing should co-exist alongside the geolocation database to provide interference protection to wireless microphones. For reasons articulated in the record, WISPA urges the Commission to eliminate spectrum sensing requirements from its rules.

In eliminating spectrum sensing, the Commission must still determine how it will address the unauthorized use of hundreds of thousands of wireless microphones operating in white space spectrum. WISPA reiterates its position that the Commission should assign two channels in each market for *non-exclusive* use by unlicensed wireless microphones. Unlicensed wireless microphones would be required to access and register in the geolocation databases, and would have co-equal, secondary status with other unlicensed white space devices. Although fixed devices would be permitted to operate on these channels on a co-equal and non-exclusive basis, they would undoubtedly seek to avoid operating on the designated spectrum unless it were necessary to do so because of congestion or spectrum scarcity. In addition, unlicensed wireless microphones could operate in first-adjacent channels to incumbent licensees where fixed devices can not operate.

Regardless of the costs, complexity and the unproven nature of spectrum sensing,¹⁹ setting aside two channels for non-exclusive wireless microphone use obviates the need for sensing and mitigates interference. Moreover, WISPA’s proposal is more spectrally efficient than those plans that would allocate spectrum for wireless microphones on an exclusive basis. WISPA’s plan takes into account areas where there is extensive wireless microphone use as well as areas where there is limited use. Finally, WISPA’s plan legitimizes unlicensed wireless microphones by affording wireless

¹⁸ “Connecting America: The National Broadband Plan,” March 2010 (“National Broadband Plan”), at 100.

¹⁹ MSTV has questioned claims that sensing technology would be expensive to deploy. See MSTV Ex Parte Comments at 2-3.

microphone users registration rights and co-equal status with other unlicensed devices, rights they currently do not enjoy under the Commission's rules.²⁰

WISPA also reiterates its position that the Commission should not expand Part 74 eligibility for wireless microphones, but instead should authorize currently non-licensed microphone operators as Part 15 devices with a status co-equal to white space devices.²¹

“Licensed Lite” Regulatory Regime

Throughout this proceeding, WISPA has urged the Commission to adopt a “licensed lite” process for fixed TVBD devices.²² The Commission declined in the *White Spaces Order* to adopt such “hybrid” licensing rules, concluding that “although *the non-exclusive licensing approach would address the non-interference status among TV band devices*, it would not resolve the interference rights between TV band devices and other licensed users of the band.”²³ WISPA sought reconsideration of this decision.²⁴

WISPA did not and does not intend to achieve primary or secondary status for unlicensed devices via a “licensed lite” regime, but rather seeks to develop a mechanism to require “best practices” *solely among unlicensed users*. In other words, proposals to register in the database, review the database and design networks to mitigate interference would require fixed unlicensed users to take modest steps to avoid and prevent harmful interference only to other unlicensed fixed devices.

The “licensed lite” approach would be similar to the licensing regime the Commission established for the 3650 MHz Service.²⁵ An applicant would obtain a non-

²⁰ MSTV and the National Association of Broadcasters (“NAB”) allege that the recent establishment of a voluntary database in the 5 GHz band to identify potential sources of interference to Terminal Doppler Weather Radar (“TDWR”) locations supports the proposition that both spectrum sensing and a geolocation database are necessary to mitigate potential interference to broadcasters in the TV bands. See Letter from Jonathan D. Blake, Counsel to MSTV and NAB, to FCC, ET Docket Nos. 04-186 and 02-380, dated Aug. 23, 2010, at 2, n.1. They also claim that registration in the database is a “requirement.” See Letter from Jennifer A. Johnston, Counsel to MSTV and NAB, to FCC, ET Docket Nos. 04-186 and 02-380, dated Aug. 31, 2010, at 2. Reliance on the 5 GHz band database to support a white space spectrum sensing “backstop” is like comparing apples to oranges. First, registration in the database is voluntary, and was implemented as a good will gesture by industry to facilitate the certification of new transmitting devices that rely on dynamic frequency selection (“DFS”) alone to mitigate interference. Second, interference to TDWR locations is the result of illegal operations such as disabling DFS and operating at unauthorized power, not a failure of DFS such that a database is warranted as a backstop. Third, the purpose of the database is to enable the federal government to identify and eliminate certain users as the sources of interference that could result in significant harm and loss of life. See also Letter from Peter Stanforth, CTO of Spectrum Bridge, to FCC, ET Docket No. 04-186, dated June 27, 2010 (filed Aug. 27, 2010).

²¹ See presentation attached to Letter from Stephen E. Coran, Counsel to WISPA, ET Docket Nos. 04-186 and 02-380, dated April 1, 2010, at 9.

²² See, e.g., WISPA Written Ex Parte Presentation, ET Docket Nos. 04-186 and 02-380, dated October 22, 2008; WISPA Petition at 16-18.

²³ *Unlicensed Operation in the TV Broadcast Bands*, Second Report and Order and Memorandum Opinion and Order, Docket Nos. 04-186 and 02-380, rel. Nov. 14, 2008 (“*White Spaces Order*”) at ¶50 (emphasis added).

²⁴ See WISPA Petition at 16-18.

²⁵ See, e.g., Section 90.1319(d).

exclusive nationwide license from the Commission that would not confer any interference protection rights. Prior to operating a base station, the licensee would be required to register certain information about the base station into the private white space databases. Subsequent fixed users would be required to review the database to determine the location of other fixed operators and take steps to design their systems to mitigate the potential for harmful interference. Once the Commission issues the non-exclusive license, the Commission's role is complete and the databases function to enforce the use of "best practices."

There are a number of benefits to this approach. First, operators providing service would have greater assurance that their networks would not be disturbed by subsequent users. Second, newcomers would know where existing operators were providing service and would have greater assurance that the networks they design and deploy will not cause or receive interference. Third, consumers would experience more reliable broadband wireless service. Fourth, incumbent stations entitled to primary or secondary status would be better able to identify sources of interference from unlicensed devices, and eliminate potential sources, simply by consulting the databases and without any Commission intervention. Fifth, the codification of "best practices" as governed by the databases should reduce the number of interference complaints that are filed with the Commission and thereby reduce the administrative burdens placed on the Commission. The Commission should adopt WISPA's "licensed lite" proposal.

The Commission Should Reject Efforts to License White Space Spectrum for High-Power Point-to-Point Links.

The need for WISPs to gain affordable access to "middle-mile" facilities has been well documented,²⁶ and WISPA supports the Commission's initiatives to remove barriers to use of 750 megahertz of Broadcast Auxiliary Service ("BAS") and Cable TV Relay Service ("CARS") spectrum.²⁷ However, WISPA reiterates its strong objections to the grossly unbalanced proposals advanced by the FiberTower Group for its self-styled "limited" point-to-point licensing of white space spectrum. If adopted, this proposal would authorize FCC-licensed and protected users to utilize inefficient and poorly designed low-cost, low-gain point-to-point antennas at the expense of WISPs, Tribes, municipalities and others who would otherwise provide point-to-multipoint broadband services to millions of consumers who currently no have access to broadband. Moreover, the FiberTower Group ignores the "Spectrum 101" principle embodied in the *Wireless Backhaul NPRM* – that the highest-value use for low-frequency spectrum is cost-effective point-to-multipoint use, and that less scarce high-frequency spectrum (such as the BAS and CARS spectrum already allocated for backhaul) is best-suited for point-to-point use. The FiberTower Group proposal is contrary to the public interest and will

²⁶ See WISPA Comments filed in response to NBP Public Notice #11, "Comment Sought on Impact of Middle and Second Mile Access on Broadband Availability and Deployment," DA 09-2186, GN Docket Nos. 09-47, 09-51 and 09-137 (rel. October 8, 2009), dated November 4, 2009.

²⁷ See *Amendment of Part 101 of the Commission's Rules to Facilitate the Use of Microwave for Wireless Backhaul and Other Uses and to Provide Additional Flexibility to Broadcast Auxiliary Service and Operational Fixed Microwave Licensees*, Notice of Proposed Rulemaking and Notice of Inquiry, WT Docket Nos. 10-153, 09-106 and 07-121, rel. August 5, 2010 ("*Wireless Backhaul NPRM*").

harm consumers much more than the FiberTower Group would lead the Commission to believe. The FiberTower Group proposal should be rejected in its entirety.

In an ex parte letter dated May 18, 2010,²⁸ the FiberTower Group responded to WISPA's evidence showing that FiberTower's proposal for licensing up to six white space channels (*i.e.*, up to 36 megahertz) exclusively for backhaul would be inefficient and have adverse consequences on use of co-channel and adjacent-channel spectrum for unlicensed point-to-multipoint use. The FiberTower Group explained that it "is not seeking to 'reserve' or set-aside certain channels in any market."²⁹ In subsequent presentations to the Commission,³⁰ the FiberTower Group repeated its arguments and provided additional details. As WISPA demonstrates below, the FiberTower Group's proposal does not improve with repetition and, in fact, the additional information it provides serves only to confirm WISPA's concerns about the legal and technical infirmities of the FiberTower Group proposal.

The Preclusive Effects of the FiberTower Group's Proposed Licensing Scheme

The fundamental flaws and unfairness of the FiberTower Group's proposal lie not just with the denial of access to desperately needed point-to-multipoint white space spectrum in sub-3 GHz frequencies. The most serious of the fatal flaws in the FiberTower Group proposal is the protection that licensees of point-to-point links would acquire *vis a vis* other fixed white space users. As the FiberTower Group stated in an ex parte letter filed in October 2008, "[l]icensed, fixed operations would be required, at a minimum, to protect co-channel and first-adjacent channel TV broadcast stations, just as DTV broadcast stations must protect each other."³¹ *But such operations would not be required to protect fixed unlicensed point-to-multipoint operators, and fixed unlicensed operators would be required to protect licensed backhaul links.* In this regard, it is simply disingenuous for the FiberTower Group to claim that "[o]ther unlicensed or licensed uses not precluded."³² Allocating white space spectrum for licensed backhaul would require unlicensed users to provide licensed operators the same level of interference protection afforded to long-time incumbent TV stations, thereby undermining the system envisioned by the Commission. Nothing would prevent licensed point-to-point users from

²⁸ See Written Ex Parte Presentation of FiberTower Corporation, Sprint Nextel Corporation, the Rural Telecommunications Group, Inc. and COMPTel to FCC, ET Docket Nos. 04-186 and 02-380; GN Docket No. 09-51, dated May 18, 2010 ("FiberTower Group 2010 Letter").

²⁹ *Id.* at 6. The FiberTower Group recently noted its "flexibility" regarding designation of particular channels for licensing. See letters and attached presentations from Michele Farquhar, Counsel to FiberTower Group, to FCC, ET Docket Nos. 04-186 and 02-380, dated July 14, 2010, July 26, 2010 and August 24, 2010 ("FiberTower Group 2010 Presentations"), at 1. A different version was filed with the Commission on September 3, 2010.

³⁰ See FiberTower Group 2010 Presentations.

³¹ FiberTower Group Notice of Ex Parte Presentation, ET Docket Nos. 04-186 and 02-380, dated October 29, 2008 ("FiberTower Group 2008 Letter"), Attachment entitled "Proposed Technical Rules for Licensed, Fixed Use of TV White Spaces" ("FiberTower Group 2008 Letter Attachment"), at 2.

³² FiberTower Group 2010 Presentations, Attachment entitled "Licensed, Fixed Use of the TV White Spaces" ("FiberTower Group 2010 PowerPoint"), at 11.

continually licensing channels that were already in use by unlicensed operators, therefore putting unlicensed point-to-multipoint operators off the air and denying broadband service to customers who today have no broadband service.

The FiberTower Group's own words undermine its case and demonstrate the harm that its proposal would cause. In the FiberTower Group 2010 Letter, the FiberTower Group states that:

point-to-point or point-to-multipoint operations under the "licensed-lite" regime proposed by WISPA could be authorized on White Spaces channels, *subject to the normal non-interference protections afforded to licensed users when they are present and operating. . . .* Thus, from a practical perspective, point-to-multipoint services and unlicensed TVBDs would see absolutely no reduction in the amount of usable spectrum anywhere, *unless and until a fixed wireless path has actually been licensed and constructed in a given area, and the path limits operations in all of some section of that path's operating area.*³³

The exceptions swallow the rule – no responsible WISP would ever construct a wireless broadband network under these conditions, where after the investment of significant capital and deployment of service to hundreds if not thousands of consumers, a licensee can come along and simply require the unlicensed system to cease operating. This real-case circumstance is exacerbated by the FiberTower Group's proposal to not designate channels for licensing in advance, but rather to allow licensees to coordinate channel selection among other licensees and with no consideration to unlicensed users with established operations in the band. The proposed licensing scheme would enable any licensee to simply knock out a flourishing unlicensed WISP deployment because of the priority status accorded to licensed users.

No prudent WISP could afford to pretend that the best-case scenario would occur such that it would enjoy permanent operations. No trusted manufacturer would develop fixed devices if there is no opportunity for permanent deployments. No prudent investor would finance operations built on such a flimsy regulatory scheme. To the contrary, responsible and prudent WISPs likely would take the more cautious approach believing that, at some point in time, a fixed licensed user would deploy, at which time the WISP would lose their entire investment and their customers would again be without broadband service. One way or the other – through prudent non-deployment or risky deployment – this is a prescription for white spaces disaster.

Moreover, the FiberTower Group can look elsewhere to satisfy its claimed need for exclusive, licensed point-to-point operations. In the *Wireless Backhaul NPRM*,

³³ FiberTower Group 2010 Letter at 6-7 (emphases added). *See also* FiberTower Group 2010 Presentations, Attachment entitled "Proposal for Limited Licensed Point-to-Point Use of the TV White Spaces for Backhaul to Rural Areas" ("Presentations Attachment").

consistent with recommendations in the National Broadband Plan,³⁴ the Commission is proposing to allow Fixed Service operations to share 750 megahertz of higher frequency BAS and CARS spectrum for point-to-point backhaul. Indeed, the FiberTower Group itself appears to embrace this plan, as evidenced by its recent recognition of the availability of BAS spectrum and the suggestion that the Commission “license non-broadcast fixed link users in the [BAS] band.”³⁵ Certainly, using higher frequency spectrum that is already licensed for point-to-point use would be a far less disruptive and penal outcome than the preclusive result the FiberTower Group proposes.

Elevating licensed backhaul to preferred status over unlicensed users is well beyond the scope of the Commission’s objectives in crafting white space rules. The white space rules were intended to “benefit wireless internet service providers (WISPs) by extending the service range of their operations” and “allow wireless broadband providers that use unlicensed devices to reach new customers and to extend and improve their services in rural areas.”³⁶ Licensing backhaul links would turn on its head these objectives by precluding the amount of quality lower-frequency spectrum that can be used for point-to-multipoint services in favor of the desires of those that seek only to reduce the costs of point-to-point systems.

The Preclusive and Disruptive Effects of Excessive Licensed Power Limits

The FiberTower Group claims that WISPA is wrong in stating that the FiberTower Group’s proposal will create interference over an area of “hundreds of miles.”³⁷ To the contrary, it is the FiberTower Group that is misleading the Commission. An unreasonably high degree of interference will result from the combination of high power and the wide beamwidth of the low-cost antennas the FiberTower Group proposes. In the initial expression of its proposal for increased power, FiberTower stated that “[f]ixed use channels would be 6 MHz wide and align with the UHF TV channels. *Contiguous channels may be aggregated to obtain a bandwidth greater than 6 MHz.*”³⁸ The FiberTower Group presented its proposed average power limits in terms of power in a 6 MHz channel (*i.e.*, 35 dBW/6 MHz or 3,162 watts EIRP), but ignored the actual radiated power (*i.e.*, 42.78 dBW or 18,974 watts EIRP) that would be transmitted over a 36 megahertz (6 contiguous channels of 6 megahertz) aggregated channel.

By expressing power limits as in this manner, the FiberTower Group’s proposal would enable a licensee using more than one contiguous channel to operate at

³⁴ See National Broadband Plan at 95-96 (recommending revisions to Parts 74, 78 and 101 to promote increased sharing of spectrum for backhaul).

³⁵ Presentations Attachment.

³⁶ *White Spaces Order* at ¶2.

³⁷ FiberTower Group 2010 Letter at 2.

³⁸ FiberTower Group 2008 Letter Attachment at 1 (emphasis added). The FiberTower Group suggests that the interference caused by its new, licensed operations would be less than those caused by existing DTV stations. See FiberTower 2010 Letter at 3. All this argument does is illustrate that adopting the proposal will present new instances of interference, new areas where licensed operations would preclude altogether fixed unlicensed operations and new frequencies that WISPs must avoid if they are to provide service.

significantly higher power.³⁹ The FiberTower Group has not in this proceeding ever revealed its proposal in these terms, no doubt because of the obvious concerns it would present.

The FiberTower Group proposes a rule that the average power to the antenna “will be the minimum amount of power necessary to carry out the communications desired.”⁴⁰ This rule would have little or no effect on an applicant’s ability to cover great distances with extremely high power, not to mention the harmful effects of other technical problems (discussed below) that would preclude WISP deployment or would drastically limit the areas where consumers could receive fixed broadband via white space spectrum.

The Creation of Interference Under the FiberTower Group’s Antenna Proposal

The FiberTower Group’s antenna proposal would codify poor engineering practices and deny unlicensed operators the use of white space spectrum over a much wider area than simply the path between the proposed licensed endpoints.

The FiberTower Group’s proposal would dispense with the high-gain, highly-directional antenna (*i.e.*, 0.7°) characteristics normally required for licensed point-to-point operations and replace them with wide-beamwidth (*i.e.*, 24°), “low-cost,” low-gain antennas. These proposed antennas possess poor directional characteristics when contrasted with the highly directional antennas normally employed for backhaul links licensed under Part 101. As a result of these two factors, transmissions would not be confined to narrow beams, but rather would disperse over a large area, causing interference to unlicensed co-channel and adjacent-channel WISP operations along the sides and beyond the ends of the beam and overshooting far beyond both endpoints, as shown in Figure 1. The black area in Figure 1 shows the area of desired point-to-point signal coverage. The yellow area is the overshoot area of noise and interference that would result if proper high gain, narrow-beamwidth antennas were used. The orange area is the overshoot area of noise and interference that will be caused by using FiberTower’s proposed low-cost, lower gain, wide-beamwidth antennas.

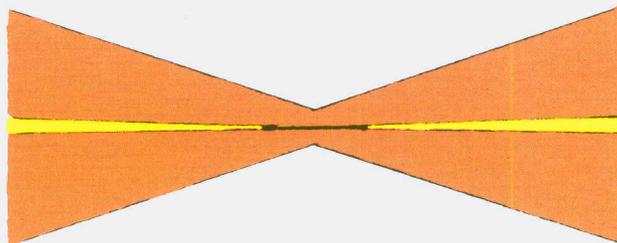


Figure 1 – Excessive Overshoot Resulting from the FiberTower Group Proposal

³⁹ As a further display of its disingenuousness, the FiberTower Group attempts to equate the rural area power limits it proposes to the BAS power limits under Section 74.602(h). See FiberTower Group 2010 Letter at 2. Under that rule, however, BAS channels are limited to 6 megahertz of bandwidth and power limits thus are not expressed as fractions, so the comparison is simply not valid.

⁴⁰ See FiberTower Group 2008 Attachment; FiberTower Group 2010 Letter at 2.

Moreover, the FiberTower Group's mountaintop wide-beamwidth antenna pattern will receive interference from co-channel users hundreds of miles away and by virtue of their secondary licensed status, licensees will enjoy interference protection from unlicensed users throughout the huge area illuminated by and seen by their low-cost wide-beamwidth antennas.

Unlicensed users on first-adjacent channels also will suffer. By proposing that fixed licensed point-to-point licensees comply with Section 101.111(a)(2)(i), the FiberTower Group seeks to protect a long list of incumbent operations,⁴¹ but noticeably missing from this list is any requirement to protect fixed unlicensed devices. Thus, in addition to every licensed channel or contiguous licensed channel block, the first-adjacent channels would likely be unavailable for WISPs and the rural and other consumers they desire to serve.

The desire for inexpensive backhaul antennas should not displace the ability of consumers in rural, Tribal, unserved and underserved areas to receive broadband or defeat the Commission's policy goals intended to promote those efforts. Nor should the Commission endorse engineering practices that rely on preclusive and inefficient spectrum use and increase the potential for harmful interference.

The Misleading Claims About Available White Space Spectrum

The FiberTower Group attempts to mislead the Commission by presenting a map purporting to show abundant available white space spectrum across the country.⁴² The map it uses to purport to show a large number of available white space channels paints an inaccurate picture of the harmful effects that the FiberTower Group's proposal will have. First, the map does not account for the fact that fixed white space devices cannot operate on channels that are first-adjacent to TV channels or are otherwise unavailable. The map at page 7 of the FiberTower Group Presentations was taken from a 2009 ex parte filing filed by Dell, Microsoft and Spectrum Bridge and shows the number of channels available for *both* fixed and personal/portable white space devices. While personal/portable devices can use channels that are first-adjacent to incumbent TV broadcasters, fixed devices can not use first-adjacent channels. Therefore, the FiberTower Group's reliance on this map vastly overstates the number of channels available to unlicensed fixed white space networks and vastly understates the harm that FiberTower's licensed backhaul proposal would do.

Second, the FiberTower Group has not indicated what channels would be subject to licensing. If the licensed channels are not aggregated, first-adjacent channels on both sides of each channel would be denied use in fixed unlicensed deployments. If all six licensed channels are aggregated (contiguous), the first adjacent channels, adjacent to the

⁴¹ See FiberTower Group 2008 Attachment at 2-4; FiberTower Group 2010 Letter at 3.

⁴² See FiberTower Group 2010 Letter at 6; FiberTower Group 2010 PowerPoint at 7-8. The FiberTower Group claims that there are 15 to 45 available white space channels lying fallow in rural areas. See *id.* at [Presentations Attachment](#); [FiberTower Group 2010 Letter at 6](#).

edges of the aggregated channel block would still face interference from the extremely high power the FiberTower Group proposes.

Third, the FiberTower Group has not shown how its high-power beams with low-cost, low-gain antennas will preclude use of both co-channel and adjacent-channel spectrum by unlicensed users. As shown in the figure above, interference over vast areas beside and beyond the backhaul path causing by the use of the FiberTower Group's poorly engineered antennas would preclude co-channel use of white space spectrum by unlicensed operators.

Moreover, WISPA is concerned that, if the Commission re-packs TV spectrum, the amount of white space spectrum available for fixed point-to-multipoint broadband will decrease. When coupled with the FiberTower Group's misleading pronouncements about the amount of "available" white space spectrum, such uncertainty creates significant questions about the short-term and long-term use of white space spectrum for unlicensed uses. Even with unlicensed spectrum some amount of regulatory certainty must exist to encourage investment, equipment and operations to proceed.

In sum, the Commission should not be misled into believing the FiberTower Group's simple use of a map showing purportedly available white space. When the absence of a spectrum plan and the presence of interference are taken into account, the availability of usable white space for fixed unlicensed operations will be substantially less than the FiberTower Group's map and statements show.

Conclusions Regarding the FiberTower Group Proposal

While the FiberTower Group seeks protected, licensed spectrum to serve the needs of mobile broadband carriers, it fails to consider the needs of millions of Americans that are today without fixed broadband service. For these consumers, fixed, unlicensed point-to-multipoint white space spectrum offers an opportunity to expeditiously receive affordable broadband service. WISPA urges the Commission to reject in its entirety the FiberTower Group's poorly conceived and preclusive proposal.

Conclusion

WISPA appreciates this opportunity to present its views as the Commission concludes its consideration of the issues in this proceeding. By adopting the views WISPA expresses in this letter and its other referenced pleadings and ex parte presentations, the Commission would be advancing the interests of consumers in rural, Tribal, unserved and underserved areas in expeditiously receiving affordable broadband service.

Please contact either of the undersigned or WISPA's counsel, Stephen Coran, at (202) 463-4310, if there are any questions.

Respectfully submitted,

/s/ Jack Unger

Jack Unger
Chair, WISPA FCC Committee
(818) 227-4220

/s/ Elizabeth Bowles

Elizabeth Bowles
President, WISPA
(501) 374-4638

cc: Commissioner Michael J. Copps
Commissioner Robert M. McDowell
Commissioner Mignon Clyburn
Commissioner Meredith Attwell Baker
Julius Knapp
Alan Stilwell
Ruth Milkman
Geoffrey Blackwell
Edward Lazarus
Rick Kaplan
Sherrese Smith
Jennifer Flynn
John Giusti
Angela Giancarlo
Charles Mathias
Louis Peraertz